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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

2,859,949, J. Willard, FORWARD DISCHARGING TRANSIT CONCRETE MIXER, **filed** Nov. 5, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–939, *R. W. Sims et al.* v. *Oshkosh Corporation.* Case dismissed on Jan. 24, 1980.

3,053,132, Lee and Golner, SHOTGUN SHELL RELOADING TOOLS; **3,134,293,** Richard J. Lee, SHELL RELOADERS; **3,343,411,** Richard J. Lee, MACHINE RESTS FOR PISTOLS; **3,343,444,** Richard J. Lee, SHOTGUN SHELL RELOADING IMPLEMENTS; **3,550,482,** Richard J. Lee, INTEGRAL CHAMFERING TOOL; **3,555,641,** Richard J. Lee, TRIMMING TOOL FOR CARTRIDGE CASES; **3,555,950,** Richard J. Lee, CARTRIDGE PRIMER; **3,580,127,** Richard J. Lee, CARTRIDGE CASE RELOADING, **filed** June 16, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77–376, *Richard J. Lee* v. *Lee Custom Engineering, Inc.* Case dismissed on Apr. 14, 1980.

3,134,293. (See 3,053,132.)

3,181,205, Frommelt and Frommelt, PAD STRUCTURES, **filed** Aug. 8, 1980, D.C., N.D.N.Y. (Utica), Doc. 80–CV–652, *Frommelt Industries, Inc.* v. *W. R. McGuire Co., Inc.*

3,211,615, Pfizer Pharmaceuticals, Inc., ORAL ANTIDIABETIC COMPOSITION AND METHOD OF USE; **3,340,124,** same, ANTIDIABETIC AGENT, **filed** Aug. 7, 1980, D.C.N.J. (Newark), Doc. 80–2405, *Premo Pharmaceuticals, Inc.* v. *Pfizer Pharmaceuticals, Inc.*

3,211,709, Adamek, Dudley and Woodhams, SULFUR-VULCANIZABLE INTERPOLYMERS OF AT LEAST TWO ALPHA-OLEFINS AND AN UNSATURATED BRIDGED-RING HYDROCARBON, **filed** Nov. 17, 1967, D.C. Del. (Wilmington), Doc. 3439, *Hercules Incorporated* v. *Enjay Chemical Company.* Order amending order of July 29, 1980 filed on Aug. 19, 1980.

3,236,709, Bandag Incorporated, TIRE RECAPPING PROCESS, **filed** Aug. 6, 1980, D.C., W.D.N.C. (Statesville), Doc. ST–C–80–33, *Bandag Incorporated* v. *Gerrard Tire Company, Inc.*

3,241,716, Eugene A. Wahl, GRAVIMETRIC BELT FEEDER, **filed** Aug. 26, 1980, D.C.N.J. (Newark), Doc. 80–2830, *Eugene A. Wahl et al.* v. *Metalfab, Inc. et al.*

3,263,509, Bendix Corp., ENGINE STARTER GEARING; **Reg. No. 715,739** (POSITORK), Facet Enterprises Inc., **filed** Aug. 12, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4279, *Facet Enterprises Inc.* v. *American Starter Drive Service Inc.*

3,316,744, ETC Incorporated, IMPACT CRIMPING TOOL, **filed** July 30, 1980, D.C., N.D. Ohio (Cleveland), Doc. C–80–1352, *ETC Incorporated* v. *Bares Co.*

3,319,734, George M. Pavey, ELASTIC DETECTION STREAMER DEAD SECTION FOR A WATER BORNE SEISMIC SURVEYING SYSTEM, **filed** Apr. 23, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–786, *Whitehall Corporation* v. *Western Geophysical Co. of America.*

3,343,411. (See 3,053,132.)

3,343,444. (See 3,053,132.)

3,340,124. (See 3,211,615.)

3,388,859, Kienzle Apparate GmbH, TAXI METER; **3,764,782,** same, TAXI METER WITH ELECTRONIC FARE COMPUTER; **3,813,869,** Geecen Limited, TAXIMETERS, **filed** Aug. 21, 1980, D.C., S.D.N.Y., Doc. 80–C–4832 MP, *Kienzle Apparate GmbH* v. *Viking Taximeter Inc. et al.*

3,395,270, Jack B. Speller, RELATIVISTIC INERTIAL REFERENCE DEVICE, **filed** July 21, 1980, D.C. Minn. (Minneapolis), Doc. 4–80–C–393, *Honeywell Inc.* v. *Jack B. Speller.*

3,411,548, Sulzer Brothers, Ltd., WEFT THREAD SUPPLY APPARATUS FOR GRIPPER SHUTTLE LOOMS, **filed** Jan. 15, 1980, D.C., S.D.N.Y., Doc. 80–C–0283, *Saria & C.S.p.A.* v. *Sulzer Brothers, Ltd.*

3,425,779, Schuh, Kennedy and Fisher, PRESSURIZED MARKING INSTRUMENT, **filed** Aug. 19, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4415, *Paul C. Fisher* v. *The Gillette Company.*

3,448,382, AM International, Inc., PHOTOELECTROSTATIC COPYING MACHINE; **3,598,580,** same, PHOTOELECTROSTATIC COPYING PROCESS EMPLOYING ORGANIC PHOTOCONDUCTORS; **3,606,532,** same, PHOTOELECTROSTATIC DUPLICATOR; **3,838,921,** same, PHOTOELECTROSTATIC COPYING APPARATUS, **filed** July 30, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4016, *AM International, Inc.* v. *Eastman Kodak Co.*

3,491,590, Billy K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS, **filed** Sept. 13, 1977, D.C., M.D. Pa. (Scranton), Doc. 77–846, *Billy K. Watkins* v. *Franklin County Tractor et al.* Order of dismissal without costs and without prejudice filed Aug. 25, 1980.

3,492,748, Armand D. Swenson, PISTOL SAFETY MECHANISM ADAPTED FOR RIGHT OR LEFT HAND OPERATION, **filed** Sept. 3, 1980, D.C., S.D. Tex. (Houston), Doc. H–80–1086, *Herman W. Mueschke, doing business as Mueschke Manufacturing* v. *Armand D. Swenson, doing business as Swenson's 45 Shop.*

3,543,073, Edward E. Sheldon, VACUUM TUBES OF TELEVISION TYPE FOR X-RAY PROTECTION; **3,610,994,** same, IMPROVEMENTS IN CATHODE-RAY TUBES OF TELEVISION TYPE FOR X-RAYS PROTECTION, **filed** May 8, 1980, D.C., S.D.N.Y., Doc. 80–C–2654, *Asahi Glass Co., Ltd.* v. *Edward E. Sheldon.*

3,550,482. (See 3,053,132.)

3,555,641. (See 3,053,132.)

3,555,950. (See 3,053,132.)

3,580,127. (See 3,053,132.)

3,592,682, CPS Industries, Inc., WATER ACTIVATED ADHESIVE RIBBON, **filed** Sept. 2, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4686, *CPS Industries, Inc.* v. *Hallmark Cards, Incorporated.*

3,598,580. (See 3,476,382.)

3,606,532. (See 3,476,382.)

3,610,799, Allen Organ Company, MULTIPLEXING SYSTEM FOR SELECTION OF NOTES AND VOICES IN AN ELECTRONIC MUSICAL INSTRUMENT; **3,610,806,** same, ADAPTIVE SUSTAIN SYSTEM FOR DIGITAL ELECTRONIC ORGAN, **filed** Aug. 28, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4599, *Allen Organ Company* v. *Conn Keyboards, Inc.*

3,610,806. (See 3,610,799.)

3,610,994. (See 3,543,073.)

3,611,549, Diversified Manufacturing and Marketing Co., METHOD FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS; 3,697,188, same, **filed** July 15, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03085, *Scoggins Mfg., Inc.* v. *Art Sager, doing business as Alarm Products of California.*

3,616,696, Robert Sarkisian POSTER DISPLAY DEVICE, **filed** July 8, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80–2648, *Robert Sarkisian* v. *Penn-Chem Corporation.*

3,669,105, Ignatius F. Castiglia, BRACE FOR ARTICULATED LIMBS; **Reg. No. 957,912** (LENOX HILL), Lenox Hill Brace Shop, Inc., **filed** Aug. 8, 1980, D.C., N.D. Ga. (Atlanta), Doc. C–80–1363A, *Lenox Hill Brace Shop, Inc.* v. *C. H. Martin Company et al.*

3,674,816, Robert J. De Brey, PARTICLE MONITOR, **filed** Aug. 15, 1980, D.C. Minn. (St. Paul), Doc. 3–80–488, *Robert J. De Brey* v. *Sears, Roebuck and Co. et al.*

3,697,188. (See 3,611,549.)

3,736,604, Robert N. Carson, FLUID FILLED MATTRESS, **filed** July 30, 1980, D.C., N.D. Calif. (San Francisco), Doc. C–80–3122 SAW, *Vinyl Products* v. *Michael Geraghty Assoc.*

3,764,782. (See 3,388,859.)

3,769,116, Charles A. Champeau, METHOD OF MAKING A BUILDING MATERIAL FROM WASTE STOCK FROM A PAPERMAKING PROCESS, **filed** Aug. 26, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77–C–547, *Charles A. Champeau* v. *Menasha Corporation.* Case dismissed on Aug. 28, 1978.

3,783,384, Keith H. Wycoff, HIGH SPEED SELECTIVE CALLING COMMUNICATION SYSTEM HAVING LOW DRAIN RECEIVER, **filed** Sept. 4, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4734, *Keith H. Wycoff et al.* v. *Motorola, Inc. et al.*

3,786,734, Martin Long, UNDERWATER ELECTRONIC FLASH ACTUATOR, **filed** Mar. 11, 1980, D.C., N.D. Calif. (San Francisco), Doc. C–80–741 RFP, *Martin Long* v. *O. H. Brigham.* Dismissal without prejudice filed Aug. 8, 1980.

3,831,502, Rengo Co. Ltd., SLITTER SCORER APPARATUS, **filed** Aug. 18, 1978, D.C.N.J. (Newark), Doc. 78–2000, *Rengo Co. Ltd. et al.* v. *Molins Machine Company, Inc.* Order of dismissal filed Aug. 19, 1980.

3,838,921. (See 3,476,382.)

3,842,841, United States of America, CONSTANT CURRENT POWER PACK FOR BONE HEALING AND METHOD OF USE, **filed** July 25, 1980, D.C. Colo. (Denver), Doc. 80–M–981, *United States of America* v. *Osteostim Division, Telectronics Proprietary Limited et al.*

3,813,869. (See 3,388,859.)

3,876,579, Rexnord Inc., COMPOSITION TO BE APPLIED TO A SURFACE TO INCREASE ITS WEAR RESISTANCE, **filed** Aug. 8, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4229, *Rexnord Inc.* v. *Polygem Inc.*

3,928,933, ITI Hawaii, Inc., HOLDING TOY, **filed** July 28, 1980, D.C., N.D. Calif. (San Francisco), Doc. C–80–3101, *ITI Hawaii, Inc.* v. *Determined Productions.*

3,943,288, Reed and Young, TELEPHONE INCORPORATING BINARY CODED DECIMAL TIME DISPLAY; **Reg. No. 997,566** (BINATIME), Edgar D. Young, **filed** Aug. 15, 1980, D.C., S.D. Ohio (Columbus), Doc. C–2–80–699, *Edgar Dale Young* v. *Media House Corp.*

3,945,023, Honeywell, Inc., AUTO-FOCUS CAMERA WITH SOLID STATE RANGE FINDER, **filed** Sept. 9, 1980, D.C., N.D. Ill. (Chicago), Doc. 79c4794, *Honeywell, Inc.* v. *Canon USA, Inc. et al.*

3,958,685, Cincinnati Milacron, Inc., COUPLING FOR HANDLING WORKPIECE, CONVEYOR COMBINED THEREWITH, AND METHOD; **4,059,188,** same, MANUAL PREFORM REMOVAL DEVICE; **4,082,175,** same, CONVEYOR COMBINED WITH COUPLING; **4,086,999,** same, CONVEYOR COMBINED WITH COUPLING FOR HANDLING WORKPIECE; **4,140,211,** same, WORKPIECE LOADER WITH RESILIENT END ON FEED CHUTE; **4,185,812,** same, BLOW MOLDING PALLET ASSEMBLY FOR CONVEYING ONE OR MORE WORKPIECES, **filed** Aug. 1, 1980, D.C., E.D. Mich. (Detroit), Doc. 80–72857, *Cincinnati Milacron, Inc.* v. *Hoover Universal, Inc.*

3,986,712, Kaiichi Hasegawa, FEEDING DEVICE FOR CARD COUNTING MACHINES, **filed** Aug. 13, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03519 IH, *Billcon Corporation of America* v. *Abbott Coin Counter Company, Inc.*

3,995,102, Raceway Components, Inc., INSERT DEVICE FOR CABLES, **filed** Aug. 6, 1980, D.C., N.D. W. Va. (Parkersburg), Doc. C–80–0056–P, *Raceway Components, Inc.* v. *Walker/Parkersburg Division, Textron, Inc.*

4,016,911, Satron, Inc., WOVEN ROPE, **filed** Aug. 13, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03358 LTL (Px), *Satron, Inc.* v. *Amera Corporation.*

4,046,923, L. D. Schreiber Cheese Co., Inc., PACKAGE WITH STAGGERED PRODUCE SLICES AND PROCESS FOR PRODUCING THE SAME, **filed** Sept. 6, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3287, *L. D. Schreiber Cheese Co., Inc.* v. *Borden, Inc.* Cause dismissed without prejudice with each party to bear its own costs filed Apr. 25, 1978. **Same, filed** Sept. 8, 1977, D.C. Minn. (Minneapolis), Doc. 4–77–C–322, *Land O'Lakes, Inc.* v. *L. D. Schreiber Cheese Co., Inc.* Stipulation and order of dismissal filed Apr. 27, 1979.

4,046,923, L. D. Schreiber Cheese Co. Inc., PACKAGE WITH STAGGERED PRODUCE SLICES AND PROCESS FOR PRODUCING THE SAME; **D. 227,352,** PACKAGE WITH STAGGERED PRODUCE SLICES, **filed** Aug. 15, 1978, D.C., N.D. Ohio (Toledo), Doc. C–78–373, *L. D. Schreiber Cheese Co., Inc.* v. *AMFAC Foods, Inc.*

4,055,029, Collo GmbH, CLEANING, SCOURING AND/OR POLISHING PADS; **4,111,666,** same, METHOD OF MAKING CLEANING, SCOURING AND/OR POLISHING PADS AND THE IMPROVED PAD PRODUCED THEREBY, **filed** Apr. 26, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–286, *Fedco Foam International, Inc.* v. *S. C. Johnson & Son, Inc.* Case settled on Feb. 20, 1980.

4,059,188. (See 3,958,685.)

4,062,155, Roy A. Fricke, SPARK PLUG CLEANER, **filed** Oct. 26, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–4144–HP, *Wells Mfg. Corp.* v. *The Allen Group et al.* **Same, filed** Sept. 4, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03903–R, *Roy A. Fricke et al.* v. *Sears, Roebuck & Co. et al.*

4,065,649, Carter and Quain, PRESSURE SENSITIVE MATRIX SWITCH HAVING APERTURED SPACER WITH FLEXIBLE DOUBLE SIDED ADHESIVE INTERMEDIATE AND CHANNELS OPTIONALLY INTERPOSED BETWEEN APERTURES, **filed** Aug. 14, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–C–517, *Lake Center Industries* v. *W. H. Brady Co.* Case dismissed on Mar. 6, 1979.

4,077,335, Luzzani and Riva, EXTENSIBLE TABLE, **filed** Apr. 24, 1979, D.C., M.D.N.C. (Greensboro), Doc. C–79–272–S, *Cicci Enterprises, Inc.* v. *Bassett Mirror Co., Inc.* Order of dismissal filed June 23, 1980.

4,082,175. (See 3,958,685.)

4,086,999. (See 3,958,685.)

4,111,666. (See 4,055,029.)

4,140,211. (See 3,958,685.)

4,156,654, James R. Blaslus, METHOD FOR MAKING CRUDE BORIC ACID FROM BORATE AND SULFURIC ACID, **filed** Aug. 13, 1980, D.C. Ariz. (Phoenix), Doc. CIV–80–656–CLH, *H. J. H. Chemicals, Inc.* v. *Superior Products Corporation of Arizona et al.*

4,175,801, Gustave C. Meyer, III, HAND-HELD WEDGE TOOL FOR SPLITTING WOOD, **filed** Aug. 5, 1980, D.C.N.J. (Newark), Doc. 80–2409, *Gustave C. Meyer, III* v. *Colonial Tool Co., Inc. et al.*

4,176,921, Carrera International Corporation, EYEGLASSES HAVING REMOVABLE LENSES, **filed** Sept. 2, 1980, D.C., S.D.N.Y., Doc. 80 C–5000 EW, *Carrera International Corporation* v. *Hudson Optical Corporation.*

4,185,812. (See 3,958,685.)

4,191,376, Systems Operations, Inc., HIGHLY SECURE PLAYING CARDS FOR INSTANT LOTTERY AND GAMES, **filed** June 12, 1980, D.C.N.H. (Concord), Doc. 80–274, *Scientific Games Development Corporation (1973)* v. *Systems Op-*

erations, Inc. Case voluntarily dismissed pursuant to judgment entered Aug. 15, 1980.

Re. 28,559, John A. Villano. METHOD FOR MILLING CAMS FOR SWISS-TYPE SCREW MACHINES; **Re. 28,766,** same, APPARATUS FOR MILLING CAMS AND THE LIKE, AS FOR SWISS-TYPE SCREW MACHINE CAMS, **filed** Sept. 5, 1980, D.C.N.J. (Newark), Doc. 80–2885. *Cam-Apt, Inc. and John A. Villano v. Macor S.A. and Cosa Corporation.*

Re. 28,766. (See Re. 28,559.)

D. 227,352. (See 4,046,923.)

D. 234,277, Salmon and Hamilton. STOOL, **filed** July 19, 1977, D.C., E.D. Wis. (Milwaukee). Doc. 77–430, *Innovative Metal, Inc. v. Britt Industries, Inc. et al.* Injunction filed Apr. 25, 1980.

D. 234,606, Paccar, Inc.. TRUCK CAB, **filed** Aug. 8, 1979, D.C., N.D. Ohio (Cleveland). Doc. C–79–1541. *Paccar, Inc. v. Triple "T" Mfg., Inc.* Consent decree and final judgment in favor of plaintiff filed on July 21, 1980.

PP 3,816, Van Well Nursery, Inc., APPLE TREE, **filed** Nov. 30, 1979, D.C., E.D. Wash. (Spokane). Doc. C–79–410. *Van Well Nursery, Inc. v. Dean Welch et al.* Consent decree with permanent injunction and order of dismissal filed Aug. 4, 1980.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,667,170, Re. S.N. 162,697, Filed Jun. 24, 1980, Cl. 51/389, FINISHING ARTICLE AND SUPPORT MEMBER THEREFOR, Joseph H. Mackay, Jr., Owner of Record: *Standard Abrasives, Inc., Northridge, Calif.*, Attorney or Agent: Byard G. Nilsson, et al., Ex. Gp.: 323

3,699,814, Re. S.N. 177,792, Filed Aug. 13, 1980, Cl. 73/421.5 R, GAS SAMPLER, Warren F. Kaufman, Owner of Record: *Philco-Ford Corporation, Philadelphia, Pa.*, Attorney or Agent: Cyrus G. Minkler, et al., Ex. Gp.: 244

3,810,274, Re. S.N. 172,255, Filed Jul. 25, 1980, Cl. 16/169, PIVOT AND GUIDE ROD ASSEMBLY FOR BI-FOLD DOOR, Ralph E. Ford, et al., Owner of Record: *Slimfold Manufacturing Company, Inc., Dothan, Ala.*, Attorney or Agent: Harold D. Jones, Jr., et al., Ex. Gp.: 353

4,065,078, Re. S.N. 172,702, Filed Jul. 28, 1980, Cl. 244/104 FP, AIRCRAFT UNDERCARRIAGE SUSPENSION, Stanley F. N. Jenkins, et al., Owner of Record: *Automotive Products Limited, Leamington Spa, England,* Attorney or Agent: Solon B. Kemon, et al., Ex. Gp.: 315

4,154,813, Re. S.N. 162,102, Filed Jun. 23, 1980, Cl. 424/48, MEANS AND METHOD FOR IMPROVING NATURAL DEFENSES AGAINST CARIES, Israel Kleinberg, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 125

4,173,908, Re. S.N. 173,826, Filed Jul. 30, 1980, Cl. 76/25 A, SAW CHAIN SHARPENING FIXTURE, Frank J. Aksamit, Owner of Record: *Pro-Sharp Corporation, Newington, Conn.*, Attorney or Agent: John M. Prutzman, Ex. Gp.: 323

4,203,341, Re. S.N. 172,564, Filed Jul. 28, 1980, Cl. 84/255, DAMPER ASSEMBLY OF PIANOS, Hiroyoshi Takahashi, Owner of Record: *Nippon Gabbi Siezo, Kafueshiki Kaisha, Shezuoka-Ken, Japan,* Attorney or Agent: Robert C. Faber, et al., Ex. Gp.: 211

PATENT NOTICES

Certificates of Correction for the Week of Nov. 4, 1980

Re. 30,195	4,193,914	4,205,199	4,211,608
3,730,310	4,194,909	4,205,237	4,211,658
3,757,294	4,194,965	4,205,275	4,211,662
3,767,706	4,195,320	4,205,356	4,211,970
3,946,358	4,195,476	4,205,455	4,212,008
3,947,764	4,195,805	4,205,610	4,212,061
3,988,092	4,195,910	4,205,702	4,212,137
3,988,246	4,197,316	4,206,342	4,212,145
4,003,651	4,198,268	4,206,457	4,212,480
4,032,412	4,198,400	4,206,630	4,212,488
4,050,344	4,198,424	4,207,013	4,212,451
4,064,687	4,198,773	4,207,133	4,212,470
4,070,526	4,198,800	4,207,288	4,212,586
4,071,949	4,199,602	4,207,310	4,212,698
4,077,909	4,199,841	4,207,407	4,213,112
4,079,037	4,200,578	4,207,502	4,213,427
4,088,669	4,200,609	4,207,580	4,213,449
4,101,487	4,200,673	4,207,792	4,213,724
4,126,911	4,200,688	4,207,952	4,213,794
4,129,724	4,200,726	4,208,249	4,213,826
4,129,803	4,200,729	4,208,267	4,213,860
4,143,863	4,200,999	4,208,399	4,214,408
4,150,202	4,201,023	4,208,431	4,214,510
4,154,022	4,201,095	4,208,493	4,214,575
4,169,016	4,201,541	4,208,739	4,214,580
4,172,724	4,201,673	4,209,310	4,214,588
4,175,004	4,201,795	4,209,353	4,214,624
4,176,006	4,202,229	4,209,371	4,214,763
4,176,021	4,202,490	4,209,418	4,214,895
4,177,142	4,202,493	4,209,827	4,214,933
4,178,752	4,202,717	4,210,058	4,215,310
4,179,661	4,202,801	4,210,174	4,215,351
4,180,568	4,203,346	4,210,241	4,215,467
4,183,386	4,203,533	4,210,515	4,215,492
4,183,795	4,204,145	4,210,726	4,215,535
4,184,019	4,204,242	4,210,782	4,215,972
4,187,405	4,204,251	4,211,007	4,216,248
4,188,198	4,204,741	4,211,051	4,216,427
4,188,282	4,204,846	4,211,091	4,216,930
4,189,214	4,204,849	4,211,098	4,217,137
4,190,451	4,205,162	4,211,232	4,217,348
		4,211,320	4,218,098

Patents Available for Licensing or Sale

3,666,352. RATE CONTROLLED PHOTOCHROME LENSES OF VINYL CHLORIDE-VINYL ACETATE COPOLYMER CONTAINING A MERCURY THIOCARBAZONE COMPOUND. Charles A. Wagner, 6679 Hawkeye Run, Columbia, Md. 21044.

3,965,498. FOLDING BED ASSEMBLY. Miklos Boni, P.O. Box 7872, Van Nuys, Calif. 91409.

4,184,779. STIRRING DEVICE. Charles Detmer, Route 2, Troy, Mo. 63379.

4,185,826. CIRCULAR BUTTERFLY. Ming-Shean Ueng, 2304 5th St., #225, Lubbock, Tex. 79401.

4,192,332. VERTICAL LIQUID STORAGE TANK AND APPARATUS FOR CLEANING. Robert H. Feldmeier. Correspondence to: James Magee, Jr., 5 Marston Drive, Morris Plains, N.J. 07950.

4,202,130. SAFETYSHIP. Terry Smith; 124 McKiernan, Folsom, Calif. 95630.

Otis Engineering Corporation is prepared to grant licenses under the following patents upon reasonable terms. Address inquiries to: Patent Attorney, Otis Engineering Corporation, P.O. Box 34380, Dallas, Tex. 75234. Telephone (214) 323–3882.

3,756,260. VALVES.

4,102,713. PLANETARY TRANSMISSION WITH HYDRAULIC ENGAGEMENT AND DISENGAGEMENT.

4,175,987. LOW ALLOY TEMPERED MARTENSITIC STEEL.

General Electric Company withdraws the following patent from the list of patents published as available for licensing in 946 O.G. 945 (May 18, 1976).

3,739,840. HEAT EXCHANGER HAVING RESILIENTLY MOUNTED TUBULAR MEMBERS.

The General Electric Company is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Turbine Operations, Turbine Patent Operation, General Electric Company, 1 River Road, Bldg. 18A–5th Floor, Schenectady, N.Y. 12345.

4,164,126. SELF-REGULATING TRANSPORT MECHANISM FOR SUPERCONDUCTIVE ROTOR REFRIGERANT.

4,164,671. RESISTOR-CONTAINING CRYOGENIC CURRENT LEAD.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Sr. Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

D. 256,117. VIDEO DISC PLAYER.

4,210,988. METHOD FOR MAKING AN INDIRECTLY-HEATED CATHODE ASSEMBLY.

4,211,182. DIFFUSION APPARATUS.

4,211,421. VIDEO DISC PLAYER HAVING ADJUSTABLE END-OF-PLAY SWITCH.

4,211,488. OPTICAL TESTING OF A SEMICONDUCTOR.

4,211,489. PHOTOMASK ALIGNMENT SYSTEM.

4,211,563. AQUEOUS PHOTORESIST OF CASEIN AND N-METHYLOL ACRYLAMIDE.

4,211,936. CCD GATE ELECTRODE STRUCTURES AND SYSTEMS EMPLOYING THE SAME.

4,211,941. INTEGRATED CIRCUITRY INCLUDING LOW-LEAKAGE CAPACITANCE.

4,212,008. CIRCUIT FOR DISPLAYING CHARACTERS ON LIMITED BANDWIDTH, RASTER SCANNED DISPLAY.

4,212,032. SYNCHRONIZATION AND GAIN CONTROL CIRCUIT.

4,212,422. WEB POSITION CONTROLLER FOR WEB TRANSPORT SYSTEMS.

4,212,540. TESTING THE DIVERGENCE OF A BEAM FROM A LASER.

4,213,068. TRANSISTOR SATURATION CONTROL.

4,213,088. VOLTAGE MEASURING CIRCUIT.

4,213,096. PHASELOCK RECEIVER WITH PHASELOCK DETECTOR.

4,213,148. RECORDING/PLAYBACK APPARATUS USING A SINGLE PILOT TONE FOR ACTIVE TRACKING AND CONTROL OF A VIDEO DISC PICKUP DEVICE.

4,213,151. AGC KEYING SIGNAL CIRCUIT.

4,213,663. WET CARBON-DIOXIDE TREATMENT OF PARTIALLY-COMPLETED CRT.

4,213,673. PROJECTOR FOR READING OUT COLOR-ENCODED FOCUSED IMAGE HOLOGRAMS EMPLOYING AN OPTIMUM ENCODING SCHEME.

4,213,798. TELLURIUM SCHOTTKY BARRIER CONTACT FOR AMORPHOUS SILICON SOLAR CELLS.

4,213,807. METHOD OF FABRICATING SEMICONDUCTOR DEVICES.

4,214,018. METHOD FOR MAKING ADHERENT PINHOLE FREE ALUMINUM FILMS ON PYROELECTRIC AND OR PIEZOELECTRIC SUBSTRATES.

4,214,067. SEALING COMPOSITION.

4,214,120. CADENCE SUPPRESSION SYSTEM.

4,214,189. REGULATED DEFLECTION CIRCUIT.

4,214,213. SIGNAL SELECTING SYSTEM.

4,214,255. GATE TURN-OFF TRIAC WITH DUAL LOW CONDUCTIVITY REGIONS CONTACTING CENTRAL GATE REGION.

4,214,261. SYNCHRONIZING APPARATUS FOR REMOTE TELEVISION APPARATUS.

4,214,550. APPARATUS FOR THE DEPOSITION OF A MATERIAL FROM A LIQUID PHASE.

4,214,798. METHOD FOR SPOT-KNOCKING THE ELECTRON-GUN MOUNT ASSEMBLY OF A CRT.

4,215,025. WATER SOLUBLE ADHESIVE COATING FOR MOUNTING COMPONENTS TO PRINTED WIRING BOARDS.

4,215,185. LIQUID JUNCTION SCHOTTKY BARRIER SOLAR CELL.

4,215,283. CADENCE SCANNED FLAT IMAGE DISPLAY DEVICE.

4,215,319. SINGLE FILAMENT SEMICONDUCTOR LASER.

4,215,368. MEMORY ADDRESSING SYSTEM FOR AUTOMATIC SETUP TV CAMERA SYSTEM.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosures. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6-132,595. Ketose Sugars. Filed Mar. 21, 1980.

Patent application 6-135,850. Carbon Dioxide Analyzer for Greenhouses. Filed Mar. 31, 1980.

Patent 4,186,608. Method and Apparatus for Verifying Declared Contents of Contents of Certain Solids. Filed July 17, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,196,149. Ternary Salts of Tris(aminomethyl) phosphines and Their Oxides. Filed Nov. 29, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,204,859. Method of Increasing the Yield of Hydrocarbons From Plants. Filed Mar. 31, 1978. Patented May 27, 1980. Not available NTIS.

Patent 4,205,133. Apparatus for Fermenting Liquids. Filed Apr. 26, 1978. Patented May 27, 1980. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 6-015,256. Solar Tracking Apparatus. Filed Feb. 26, 1979.

Patent application 6-015,257. Reactor and Method for Hydrocracking Carbonaceous Material. Filed Feb. 26, 1979.

Patent application 6-015,258. Process for Hydrocracking Carbonaceous Material to Provide Fuels or Chemical Feed Stock. Filed Feb. 26, 1979.

Patent application 6-010,037. Method of Controlling Switching of a Multiphase Inductor-Converter Bridge. Filed Feb. 28, 1979.

Patent application 6-017,299. Coal Liquefaction in an Inorganic-Organic Medium. Filed Mar. 5, 1979.

Patent application 6-025,629. Method of Preparing Porous, Rigid Ceramic Separators for an Electrochemical Cell. Filed Mar. 30, 1979.

Patent application 6-029,063. Process for Hydrocracking Carbonaceous Material in Liquid Carrier. Filed Apr. 13, 1979.

Patent application 6-039,986. Novel Fischer-Tropsch Catalysts. Filed May 17, 1979.

Patent application 6-052,716. Trace Desulfurization. Filed June 27, 1979.

Patent 4-085,590. Hydride Compressor. Filed Jan. 5, 1976. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,172,236. Loss-Free Method of Charging Accumulator Rings. Filed June 16, 1978. Patented Oct. 23, 1979. Not available NTIS.

Patent 4,174,190. Annular Linear Induction Pump With an Externally Supported Duct. Filed June 30, 1977. Patented Nov. 13, 1979. Not available NTIS.

Patent 4,176,093. Neutron Absorbing Room Temperature Vulcanizable Silicone Rubber Compositions. Filed Feb. 22, 1977. Patented Nov. 27, 1979. Not available NTIS.

Patent 4,180,736. Use of a Large Time-Compensated Scintillation Detector in Neutron Time-of-Flight Measurements. Filed Sept. 25, 1978. Patented Dec. 25, 1979. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent application 6-158,907. Hand-Held Railroad Data Acquisition System. Filed June 12, 1980.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6-125,004. Seal for Situ Replacement on a Rotatable Shaft. Filed Feb. 27, 1980.

U.S. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP-2, Washington, D.C. 20546

Patent application 6-145,207. Potential Heat Exchange Fluids for Use in Sulfuric Acid Vaporizers. Filed Apr. 30, 1980.

Patent 4,198,792. Chelate-Modified Polymers for Atmospheric Gas Chromatography. Filed June 30, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,199,448. Reverse Osmosis Membrane of High Urea Rejection Properties. Filed June 9, 1976. Patented Apr. 22, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6-034,877. Tris(N-carbalkoxylaminomethyl)phosphine Oxides and Sulfides. Filed Apr. 30, 1979.

Patent application 6-098,459. Quarternary Ureidomethyl Phosphonium Salts. Filed Nov. 29, 1979.

Patent application 6-118,948. Improved Abrasion Resistance and Strength of Cotton-Containing Fabric Made Resilient With N-Methylolacrylamide-Type Reagent. Filed Feb. 6, 1980.

Patent application 6-118,949. Process for Producing Durable-Press Cotton Fabrics With Improved Balances of Textile Properties. Filed Feb. 5, 1980.

Patent application 6-132,589. Method of Decontaminating Waste Liquors. Filed Mar. 21, 1980.

Patent 4,200,630. Sesbanine and the Use Thereof in Treating Leukemic Tumors. Filed Mar. 29, 1979. Patented Apr. 29, 1980. Not available NTIS.

Patent 4,203,906. Synthetic Cephalotaxine Esters Having Antileukemic P388 Activity. Filed Jan. 3, 1979. Patented May 20, 1980.

Patent 4,204,072. Tris(N-carbalkoxylaminomethyl)-Phosphines. Filed Nov. 29, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,206,221. Cephalomannine and Its Use in Treating Leukemic Tumors. Filed Jan. 3, 1979. Patented June 3, 1980. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent 4,205,553. Automated Gain Control in Rail Flaw Detection. Filed Feb. 21, 1979. Patented June 3, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Ile arings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—R. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers, Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 618, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents ..... Numbers 2,277 to 2,280, inclusive

XEROX LICENSE OFFER

This notice is published pursuant to a CONSENT ORDER TO CEASE AND DESIST dated July 29, 1975 between Xerox Corporation and the Federal Trade Commission.

TERMS *contained in this notice are defined in the Consent Order. All interested parties should refer to that document for the definitions and additional details of Xerox' patent and know-how licensing obligations thereunder.* A copy of the Consent Order and a list of PATENTS licensed to Xerox which are subject to the provisions of paragraphs II and IV (C) (9) of the Order, if any, are available from Xerox upon written request. All such requests and any request relating to the licensing of PATENTS and the licensing and disclosure of KNOW-HOW pursuant to the Consent Order should be made in writing and addressed to:

The Manager of Patent Licensing
Xerox Corporation
Stamford, Connecticut 06904

Xerox shall in accordance with the terms of the Consent Order:

(1) Grant licenses under
  (a) its ORDER PATENTS to make, have made, use and vend OFFICE COPIER PRODUCTS under the terms of the Consent Order, and
  (b) patents which are required to be licensed pursuant to the terms of paragraph X of the Consent Order, if any, and

(2) Disclose certain written materials as provided in the Consent Order [KNOW-HOW] to any LICENSEE of its United States ORDER PATENTS for use in connection with the manufacture of OFFICE COPIER PRODUCTS in the United States upon payment of the cost of collection and duplication of the requested materials.

The following is a list of patents which is believed to include all of the PATENTS available for licensing in accordance with the terms of the Consent Order. Fuji Xerox, Ltd. patents which also make up part of the list are grouped separately. There also follows a classification index for use in conjunction with the classification data appearing in the patent list to identify the category of the patent and a schedule of foreign countries and their corresponding key letters which are used in identifying corresponding foreign patents in the list. Since the classification system is not restricted solely to OFFICE COPIER PRODUCTS there are several patents included in the list to which the Consent Order is not applicable.

LIST CLASSIFICATION

The Patents are listed in numerical order according to their class assignment. For example, all U.S. patents classified as 1(A) appear at the beginning followed by those classified as 1A1, 1A1A, 1A1B, etc. The left-hand column shows the U.S. patent number. To the right of the U.S. patent number is its title followed by its issue date. Following the U.S. patent issue date is a list of the foreign patents based on the U.S. patents. An example of how the list should be used is as follows:

Under Class 1A which is entitled "Electrostatographic Systems, Imaging Systems—Distinctive Photosensitive Members Imaged", two U.S. patents are listed—2,573,881 which issued November 6, 1951 with corresponding patents in Australia, Canada, Germany, Great Britain, Switzerland and Sweden, and 3,877,936 which issued April 15, 1975 with a corresponding patent in Belgium.

XEROX PATENT CLASSIFICATION INDEX

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     - 5. Imaging Systems Capable of Development in Ambient Light
     - 6. Imaging Systems with Liquid Polar Ink Development
   - H. Display Systems with Imaging Capability
     - 1. Projection of a Xerographic Image (PROXI)
     - 2. Pin Matrix
   - I. Imaging Systems with Image Enhancement
   - J. Electrostatographic Apparatus
     - 1. Total Reproduction Systems
     - 2. Cameras
     - 3. Variable Imaging Speed
     - 4. Moving Document Reproduction
     - 5. Flat Plate Electrostatographic Apparatus
     - 6. Flexible Electrostatographic Apparatus
     - 7. Count Control Apparatus
     - 8. Developer Dispensing and Control Apparatus
   - K. Miscellaneous Methods and Apparatus
     - 1. Electrometers
     - 2. Reflex Imaging Systems
     - 3. Resist Formation System
2. DISTINCTIVE PHOTOSENSITIVE MEMBERS
   - A. Photosensitive Members—Novel Compositions
     - 1. Inorganic
       - a. Selenium
       - b. Alloys of Selenium with Arsenic and/or Antimony
       - c. As_2S_3 and Combinations Thereof with Selenium
       - d. Group III A Phosphides (Ga, Al or B)
       - e. Chalcogenides (Compounds Containing O, S, Se, or Te)
         - (1) ZnO
         - (2) PbO
       - f. Dye Sensitized Inorganic Photoconductors
       - g. Inorganic Photoconductors in Glass Binders
     - 2. Organic
       - a. Photosensitive Organic Compounds in a Binder
       - b. Lewis Acid Charge Transfer Complexes
   - B. Multi-Layered Photosensitive Members
     - 1. Members Having Subadjacent Barrier Layers
     - 2. Members Having Protective Overlayer
     - 3. Members Having Electroluminescent Layer
     - 4. Members Having Releasable or Soluble Layer
   - C. Deformation Imaging Members
   - D. Fibrous Photosensitive Member
   - E. Photosensitive Members—Novem Fabrication Techniques and Configurations
   - F. Apparatus for Alignment of Photosensitive members
3. CHARGING SYSTEMS
   - A. Induction Charging Systems
   - B. Non-Uniform Charging Systems
   - C. Corotron Charging Systems
     - 1. A.C. Charging
     - 2. Negative Charging
     - 3. With Fringe or Needle-like Electrodes
     - 4. Scorotron Charging
     - 5. Bipolar Charging
     - 6. Charge Level Smoothing
     - 7. Toner Dust Control
     - 8. Charge Sensing to Terminate Charging

9. Transfer From Intermediate Insulating Member
D. Charging Across a Liquid Layer
E. Charging a Semiconductive Photoconductor
F. Charging Including Illumination of Photoconductor

4. OPTICAL IMAGE FORMATION AND PROJECTION
A. Illumination of Original
1. Light Sources and Method of Illumination
2. Document Holders
a. Platen Covers
3. Illumination Control Systems
B. Projection of Optical Image onto Photoresponsive Member
1. Scanning Systems—In General
a. Distinctive Optical Scanning Systems
(1) Lens Strip
(2) Fiber Optics
(3) Half Tone Projection Systems
(4) Fresnel Lens
2. Simultaneous Charging and Projection of Optical Image
3. Distortion of Optical Image (e.g., for Coding Purposes)
4. Full Frame Exposure
5. Reflex Exposure
6. Projection with Variable Magnification
a. Magnification with Fixed Optical Path Length
7. Projection of Composite Image
C. Control of Image Contrast

5. LATENT IMAGE DEVELOPMENT SYSTEMS AND COMPOSITIONS
A. Powder Cloud Development
1. Aerosol Development Methods and Apparatus in General
a. Plate Development Apparatus
2. Cloud Charging Methods and Devices
3. Specific Toner and/or Gas Supply Devices and Methods
a. Belt and Porous Material Toner Supply Device
b. Cloud Directing Devices and Methods
4. Induction Development
5. Cleaning Devices
6. Charcoal Development Method
B. Fibrous Brush Development Devices and Methods
C. Magnetic Brush Development (Dry)
1. Magnetic Brush Development Methods and Devices
a. Magnetic Belt Devices
b. Loading Devices
2. Color Producing Development
3. Single Component Magnetic Developer
D. Cascade Development
1. Gravitational Developer Handling Methods and Devices
a. Incremental (e.g., Bucket Devices)
b. Continuous (e.g., Wheel)
c. Magnetic
d. Non-Linear Developer Flow
2. Impact Developing Methods and Devices
3. Developer Contact and Concentration Control Apparatus
4. Background Suppression Apparatus
5. Flat Plate Development
E. Liquid Development
1. Liquid Aerosol Development
2. Emulsion Development
3. Encapsulated Liquid Development
4. Electrophoretic Development
5. Polar Ink Development
F. Donor Development Methods and Apparatus
G. Dense Bed Development Methods and Apparatus
H. Fluidized Bed Development Methods and Apparatus
I. Toner and Developer Dispensing Methods and Apparatus
1. Developer Dispensing
2. Toner Dispensing
a. Powdered Toner Containers
b. Solid Toner Containers
c. Dispensing Apparatus
(1) Without Concentration Control
(2) With Concentration Control
J. Development Electrodes
1. Electrode Types in General
2. Segmented Electrodes
3. Flexible Electrodes
4. Self-Cleaning Electrodes
5. With Variation of Potential
K. Contrast and Large Area Development Enhancement
L. Simultaneous Positive-Negative Formation
M. Reversal Development
N. Developer, Toner and Carrier Compositions
1. Three Component Developer-Carrier, Toner and Additive
a. Inorganic Additive
b. Organic Additive
2. Two Component Developer
a. Distinctive Toner
(1) Polystyrene-Containing
(2) Phenol-Formaldehyde Containing
b. Distinctive Carrier
3. One Component
4. New Carriers
5. New Toners
a. Distinctive Pigment
b. Encapsulated Liquids
6. Developer Manufacture
a. Carrier Preparation
b. Toner Preparation
O. Miscellaneous
P. Simultaneous Development and Cleaning

6. COPY SUBSTRATE HANDLING SYSTEMS
A. Paper Holding Trays
1. With Stack Height Control
B. Seriatim Stack Feeding Devices
1. Mechanical
2. Aeriform
C. Non-Seriatim Stack Feeding Devices
D. Sheet Tracking, Registration, Aligning, Conveying Devices
1. Belt Conveyors
2. Clutch Mechanisms
E. Sheet Holding Devices (During Image Transfer)
F. Mispuff and Multiple Sheet Detecting Devices
G. Counter Devices
H. Sheet Stripping Devices
I. Sheet Cutting Devices
J. Sheet Inverting Devices

K. Copy Distribution, Collection and Sorting Devices

7. DEVELOPED IMAGE TRANSFER AND DISPLAY
A. Image Display Systems
1. Reflective Projection
2. Transmittive Projection
B. Chemical Treatment to Enhance Transfer
C. Electrostatic Transfer of Toner
1. Corona Charging Systems
a. With Conductive Transfer Web
2. A.C. Field Transfer
3. Multiple Transfer
4. Selective Transfer
D. Magnetic Transfer of Toner
E. Pressure Transfer of Toner
1. With Heat
2. With Solvent
3. With Tackified Copy Substrate
a. Gelatin Coated Substrate

8. IMAGE FIXING SYSTEMS
A. Heat Fixation
1. Radiation
a. Flash Heating
b. Control Systems
c. Glass Panel Heating
2. Conduction
a. With Pressure Means
3. Convection
4. Induction
B. Fixation with Vapor Fixative
1. Fixative Removal
C. Fixation with Liquid Fixative
D. Fixation with Solid Fixative
E. Fixation with Pressure
1. Gelatin Coated Copy Substrate

9. CLEANING OF IMAGING SURFACE
A. Frictional
1. Web
2. Brush
a. With Brush Scraper
b. With Electrostatic Assist
(1) Within a Liquid
c. Filter Bag For Use with
B. Non-Frictional
1. Magnetic Brush
2. Cleaning Beads
3. Liquid

10. DOCUMENT HANDLING
A. Document Feed Apparatus
B. Microfiche Handling Systems
C. Stack Feeding Apparatus
D. Facsimile Feeding Apparatus
E. Document Registration Systems
F. Document Inverting Apparatus
G. Stacking and/or Imbricating Apparatus
H. Collating Apparatus
I. Document Jamming Detection Devices

12. PHOTOELECTROPHORESIS
A. Basic Process and Materials
B. Basic Apparatus
C. Machines
D. Air Breakdown
E. Blocking Electrode
F. Camera Apparatus
G. Cleaning
H. Apparatus Components
I. Composite Particle
J. Fixing
K. Inking
L. Masking
M. Pigments (Including PEP Use of Particular Pigment)
N. Process Variation
O. Sensitizors
P. Shear
Q. Transfer
R. Use of Image

15. IMAGING SYSTEMS OTHER THAN ELECTROSTATOGRAPHIC
A. Deformation Imaging
B. Polymerization Imaging
1. Photopolymerization Imaging
2. Charge Injection Polymerization Imaging
C. Ferromagnetic Imaging
D. Photochromic Imaging
E. Vesicular Imaging
F. Exposure Only Imaging

17. OPTICAL SYSTEMS
A. Radiation Sensing
1. X-ray, Ultraviolet
2. Solar Cell
3. Spectral Response Junctions
4. Photocell Circuits
B. Optical Projection and Modulation
1. Image Projection
2. Lenses, Transparencies
3. Kerr Cell
4. Modulators
C. Image Conversion and Intensification
1. Emission
2. Infrared
3. Passive
4. Active (Semiconductor)
D. Character Generation and Display Devices
1. Deflection Generated Display
2. Character Mask
3. Translation and Function Generation
4. Justifier
5. Optical Lens Arrangements
E. Optical Imaging and Scanning
1. Photosensitive Scanners and Spot Scanning Systems
2. Field Effect Scanners
3. Lenticular
4. Scanning Lens Strip and Rotating Mirror Mechanisms
5. Thermotropic, Thermal, Deformation
6. Optical Stabilizing Devices
F. Electron Beam Devices
1. Tubes
2. Circuits
G. Electroluminescent Devices
1. Storage with Field Effect Device
2. Storage Panels—Construction
3. Display, Actuation
4. Enhancement, Amplifications, Conversion
H. Stimulated Emission Devices
1. Laser Structure and Materials

2. Laser Structures
3. Laser Optical Systems and Applications

I. Optical Devices
1. Pressure Gauge
2. Density Measuring
3. Fiber Optics

J. Miscellaneous

18. CHEMICAL COMPOSITIONS AND PREPARATION THEREOF

A. Photosensitive
1. With a Liquid Vehicle
2. Phthalocyanine
a. X-Form
3. Carboxamides
4. Naphthols

B. Polymers

C. Developer, Toner and Carrier Compositions
1. Three Component Developer-Carrier, Toner and Additive
a. Inorganic Additive
b. Organic Additive
2. Two Component Developer
a. Distinctive Toner
(1) Polystyrene-Containing
(2) Phenol-Formaldehyde Containing
b. Distinctive Carrier
3. One Component Developer
4. New Carriers
5. New Toners
a. Distinctive Pigment
b. Encapsulated Liquids
6. Developer Manufacture
a. Carrier Manufacture
b. Toner Preparation

D. Brazing Compositions

20. MECHANICAL COMPONENTS

A. Mechanical Reaction Devices
1. Belts
2. Drives
3. Pulleys and Rollers
4. Load Movers
5. Clutch
6. Transport Motor and Speed Controls

B. Dispensing and Filtering Devices
1. Powder Cloud
2. Particulate Material Dispensing, Distribution
3. Filtering

C. Sensing Devices
1. Powder Level
2. Temperature
3. Quality (Web)
4. Pressure Gauge
5. Wind
6. Weight
7. Thickness

D. Work Devices (Mechanical)
1. Holding, Forming, Feeding
2. Bonding and Fastening
3. Coupling (Pipe)
4. Testing
5. Molding
6. Valves
7. Sizing

E. Antenna Structure

F. Fluid Amplifiers and Magnetically Controllable Switching Devices

G. Miscellaneous

21. METAL WORKING, FORMING AND TREATING

A. Electroforming and Plating
1. Methods
2. Structure
3. Apparatus

B. Metal Treating

24. GRAPHIC ARTS

A. Liquid Ink Recording
1. Electrically Responsive System
2. Electromechanically Responsive System
3. Magnetically Responsive System
4. Photoresponsive System

B. Photographic Copying
1. Transparency Formation
a. Document Support
b. Projection and Exposure
(1) Simultaneous Exposure and Development of Different Frames
(2) Image Reversal Optics
(3) Automatic Masking
c. Transparency Identification
d. Frame Counting and Locating
e. Miscellaneous
2. Contact Printing From a Transparency
a. Transparency Feed
b. Establishing and Maintaining Contact Between Transparency and Copy Material
c. Exposure Control
d. Transfer Imaging
(1) Image Layer Support Strip
3. Processing
a. Material Purification
b. Transparency Transport
4. Viewing

C. Duplicating
1. Method and Apparatus
a. Thermographic
b. Pressure Applied to Sandwich of Original, Transfer and Receiving Sheet
c. Transfer of Electrostatic Charge Through Stencil
d. Condensation Imaging
e. Spirit and Dry Duplicating Systems (Including ELCAR)
(1) Means for Rotably Mounting a Transfer Sheet
(2) Means for Establishing Pressure Between Transfer Sheet and Copy Substrate
(3) Copy Substrate Handling
(4) Program Control
(5) Formation of a Spirit Duplicating Transfer Sheet
(6) Formation of a Stencil Transfer Sheet
(7) Composition of a Transfer Sheet, Receiving Sheets and Printing Inks

D. Planographic Imaging (Including Lithography)

E. Relief Imaging

F. Gravure Printing

G. Miscellaneous

25. ELECTRONIC COMPONENTS

A. Passive Components
1. Printed Circuit Boards
2. Semiconductor Devices
3. Thin Film Components
4. Connectors

B. Active Components

1. Space Charge Devices
2. Junction Devices
3. Thermionic Conversion Devices
4. Thyratrons

C. Circuits
1. Amplifiers
2. Switching
3. Oscillators and Generators
4. Pulse Circuitry, Including Signal Storage and Delay
5. Power Supply
6. Miscellaneous

26. DESIGN PATENTS

A. Reproduction Apparatus
1. In General
2. Document Feeding Apparatus
3. Transfer and Fusing Apparatus
4. Printer
5. Camera

B. Sorting and/or Storing Apparatus

C. Containers for Xerographic Powder

D. Labeling Apparatus

E. Facsimile Transmission Apparatus
1. In General
2. Transceiver Paper Feed Apparatus
3. Adapter for Facsimile Computer System

F. Microform Apparatus
1. Viewer and/or Copier

G. Educational Devices
1. Scales

H. Miscellaneous
1. Housing For Electronic Apparatus
2. Computer Keyboard
3. Send/Receive Data Printer Terminal
4. Telephone Acoustic Coupler
5. Prism
6. Paper Shredder
7. Other

27. PHOTOGRAPHY

A. Direct Printout Members

B. Direct Printout Processes

C. Imaging Member Fabrication

D. Photographic Processes Generally

30. MANIFOLD

A. Basic Process

B. Apparatus

C. Process Variations

D. Activation

E. Image Transfer and Fixing

F. Duplication Masters

G. Image Reversal

H. Reflex Imaging

I. Color Processes

31. MIGRATION IMAGING (XDM)

A. Basic Process

B. Apparatus

C. Process Variation

D. Imaging Members

E. Imaging Member Fabrication

F. Imaged Members

G. Stripping and Splitting

H. Reversal

I. Fixing

J. Duplicating Masters

K. Color

L. Use of Image

32. MISCELLANEOUS

A. Energy Cells

B. Miscellaneous

FOREIGN COUNTRY KEY LETTER CODE

COUNTRY KEY	COUNTRY NAME
AAA	NO FOREIGN FILING
ALB	ALBANIA
ALG	ALGERIA
ARG	ARGENTINA
ATR	AUSTRIA
AUS	AUSTRALIA
BAH	BAHAMAS
BAR	BAHRAIN
BEL	BELGIUM
BOL	BOLIVIA
BRA	BRAZIL
BRS	BR. SOLOMON ISL.
BRU	BRUNEI
BUL	BULGARIA
BUR	BURUNDI
CAM	CAMBODIA
CAN	CANADA
CEY	CEYLON
CHL	CHILE
CHN	CHINA
CLB	COLOMBIA
COR	CONGO REP. (ZAIRE)
COS	COSTA RICA
CUB	CUBA
CZC	CZECHOSLOVAKIA
DNK	DENMARK
DOR	DOMINICAN REP.
ECD	ECUADOR
EGP	EGYPT
EGR	E. GERMANY
EIR	EIRE
ELS	EL SALVADOR
FIJ	FIJI
FIN	FINLAND
FOM	FORMOSA
FRA	FRANCE
GER	GERMANY
GHA	GHANA
GIB	GIBRALTAR
GIE	GIBERT & ELLICE
GNR	GUINEA REP.
GRB	GR. BRITAIN
GRK	GREECE
GUA	GUATEMELA
GUR	GUERNSEY
HGK	HONG KONG
HOL	HOLLAND
HON	HONDURAS
HUN	HUNGARY
ICE	ICELAND
IDS	INDONESIA
IND	INDIA
IRL	IRELAND
IRN	IRAN
ISR	ISRAEL
ITL	ITALY
JAM	JAMAICA
JAP	JAPAN
JER	JERSEY
KEN	KENYA
KOR	KOREA
KUW	KUWAIT
LAS	LAOS
LEB	LEBANON
LIB	LIBERIA
LXB	LUXEMBOURG
MAU	MAURITIUS
MEX	MEXICO
MLI	MALI
MLS	MALASIA
MLT	MALTA
MLW	MALAWI
MNC	MONACO
MRC	MOROCCO
NIG	NIGERIA
NOR	NORWAY
NZL	NEW ZEALAND
PAK	PAKISTAN
PLD	POLAND
PLP	PHILIPPINES
PNM	PANAMA
PRU	PERU
PTG	PORTUGAL
RHD	RHODESIA
RMN	RUMANIA
RWD	RWANDA
SAB	SAUDI ARABIA
SAF	SOUTH AFRICA
SBH	SABAH
SGP	SINGAPORE
SHL	ST. HELENA
SLN	SIERRA LEONE
SPN	SPAIN
SRK	SARAWAK
STZ	SWITZERLAND
SWA	SO. WEST AFRICA
SWD	SWEDEN
SYA	SYRIA
TGR	TANGIER
THL	THAILAND
TIW	TAIWAN
TNS	TUNIS
TRD	TRINIDAD
TRK	TURKEY
TZN	TANZANIA
UGD	UGANDA
UK	UNITED KINGDOM (Fuji Xerox list only)
URG	URUGUAY
USA	USA
USR	USSR
UAR	UNITED ARAB REP.
VTM	VIETNAM
VZL	VENEZUELA
YGS	YUGOSLAVIA
ZMB	ZAMBIA
ZZZ	

FUJI XEROX PATENTS

Class 1A1C

3,569,803.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING FRICTION CHARGING. MAR. 9, 1971. BEL. 719365, CAN. 925561, FRA. 1577647, U.K. 1232470.

3,573,905.—METHOD OF PRODUCING ELECTROPHOTOSENSITIVE CADMIUM SULFIDE WITH CRYSTALS OF A HEXAGONALITY OF LESS THAN 80%. APR. 6, 1971. BEL. 682886, CAN. 814845, FRA. 1526846, JAP. 43-16195, MEX. 93082, U.K. 1148487.

3,775,103.—ELECTROPHOTOGRAPHIC MATERIAL AND PROCESS FOR PRODUCING SAME. NOV. 27, 1973. BEL. 693919, FRA. 1511300, GER. 1,522,612, ITL. 798303, NOR. 122730, U.K. 1,183,762.

3,775,106.—ELECTROPHOTOGRAPHIC PROCESS. NOV. 27, 1973. BEL. 771855, CAN. 946465, JAP. 49-17531, U.K. 1328318.

Class 1A1F

3,705,032.—ELECTROPHOTOGRAPHIC MATERIALS. DEC. 5, 1972. AUS. 432027, BEL. 737701, CAN. 918984, FRA. 6928605, GER. 1942383, ITL. 872749, JAP. 48-2966, U.K. 1237036.

Class 1A2

4,105,466.—ORGANIC PHOTOCONDUCTIVE COATING COMPOSITIONS CONTAINING TRICYANOVINYL COMPOUNDS FOR ELECTROPHOTOGRAPHY. AUG. 8, 1978. U.K. 1531921.

Class 1A2C

3,660,086.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING INORGANIC PHOTOCONDUCTIVE MATERIAL WITH A PHOTOCHROMIC SENSITIZING AGENT. MAY 2, 1972. U.K. 1290441.

3,799,773.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A PHOTOCHROMIC COMPOUND AND TRANSPARENT TONER. MAR. 26, 1974.

Class 1A6

3,787,235.—METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER. JAN. 22, 1974. JAP. 48-1330.

4,197,119.—ELECTROPHOTOGRAPHIC PROCESS. APR. 8, 1980.

Class 1C4B

3,563,733.—METHODS OF PREPARING RELIEF IMAGES BY ENZYMATIC DIGESTION. FEB. 16, 1971. BEL. 709856, CAN. 830395, FRA. 1564578, JAP. 46-11628, U.K. 1217087.

3,630,728.—ELECTROPHOTOGRAPHIC METHOD OF FORMING RELIEF IMAGES. DEC. 28, 1971. BEL. 728693, CAN. 877883, FRA. 2002.362, JAP. 46-41348, U.K. 1228509.

Class 1E

3,549,359.—COLOR ELECTROPHOTOGRAPHY EMPLOYING DYE TRANSFER FROM A DYE-CONTAINING PHOTOSENSITIVE LAYER TO AN IMAGE RECEIVING SHEET. DEC. 22, 1970. FRA. 1524473, GER. 1,572,341, JAP. 45-40159, U.K. 1,183,532.

3,615,391.—ELECTROPHOTOGRAPHIC COLOR DEVELOPING METHOD. OCT. 26, 1971. AUS. 435735, CAN. 842157, FRA. 1572518, JAP. 46-21996, U.K. 1231846, U.K. 1257609.

3,615,392.—ELECTROPHOTOGRAPHIC REPRODUCTION OF ORIGINALS CONTAINING BOTH MULTICOLOR AND LINE AREAS. OCT. 26, 1971. CAN. 902986, JAP. 46-43951.

3,654,865.—METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER. APR. 11, 1972. AUS. 435812, BEL. 745534, CAN. 924.951, FRA. 7004034, ITL. 888.447, JAP. 48-9017, U.K. 1257296.

3,656,947.—CODING OF ORIGINALS AND SENSITIVE PAPER IN A MULTI-COLOR ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. BEL. 748591, CAN. 902987, FRA. 7012518, JAP. 48-26778, U.K. 1309644.

3,672,887.—ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION. JUNE 27, 1972. JAP. 47-19395.

3,687,661.—COLOR ELECTROPHOTOGRAPHIC PROCESS. AUG. 29, 1972. CAN. 925929, JAP. 48-28697.

3,689,260.—COLOR ELECTROPHOTOGRAPHIC PROCESS WITH RESIN DEPOSITION FOR STABILIZATION OF TONER IMAGE. SEPT. 5, 1972. AUS. 437666, BEL. 7531555, CAN. 927649, FRA. 7025295, ITL. 910210, JAP. 48-26779, U.K. 1279506.

3,705,767.—ELECTROPHOTOGRAPHIC DEVICE. DEC. 12, 1972. BEL. 753687, CAN. 947357, FRA. 7026800, GER. 2036140, ITL. 902477, JAP. 48-11054, U.K. 1266112.

3,779,639.—COLOR ELECTROPHOTOGRAPHIC APPARATUS. DEC. 18, 1973. U.K. 1331870.

3,785,812.—METHOD OF EXPOSURE IN MULTI-COLOR ELECTROPHOTOGRAPHY. JAN. 15, 1974. ARG. 185812, AUS. 417288, BEL. 759392, CAN. 945619, FRA. 7042329, ITL. 914549, JAP. 49-23905, U.K. 1322847.

3,806,340.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A POLAR ORGANIC SOLVENT VAPOR. APR. 23, 1974. BEL. 774765, CAN. 946671, FRA. 7138742, JAP. 49-23905, U.K. 1322847.

Class 1F

3,473,923.—REPRODUCTION PROCESS INCLUDING TRANSFER AND REDEVELOPMENT OF ELECTROSTATICALLY FORMED IMAGES. OCT. 21, 1969. BEL. 679506, FRA. 1479592, GER. 1,522,597. JAP. 43-07586, U.K. 1152832.

3,745,002.—METHOD OF PREPARING A PRINTING MASTER BY XEROGRAPHY. JULY 10, 1973. ARG. 120543, AUS. 432568, BEL. 756.595, CAN. 903014, FRA. 2068748, JAP. 48-27362, MEX. 119463, U.K. 1314109.

3,788,845.—PROCESS FOR FORMING DYE IMAGES. JAN. 29, 1974.

Class 1G

3,764,309.—COLOR PRINTING METHOD. OCT. 9, 1973. BEL. 724581, CAN. 877884, FRA. 1595848, ITL. 848192, JAP. 46-33541, U.K. 1223020.

Class 1G1

4,151,604.—IMAGE STORAGE AND OPTICAL READOUT DEVICE HAVING STRIPED ELECTRODES. APR. 24, 1979.

Class 1I

3,762,811.—METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY. OCT. 2, 1973.

3,784,301.—ELECTROPHOTOGRAPHIC BORDER APPARATUS. JAN. 8, 1974. JAP. 49-26590.

Class 1J6

3,796,187.—APPARATUS FOR DEVELOPING CONTINUOUS ELECTROPHOTOGRAPHIC PHOTOSENSITIVE WEB MATERIAL. MAR. 12, 1974. BEL. 769412, CAN. 934541, FRA. 7123852, ITL. 934462, U.K. 1332534.

Class 1K

3,408,217.—FINGERPRINT RECORDING. OCT. 29, 1968. JAP. 41-21520, U.K. 1095572.

3,492,140.—METHOD OF RECORDING FINGERPRINTS OF HUMAN BODY. JAN. 7, 1970. FRA. 1386116, JAP. 39-27575, U.K. 1063635.

Class 1K3

3,745,002.—METHOD OF PREPARING A PRINTING MASTER BY XEROGRAPHY. JULY 10, 1973. ARG. 120543, AUS. 432568, BEL. 756.595, CAN. 903014, FRA. 2068748, JAP. 48-27362, MEX. 119463, U.K. 1314109.

Class 2A1B

4,170,476.—LAYERED PHOTOCONDUCTIVE ELEMENT HAVING AS AND/OR TE DOPED WITH GA, IN OR TL INTERMEDIATE TO SE AND INSULATOR. OCT. 9, 1979. U.K. 1535629.

Class 2A1E

3,506,595.—PHOTOCONDUCTIVE INSULATING MATERIALS. APR. 14, 1970. FRA. 1498064, GER. 1,522,606, JAP. 43-24394, U.K. 1148537.

3,615,401.—PROCESS FOR THE PREPARATION OF PHOTOCONDUCTIVE LIGHT-SENSITIVE MATERIALS COMPRISING CdS OR CdS.N $CdCo_2$. OCT. 26, 1971. FRA. 2001257, JAP. 47-40819, U.K. 1239129.
3,615,410.—ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A PROTEASE ENZYME. OCT. 26, 1971. BEL. 730415, CAN. 885386, FRA. 2004.940, U.K. 1224711.

Class 2A1E1

3,385,699.—PROCESS FOR PROCESSING ELECTROPHOTOSENSITIVE LAYERS. MAY 28, 1968. BEL. 651039, FRA. 1402385, HOL. 130806, SWD. 310458, U.K. 1072476.
3,494,766.—LIGHT SENSITIVE LAYER FOR ELECTROPHOTOGRAPHY. FEB. 10. 1970. CAN. 791648, FRA. 1460449, NOR. 112288, SWD. 226000, U.K. 1085939.
3,494,789.—PHOTOCONDUCTIVE INSULATING MATERIAL. FEB. 10, 1970. CAN. 813810, FRA. 1564467, ITL. 788829, JAP. 44-10631, MEX. 88112, U.K. 1120091.
3,615,410.—ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A PROTEASE ENZYME. OCT. 26, 1971. BEL. 730415, CAN. 885386, FRA. 2004.940, U.K. 1224711.
3,634,333.—PROCESS FOR COATING ZINC OXIDE POWDER WITH CADMIUM SULFIDE. JAN. 11, 1972. BEL. 731056, CAN. 882.627, FRA. 2.005.849, GER. 1916761, JAP. 47-49616, U.K. 1215685.
3,660,086.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING INORGANIC PHOTOCONDUCTIVE MATERIAL WITH A PHOTOCHROMIC SENSITIZING AGENT. MAY 2, 1972. U.K. 1290441.
3,674,476.—PROCESS FOR PRODUCING PHOTOCONDUCTIVE LAYER FOR ELECTROPHOTOGRAPHY. JULY 4, 1972. BEL. 751.676, CAN. 918481, FRA. 2051030, U.K. 1264719.
3,689,260.—COLOR ELECTROPHOTOGRAPHIC PROCESS WITH RESIN DEPOSITION FOR STABILIZATION OF TONER IMAGE. SEPT. 5, 1972. AUS. 437666, BEL. 753155, CAN. 927649, FRA. 7025295, ITL. 910210, JAP. 48-26779, U.K. 1279506.
3,707,392.—METHOD OF SENSITIZATION OF AN ELECTROPHOTOGRAPHIC MATERIAL. DEC. 26, 1972. AUS. 444836, BEL. 744600, CAN. 888125, FRA. 7001955, GER. 2002507, ITL. 892368, JAP. 48-7814, U.K. 1257154.
3,725,060.—HEMATEIN OR HEMATOXYLIN-CONTAINING ZINC OXIDE PHOTOCONDUCTIVE LAYERS. APR. 3, 1973. JAP. 49-4340.
3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973. JAP. 45-990335.

Class 2A1F

3,394,001.—ELECTROPHOTOGRAPHIC SENSITIVE CONTAINING ELECTRON DONOR DYE LAYERS. JULY 23, 1968. JAP. 44-15758, U.K. 1,106,562.
3,476,659.—ELECTROPHOTOGRAPHIC IMAGING AND COPYING PROCESS. NOV. 4, 1969. BEL. 684406, FRA. 1489929, ITL. 773333, JAP. 43-27579, U.K. 1159394.
3,654,865.—METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER. APR. 11, 1972. AUS. 435812, BEL. 745534, CAN. 924.951, FRA. 7004034, ITL. 888.447, JAP. 48-9017, U.K. 1257296.
3,704,123.—DYE SENSITIZED PHOTOCONDUCTIVE MATERIAL. NOV. 28, 1972. AUS. 424510, BEL. 720260, CZC. 142206, FRA. 1568416, GER. 1772210, ITL. 831114, JAP. 47-20753, U.K. 1190676, USR. 374866.
3,705,032.—ELECTROPHOTOGRAPHIC MATERIALS. DEC. 5, 1972. AUS. 432027, BEL. 737701, CAN. 918984, FRA. 6928605, GER. 1942383, ITL. 872749, JAP. 48-2966, U.K. 1237036.
3,707,392.—METHOD OF SENSITIZATION OF AN ELECTROPHOTOGRAPHIC MATERIAL. DEC. 26, 1972. AUS. 444836, BEL. 744600, CAN. 888125, FRA. 7001955, GER. 2002607, ITL. 892368, JAP. 48-7814, U.K. 1257154.

Class 2A1G

3,541,028.—PHOTOCONDUCTIVE INSULATING MATERIALS. NOV. 17, 1970. FRA. 1494699, GER. 1,522,605, JAP. 43-14494, U.K. 1128417.

Class 2A2

3,647,428.—PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY. MAR. 7, 1972. AUS. 429949, BEL. 759550, CAN. 924162, FRA. 2072521, ITL. 923181, JAP. 48-4316, U.K. 1269429.
3,704,119.—ELECTROPHOTOGRAPHIC PROCESS USING TONER OF SAME REFRACTIVE INDEX AS ORGANIC PHOTOCONDUCTIVE LAYER. NOV. 28, 1972. AUS. 433360, BEL. 754544, FRA. 7028556, ITL. 902771, JAP. 48-21054, U.K. 1321065.

Class 2A2A

3,707,369.—PHOTOCONDUCTIVE ELEMENTS CONTAINING 2-METHYL-3, 3-DIMETHYL INDOLE DERIVATIVES. DEC. 26, 1972. BEL. 754969, CAN. 898823, FRA. 703049, GER. 2041490, U.K. 1268889.
4,209,579.—ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL WITH A QUINOCYANINE PIGMENT. JUNE 24, 1980.

Class 2B

3,394,001.—ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL CONTAINING ELECTRON-DONOR DYE LAYERS. JULY 23, 1968. JAP. 44-15758, U.K. 1,106,562.
3,656,949.—METHOD OF PRODUCING AN ELECTROPHOTOGRAPHIC AND ELECTROGRAPHIC RECORDING MEMBER. APR. 18, 1972. BEL. 734288, CAN. 890875, FRA. 6919148, GER. 1929162, JAP. 48-787, U.K. 1259158.
3,704,121.—ELECTROPHOTOGRAPHIC REPRODUCTION PROCESS USING A DUAL LAYERED PHOTORECEPTOR. NOV. 28, 1972. BEL. 739153, FRA. 6932116, ITL. 890989, JAP. 49-25218, SPN. 371685, STZ. 519188, U.K. 1272131.
4,023,181.—RECORDING MEDIUM CONDUCTIVE ELECTRODE. MAY 10, 1977. JAP. 49-91720.
4,042,936.—ELECTROSENSITIVE RECORDING METHOD. AUG. 16, 1977. JAP. P49-042206.

Class 2B1

3,574,682.—ELECTROSTATIC RECORDING MATERIALS. APR. 13, 1971. U.K. 1213395.
3,787,235.—METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER. JAN. 22, 1974. JAP. 48-1330.

Class 2B2

3,552,956.—METHOD FOR TREATING ELECTROPHOTOGRAPHIC RECORDING MATERIALS WITH PROTECTIVE OVERCOATINGS. JAN. 5, 1971. BEL. 693184, FRA. 1508918, SWD. 326372, U.K. 1155665.
3,717,461.—REMOVAL OF PROTECTIVE RESIN LAYER BY LIQUID DEVELOPER IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 20, 1973. ARG. 182091, AUS. 428797, BEL. 762.808, CAN. 929016, FRA. 2078511, ITL. 919801, MEX. 120941, U.K. 1326300.

Class 2B4

3,428,453.—IMAGING FORMING PROCESS UTILIZING XEROGRAPHY. FEB. 18, 1969. FRA. 1,428,775, ITL. 754,825, JAP. 43-02622, U.K. 1,085,151.

Class 2E

3,417,733.—APPARATUS FOR VACUUM COATING. DEC. 24, 1968. FRA. 1,415,251, GER. 1,521,238, JAP. 40-26402, U.K. 1,081,324.
3,573,905.—METHOD OF PRODUCING ELECTROPHOTOSENSITIVE CADMIUM SULFIDE WITH CRYSTALS OF A HEXAGONALITY OF LESS THAN 80% APR. 6, 1971. BEL. 682886, CAN. 814845, FRA. 1526846, JAP. 43-16195, MEX. 93082, U.K. 1148487.
3,656,949.—METHOD OF PRODUCING AN ELECTROPHOTOGRAPHIC AND ELECTOGRAPHIC RECORDING MEMBER. APR. 18, 1972. BEL. 734288, CAN. 890875, FRA. 6919148, GER. 1929162, JAP. 48-787, U.K. 1259158.
3,672,988.—METHOD OF MANUFACTURING BASES FOR ELECTROSTATIC RECORDING MATERIAL OR ELECTROPHOTOGRAPHIC MATERIAL. JUNE 27, 1972. AUS. 437336, BEL. 746420, CAN. 898621, GER. 2008636, ITL. 888758, JAP. 47-45549, U.K. 1301926.
3,674,476.—PROCESS FOR PRODUCING PHOTOCONDUCTIVE LAYER FOR ELECTROPHOTOGRAPHY. JULY 4, 1972. BEL. 751.676, CAN. 918481, FRA. 2051030, U.K. 1264719.
3,772,173.—ELECTROCONDUCTIVE PAPER. NOV. 13, 1973. CAN. 930693, JAP. 48-15037, U.K. 1329569.
3,775,103.—ELECTROPHOTOGRAPHIC MATERIAL AND PROCESS FOR PRODUCING SAME. NOV. 27, 1973. BEL. 693919, FRA. 1511300, GER. 1522612, ITL. 798303, NOR. 122730, U.K. 1183762.
3,927,638.—VACUUM EVAPORATION PLATING APPARATUS. DEC. 23, 1975.

3,984,585.—VACUUM EVAPORATION PLATING METHOD. MAY 5, 1976. FRA. 7422500, GER. P-2430653.4, JAP. 48-72263, U.K. 1,214,698.

Class 2F

3,998,548.—SENSITIVE DRUM RECEIVING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC REPRODUCING MACHINE. DEC. 21, 1976. JAP. 49-94060, U.K. 32984/75.

Class 3

3,764,207.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING SINGLE CHARGING MEANS FOR EFFECTING SIMULTANEOUS FUNCTIONS OF CHARGING AND FACILITATING TONER IMAGE TRANSFER. OCT. 9, 1973.

Class 3C

3,612,864.—IMAGING SYSTEM UTILIZING AN ELECTRODE TREATED WITH A MIXTURE OF A HYGROSCOPIC MATERIAL AND A HYDROPHILIC BINDER. OCT. 12, 1971. BEL. 726690, CAN. 885615, JAP. 47-12440.
3,775,106.—ELECTROPHOTOGRAPHIC PROCESS. NOV. 27, 1973. BEL. 771855, CAN. 946465, JAP. 49-17531, U.K. 1328318.

Class 3C1

3,772,173.—ELECTROCONDUCTIVE PAPER. NOV. 13, 1973. CAN. 930693, JAP. 48-15037, U.K. 1329569.

Class 3C3

3,649,830.—UNIFORM CHARGING METHOD AND APPARATUS USING AN ARRAY OF NEEDLE ELECTRODES. MAR. 14, 1972. CAN. 940590, JAP. 48-28301, U.K. 1279758.
3,655,966.—ELECTRIC CHARGING DEVICE FOR ELECTROPHOTOGRAPHY. APR. 11, 1972. CAN. 922359, JAP. 48-25942, U.K. 1323599.

Class 3C4

3,719,481.—ELECTROSTATOGRAPHIC IMAGING PROCESS. MAR. 6, 1973. CAN. 948693, FRA. 7108391, ITL. 921208, U.K. 1281149.

Class 3C5

3,715,640.—CORONA CHARGING PROCESS AND APPARATUS IN ELECTROPHOTOGRAPHY. FEB. 6, 1973. AUS. 425637, BEL. 765716, CAN. 927473, FRA. 71131128, ITL. 923947, JAP. 49-17379, U.K. 1338691.
3,779,749.—METHOD OF CHARGING IN ELECTROPHOTOGRAPHY. DEC. 18, 1973. BEL. 772412, CAN. 9481495, FRA. 7132246, ITL. 942080, JAP. 49-17532, U.K. 1359182.
3,788,844.—CHARGING METHOD FOR ELECTROPHOTOGRAPHY. JAN. 29, 1974. JAP. 49-13025, U.K. 1344908.
3,789,222.—CORONA CHARGE METHOD. JAN. 29, 1974. BEL. 771311, CAN. 943180, FRA. 7129655, ITL. 933902, JAP. 49-17530.
3,789,224.—PROCESS FOR CHARGING ELECTROPHOTOGRAPHIC MATERIALS. JAN. 29, 1974. AUS. 435928, BEL. 772465, CAN. 945834, FRA. 7132445, ITL. 938023, JAP. 49-23902, U.K. 1359181.

Class 3C9

3,582,731.—CHARGING SYSTEM. JUNE 1, 1971. CAN. 906045, JAP. 46-30636.

Class 3D

3,546,545.—METHOD OF CHARGING A PHOTOCONDUCTIVE INSULATING LAYER. DEC. 8, 1970. BEL. 721040, FRA. 1586221, U.K. 1205297.
3,569,803.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING FRICTION CHARGING. MAR. 9, 1971. BEL. 719365, CAN. 925561, FRA. 1577647, U.K. 1232470.

Class 3E

3,704,121.—ELECTROPHOTOGRAPHIC REPRODUCTION PROCESS USING A DUAL LAYERED PHOTORECEPTOR. NOV. 28, 1972. BEL. 739153, FRA. 6932116, ITL. 890989, JAP. 49-25218, SPAN. 371685, STZ. 519188, U.K. 1272131.
3,715,640.—CORONA CHARGING PROCESS AND APPARATUS IN ELECTROPHOTOGRAPHY. FEB. 6, 1973. AUS. 425637, BEL. 765716, CAN. 927473, FRA. 71131128, ITL. 923947, JAP. 49-17379, U.K. 1338691.

Class 3F

3,749,927.—ELECTROSTATIC CHARGING PROCESS FOR ELECTROPHOTOSENSITIVE MATERIAL. JULY 31, 1973. AUS. 435008, BEL. 469413, FRA. 7123717, ITL. 934461, JAP. 49-16060, U.K. 1316047.
3,778,148.—APPARATUS AND METHOD FOR SELECTIVELY DISCHARGING THE PHOTOCONDUCTIVE SURFACE OF AN ELECTROSTATIC DRUM COPIER TO FACILITATE THE CLEANING THEREOF. DEC. 11, 1973.
3,778,623.—CHARGING METHOD OF ELECTROPHOTOGRAPHIC MATERIALS. DEC. 11, 1973. FRA. 7229549.
3,789,223.—CHARGING METHOD FOR RELATIVELY MOVABLE ELECTROPHOTOGRAPHIC MEANS AND CORONA MEANS. JAN. 29, 1974. AUS. 431512, BEL. 771143, FRA. 7129349, ITL. 935108, JAP. 49-17529, U.K. 1347100.
3,789,224.—PROCESS FOR CHARGING ELECTROPHOTOGRAPHIC MATERIALS. JAN. 29, 1974. AUS. 435928, BEL. 772465, CAN. 945834, FRA. 7132445, ITL. 938023, JAP. 49-23902, U.K. 1359181.

Class 4A

3,741,644.—ORIGINAL POSITION CONFIRMING MEANS FOR DUPLICATING APPARATUS. JUNE 26, 1973.

Class 4A1

3,771,082.—COPYING APPARATUS WITH AUXILIARY LIGHT SOURCE FOR ILLUMINATING AN ORIGINAL TO BE REPRODUCED. NOV. 6, 1973. U.K. 1350616.
3,841,752.—LIGHT SOURCE FOR COPYING MACHINE. OCT. 15, 1974.

Class 4A2

3,737,223.—PLATEN DRIVING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JUNE 5, 1973. U.K. 1341619.

Class 4B

3,687,661.—COLOR ELECTROPHOTOGRAPHIC PROCESS. AUG. 29, 1972. ARG. 182081, BEL. 759454, CAN. 932785, FRA. 7043828, ITL. 909538, JAP. 49-18265, U.K. 1327486.
3,784,301.—ELECTROPHOTOGRAPHIC BORDER APPARATUS. JAN. 8, 1974. JAP. 49-26590.
3,785,812.—METHOD OF EXPOSURE IN MULTI-COLOR ELECTROPHOTOGRAPHY. JAN. 15, 1974. ARG. 185812, AUS. 417288, BEL. 759392, CAN. 945619, FRA. 7042329, ITL. 914549, JAP. 49-11573, U.K. 1326580.

Class 4B1

3,927,940.—MANUSCRIPT SCANNING DEVICE FOR COPYING MACHINES AND THE LIKE. DEC. 23, 1975.
3,955,048.—SCANNING METHOD AND APPARATUS. MAY 4, 1976.

Class 4B1A

3,778,153.—OPTICAL IMAGING SYSTEM. DEC. 11, 1973.
4,063,813.—METHOD OF EXPOSING A LIGHT SENSITIVE MEMBER. DEC. 20, 1977. JAP. 51-89646, U.K. 76-19272.

Class 4B7

3,313,883.—SYSTEMS FOR RECORDING CHARACTERS ON LIGHT SENSITIVE RECORDING SURFACES. AUG. 25, 1964. CAN. 693,055, FRA. 1,246,197, GER. 1,449,634, JAP. 318,009.
3,615,391.—ELECTROPHOTOGRAPHIC COLOR DEVELOPING METHOD. OCT. 26, 1971. AUS. 435735, CAN. 842157, FRA. 1572518, JAP. 46-21996, U.K. 1231846, U.K. 1257609.
3,656,947.—CODING OF ORIGINALS AND SENSITIVE PAPER IN A MULTI-COLOR ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. BEL. 748591, CAN. 902987, FRA. 7012518, JAP. 48-26778, U.K. 1309644.

Class 5A1A

3,451,376.—DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHY. JUNE 24, 1969. AUS. 410555, FRA. 1556520, SWD. 319382, U.K. 1173377.

Class 5A2

3,418,972.—POWDER DUSTING DEVICE FOR ELECTROPHOTOGRAPHY. DEC. 31, 1968. FRA. 1544620, JAP. 45-8838, U.K. 1169410.

Class 5A3B

3,418,972.—POWDER DUSTING DEVICE FOR ELECTROPHOTOGRAPHY. DEC. 31, 1968. FRA. 1544620, JAP. 45-8838, U.K. 1169410.

Class 5A4

3,681,065.—DYE TRANSFER COLOR ELECTROPHOTOGRAPHY. AUG. 1, 1972. CAN. 884,227, JAP. 44-32208.

Class 5A5

3,620,800.—CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID. NOV. 16, 1971. CAN. 915753, CAN. 933997, JAP. 48-13454.

Class 5C

3,927,641.—DEVELOPING MECHANISM USING MAGNETIC BRUSH. DEC. 23, 1975.

3,937,181.—MAGNETIC BRUSH TYPE DEVELOPING MECHANISM IN ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 10, 1976.

Class 5C1

3,545,968.—DEVELOPING A LATENT ELECTROSTATIC IMAGE WITH FERROMAGNETIC CARRIER AND TONER BY EMPLOYING A VARYING MAGNETIC FIELD. DEC. 8, 1970. BEL. 710692, FRA. 1561470, U.K. 1205175.

3,908,595.—MAGNETIC BRUSH DEVELOPMENT APPARATUS UTILIZING MAGNETIC MEANS. SEPT. 30, 1975.

3,977,361.—MAGNETIC BRUSH DEVELOPMENT DEVICE. AUG. 31, 1976. GER. P2521275.3, JAP. 49-52302, KOR. 3670, TIW. 6410622, U.K. 19955-75.

3,981,271.—MAGNETIC BRUSH TYPE DEVELOPER FOR USE IN AN ELECTROPHOTOGRAPHIC MACHINE. SEPT. 21, 1976. GER. P2507391.0, JAP. 49-19615, U.K. 6841-75.

3,985,099.—MAGNETIC BRUSH DEVELOPING DEVICE. OCT. 12, 1976. GER. P2521291.3 JAP. 52303, KOR. 3669, TIW. 6410736, U.K. 19951-75.

4,048,958.—MAGNETIC BRUSH DEVELOPING DEVICE. SEPT. 20, 1977. KOR. 4052-74, TIW. 22,999, U.K. 9472/76, W. GER. P2611755.5.

4,194,465.—MAGNETIC BRUSH DEVELOPER DEVICE. MAR. 25, 1980.

Class 5C2

3,672,887.—ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION. JUNE 27, 1972. JAP. 47-19395.

3,764,309.—COLOR PRINTING METHOD. OCT. 9, 1973. BEL. 724581, CAN. 877884, FRA. 1595848, ITL. 848192, JAP. 46-33541, U.K. 1223020.

Class 5D1

3,783,818.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. JAN. 8, 1974. BEL. 781515, FRA. 7211409, ITL. 950927, U.K. 1358450.

Class 5D2

3,336,904.—XEROGRAPHIC DEVELOPING APPARATUS. AUG. 22, 1967. BEL. 651786, GER. 1,472,946, HOL. 132649, JAP. 40-23755, U.K. 1068575.

Class 5D3

3,804,659.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPMENT PROCESS FOR ENHANCING THE QUALITY OF THE DEVELOPED IMAGE. APR. 16, 1974. FRA. 7144069, JAP. 49-26901.

Class 5E

3,540,885.—REDUCTION OF FOG FORMATION IN AN ELECTROPHOTOGRAPHIC LIGHT SENSITIVE SHEET. NOV. 17, 1970. BEL. 693302, FRA. 1509571, JAP. 44-2551, U.K. 1176001.

3,560,203.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. FEB. 2, 1971. FRA. 1604137, U.K. 1165038.

3,566,834.—ELECTROPHOTOGRAPHIC DEVELOPING DEVICE. MAR. 2, 1971. AUS. 417201, BEL. 718329, FRA. 1578391, JAP. 48-31853, U.K. 1194789.

3,622,515.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPER HAVING A PROTEOLYTIC ENZYME. NOV. 23, 1971. AUS. 436813, BEL. 732273, CAN. 896948, FRA. 2007.520, ITL. 867188, JAP. 47-17879, U.K. 1231544.

3,627,557.—LIQUID DEVELOPMENT BY REDUCING THE VISCOSITY OF THE DEVELOPER ON A ROLLER APPLICATION PRIOR TO DEVELOPMENT. DEC. 14, 1971. CAN. 905230, U.K. 1303499.

3,628,981.—LIQUID TONER DEVELOPMENT. DEC. 21, 1971. BEL. 751669, CAN. 902982, FRA. 7021033, ITL. 893939, JAP. 48-18859, U.K. 1284477.

3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972. CAN. 867698.

3,668,126.—METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL. JUNE 6, 1972. BEL. 709625, FRA. 1562934, U.K. 1218064.

3,671,290.—IMAGING SYSTEM. JUNE 20, 1972. CAN. 917486, JAP. 48-8134, U.K. 1278858.

3,685,907.—ELECTROPHOTOGRAPHIC PROCESS. AUG. 22, 1972. ARG. 181932, AUS. 442703, BEL. 752387, CAN. 910132, FRA. 2-51297, ITL. 902170, MEX. 116451, U.K. 1292200.

3,692,523.—PROCESS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE AND LIQUID DEVELOPER USED THEREFOR. SEPT. 19, 1972. AUS. 437065, BEL. 745533, CAN. 924.167, FRA. 7040233, GER. 20052680, ITL. 888.449, JAP. 48-7821, U.K. 1255445.

3,703,400.—DEVELOPING METHOD FOR ELECTROPHOTOGRAPHY. NOV. 21, 1972. AUS. 435816, BEL. 748.590, CAN. 898073, FRA. 7012445, GER. 2016586, ITL. 903950, U.K. 1251623.

3,705,032.—ELECTROPHOTOGRAPHIC MATERIALS. DEC. 5, 1972. AUS. 432027, BEL. 737701, CAN. 918984, FRA. 6928605, GER. 1942383, ITL. 872749, JAP. 48-2966, U.K. 1237036.

3,705,767.—ELECTROPHOTOGRAPHIC DEVICE. DEC. 12, 1972. BEL. 753687, CAN. 947357, FRA. 7026800, GER. 2036140, ITL. 902477, JAP. 48-11054, U.K. 1266112.

3,707,139.—LIQUID TYPE ELECTROPHOTOGRAPHY DEVELOPING APPARATUS. DEC. 26, 1972. BEL. 756409, CAN. 918413, FRA. 7034577, GER. 1314865.

3,713,422.—APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE BY LIQUID DEVELOPMENT. JAN. 30, 1973. BEL. 764267, CAN. 932954, FRA. 7109086, GER. 763,992, U.K. 1341631.

3,716,360.—MOLTEN IMAGE TRANSFER IN ELECTROPHOTOGRAPHY. FEB. 13, 1973. BEL. 763191, FRA. 7105717, GER. 2108080, ITL. 919905, U.K. 1313059.

3,717,461.—REMOVAL OF PROTECTIVE RESIN LAYER BY LIQUID DEVELOPER IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 20, 1973. ARG. 182091, AUS. 428797, BEL. 762808, CAN. 929016, FRA. 2078511, ITL. 919801, MEX. 120941, U.K. 1326300.

3,718,593.—PROCESS FOR THE PRODUCTION OF AN ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. FEB. 27, 1973. AUS. 438586, BEL. 745535, CAN. 924166, FRA. 7004034, ITL. 888743, JAP. 48-7822, U.K. 1255763.

3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATIN. JUNE 12, 1973. CAN. 921746, JAP. 47-30858, U.K. 1277723.

3,749,059.—APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE. JULY 31, 1973. AUS. 445683, BEL. 755061, CAN. 903579, FRA. 7029636, JAP. 48-25936, U.K. 1267888.

3,750,624.—APPARATUS FOR DEVELOPING ELECTROPHOTOGRAPHIC CONTINUOUS WEB MATERIAL. AUG. 7, 1973. AUS. 433381, BEL. 770250, CAN. 948843, FRA. 7126524, ITL. 948843, U.K. 1328313.

3,753,419.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPING APPARATUS. AUG. 21, 1973. AUS. 430772, BEL. 768788, CAN. 334540, FRA. 7122426, ITL. 928531, U.K. 1337485.

3,766,887.—DEVELOPING DEVICE FOR ELECTROSTATIC LATENT IMAGE. OCT. 28, 1973. AUS. 429869, BEL. 761227, CAN. 102437, FRA. 2075270, ITL. 919235, U.K. 1310092.

3,774,574.—DEVELOPMENT DEVICE FOR ELECTROPHOTOGRAPHY. NOV. 27, 1973. FRA. 7143873.

3,783,827.—LIQUID DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHY. JAN. 8, 1974. BEL. 777528, CAN. 949309, FRA. 7147339, ITL. 945720.

3,784,397.—IMAGING SYSTEM. JAN. 8, 1974. ARG. 185194, JAP. 1348667, MEX. 120938.

3,788,930.—METHOD OF FIXING IMAGES OBTAINED BY LIQUID DEVELOPMENT IN ELECTROPHOTOGRAPHY. JAN. 29, 1974. BEL. 774763.

3,796,187.—APPARATUS FOR DEVELOPING CONTINUOUS ELECTROPHOTOGRAPHIC PHOTOSENSITIVE WEB MATERIAL. MAR. 12, 1974. BEL. 769412, CAN. 934541, FRA. 7123852, ITL. 934462, U.K. 1332534.

3,804,659.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPMENT PROCESS FOR ENHANCING THE QUALITY OF THE DEVELOPED IMAGE. APR. 16, 1974. FRA. 7144069, JAP. 49-26901.

3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974. U.K. 1310448.

3,836,384.—IMAGING SYSTEMS. SEPT. 17, 1974. JAP. 46-43198.

3,991,711.—ELECTROSTATIC DUPLICATING METHOD AND APPARATUS UTILIZING WET DEVELOPING. NOV. 16, 1976. FRA. 733636, GER. 2350429, JAP. 47-101120, U.K. 1,443,209.

4,029,826.—ELECTROSTATIC PRINTING METHOD. JUNE 14, 1977. FRA. 7434015, GER. P2448211.9, JAP. 48-112875, U.K. 43016-74.

Class 5E4

3,577,259.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES UTILIZING A TOWER-FREE ZONE. MAY 4, 1971. AUS. 418640, CAN. 871081, FRA. 1592038, JAP. 46-11633, U.K. 1252917.

3,592,678.—LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING. JULY 13, 1971. CAN. 939733, JAP. 48-34774, U.K. 1261752.

3,597,368.—LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY CONTAINING YELLOW PIGMENT. AUG. 3, 1971. BEL. 719289, CAN. 846.122, FRA. 1578390, JAP. 46-10480, U.K. 1201134.

Class 5I1

3,537,427.—ELECTROSTATIC LATENT IMAGE DEVELOPING DEVICE. NOV. 3, 1930. BEL. 722040, JAP. 46-14440, U.K. 1239635.

3,607,342.—METHOD OF DEVELOPMENT OF ELECTROSTATIC IMAGES. SEPT. 21, 1971. BEL. 707253, FRA. 1555753, JAP. 44-9878, U.K. 1204548.

3,627,557.—LIQUID DEVELOPMENT BY REDUCING THE VISCOSITY OF THE DEVELOPER ON A ROLLER APPLICATION PRIOR TO DEVELOPMENT. DEC. 14, 1971. CAN. 905230, U.K. 1303499.

Class 5J

3,713,422.—APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE BY LIQUID DEVELOPMENT. JAN. 30, 1973. BEL. 764267, CAN. 932954, FRA. 7109086, GER. 763,992, U.K. 1341631.

3,750,624.—APPARATUS FOR DEVELOPING ELECTROPHOTOGRAPHIC CONTINUOUS WEB MATERIAL. AUG. 7, 1973. AUS. 433381, BEL. 770250, CAN. 948843, FRA. 7126524, ITL. 937783, U.K. 1328313.

Class 5J1

3,620,798.—DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE EMPLOYING NOVEM DEVELOPMENT ELECTRODE. NOV. 16, 1971. BEL. 709410, FRA. 1552425, U.K. 1186841.

3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972. CAN. 867698.

3,655,419.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPING PROCESS. APR. 11, 1972. AUS. 432643, BEL. 741.440, CAN. 914.518, FRA. 6938659, ITL. 880.593, U.K. 1287.903.

3,685,907.—ELECTROPHOTOGRAPHIC PROCESS. AUG. 22, 1972. AUS. 442703, BEL. 752387, CAN. 910132, FRA. 2-51297, ITL. 902170, U.K. 1292200.

3,783,827.—LIQUID DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHY. JAN. 8, 1974. BEL. 777528, CAN. 949309, FRA. 7147339, ITL. 945720.

3,836,384.—IMAGING SYSTEMS. SEPT. 17, 1974. JAP. 46-43198.

Class 5J2

3,774,574.—DEVELOPMENT DEVICE FOR ELECTROPHOTOGRAPHY. NOV. 27, 1973. FRA. 7143873.

3,784,397.—IMAGING SYSTEM. JAN. 8, 1974. ARG. 185194, MEX. 120938, U.K. 1348667.

Class 5J3

3,566,834.—ELECTROPHOTOGRAPHIC DEVELOPING DEVICE. MAR. 2, 1971. AUS. 417201, BEL. 718329, FRA. 1578391, JAP. 48-31853, U.K. 1194789.

3,672,330.—APPARATUS FOR DEVELOPING A LATENT ELECTROSTATIC IMAGE. JUNE 27, 1972. BEL. 708760, FRA. 149128, U.K. 1192600.

Class 5J5

3,560,203.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. FEB. 2, 1971. FRA. 1604137, U.K. 1165038.

3,783,818.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. JAN. 8, 1974. BEL. 781515, FRA. 7211409, ITL. 950927, U.K. 1358450.

3,784,397.—IMAGING SYSTEM. JAN. 8, 1974. ARG. 185194, MEX. 120938, U.K. 1348667.

3,981,268.—DEVICE FOR CONTROLLING ELECTRIC POTENTIAL APPLIED TO DEVELOPING ELECTRODE IN AN ELECTROPHOTOGRAPHIC DUPLICATOR. SEPT. 21, 1976. GER. P2526802.4, JAP. 49-47554, KOR. 3672, TIW. 6410621, U.K. 24745-75.

Class 5K

3,724,941.—ELECTROPHOTOGRAPHIC APPARATUS. APR. 3, 1973.

3,762,811.—METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY. OCT. 2, 1973.

Class 5M

3,620,798.—DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE EMPLOYING NOVEM DEVELOPMENT ELECTRODE. NOV. 16, 1971. BEL. 709410, FRA. 1552425, U.K. 1186841.

3,655,419.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPING PROCESS. APR. 11, 1972. AUS. 432643, BEL. 471.440, CAN. 914.518, FRA. 6938659, ITL. 880.593, U.K. 1287.903.

3,773,507.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPMENT PROCESS EMPLOYING A PRETONER. NOV. 20, 1973. AUS. 426720, BEL. 769893, CAN. 947812, FRA. 7124853, ITL. 934605, JAP. 49-5465, U.K. 1340947.

Class 5N

3,764,312.—ELECTROPHOTOGRAPHIC PROCESS. OCT. 9, 1973. FRA. 7146405, JAP. 49-26903.

Class 5N2B

4,020,192.—XEROGRAPHIC REPRODUCTION PROCESS AND TONER CARRIER FOR USE THEREIN. APR. 26, 1977. FRA. 7430644, GER. P2443013.1, JAP. 48-101085, U.K. 39509.

Class 5N5

3,941,898.—DEVELOPING METHOD UTILIZING PULVERIZED, COLORED, CROSSLINKED, VINYLIC POLYMER RESIN AS TONER. MAR. 2, 1976.

Class 5O

3,476,659.—ELECTROPHOTOGRAPHIC IMAGING AND COPYING PROCESS. NOV. 4, 1969. BEL. 684406, FRA. 1489929, ITL. 773333, JAP. 43-27579, U.K. 1159394.

3,565,613.—ELECTROLYTIC ELECTROPHOTOGRAPHY. FEB. 23, 1971. GER. 1597849, JAP. 44-13679, U.K. 1202409.

Class 5P

4,127,083.—DEVELOPER SEALING DEVICE FOR XEROGRAPHIC COPYING MACHINE. NOV. 28, 1978.

Class 6B1

3,791,643.—CHAIN DELIVERY PAPER FEEDING DEVICE. FEB. 12, 1974. JAP. 48-20232.

3,927,877.—PAPER FEED TRAY FOR USE WITH COPYING MACHINE AND THE LIKE. DEC. 23, 1975.

Class 6C

3,901,427.—COPY PAPER FEEDER. AUG. 26, 1975.

Class 6D

3,924,848.—PAPER FEED APPARATUS FOR GRIPPER-TYPE PAPER TRANSPORT DEVICE. DEC. 9, 1975.
3,924,849.—PAPER GRIPPING DEVICE FOR USE WITH A CHAIN DRIVEN PAPER CARRIAGE. DEC. 9, 1975.

Class 6H

3,704,881.—TRANSFER SHEET PEELING DEVICE FOR XEROGRAPHIC APPARATUS. DEC. 5, 1972. CAN. 940546, U.K. 1275888.

Class 7C

3,764,207.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING SINGLE CHARGING MEANS FOR EFFECTING SIMULTANEOUS FUNCTIONS OF CHARGING AND FACILITATING TONER IMAGE TRANSFER. OCT. 9, 1973.

Class 7E1

3,716,360.—MOLTEN IMAGE TRANSFER IN ELECTROPHOTOGRAPHY. FEB. 13, 1973. BEL. 763191, FRA. 7105717, GER. 2108080, ITL. 919905, U.K. 1313059.

Class 7E3A

3,549,359.—COLOR ELECTROPHOTOGRAPHY EMPLOYING DYE TRANSFER FROM A DYE-CONTAINING PHOTOSENSITIVE LAYER TO AN IMAGE RECEIVING SHEET. DEC. 22, 1970. FRA. 1524473, GER. 1,572,341, JAP. 45-40159, U.K. 1,183,532.
3,654,865.—METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER. APR. 11, 1972. AUS. 435812, BEL. 745534, CAN. 924,951, FRA. 7004034, ITL. 888.447, JAP. 48-9017, U.K. 1257296.

Class 8A

3,825,407.—HEATER HOLDING BRACKET FOR A HEAT FIXER IN A COPYING MACHINE OR THE LIKE. JULY 23, 1974.

Class 8AB

3,806,314.—FIXING APPARATUS FOR THERMOPLASTIC RECORDING. APR. 23, 1974.

Class 8A1B

3,8[illegible]8,185.—HEAT FUSION-BONDING APPARATUS FOR ELECTROPHOTOGRAPHY. JUNE 18, 1974.
3,916,256.—PROTECTIVE CIRCUIT IN A TEMPERATURE REGULATOR FOR THE THERMAL FIXING DEVICE OF A DUPLICATOR. NOV. 4, 1975.

Class 8A2

3,904,786.—PROCESS FOR FIXING IMAGES BY CONTACT HEATING IN A DUPLICATOR. SEPT. 9, 1975.
3,981,269.—FIXING DEVICE FOR ELECTROPHOTOGRAPHIC DUPLICATING MACHINES. SEPT. 21, 1976. GER. P2507365.8, JAP. 31159, KOR. 3389, U.K. 5395-75.

Class 8A2A

3,788,930.—METHOD OF FIXING IMAGES OBTAINED BY LIQUID DEVELOPMENT IN ELECTROPHOTOGRAPHY. JAN. 29, 1974. BEL. 774763.

Class 8B

3,647,773.—SUSPENSION POLYMERIZATION IN THE PRESENCE OF A METHYL STYRENE. MAR. 7, 1972. BEL. 727179, FRA. 2000527, JAP. 47-909, U.K. 1251434.

Class 8C

3,385,699.—PROCESS FOR PROCESSING ELECTROPHOTOSENSITIVE LAYERS. MAY 28, 1968. BEL. 651039, FRA. 1402385, HOL. 130806, SWD. 310458, U.K. 1072476.
3,740,249.—SOLVENT FIXING PROCESS. JUNE 19, 1973. JAP. 49-26591.

Class 9A

3,488,896.—PROCESS OF PUMICING A SURFACE. JAN. 13, 1970. FRA. 1,474,687, ITL. 782,665, JAP. 44-12197, U.K. 1,143,923.
3,936,183.—ELECTROPHOTOGRAPHIC COPYING MACHINE WITH IMPROVED CLEANING BLADE. FEB. 3, 1976.

Class 9A1

3,766,592.—DRUM CLEANING DEVICE FOR AN ELECTROPHOTOGRAPHIC DUPLICATOR. OCT. 23, 1973.

Class 9B3

3,671,290.—IMAGING SYSTEM. JUNE 20, 1972. CAN. 917486, JAP. 48-8134, U.K. 1278858.
3,703,400.—DEVELOPING METHOD FOR ELECTROPHOTOGRAPHY. NOV. 21, 1972. AUS. 435816, BEL. 748.590, CAN. 898073, FRA. 7012445, GER. 2016586, ITL. 903950, U.K. 1251623.

Class 10A, 10E

3,922,662.—DETECTOR FOR USE WITH A DUPLICATOR OR THE LIKE FOR DETECTING INCORRECTLY ALIGNED DOCUMENTS. NOV. 25, 1975.

Class 14A5

3,937,883.—BRAKING CIRCUIT FOR USE WITH PHASE SYNCHRONIZING CIRCUITRY. FEB. 10, 1976.

Class 15

3,795,187.—IMPELLERS FOR IMPACT PRINTERS. MAR. 5, 1974.

Class 15C

4,058,800.—IMAGE PICKUP ELEMENT AND SYSTEM UTILIZING MAGNETIC BUBBLES. NOV. 15, 1977. JAP. P49-137738.
4,054,866.—CONVERSION ELEMENT AND SYSTEM UTILIZING MAGNETIC BUBBLES. OCT. 18, 1977. JAP. P50-077558.
4,151,599.1.—MAGNETIC BUBBLE DISPLAY UNITS. APR. 24, 1979.

Class 17B1

3,687,538.—APPARATUS FOR EXPOSING LATENT IMAGE MARGINS IN ELECTROPHOTOGRAPHIC COPYING APPARATUS. AUG. 29, 1972. CAN. 931204, U.K. 1350795.

Class 17D3

3,936,664.—METHOD AND APPARATUS FOR GENERATING CHARACTER PATTERNS. FEB. 3, 1976.

Class 18A

3,417,733.—APPARATUS FOR VACUUM COATING. DEC. 24, 1968. FRA. 1,415,251, GER. 1,521,238. JAP. 40-26402, U.K. 1,081,324.
3,730,711.—PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY. MAY 1, 1973. BEL. 754699, CAN. 925087, FRA. 754699, GER. 2040152, JAP. 48-32381, U.K. 1272720.
3,799,340.—REFINING PHOTOCONDUCTIVE PARTICLE. MAR. 26, 1974. BEL. 776110, CAN. 944204, FRA. 714325.

Class 18A1

3,589,928.—PROCESS FOR THE PRODUCTION OF A LIGHT SENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY. JUNE 29, 1971. BEL. 685072, FRA. 1500187, GER. 1,522,603, JAP. 44-23775, U.K. 1139532.
3,607,363.—PROCESS FOR PRODUCING PHOTOCONDUCTIVE MATERIAL. SEPT. 21, 1971. U.K. 1210071.
3,625,747.—PHOTOCONDUCTIVE POWDERS AND A METHOD FOR PRODUCING THE SAME. DEC. 7, 1971.
3,634,333.—PROCESS FOR COATING ZINC OXIDE POWDER WITH CADMIUM SULFIDE. JAN. 11, 1972. BEL. 731056, CAN. 882.627, FRA. 2.005.849, GER. 1916761, JAP. 47-49616, U.K. 1215685.
3,682,825.—PROCESS FOR THE PRODUCTION OF ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. AUG. 8, 1972. AUS. 424258, BEL. 745390, CAN. 924165, FRA. 7003324, GER. 2004817, ITL. 887410, JAP. 48-7819, U.K. 1255762.

3,729,419.—LIQUID DEVELOPER. APR. 24, 1973. AUS. 451254, FRA. 71.09434, JAP. 48-43157, U.K. 1341627.
3,743,537.—METHOD OF MAKING ELECTROPHOTOGRAPHIC RECORDING MEMBER. JULY 3, 1973. AUS. 430736, ATR. 305766, BEL. 757.393, CAN. 928165, FRA. 7037234, ITL. 917004, JAP. 49-3846, U.K. 1269306.
3,755,177.—PROCESS OF MAKING LIQUID ELECTROSTATIC DEVELOPERS CONTAINING GELATIN. AUG. 28, 1973. AUS. 443292, CAN. 925743, JAP. 48-7820, U.K. 1284646.
3,803,011.—PROCESS FOR PREPARING 2, 3-DIHYDRO-1H,6H-1,5-BENZODIAZOCINE-2-ONE DERIVATIVE. APR. 9, 1974.

Class 18A2

3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973.

Class 18A3

3,806,314.—FIXING APPARATUS FOR THERMOPLASTIC RECORDING. APR. 23, 1974.
3,661,572.—MANUFACTURING PROCESS FOR MANUFACTURING ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL. MAY 9, 1972. AUS. 429948, BEL. 754323, CAN. 754323, FRA. 7028557, GER. 2038762, ITL. 902691, U.K. 1305298.

Class 18B

3,548,035.—SUSPENSION POLYMERIZATION PROCESS. DEC. 15, 1970. FRA. 1559138, GER. 1720782, JAP. 45-40052, U.K. 1185775.
3,625,747.—PHOTOCONDUCTIVE POWDERS AND A METHOD FOR PRODUCING THE SAME. DEC. 7, 1971.
3,647,773.—SUSPENSION POLYMERIZATION IN THE PRESENCE OF METHYL STYRENE. MAR. 7, 1972. BEL. 727179, FRA. 2000527, JAP. 47-909, U.K. 1251434.
3,668,126.—METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL. JUNE 6, 1972. BEL. 709625, FRA. 1562934, U.K. 1218064.
3,697,266.—ORGANIC PHOTOCONDUCTIVE MATERIALS FOR ELECTROPHOTOGRAPHY. OCT. 10, 1972. BEL. 761043, CAN. 915493, FRA. 2074451, ITL. 913992, JAP. 48-38429, U.K. 1323109.
3,716,505.—PROCESS FOR SUSPENSION POLYMERIZATION. FEB. 13, 1973. FRA. 2048682. GER. 2025104, JAP. 47-23406, U.K. 1316693.

Class 18C

3,622,515.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPER HAVING A PROTEOLYTIC ENZYME. NOV. 23, 1971. AUS. 436813, BEL. 732273, CAN. 896948, FRA. 2007.520, ITL. 867188, JAP. 47-17879, U.K. 1231544.
3,718,593.—PROCESS FOR THE PRODUCTION OF AN ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. FEB. 27, 1973. AUS. 438586, BEL. 745535, CAN. 924166, FRA. 7004034, ITL. 888743, JAP. 48-7822, U.K. 1255763.
3,740,249.—SOLVENT FIXING PROCESS. JUNE 19, 1973. JAP. 49-26591.

Class 18C2A1

3,704,119.—ELECTROPHOTOGRAPHIC PROCESS USING TONER OF SAME REFRACTIVE INDEX AS ORGANIC PHOTOCONDUCTIVE LAYER. NOV. 28, 1972. AUS. 433360, BEL. 754544, FRA. 7028556, ITL. 902771, JAP. 48-21054, U.K. 1321065.

Class 18C2A2

3,668,126.—METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL. JUNE 6, 1972. BEL. 709625, FRA. 1562934, U.K. 1218064.
3,682,825.—PROCESS FOR THE PRODUCTION OF ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. AUG. 8, 1972. AUS. 424258, BEL. 745390, CAN. 924165, FRA. 7003324, GER. 2004817, ITL. 887410, JAP. 48-7819, U.K. 1255762.

Class 18C5A

3,597,368.—LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY CONTAINING YELLOW PIGMENT. AUG. 3, 1971. BEL. 719289, CAN. 846.122, FRA. 1578390, JAP 46-10480, U.K. 1201134.
3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATIN. JUNE 12, 1973. CAN. 921746, JAP. 47-30858, U.K. 1277723.

Class 20A3

3,753,419.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPING APPARATUS. AUG. 21, 1973. AUS. 430722, BEL. 768788, CAN. 334540, FRA. 7122426, ITL. 928531, U.K. 1337485.
3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974. U.K. 1310448.

Class 20B3

3,544,458.—METHOD OF FILTERING. DEC. 1, 1970. BEL. 732578, CAN. 888335.

Class 20C

3,707,139.—LIQUID TYPE ELECTROPHOTOGRAPHY DEVELOPING APPARATUS. DEC. 26, 1972. BEL. 756409, CAN. 918413, FRA. 7034577, GER. 1314865.

Class 20C2

3,753,466.—AUTOMATIC FIRE EXTINGUISHER IN ELECTROPHOTOGRAPHIC COPYING MACHINE OR THE LIKE. AUG. 21, 1973. U.K. 1334579.

Class 20C4

3,704,881.—TRANSFER SHEET PEELING DEVICE FOR XEROGRAPHIC APPARATUS. DEC. 5, 1972. CAN. 940546, U.K. 1275888.

Class 20D

3,653,292.—AUTOMATIC CONTOUR TRACING DEVICE. APR. 4, 1972. FRA. 7204547, GER. 2033094, U.K. 1295128.
3,825,407.—HEATER HOLDING BRACKET FOR A HEAT FIXER IN A COPYING MACHINE OR THE LIKE. JULY 23, 1974.

Class 20D1

3,791,643.—CHAIN DELIVERY PAPER FEEDING DEVICE. FEB. 12, 1974. JAP. 48-20232.

Class 20G

3,795,187.—IMPELLERS FOR IMPACT PRINTERS MAR 5, 1974.

Class 20I

3,341,664.—METAL DRAWING APPARATUS. APR. 24, 1974.

Class 24A1

4,212,017.—DEFLECTION ELECTRODE ASSEMBLY FOR MULTI-NOZZLE INK JET PRINTERS. JULY 8, 1980

Class 25A4

3,952,167.—ELECTROMAGNETIC COUPLER FOR USE WITH A TELEPHONE SET. APR. 20, 1976.

Class 25C2

3,341,631.—CIRCUIT INTERRUPTER. APR 24, 1974 BEL. 764267, CAN. 932954, FRA. 7109086.
3,846,647.—TRIGGER CIRCUIT FOR USE WITH MULTI-VIBRATORS. NOV. 5, 1974.

Class 25C4

3,838,344.—FREQUENCY MULTIPLYING CIRCUIT. SEPT 24, 1974.

Class 25C5

3,936,675.—REFERENCE POINT POTENTIAL COMPENSATING CIRCUIT FOR USE WITH PHASE CONTROLLER. FEB. 3, 1976.

Class 27D

3,779,206.—APPARATUS FOR SCRAPING LIQUID OFF OF SHEET MATERIAL. DEC. 18, 1973.

Class 32

3,813,262.—RESIN-IMPREGNATED TISSUE OVERLAYS. MAY 28, 1974. BEL. 777312, FRA. 7146406, ITL. 945655.

Class 32B

3,273,450.—DATA PROCESSING APPARATUS. NOV. 15, 1963. FRA. 1384061, GER. 1449563, GRB. 1048048, JAP. 629392.

Xerox Patents

Class 1

4,043,549.—IMPACT FEEDER. AUG. 23, 1977
4,060,105.—TONER LOADING APPARATUS WITH REPLENISHING SUPPLY CONTAINER. NOV. 29, 1977
4,109,903.—FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION. AUG. 29, 1978

Class 1A

3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436, FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.
3,954,951.—PREPARATION OF RED AMORPHOUS SELENIUM. MAY 4, 1976.
3,961,954.—ACID SENSITIZED CHARGE TRANSFER COMPLEXES AND CYCLIC ELECTRSTATOGRAPHC IMAGNG METH-ACID SENSITIZATN. JUNE 8, 1976. CAN. 1002366.
4,009,249.—PREPARATION OF RED AMORPHOUS SELENIUM. FEB. 22, 1977.
4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.
4,078,924.—IMAGING SURFACE SMOOTHING WITH ROUGHENED FOIL NICKEL. MAR. 14, 1978.
4,099,969.—COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS. JULY 11, 1978.

Class 1A 1

3,607,261.—INORGANIC CRYSTALLINE BINDERS FOR ELECTROPHOTOGRAPHIC PLATES. SEPT. 21, 1971.
3,850,631.—PHOTOCONDUCTIVE ELEMENT WITH A POLYVINVLIDENE FLUORIDE BINDER. NOV. 26, 1974.
3,928,036.—FLEXIBLE XEROGRAPHIC PHOTORECEPTOR ELEMENT. DEC. 23, 1975.
3,981,728.—XEROGRAPHIC IMAGING MEMBER HAVING HEXAGONAL SELENIUM IN INTERLOCKING CONTINUOUS PATHS. SEPT. 21, 1971.

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3,174,855.—METHOD FOR A PRODUCTION OF A XEROGRAPHIC PLATE. MAR. 23, 1965.
3,251,686.—XEROGRAPHIC PROCESS. MAY 17, 1966. FRA. 1292831, GER. 1243979, GRB. 0996972, JAP. 0416023.
3,312,547.—XEROGRAPHIC PLATE AND PROCESSES OF MAKING AND USING SAME. APR. 4, 1967.
3,341,326.—DARK DECAY CONTROLLED XEROGRAPHY. SEPT. 12, 1967. AUS. 0285843, CAN. 0729829, FRA. 1377592, GRB. 1029199, ITL. 0706101.
3,352,669.—PHOTOCONDUCTIVE MEMBER AND PROCESSES OF PREPARING AND USING SAME. NOV. 14, 1967. AUS. 0405164, CAN. 0834670, FRA. 1422625, GER. 1497194, GRB. 1052970, HOL. 0137891, ITL. 0749420, JAP. 0501912.
3,508,918.—XEROGRAPHIC PLATE CONTAINING ALUMINUM SELENIDE BARRIER LAYER. APR. 28, 1970. CAN. 0872175.
3,532,496.—XRGRPHC PLTS AND PROCS EMPLYNG HMGNUS DISPRSNS OF VTREOUS SLNIUM AND SNSTZNG DYES AS PHTCNDCTV LAYER. OCT. 6, 1970.
3,621,248.—METHOD USING XERORADIOGRAPHIC PLATE INSENSITIVE TO VISIBLE LIGHT. NOV. 16, 1971.
3,645,729.—METHOD OF TRANSFERRING ELECTROSTATIC LATENT IMAGES USING MULTIPLE PHOTOCONDUCTIVE LAYERS. FEB. 29, 1972.
3,690,252.—LITHOGRAPHIC INKING APPARATUS. SEPT. 12, 1972. CAN. 0919006.
3,930,853.—ACCELERATING AGING METHOD FOR SELENIUM ARSENIC PHOTOCONDUCTORS. JAN. 6, 1976.
4,013,463.—PHOTORECEPTOR FABRICATION UTILIZING AC ION PLATING. MAR. 22, 1977.
4,150,029.—SELENIUM AND SELENIUM ALLOY EVAPORATION TECHNIQUE. MAR. 29, 1977.
4,016,310.—COATR HRDWR AND METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,109,902.—PHOTORECEPTOR FABRICATION. APR. 26, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.
4,072,518.—METHOD OF MAKING TRIGONAL SELENIUM INTERLAYERS BY GLOW DISCHARGE. FEB. 7, 1978.
4,075,013.—ELECTROPHOTOCHEMICAL PREPARATION OF SELENIUM PHOTOCONDUCTIVE MEMBERS. FEB. 21, 1978.
4,098,655.—METHOD FOR FABRICATING A PHOTORECEPTOR. JULY 4, 1978.

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3,312,548.—XEROGRAPHIC PLATES. APR. 4, 1967. BEL. 0691217, CAN. 0819658, FRA. 1505803, GRB. 1165579, JAP. 0650232.
3,355,289.—CYCLICAL XEROGRAPHIC PROCESSD UTILIZING A SELENIUM-TELLURIUM XEROGRAPHIC PLATE. NOV. 28, 1967.
3,427,157.—XEROGRAPHIC PROCESS UTILIZING A PHOTOCONDUCTIVE ALLOY OF THALLIUM IN SELNIUM. FEB. 11, 1969. CAN. 0834085, FRA. 1461161, GRB. 1132993, HOL. 0150924, ITL. 0749553, JAP. 0534762, MEX. 0085232.
3,489,560.—PHOTOCONDUCTIVE LAYR COMPRISN SELENIUM COMPOUND AND SOLID HYDROPHOBIC METL SALT OF A FATTY ACID. JAN. 13, 1970. BEL. 0711297, CAN. 0871632, FRA. 1544448, GRB. 1203237, ITL. 0815227, JAP. 0632160.
3,490,903.—ALLOYS OF ANTIMONY AND SELENIUM USED IN PHOTOCONDUCTIVE ELEMENTS. JAN. 20, 1970. AUS. 0412949, CAN. 0871074, FRA. 1533536, GRB. 1185389, ITL. 0805955, JAP. 0626127, SWD. 0318193.
3,511,649.—PROCESS OF REDUCING FATIGUE IN PHOTOCONDUCTIVE GLASSES. MAY 12, 1970. GRB. 1193472, JAP. 0604152.
3,524,745.—PHOTOCONDUCTIVE ALLOY OF ARSENIC ANTIMONY AND SELENIUM. AUG. 18, 1970. ARG. 0164055, AUS. 0410443, BEL. 0709132, CAN. 0884810, CHL. 0024255, FRA. 1550902, GRB. 1209971, IND. 0113988, ITL. 0833508, JAP. 9124370, LXB. 0055231, MEX. 0108993, NOR. 0127943, NZL. 0151243, PRU. 0009904, PTG. 0048919, SAF. 0680228, SPN. 0349235, STZ. 0495573, SWD. 0328189, URG. 0009683.
3,645,729.—METHOD OF TRANSFERRING ELECTROSTATIC LATENT IMAGES USING MULTIPLE PHOTOCONDUCTIVE LAYERS. FEB. 29, 1972.
3,690,252.—LITHOGRAPHIC INKING APPARATUS. SEPT. 12, 1972. CAN. 0919006.
3,709,683.—INFRARED SENSITIVE IMAGE RETENTION PHOTORECEPTOR. JAN. 9, 1973.
3,874,917.—METHOD OF FORMING VITREOUS SEMICONDUCTORS BY VAPOR DEPOSITING BISMUTH AND SELENIUM. APR. 1, 1975.
4,015,029.—SELENIUM AND SELENIUM ALLOY EVAPORATION TECHNIQUE. MAR. 29, 1977.
4,016,310.—COATR HRDWR AND METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,019,902.—PHOTORECEPTOR FABRICATION. APR. 26, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.
4,099,969.—COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS. JULY 11, 1978.
4,121,981.—ELECTROCHEMICAL METHOD FOR FORMING A SELENIUM-TELLURIUM LAYER IN A PHOTORECEPTOR. OCT. 24, 1978
4,126,457.—EVAPORATION TECHNIQUE FOR PRODUCING TEMPERATURE PHOTORECEPTOR ALLOYS. NOV. 21, 1978. CAN 1046864.
4,187,104.—ELECTROPHOTOGRAPHIC PHOTORECEPTOR. FEB. 5, 1980.

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3,121,006.—PHOTO-ACTIVE MEMBER FOR XEROGRAPHY. FEB. 11, 1964. ARG. 0147758, BEL. 0656892, CAN. 0674311, CHL. 0020455, CLB. 0014118, ECD. 0000029, GUA. 0001696, PRU. 0009656, TRK. 0012835, URG. 0006526, VZL. 0016353.
3,121,007.—PHOTO-ACTIVE MEMBER FOR XEROGRAPHY. FEB. 11, 1964.
3,140,174.—PROCESS FOR OVERCOATING A XEROGRAPHIC PLATE. JULY 7, 1964. GRB. 0960871.

3,151,982.—XEROGRAPHIC PLATE. OCT. 6, 1964. ARG. 0149584, ATR. 0247148, AUS. 0275834, BEL. 0630478, BRA. 0088013, CAN. 0879017, DNK. 0116707, FRA. 1359402, GER. 1497054, GRB. 1049872, GRK. 0026268, HOL. 0139212, IND. 0086999, ISR. 0018877, ITL. 0701505, JAP. 0489512, LXB. 0043461, MEX. 0081663, NOR. 0108058, NZL. 0134420, PTG. 0040700, SAF. 0001331, SPN. 0286492, STZ. 0450173, SWD. 0313998.

3,251,686.—XEROGRAPHIC PROCESS. MAY 17, 1966. FRA. 1292831, GER. 1243979, GRB. 0996972, JAP. 0416023.

3,379,527.—PHOTOCONDUCTIVE INSULATORS COMPRISING ACTIVATED SULFIDES SELENIDES AND SULFOSELENIDES OF CADMIUM. APR. 23, 1968. CAN. 0907921, GRB. 1079065.

3,519,420.—METHOD OF CHARGING A ZINC OXIDE PHOTOCONDUCTIVE LAYER WITH A POSITIVE CHARGE. JULY 7, 1970.

3,522,040.—PHOTOSENSITIVE INSULATING MATERIAL. JULY 28, 1970. CAN. 0884808, GRB. 1171910, JAP. 0552966.

3,941,594.—ELECTROPHOTOGRAPHIC ELEMENT WITH ZNO AND TIO2. MAR. 2, 1976.

3,969,113.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY CONTAINING TITANIUM OXIDE AND A CADMIUM PIGMENT. JULY 13, 1976.

3,975,306.—METHOD FOR IMPROVING THE PHOTOINDUCED DISCHARGE CHARACTERISTICS OF CERTAIN CADMIUM CHALOCOGENIDE. AUG. 17, 1976.

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3,469,978.—PHOTOSENSITIVE ELEMENT. SEPT. 30, 1969. CAN. 0872173, GRB. 1171909, JAP. 0552967.

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3,288,604.—IMAGING METHOD USING AN ELEMENT HAVING A GLASS OVERCOATING. NOV. 29, 1966. CAN. 0815735.

3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.

3,507,646.—ELECTROPHOTOGRAPHIC PROCESS USING A SINGLE PHASE PHOTOCONDUCTIVE GLASS IMAGING LAYER. APR. 21, 1970. ARG. 0164449, AUS. 0416137, BEL. 0691757, CAN. 0818383, FRA. 1511172, GER. 1522713, GRB. 1167520, ITL. 0787661, JAP. 0567233, MEX. 0105237, SPN. 0334896, STZ. 0472707, SWD. 0331793, VZL. 0024006.

3,565,713.—METHOD OF FORMING A CERAMIC IMAGE ON A CERAMIC SUBSTRATE. FEB. 23, 1971.

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3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.

3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.

3,770,428.—ORGANIC PHOTOCONDUCTIVE MATERIAL. NOV. 6, 1973.

3,850,631.—PHOTOCONDUCTIVE ELEMENT WITH A POLYVINVLIDENE FLUORIDE BINDER. NOV. 26, 1974.

3,864,144.—PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS. FEB. 4, 1975. FRA. 740836, GRB. 1414158, ITL. 1010695, TIW. 0008534.

3,879,198.—ELECTROPHOTOGRAPHIC AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. APR. 22, 1975.

3,882,087.—ORGANIC PHOTOCONDUCTIVE MATERIAL. MAY 6, 1975.

3,903,107.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL CONTAINING PHTHALOCYANINE. SEPT. 2, 1975. BEL. 0815632, SAF. 0743536.

3,915,704.—PHOTOINDUCED ACID CATALYZED DEGRADATION OF DEGRADABLE POLYMERS. OCT. 28, 1975.

3,917,483.—PHOTOINDUCED ACID CATALIZED DEPOLYMERIZATION OF DEGRADABLE POLYMERS. NOV. 4, 1975.

3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.

3,932,180.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. BEL. 0815632, SAF. 0743536.

3,943,108.—PHOTOCONDUCTIVE COMPOSITION OF AN ALDEHYDE CONDENSATE. MAR. 9, 1976.

3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.

3,954,906.—AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. MAY 4, 1976. FRA. 7403086, GRB. 1446966.

3,978,029.—PHOTOCONDUCTIVE COMPOSITIONS AND IMAGING MEMBERS AND METHODS EMPLOYING SAME. AUG. 31, 1976. ARG. 0206212, BEL. 0816552, FRA. 7422479, SAF. 0744129.

3,981,848.—PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHODS EMPLOYING SAME. SEPT. 21, 1976. ARG. 0206211, ATR. 0332734, FRA. 7422484.

4,043,812.—A PROCESS FOR PREPARATION OF 2-ANTHRYL & SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND POLY. JUL 23, 1977. BEL. 822305, FRA. 7527053, STZ. 32598.

4,050,934.—ELECTRON ACCEPTOR MONOMERS & POLYMERS. SEPT. 27, 1977.

4,056,391.—METHOD FOR ENHANCING SOLID SOLUTION STABILITY OF ELECTRON ACCEPTOR MOLECULES AND ELECTROPHO. NOV. 1, 1977.

4,117,072.—PROCESS FOR ENHANCEMENT OF MECHANICAL PROPERTIES OF PHOTOCONDUCTIVE POLYMERS. SEPT. 26, 1978. FRA. 7531736. GRB. 1469371.

4,117,239.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS & POLYMERS. SEPT. 26, 1978. BEL. 822305.

4,153,802.—ELECTRON ACCEPTOR MONOMERS AND POLYMERS. MAY 8, 1979. FRA. 7626102.

4,161,490.—ELECTRON ACCEPTOR MONOMERS. JULY 17, 1979. FRA. 7626102.

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3,357,989.—METAL FREE PHTHALOCYANINE IN THE NEW X-FORM-SEE D2167 FOR RE27117. DEC. 12, 1967. CAN. 0860929, FRA. 1508173, GRB. 1169901, ITL. 0787592, JAP. 0560090, MEX. 0101543.

3,432,415.—ELECTROPHORETIC IMG. PROCESS USING PHOTOSENSITIVE XANTHENONIUM SALTS. MAR. 11, 1969. AUS. 0439502, BEL. 0743895, CAN. 0851118, GER. 1522701, GRB. 1155747, JAP. 0650631, MEX. 0104632.

3,442,781.—PHOTOELECTROPHORETIC AND XEROGRAPHIC IMG. PROC. EMPL. TRIPHENODIOXAZINES AS ELECTRIC. PHOTOSENSIT. MAY 6, 1969. AUS. 0445582, BEL. 0743894, CAN. 0855152, GRB. 0175452, JAP. 0611634.

3,445,225.—ELECTROPHOTOGRAPHIC IMAGING PROCESS. MAY 20, 1969. CAN. 0846121.

3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.

3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.

3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPTHO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.

3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. AUS. 0445639, BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.

3,482,970.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS USING NAPHTHYLAZO COMPOUNDS AS THE PRIMARY PHOTOCONDUCTOR. DEC. 9, 1969. ATR. 0279351, AUS. 0453397, BEL. 0742978, CAN. 0869486, GRB. 1296390, ITL. 0878843, JAP. 0725059.

3,607,261.—INORGANIC CRYSTALLINE BINDERS FOR ELECTROPHOTOGRAPHIC PLATES. SEPT. 21, 1971.

3,615,409.—ELCTROPHOTOGRPHC PLATE AND PROCESS EMPLOYING A PHOTODNDCTV PIGMNT OF GENERAL FORMULA R2 N4 S3. OCT. 26, 1971.

3,640,710.—PHTHALOCYANINE PHOTOCONDUCTIVE ELEMENTS CONTAINING MULTIPLE BINDER MATERIALS. FEB. 8, 1972. ARG. 0184666, ATR. 0328861, AUS. 0456430, BEL. 0760751, CAN. 0933012, FRA. 7047636, GRB. 1333605, ITL. 0913999, PNM. 0002243, STZ. 0554550, SWD. 0365878, TIW. 0006738, USR. 0450420, VZL. 0032928.

3,672,979.—METHOD OF PRODUCING A PHTHALOCYANINE PHOTOCONDUCTIVE LAYER. JUNE 27, 1972. ARG. 0184673, AUS. 0457271, BEL. 0761135, CAN. 0951697, FRA. 7047702, GRB. 1334060, ITL. 0914074, JAP. 0753795, MEX. 0119529, PNM. 0002191, SPN. 0386759, STZ. 0571731, TIW. 0007180, VZL. 0032789.

3,708,292.—PI-FORM METAL PHTHALOCYANINE. JAN. 2, 1973. ARG. 0194234, BEL. 0783793, CAN. 0996931, GRB. 1396922, ITL. 0955644, MEX. 0128928.

3,789,216.—PHOTODETECTION DEVICE AND METHOD COMPRISING PHTHALOCYANINE. JAN. 29, 1974.

3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515, VZL. 003956.

3,895,945.—PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION. JULY 22, 1975.

3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.

3,951,654.—MTHD ENHNCMT RATE AND EFFICIENCY OF PHOTODSCHG OF ELCTRPHGRIC IMAGING MEMBERS COMPRSNG PHTHALOCYA. APR. 20, 1976.

3,970,602.—COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF. JULY 20, 1976. BEL. 0812436. FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.

3,989,860.—REPAIR TECHNIQUE FOR PHOTORECEPTOR. NOV. 2, 1976.

4,006,017.—PHOTOCONDUCTIVE COMPOSITION ARTICLE AND PROCESS. FEB. 1, 1977.

4,012,122.—LIQUID CRYSTALLINE PLATEN FOR A ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 15, 1977.

4,046,563.—PHOTOCONDUCTIVE COMPOSITION CONTAINING A TRICYANOPYRENE, ARTICLE AND PROCESS OF USE. SEPT. 6, 1977. FRA. 7509147.

4,055,420.—SINGLE PHASE ORGANIC PHOTOCONDUCTIVE COMPOSITION. OCT. 25, 1977.

4,072,519.—PHOTOCONDUCTIVE COMPOSITION, AND ELEMENT. FEB. 7, 1978. FRA. 7509146.

4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978. AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.

4,122,114.—1-TRICYANOINYLPYRENE. OCT. 24, 1978.

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3,408,182.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0847805, FRA. 1463743, GER. 1522679, GRB. 1137665, ITL. 0755290, JAP. 0572185, MEX. 0107318.

3,408,183.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0819066, FRA. 1463745, GER. 1522676, GRB. 1126048, ITL. 0755287, JAP. 0727091, MEX. 0106758.

3,408,184.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT. 29, 1968. CAN. 0818382, FRA. 1463727, GRB. 1137664, ITL. 0755289, JAP. 0726382, MEX. 0105835.

3,408,185.—ELECTROPHOTOGRAPHIC MATERIALS AND METHOD EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0848383, FRA. 1463728, GER. 1645192, GRB. 1137476, ITL. 0755291, MEX. 0106763.

3,408,186.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT.29,1968. CAN. 0846736, FRA. 1463746, GRB. 1138629, ITL. 0755288, JAP. 0569483, MEX. 0106589.

3,408,187.—ELECTROPHOTOGRAPHIC MATER AND METH EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0867298, GER. 1522721, GRB. 1163097, JAP. 0797719.

3,408,188.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS COMPRISING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0869485, GRB. 1183516, JAP. 0797720.

3,408,189.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0850019, GER. 1302772, GRB. 1182172.

3,408,190.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0850019, GER. 1302772, GRB. 1182172.

3,536,482.—ELECTROPHOTOGRPHC IMG SYS INCL A HALOGEN TREATMENT STOP FOR MAKING BCKGRND AREAS TRANSPARENT. OCT. 27, 1970.

3,607,258.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. SEPT. 21, 1971. CAN. 0871634, GRB. 1174171.

3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515, VZL. 0033956.

3,879,201.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. APR. 22, 1975.

3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975.

3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.

3,957,725.—AN ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER. MAY 18, 1976. ITL. 1010430.

4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.

4,013,623.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAR. 22, 1977.

4,025,710.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAY 24, 1977.

4,033,769.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. JULY 5, 1977.

4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.

4,062,886.—FLUORENONE CARBOXYLE ACID ESTERS. DEC. 13, 1977. FRA. 7621895.

4,069,046.—POLYMERIZED VINYL CARBAZOLES SENSITIZED BY NITRO-SUBSTITUTED 9-DICYANOMETHYLENE FLUORENES. JAN. 17, 1978.

4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1978.

4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978.

AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.

4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.

4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.

4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.

4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.

4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.

4,172,933.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS—PROCESS FOR PREPARATION AND USE. OCT. 30, 1979.

Class 1A 2C

3,451,811.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES USING ELECTRICALLY PHOTOSENSITIVE PHOTOCHROMIC MATERIALS. JUNE 24, 1969. CAN. 0828692, JAP. 0573734.

3,660,086.—ELCTRPHTGRPC PLATE AND PROCS EMPLYNG INORGNC PHOTCNDCTV MATRL W/PHOTOCHROMIC SENSITIVE AGENT. MAY 2, 1972.

3,961,948.—PHOTOCHROMIC IMAGING METHOD. JUNE 8, 1976.

Class 1A 2D

3,518,081.—IMAGE FORMATION AND DEVELOPMENT - REISSUED D 857R. JUNE 30, 1970. CAN. 0801270, GRB. 1085573.

RE29,357.—IMAGE FORMATION AND DEVELOPMENT—REISSUE OF 3,518,081--D 857. AUG. 16, 1977. CAN. 801270, GRB. 1085573.

Class 1A 3

3,312,547.—XEROGRAPHIC PLATE AND PROCESSES OF MAKING AND USING SAME. APR. 4, 1967.
3,341,326.—DARK DECAY CONTROLLED XEROGRAPHY. SEPT. 12, 1967. AUS. 0285843, CAN. 0729829, FRA. 1377592, GRB. 1029199, ITL. 0706101.
3,352,669.—PHOTOCONDUCTIVE MEMBER AND PROCESSES OF PREPARING AND USING SAME. NOV. 14, 1967. AUS. 0405164, CAN. 0834670, FRA. 1422625, GER. 1497194, GRB. 1052970, HOL. 0137891, ITL. 0749420, JAP. 0501912.
3,393,070.—XEROGRAPHIC PLATE WITH ELECTRIC FIELD REGULATING LAYER. JULY 16, 1968. CAN. 0871308, GER. 1490987, GRB. 1141452, JAP. 0764435, MEX. 0105660.
3,508,918.—XEROGRAPHIC PLATE CONTAINING ALUMINUM SELENIDE BARRIER LAYER. APR. 28, 1970. CAN. 0872175.
3,573,906.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. APR. 6, 1971. ARG. 0177890, AUS. 0441534, BEL. 0725173, BRA. 0088092, CAN. 0906801, CZC. 0157053, FRA. 1594981, GRB. 1217726, ITL. 0852743, SPN. 0379204, SWD. 0335063, USR. 0448658, VZL. 0029780.
3,723,110.—ELECTROPHOTOGRAPHIC PROCESS. MAR. 27, 1973.
3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.
3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.
4,043656.—TRANSPARENCY COPYING MACHINE. AUG. 23, 1977.

Class 1A 4

3,251,686.—XEROGRAPHIC PROCESS. MAY 17, 1966. FRA. 1292831, GER. 1243979, GRB. 0996972, JAP. 0416023.
3,256,089.—MASKED PLATE XEROGRAPHY. JUNE 14, 1966.
3,288,604.—IMAGING METHOD USING AN ELEMENT HAVING A GLASS OVERCOATING. NOV. 29, 1966. CAN. 0815735.
3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.
3,434,832.—XEROGRAPHIC PLATE COMPRISING A PROTECTIVE COATING OF A RESIN MIXED WITH A METALLIC STEARATE. MAR. 25, 1969. CAN. 0835883, FRA. 1454672, GER. 1497223, GRB. 1128156, ITL. 0772535, JAP. 0545757, MEX. 0085603.
3,488,189.—ELECTROPHOTOGRAPHIC RECORDING MEMBER HAVING SOLID CRYSTALLINE PLASTICIZR AVAILBL AT IMGNG SURFA. JAN. 6, 1970. CAN. 0866700, FRA. 1506810, GRB. 1183205, ITL. 0788976, JAP. 0570734, MEX. 0108241.
3,607,258.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. SEPT. 21, 1971. CAN. 0871634, GRB. 1174171.
3,816,115.—METHOD FOR FORMING A PLURALITY OF ELECTROSTATIC LATENT IMAGES ON AN ELECTROPHOTOGRAPHIC PLATE. JUNE 11, 1974.
3,860,421.—N-ALKYL MORPHOLINE TREATMENT OF A SELENIUM-CONTAINING PHOTOCONDUCTIVE LAYER. JAN. 14, 1975.
3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515.
3,884,690.—POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS. MAY 20, 1975.
3,896,184.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. JULY 22, 1975.
3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975.
3,957,725.—AN ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER. MAY 18, 1976. ITL. 1,010,430.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,027,964.—IMAGING METHOD AND APPARATUS. JUNE 7, 1977. ARG. 0190535, BEL. 0777714, CAN. 0949825, FRA. 7201000, GRB. 1374501, ITL. 0946355, MEX. 0124981.
4,045,413.—POSSIBLE ACTIVE MATRIX POLYMERS. AUG. 30, 1977. FRA. 7432710.
4,063,943.—ELECTROSTATOGRAPHIC IMAGING METHOD. DEC. 20, 1977.
4,063,945.—ELECTROSTATOGRAPHIC IMAGING METHOD. DEC. 20, 1977.
4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978.AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.

Class 1A 5

3,411,903.—XEROGRAPHIC METHOD AND PLATE COMPRISING PHOTOCONDUCTIVE INSULATING FIBERS. NOV. 19, 1968. ARG. 0149620, ATR. 0270379, AUS. 0410718, BEL. 0672668, BRA. 0084119, CAN. 0834669, CHL. 0023648, CLB. 0014943, DNK. 0120577, EGR. 0055545, FRA. 1464792, GER. 1497224, GRB. 1084024, GRK. 0031509, IND. 0102560, ISR. 0024632, ITL. 0734376, JAP. 0724233, LXB. 0049849, MEX. 0098487, NOR. 0122817, NZL. 0143432, PLO. 0067959, PLP. 0004547, PNM. 0001533, PRU. 0008384, PTG. 0044879, SAF. 0656280, SPN. 0319795, STZ. 0458076, SWD. 0308250, THL. 1084024, TIW. 0003735, URG. 0006624, VZL. 0023996.
3,947,184.—IMAGING METHOD. MAR. 30, 1976.
3,972,718.—ELECTROSTATOGRAPHIC GRAVURE MEMBER. AUG. 3, 1976.

Class 1A 6

3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.
3,621,248.—METHOD USING XERORADIOGRAPHIC PLATE INSENSITIVE TO VISIBLE LIGHT. NOV. 16, 1971.
3,684,500.—METHOD OF FORMING PERMANENT ELECTROSTATIC IMAGE WITH TWO-LAYERED PHOTORECEPTOR. AUG. 15, 1972.
3,843,407.—BLADE CLEANING WITH REVERSE MOVEMENT. OCT. 22, 1974.
3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.
3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.
3,994,791.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. NOV. 30, 1976.
4,049,449.—METHOD FOR FORMING AN ELECTROPHOTOGRAPHIC MEMBER. SEPT. 20, 1977.

Class 1B

3,730,453.—EARLY END-OF-TAPE DETECTION. MAY 1, 1973. CAN. 0939052, GRB. 1354581.
3,889,292.—APPARATUS FOR MAKING MULTIPLE ALPHANURMIC COPIES OF A BINARY CODED MESSAGE. JUNE 10, 1975. CAN. 0986572.
4,032,746.—CONTROL SYSTEM FOR A FUSING APPARATUS. JUNE 28, 1977.
4,076,858.—ELECTROSTATIC COPYING PROCESS WITH CHARGING OF THE ORIGINAL. FEB. 28, 1978.

Class 1B 1

3,244,546.—ELECTROSTATIC IMAGE REPRODUCTION. APR. 5, 1966. CAN. 0847532, GRB. 1040371, JAP. 0477223.
3,484,162.—ELECTROVISCOUS RECORDING. DEC. 16, 1969.
3,518,698.—IMAGING SYSTEM. JUNE 30, 1970. CAN. 0905481, FRA. 1542838, GRB. 1200804, JAP. 0604154, MEX. 0099911.
3,561,957.—ELECTROPHOTOGRAPHIC PROCESS USING A HIGH INTENSITY ELECTROMAGNETIC RADIATION SOURCE. FEB. 9, 1971. CAN. 0914266, GRB. 1207361.
3,631,507.—METHOD OF REDISTRIBUTING CHARGE ON A DIELECTRIC MEDIUM. DEC. 28, 1971.
3,677,750.—PHOTOELECTROSOLOGRAPHIC IMAGING. JULY 18, 1972. GRB. 1326934.
3,686,678.—DUAL MODE ELECTROSTATIC PRINTING. AUG. 22, 1972. BEL. 0747125, CAN. 0952574, FRA. 7007650, GRB. 1297996, JAP. 0753534.

3,693,185.—ELECTROSTATIC RECORDING HEAD AND METHOD OF MANUFACTURE. SEPT. 19, 1972.
3,719,481.—ELECTROSTATOGRAPHIC IMAGING PROCESS. MAR. 6, 1973.
3,729,123.—PRINTING MACHINE AND METHOD. APR. 24, 1973. CAN. 0959532, FRA. 7142517, GRB. 1348014.
3,729,334.—IMAGING PROCESS. APR. 24, 1973.
3,793,107.—ELECTROSTATIC RECORDING HEAD AND METHOD OF MANUFACTURE. FEB. 19, 1974.
3,829,185.—HOUSING ASSEMBLY FOR ELECTROSTATIC PRINTING MACHINE. AUG. 13, 1974.
3,854,942.—TRANSPARENCY FOR MULTI-COLOR ELECTROSTATIC COPYING. DEC. 17, 1974.
3,859,960.—PRINTING MACHINE WITH ELECTROSTATIC WEB DEVELOPING APPARATUS. JAN. 14, 1975. CAN. 0959532, FRA. 7142517, GRB. 1348014.
3,937,177.—ELECTROSTATIC PRINTING MACHINE WITH IMPROVED TONER FOUNTAIN AND RECOVERY, FEB. 10, 1976 .
3,985,666.—PLASTIC MATERIALS MIXED WITH POLAR GROUP CONTAINING MATERIALS. OCT. 12, 1976. ARG. 0195541, BEL. 0781970, CAN. 0976742, FRA. 7213873, GRB. 1396141, ITL. 0951326, MEX. 0126158, VZL. 0032937.
4,042,939.—PRINTER/PLOTTER STYLE SYSTEM FOR CONFINED INSTALLATION AND METHOD. AUG. 16, 1977.

Class 1B 2

3,196,013.—XEROGRAPHIC INDUCTION RECORDING WITH MECHANICALLY DEFORMABLE IMAGE-FORMATION IN A DEFORMABLE LAY. JULY 20, 1965. CAN. 0778520, FRA. 1360084, GER. 1253581, ITL. 0711488, JAP. 0649672.
3,321,308.—XEROGRAPHIC INDUCTION RECORDING. MAY 23, 1967. CAN. 0778521, FRA. 1393821, GRB. 1049903, ITL. 0801906, JAP. 0537660.
3,551,146.—INDUCTION IMAGING SYSTEM. DEC. 29, 1970.
3,703,376.—INDUCTION SYSTEM. NOV. 21, 1972. ARG. 0190247, MEX. 0123032.
3,738,855.—INDUCTION IMAGING SYSTEM. JUNE 12, 1973.
3,778,841.—INDUCTION IMAGING SYSTEM. DEC. 11, 1973. ARG. 0190247, MEX. 0123032.
3,953,206.—IMAGING METHOD. APR. 27, 1976.
4,050,804.—LIQUID INK IMAGING SYSTEM. SEPT. 27, 1977.
4,056,314.—LIQUID INK IMAGING SYSTEM. NOV. 1, 1977.
4,076,405.—LIQUID INK IMAGING SYSTEM. FEB. 28, 1978.
4,197,331.—A NOVEL ELECTROSTATIC IMAGING SYSTEM. APR. 8, 1980.

Class 1B 3

3,145,655.—EQUIPOTENTIAL XEROPRINTING MEMBER AND PROCESS OF PRINTING THERE WITH. AUG. 25, 1964. CAN. 0784647, GER. 1287095, GRB. 0958964, JAP. 0591209.
3,160,091.—HIGH SPEED XEROPRINTER AND METHOD THEREFOR. DEC. 8, 1964. GRB. 0978349.
3,318,698.—XEROPRINTING REPRODUCTION. MAY 9, 1967. CAN. 0790236, FRA. 1394421, GRB. 1055323, ITL. 0801547, JAP. 0504497.
3,515,584.—XEROPRINTING MASTER. JUNE 2, 1970. CAN. 0882600, GRB. 1204246, JAP. 0659019.
3,547,627.—LITHOGRPHC PRINTG MASTER AND METHOD EMPLOYING A CRYSTALLINE PHOTOCONDUCTIVE IMAGING LAYER. DEC. 15, 1970.
3,574,614.—PROCESS OF PREPARING MULTIPLE COPIES FROM A XEROPRINTING MASTER. APR. 13, 1971. ATR. 0305769, AUS. 0448396, BEL. 0743660, CAN. 0882599, FRA. 6944513, GRB. 1209060, ITL. 0879118, JAP. 0713808.
3,967,818.—DUPLICATING SYSTEM. JULY 6, 1976.
4,047,945.—XEROPRINTING MASTER AND PROCESS. SEPT. 13, 1977.

Class 1B 4A

3,653,891.—FORMS OVERLAY TECHNIQUE USING TESI. APR. 4, 1972. ARG. 0184314, AUS. 0459354, BEL. 0761030, CAN. 0946912, FRA. 7047635, GRB. 1339714, ITL. 0913996, MEX. 0119467.
4,023,895.—ELECTROSTATOGRAPHIC APPARATUS. MAY 17, 1977.

Class 1B 4B

3,182,591.—IMAGE FORMING APPARATUS AND METHOD. MAY 11, 1965.
3,208,076.—ELECTROSTATIC PRINTER. SEPT. 21, 1965. GRB. 0999260.
3,217,330.—ELECTROSTATIC PRINTING UTILIZING PRINT-THROUGH RECORDING. NOV. 9, 1965. CAN. 0773752, GRB. 1001152.
3,234,359.—RECORD CARD SCANNING APPARATUS. FEB. 8, 1966.
3,234,904.—DEVICE FOR TESIPRINTING. FEB. 15, 1966. AUS. 0277492, CAN. 0804878, FRA. 1367728, GRB. 1024635, ITL. 0697883.
3,257,222.—ELECTROSTATIC RECORDING METHOD AND APPARATUS USING SHAPED ELECTRODES. JUNE 21, 1966. CAN. 0736231, GRB. 1027438, JAP. 0451019.
3,289,209.—ELECTROSTATIC MATRIX PRINTER. NOV. 29, 1966. CAN. 0707049, FRA. 1357858, GER. 1447873, GRB. 1018513, ITL. 0694321, JAP. 0440456.
3,342,126.—MULTIPLE ELECTROGRAPHIC PRINTER HAVING PLURAL UNITS CONNECTED TO COMMON DRIVE MEANS. SEPT. 19, 1967. CAN. 0825341, GRB. 1182685, JAP. 0648073.
3,348,232.—ASYNCHRONOUS PAGE-AT-A-TIME PRINTER. OCT. 17, 1967. CAN. 0709971, GRB. 1025487, JAP. 0462803.
3,358,592.—ELECTROGRAPHIC PRINTING. DEC. 19, 1967. CAN. 0896701, FRA. 1514749, GER. 1512401, GRB. 1182686, ITL. 0793834, MEX. 0098070.
3,430,254.—TESI PRINTING WITH FLEXIBLE ELECTRODE ON ENDLESS BELT. FEB. 25, 1969.
3,438,052.—AIR-SUPPORTED HOUSING CONTAINING TESI PRINTING DRUM. APR. 8, 1969. CAN. 0827330, GRB. 1149349.
3,495,269.—ELECTROGRAPHIC RECORDG METH AND APPRTS W/INERT GASEOUS DISCHARGE IONIZATION AND ACCELERATION GAPS. FEB. 10, 1970. ARG. 0174765, ATR. 0309208, AUS. 0413341, BEL. 0707986, CAN. 0865837, CZC. 0164808, FRA. 1551296, GRB. 1205790, ITL. 0819587, JAP. 0587936, MEX. 0103538, SPN. 0348328, SWD. 0346867, USR. 0291520.
3,599,225.—ELECTROSTATIC RECORDING APPARATUS - AIR GAP APERTURE BELT COMMUNICATIONS PRINTER. AUG. 10, 1971. CAN. 0882319, GRB. 1226436, JAP. 0675796.
3,644,930.—MULTI-STYLUS RECORDER. FEB. 22, 1972. ARG. 0181835, AUS. 0457379, BEL. 0751150, CAN. 0944812, CHL. 0025752, FRA. 7019463, GRB. 1297110, ITL. 0893693, MEX. 0119071, SPN. 0380273, SWD. 0368289, TIW. 0005822, VZL. 0027516.
3,673,600.—ELECTROGRAPHIC RECORDING METHOD AND APPARATUS. JUNE 27, 1972. CAN. 0947361, GRB. 1318605.
3,673,603.—RECIPROCATING CARRIAGE FOR ELECTROGRAPHIC PRINTING. JUNE 27, 1972. CAN. 0937629, GRB. 1346647.
3,686,676.—DUAL MODE ELECTROGRAPHIC RECORDER. AUG. 22, 1972. CAN. 0954293.
3,686,679.—MULTI-STYLUS RECORDING ASSEMBLY. AUG. 22, 1972.
3,714,665.—ELECTROSTATIC RECORDING WITH IMPROVED ELECTROSTATIC CHARGE RETENTION. JAN. 30, 1973.
3,717,880.—DUAL MODE ELECTROGRAPHIC RECORDING. FEB. 20, 1973. BEL. 0774564, CAN. 0948271, FRA. 7139638, GRB. 1366129, ITL. 0937674.
3,766,850.—DEVELOPING MEANS FOR ELECTROSTATIC PRINTING APPARATUS. OCT. 23, 1973. CAN. 0972551, FRA. 7246855, GRB. 1415325, ITL. 0973310, SWD. 7216975.
3,771,184.—PRINTING APPARATUS. NOV. 13, 1973. CAN. 0973704, FRA. 7246858, GRB. 1415200, ITL. 0973321, SWD. 7216973.
3,795,010.—WRITING APPARATUS AND METHOD OF MANUFACTURE. FEB. 26, 1974.
3,806,238.—FORMS OVERLAY TECHNIQUE USING TEST. APR. 23, 1974.
3,811,766.—DEVELOPING APPARATUS. MAY 21, 1974. ARG. 0183333, AUS. 0446187, BEL. 0747127, CAN 0879412, EGR. 0084803, FRA. 7008249, GRB. 1296417, ITL. 0898245, JAP. 0770134, MEX. 0112930, SPN. 0377301, STZ. 0521614, SWD. 0361749, TIW. 0006826, USR. 0352484.
3,875,578.—ENVELOPED STYLUS RECORDER. APR. 1, 1975. CAN. 0947360, FRA. 7008242, GRB. 1296416.
3,971,042.—WRITING APPARATUS AND METHOD OF MANUFACTURE. JULY 20, 1976.

Class 1C

4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.

Class 1C 1

3,236,165.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 22, 1966. CAN. 0771829, JAP. 0547196.
3,343,142.—XEROGRAPHIC CODING AND INFORMATION STORAGE ON A SPECULAR BUSINESS MACHINE CARD. SEPT. 19, 1967. CAN. 0844786, GRB. 1047261, JAP. 0701182.
3,437,020.—MICROFILM TITLING APPARATUS. APR. 8, 1969. CAN. 0837780, GRB. 1191019, JAP. 0572188.
3,499,374.—XEROGRAPHIC PRINTER. MAR. 10, 1970. AUS. 0415164, BEL. 0677146, CAN. 0846424, FRA. 1470069, GRB. 1135603, ITL. 0762255, MEX. 0091183, SWD. 0327142.
3,521,950.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 28, 1970. ARG. 0184148, ATR. 0317675, AUS. 0441739, BEL. 0713876, CAN. 0877511, CHL. 0024535, DNK. 0129304, FRA. 1558225, GRB. 1231622, GRK. 0037839, IND. 0124668, ISR. 0029824, ITL. 0831700, JAM. 0001853, JAP. 0774498, LXB. 0055912, MEX. 0102085, NOR. 0131313, NZL. 0159801, PRU. 0009366, PTG. 0049474, SAF. 6872518, SPN. 0352885, STZ. 0505015, SWD. 7012263, UAR. 0008668, URG. 0009239, VZL. 0025077.
3,689,143.—REPRODUCING MACHINE. SEPT. 5, 1972.
4,047,810.—DUAL MODE COPYING MACHINE. SEPT. 13, 1977.

Class 1C 2

3,236,165.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 22, 1966. CAN. 0771829, JAP. 0547196.
3,379,106.—XEROGRAPHIC REPRODUCTION APPARATUS. APR. 23, 1968. ATR. 0300567, AUS. 0416116, BEL. 0674602, CAN. 0821718, DNK. 0117045, FRA. 1475712, GRB. 1135742, ITL. 0750206, MEX. 0095580, SPN. 0321099, STZ. 0509924, SWD. 6912065.
3,480,360.—XEROGRAPHIC COPYING APPARATUS. NOV. 25, 1969. ARG. 0180571, ATR. 0301344, AUS. 0310556, BEL. 0704978, CAN. 0870794, CHL. 00235e9, FRA. 1540839, GRB. 1206964, GRK. 0035147, HUN. 0158496, IND. 0112715, ITL. 0827017, LXB. 0054635, MEX. 0102269, NZL. 0156632, PRU. 0009341, PTG. 0048460, SAF. 0676065, SPN. 0345998, STZ. 0487439, SWD. 0337743, URG. 0008847, VZL. 0023675.
3,592,539.—RECORDING APPARATUS. JULY 13, 1971. CAN. 0917230.
3,689,143.—REPRODUCING MACHINE. SEPT. 5, 1972.

Class 1C 3

3,130,411.—ELECTRONIC RECORDER. APR. 21, 1964. CAN. 0729326.
3,212,888.—METHOD FOR DEVELOPING LATENT ELECTROSTATIC CHARGE HALFTONE IMAGES. OCT. 19, 1965. GER. 1284302, GRB. 1017683, JAP. 0470423.
3,281,857.—XEROGRAPHIC TRANSFER PLATEN. OCT. 25, 1966. CAN. 0733683, GRB. 1025199.
3,535,036.—APPARATUS FOR FORMING HALF-TONE LINE SCREEN WITH A LENS. OCT. 20, 1970. CAN. 0909309, GRB. 1253887.
3,698,893.—METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR. OCT. 17, 1972.
3,873,310.—METHOD OF CONTROLLING THE BRIGHTNESS ACCEPTANCE RANGE AND TONAL CONTRAST OF XEROGRAPHIC PLATE. MAR. 25, 1975. GRB. 1414951.
3,905,822.—COMPOUND SCREEN FOR OBJECT SCREENING. SEPT. 16, 1975. GRB. 1459558.
3,912,510.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A COMPOUND DOCUMENT SCREEN. OCT. 14, 1975. GRB. 1459558.
4,013,355.—NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES. MAR. 22, 1977.
4,014,607.—REMOVABLE SCREENING SYSTEM FOR A TRANSPARENCY REPRODUCTION MACHINE. MAR. 29, 1977.
4,025,181.—A SCREEN CLEANING DEVICE. MAY 24, 1977.
4,043,656.—TRANSPARENCY COPYING MACHINE. AUG. 23, 1977.
4,051,536.—ELECTRONIC HALFTONE IMAGING SYSTEM. SEPT. 27, 1977.
4,066,353.—HALF TONE IMAGING SYSTEM. JAN. 3, 1978.
4,068,940.—VARIABLE CONTRAST OPTICAL SCREENING SYSTEM. JAN. 17, 1978.
4,072,414.—SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. FEB. 7, 1978.
4,080,055.—A HALF-TONE COLOR COPIER. MAR. 21, 1978.
4,083,632.—MULTI FREQUENCY SCREEN. APR. 11, 1978.
4,090,786.—MULTI-COLOR SCREEN FOR ELECTROPHOTOGRAPHIC PRINTING. MAY 23, 1978.
4,095,889.—EXPOSURE SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 20, 1978.
4,108,654.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A DOCUMENT SCREEN. AUG. 22, 1978. FRA. 7514227. GRB. 1490898.
4,130,841.—VARIABLE FREQUENCY HALF-TONE IMAGING APPARATUS. DEC. 19, 1978.
4,149,183.—ELECTRONIC HALFTONE GENERATOR. APR. 10, 1979.
4,149,194.—VARIABLE ANGLE ELECTRONC HALFTONE SCREENING. APR. 10, 1979.
4,185,304.—ELECTRONIC HALFTONE SCREENING. JAN. 22, 1980.
4,196,451.—ELECTRONIC HALFTONE GENERATOR. APR. 1, 1980.
4,196,452.—TONER ERROR CONTROL FOR IMAGE CONTOUR REMOVAL. APR. 1, 1980.
4,196,453.—IMAGE SCREENING SYSTEM. APR. 1, 1980.
4,196,454.—TONER ERROR CONTROL FOR RELATIVELY LARGE IMAGE AREAS. APR. 1, 1980.
4,214,277.—HALFTONE IMPLEMENTATION APPARATUS. JULY 22, 1980.

Class 1C 4

3,196,009.—ELECTROSTATIC IMAGE LIQUID DEFORMATION DEVELOPMENT. JULY 20, 1965. ATR. 0267320, AUS. 0273895, BEL. 0631984, CAN. 0768329, DNK. 0129676, FRA. 1408156, GER. 1497058, GRB. 1043981, HOL. 0134043, ISR. 0019144, ITL. 0695213, JAP. 0620918, LXB. 0043704, MEX. 0080571, NOR. 0123260, SAF. 0001947, STZ. 0448745, SWD. 0315502.
3,196,010.—ELECTROPHOTOGRAPHIC PROCESS FOR FORMATION OF DEFORMATION IMAGES IN DEFORMABLE INTERFERENCE FILM. JULY 20, 1965. CAN. 0790232, FRA. 1364100, GRB. 1036738, ITL. 0695214, JAP. 0510166.
3,196,012.—HALF-TONE XEROGRAPHY WITH THERMOPLASTIC DEFORMATION OF THE IMAGE. JULY 20, 1965. CAN. 0760623, FRA. 1359565, GER. 1497060, GRB. 1040836, ITL. 0697483, JAP. 0478444.
3,196,013.—XEROGRAPHIC INDUCTION RECORDING WITH MECHANICALLY DEFORMABLE IMAGE FORMATION IN A DEFORMABLE LAY. JULY 20, 1965. CAN. 0778520, FRA. 1360084, GER. 1253581, ITL. 0711488, JAP. 0649672.
3,307,941.—PLASTIC DEFORMATION IMAGING FILM AND PROCESS. MAR. 7, 1967. CAN. 0801262.
3,419,885.—IMAGE DEVELOPMENT OF THERMOPLASTIC LAYERS. DEC. 31, 1968. CAN. 0785985, GRB. 1117644, JAP. 0537663.
3,436,216.—IMAGE STORAGE COMPRISING A THERMOPLASTIC DEFORMATION PATTERN. APR. 1, 1969. CAN. 0807326, FRA. 1488094, GRB. 1160731, ITL. 0774940.
3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.
3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.
3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPTHO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.
3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.
3,698,892.—METHODS OF THERMOPLASTIC XEROGRAPHY AND APPARATUS THEREFOR. OCT. 17, 1972. CAN. 0949117, GRB. 1343191.
3,698,893.—METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR. OCT. 17, 1972.
3,716,359.—CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD. FEB. 13, 1973. ARG. 0196734, AUS. 0461213, BEL. 0777320, CAN. 0953990, FRA. 7147891, GRB. 1380057, ITL. 0944392, MEX. 0131400, SPN. 0398306.
3,719,483.—METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR. MAR. 6, 1973.
3,730,621.—CONTROL OF ELECTROSTATIC DEFORMATION OF THERMOPLASTIC FILM. MAY 1, 1973.

3,795,514.—DEFORMATION IMAGING METHOD. MAR. 5, 1974.
3,842,406.—CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD. OCT. 15, 1974. ARG. 0196734, AUS. 0461213, BEL. 0777320, CAN. 0953990, FRA. 7147891, GRB. 1380057, ITL. 0944392, MEX. 0131400, SPN. 0398306.
3,858,973.—METHODS OF THERMOPLASTIC XEROGRAPHY AND APPARATUS THEREFOR. JAN. 7, 1975. CAN. 0949117, GRB. 1343191.
3,888,591.—IMAGE SUBTRACTION APPARATUS. JUNE 10, 1975.
3,932,025.—IMAGING SYSTEM. JAN. 13, 1976.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,946,433.—PHASE IMAGE SCANNING METHOD. MAR. 23, 1976. BEL. 0835551.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,961,950.—IMAGING SYSTEM. JUNE 8, 1976.
3,980,476.—IMAGING SYSTEM. SEPT. 14, 1976.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
3,999,988.—METHOD FOR REAL-TIME COLOR MASKING. DEC. 28, 1976.
4,018,603.—DEFORMATION IMAGING SYSTEM USING THERMOPLASTIC AND ELASTOMERIC LAYERS. APR. 19, 1977.
4,021,236.—IMAGING SYSTEM. MAY 3, 1977.
4,023,969.—DEFORMABLE ELASTOMER - IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,065,308.—DEFORMATION IMAGING ELEMENT. DEC. 27, 1977.
4,079,421.—IMAGE SCANNING SYSTEM. MAR. 14, 1978.BEL. 835551, SPN. 442965.
4,163,667.—DEFORMABLE IMAGING MEMBER USED IN ELECTRO-OPTIC IMAGING SYSTEMS. AUG. 7, 1979. BEL. 820868, CAN. 1005111, FRA. 7434330, GER 2431770, GRB. 1482703, ITL. 1030694, JAP. 886837.

Class 1C 4A

3,196,008.—ELECTROPC PRCS FOR FRMTN OF FRST LIKE DEFRMTN IMGS IN MECHANICALLY DEFRMBL PHOTOCONDUCTIVE LAYER. JULY 20, 1965. CAN. 0844221.
3,196,011.—ELECTROSTATIC FROSTING. JULY 20, 1965. ARG. 0150575, ATR. 0256625, AUS. 0275848, BEL. 0631983, BRA. 0082433, CAN. 0918226, CHL. 0019655, EIR. 0027268, FIN. 0044982, FRA. 1364101, GER. 1295371, GRB. 1039881, GRK. 0026981, HOL. 0140635, IND. 0087685, ISR. 0019143, ITL. 0695215, LXR. 0043693, MEX. 0102124, NOR. 0118346, NZL. 0134799, PAK. 0114430, PLP. 0003269, PTG. 0040894, SAF. 0001948, SPN. 0292129, STZ. 0425467, SWD. 0315201, TRK. 0011937, UAR. 0004997, VTM. 0000992, VZL. 0014488.
3,213,429.—HIGH SPEED INFORMATION RECORDER. OCT. 19, 1965.
3,258,336.—STRIPPABLE LAYER FROST PRINTING. JUNE 28, 1966. CAN. 0815184.
3,322,034.—FROST COLOR DISPLAY. MAY 30, 1967.
3,329,500.—ELECTROSTATIC FROSTING. JULY 4, 1967.
3,482,969.—FIXING OF DEFORMATION IMAGES. DEC. 9, 1969. CAN. 0801883, FRA. 1399003, GRB. 1061235, ITL. 0726200, SWD. 0315806.
3,485,623.—CONTINUOUS TONE THERMOPLASTIC PHOTOGRAPHY. DEC. 23, 1969. CAN. 0810834, GRB. 1181093, JAP. 0565795.
3,526,879.—INTERNAL FROST RECORDING APPARATUS USING A DEFORMABLE PHOTOCONDUCTOR. SEPT. 1, 1970.
3,542,545.—FROST OR RELIEF WRNKLNG OF AN IMGNG ARTCL COMPRSNG AN ELCTRCLY PHOTSNSTV LAYER AND DEFORMABLE LAY. NOV. 24, 1970. ARG. 0174588, ATR. 0300563, AUS. 0424162, BEL. 0726280, CAN. 0928764, CHL. 0025764, DNK. 0126400, FRA. 1604336, GER. 1817226, GRB. 1234600, GUA. 0002531, ITL. 0864015, JAP. 0693385, LXB. 0057697, MEX. 0107799, NZL. 0154931, PNM. 0001803, PRU. 0010480, SAF. 0688517, SPN. 0362039, STZ. 0518578, SWD. 0354132, URG. 0009690.
3,560,205.—METHOD OF FORMING A PHASE MODULATING HOLOGRAM ON A DEFORMABLE THERMOPLASTIC. FEB. 2, 1971. CAN. 0949793, GRB. 1162853.
3,560,206.—PRODUCTION OF LATENT PERODIC MEMORY PATTERNS IN FROSTABLE FILMS. FEB. 2, 1971.
3,561,958.—INDUCING FROST DEFORMATION IMAGING BY ELECTROLYTIC DEPOSITION. FEB. 9, 1971.
3,672,883.—CRYSTALLINE POLYMERS FOR FROST. JUNE 27, 1972.
3,672,886.—NOVOLAR RESINS IN DEFORMATION IMAGING. JUNE 27, 1972.
3,764,311.—IMAGING SYSTEM. OCT. 9, 1973.
3,819,369.—SURFACE DEFORMABLE IMAGING MEMBER OF IMPROVED DARK DECAY CHARACTERISTICS. JUNE 25, 1974.
3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975. GRB. 1461872.
3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.
4,047,810.—DUAL MODE COPYING MACHINE. SEPT. 13, 1977.

Class 1C 4B

3,238,041.—RELIEF IMAGING OF PHOTORESPONSIVE MEMBER AND PRODUCT. MAR. 1, 1966. CAN. 0850841, GRB. 1043983, MEX. 0080410.
3,321,308.—XEROGRAPHIC INDUCTION RECORDING. MAY 23, 1967. CAN. 0778521, FRA. 1393821, GRB. 1049903, ITL. 0801906, JAP. 0537660.
3,542,545.—FROST OR RELIEF WRNKLNG OF AN IMGNG ARTCL COMPRSNG AN ELCTRCLY PHOTSNSTV LAYER AND DEFORMABLE LAY. NOV. 24, 1970. ARG. 0174588, ATR. 0300563, AUS. 0424162, BEL. 0726280, CAN. 0928764, CHL. 0025764, DNK. 0126400, FRA. 1604336, GER. 1817226, GRB. 1234600, GUA. 0002531, ITL. 0864015, JAP. 0693385, LXB. 0057697, MEX. 0107799, NZL. 0154931, PNM. 0001803, PRU. 0010480, SAF. 0688517, SPN. 0362039, STZ. 0518578, SWD. 0354132, URG. 0009690.
3,615,388.—DEFORMATION IMAGING PROCESS AND ELEMENT. OCT. 26, 1971. CAN. 0941877, MEX. 0101539.
3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975. GRB 1461872.
3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.

Class 1C 5

3,519,818.—METHOD OF PREPARING A NEGATIVE XEROGRAPHIC REPRODUCTION FROM A POSITIVE LINE COPY IMAGE. JULY 7, 1970. CAN. 0829037, GRB. 1191159, JAP. 0589516.

Class 1D

3,318,212.—DUPLEX XEROGRAPHIC REPRODUCTION. MAY 9, 1967.
3,506,347.—DUPLEX XEROGRAPHIC REPRODUCTION APPARATUS. APR. 14, 1970.
3,536,398.—REPRODUCTION APPARATUS. OCT. 27, 1970. AUS. 0442047, BEL. 0737274, CAN. 0899443, EGR 0091200, FRA. 6927759, GRB. 1246226, ITL. 0883645, SPN. 0370416, STZ. 0500517, SWD. 0356144, TIW 0005358, USR. 0359871.
3,580,670.—APPARATUS FOR DUPLEXING. MAY 25, 1971. CAN. 0929581.
3,615,129.—DUPLEXING XEROGRAPHIC REPRODUCING MACHINE WITH COPY SHEET REVERSING STATION. OCT. 26, 1971. ARG. 0172601, AUS. 0432830, BEL. 0737341, CAN. 0909853, CZC. 0158650, EGR 0083299, FRA. 6927784, GRB. 1256767, ITL. 0883644, JAP. 0774495, MEX. 0108784, SPN. 0370415, STZ. 0500518, SWD. 0356143, TIW. 0006822, USR. 0371736, VZL. 0032923.
3,671,118.—APPARATUS FOR CREATING DUPLEX REPRODUCTIONS. JUNE 20, 1972. ARG. 0186265, AUS. 0445064, BEL. 0760746, CAN. 0922768, EGR. 0088254, FRA. 7047143, GRB. 1282808, ITL. 0913849, JAP 0773214, MEX. 0116655, SPN. 0386707, STZ. 0526137, SWD. 0366403.
3,674,475.—ENCLOSED MIGRATION IMAGING SYSTEM. JULY 4, 1972.
3,694,073.—METHOD FOR DUPLEXING. SEPT. 26, 1972.
3,754,822.—SCANNING SYSTEM. AUG. 28, 1973
3,844,653.—ROOF MIRROR COPYING SYSTEM OCT. 29, 1974.
3,844,654.—DUPLEX COPYING SYSTEM. OCT. 29, 1974 FRA. 7340246.
3,847,478.—SEGMENTED BIAS ROLL. NOV. 12, 1974.
3,936,171.—ELECTROSTATOGRAPHIC METHODS AND APPARATUS. FEB. 3, 1976.
3,940,210.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. FEB. 24, 1976. BEL. 0832356, IRN. 0013436
3,944,359.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. MAR. 16, 1976.

4,014,609.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINE. MAR. 29, 1977.
4,035,073.—DUPLEX REPRODUCTION MACHINE. JULY 12, 1977. BEL. 0832115, SPN. 0440012.
4,104,726.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. AUG. 1, 1978.
4,107,779.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. AUG. 15, 1978.
4,109,313.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. AUG. 22, 1978.
4,116,558.—DUPLEX SYSTEM AND METHOD FOR PRECOLLATION COPIERS. SEPT. 26, 1978.
4,120,034.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. OCT. 10, 1978.
4,131,360.—DUPLEX REPRODUCTION SYSTEM EMPLOYING COPY SHEET CLEANER. DEC. 26, 1978.
4,172,655.—SHINGLE SHEET STACKING FOR DUPLEX COPYING. OCT. 30, 1979.

Class 1E

3,227,549.—MULTIPLE IMAGE FORMING XEROGRAPHIC REPRODUCTION PROCESS. JAN. 4, 1966.
3,313,623.—LINE SEQUENTIAL COLOR XEROGRAPHY. APR. 11, 1967. CAN. 0880483, GRB. 1019974.
3,316,805.—COLOR DISPLAY. MAY 2, 1967.
3,357,830.—DYED IMAGE XEROGRAPHY. DEC. 12, 1967. CAN. 0821484, GER. 1277018, GRB. 1016581, ITL. 0679720, JAP. 0477809.
3,373,091.—DATA STORAGE DEVICE AND METHOD. MAR. 12, 1968.
3,386,379.—DUPLICATING WITH COLOR PRODUCING REAGENTS. JUNE 4, 1968. AUS. 0294747, CAN. 0842445, FRA. 1390006, GER. 1249089, GRB. 1043875, ITL. 0801548, JAP. 0611643.
3,468,705.—METHOD OF PREPARING LEAD OXIDE FILMS. SEPT. 23, 1969. CAN. 0806134, FRA. 1501511, GER. 1521942, GRB. 1170428, ITL. 0787638, JAP. 0634868, MEX. 0093335.
3,508,823.—DUPLICATING APPARATUS. APR. 28, 1970.
3,583,806.—DYED IMAGE XEROGRAPHY. JUNE 8, 1971.
3,615,392.—ELECTROPHORETIC REPRODUCTION ORIGINAL CONTAINING BOTH MULTI-COLOR AND LINE AREAS. OCT. 26, 1971.
3,672,887.—ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION. JUNE 27, 1972.
3,687,661.—COLOR ELECTROPHOTOGRAPHIC PROCESS. AUG. 29, 1972. CAN. 0932785.
3,690,756.—COLOR XEROGRAPHY. SEPT. 12, 1972. BEL. 0781001, CAN. 0963522, FRA. 7210584, GRB. 1365753, ITL. 0950399.
3,702,483.—COLOR RENDITION METHOD. NOV. 7, 1972. BEL. 0777015, CAN. 0935334, FRA. 7146255, GRB. 1361647, ITL. 0944210.
3,719,482.—IMAGING SYSTEM. MAR. 6, 1973.
3,724,943.—COLOR REPRODUCTION APPARATUS. APR. 3, 1973. CAN. 0946463.
3,734,607.—COLOR REPRODUCTION APPARATUS. MAY 22, 1973. ARG. 0184654, ATR. 0314352, AUS. 0459724, BEL. 0751490, CAN. 0946462, CHL. 0026265, DNK. 0130156, EGR. 0085001, FRA. 7020455, GRB. 1316499, ITL. 0893863, MEX. 0120285, NZL. 0160302, PNM. 0002259, PTG. 0053890, SAF. 0703775, SPN. 0380376, STZ. 0514164, SWD. 0359176.
3,799,668.—COLOR STANDARD AND METHOD OF CALIBRATING A MULTI-COLOR ELECTROPHOTGRAPHIC PRINTING MACHINE. MAR. 26, 1974. BEL. 0812179, SAF. 0741562.
3,799,774.—MULTI COLOR ELECTROPHOTOGRAPHIC MASKING PROCESS. MAR. 26, 1974.
3,805,283.—CHART CREATION APPARATUS. APR. 16, 1974.
3,869,203.—COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 4, 1975. BEL. 0820041.
3,884,686.—COLOR CORRECTION METHOD. MAY 20, 1975.
3,909,127.—MULTI-COLOR ORIGINAL FOR AN ELECTROPHOTOGRAPHIC PRINTING SYSTEM. SEPT. 30, 1975.
3,914,043.—COLOR ACCENTING COPYING MACHINE. OCT. 21, 1975.
3,936,182.—CONTROL ARRANGEMENT FOR AN ELECTROSTATOGRAPHIC REPRODUCTION APPARATUS. FEB. 3, 1976.
3,944,711.—TRANSPARENCY. MAR. 16, 1976.
3,958,990.—TRANSFERRING TONER TO AN AMINE COATED SHEET. MAY 25, 1976.
3,960,445.—COLOR HIGHLIGHTING ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
3,963,341.—A COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 15, 1976.
3,970,042.—COLOR DEVELOPMENT APPARATUS. JULY 20, 1976.
3,999,987.—COLOR REPRODUCTION METHOD. DEC. 28, 1976.
4,013,355.—NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES. MAR. 22, 1977.
4,014,696.—MULTICOLORED XEROGRAPHIC TRANSPARENCY UTILIZING AN APIPHATIC ESTER COATING. MAR. 29, 1977.
4,027,962.—COLOR TRANSPARENCY REPRODUCING MACHINE. JUNE 7, 1977. BEL. 0830321, IRN. 0013435, SPN. 0437814.
4,040,828.—MULTICOLOR IMAGING METHOD AND IMAGED MEMBER EMPLOYING COMBINATION OF TRANSPARENT TONER AND. AUG. 9, 1977. FRA. 7540219.
4,045,218.—METHOD FOR ELECTROSTATICALLY PRODUCING A COLOR ACCENTED PHOTOCOPY. AUG. 30, 1977.
4,045,219.—METHOD OF REPRODUCING COLOR HIGHLIGHTED DOCUMENTS. AUG. 30, 1977.
4,053,216.—COLOR TRANSPARENCY REPRODUCING MACHINE. OCT. 11, 1977. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,053,217.—COLOR TRANSPARENCY REPRODUCING MACHINE. OCT. 11, 1977. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,058,850.—PROGRAMMABLE CONTROLLER. NOV. 15, 1977.
4,063,810.—COLOR TRANSPARENCY REPRODUCING MACHINE. DEC. 20, 1977. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,063,946.—ELECTROPHOTOGRAPHIC COLOR REPRODUCTION PROCESS EMPLOYING PHOTOCONDUCTIVE MATERIAL WITH DUAL. DEC. 20, 1977.
4,068,938.—ELECTROSTAIC COLOR PRINTING USING DISCRETE POTENTIALS. JAN. 17, 1978. GRB. 1442234.
4,068,939.—COLOR TRANSPARENCY REPRODUCING MACHINE. JAN. 17, 1978. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.
4,078,929.—METHOD FOR TWO-COLOR DEVELOPMENT OF A XERIOGRAPHIC CHARGE PATTERN. MAR. 14, 1978.
4,082,443.—SYSTEM FOR SUPERPOSITION OF COLOR SEPARATION IMAGES. APR. 4, 1978.
4,087,168.—CHARGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. MAY 2, 1978.
4,097,139.—REPRODUCING MACHINE HAVING INTERCHANGEABLE DEVELOPER HOUSINGS. JUNE 27, 1978.
4,111,542.—COLLATING SYSTEM FOR OPAQUE DOCUMENTS AND SLIDE REPRODUCTIONS. SEPT. 5, 1978.
4,135,927.—MULTICOLOR XEROGRAPHIC PROCESS. JAN. 23, 1979. ARG. 188730. AUS. 459398. BEL. 767360. CAN. 946910. CHL. 26754. DNK. 133524. FRA. 7118951. GRB. 1345391. ITL. 930586. MEX. 121678. PNM. 2395. SPN. 391274. STZ. 530659. SWD. 358245. TIW. 8520. VZL. 32422.
4,188,110.—PHOTOCONDUCTIVE BELT SUPPORTING APPARATUS. FEB. 12, 1980.

Class 1F

3,109,366.—METHOD FOR PATTERN REPRODUCTION. NOV. 5, 1963. CAN. 0624372.
3,109,367.—METHOD FOR PATTERN REPRODUCTION. NOV. 5, 1963. CAN. 0624374, FRA. 1146623, GER. 1029837, GRB. 0813637.
3,143,066.—PRODUCTION OF DUPLICATING MASTERS. AUG. 4, 1964. CAN. 0722954.
3,428,453.—IMAGE FORMING PROCESS UTILIZING XEROGRAPHY-ETCHING PROCESS. FEB. 18, 1969. CAN. 0856722, FRA. 1428775, GRB. 1085151, ITL. 0754825.
3,455,240.—IMAGING SYSTEM. JULY 15, 1969. CAN. 0823599, GER. 1571913, GRB. 1165676, JAP. 0594700.
3,460,476.—IMAGING PROCESS. AUG. 12, 1969. ARG. 0164839, AUS. 0418783, BEL. 0691755, CAN. 0882050, FRA. 1511173, GRB. 1168268, ITL. 0787662, JAP. 0562388, MEX. 0108240, SPN. 0346128, STZ. 0480672, SWD. 0331794, VZL. 0024009.
3,490,368.—PRINTING BY PARTICULATE IMAGES. JAN. 20, 1970. ARG. 0152222, ATR. 0281875, AUS. 0403243, BEL. 0674293, BRA. 0086720, CAN. 0824922, DNK.

0117303, FIN. 0047145, FRA. 1464987, GER. 1496169, GRB. 1128173, GRK. 0031516, HOL. 0145056, ITL. 0750153, JAP. 0547199, MEX. 0101075, NOR. 0130551, SAF. 0656968, SPN. 0321274, STZ. 0446906, SWD. 0355681, VZL. 0023998.
3,549,447.—IMAGING SYSTEM. DEC. 22, 1970.
3,559,570.—METHOD OF PREPARING AND USING A GRAVURE PRINTING PLATE. FEB. 2, 1971. CAN. 0844544, GRB. 1198142.
3,589,290.—RELIEF IMAGING PLATES MADE BY REPETITIVE XEROGRAPHIC PROCESSES. JUNE 29, 1971. CAN. 0896949.
3,615,128.—APPARATUS FOR ELECTROSTATIC PRINTING. OCT. 26, 1971. CAN. 0910956.
3,638,567.—METHOD OF PREPARING AND UTILIZING A GRAVURE PRINTING MASTER. FEB. 1, 1972.
3,806,354.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES. APR. 23, 1974.
3,884,686.—COLOR CORRECTION METHOD. MAY 20, 1975.
3,919,938.—PERMANENT ELECTROSTATIC MASTER. NOV. 18, 1975.
4,006,267.—COLOR HIGHLIGHTING PROCESS. FEB. 1, 1977.
4,068,588.—PRINTING USING AN ELECTROCHROMIC IMAGE. JAN. 17, 1978.

Class 1G 1

3,124,457.—DIFFERENTIAL IMAGE TRANSFER SYSTEM. MAR. 10, 1964. CAN. 0800184, GRB. 1031986, JAP. 0477375.
3,185,777.—MAGNETIC RECORDING. MAY 25, 1965.
3,485,621.—RECORDING BY PARTICLE ORIENTATION. DEC. 23, 1969. CAN. 0916777, GRB. 1188982, JAP. 0582501.
3,526,191.—DUPLICATING PROCESS EMPLOYING MAGNETIC DEVELOPER MATERIAL. SEPT. 1, 1970. CAN. 0903830, GRB. 1208307.
3,803,638.—RECORDING SYSTEM USING MAGNETIC CORE MATRIX. APR. 9, 1974.
3,875,576.—ELECTROSTATIC IMAGING SYSTEM WITH MAGNETIC TONER. APR. 1, 1975.
4,160,046.—METHOD OF MAKING AN IMAGING SYSTEM. JULY 3, 1979.

Class 1G 2

3,592,642.—DUPL METH PAPR SHT HTS MELTG PT TONR IMG SIMUL CAUSE TRANSF TNR FRPHOTOCNDCR AND FSG TNR IMG ON PAP. JULY 13, 1971. BEL. 0706852, FRA. 1547828, GRB. 1198306, HUN. 0157321, ITL. 0815498.

Class 1G 3

3,275,436.—METHOD OF IMAGE REPRODUCTION UTILIZING A UNIFORM RELEASABLE SURFACE FILM. SEPT. 27, 1966. AUS. 0296158, CAN. 0811877, FRA. 1371894, GRB. 1033523, ITL. 0702168, JAP. 0508402.
3,438,772.—IMG RPDCTN INVLVNG ELCTROSTC TRSF OF RELESBL DONR FILM FRM PTOCNDTV INSLTNG LAYER TO ADHSV TRS. APR. 15, 1969. CAN. 0838044, GRB. 1124954, JAP. 0542587.
3,446,616.—XEROGRAPHIC IMAGING EMPLOYING A SELECTIVELY REMOVABLE LAYER. MAY 27, 1969.

Class 1G 4

3,166,418.—IMAGE DEVELOPMENT. JAN. 19, 1965. CAN. 0747566, FRA. 1259438, GER. 1190334, GRB. 0952609, JAP. 0418117.
3,619,054.—OIL FILM IMAGING APPARATUS. NOV. 9, 1971.

Class 1G 5

3,234,019.—METHOD FOR FORMATION OF AN ELECTROSTATIC IMAGE RESISTANT TO DETERIORATION ON STORAGE. FEB. 8, 1966. ATR. 0248873, AUS. 0266424, BEL. 0618720, FRA. 1325903, GER. 1295374, GRB. 1006231, IND. 0081730, ISR. 0017057, ITL. 0667262, SAF. 0001489, STZ. 0407176, SWD. 0307733.

Class 1G 6

3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,924,945.—APPARATUS FOR INDUCTIVE IMAGING WITH SIMULTANEOUS POLAR INK DEVELOPMENT. DEC. 9, 1975.
3,974,554.—QUANDRANGULAR TRIPETICORD GRAVURE ROLL. AUG. 17, 1976.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR NOV. 30, 1976. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,017,174.—DEVELOPER ASSEMBLY SUPPORT. APR. 12, 1977.
4,020,788.—DOCTORING MEANS. MAY 3, 1977.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. MAY 17, 1977. BEL. 0819537.
4,024,838.—DEVELOPER LIQUID SUPPLY DEVICE. MAY 24, 1977.

Class 1H 1

3,100,427.—PROJECTION DEVICE. AUG. 13, 1963.
3,166,419.—IMAGE PROJECTION. JAN. 19, 1965. CAN. 0699802, FRA. 1260843, GRB. 0955994.
3,166,420.—SIMULTANEOUS IMAGE FORMATION. JAN. 19, 1965. CAN. 0756267, GRB. 0955142.
3,185,050.—XEROGRAPHIC IMAGE PROCESSOR PROJECTOR. MAY 25, 1965.
3,196,765.—IMAGE DEVELOPMENT AND PROJECTION. JULY 27, 1965.
3,220,012.—SIMULTANEOUS RECORDING AND DISPLAY SYSTEM. NOV. 23, 1965. CAN. 0809339, FRA. 1373673, GER. 1303156, GRB. 1019900, ITL. 0695895, JAP. 0470425.
3,317,317.—XEROGRAPHIC METHOD OF MAKING A PARTICLE TRANSPARENCY PROJECTIBLE IMAGE. MAY 2, 1967.
3,320,061.—MASKING BY TOTAL INTERNAL REFLECTION FOR IMAGE REPRODUCTION AND DISPLAY. MAY 16, 1967. CAN. 0847533, FRA. 1401615, GER. 1497081, GRB. 1065986, ITL. 0729029, JAP. 0471308.
3,343,142.—XEROGRAPHIC CODING AND INFORMATION STORAGE ON A SPECULAR BUSINESS MACHINE CARD. SEPT. 19, 1967. CAN. 0844786, GRB. 1047261, JAP. 0701182.
3,519,344.—IMAGE PROJECTION. JULY 7, 1970.
3,543,031.—DEVICE AND PROCESS FOR IMAGE STORAGE. NOV. 24, 1970. ARG. 0161299, AUS. 0432468, BEL. 0703461, CAN. 0862332, FRA. 1543309, GER. 1549142, GRB. 1201374, ITL. 0811521, JAP. 0742514, MEX. 0100142, SPN. 0344004, STZ. 0497022, SWD. 0354169, VZL. 0023663.
3,593,832.—KEYBOARD INPUT DISPLAY DEVICE. JULY 20, 1971.
3,619,049.—XEROGRAPHIC IMAGERY USING A LONG PERSISTENCE PHOSPHOR INTERMEDIATE. NOV 9, 1971.
3,955,977.—ELECTROSTATOGRAPHIC PROCESS. MAY 11, 1976.

Class 1H 2

3,437,408.—MULTIPLE COPY ELECTROSTATIC IMAGING APPARATUS. APR. 8, 1969. ARG. 0164840, ATR. 0283115, AUS. 0410817, BEL. 0704323, CAN. 0831674, CZC. 0156411, EGR. 0065587, FRA. 1538197, GRB. 1202583, HUN. 0161168, ITL. 0822157, JAP. 0582502, MEX. 0099950, SPN. 0345482, STZ. 0484459, SWD. 0331795, USR. 0353450, VZL. 0023662.
3,512,038.—PIN SYSTEM. MAY 12, 1970. CAN. 0873507, GRB. 1201497, JAP. 0623001.

Class 1I

3,414,409.—PARTICLE TRANSFER. DEC. 3, 1968. BEL. 0713399, CAN. 0822324, FRA. 1568374, GRB. 1145026, ITL. 0829803.
3,543,022.—METH AND APPARATUS CHARG DISCRETE SMALL AREAS XEROGRAPHIC PLATES TO DIF POTENT CONT TONE PRINTG. NOV. 24, 1970. CAN 0921971, GRB. 1186599.
3,682,677.—BACKGROUND REMOVAL. AUG. 8, 1972
3,784,301.—ELECTROPHOTOGRAPHIC METHOD. JAN. 8, 1974.
3,883,349.—ELECTROPHOTOGRAPHIC CHARGING METHOD. MAY 13, 1975.
3,973,846.—ELECTROSTATIC MASTER MAKING APPARATUS. AUG. 10, 1976.

4,021,112.—PHOTORECEPTOR DARK CURRENT LEAKAGE DETECTING APP FOP XEROGRAPHIC MACHINES. May 3, 1977.
4,039,831.—TWO COLOR XERORADIOGRAPHY DEVELOPMENT. AUG. 2, 1977.
4,134,137.—SINGLE WIRE MICROELECTROMETER IMAGING SYSTEM. JAN. 9, 1979.

Class 1J

3,652,156.—LINEAR-TO-DRUM OPTICAL SCAN CONVERTER SYSTEM. MAR. 28, 1972.
3,766,850.—DEVELOPING MEANS FOR ELECTROSTATIC PRINTING APPARATUS. OCT. 23, 1973. CAN. 097255l, FRA. 7246855, GRB. 1415325, ITL. 0973310, SWC. 7216975.
3,954,463.—METHOD FOR ELECTROSTATIC PRINTING. MAY 4, 1976.
4,046,472.—ELECTROSTATIC IMAGING APPARATUS. SEPT. 6, 1977.
4,103,995.—IMAGING APPARATUS. AUG. 1, 1978.
4,174,903.—COMBINED PROCESSING STATION FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. NOV. 20, 1979.

Class 1J 1

3,099,943.—XEROGRAPHIC REPRODUCING APPARATUS. AUG. 6, 1963. ADN. 0000468, ARG. 0169828, ATR. 0251420, AUS. 0270773, BEL. 0629050, BRA. 0082981, BRS. 00J3736, BRU. 0000369, CAN. 0738132, CHL. 0023724, CLB. 0015207, COS. 0001436, ECD. 0000022, FIJ. 0000340, FRA. 1346575, GHA. 0000997, GIB. 1032951, GIE. 0006569, GRB. 1032951, GRK. 0025939, GUA. 0001740, GUR. 1032951, HGK. 0008969, IND. 0086614, ISR. 0018757, ITL. 0752146, JAP. 0491155, JER. 0000P97, KEN. 0001743, LXB. 0043231, MAU. 1897571, MEX. 0074814, MLS. 0014969, NIG. 0001617, NOR. 0124476, NZL. 0134238, PRU. 0008375, PTG. 0040583, SAF. 0063737, SBH. 0005169, SGP. 0008069, SHL. 0000016, SLN. 1677286, SPN. 0286059, SRK. 0000387, STZ. 0425469, SWD. 0323285, UGD. 0000169, URG. 0007713, VZL. 0017049.
3,131,617.—XEROGRAPHIC REPRODUCING APPARATUS. MAY 5, 1964.
3,135,179.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,135,180.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,139,013.—DOCUMENT REPRODUCING APPARATUS. JUNE 30, 1964. CAN. 0727819, FRA. 1346596, GRB. 1016265, JAP. 0442652.
3,146,688.—XEROGRAPHIC MACHINE. SEPT. 1, 1964. ATR. 0249503, AUS. 0272158, BEL. 0616948, CAN. 0712269, FRA. 1324504, GER. 1295372, GRB. 1009867, JAP. 0464921.
3,182,573.—MASKED PLATE XEROGRAPHY. MAY 11, 1965. CAN. 0859657, FRA. 1353685, GRB. 1021882, ITL. 0694073, JAP. 0470242.
3,205,484.—ELECTROSTATIC MEMORY SYSTEM. SEPT. 7, 1965.
3,355,983.—CARD HANDLING MECHANISM. DEC. 5, 1967. CAN. 0814086, MEX. 0113373.
3,514,201.—RECORDING APPARATUS. MAY 26, 1970. CAN. 0880484.
3,520,602.—GRAPHIC DISPLAY DEVICE. JULY 14, 1970. CAN. 0838312.
3,536,395.—TRANSACTION RECORDING APPARATUS AND SYSTEM. OCT. 27, 1970. CAN. 0870184, GRB. 1213825.
3,580,671.—EXPOSURE APPARATUS. MAY 25, 1971. CAN. 0912104, GRB. 1276010.
3,677,633.—PORTABLE DOCUMENT ABSTRACTOR. JULY 18, 1972.
3,770,430.—PHOTOELECTROSCLOGRAPHIC IMAGING PROCESS. NOV. 6, 1973.
3,865,482.—ELECTROSTATOGRAPHIC COPYING MACHINE. FEB. 11, 1975.
3,917,396.—CONTROL SYSTEM. NOV. 4, 1975.
3,955,977.—ELECTROSTATOGRAPHIC PROCESS. MAY 11, 1976.
3,976,374.—ELIMINATION OF REDUNDANT IMAGE. AUG. 24, 1976. GRB. 1419725.
3,977,780.—ELECTROSTATIC REPRODUCTION METHOD AND APPARATUS. AUG. 31, 1976.
RE29,514.—PROGRAMMING CONTROL SYSTEM FOR PRINTING MACHINE. JAN. 10, 1978.
4,046,472.—ELECTROSTATIC IMAGING APPARATUS. SEPT. 6, 1977.
4,054,380.—CONTROL SYSTEM FOR HIGH SPEED COPIER/DUPLICATORS. OCT. 18, 1977. GRB. 1491911.
4,093,367.—IMAGING APPARATUS. JUNE 6, 1978.
4,103,995.—IMAGING APPARATUS. AUG. 1, 1978.
4,122,996.—COPY REPRODUCTION MACHINE WITH CONTROLLER SELF CHECK SYSTEM. OCT. 31, 1978.
4,124,287.—IMAGING SYSTEM UTILIZING UNCHARGED MARKING PARTICLES. NOV. 7, 1978.
4,125,325.—AUTOMATIC DUPLEX CONTROL SYSTEM FOR A REPRODUCTION MACHINE. NOV. 14, 1978. BEL. 870043.
4,130,354.—REPRODUCTION MACHINE HAVING DUPLEX JOB RECOVERY CAPABILITIES. DEC. 19, 1978. BEL. 870038.
4,149,487.—XEROGRAPHIC MACHINE WITH INFINITELY VARIABLE DEVELOPER BIAS. APR. 17, 1979.
4,153,241.—DOUBLE DOCUMENT FEED DETECTION FOR A DOCUMENT HANDLER IN A REPRODUCTION MACHINE. MAY 8, 1979. BEL. 870041.
4,156,133.—REPRODUCTION MACHINE WITH PAPER PATH DETECTION DIAGNOSTICS. MAY 22, 1979. BEL. 870040.
4,158,886.—OPERATOR CONSOLE FOR A REPRODUCTION MACHINE. JUNE 19, 1979. BEL. 870041.
4,161,277.—IMPROPER COPY RUN PROGRAM ENTRY CHECK FOR ELECTROSTATIC TYPE REPRODUCTION OR COPYING MACHINE. JULY 17, 1979.
4,162,844.—REPRODUCTION MACHINE WITH DUPLEX IMAGE SHIFT. JULY 31, 1979. BEL. 870037.
4,165,170.—CONTROL SYSTEM. AUG. 21, 1979.
4,181,429.—SAMPLE COPY SYSTEM FOR XEROGRAPHIC REPRODUCTION MACHINE. JAN. 1, 1980.
4,186,299.—REPRODUCTION MACHINE WITH DIFFERENT OPERATING PROGRAMS. JAN. 29, 1980. BEL. 870041.
4,196,476.—REPRODUCTION MACHINE WITH SELECTIVELY DISCLOSABLE PROGRAMS. APR. 1, 1980. BEL. 870039.
4,198,680.—CONTROL SYSTEM FOR ELECTROSTATIC TYPE COPY REPRODUCING MACHINES. APR. 15, 1980.
4,204,670.—SORTER FOR A REPRODUCTION MACHINE. MAY 27, 1980. BEL. 870044.
4,206,995.—REPRODUCTION MACHINE WITH ON BOARD DOCUMENT HANDLER DIAGNOSTICS. JUNE 10, 1980. BEL. 870041.

Class 1J 1A

4,183,089.—DATA COMMUNICATIONS SYSTEM. JAN. 8, 1980.
4,190,350.—DISTRIBUTED MICROPROCESSOR CONTROL SYSTEM FOR A COPIER/DUPLICATOR. FEB. 26, 1980.

Class 1J 2

3,185,051.—XEROGRAPHIC METHOD. MAY 25, 1965. CAN. 0740113, FRA. 1385444, GRB. 1026557, ITL. 0712017.
3,237,197.—IMAGE METHOD FOR ELECTROSTATIC RETENTION IN PHOTOCONDUCTIVE LAYERS. FEB. 22, 1966.

Class 1J 3

3,105,426.—XEROGRAPHIC APPARATUS. OCT. 1, 1963. CAN. 0689214, FRA. 1290414, GER. 1297476, GRB. 0989487, JAP. 0626117.
3,132,206.—HIGH SPEED PRINTING APPARATUS. MAY 5, 1964. GRB. 0999043.
3,649,114.—MULTIPLE OUTPUT ELECTROSTATIC RECORDING SYSTEM. MAR. 14, 1972. ARG. 0200567, AUS. 0447901, CAN. 0923542, NZL. 0160104.

Class 1J 4

3,148,601.—XEROGRAPHIC REPRODUCING APPARATUS. SEPT. 15, 1964.
3,187,651.—XEROGRAPHIC REPRODUCING APPARATUS. JUNE 8, 1965. FRA. 1338861, GER. 1797533, GRB. 1015633, HGK. 0013368, JAP. 0441423, KEN. 0167368.
3,196,767.—DOCUMENT COPY MECHANISM. JULY 27, 1965. CAN. 0731929, GRB. 1032953, JAP. 0651995.
3,399,610.—XEROGRAPHIC APPARATUS. SEPT. 3, 1968. CAN. 0819923.
3,788,203.—JUSTIFICATION APPARATUS. JAN. 29, 1974. CAN. 0989929, GRB. 1380831.
3,982,831.—ELECTROSTATOGRAPHIC REPRODUCTION APP & DRIVE THEREFOR. SEPT. 28, 1976.
4,002,409.—CHAIN-FEED CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. JAN. 11, 1977. BEL. 0840300.
4,027,963.—MULTI-MODE REPRODUCING APPARATUS. JUNE 7, 1977. BEL. 0843154, HAT. 0001534.

4,053,221.—MULTI-MODE REPRODUCING APPARATUS. OCT. 11, 1977.

Class 1J 5

3,160,057.—XEROGRAPHIC PROCESSING APPARATUS. DEC. 8, 1964.
3,272,101.—XEROGRAPHIC APPARATUS. SEPT. 13, 1966.
3,520,605.—DOCUMENT SCAN DRIVE AND RETURN APPARATUS. JULY 14, 1970. CAN. 0858848.
3,697,160.—CONTINUOUS IMAGING APPARATUS. OCT. 10, 1972.

Class 1J 6

RE.27,776.—ROLLER ASSEMBLY FR BELT-TYPE PHOTORECEPTR IN ELECTROSTATC PRNTNG MACHINES—RE OF D1480—3,536. OCT. 9, 1973.
3,190,199.—XEROGRAPHIC COPYING APPARATUS. JUNE 22, 1965. CAN. 0709970, GRB. 1033834, JAP. 0477813.
3,435,693.—BELT TRACKING DEVICE. APR. 1, 1969. ARG. 0168295, ATR. 0283116, AUS. 0421893, BEL. 0705641, CAN. 0853440, CHL. 0023084, CLB. 0017528, DNK. 0117047, FRA. 1543079, GRB. 1180659, ITL. 0827782, MEX. 0100320, NOR. 0124530, PRU. 0009336, SAF. 0676414, SPN. 0346430, STZ. 0471736, URG. 0009729, VZL. 0023676.
3,536,323.—BELT ASSEMBLY—REISSUED D3492—27,776. OCT. 27, 1970. ARG. 0181307, AUS. 0437364, BEL. 0733405, BRA. 6909127, CAN. 0943179, FRA. 6917082, GRB. 1275135, HUN. 0157763, ITL. 0869475, JAP. 0700616, MEX. 0112302, PNM. 0001817, SPN. 0367615, STZ. 0506819, TIW. 0UM5646, USR. 0406385, VZL. 0025831.
3,661,452.—XEROGRAPHIC REPRODUCTION MACHINE. MAY 9, 1972. ARG. 0169621, AUS. 0442749, BEL. 0733407, CAN. 0910959, CHL. 0024800, DNK. 0125257, FRA. 6917084, GRB. 1264406, ITL. 0877771, MEX. 0115542, PNM. 0001759, PRU. 0010640, SPN. 0367613, STZ. 0491418, TIW. 0006498, USR. 0358875, VZL. 0026279.
3,664,204.—BELT ASSEMBLY FOR USE IN AN ELECTROSTATIC PRINTING MACHINE. MAY 23, 1972. ARG. 0193980, BEL. 0777322, CAN. 0939735, FRA. 7147893, GRB. 1372389, ITL. 0944437, MEX. 0128274, VZL. 0032791.
3,730,623.—VACUUM HOLDDOWN DEVICE FOR MOVING BELTS. MAY 1, 1973. ARG. 0191239, BEL. 0777323, CAN. 0940591, FRA. 7147894, GRB. 1372390, ITL. 0944436, MEX. 0127634.
3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,790,271.—PROCESSING CONTROL SYSTEM FOR PRINTING MACHINES. FEB. 5, 1974. CAN. 0986173, SPN. 0418256.
3,801,092.—VACUUM HOLD-DOWN DEVICE FOR MOVING BELTS. APR. 2, 1974. ARG. 0191239, BEL. 0777323, CAN. 0940591, FRA. 7147894, GRB. 1372390, ITL. 0944436, MEX. 0127634.
3,860,340.—OPTICAL ALIGNMENT ON VACUUM PLENUM. JAN. 14, 1975. BEL. 0784630, FRA. 7220686, GRB. 1379674, ITL. 0956164.
3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.
3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.
3,921,179.—FLUID PEN ASSEMBLY. NOV. 18, 1975.
3,961,849.—ELECTROSTATIC PRINTING MACHINE. JUNE 8, 1976. ARG. 0200108, ATR. 0323556, AUS. 0458405, BEL. 0776599, CAN. 0948274, FRA. 7145342, GRB. 1374799, ITL. 0943875, MEX. 0127493, PNM. 0718307, SAF. 0718307, SPN. 0397851, STZ. 0554009, SWD. 7115731, VZL. 0032936.
4,094,606.—XEROGRAPHIC SYSTEM EMPLOYING WAVEGUIDE ADDRESSING AND MODULATING APPARATUS. JUNE 13, 1978.

Class 1J 7

3,099,944.—XEROGRAPHIC CONTROL APPARATUS. AUG. 6, 1963. CAN. 0738131, IND. 0096308, JAP. 0491992.
3,512,885.—ACCOUNTING DEVICE FOR XEROGRAPHIC REPRODUCING APPARATUS. MAY 19, 1970. ARG. 0152214, ATR. 0285324, AUS. 0409894, BEL. 0670170, BRA. 0086686, CAN. 0763624, CHL. 0022095, CLB. 0015661, COS. 0001881, DNK. 0125559, ECD. 0000019, EGR. 0050203, EIR. 0029756, ELS. 0000939, FRA. 1459931, GER. 1522804, GRB. 1122622, GRK. 0030861, GUA. 0001741, HOL. 0146300, IND. 0096570, ISR. 0024363, ITL. 0729658, JAP. 0513607, LXB. 0049537, MEX. 0079047, NOR. 0124392, NZL. 0142991, PAK. 0116058, PLP. 0005074, PNM. 0002079, PRU. 0008106, PTG. 0044651, SAF. 0655276, SPN. 0318011, STZ. 0438031, SWD. 0358037, TRK. 0013473, UAR. 0007497, URG. 0006622, VZL. 0023997.
3,588,472.—LOGIC CONTROL APPARATUS. JUNE 28, 1971. ARG. 0181590. ATR. 0279353, BEL. 0706629, BRA. 6793350, CAN. 0834957, FRA. 1567082, GRB. 1204719, ITL. 0815466, JAP. 0645591, LXB. 0054882, MEX. 0101675, VZL. 0023684.
3,734,610.—MICROFICHE VIEWER-COPIER WITH BILLING DATA STORAGE. MAY 22, 1973.
3,813,157.—CONTROL LOGIC FOR TROUBLE DETECTION AND RECOVERY. MAY 28, 1974.

Class 1J 8

3,301,152.—XEROGRAPHIC COPYING APPARATUS. JAN. 31, 1967.
3,348,521.—AUTOMATIC TONER CONTROL SYSTEM. OCT. 24, 1967. CAN. 0799398.
3,453,045.—XEROGRAPHIC DEVELOPMENT APPARATUS. JULY 1, 1969. CAN. 0852125. FRA. 1559973, GRB. 1213493, HUN. 0156188, ITL. 0832847, JAP. 0602169, USR. 0371739.
3,542,466.—DEVELOPMENT APPARATUS. NOV. 24, 1970. AUS. 0428620, BEL. 0725611, CAN. 0884213, FRA. 1598505, GRB. 1203167, ITL. 0870661, JAP. 0641479, SPN. 0361653, SWD. 0343694.
3,695,224.—CASCADE DEVELOPMENT. OCT. 3, 1972.
3,816,756.—AUTOMATIC BIAS CONTROL. JUNE 11, 1974.
3,851,966.—REPRODUCTION APPARATUS. DEC. 3, 1974. BEL. 808482.
3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT BEL. 0819537, GRB. 1429518.

Class 1K

T.940,022.—PRESSURIZED AND FILTERED XEROGRAPHIC SYSTEM. NOV. 4, 1975.
3,638,110.—DEVC FOR MEASRNG CHRG ON MATRIAL BY CONVRTNG INTO ELCTRCL SGNLS FRICTNL FORCS CAUSD BY CHARGE. JAN. 25, 1972. AUS 0161306, BEL. 0746479, FRA. 7007991, GRB 1280803, HUN. 0161306, ITL. 0892329, JAP. 0681943, PLD. 0069581, SPN. 0376910, STZ. 0519185, SWD. 0364418, USR. 0412696.
3,661,453.—ELECTROSTATIC LABEL PRINTER. MAY 9, 1972. CAN. 0927471, FRA. 7122950. GRB. 1345800, ITL 0927543.
3,893,175.—RECORDER FOR MONITORING COPIERS JULY 1, 1975. GRB. 1427292.
4,007,326.—ELECTRONIC COPY ANALYSIS. FEB. 8, 1977.
4,016,310.—COATR HRDWR & METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO MAY 17, 1977.
4,023,901.—REPRODUCTION MACHINE SERVICE CONTROL. MAY 17, 1977.
4,025,188.—PHOTOACTIVE DEVICE FOR XEROGRAPHY. MAY 24, 1977.
4,026,397.—CONTROL KNOB CLUTCHES WITH LOCK MAY 31, 1977.
4,134,137.—SINGLE WIRE MICROELECTROMETER IMAGING SYSTEM. JAN 9, 1979.

Class 1K 1

3,835,380.—ELECTROMETER SYSTEM. SEPT. 10, 1974.
3,852,668.—ELECTROMETER SYSTEM. DEC. 3, 1974.
3,887,845.—COPIER PHOTORECEPTOR CHARGE CONTROL. JUNE 3, 1975. GRB. 1465969.

3,891,316.—MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 24, 1975.
3,898,001.—ELCTROMETR SYSTM FOR NON-CNTCT DETCTN OF ELCTRSTATC CHRGE ON A MVNG ELCTRSTGRPHC IMAGNG SURFACE. AUG. 5, 1975.
3,909,126.—MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 30, 1975.
3,934,141.—APPARATUS FOR AUTOMATICALLY REGULATING THE AMOUNT OF CHARGE APPLIED TO AN INSULATING SURFACE. JAN. 20, 1976.
3,935,531.—ELECTROMETER WITH LOW VOLTAGE INDICATOR. JAN. 27, 1976.
3,935,532.—AUTOMATIC ZEROING ELECTROMETER. JAN. 27, 1976.
3,998,538.—ELECTROMETER APPARATUS FOR REPRODUCTION MACHINES. DEC. 21, 1976.
4,000,944.—PHOTORECEPTOR FOR ELECTROSTATIC REPRODUCTION MACHINES WITH BUILT IN ELECTRODE. JAN. 4, 1977.
4,003,650.—CONTROLLER FOR REPRODUCTION APPARATUS. JAN. 18, 1977.
4,100,484.—D.C. ELECTROMETER. JULY 11, 1978.
4,105,321.—ILLUMINATED CHARGE CONTROL SYSTEM FOR XEROGRAPHIC MACHINES. AUG. 8, 1978.
4,127,806.—SHIELDED ELECTROMETER WHOSE OUTPUT IS USED TO CONTROL WIDTH OF PULSES FED BACK TO THE SHIELD. NOV. 28, 1978.
4,139,813.—ADAPTOR FOR AN ELECTROMETER PROBE TO PERMIT CONTACT POTENTIAL MEASUREMENTS AND METHOD FOR USE. FEB. 13, 1979.
4,149,119.—COMBINED AC-DC ELECTROMETER WITH AC FEEDBACK FOR DRIFT COMPENSATION. APR. 10, 1979.

Class 1K 2

3,335,003.—REFLEX XEROGRAPHIC PROCESS. AUG. 8, 1967. CAN. 0764912, FRA. 1415836, GER. 1261398, GRB. 1059657, ITL. 0741353, JAP. 0511404.
3,337,339.—SCREEN XEROGRAPHY. AUG. 22, 1967. AUS. 0291558, BEL. 0638029, CAN. 0729824, DNK. 0114045, FRA. 1404424, GER. 0114045, GRB. 1027354, HOL. 0130250, ITL. 0706191, JAP. 0489562, LXB. 0044538, NOR. 0109228, SWD. 0321859.
3,676,118.—REFLEX XEROGRAPHY IMAGING SYSTEM. JULY 11, 1972.
4,063,154.—D.C. ELECTROMETER. DEC. 13, 1977.
4,063,155.—D.C. ELECTROMETER PROBE. DEC. 13, 1977.
4,106,869.—DISTANCE COMPENSATED ELECTROSTATIC VOLTMETER. AUG. 15, 1978.

Class 1K 3

3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.

Class 2

4,043,549.—IMPACT FEEDER AUG. 23, 1977.
4,059,353.—PHOTORECEPTOR BELT SYSTEM. NOV. 22, 1977.
4,192,989.—BLANKET HEATED PHOTORECEPTOR. MAR. 11, 1980.

Class 2A

3,856,461.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974.
3,856,462.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974. BEL. 0821050.
3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLF AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436.
3,883,921.—CLEANING ROLL APPARATUS HAVING REJUVENATED CLEANING SURFACE. MAY 20, 1975.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,984,183.—SHEET STRIPPING FROM IMAGING SURFACE. OCT. 5, 1976. BEL. 0836791.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
4,004,549.—ROLL FUSER. JAN. 25, 1977.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,027,138.—A FUSER RELEASE MATERIAL DISPENSER. MAY 31, 1977.
4,035,140.—FIXING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 12, 1977.
4,045,163.—HEATED FUSER RELEASE AGENT CONTAINER. AUG. 30, 1977.
4,060,105.—TONER LOADING APPARATUS WITH REPLENISHING SUPPLY CONTAINER. NOV. 29, 1977.
4,063,530.—IMAGE FIXING. DEC. 20, 1977.
4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.
4,078,924.—IMAGING SURFACE SMOOTHING WITH ROUGHENED FOIL NICKEL. MAR. 14, 1978.
4,172,721.—DYE-AMPLIFIED IMAGING PROCESS. OCT. 30, 1979. AUS. 494739, BEL. 822400, CAN. 1033041, FRA. 7438506, GER. 7438730, GRB. 1484706, ITL. 1025877, SPN. 432205, SWD. 74144650.

Class 2A 1

3,764,315.—AMBIPOLAR ELECTROPHOTOGRAPHIC PLATE. OCT. 9, 1973. BEL. 0802608, GRB. 1421948.
3,948,656.—IMPROVED METHOD FOR THE PREPARATION OF CDSSE. APR. 6, 1976.

Class 2A 1A

3,170,790.—RED SENSITIVE XEROGRAPHIC PLATE AND PROCESS THEREFOR. FEB. 23, 1965.
3,174,855.—METHOD FOR A PRODUCTION OF A XEROGRAPHIC PLATE. MAR. 23, 1965.
3,234,020.—PLATE FOR ELECTROSTATIC ELECTROPHOTOGRAPHY. FEB. 8, 1966.
3,460,296.—METAL WORKING. AUG. 12, 1969. BEL. 0705574, CAN. 0853918, GRB. 1196684.
3,488,896.—PROCESS OF PUMICING A SURFACE. JAN. 13, 1970.
3,489,560.—PHOTOCONDUCTIVE LAYR COMPRISN SELENIUM COMPOUND AND SOLID HYDROPHOBIC METL SALT OF A FATTY ACID. JAN. 13, 1970. BEL. 0711297, CAN. 0871632, FRA. 1544448, GRB. 1203237.
3,517,995.—METHOD & APPARATUS FOR INCREASING THE EFFICIENCY OF CORONA CHARGNG. JUNE 30, 1970. ARG. 0172471, BEL. 0721553, CAN. 0856714, FRA. 1585283, GRB. 1247034, ITL. 0844214, JAP. 0708414, MEX. 0103113, VZL. 0023701.
3,552,848.—XEROGRAPHIC PLATE. JAN. 5, 1971.
3,621,248.—METHOD USING XERORADIOGRAPHIC PLATE INSENSITIVE TO VISIBLE LIGHT. NOV. 16, 1971.
3,954,464.—METHOD OF FABRICATING A COMPOSITE TRIGONAL SELENIUM PHOTORECEPTOR. MAY 4, 1976.
3,961,953.—METHOD OF FABRICATING COMPOSITES TRIGONAL SELENIUM PHOTORECEPTORS. JUNE 8, 1976.
4,007,255.—PREPARATION OF RED AMORPHOUS SELENIUM. FEB. 8, 1977.
4,009,249.—PREPARATION OF RED AMORPHOUS SELENIUM. FEB. 22, 1977.
4,019,014.—METHOD FOR HEAT WELDING SELENIUM. APR. 19, 1977.

Class 2A 1B

3,312,548.—XEROGRAPHIC PLATES. APR. 4, 1967. BEL. 0691217, CAN. 0819658, FRA. 1505803, GRB. 1165579, JAP. 0650232.
3,467,548.—METHOD OF MAKING XEROGRAPHIC PLATE BY VACUUM EVAPORATION OF SELENIUM ALLOY. SEPT. 16, 1969.
3,490,903.—ALLOYS OF ANTIMONY AND SELENIUM USED IN PHOTOCONDUCTIVE ELEMENTS. JAN. 20, 1970. AUS. 0412949, CAN. 0871074, FRA. 1533536, GRB. 1185389, ITL. 0805955, JAP. 0626127, SWD. 0318193.
3,511,649.—PROCESS OF REDUCING FATIGUE IN PHOTOCONDUCTIVE GLASSES. MAY 12, 1970. GRB. 1193472, JAP. 0604152.
3,524,745.—PHOTOCONDUCTIVE ALLOY OF ARSENIC ANTIMONY AND SELENIUM. AUG. 18, 1970. ARG. 0164055, AUS. 0410443, BEL. 0709132, CAN. 0884810, CHL. 0024255, FRA. 1550902, GRB. 1209971, IND. 0113988, ITL. 0833508, JAP. 9124370, LXB. 0055231, MEX. 0108993, NOR. 0127943, NZL. 0151243, PRU. 0009904, PTG. 0048919, SAF. 0680228, SPN. 0349235, STZ. 0495573, SWD. 0328189, URG. 0009683.
3,615,413.—INDIUM DOPING OF A SE-AS PHOTOCONDUCTIVE ALLOYS. OCT. 26, 1971. CAN. 0917981, GRB. 1309312, JAP. 0739528.
3,655,377.—TRI-LAYERED SELENIUM DOPED PHOTORECEPTOR. APR. 11, 1972.
3,660,086.—ELCTRPHTGRPC PLATE AND PROCS EMPLYNG INORGNC PHOTCNDCTV MATRL W/PHOTOCHROMIC SENSITIVE AGENT. MAY 2, 1972.

3,685,989.—AMBIPOLAR PHOTORECEPTOR AND METHOD OF IMAGING. AUG. 22, 1972. CAN. 0971800, GRB. 1360078.
3,697,265.—VTRS SELNUM ALLY MTRX CNTNING ISLTD PRTCLS/PRTCL NETWKS OF RSN. OCT. 10, 1972. ARG. 0183560, ATR. 0299699, AUS. 0449439, BEL. 0752439, CAN. 0933014, EGR. 0090944, FRA. 7023472, GRB. 1319341, ITL. 0894623, MEX. 0116409, PNM. 0002559, SPN. 0409740, STZ. 0000000, SWD. 7216008, TIW. 0006838, USR. 0374867, VZL. 0031909.
3,879,199.—SURFACE TREATMENT OF ARSENIC-SELENIUM PHOTOCONDUCTORS. APR. 22, 1975.
3,884,688.—PHOTOSENSITIVE ELEMENT EMPLOYING A VITREOUS BISMUTH-SELENIUM FILM. MAY 20, 1975.
3,887,368.—COMPOSITION. JUNE 3, 1975.
3,898,083.—HIGH SENSITIVITY VISIBLE INFRARED PHOTOCONDUCTOR. AUG. 5, 1975.
3,909,458.—PHOTOSENSITIVE VITREOUS LAYER COMPRISING BISMUTH AND SELENIUM. SEPT. 30, 1975.
4,015,029.—SELENIUM & SELENIUM ALLOY EVAPORATION TECHNIQUE. MAR. 29, 1977.
4,126,457.—EVAPORATION TECHNIQUE FOR PRODUCING TEMPERATURE PHOTORECEPTOR ALLOYS. NOV. 21, 1978. CAN. 1046864.

Class 2A 1C

3,140,174.—PROCESS FOR OVERCOATING A XEROGRAPHIC PLATE. JULY. 7, 1964. FRA. 1260498, GRB. 0960871.
3,379,527.—PHOTOCONDUCTIVE INSULATORS COMPRISING ACTIVATED SULFIDES SELENIDES AND SULFOSELENIDES OF CADMIUM. APR. 23, 1968. CAN. 0907921, GRB. 1079065.
3,682,631.—METHOD OF FORMING AN ELECTROPHOTOGRAPHIC LAYER CONTAINING A BENZOQUANAMINE RESIN BINDER. AUG. 8, 1972.
3,867,145.—METHANOL AND HEAT TREATED ZINC OXIDE. FEB. 18, 1975.
3,971,742.—ORGANO-CHALCOGEN COMPOSITIONS. JULY 27, 1976.

Class 2A 1D

3,469,978.—PHOTOSENSITIVE ELEMENT. SEPT. 30, 1969. CAN. 0872173, GRB. 1171909, JAP. 0552967.
3,522,040.—PHOTOSENSITIVE INSULATING MATERIAL. JULY 28, 1970. CAN. 0884808, GRB. 1171910, JAP. 0552966.
3,627,573.—COMPOSITION AND METHOD. DEC. 14, 1971. ARG. 0176480, AUS. 0441224, BEL. 0721965. CAN. 0892493, FRA. 0095985, GRB. 1251630, ITL. 0889828, MEX. 0124897, SPN. 0358960, STZ. 0517359, VZL. 0030358.

Class 2A 1E

3,238,150.—PHOTOCONDUCTIVE CADMIUM SULFIDE POWDER AND METHOD FOR THE PREPARATION THEREOF. MAR. 1, 1966. CAN. 0712516, GRB. 1062022, JAP. 0486530.
3,879,200.—NOVEL XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING BIX-BENZIMIDAZOLE PIGMENTS. APR. 22, 1975. ARG. 0188392, AUS. 0465970, BEL. 0763545, BRA. 0088118, CAN. 0928125, CHL. 0027130, EGR. 0093279, FRA. 7107565, GRB. 1337222, ITL. 0919105, MEX. 0122169, PNM. 0002460, SAF. 0711225, SPN. 0388590, TIW. 0008178, USR. 0449515.
3,909,261.—XEROGRAPHIC IMAGING MEMBER HAVING PHOTOCONDUCTIVE MATERIAL IN INTERLOCKING CONTINUOUS PATHS. SEPT. 30, 1975. ARG. 0186443, ATR. 0451252, BEL. 0763544, CAN. 0925741, CHL. 0026794, FRA. 7107567, GRB. 1296291, ITL. 0918909, MEX. 0122096, NZL. 0162891, PLP. 0009378, PNM. 0002396, SAF. 0711227, SPN. 0388639, STZ. 0568591, SWD. 0367259, TIW. 0007844, USR. 0398062.

Class 2A 1F

3,394,001.—ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL CONTAINING ELECTRON-DONOR DYE LAYERS. JULY 23, 1968. GRB. 1106562.
3,498,835.—METHOD FOR MAKING XEROGRAPHIC PLATES. MAR. 3, 1970. ARG. 0154134, AUS. 0418468, BEL. 0700454, CAN. 0872174, FRA. 1529285, GRB. 1189504, ITL. 0807717, JAP. 0567234, MEX. 0096199, SPN. 0342303, STZ. 0479093, SWD. 0332346, VZL. 0024014.
3,532,496.—XRGRPHC PLTS AND PROCS EMPLYNG HMGNUS DISPRSNS OF VTREOUS SLNIUM AND SNSTZNG DYES AS PHTCNDCTV LAYER. OCT. 6, 1970.

Class 2A 1G

3,288,603.—METHOD OF RESTORING XEROGRAPHIC PROPERTIES TO A GLASS BINDER PLATE. NOV. 29, 1966. CAN. 0800955, FRA. 1432127, GER. 1497201, GRB. 1088473, ITL. 0802168, JAP. 0519677.
3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.
3,451,846.—PROCESS OF MAKING XEROGRAPHIC PLATE. JUNE 24, 1969. CAN. 0818384, GRB. 1183961, JAP. 0598621.
3,510,298.—PROCESS OF ACTIVATING PHOTOCONDUCTIVE MATERIAL IN GLASS BINDER. MAY 5, 1970. CAN. 0834668, GER. 1572366, GRB. 1189822, JAP. 0552968.
3,537,848.—PROCESS OF TREATING A XEROGRAPHIC GLASS BINDER PLATE AND PRODUCT. NOV. 3, 1970. ARG. 0180580.
3,655,376.—ELECTROPHOTOGRAPHIC DENITRIFIED GLASS BINDER PLATE. APR. 11, 1972.
3,885,962.—PHOTOGRAPHIC AND ELECTROPHOTOGRAPHIC MEMBERS WITH GLASS FIBER CONTAINING PAPER SUBSTRATES. MAY 27, 1975.

Class 2A 2

3,657,272.—PROCESS FOR PREPARING X-FORM METAL FREE PHTHALOCYANINE. APR. 18, 1972.
3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,770,428.—ORGANIC PHOTOCONDUCTIVE MATERIAL. NOV. 6, 1973.
3,864,144.—PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS. FEB. 4, 1975. GRB. 1414158, TIW. 0008534.
3,870,516.—METHOD OF IMAGING PHOTOCONDUCTOR IN CHARGE TRANSPORT BINDER. MAR. 11, 1975. AUS. 0466028, BEL. 0763541, CAN. 0931413, CHL. 0026797, EGR. 0094762, FRA. 7107559, GRB. 1343671, ITL. 0919108, MEX. 0122098, NZL. 0162883, PNM. 0002450, SAF. 0711219, SPN. 0388584, STZ. 0567744.
3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436.
3,879,198.—ELECTROPHOTOGRAPHIC AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. APR. 22, 1975.
3,882,087.—ORGANIC PHOTOCONDUCTIVE MATERIAL. MAY 6, 1975.
3,903,107.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL CONTAINING PHTHALOCYANINE. SEPT. 2, 1975. BEL. 0815632, SAF. 0743536.
3,915,702.—PHTOELCTRC & ELCTRPHTGRPHC PGMNTS COMPRISING DERIVATIVES OF CONDENSED PLYCYLC ARMATC HYDRCABN A. OCT. 28, 1975.
3,915,704.—PHOTOINDUCED ACID CATALYZED DEGRADATION OF DEGRADABLE POLYMERS. OCT 28, 1975.
3,917,483.—PHOTOINDUCED ACID CATALTZED DEPOLYMERIZATION OF DEGRADABLE POLYMERS. NOV. 4, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
3,926,629.—ELECTROPHOTOGRAPHIC METHOD AND PLATE EMPLOYING A PHTHALOCYANINE POLYMER. DEC. 16, 1975.
3,932,180.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE. JAN 13, 1976. BEL. 0815632, SAF. 0743536.
3,943,108.—PHOTOCONDUCTIVE COMPOSITION OF AN ALDEHYDE CONDENSATE. MAR. 9, 1976.
3,954,906.—AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. MAY 4, 1976.
3,970,602.—COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF. JULY 20, 1976. BEL. 0812436.
3,978,029.—PHOTOCONDUCTIVE COMPOSITIONS AND IMAGING MEMBERS AND METHODS EMPLOYING SAME. AUG. 31, 1976. ARG. 0206212, BEL. 0816552, FRA. 7422479, SAF. 0744129.

3,981,848.—PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHODS EMPLOYING SAME. SEPT. 21, 1976. ARG. 0206211, ATR. 0332734, FRA. 7422484.
4,043,812.—A PROCESS FOR PREPARATION OF 2-ANTHRYL & SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND POLY. AUG. 23, 1977. BEL. 822305, FRA. 7527053, STZ. 32598.
4,089,684.—IMAGING METHOD UTILIZING THE CHEMICAL REACTIVITY OF DONOR-ACCEPTOR MIXTURES. MAY 16, 1978.
4,117,239.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS & POLYMERS. SEPT. 26, 1978. BEL. 822305.
4,197,242.—POTASSIUM PHTHALOCYANINE COMPLEXES, METHOD OF PREPARATION, AND PHTHALOCYANINE PURIFICATION PROCESSES. APR. 8, 1980.

Class 2A 2A

3,408,181.—HEAT DEFORMABLE RECORDING MATERIALS CONTAINING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLE. OCT. 29, 1968. CAN. 0843620, FRA. 1463744, GER. 1522677, GRB. 1138552, ITL. 0755286, MEX. 0109927.
3,432,415.—ELECTROPHORETIC IMG. PROCESS USING PHOTOSENSITIVE XANTHENONIUM SALTS. MAR. 11, 1969. AUS. 0439502, BEL. 0743895, CAN. 0851118, GER. 1522701, GRB. 1155747, JAP. 0650631, MEX. 0104632.
3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.
3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.
3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPTHO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.
3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.
3,482,970.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS USING NAPHTHYLAZO COMPOUNDS AS THE PRIMARY PHOTOCONDUCTOR. DEC. 9, 1969. AUS. 0453397, BEL. 0742978, CAN. 0869486, GRB. 1296390, ITL. 0878843, JAP. 0725059.
3,553,009.—PROCESS OF PREPARING AN ELECTROPHOTOGRAPHIC MATERIAL. JAN. 5, 1971.
3,594,163.—METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X FORM. JULY 20, 1971.
3,640,710.—PHTHALOCYANINE PHOTOCONDUCTIVE ELEMENTS CONTAINING MULTIPLE BINDER MATERIALS. FEB. 8, 1972. ARG. 0184666, ATR. 0328861, AUS. 0456430, BEL. 0760751, CAN. 0933012, FRA. 7047636, GRB. 1333605, ITL. 0913999, PNM. 0002243, STZ. 0554550, SWD. 0365878, TIW. 0006738, USR. 0450420, VZL. 0032928.
3,667,943.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972. ARG. 0184823, AUS. 0452663, BEL. 0737810, CAN. 0877882, EGR. 0077411, FRA. 6928700, GRB. 1278702, ITL. 0888005, SPN. 0370720, STZ. 0519183, SWD. 0346396, TIW. 0005517, USR. 0351396.
3,667,944.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC RECORDING. JUNE 6, 1972. ARG. 0177369, AUS. 0452031, BEL. 0741159, CAN. 0884807, FRA. 6937223, GRB. 1286079, ITL. 0879710, JAP. 0693421, MEX. 0115407.
3,667,945.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972.
3,708,292.—PI-FORM METAL PHTHALOCYANINE. JAN. 2, 1973. ARG. 0194234, BEL. 0783793, GRB. 1396922, ITL. 0955644, MEX. 0128928.
3,708,293.—PI-FORM METAL-FREE PHTHALOCYANINE. JAN. 2, 1973. ARG. 0195167, BEL. 0783792, GRB. 1395769, ITL. 0955643, MEX. 0131970.
3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973.
3,816,118.—ELECTROPHOTOGRAPHIC ELEMENT CONTAINING PHTHALOCYANINE. JUNE 11, 1974. ARG. 0156316, CAN. 0890855, FRA. 0091579, GRB. 1175451, ITL. 0809972, MEX. 0115884, VZL. 0024012.
3,850,630.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING INDIGOLD PIGMENTS. NOV. 26, 1974. ARG. 0188393, AUS. 0465971, BEL. 0763391, CAN. 0932198, CHL. 0027129, EGR. 0093923, FRA. 7107566, GRB. 1337221, ITL. 0919106, MEX. 0122099, NZL. 0162890, PNM. 0002480, SAF. 0711226, SPN. 0388591, TIW. 0006740, USR. 0463276.
3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515.
3,877,935.—NOVEL XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING POLYNUCLEAR QUINONE PIGMENTS. APR. 15, 1975. ARG. 0002614, AUS. 0452620, BEL. 0763389, CAN. 0932197, CHL. 0027120, FRA. 7107563, GRB. 1337224, GUA. 0002614, ITL. 0919103, MEX. 0122100, NZL. 0162887, PNM. 0002467, SAF. 0711223, SPN. 0388588, TIW. 0006741.
3,884,689.—POLYCYCLIC AROMATIC POLYMER AS A PHOTO-CONDUCTOR OR OVERLAYER. MAY 20, 1975.
3,895,945.—PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION. JULY 22, 1975.
3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975.
3,899,329.—MIXTURE OF PHOTOCONDUCTORS IN AN ACTIVE MATRIX. AUG. 12, 1975. ARG. 0187047, ATR. 327000, AUS. 0450862, BEL. 0775968, CAN. 0971797, CHL. 0027272, FRA. 7143179, GRB. 1348138, GUA. 0002724, ITL. 0941822, MEX. 1328040, PNM. 0002602, SAF. 0718022, SPN. 397403, STZ. 0026771.
3,904,407.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING PERYLENE PIGMENTS. SEPT. 9, 1975. ARG. 0189747, AUS. 0465811, BEL. 0763388, CAN. 0933010, CHL. 0026796, EGR. 0093458, FRA. 7107562, GRB. 1337225, GUA. 0002799, ITL. 0919102, MEX. 0126620, PNM. 0002468, SAF. 0711222, SPN. 0388587, SWD. 0362509, TIW. 0007210, USR. 0473381.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
3,927,026.—PROCESS OF MAKING X-FORM METAL PHTHALOCYANINE. DEC. 16, 1975. CAN. 0916703, GRB. 1312946, JAP. 0693981.
3,932,454.—PROCESS OF MAKING HEXAGONAL ALPHA METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. CAN. 0918152, GRB. 1327084, JAP. 0752724.
3,941,085.—RELEASE MATERIAL APPLICATOR. MAR. 2, 1976.
3,941,750.—POLYVINYL PYREMAL-AN INTRINSIC PHOTOCONDUCTOR AND ACTIVE MATRIX POLYMER. MAR. 2, 1976.
3,951,654.—MTHD ENHNCMT RATE AND EFFICIENCY OF PHOTODSCHG OF ELCTRPHGRIC IMAGING MEMBERS COMPRSNG PHTHALOCYA. APR. 20, 1976.
4,006,017.—PHOTOCONDUCTIVE COMPOSITION ARTICLE & PROESS. FEB. 1, 1977.
4,031,109.—METHOD FOR THE PREPARATION OF X-FORM METAL PHTHALOCYANINE AND X-FORM METAL FREE COMPOUNDS. JUNE 21, 1977. ARG. 0188048.
4,046,563.—PHOTOCONDUCTIVE COMPOSITION CONTAINING A TRICYANOPYREME, ARTICLE AND PROCESS OF USE. SEPT. 6, 1977. FRA. 7509147.
4,050,934.—ELECTRON ACCEPTOR MONOMERS & POLYMERS. SEPT. 27, 1977.
4,056,391.—METHOD FOR ENHANCING SOLID SOLUTION STABILITY OF ELECTRON ACCEPTOR MOLECULES AND ELECTROPHO. NOV. 1, 1977.
4,072,519.—PHOTOCONDUCTIVE COMPOSITION, AND ELEMENT. FEB. 7, 1978. FRA. 7509146.
4,076,528.—XEROGRAPHIC BINDER PLATE. FEB. 28, 1978. AUS. 456887, BEL. 775967, CAN. 971796, CHL. 27271, FRA. 7143178, GRB. 1358269, ITL. 941821, MEX. 124712, PNM. 2599, SAF. 718023, SPN. 397402, STZ. 26772.
4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978. AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.
4,098,795.—METHOD FOR THE PREPARATION OF X-FORM METAL FREE PHTHALOCYAMINE. JULY 4, 1978. ARG. 182328, BEL. 737989, CAN. 899870, FRA. 6928871, GER. 1943381, GRB. 1280843, ITL. 870314, JAP. 654041, MEX. 116011.
4,122,114.—1-TRICYANOINYLPYRENE. OCT. 24, 1978.
4,153,802.—ELECTRON ACCEPTOR MONOMERS AND POLYMERS. MAY 8, 1979. FRA. 7626102.
4,161,490.—ELECTRON ACCEPTOR MONOMERS. JULY 17, 1979. FRA. 7626102.

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3,408,182.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0847805, FRA. 1463743, GRB. 1137665, ITL. 0755290, JAP. 0572185, MEX. 0107318.
3,408,183.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0819066, FRA. 1463745, GER. 1522676, GRB. 1126048, ITL. 0755287, JAP. 0727091, MEX. 0106758.
3,408,184.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT. 29, 1968. CAN. 0818382, FRA. 1463727, GRB. 1137664, ITL. 0755289, JAP. 0726382, MEX. 0105835.
3,408,185.—ELECTROPHOTOGRAPHIC MATERIALS AND METHOD EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0848383, FRA. 1463728, GER. 1645192, GRB. 1137476, ITL. 0755291, MEX. 0106763.
3,408,186.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT. 29, 1968. CAN. 0846736, FRA. 1463746, GRB. 1138629, ITL. 0755288, JAP. 0569483, MEX. 0106589.
3,408,187.—ELECTROPHOTOGRAPHIC MATER AND METH EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0867298, GER. 1522721, GRB. 1163097, JAP. 0797719.
3,408,188.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS COMPRISING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0869485, GRB. 1183516, JAP. 0797720.
3,408,189.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968.
3,408,190.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0850019, GER. 1302772, GRB. 1182172.
3,879,201.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. APR. 22, 1975.
3,896,184.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. JULY 22, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
4,033,769.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. JULY 5, 1977.
4,069,046.—POLYMERIZED VINYL CARBAZOLES SENSITIZED BY NITRO-SUGSTITUTED 9-DICYANOMETHYLENE FLUORENES. JAN. 17, 1978.

Class 2A 2C

4,019,902.—PHOTORECEPTOR FABRICATION. APR. 26, 1977.

Class 2A2E

4,099,969.—COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS. JULY 11, 1978.

Class 2B

3,617,265.—METHOD FOR PREPARING A RESIN OVERCOATED ELECTROPHOTOGRAPHIC PLATE. NOV. 2, 1971.
3,635,705.—MULTI-LAYERED HALOGEN-DOPED SELENIUM PHOTOCONDUCTIVE ELEMENT. JAN. 18, 1972. GRB. 1311329, ITL. 0901916, JAP. 0739531.
3,639,120.—2-LAYERED PHOTOCONDUCTIVE ELEMNT CONTNG A HALOGEN DOPED STORG LAYER AND SELENIUM ALLOY CNTRL LAYER. FEB. 1, 1972. CAN. 0870535, GRB. 1193876, JAP. 0558440.
3,655,377.—TRI-LAYERED SELENIUM DOPED PHOTORECEPTOR. APR. 11, 1972.
3,712,810.—AMBIPOLAR PHOTORECEPTOR AND METHOD. JAN. 23, 1973. CAN. 0971025, GRB. 1363266.
3,843,407.—BLADE CLEANING WITH REVERSE MOVEMENT. OCT. 22, 1974.
3,848,994.—LINE CHARGE TONER CLEANING. NOV. 19, 1974.
3,928,034.—ELECTRON TRANSPORT LAYER OVER AN INORGANIC PHOTOCONDUCTIVE LAYER. DEC. 23, 1975. AUS. 0453265, BEL. 0763542, CAN. 0932199, CHL. 0026802, EGR. 0093924, FRA. 7107560, GRB. 1337227, GUA. 0002423, ITL. 0919109, MEX. 0121682, NZL. 0162884, PNM. 0002473, SAF. 0711220, SPN. 0388585, STZ. 0576659, SWD. 0363176, TIW.00 07181.
3,953,207.—A COMPOSITE LAYERED PHOTORECEPTOR. APR. 27, 1976.
4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.
4,007,100.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,007,101.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,012,251.—MULTI-LAYERED PHOTOCONDUCTIVE MEMBER. MAR. 15, 1977.
4,013,528.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATRIALS. MAR. 22, 1977.
4,013,529.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,530.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,623.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAR. 22, 1977.
4,014,768.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 29, 1977.
4,016,058.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. APR. 5, 1977.
4,018,602.—METHOD FOR IN-SITU FABRICATION OF PHOTOCONDUCTIVE COMPOSITE. APR. 19, 1977.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,025,710.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAY 24, 1977.
4,028,203.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 7, 1977.
4,030,991.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,992.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,993.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.
4,047,948.—COMPOSITE LAYERED IMAGING MEMBER FOR ELECTROPHOTOGRAPHY. SEPT. 13, 1977.
4,047,949.—COMPOSITE LAYERED IMAGING MEMBER FOR ELECTROPHOTOGRAPHY. SEPT. 13, 1977.
4,049,449.—METHOD FOR FORMING AN ELECTROPHOTOGRAPHIC MEMBER. SEPT. 20, 1977.
4,050,935.—TRIGONAL SE LAYER OVERCOATED BY BIS(4-DIETHYLAMINO-2-METHYLPHENYL) PHENYLMETANE CONTAINING. SEPT. 27, 1977. FRA. 7709994.
4,052,205.—PHOTOCONDUCTIVE IMAGING MEMBER WITH STUBSTITUTED ANTHRACENE PLASTICIZER. OCT. 4, 1977.
4,053,311.—POLY-L-VINYL CARBAZOLE IMAGE TRANSPORT LAYER PLASTICIZED OF BIS-(4-DIETHYLAMINO-2-METHYLPHE. OCT. 11, 1977.
4,062,886.—FLUORENONE CARBOXYLE ACID ESTERS DEC. 13, 1977. FRA. 7621895.
4,063,947.—PHOTOCONDUCTIVE INSULATING FILMS COMPRISING FLUORENONE-SUBSTITUTED OLIGOMERS. DEC. 20, 1977.
4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1977.
4,078,925.—A COMPOSITE LAYERED PHOTORECEPTOR. MAR. 14, 1978.
4,081,274.—COMPOSITE LAYERED PHOTORECEPTOR MAR. 28, 1978.
4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.
4,115,116.—IMAGING MEMBER HAVING A POLYCARBONATE-BIPHENYL DIAMINE CHARGE TRANSPORT LAYER. SEPT. 19, 1978.

4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.
4,117,072.—PROCESS FOR ENHANCEMENT OF MECHANICAL PROPERTIES OF PHOTOCONDUCTIVE POLYMERS. SEPT. 26, 1978. FRA. 7531736. GRB. 1469371.
4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.
4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.
4,140,529.—CHARGE TRANSPORT OVERLAYER IN PHOTOCONDUCTIVE ELEMENT AND METHOD OF USE. FEB. 20, 1979.
4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.
4,172,933.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS—PROCESS FOR PREPARATION AND USE. OCT. 30, 1979.

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3,243,293.—PLATE FOR ELECTROSTATIC ELECTROPHOTOGRAPHY. MAR. 29, 1966. CAN. 0830430.
3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.
3,312,547.—XEROGRAPHIC PLATE AND PROCESSES OF MAKING AND USING SAME. APR. 4, 1967.
3,341,326.—DARK DECAY CONTROLLED XEROGRAPHY. SEPT. 12, 1967. AUS. 0285843, CAN. 0729829, FRA. 1377592, GRB. 1029199, ITL. 0706101.
3,352,669.—PHOTOCONDUCTIVE MEMBER AND PROCESSES OF PREPARING AND USING SAME. NOV. 14, 1967. AUS. 0405164, CAN. 0834670, FRA. 1422625, GER. 1497194, GRB. 1052970, HOL. 0137891, ITL. 0749420, JAP. 0501912.
3,393,070.—XEROGRAPHIC PLATE WITH ELECTRIC FIELD REGULATING LAYER. JULY 16, 1968. CAN. 0871308, GER. 1490987, GRB. 1141452, JAP. 0764435, MEX. 0105660.
3,508,918.—XEROGRAPHIC PLATE CONTAINING ALUMINUM SELENIDE BARRIER LAYER. APR. 28, 1970. CAN. 0872175.
3,539,255.—XEROGRAPHIC RECORDING APPARATUS - LIGHT-CONTROLLED-CHARGE STORAGE LAYER. NOV. 10, 1970.
3,573,906.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. APR. 6, 1971. ARG. 0177890, AUS. 0441534, BEL. 0725173, BRA. 0088092, CAN. 0906801, CZC. 0157053, FRA. 1594981, GRB. 1217726, ITL. 0852743, SPN. 0379204, SWD. 0335063, USR. 0448658, VZL. 0029780.
3,619,153.—PHOTOCONDUCTIVE ELMNT AND PROCESS EMPLYNG SBSTUTD SILYLISOBUTYLETHYLENEDIAMINE ADHESIVE INTERLAYE. NOV. 9, 1971. ARG. 0180118, ATR. 0305764, AUS. 0434739, BEL. 0733402, BUL. 0017353, CAN. 0898034, DNK. 0131833, EGR. 0078900, FRA. 6917079, GRB. 1229559, GRK. 0040058, IND. 0121424, ISR. 0032250, ITL. 0864983, JAP. 0702563, LXB. 0058678, MEX. 0109385, NOR. 0125557, NZL. 0156506, PAK. 0121226, PLP. 0008481, PNM. 0001683, PTG. 0051754, RHD. 2236953, RMN. 0054256, SAF. 0693687, SPN. 0367618, STZ. 0511461, SWD. 0341926, TIW. 0006442, TRK. 0015647, USR. 0300036, VTM. 0001865.
3,713,821.—PHOTORECEPTOR INTERFACE. JAN. 30, 1973. ARG. 0194731, ATR. 0322357, AUS. 0464711, BEL. 0784453, CAN. 0964916, EGR. 0099870, FRA. 7220691, GRB. 1393612, ISR. 0039655, ITL. 0959793, SAF. 0723958, SPN. 0403454, STZ. 0554007, SWD. 0367491, VZL. 0032939.
3,720,514.—ELECTROPHOTOGRAPHIC PAPER HAVING AN IMONGANIC COLLOIDAL OXIDE COATING. MAR. 13, 1973.
3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,795,513.—METHOD OF STORING AN ELECTROSTATIC IMAGE IN A MULTILAYERED PHOTORECEPTOR. MAR. 5, 1974. BEL. 0788303, CAN. 976018, FRA. 7230831, GRB. 1388934, ITL. 0964410, SWD. 7211341.
3,799,775.—XEROGRAPHIC SYSTEM. MAR. 26, 1974. ARG. 0172053, ATR. 0300559, AUS. 0423123, BEL. 0720940, BRA. 6800650, BUR. 0000043, CAM. 00043/3, CAN. 0895805, CHL. 0024257, EIR. 0032903, FRA. 1586238, GNR. 0000039, GRB. 1243384, GRK. 0039223, IND. 0119625, ISR. 0031543, ITL. 0844307, LEB. 0002816, LIB. P102693, LXB. 0056890, MEX. 0105163, MLG. 0003058, MLW. 00MW569, MNC. 8126975, MRC. 0014727, NOR. 0128132, NZL. 0153781, PAK. 0120895, PLP. 0009065, PNM. 0002053, PTG. 0050322, RHD. 5369487, SAF. 0681107, SPN. 0358355, STZ. 0506102, SWD. 0345530, TGR. 0000547, URG. 0009361, VTM. 0001830, VZL. 0023696, ZMB. 0156971.
3,816,288.—GLOW DISCHARGE TECHNIQUE FOR THE PREPARATION OF ELECTROPHOTOGRAPHIC PLATES. JUNE 11, 1974.
3,888,667.—HETROPHASE ADHESIVE COMPOSITIONS CONTAINING POLYSULFONE FOR METAL-SELENIUM COMPOSITIES. JUNE 10, 1975.
3,891,435.—HETEROPHASE ADHESIVE COMPOSITIONS CONTAINING CHLOROSULFONATED POLYETHLENE FOR METAL-SELENIUM CO. JUNE 24, 1975.
3,895,131.—ELECTROLESS COATING METHOD. JULY 15, 1975.
3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.
3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.
3,958,207.—INJECTION CURRENT DEVICE AND METHOD. MAY 18, 1976.
4,011,078.—PHOTOSENSITIVE MEMBER AND METHOD OF IMAGING. MAR. 8, 1977.
4,106,935.—XEROGRAPHIC PLATE HAVING AN PHTHALOCYANINE PIGMENT INTERFACE BARRIER LAYER. AUG. 15, 1978.

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3,146,145.—PROCESS FOR ADHERING PLASTIC TO VITREOUS SELENIUM. AUG. 25, 1964.
3,256,089.—MASKED PLATE XEROGRAPHY. JUNE 14, 1966.
3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.
3,434,832.—XEROGRAPHIC PLATE COMPRISING A PROTECTIVE COATING OF A RESIN MIXED WITH A METALLIC STEARATE. MAR. 25, 1969. CAN. 0835883, FRA. 1454672, GER. 1497223, GRB. 1128156, ITL. 0772535, JAP. 0545757, MEX. 0085603.
3,488,189.—ELECTROPHOTOGRAPHIC RECORDING MEMBER HAVING SOLID CRYSTALLINE PLASTICIZR AVAILBL AT IMGNG SURFA. JAN. 6, 1970. CAN. 0866700, FRA. 1506810, GRB. 1183205, ITL. 0788976, JAP. 0570734, MEX. 0108241.
3,720,514.—ELECTROPHOTOGRAPHIC PAPER HAVING AN IMONGANIC COLLOIDAL OXIDE COATING. MAR. 13, 1973.
3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,837,849.—MULTILAYERED VARIABLE SPEED PHOTORECEPTOR AND METHOD OF USING SAME. SEPT. 24, 1974. BEL. 0788302, CAN. 0978007, FRA. 7230830, GRB. 1401040, ITL. 0964409, SWD. 7211342.
3,850,630.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING INDIGOLD PIGMENTS. NOV. 26, 1974. ARG. 0188393, AUS. 0465971, BEL. 0763391, CAN. 0932198, CHL. 0027129, EGR. 0093923, FRA. 7107566, GRB. 1337221, ITL. 0919106, MEX. 0122099, NZL. 0162890, PNM. 0002480, SAF. 0711226, SPN. 0388591, TIW. 0006740, USR. 0463276.
3,856,548.—STRIPPABLE OVERCOATING FOR IMPROVED XEROGRAPHIC PLATES. DEC. 24, 1974. GRB. 1426030.
3,860,421.—N-ALKYL MORPHOLINE TREATMENT OF A SELENIUM-CONTAINING PHOTOCONDUCTIVE LAYER. JAN. 14, 1975.
3,868,983.—HAND TOOL. MAR. 4, 1975.
3,877,935.—NOVEL XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING POLYNUCLEAR QUINONE PIGMENTS. APR. 15, 1975. ARG. 0002614, AUS. 0452620, BEL. 0763389, CAN. 0932197, CHL. 0027120, FRA. 7107563, GRB. 1337224, GUA. 0002614, ITL. 0919103, MEX. 0122100, NZL. 0162887, PNM. 0002467, SAF. 0711223, SPN. 0388588, TIW. 0006741.
3,884,690.—POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS. MAY 20, 1975.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,896,184.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. JULY 22, 1975.

3,900,589.—AN ELECTROSTATOGRAPHIC IMAGING PROCESS. AUG. 19, 1975. AUS. 0467835, BEL. 0802879, GRB. 1437041.
3,904,407.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING PERYLENE PIGMENTS. SEPT. 9, 1975. ARG. 0189747, AUS. 0465811, BEL. 0763388, CAN. 0933010, CHL. 0026796, EGR. 0093458, FRA. 7107562, GRB. 1337225, GUA. 0002799, ITL. 0919102, MEX. 0126620, PNM. 0002468, SAF. 0711222, SPN. 0388587, SWD. 0362509, TIW. 0007210, USR. 0473381.
3,912,511.—MULTICOMPONENT ORGANIC COATING OF POLYESTER POLYURETHAND AND HUMIDITY. OCT. 14, 1975. ARG. 0182692, BEL. 0767325, CAN. 0938143, FRA. 7118948, GRB. 1350476, ITL. 0926822, MEX. 0121668.
3,954,464.—METHOD OF FABRICATING A COMPOSITE TRIGONAL SELENIUM PHOTORECEPTOR. MAY 4, 1976.
3,961,953.—METHOD OF FABRICATING COMPOSITES TRIGONAL SELENIUM PHOTORECEPTORS. JUNE 8, 1976.
3,973,843.—ELECTROSTATOGRAPHIC IMAGING APPARATUS. AUG. 10, 1976. AUS. 0467835, BEL. 0802879, GRB. 1437041.
4,006,019.—METHOD FOR PREPARATION OF AN ELECTROSTATOGRAPHIC PHOTORECEPTOR. FEB. 1, 1977.
4,006,020.—OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR. FEB. 1, 1977.
4,012,255.—OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR. MAR. 15, 1977.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,064,514.—PORTABLE CAMERA. DEC. 20, 1977.
4,072,521.—AMIDES OF W AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT. FEB. 7, 1978.
4,073,649.—DI CARBOXYLIC ACID BIS AMIDES AND IMPROVED IMAGING PROCESS. FEB. 14, 1978.
4,076,641.—W- AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS. FEB. 28, 1978.
4,099,968.—DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES. JULY 11, 1978.
4,123,269.—ELECTROSTATOGRAPHIC PHOTOSENSITIVE DEVICE COMPRISING HOLE INJECTING AND HOLE TRANSPORT LAYER. OCT. 31, 1978.
4,126,455.—ELECTROSTATOGRAPHIC IMAGING PROCESS AND RELATED APPARATUS. NOV. 21, 1978. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.
4,147,541.—ELECTROSTATIC IMAGING MEMBER WITH ACID LUBRICANT. APR. 3, 1979. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.
4,181,772.—ADHESIVE GENERATOR OVERCOATED PHOTORECEPTORS. JAN. 1, 1980.

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3,510,660.—METHOD FOR VISUAL COMPARISON OF INFORMATION. MAY 5, 1970. CAN. 0848611, GRB. 1201376, JAP. 0595641.
3,543,031.—DEVICE AND PROCESS FOR IMAGE STORAGE. NOV. 24, 1970. ARG. 0161299, AUS. 0432468, BEL. 0703461, CAN. 0862332, FRA. 1543309, GER. 1549142, GRB. 1201374, ITL. 0811521, JAP. 0742514, MEX. 0100142, SPN. 0344004, STZ. 0497022, SWD. 0354169, VZL. 0023663.

Class 2B 4

3,428,453.—IMAGE FORMING PROCESS UTILIZING XEROGRAPHY-ETCHING PROCESS. FEB. 18, 1969. CAN. 0856722, FRA. 1428775, GRB. 1085151, ITL. 0754825.
3,446,616.—XEROGRAPHIC IMAGING EMPLOYING A SELECTIVELY REMOVABLE LAYER. MAY 27, 1969.
3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.
4,007,372.—IMPROVED METHOD & ARTICLE FOR IMAGE REPRODUCTION. FEB. 8, 1977.
4,011,078.—PHOTOSENSITIVE MEMBER AND METHOD OF IMAGING. MAR. 8, 1977.

Class 2C

3,307,941.—PLASTIC DEFORMATION IMAGING FILM AND PROCESS. MAR. 7, 1967. CAN. 0801262.
3,317,316.—INTERNAL FROST RECORDING. MAY 2, 1967. ATR. 0272830, AUS. 0292886, BEL. 0648043, CAN. 0882890, FRA. 1399017, GER. 1243018, GRB. 1069741, ITL. 0725002, JAP. 0521009, LXB. 0046101, NOR. 0122729, STZ. 0469292, SWD. 0319083.
3,408,181.—HEAT DEFORMABLE RECORDING MATERIALS CONTAINING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLE. OCT. 29, 1968. CAN. 0843620, FRA. 1463744, GER. 1522677, GRB 1138552, ITL. 0755286, MEX. 0109927.
3,443,937.—IMAGE RESOLUTION. MAY 13, 1969. CAN. 0824316, GRB. 1137766, JAP. 0544235.
3,443,938.—FROST IMAGING EMPLOYING A DEFORMABLE ELECTRODE. MAY 13, 1969. CAN. 0801263, FRA. 1441806, GRB. 1073097, JAP. 0573732.
3,526,879.—INTERNAL FROST RECORDING APPARATUS USING A DEFORMABLE PHOTOCONDUCTOR. SEPT. 1, 1970.
3,672,883.—CRYSTALLINE POLYMERS FOR FROST. JUNE 27, 1972.
3,672,886.—NOVOLAR RESINS IN DEFORMATION IMAGING. JUNE 27, 1972.
3,707,391.—IMAGING PROCESS. DEC. 26, 1972.
3,873,197.—APPARATUS FOR REGULATING THE TONER CONCENTRATION IN A ELECTROPHOTOGRAPHIC DEVICE. MAR. 25, 1975.
3,892,567.—ELECTROSTATICALLY DEFORMABLE MATERIALS. JULY 1, 1975. ARG. 0196065, BEL. 0781973, CAN. 9814520, FRA. 7213876, GRB. 1394286, ITL. 0951328, MEX. 0124825.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,980,476.—IMAGING SYSTEM. SEPT. 14, 1976.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,054,381.—TONER FILTER ARRANGEMENT. OCT. 18, 1977.
4,065,031.—PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM. DEC. 27, 1977.
4,093,369.—CLEANING SYSTEM. JUNE 6, 1978.

Class 2D

3,411,903.—XEROGRAPHIC METHOD AND PLATE COMPRISING PHOTOCONDUCTIVE INSULATING FIBERS. NOV. 19, 1968. ARG. 0149620, ATR. 0270379, AUS. 0410718, BEL. 0672668, BRA. 0084119, CAN. 0834669, CHL. 0023648, CLB. 0014943, DNK 0120577, EGR. 0055545, FRA. 1464792, GER. 1497224, GRB. 1084024, GRK. 0031509, IND. 0102560, ISR. 0024632, ITL. 0734376, JAP. 0724233, LXB. 0049849, MEX. 0098487, NOR. 0122817, NZL. 0143432, PLD. 0067959, PLP 0004547, PNM. 0001533, PRU. 0008384, PTG. 0044879, SAF. 0656280, SPN. 0319795, STZ. 0458076, SWD 0308250, THL. 1084024, TIW. 0003735, URG. 0006624, VZL. 0023996.
3,787,235.—METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER. JAN. 22, 1974.
3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.
4,045,413.—POSSIBLE ACTIVE MATRIX POLYMERS. AUG. 30, 1977. FRA. 7432710.
4,130,274.—PNEUMATIC REGISTRATION APPARATUS. DEC. 19, 1978. BEL. 847912. SAF. 6401.

Class 2E

3,341,681.—XEROGRAPHIC PLATE FABRICATION SEPT. 12, 1967. CAN. 0780598, FRA. 1415795, GRB 1070555, HOL. 0144068, IND. 0094992, ITL. 0738063.
3,350,203.—XEROGRAPHIC PLATE. OCT. 31, 1967. CAN 0715017, FRA. 1421950, GER. 1270400, GRB. 1085989, ITL. 0750417, JAP. 0511420.
3,447,957.—METHOD OF MAKING A SMOOTH SURFACED ADHESIVE BINDER XEROGRAPHIC PLATE. JUNE 3, 1969. CAN. 0788947.
3,468,705.—METHOD OF PREPARING LEAD OXIDE FILMS. SEPT. 23, 1969. CAN. 0806134, FRA. 1501511, GER. 1521942, GRB. 1170428, ITL. 0787638, JAP 0634868, MEX. 0093335.
3,472,679.—COATING SURFACES. OCT. 14, 1969 CAN. 0896992.
3,536,397.—XEROGRAPHIC APPARATUS. OCT. 27, 1970 CAN. 0917231.
3,536,481.—ELECTROLYTIC PROCESS OF FORMING A XEROGRAPHIC BELT. OCT. 27, 1970. ARG. 0175659, AUS. 0416583, BEL. 0716410, CAN. 0865080, FRA. 1572605, GRB. 1200670, ITL. 0859021, MEX. 0103043, SWD. 0345698.

3,536,485.—XEROGRAPHIC PLATE SUPPORTED BY A MANDREL. OCT. 27, 1970.
3,578,445.—XEROGRAPHIC PLATE FABRICATION. MAY 11, 1971.
3,634,134.—METHOD OF MAKING A PHOTOCONDUCTIVE COMPOSITION AND DEVICE. JAN. 11, 1972. ARG. 0184074, ATR. 0307226, AUS. 449514, BEL. 0752440, CAN. 0904111, EGR. 0083703, FRA. 7023473, GRB. 1319342, ITL. 0894622, MEX. 0117839, PNM. 0002547, SPN. 0381111, STZ. 0548624, SWD. 0351734, TIW. 0007153.
3,695,757.—XEROGRAPHIC PLATE. OCT. 3, 1972.
3,746,571.—METHOD OF VACUUM EVAPORATION. JULY 17, 1973.
3,752,691.—METHOD OF VACUUM EVAPORATION. AUG. 14, 1973.
3,756,811.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING PHOTOCONDUCTIVE MATERIALS OF DIFFERENT DYNAMIC RANGES. SEPT. 4, 1973. CAN. 0894715, GRB. 1226578.
3,787,208.—XEROGRAPHIC IMAGE MEMBER HAVING PHOTOCONDUCTIVE MATERIAL IN INTERLOCKING CONTINUOUS PATHS. JAN. 22, 1974. ARG. 0186443, ATR. 0451252, BEL. 0763544, CAN. 0925741, CHL. 0026794, FRA. 7107567, GRB. 1296291, ITL. 0918909, MEX. 0122096, NZL. 0162891, PLP. 0009378, PNM. 0002396, SAF. 0711227, SPN. 0388639, STZ. 0568591, SWD. 0367259, TIW. 0007844, USR. 0398062.
3,788,889.—METHOD OF PREPARING BINDER LAYERS. JAN. 29, 1974.
3,837,906.—METHOD OF MAKING A XEROGRAPHIC BINDER LAYER AND LAYER SO PREPARED. SEPT. 24, 1974. ARG. 0186444, ATR. 0319750, AUS. 0448147, BEL. 0763392, CAN. 0939204, CHL. 0027098, FRA. 7107568, GRB. 1292425, ITL. 0918910, NZL. 0162892, PNM. 0002439, SAF. 0711228, SPN. 0388640, STZ. 0558554, SWD. 0036479, TIW. 0007713.
3,856,548.—STRIPPABLE OVERCOATING FOR IMPROVED XEROGRAPHIC PLATES. DEC. 24, 1974. GRB. 1426030.
3,894,868.—ELECTRON TRANSPORT BINDER STRUCTURE. JULY 15, 1975. AUS. 0461951, BEL. 0763543, CAN. 0932196, CHL. 0026795, EGR. 0096346, FRA. 7107561, GRB. 1337226, GUA. 0002467, ITL. 0919110, MEX. 0120807, NZL. 0162885, PNM. 0002481, SAF. 0711221, SPN. 0388586, TIW. 0007182, USR. 0444380.
3,911,091.—MILLING TRIGONAL SELENIUM PARTICLES TO IMPROVED XEROGRAPHIC PERFORMANCE. OCT. 7, 1975.
3,911,162.—SYSTEM FOR VAPOR DEPOSITION OF THIN FILMS. OCT. 7, 1975. BEL 0798324.
3,926,762.—R F SPUTTERING OF TRIGONAL SELENIUM FILM. DEC. 16, 1975.
3,944,682.—METHOD OF PROVIDING AN ELECTROPHOTOGRAPHIC COATING AND COMPOSITIONS FOR METHOD. MAR. 16, 1976.
3,945,723.—RESILIENT ROLLERS. MAR. 23, 1976. ARG. 0205448.
3,954,466.—ELECTROSTATOGRAPHIC PHOTORECEPTOR. MAY 4, 1976.
3,979,495.—METHOD OF MAKING A PHOTORECPTOR. SEPT. 7, 1976.
3,984,183.—SHEET STRIPPING FROM IMAGING SURFACE. OCT. 5, 1976. BEL. 0836791.
3,992,091.—ROUGHENED IMAGING SURFACE FOR CLEANING. NOV. 16, 1976.
4,014,697.—ELECTROSTATOGRAPHIC IMAGING MEMBER. MAR. 29, 1977.
4,014,728.—METHOD OF MAKING AN IMAGING MEMBER. MAR. 29, 1977.
4,015,985.—COMPOSITE XEROGRAPHIC PHOTORECPTOR WITH INJECTING CONTACT LAYER. APRIL 5, 1977. BEL. 0840221.
4,016,310.—COATR HRDWR AND METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.
4,025,188.—PHOTOACTIVE DEVICE FOR XEROGRAPHY. MAY 24, 1977.
4,033,768.—METHOD FOR THE PREPARATION OF AN ELECTROSTATOGRAPHIC PHOTOSENSITIVE DEVICE. JULY 5, 1977.
4,047,973.—RECOVERY OF SELENIUM AND SELENIUM ALLOYS BY HUDRAULIC LATHING. SEPT. 13, 1977.
4,071,363.—METHOD OF MAKING COMPOSITE XEROGRAPHIC PHOTORECEPTOR WITH INJECTING CONTACT LAYER FOR A PHO. JAN. 31, 1978. BEL. 840221. FRA. 7610576.
4,072,518.—METHOD OF MAKING TRIGONAL SELENIUM INTERLAYERS BY GLOW DISCHARGE. FEB. 7, 1978.
4,076,183.—PHOTOCONDUCTOR INCREMENTING APPARATUS. FEB. 28, 1978.
4,076,564.—ROUGHENED IMAGING SURFACE FOR CLEANING. FEB. 28, 1978.
4,103,994.—RECORDING PLATE. AUG. 1, 1978.
4,115,115.—CRYSTALLIZATION OF SELENIUM IN POLYMER MATRICES VIA IN SITU GENERATION OF ORGANIC CRYSTALLIZATION. SEPT. 19, 1978.
4,122,030.—FORMATION OF COLLOIDAL DISPERSIONS OF SELENIUM BY THE LOCUS CONTROL METHOD. OCT. 24, 1978.
4,126,457.—EVAPORATION TECHNIQUE FOR PRODUCING TEMPERATURE PHOTORECEPTOR ALLOYS. NOV. 21, 1978. CAN. 1046864.
4,175,959.—PRECIPITATION OF PARTICULATE TRIGONAL SILENIUM FOR USE IN ELECTROPHOTOGRAPHY. NOV. 27, 1979. CAN. 1054339, GRB. 1510737.
4,192,603.—REPLENISHABLE PHOTOCONDUCTOR SYSTEM. MAR. 11, 1980.
4,206,994.—BELT TENSIONING SYSTEM. JUNE 10, 1980.

Class 2F

3,143,044.—XEROGRAPHIC PLATE HOLDER. AUG. 4, 1964.
3,592,071.—BELT TRACKING APPARATUS. JULY 13, 1971. ARG. 0179666, BEL. 0751117, CAN. 0925118, FRA. 7019040, GRB. 1298926, ITL. 0893540, JAP. 0770135, MEX. 0118981, SPN. 0380136.
3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,820,888.—MISTRACK INTERLOCK FOR SELENIUM BELT. JUNE 28, 1974.
3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,874,790.—FAIL-SAF MECH STPNG MVMNT PHTCNDCTV BLT ELTRSTC REPRDCTN MACH WHEN TRCKNG BECOMES IREGULAR AND UN. APR. 1, 1975.
3,888,577.—APPARATUS FOR PACKAGING AND SUBSEQUENTLY INSTALLING A BELT ONTO A ROLLER ASSEMBLY. JUNE 10, 1975. BEL. 0810900.
3,994,053.—DRUM SUPPORT APPARATUS. NOV. 30, 1976.
4,005,285.—OPTICAL SYSTEM FOR EXTENDING PHOTOSENSOR ARRAY RESOLUTION. JAN. 25, 1977.
4,009,388.—ARRANGEMENT FOR EXTENDING PHOTOSENSOR ARRAY SOLUTION. FEB. 22, 1977.
4,027,966.—TRACKING ASSEMBLY FOR AN ENDLESS BELT ELECTROSTATIC REPRODUCTION MACHINE. JUNE 7, 1977.
4,040,157.—DRUM SUPPORT APPARATUS. AUG. 9, 1977.
4,068,942.—ADVANCED PHOTORECEPTOR. JAN. 17, 1978. BEL. 847264, FRA. 7630970.
4,088,403.—REPLENISHABLE PHOTOSENSITIVE SYSTEM. MAY 9, 1978.
4,105,345.—EXPANDABLE PHOTORECEPTOR ENDBELLS. AUG. 8, 1978.
4,120,576.—DRUM SUPPORT APPARATUS. OCT. 17, 1978.
4,174,171.—BELT TRACKING SYSTEM. NOV. 13, 1979.
4,178,094.—BELT SUPPORT AND STEERING MODULE. DEC. 11, 1979.
4,189,223.—A STEERING AND SUPPORTING SYSTEM FOR A PHOTOCONDUCTIVE BELT. FEB. 19, 1980.
4,197,002.—PNEUMATIC SYSTEM FOR SUPPORTING AND STEERING BELT. APR. 8, 1980.
4,198,155.—PHOTOCONDUCTIVE BELT ASSEMBLY. APR. 15, 1980.

Class 3

3,935,517.—CONSTANT CURRENT CHARGING DEVICE. JAN. 27, 1976.

Class 3A

3,172,024.—CHARGE INDUCTION. MAR. 2, 1965. CAN. 0809341, FRA. 1294161, GER. 1414991, GRB. 0958663, JAP. 0455338.
3,254,998.—INDUCTION IMAGE FORMATION. JUNE 7, 1966. CAN. 0740576, FRA. 1357220, GER. 1276445, GRB. 1024985, JAP. 0451689.
3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.
3,684,364.—LIFTOFF ELECTRODE. AUG. 15, 1972.

3,842,273.—CORONA GENERATOR CLEANING APPARATUS. OCT. 15, 1974. AUS. 0480142, BEL. 0817485. GRB. 1458088, SPN. 0428358.
3,884,181.—CAPILLARY BAFFLE-CONSTANT OIL HEIGHT INDEPENDENT TO OIL LEVEL. MAY 20, 1975.
3,893,800.—BACKSIDE HEATING AND FIXING APP IN AN ELECTRONIC PHOTOGRAPH DUPLICATOR. JULY 8, 1975.
3,957,423.—STRIPPER FINGER DESIGN. MAY 18, 1976.
4,049,344.—ELECTROSTATIC IMAGING SYSTEM. SEPT. 20, 1977.
4,082,444.—LAMP CARRIAGE DRIVE SYSTEM. APR. 4, 1978.

Class 3B

3,160,746.—CORONA CHARGING APPARATUS FOR NON-UNIFORMLY CHARGING A XEROGRAPHIC PLATE IN A PREDETERMINED MAN. DEC. 8, 1964. GER. 1197475, GRB. 1011793, JAP. 0484759.
3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.
3,449,568.—CORONA DISCHARGE APPARATUS FOR CREATING AN ELECTROSTATIC CHARGE PATTERN ON A XEROGRAPHIC SURFAC. JUNE 10, 1969. CAN. 0858664.
3,532,494.—SOLID AREA DEVELOPMENT IN XEROGRAPHY EMPLOYING AN INSULATING SCREEN IN THE CHARGING STEP. OCT. 6, 1970.
3,543,022.—METH AND APPARATUS CHARG DISCRETE SMALL AREAS XEROGRAPHIC PLATES TO DIF POTENT CONT TONE PRINTG. NOV. 24, 1970. CAN. 0921971, GRB. 1186599.
3,784,299.—DARK DECAY RETARDATION. JAN. 8, 1974.
3,981,498.—NON-UNIFORM CHARGING OF SHEET MATERIAL. SEPT. 21, 1976.
4,043,656.—TRANSPARENCY COPYING MACHINE. AUG. 23,1977.
4,073,587.—COROTRON APPARATUS. FEB. 14, 1978.
4,095,233.—METHOD FOR FORMING A CHARGE PATTERN. JUNE 13, 1978.

Class 3C

3,122,634.—CONTROLLED CHARGING IN XEROGRAPHIC COPYING APPARATUS. FEB. 25, 1964. CAN. 0706543, FRA. 1352624, GER. 1210323, GRB. 1026262, JAP. 0446815.
3,160,746.—CORONA CHARGING APPARATUS FOR NON-UNIFORMLY CHARGING A XEROGRAPHIC PLATE IN A PREDETERMINED MAN. DEC. 8, 1964. GER. 1197475, GRB. 1011793, JAP. 0484759.
3,335,274.—XIC CHARGING APPARATUS WITH MEANS TO AUTOMATICALLY CONTROL THE POT ENTAIL APPLIED TO THE CORONA. AUG. 8, 1967. CAN. 0801834, FRA. 1459487, GRB. 1121498, ITL. 0734870, MEX. 0085777.
3,382,360.—XIC CHARGING SYSTEM HAVING MEANS FOR PROVIDING AN AIR CUSHION BETWEEN CHARGING DEVICE AND XIC DR. MAY 7, 1968.
3,457,405.—CORONA WIRE MOUNTING MEANS WHICH COMPENSATES FOR WIRE EXPANSION DUE TO HEAT. JULY 22, 1969. CAN. 0857406, GRB. 1196927.
3,471,695.—CORONA CHGNG APPTS W/MEANS TO URGE A FLOW OF AERIFORM FLUID ACROSS THE CORONA WIRES. OCT. 7, 1969. CAN. 0856355, GRB. 1220745.
3,483,372.—CORONA CHARGING DEVICE WITH CONDUCTIVE SHIELD AND INSULATING MEANS ON SAID SHIELD. DEC. 9, 1969. CAN. 0840508, GRB. 1169632, JAP. 0770817.
3,517,995.—METHOD AND APPARATUS FOR INCREASING THE EFFICIENCY OF CORONA CHARGNG. JUNE 30, 1970. ARG. 0172471, BEL. 0721553, CAN. 0856714, FRA. 1585283, GRB. 1247034, ITL. 0844214, JAP. 0708414, MEX. 0103113, VZL. 0023701.
3,566,108.—CORONA GENERATING ELECTRODE STRUCTURE FOR USE IN A XEROGRAPHIC CHARGING METHOD. FEB. 23, 1971.
3,598,991.—ELCTRSTC CHRGNG DEV HAVNG SPRK GAP VOLTG REGULTR BETWEEN A CORONA SOURCE AND VOLTG SOURCE. AUG. 10, 1971. AUS. 0457211, BEL. 0754426, CAN. 0916233, CZC. 0163219, EGR. 0084558, FRA. 7029148, GRB. 1322378, ITL. 0901159, JAP. 0715800, PLD. 0070053, SPN. 0382404, STZ. 0513436, SWD. 0359663, TIW. 0007173, USR. 0442617.
3,604,925.—APPARATUS FOR CONTROLLING THE AMOUNT OF CHARGE APPLIED TO SURFACE. SEPT. 14, 1971.
3,612,864.—IMAGING SYSTEM UTILIZING AN ELECTRODE TREATED W/MIXTURE OF HYDROSCOPIC MATERIAL AND HYDROPHILIC B. OCT. 21, 1971.
3,675,011.—METHODS AND APPARATUS FOR OPERATING RAISED COROTRONS OF OPPOSITE POLARITY. JULY 4, 1972.
3,723,793.—COATED CORONA GENERATING ELECTRODE. MAR. 27, 1973.
3,742,237.—AC CORONA CHARGING APPARATUS. JUNE 26, 1973. CAN. 0955299, GRB. 1387209.
3,760,229.—A C COROTRON. SEPT. 18, 1973. GRB. 1410671.
3,769,506.—CORONA GENERATING METHOD AND APPARATUS THEREFOR. OCT. 30, 1973.
3,790,999.—CORONA WIRE APPARATUS. FEB. 12, 1974.
3,800,153.—ELECTROPHOTOGRAPHY CHARGING DEVICE. MAR. 26, 1974.
3,813,547.—CORONA GENERATING APPARATUS. MAY 28, 1974.
3,813,548.—CORONA GENERATING METHODS AND APPARATUS THEREFOR. MAY 28, 1974.
3,816,749.—EXPOSURE CONTROLLED CORONA DEVICE. JUNE 11, 1974.
3,851,229.—CURRENT MEASURING DEVICE. NOV. 26, 1974.
3,870,883.—ELECTROSTATIC PRINTING MACHINE WITH SELF-CLEANING CORONAL GENERATING DEVICE. MAR. 11, 1975.
3,901,189.—MAGNETIC BRUSH DEVELOPING APPARATUS. AUG. 26, 1975.
3,919,605.—CORONA DISCHARGE APPARATUS. NOV. 11, 1975.
3,922,548.—CORONA CHARGING DEVICE AND SUPPORT ARRANGEMENT. NOV. 25, 1975.
3,937,960.—CHARGING DEVICE FOR ELECTROPHOTOGRAPHY. FEB. 10, 1976.
3,939,386.—TECHNIQUE FOR CHARGING DIELECTRIC SURFACES TO HIGH VOLTAGE. FEB. 17, 1976.
3,950,680.—ELECTROSTATOGRAPHIC DIAGNOSTIC SYSTEM. APR. 13, 1976.
3,976,880.—CORONA STABILIZATION ARRANGEMENT. AUG. 24, 1976.
3,976,881.—ARRANGEMENT FOR STABILIZING CORONA DEVICES. AUG. 24, 1976.
3,978,379.—CORONA GENERATING DEVICE WITH AN IMPROVED CLEANING MECHANISM. AUG. 31, 1976.
3,983,393.—CORONA DEVICE WITH REDUCED OZONE EMISSION. SEPT. 28, 1976.
3,996,466.—TRANSFER CORONA DEVICE WITH ADJUSTABLE SHIELD BIAS. DEC. 7, 1976.
4,027,960.—TRANSFER SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. JUNE 7, 1977.
4,038,544.—IMPROVED APPARATUS AND METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE. JULY 26, 1977.
4,038,546.—AN IMPROVED APPARATUS FOR A CORONA GENERATING DEVICE. JULY 26, 1977.
4,056,723.—ROTATIABLE CORONA DEVICE. NOV. 1, 1977.
4,068,284.—CORONA DISCHARGE DEVICE. JAN. 10, 1978. CAN. 1029794, FRA. 7432708, GRB 1407718.
4,072,413.—ELECTROSTATOGRAPHIC REPRODUCTION METHODS AND MACHINES. FEB. 7,1978.
4,099,219.—CORONODE TENSIONING AND SUPPORT ARRANGEMENT. JULY 4, 1978.
4,100,411.—BIASING ARRANGEMENT FOR A CORONA DISCHARGE DEVICE. JULY 11, 1978.
4,110,811.—SUPPORT STRUCTURE FOR A CORONA GENERATING DEVICE. AUG. 29, 1978.
4,112,298.—CORONA WIRE MOUNTING MEANS. SEPT 5, 1978.
4,112,299.—CORONA DEVICE WITH SEGMENTED SHIELD. SEPT. 5, 1978 GRB. 1499477.
4,118,751.—CORONODE CONNECTION ARRANGEMENT. OCT. 3, 1978.
4,138,719.—AUTOMATIC WRITING SYSTEMS AND METHODS OF WORD PROCESSING. FEB. 6, 1979. CAN. 1055161. GRB. 1530444.

Class 3C 1

3,275,837.—XEROGRAPHIC CHARGING APPARATUS. SEPT. 27, 1966. ARG. 0158430, ATR. 0242511, AUS. 0276177, BEL. 0642095, CAN. 0753356, FRA. 1385736, GER. 1488286, GRB. 1040264, ITL. 0712888, JAP. 0477814, MEX. 0075819, STZ. 0460930, SWD. 0314133
3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP 0491997.

3,492,476.—ELECTROSTATIC CHARGING DEVICE UTILIZING BOTH AC AND DC FIELDS. JAN. 27, 1970. ARG. 0175174, ATR. 0300573, AUS. 0425768, BEL. 0729976, CAN. 0862232, CHL. 0024600, CZC. 0158639, DNK. 0126728, EGR. 0081574, EIR. 0032976, FRA. 6907701, GRB. 1255998, GRK. 0039915, IND. 0120218, ISR. 0031765, ITL. 0860063, LXB. 0058234, MEX. 0108894, NOR. 0129709, NZL. 0155636, PAK. 0120995, PLD. 0017649, PLP. 0007523, PNM. 0001813, PTG. 0051315, RHD. 1096947, RMN. 0055216, SAF. 0691730, SPN. 0364888, STZ. 0493014, SWD. 0341528, UAR. 0009212, USR. 0318248, VTM. 0001845, VZL. 0023731.

3,873,895.—TECHNIQUE FOR CHARGING DIELECTRIC SURFACES TO HIGH VOLTAGE. MAR. 25, 1975.

3,886,416.—METHOD AND APPARATUS FOR ADJUSTING COROTRON CURRENTS. MAY 27, 1975.

3,908,164.—CORONA CURRENT MEASUREMENT AND CONTROL ARRANGEMENT. SEPT. 23, 1975.

3,921,042.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED CORONA GENERATING DEVICE. NOV. 18, 1975.

3,961,193.—SELF ADJUSTING CORONA DEVICE. JUNE 1, 1976.

3,984,182.—PRETRANSFER CONDITIONING FOR ELECTROSTATIC PRINTING. OCT. 5, 1976.

4,038,593.—REGULATED HIGH VOLTAGE AC POWER SUPPLY WITH REGULATED DC BIAS CURRENT. JULY 26, 1977. BEL. 0846572.

4,039,257.—PRETRANSFER COROTRON SWITCHING. AUG. 2, 1977. GRB. 1498259

4,042,874.—HIGH VOLTAGE AC POWER SUPPLY WITH AUTOMATICALLY VARIABLE DC BIAS CURRENT. AUG. 16, 1977.

4,057,723.—COMPACT CORONA CHARGING DEVICE. NOV. 8, 1977. BEL. 850335, SPN. 455179.

4,086,650.—CORONA CHARGING DEVICE. APR. 25, 1978. BEL. 844116, SAF. 764178, SPN. 449789.

4,110,614.—CORONA DEVICE. AUG. 29, 1978.

Class 3C 2

3,304,476.—TRANSFER SWITCH FOR A XEROGRAPHIC APPARATUS. FEB. 14, 1967.

3,433,948.—NEGATIVE CORONA DISCHARGE SYSTEM USING ALTERNATING ELECTRIC FIELDS ACROSS THE AIR GAP. MAR. 18, 1969. CAN. 0855811, FRA. 1564157, GRB. 1211442, ITL. 0829718, JAP. 0655407.

3,541,329.—NEGATIVE CORONA DEVICE WITH MEANS FOR PRODUCING A REPELLING ELECTROSTATIC FIELD. NOV. 17, 1970. CAN. 0841136, FRA. 1546256, GRB. 1205040, JAP. 0634886.

4,140,874.—AUTOMATIC COMPENSATING CIRCUIT. FEB. 20, 1979. CAN. 1056919. GRB. 1522703.

Class 3C 3

3,146,385.—XEROGRAPHIC PLATE CHARGING METHOD AND APPARATUS. AUG. 25, 1964. GRB. 1013924.

3,649,830.—UNIFORM CHARGING METHOD AND APPARATUS USING AN ARRAY OF NEEDLE ELECTRODES. MAR. 14, 1972.

3,655,966.—ELECTRIC CHARGING DEVICE FOR ELECTROPHOTOGRAPHY. APR. 11, 1972.

3,689,767.—METHOD AND APPARATUS FOR UNIFORMLY CHARGING THE SURFACE OF AN INSULATING MEMBER. SEPT. 5, 1972.

3,709,595.—PRINTER SYSTEM. JAN. 9, 1973.

Class 3C 4

3,220,324.—PHOTOCONDUCTIVELY CONTROLLED CORONA CHARGING. NOV. 30, 1965. CAN. 0710976, GER. 1243967, GRB. 1034009, JAP. 0651092.

3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.

3,492,476.—ELECTROSTATIC CHARGING DEVICE UTILIZING BOTH AC AND DC FIELDS. JAN. 27, 1970. ARG. 0175174, ATR. 0300573, AUS. 0425768, BEL. 0729976, CAN. 0862232, CHL. 0024600, CZC. 0158639, DNK. 0126728, EGR. 0081574, EIR. 0032976, FRA. 6907701, GRB. 1255998, GRK. 0039915, IND. 0120218, ISR. 0031765, ITL. 0860063, LXB. 0058234, MEX. 0108894, NOR. 0129709, NZL. 0155636, PAK. 0120995, PLD. 0017649, PLP. 0007523, PNM. 0001813, PTG. 0051315, RHD. 1096947, RMN. 0055216, SAF. 0691730, SPN. 0364888, STZ. 0493014, SWD. 0341528, UAR. 0009212, USR. 0318248, VTM. 0001845, VZL. 0023731.

3,496,351.—CORONA CONTROL CIRCUIT FOR STEPPING XEROGRAPHIC RECORDNG APPARATUS. FEB. 17, 1970. CAN. 0834978, FRA. 1512919, GRB. 1170472, ITL. 0793742, JAP. 0923309.

3,688,107.—ELECTROSTATOGRAPHIC CHARGING APPARATUS. AUG. 29, 1972. CAN. 0938660, GRB. 1365130.

3,875,407.—CORONA GENERATOR CLEANING APPARATUS. APR. 1, 1975.

3,908,127.—CORONA GENERATING DEVICES. SEPT. 23, 1975.

3,909,614.—SCOROTRON POWER SUPPLY CIRCUIT. SEPT. 30, 1975.

3,936,635.—CORONA GENERATING DEVICE. FEB. 3, 1976.

Class 3C 5

3,970,381.—METHOD AND APPARATUS FOR XEROGRAPHIC REPRODUCTION. JULY 20, 1976. BEL. 0811188.

Class 3C 6

3,549,962.—UNIFORM ELECTROSTATIC CHARGING. DEC. 22, 1970. CAN. 0897757, GRB. 1189578.

3,648,133.—UNIFORM ELECTROSTATIC CHARGING OF A PHOTOCONDUCTIVE INSULATING SURFACE. MAR. 7, 1972.

3,743,830.—DEVICE FOR UNIFORMLY CHARGING A NON PLANAR ELECTROPHOTOGRAPHIC PLATE. JULY 3, 1973.

3,764,866.—CORONA GENERATOR. OCT. 9, 1973. ARG. 0198185, ATR. 0325420, AUS. 0467386, BEL. 0793227, CZC. 0168018, DNK. 0131699, FRA. 7245484, GRB. 1402739, ITL. 0972692, MEX. 0128581, NZL. 0169420, PTG. 0058386, SAF. 0729029, STZ. 0553435, SWD. 7216596.

3,792,913.—XEROGRAPHIC ERASE MECHANISM. FEB. 19, 1974. GRB. 1422175.

3,811,048.—ELECTROPHOTOGRAPHIC CHARGING APPARATUS. MAY 14, 1974.

3,967,119.—CORONA CHARGING DEVICE. JUNE 29, 1976.

3,967,891.—IMAGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. JULY 6, 1976.

4,087,168.—CHARGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. APR. 2, 1978.

Class 3C 7

3,323,373.—ESCAPEMENT MECHANISM. JUNE 6, 1967. CAN. 0841310.

3,324,291.—CORONA GENERATING DEVICE W/MEANS TO CAUSE AIR FLOW THERE-THROUGH TO MAINTN PARTS FREE OF DUST. JUNE 6, 1967. CAN. 0794904, GRB. 1070615, JAP. 0512648.

3,339,069.—CORONA CHARGING DEVICE W/MEANS TO PREVENT TONER DUST CONTAMINATION. AUG. 29, 1967. CAN. 0788539, FRA. 1450010, GRB. 1116687, ITL. 0730715, JAP. 0875339, MEX. 0089459.

3,496,352.—SELF-CLEANING CORONA GENERATING APPARATUS. FEB. 17, 1970. CAN. 0856356, GRB. 1227987, JAP. 0641478.

3,743,540.—SURFACE CLEANING BY IONIZED FLOW. JULY 3, 1973.

3,794,839.—CORONA GENERATING APPARATUS. FEB. 26, 1974. GRB. 1434863.

3,942,006.—CORONA GENERATOR CLEANING APPARATUS. MAR. 2, 1976.

3,965,400.—CORONA GENERATING DEVICE WITH IMPROVED BUILT IN CLEANING MECHANISM. JUNE 22, 1976.

4,019,055.—CORONA CLEANING ASSEMBLY. APR. 19, 1977. BEL. 0795870, GRB. 1416480.

Class 3C 8

3,335,273.—XIC CHARGING APPARATUS W/MEANS TO TERMINATE CHARGING CYCLE WHEN A PREDETERMINED CHARGE IS OBTAI. AUG. 8, 1967. CAN. 0794905, FRA. 1462556, GRB. 1128618, ITL. 0743940, JAP. 0632530, MEX. 0087314.

3,335,275.—XIC CHARGNG APPTS W/ADJSTBL MEANS TO TERMINATE CHRGNG CYCLE WHEN PRE-DETERMINED CHARGE IS OBTAI. AUG. 8, 1967. CAN. 0801833.

3,667,036.—ELECTROMETER AMPLIFIER CIRCUITS. MAY 30, 1972.

3,678,350.—ELECTRIC CHARGING METHOD. JULY 18, 1972.

3,805,069.—REGULATED CORONA GENERATOR. APR. 16, 1974.

3,934,141.—APPARATUS FOR AUTOMATICALLY REGULATING THE AMOUNT OF CHARGE APPLIED TO AN INSULATING SURFACE. JAN. 20, 1976.

3,944,356.—A CHARGING APPARATUS. MAR. 16, 1976.

3,980,929.—CORONA CURRENT INTERRUPTER. SEPT. 14, 1976.

Class 3C 9

3,557,367.—METHOD AND APPARATUS FOR INCREASING THE EFFICIENCY OF CORONA CHARGING OF A PHOTOCONDUCTOR. JAN. 19, 1971. ARG. 0170822, BEL. 0720017, BRA. 6800368, CAN. 0879279, FRA. 1597512, GRB. 1244378, ITL. 0840366, JAP. 0628391, MEX. 0105427, VZL. 0023699.

3,582,731.—CHARGING SYSTEM. JUNE 1, 1971. CAN. 0906045.

3,765,026.—ELECTROGRAPHIC RECORDING SYSTEM. OCT. 9, 1973. CAN. 0948272, GRB. 1365346.

4,049,344.—ELECTROSTATIC IMAGING SYSTEM. SEPT. 20, 1977.

Class 3D

3,394,002.—CHARGE TRANSFER WITH LIQUID LAYERS. JULY 23, 1968. CAN. 0840028, GRB. 1126048, JAP. 0524527.

3,398,336.—ELECTRICAL CHARGING UTILIZING TWO PHASE LIQUID MEDIUM. AUG. 20, 1968. CAN. 0815738, GRB. 1149074, JAP. 0562387.

3,687,106.—DONOR APPARATUS AND METHOD. AUG 29, 1972. ARG. 0185079, BEL. 0753207, CAN. 0911706, FRA. 7027124, GRB. 1314862, ITL. 0900444, JAP. 0733285, MEX. 0117318, PNM. 0002237, VZL. 0027517.

3,907,559.—IMGNG PRCS EMPLYNG FRCTN CHRGNG IN THE PRESENCE OF AN ELECTRICALLY INSULATING DEVELOPER LIQUID. SEPT. 23, 1975.

3,971,658.—IMAGING PROCESS EMPLOYING FRICTION CHARGING IN THE PRESENCE OF AN ELECTRICALLY INSULATING LIQUID. JULY 27, 1976.

Class 3E

3,172,024.—CHARGE INDUCTION. MAR. 2, 1965. CAN. 0809341, FRA. 1294161, GER. 1414991, GRB. 0958663, JAP. 0455338.

3,254,998.—INDUCTION IMAGE FORMATION. JUNE 7, 1966. CAN. 0740576, FRA. 1357220, GER. 1276445, GRB. 1024985, JAP. 0451689.

Class 3F

3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.

3,453,427.—ELEC LAMP FOR UNIFRMLY CHRGNG THE PHOTOCNDCTIVE INSULATNG LAYER OF A XEROGRAPHIC PLATE. JULY 1, 1969.

3,481,669.—PHOTO-CHARGING OF XEROGRAPHIC PLATES. DEC. 2, 1969. AUS. 0420860, BEL. 0705167, CAN. 0814631, FRA. 1541297, GER. 1522683, GRB. 1088073, JAP. 0517512.

3,687,538.—APPARATUS FOR EXPOSING LATENT IMAGE MARGINS IN ELECTROPHOTOGRAPHIC COPYING APPARATUS. AUG. 29, 1972.

3,751,155.—PRE-DEVELOPMENT EXPOSURE ASSEMBLY. AUG. 7, 1973.

3,809,472.—PRE-DEVELOPMENT EXPOSURE ASSEMBLY. MAY 7, 1974. ARG. 0196103, AUS. 0466757, BEL. 0793559, CHL. 0027991, FRA. 7246234, GRB. 1415170, ITL. 0973319, JAP. 0552841, MEX. 0131207, NZL. 0169421, PRU. 0013334, PTG. 0058769, SAF. 0729132, SPN. 0410172, STZ. 0552841, SWD. 7216970.

3,845,307.—COMBINED CORONA AND LUMINESCENT DISCHARGE. OCT. 29, 1974. BEL. 0811310, GRB. 1433663.

3,860,338.—ADJUSTABLE FADEOUT. JAN. 14, 1975. BEL. 0809655.

3,893,419.—BACKGROUND REDUCTION TECHNIQUE. JULY 8, 1975.

3,984,842.—DEVICE FOR CONTINOUS ELECTROSTATIC REPRODUCTION OF AN OPTICAL IMAGE. OCT. 5, 1976.

3,994,000.—DEVICE FOR ELECTROSTATOGRAPHIC REPRODUCTION OF AN OPTICAL IMAGE USING A CHARGE STORAGE GRID. NOV. 23, 1976.

4,005,438.—DEVICE WITH CONTROL GRID FOR ELECTROSTATOGRAPHIC REPRODUCTION OF AN OPTICAL IMAGE. JAN. 25, 1977.

Class 4

4,162,118.—WAVEGUIDE IMAGING SYSTEM. JULY 24, 1979.

Class 4A

3,811,764.—APPARATUS FOR PHOTOELECTROPHORETIC IMAGING USING A PERIODIC ELECTRIC FIELD. MAY 21, 1974.

4,068,950.—VARIABLE PLATEN COVER. JAN. 17, 1978

4,111,541.—EXPOSURE SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES. SEPT. 5, 1978.

4,120,579.—IMAGING SYSTEM FOR A PHOTOCOPYING DEVICE. OCT. 17, 1978.

Class 4A 1

3,330,180.—ILLUMINATION CONTROL SYSTEM. JULY 11, 1967. ARG. 0151653, BRA. 0084295, CAN. 0785137, FRA. 1450157, GER. 1264239, GRB. 1122629, ITL. 0730678, JAP. 0508404, MEX. 0078870.

3,432,231.—EXPOSURE CONTROL DEVICE. MAR. 11, 1969.

3,432,232.—ILLUMINATION SYSTEM. MAR. 11, 1969 CAN. 0846423, JAP. 0534763.

3,487,252.—CESIUM LIGHT SOURCE. DEC. 30, 1969.

3,504,969.—IMAGING APPARATUS. APR. 7, 1970.

3,512,886.—DUAL CARRIAGE SCANNING SYS. MAY 19, 1970. CAN. 0875712, GRB. 1235136.

3,586,849.—ILLUMINATION SYSTEM. JUNE 22, 1971. ARG. 0183139, ATR. 0303522, AUS. 0428629, BEL. 0733400, BRA. 6908480, CAN. 0903730, CHL. 0024870, FRA. 6917011, GRB. 1260688, ITL. 0864185, MEX. 0111515, NOR. 0125954, NZL. 0156507, PNM. 0001430, PRU. 0010320, PTG. 0051752, SAF. 0693689, SPN. 0367616, STZ. 0758269, SWD. 0354924, VZL. 0025067.

3,622,217.—LIGHT PRODUCING SYSTEM. NOV. 23, 1971.

3,733,599.—TRIGGERING APPARATUS FOR A FLASH LAMP. MAY 15, 1973. CAN. 0937281, GRB. 1361073.

3,746,442.—ELECTROPHOTOGRAPHIC IMAGING APPARATUS. JULY 17, 1973.

3,767,956.—APERTURE FLUORESCENT LAMP FOR COPYING MACHINES. OCT. 23, 1973.

3,777,135.—ILLUMINATION SYSTEM. DEC. 4, 1973.

3,779,640.—HEATING APPARATUS FOR SCAN LAMP. DEC. 18, 1973. ITL. 0995677.

3,781,585.—LIGHT PRODUCING SYSTEM. DEC. 25, 1973

3,824,013.—LIGHT SOURCE ALIGNMENT DEVICE. JULY 16, 1974.

3,851,201.—LAMP ASSEMBLY. NOV. 26, 1974.

3,868,182.—LAMP ASSEMBLY. FEB. 25, 1975.

3,869,205.—ILLUMINATION SOURCE FOR XEROGRAPHIC EXPOSURE. MAR. 4, 1975.

3,881,817.—OPTICAL ALIGNMENT SYSTEM FOR AN ORIGINAL DOCUMENT. MAY 6, 1975. CAN 1881817

3,893,754.—COMBINATION PARABOLOID-ELLIPSOID MIRROR SYSTEM. JULY 8, 1975.

3,904,290.—OPTICAL SYSTEM ALIGNMENT APPARATUS. SEPT. 9, 1975.

3,909,254.—LASER RECORDING METHOD SEPT 30, 1975.

3,914,649.—PULSED METAL OR METAL HALIDE LAMPS FOR PHOTOCOPYING APPLICATIONS OCT. 21, 1975.

3,961,222.—SODIUM VAPOR LAMP CONFIGURATION JUNE 1, 1976.

3,967,893.—AN ILLUMINATING APPARATUS. JULY 6, 1976.

3,983,441.—MULTIPLE PINCH INCANDESCENT LAMP SEPT. 28, 1976.

3,992,108.—OPTICAL SYSTEM ALIGNMENT APPARATUS. NOV. 16, 1976.

3,998,539.—AN ILLUMINATION SYSTEM DEC. 21, 1976

4,005,332.—EFFICIENT DC OPERATED FLUORESCENT LAMPS. JAN. 25, 1977.

4,005,940.—OPTICAL SYSTEM ALIGNMENT APPARATUS. FEB. 1, 1977.

4,071,798.—SODIUM VAPOR LAMP WITH EMISSION APERTURE. JAN. 31, 1978.

4,071,799.—SODIUM VAPOR LAMP WITH EMISSION APERTURE. JAN. 31, 1978.

4,072,417.—EXPOSURE DEVICE FOR A XEROGRAPHIC COPYING MACHINE. FEB. 7, 1978.

4,080,545.—SODIUM VAPOR LAMP. MAR 21, 1978

4,086,010.—ILLUMINATION SYSTEM UTILIZING TWO OPPOSING DC LAMPS WITH AN OPTIMUM BARREL-SHAPED SLIT. APR. 25, 1978.

4,113,379.—ILLUMINATION APPARATUS FOR ELECTRONIC COPYING MACHINES. SEPT. 12, 1978

4,128,332.—ILLUMINATOR. DEC. 5, 1978. GRB. 1494424

4,140,385.—LOW PRESSURE METAL OR METAL HALIDE LAMPS FOR PHOTOCOPYING APPLICATIONS. FEB. 20, 1979.
4,190,355.—FACETTED REFLECTION. FEB. 26, 1980. BEL. 875979.

Class 4A 2

3,381,573.—SCANNING ATTACHMENT. MAY 7, 1968. CAN. 0820036, GER. 1945460, GRB. 1134645, JAP. 0524529.
3,524,704.—MULTI-LENGTH DOCUMENT RECORDING APPARATUS. AUG. 18, 1970.
3,888,581.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,582.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,584.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,585.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,901,594.—SEMI-AUTOMATIC DOCUMENT HANDLER. AUG. 26, 1975.
3,930,724.—MASKING APPARATUS FOR A MULTI-COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. JAN. 6, 1976.

Class 4A 2A

3,560,089.—PLATEN COVER. FEB. 2, 1971. BEL. 0736415, CAN. 0910104, FRA. 0024759, GRB. 1245543, ITL. 8691460, JAP. 0674392.
3,560,090.—PLATEN COVER. FEB. 2, 1971. CAN. 0910103.
3,615,134.—COUNTERBALANCED AND SELF-CLOSING PLATEN COVER. OCT. 26, 1971. ARG. 0185533, AUS. 0449673, BEL. 0756482, CAN. 0921744, CHL. 0025836. EGR. 0084323, FRA. 7035445, GRB. 1318753, GUA. 0002610, ITL. 0908279, MEX. 0116804, PLD. P143518, PNM. 0002181, SPN. 0384046, STZ. 0515525, TIW. 0006830, USR. 0439097.
3,642,371.—PLATEN COVER FOR COPYING MACHINE. FEB. 15, 1972. ARG. 0189873, BEL. 0768991, CAN. 0938485, FRA. 7124554, ITL. 0932443.
3,642,376.—REMOVABLE PLATEN COVER. FEB. 15, 1972. CAN. 0926919.
3,685,905.—COMBINED DOCUMENT FEED AND BOOK COPYING APPARATUS. AUG. 22, 1972. ARG. 0189167, BEL. 0782370, CAN. 0954579, FRA. 7214327, GRB. 1382646, ITL. 0959701, MEX. 0127002, VZL. 30688.
3,788,737.—LUMINESCENT COVER. JAN. 29, 1974. FRA. 7336535.
3,813,161.—PLATEN COVER. MAY 28, 1974.
3,860,338.—ADJUSTABLE FADEOUT. JAN. 14, 1975. BEL. 0809655.
3,914,043.—COLOR ACCENTING COPYING MACHINE. OCT. 21, 1975.
3,914,049.—OPTICAL SCANNING SYSTEM. OCT. 21, 1975. BEL. 0815416.
3,930,466.—SEGMENTED GATE DEVELOPER FLOW CONTROLLER. JAN. 6, 1976.
3,936,172.—LIQUID CRYSTALLINE PLATEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. FEB. 3, 1976.
3,997,265.—PLATEN COVER. DEC. 14, 1976.
4,045,218.—METHOD FOR ELECTROSTATICALLY PRODUCING A COLOR ACCENTED PHOTOCOPY. AUG. 30, 1977.
4,072,418.—DEVICE FOR PREVENTING MOVEMENT OF AN ORIGINAL DOCUMENT ON A RECIPROCATING COPIER PLATEN. FEB. 7, 1978.
4,111,540.—FIELD LENS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 5, 1978.
4,118,119.—FACETTED EDGE FADEOUT REFLECTOR. OCT. 3, 1978.

Class 4A 3

3,432,232.—ILLUMINATION SYSTEM. MAR. 11, 1969. CAN. 0846423, JAP. 0534763.
3,600,610.—TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS. AUG. 17, 1971.
3,672,759.—ILLUMINATION CONTROL SYSTEM. JUNE 27, 1972.
3,775,008.—OPTICAL SCANNING APPARATUS. NOV. 27, 1973.
3,829,209.—IMAGE REGISTRATION IN A MULTIPLE MAGNIFICATION PHOTOCOPY INH SYSTEM. AUG. 13, 1974. ARG. 0194481, BEL. 0784522, CAN. 0988146, FRA. 7220688, GRB. 1397446, ITL. 0956415, MEX. 0128160, SPN. 403.700, STZ. 0563605, SWD. 7207535.
3,926,518.—OPTICAL SCANNING SYSTEM. DEC. 16, 1975.
3,947,117.—EXPOSURE CONTROL SYSTEM. MAR. 30, 1976.
3,975,289.—CHARGE TRANSFER COMPLEXE OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
3,995,954.—EXPOSURE SYSTEM. DEC. 7, 1976.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.
4,080,071.—EXPOSURE DEVICE OF A COPYING MACHINE. MAR. 21, 1978.
4,098,552.—COPYING MACHINE. JULY 4, 1978.
4,101,807.—METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF LOW PRESSURE METAL OR METAL HALIDE. JULY 18, 1978.

Class 4B

3,912,387.—ELECTROSTATOGRAPHY. OCT. 14, 1975.
3,967,894.—A SCREENED OPTICAL SYSTEM. JULY 6, 1976.
3,967,895.—ILLUMINATION CONTROL SYSTEM. JULY 6, 1976.
3,981,577.—AN OPTICAL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 21, 1976.
3,994,723.—ELECTROPHOTOGRAPHIC PROCESS INVOLVING STEP OF SUBSEQUENT DISCHARGE OF AREAS RECEIVING INSUFFICIENT. NOV. 30, 1976.
4,134,671.—INTERSECTING OPTICAL AND COPY SHEET PATH METHOD AND APPARATUS. JAN. 16, 1979.

Class 4B 1

3,062,094.—ELECTROPHOTOGRAPHIC COPYING APPARATUS. NOV. 6, 1962. JAP. 0286655.
3,062,095.—PROJECTOR OPTICAL SCANNING SYSTEM. NOV. 6, 1962. CAN. 0706050.
3,062,108.—ELECTROPHOTOGRAPHIC COPYING APPARATUS. NOV. 6, 1962.
3,076,392.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 5, 1963. CAN. 0689623, FRA. 1271754, GER. 1209418, GRB. 0962654.
3,137,202.—OPTICAL SCANNING APPARATUS FOR XEROGRAPHIC PRINTERS. JUNE 16, 1964. CAN. 0685880.
3,221,622.—OPTICAL SCANNING SYSTEM. DEC. 7, 1965. ADN. 0000471, ARG. 0150818, ATR. 0267325, AUS. 0402541, BEL. 0657557, BRS. 0033737, BRU. 0000469, CAN. 0756354, EIR. 0028649, FIJ. 0000342, FIN. 0045258, FRA. 1420763, GER. 1497089, GHA. 0000994, GIB. 1089536, GIE. 0006969, GRB. 1089536, GRK. 0029663, GUR. 1089536, HGK. 0009169, HOL. 0146615, ISR. 0022618, ITL. 0742392, JAP. 0599246, JER. 0000P96, KEN. 0001744, LXB. 0047657, MAU. 1927571, MLS. 0015069, NIG. 0001619, NOR. 0118726, NZL. 0140371, PTG. 0043364, SAF. 0646113, SBH. 0005269, SGP. 0008269, SHL. 0000017, SLN. 2677286, SPN. 0307501, SRK. 0000389, STZ. 0450920, SWD. 0338716, UGD. 0000269.
3,318,186.—OPTICAL SYSTEM FOR REPRODUCTION MACHINES. MAY 9, 1967. CAN. 0798356, FRA. 1467332, GRB. 1139231, ITL. 0758313, JAP. 0512656, MEX. 0085288, SWD. 6912062.
3,381,573.—SCANNING ATTACHMENT. MAY 7, 1968. CAN. 0820036, GER. 1945460, GRB. 1134645, JAP. 0524529.
3,405,564.—PULLEY. OCT. 15, 1968. CAN. 0850353.
3,454,335.—SCANNING SYSTEM. JULY 8, 1969. BEL. 0708647, CAN. 0853453, FRA. 1549127, GRB. 1207850, ITL. 0819656, JAP. 0591210.
3,484,163.—SCANNING SYSTEM. DEC. 16, 1969. CAN. 0840630.
3,504,969.—IMAGING APPARATUS. APR. 7, 1970.
3,512,886.—DUAL CARRIAGE SCANNING SYS. MAY 19, 1970. CAN. 0875712, GRB. 1235136.
3,523,725.—XEROGRAPHIC REPRODUCING APPARATUS. AUG. 11, 1970. CAN. 0917730, GRB. 1271862.
3,532,425.—GRAPHIC DISTORTION APPARATUS. OCT. 6, 1970.
3,552,221.—SPEED CONVERTING MECHANISM. JAN. 5, 1971.
3,591,277.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 6, 1971. AUS. 0428584, BEL. 0723949, CAN. 0869628, CZC. 0157352, FRA. 1591801, GER. 0989774, GRB. 1223429, ITL. 0856815, SWD. 0348060, USR. 0465805.
3,612,679.—SCANNING APPARATUS. OCT. 12, 1971. GRB. 1307918.
3,671,237.—METHOD FOR PRODUCING IMAGES. JUNE 20, 1972. CAN. 0886492, GRB. 1317043.
3,794,418.—IMAGING SYSTEM. FEB. 26, 1974.

3,832,057.—SCANNING APPARATUS. AUG. 27, 1974. GRB. 1417255.
3,858,976.—OPTICAL SCANNING SYSTEM. JAN. 7, 1975.
3,869,204.—SCANNING OPTICAL SYSTEM. MAR. 4. 1975. BEL. 0815215.
3,905,247.—CLUTCHES. SEPT. 16, 1975.
3,918,806.—DASHPOT FOR COPIER OPTICAL SCANNING. NOV. 11, 1975.
3,936,173.—OPTICAL SYSTEM. FEB. 3, 1976.
3,948,374.—CLUTCHES. APR. 6, 1976.
3,950,091.—APPARATUS FOR CONTROLLING MOVEMENT OF A CARRIAGE. APR. 13, 1976.
3,973,825.—FLAT FIELD SCANNING SYSTEM. AUG. 10, 1976. BEL. 0836735.
3,989,369.—SCANNING MECHANISM FOR A COPYING APPARATUS. NOV. 2, 1976.
4,027,961.—COPIER/RASTER SCAN APPARATUS. JUNE 7, 1977.
4,032,231.—MULTIPLE RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE USING THREE-DIMENSIONAL CAM. JUNE 28, 1977. BEL. 0843419.
4,054,359.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR USING PULLEYS. OCT. 18, 1977.
4,066,353.—HALF TONE IMAGING SYSTEM. JAN. 3, 1978.
4,067,640.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR. JAN. 10, 1978.
4,068,940.—VARIABLE CONTRAST OPTICAL SCREENING SYSTEM. JAN. 17, 1978.
4,068,950.—VARIABLE PLATEN COVER. JAN. 17, 1978.
4,070,089.—TWO DIMENSIONAL LASER SCANNER WITH MOVABLE CYLINDER LENS. JAN. 24, 1978.
4,093,374.—MULTIPLE RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE. JUNE 6, 1978. BEL. 843419, GRB. 1500877, SPN. 449267.
4,095,880.—EXTENDED RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE. JUNE 20, 1978. BEL. 843419, GRB. 1500877, SPN. 449267.
4,143,311.—HYSTERESIS SYNCHRONOUS MOTOR RATE SERVO SYSTEM. MAR. 6, 1979.
4,161,359.—APPARATUS FOR SYNCHRONIZING MOVEMENT BETWEEN AN OPTICAL SCANNING SYSTEM AND AN IMAGING MEMBER. JULY 17, 1979.

Class 4B 1A

3,139,013.—DOCUMENT REPRODUCING APPARATUS. JUNE 30, 1964. CAN. 0727819, FRA. 1346596, GRB. 1016265, JAP. 0442652.
3,330,190.—PRINTING APPARATUS. JULY 11, 1967. CAN. 0758791, GER. 1280282, GRB. 1102419, JAP. 0529726.
3,438,704.—ILLUMINATION CONTROL SYSTEM. APR. 15, 1969. CAN. 0865838, GRB. 1209473, JAP. 1002842.
3,485,546.—FIELD FLATTENER SCANNING MEANS. DEC. 23, 1969. CAN. 0850916, GRB. 1196373, JAP. 0667705.
3,504,960.—SAGITTAL RAY APERTURE STOP. APR. 7, 1970. AUS. 0413558, BEL. 0704924, CAN. 0849815, FRA. 1540700, GRB. 1209472, ITL. 0814606, JAP. 0972613.
3,524,704.—MULTI-LENGTH DOCUMENT RECORDING APPARATUS. AUG. 18, 1970.
3,542,467.—XEROGRAPHIC REPRODUCING APPARATUS. NOV. 24, 1970. ARG. 0180116. AUS. 0442029, BEL. 0731552, BRA. 6908056, CAN. 0877451, FRA. 6911558, GRB. 1257103, ITL. 0857659, JAP. 0668806, MEX. 0108892, SPN. 0366056, SWD. 0346397, VZL. 0023746.
3,592,531.—SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM. JULY 13, 1971. CAN. 0929389.
3,640,615.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 8, 1972. ARG. 0174792, AUS. 0428440, BEL. 0723948, CAN. 0884439, FRA. 1596660, GRB. 1223428, ITL. 0847541, JAP. 0992414, MEX. 0108966, PNM. 0001806, SPN. 0360210, SWD. 0352456, VZL. 0023711.
3,652,157.—MICROFILM PROJECTION APPARATUS. MAR. 28, 1972. CAN. 0937797, GRB. 1324097.
3,655,284.—LONGITUDINALLY INSENSITIVE LENS STRIP IMAGING DEVICE. APR. 11, 1972.
3,670,633.—RECORDING APPARATUS. JUNE 20, 1972.
3,778,147.—ELECTROSTATIC REPRODUCTION MACHINE HAVING SLEECTSBLE MAGNIFICATION-RATIOS. DEC. 11, 1973. CAN. 989464.
3,788,740.—IMAGING SYSTEM. JAN. 29, 1974.
3,975,289.—CHARGE TRANSFER COMPLEXEX OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
3,994,580.—OPTICAL SYSTEM FOR SCANNING DURING RECIPROCAL MOTION. NOV. 30, 1976.
4,008,958.—OPTICAL SYSTEM FOR EFFECTED IMAGE ROTATION. FEB. 22, 1977.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.
4,029,409.—MULTI-MODE OPTICAL SCANNING SYSTEM. JUNE 14, 1977. BEL. 0843153, HAT. 0001524.
4,088,401.—OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE I. MAY 9, 1978.
4,103,991.—OPTICAL SYSTEM FOR SCANNING DURING RECIPROCAL MOTION PROVIDING 180 ROTATION OF IMAGE. AUG. 1, 1978.
4,134,670.—HIGH CAPACITY PHOTOCOPY OPTICAL SCANNING SYSTEM. JAN. 16, 1979.
4,195,928.—TWO DIRECTION SCAN SORTING TECHNIQUE. APR. 1, 1980.

Class 4B 1A 1

3,544,190.—LENS STRIP OPTICAL SCANNING SYSTEM. DEC. 1, 1970. CAN. 0904070, GRB. 1278336.
3,584,950.—LENS STRIP OPTICAL SCANNING SYSTEM. JUNE 15, 1971.
3,584,952.—LENS STRIP OPTICAL SCANNING SYSTEM - REISSUED D 2074R. JUNE 15, 1971.
3,584,953.—SHORT FOCAL OPTICAL LENGTH SCANNING SYSTEM. JUNE 15, 1971.
3,650,621.—OPTICAL IMAGING SYSTEM. MAR. 21, 1972. BEL. 0747978, CAN. 0927470, FRA. 7011548, GRB. 1297907, ITL. 0898936, JAP. 0731225.
3,881,369.—BI-AXIAL POSITIONER. MAY 6, 1975.
3,912,392.—SHORT FOCAL LENGTH OPTICAL SCANNING SYSTEM. OCT. 14, 1975.

Class 4B 1A 2

3,496,846.—SCRIPTWRITER USING FIBER OPTIC BUNDLE. FEB. 24, 1970.
3,560,085.—APPARATUS FOR GRAPHIC DISTORATION. FEB. 2, 1971.
3,681,777.—RECORDING APPARATUS. AUG. 1, 1972.

Class 4B 1A 3

3,120,790.—XEROGRAPHIC EXPOSURE APPARATUS. FEB. 11, 1964. AUS. 0270483, FRA. 1333280, GER. 1204066, GRB. 1019291, ITL. 0674895, JAP. 0468454.
3,497,296.—XEROGRAPHIC EXPOSURE APPARATUS. FEB. 24, 1970.
3,535,036.—APPARATUS FOR FORMING HALF-TONE LINE SCREEN WITH A LENS. OCT. 20, 1970. CAN. 0909309, GRB. 1253887.
3,540,806.—HALF TONING METH AND APPARATUS FOR SOLID AREA COVERAG. NOV. 17, 1970. CAN. 0892754, GRB. 1253888.
3,580,671.—EXPOSURE APPARATUS. MAY 25, 1971. CAN 0912104, GRB. 1276010.
3,905,822.—COMPOUND SCREEN FOR OBJECT SCREENING. SEPT. 16, 1975.
3,912,510.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A COMPOUND DOCUMENT SCREEN OCT. 14, 1975.
3,914,040.—REVERSIBLE SCREEN FOR ELECTROPHOTOGRAPHIC PRINTING. OCT. 21, 1975.
3,958,877.—HALF-TONE SCREEN WITH CLEANING MEANS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAY 25, 1976
3,961,847.—AN ARCUATE SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 8, 1976.
3,961,848.—AN ELECTROPHOTOGRAPHIC PRINTING MACHINE WITH HALFTONE SCREEN CLEANING JUNE 8, 1976.
3,963,342.—CURVED SCREEN. JUNE 15, 1976
3,973,953.—IMAGING METHOD INCLUDING EXPOSURE OF PHOTOCONDUCTIVE IMAGING MEMBER THROUGH LENTICULAR LENS ELE. AUG 10, 1976 STZ. 0557051.
3,973,954.—IMAGING METHOD INCLUDING EXPOSURE OF PHOTOCONDUCTIVE IMAGING MEMBER THROUGH LENTICULAR LENS ELE. AUG 10, 1976 STZ. 0557051.
3,973,957.—IMAGING METHOD INCLUDING EXPOSURE OF DEFORMATION IMAGING MEMBER THROUGH LENTICULAR LENS ELEMENT AUG 10, 1976.
3,973,958.—IMAGING METHOD INCLUDING EXPOSURE OF DEFORMATION IMAGING MEMBER THROUGH LENTICULAR ELEMENT. AUG 10, 1976
4,003,649.—ELECTROPHOTOGRAPHIC HALFTONE PRINTING MACHINE EMPLOYING A PHASE SCREEN. JAN. 18, 1977.
4,007,981.—DUAL MODE ELECTROSTATOGRAPHIC PRINTING MACHINE. FEB. 15, 1977

4,012,137.—AN OPTICAL SYSTEM HAVING A ROTATING SCREEN. MAR. 15, 1977.
4,013,355.—NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES. MAR. 22, 1977.
4,014,030.—HALF-TONE IMAGING WITH FLYING SPOT SCANNER SYSTEM. MAR. 22, 1977.
4,014,607.—REMOVABLE SCREENING SYSTEM FOR A TRANSPARENCY REPRODUCTION MACHINE. MAR. 29, 1977.
4,025,181.—A SCREEN CLEANING DEVICE. MAY 24, 1977.
4,035,070.—APPARATUS AND METHOD FOR OPTICAL GENERATION OF A STRUCTURED CHARGE-DISCHARGE PATTERN ON A PHOTO. JULY 12, 1977.
4,047,810.—DUAL MODE COPYING MACHINE. SEPT. 13, 1977.
4,072,414.—SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. FEB. 7, 1978.
4,080,055.—A HALF-TONE COLOR COPIER. MAR. 21, 1978.
4,083,632.—MULTI FREQUENCY SCREEN. APR. 11, 1978.
4,090,786.—MULTI-COLOR SCREEN FOR ELECTROPHOTOGRAPHIC PRINTING. MAY 23, 1978.
4,095,889.—EXPOSURE SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 20, 1978.
4,108,654.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A DOCUMENT SCREEN. AUG. 22, 1978. FRA. 7514227. GRB. 1490898.
4,111,542.—COLLATING SYSTEM FOR OPAQUE DOCUMENTS AND SLIDE REPRODUCTIONS. SEPT. 5, 1978.
4,130,841.—VARIABLE FREQUENCY HALF-TONE IMAGING APPARATUS. DEC. 19, 1978.

Class 4B 1A 4

3,424,525.—MICROFILM COPIER ATTACHMENT. JAN. 28, 1969.
3,542,468.—MICROFILM ENLARGER-COPIER - MICROFILM ATTACHMENT. NOV. 24, 1970. CAN. 0858250.
3,547,533.—MICROFILM REPRODUCTION MACHINE. DEC. 15, 1970. BEL. 0689227. CAN. 0891072. FRA. 1498788, GRB. 1160904, ITL. 0794772, MEX. 0095144.
4,046,473.—PHOTORECEPTOR METHOD AND SYSTEM. SEPT. 6, 1977.

Class 4B 2

3,220,324.—PHOTOCONDUCTIVELY CONTROLLED CORONA CHARGING. NOV. 30, 1965. CAN. 0710976, GER. 1243967, GRB. 1034009, JAP. 0651092.
3,254,998.—INDUCTION IMAGE FORMATION. JUNE 7, 1966. CAN. 0740576, FRA. 1357220, GER. 1276445, GRB. 1024985, JAP. 0451689.
3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.
3,394,002.—CHARGE TRANSFER WITH LIQUID LAYERS. JULY 23, 1968. CAN. 0840028, GRB. 1126048, JAP. 0524527.
3,698,807.—DISPLAYING AND PRINTING APPARATUS. OCT. 17, 1972. CAN. 0963521, GRB. 1376814.

Class 4B 3

3,283,651.—INFORMATION ENCODING DEVICE. NOV. 8, 1966. CAN. 0859923, GRB. 1096645, JAP. 0547197.
3,532,425.—GRAPHIC DISTORTION APPARATUS. OCT. 6, 1970.
3,560,085.—APPARATUS FOR GRAPHIC DISTORATION. FEB. 2, 1971.
3,584,950.—LENS STRIP OPTICAL SCANNING SYSTEM. JUNE 15, 1971.
3,584,953.—SHORT FOCAL OPTICAL LENGTH SCANNING SYSTEM. JUNE 15, 1971.
3,725,059.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC SURFACE. APR. 3, 1973. GRB. 1337282.
3,862,801.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC IMAGING SURFACE. JAN. 28, 1975. GRB. 1337282.
4,066,353.—HALF TONE IMAGING SYSTEM. JAN. 3, 1978.
4,068,940.—VARIABLE CONTRAST OPTICAL SCREENING SYSTEM. JAN. 17, 1978.

Class 4B 4

3,283,651.—INFORMATION ENCODING DEVICE. NOV. 8, 1966. CAN. 0859923, GRB. 1096645, JAP. 0547197.
3,432,231.—EXPOSURE CONTROL DEVICE. MAR. 11, 1969.
3,473,455.—EXPOSURE REGISTRATION APPARATUS. OCT. 21, 1969.
3,521,950.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 28, 1970. ARG. 0184148, ATR. 0317675, AUS. 0441739, BEL. 0713876, CAN. 0877511, CHL. 0024535, DNK. 0129304, FRA. 1558225, GRB. 1231622, GRK. 0037839, IND. 0124668, ISR. 0029824, ITL. 0831700, JAM. 0001853, JAP. 0774498, LXB. 0055912, MEX. 0102085, NOR. 0131313, NZL. 0159801, PRU. 0009366, PTG. 0049474, SAF. 68/2518, SPN. 0352885, STZ. 0505015, SWD. 7012263, UAR. 0008668, URG. 0009239, VZL. 0025077.
3,586,849.—ILLUMINATION SYSTEM. JUNE 22, 1971. ARG. 0183139, ATR. 0303522, AUS. 0428629, BEL. 0733400, BRA. 6908480, CAN. 0903730, CHL. 0024870, FRA. 6917011, GRB. 1260688, ITL. 0864185, MEX. 0111515, NOR. 0125954, NZL. 0156507, PNM. 0001430, PRU. 0010320, PTG. 0051752, SAF. 0693689, SPN. 0367616, STZ. 0758269, SWD. 0354924, VZL. 0025067.
3,697,160.—CONTINUOUS IMAGING APPARATUS. OCT. 10, 1972.
3,995,950.—EXPOSURE SYSTEM FOR ELECTROSTATIC MACHINES. DEC. 7, 1976.
4,111,541.—EXPOSURE SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES. SEPT. 5, 1978.

Class 4B 5

3,212,417.—REFLEX EXPOSURE SYSTEM. OCT. 19, 1965. CAN. 0733682, GRB. 1052783, JAP. 0487026.
3,278,302.—PHOSPHORESCENT SCREEN REFLEX. OCT. 11, 1966. CAN. 0748828.

Class 4B 6

3,355,236.—AUTOMATIC OPTICAL CONTROL APPARATUS. NOV. 28, 1967. CAN. 0771917.
3,542,467.—XEROGRAPHIC REPRODUCING APPARATUS. NOV. 24, 1970. ARG. 0180116, AUS. 0442029, BEL. 0731552, BRA. 6908056, CAN. 0877451, FRA. 6911558, GRB. 1257103, ITL. 0857659, JAP. 0668806, MEX. 0108892, SPN. 0366056, SWD. 0346397, VZL. 0023746.
3,765,027.—ION LENS RECORDING SYSTEM. OCT. 9, 1973.
3,848,996.—PHOTOCOMPOSING APPARATUS. NOV. 19, 1974. BEL. 0815043.
3,901,585.—ZOOM LENS ASSEMBLY. AUG. 26, 1975. GRB. 1443481.
3,909,103.—LENS SCAN MECHANISM. SEPT. 30, 1975.
3,947,188.—VARIABLE CONJUGATE OPTICAL SYSTEM. MAR. 30, 1976.
3,967,896.—VARIABLE EDGE FADEOUT APP FOR ELECTROSTATIC REPRODUCTION MACHINE. JULY 6, 1976.
3,998,540.—REPOSITIONING SYSTEM FOR VIEWING AND PROJECTION ELEMENTS OF A REPRODUCING APPARATUS. DEC. 21, 1976.
4,013,361.—OPTICAL APP AND REPRODUCING MACHINE. MAR. 22, 1977. BEL. 0843158.
4,027,963.—MULTI-MODE REPRODUCING APPARATUS. JUNE 7, 1977. BEL. 0843154, HAT. 0001534.
4,029,411.—VARIABLE MAGNIFICATION COPIER. JUNE 14, 1977. BEL. 0839792, SPN. 0445641.
4,033,691.—VARIABLE MAGNIFICATION REPRODUCING APPARATUS. JULY 5, 1977.
4,033,692.—MULTI-MODE REPRODUCING MACHINE. JULY 5, 1977. HAT. 0001504.
4,046,467.—ZOOM LENS COPIER. SEPT. 6, 1977.
4,053,221.—MULTI-MODE REPRODUCING APPARATUS. OCT. 11, 1977.
4,060,324.—LENS SWITCHING MECHANISM FOR USE IN COPYING MACHINE. NOV. 29, 1977.
4,076,388.—ZOOM LENS ASSEMBLY. FEB. 28, 1978. GRB. 1443481.
4,076,416.—ILLUMINATION SLIT FOR AND A PROCESS OF USE THEREOF IN A REPRODUCING MACHINE. FEB. 28, 1978. HAT. 1584.
4,076,417.—INTERLOCKING APPARATUS FOR AN OPTICAL SYSTEM AND REPRODUCING MACHINE. FEB. 28, 1978. HAT. 1604.
4,101,213.—ZOOM LENS COPIER. JULY 18, 1978.

Class 4B 6A

3,318,186.—OPTICAL SYSTEM FOR REPRODUCTION MACHINES. MAY 9, 1967. CAN. 0798056, FRA. 1467332, GRB. 1139231, ITL. 0758313, JAP. 0512656, MEX. 0085288, SWD. 6912062.
3,454,335.—SCANNING SYSTEM. JULY 8, 1969. BEL. 0708647, CAN. 0853453, FRA. 1549127, GRB. 1207850, ITL. 0819656, JAP. 0591210.

3,476,478.—APPARATUS FOR CHANGING MAGNIFICATION OF PHOTOCOPIER W/O CHANGING CONJUGATE LENGTH OF OPTICAL SY. NOV. 4, 1969. ARG. 0172460, AUS. 0415808, BEL. 0708650, BRA. 6795668, CAN. 0845405, FRA. 1552364, GER. 1297981, GRB. 1223427, ITL. 0821929, MEX. 0100019, VZL. 0023689.
3,510,219.—OPTICAL ALIGNMENT SYSTEM. MAY 5, 1970. ARG. 0172455, BRA. 6793791, CAN. 0881018, CHL. 0023570, GRB. 1206966, MEX. 0101166, PRU. 0009329, SPN. 0360896, STZ. 0501233, SWD. 0359168, URG. 0008831, VZL. 0025783.
3,521,950.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 28, 1970. ARG. 0184148, ATR. 0317675, AUS. 0441739, BEL. 0713876, CAN. 0877511, CHL. 0024535, DNK. 0129304, FRA. 1558225, GRB. 1231622, GRK. 0037839, IND. 0124668, ISR. 0029824, ITL. 0831700, JAM. 0001853, JAP. 0774498, LXB. 0055912, MEX. 0102085, NOR. 0131313, NZL. 0159801, PRU. 0009366, PTG. 0049474, SAF. 68/2518, SPN. 0352885, STZ. 0505015, SWD. 7012263, UAR. 0008668, URG. 0009239, VZL. 0025077.
3,524,704.—MULTI-LENGTH DOCUMENT RECORDING APPARATUS. AUG. 18, 1970.
3,591,256.—VARIABLE MAGNIFICATION LENS SYSTEM. JULY 6, 1971. BEL. 0731553, CAN. 0881019, FRA. 6911559, GRB. 1234515, ITL. 0857660.
3,591,277.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 6, 1971. AUS. 0428584, BEL. 0723949, CAN. 0869628, CZC. 0157052, FRA. 1591801, GER. 0989774, GRB. 1223429, ITL. 0856815, SWD. 0348060, USR. 0465805.
3,600,066.—OPTICAL ASSEMBLY WITH SUPPLEMENTAL LENS MEANS. AUG. 17, 1971. CAN. 0943792, GRB. 1261159, JAP. 0728824.
3,817,599.—PROJECTION LENS WITH ADD LENS ELEMENTS. JUNE 18, 1974.
3,912,374.—SIX COMPONENT ZOOM LENS. OCT. 14, 1975.
4,047,811.—AVAILABLE LIGHT MARGINAL ILLUMINATION SYSTEM. SEPT. 13, 1977.
4,056,308.—VARIABLE FOCAL LENGTH REFLECTOR LENS SYSTEM. NOV. 1, 1977.
4,057,342.—ILLUMINATION SLIT FOR A REPRODUCING MACHINE. NOV. 8, 1977.
4,061,419.—VARIABLE MAGNIFICATION LENS SYSTEM. DEC. 6, 1977.
4,076,389.—ZOOM LENS MOUNT AND MECHANISM. FEB. 28, 1978.

Class 4B 7

3,470,797.—DISPLAY DEVICE. OCT. 7, 1969.
3,472,136.—CHARACTER GENERATOR. OCT. 14, 1969. CAN. 0884500, GRB. 1191881.
3,473,455.—EXPOSURE REGISTRATION APPARATUS. OCT. 21, 1969.
3,523,725.—XEROGRAPHIC REPRODUCING APPARATUS. AUG. 11, 1970. CAN. 0917730, GRB. 1271862.
3,615,132.—METHOD OF PRINTING MULTIPLE COPIES OF COMPOSITE INFORMATION ON STANDARD SIZE COPY SHEETS. OCT. 26, 1971.
3,620,618.—MULTIPLE INPUT COPYING APPARATUS. NOV. 16, 1971.
3,775,007.—FORMS REPRODUCTION APPARATUS. NOV. 27, 1973.
3,827,062.—OPTICAL ARRANGEMENT FOR HIGH SPEED PRINTOUT SYSTEM. JULY 30, 1974.
4,157,869.—TRANSPARENCY REPRODUCING MACHINE. JUNE 12, 1979.

Class 4C

3,188,208.—SPECTRAL CONTRAST CONTROL IN XEROGRAPHY. JUNE 8, 1965.
3,432,232.—ILLUMINATION SYSTEM. MAR. 11, 1969. CAN. 0846423, JAP. 0534763.
3,438,705.—AUTOMATIC XEROGRAPHIC DEVELOPMENT CONTROL. APR. 15, 1969. GRB. 1207830.
3,852,782.—IMAGING SYSTEM. DEC. 3, 1974.
3,901,189.—MAGNETIC BRUSH DEVELOPING APPARATUS. AUG. 26, 1975.
3,917,393.—VARIOSLIT. NOV. 4, 1975. BEL. 0820132.
3,970,382.—A SPATIALLY SELECTIVE OPTICAL SYSTEM. JULY 20, 1976. FRA. 7421348.
3,975,289.—CHARGE TRANSFER COMPLEXE OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
3,997,259.—APPARATUS FOR REDUCING IMAGE BACKGROUND IN ELECTROSTATIC REPRODUCTION MACHINES. DEC. 14, 1976.
4,007,326.—ELECTRONIC COPY ANALYSIS. FEB. 8, 1977.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.
4,066,351.—VARIABLE ILLUMINATION OPTICAL SYSTEM. JAN. 3, 1978.
4,118,122.—METHOD OF RENDERING OBJECTS UNCOPYABLE BY PHOTOCOPY PROCESSES. OCT. 3, 1978.
4,162,845.—COPIER FOR GREATER THAN STANDARD LENGTH DOCUMENTS. JULY 31, 1979.

Class 5

3,942,266.—METHOD AND APPARATUS FOR FIXING TONER IMAGES. MAR. 9, 1976.
4,043,052.—METHOD AND APPARATUS FOR FIXING TONER IMAGES. AUG. 23, 1977.

Class 5A 1

3,094,248.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 18, 1963. CAN. 0678004, GRB. 0985306.
3,276,426.—CLOSED AEROSOL DEVELOPMENT. OCT. 4, 1966.
3,518,969.—DEVELOPMENT APPARATUS. JULY 7, 1970. CAN. 0852127, GRB. 1259879.
3,791,730.—APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES. FEB. 12, 1974.
3,795,443.—XEROGRAPHIC DEVELOPMENT. MAR. 5, 1974. GRB. 1255568, JAP. 0721852.
4,096,826.—MAGNETIC BRUSH DEVELOPMENT SYSTEM FOR FLEXIBLE PHOTORECEPTORS. JUNE 27, 1978.

Class 5A 1A

3,129,113.—AUTOMATIC POWDER APPLICATOR APPARATUS. APR. 14, 1964.
3,640,246.—DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGE. FEB. 8, 1972. ATR 0319044, AUS. 0457007, BEL. 0758632, CAN. 0917404, FRA. 7042231, GRB. 1336741, ITL. 0909113, JAP. 0815548, SPN. 0385187, STZ. 0527453, SWD. 0363411, USR. 0505386.
3,646,910.—DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGES. MAR. 7, 1972.
3,924,568.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. DEC. 9, 1975. BEL. 0809747, GRB. 1434673.
3,974,796.—DUAL MODE APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. AUG. 17, 1976.
4,033,292.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. JULY 5, 1977.

Class 5A 2

3,160,524.—APPARATUS FOR CHARGING POWDER PARTICLES AND APPLYING THE CHARGED PARTICLES TO A RECEIVING MEMBER. DEC. 8, 1964 CAN. 0779861, GRB. 1026457.
3,257,223.—ELECTROSTATIC POWDER CLOUD XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. JUNE 21, 1966. CAN. 0756559, GRB. 1028900, JAP. 0460474.
3,284,224.—CONTROLLED XEROGRAPHIC DEVELOPMENT. NOV. 8, 1966. CAN. 0751349, GRB. 1038801, JAP. 0640353.
3,357,403.—POWDER CLOUD DEVELOPMENT APPARATUS. DEC. 12, 1967.
3,470,009.—POWDER CLOUD DEVELOPMENT OF ELECTROSTATIC IMAGES SEPT. 30, 1969. CAN 0820240, FRA. 1461941, GRB. 1130452, HOL. 0142253, ITL. 0750148, JAP. 0512653, MEX. 0085176.
3,707,390.—METHOD FOR DEVELOPING ELECTROSTATIC LATENT IMAGES. DEC 26, 1972.
3,767,446.—DEVELOPMENT METHOD WITH OSCILLATING BRUSH PAD. OCT. 23, 1973.

Class 5A 3

RE.28,183.—POWDER CLOUD. OCT. 1, 1974. ARG 0119221, BEL. 0764300, CAN. 0939137, FRA. 7110037, GRB 1351471, ITL. 0921294, MEX. 0119823, VZL. 0032790.
RE.28,193.—POWDER CLOUD XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 8, 1974. ARG 0119221, BEL. 0764300, CAN. 0939137, FRA. 7110037, GRB 1351471, ITL. 0921294, MEX. 0119823, VZL. 0032790.
3,129,850.—POWDER CLOUD GENERATING APPARATUS. APR. 21, 1964. CAN. 0693933, GER. 1497044, GRB 1001237, JAP. 0436042.
3,648,901.—POWDER CLOUD XEROGRAPHIC DVLMNT APP-REISSUED AS 28183 AND 28193 10/74. MAR 14,

1972. ARG. 0119221, BEL. 0764300, CAN. 0939137, FRA. 7110037, GRB. 1351471, ITL. 0921294, MEX. 0119823, VZL. 0032790.

3,799,113.—HYBRID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE. MAR. 26, 1974. CAN. 0980634, GRB. 1411708.

4,057,340.—SINGLE COMPONENT COLOR DEVELOPMENT SYSTEM. NOV. 8, 1977.

Class 5A 3A

3,060,131.—POWDER CLOUD GENERATING APPARATUS. OCT. 23, 1962.

Class 5A 3B

3,599,604.—XEROGRAPHIC DEVELOPMENT APPARATUS. AUG. 17, 1971. ARG. 0187552, ATR. 0300574, AUS. 0427548, BEL. 0726572, BUL. 0017289, CAN. 0882577, DNK. 0122194, EGR. 0074431, EIR. 0032989, FRA. 1597322, GRB. 1248671, GRK. 0039920, IND. 0120485, ISR. 0031892, ITL. 0854007, LXB. 0058261, MEX. 0108936, NZL. 0155879, PAK. 0121035, PLP. 0006856, PNM. 0001804, PTG. 0051418, RHD. 1406967, RMN. 0054927, SAF. 0069181, SPN. 0362359, STZ. 0493015, UAR. 0009253, VTM. 0001857, VZL. 0023728.

3,633,544.—TURBO-CLOUD DEVELOPMENT. JAN. 11, 1972. CAN. 0934959, GRB. 1322363, JAP. 0741518.

3,670,701.—TWO STEP ORBITAL PAD DEVELOPMENT. JUNE 20, 1972. CAN. 0092849, GRB. 1313870, JAP. 0743834.

3,882,822.—APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE. MAY 13, 1975.

Class 5A 5

3,345,293.—COLORED ELECTROSTATOGRAPHIC TONERS CONTAINING ORGANIC DYE PIGMENTS. CAN. 0834674, GRB. 107147, JAP. 0788652.

3,483,679.—FILTER APPARATUS. DEC. 16, 1969. BEL. 0708648, CAN. 0853503, FRA. 1552363, ITL. 0837050.

3,697,263.—METHOD OF CLEANING RESIDUAL LIQUID DEVELOPER FROM ELECTROPHOTOGRAPHIC PLATES. OCT. 10, 1972. ARG. 0181940, AUS. 0455091, BEL. 0758060, CAN. 0906334, EGR. 0087483, FRA. 7041623, GRB. 1328406, ITL. 0916264, JAP. 0749381, MEX. 0116862, SPN. 0385000, STZ. 0519186, SWD. 0365624, TIW. 0006850, USR. 0349206, VZL. 0032211.

3,924,568.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. DEC. 9, 1975. BEL. 0809747, FRA. 7401161, GRB. 1434673, ITL. 1003370.

3,937,570.—CLOUD SUPPRESSION IN AN ELECTROSTATIC COPYING APPARATUS. FEB. 10, 1976. CAN. 0974751, GRB. 1396922.

Class 5B

3,103,445.—METHOD OF DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON A XEROGRAPHIC PLATE. SEPT. 10, 1963, GRB. CAN. 0705363, GRB. 0956358.

3,251,706.—XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. MAY 17, 1966. CAN. 0629542, FRA. 1120534, GER. 1020234, GRB. 0774433.

3,357,402.—ROTARY BRUSH DEVELOPMENT. DEC. 12, 1967. ARG. 0167329, ATR. 0279354, AUS. 0416581, BEL. 0708497, BRA. 0088306, CAN. 0859029, FRA. 1548189, GER. 1597901, GRB. 1200068, HUN. 0156541, ITL. 0819626, JAP. 0608703, MEX. 0106260, PLD. 0071357, SPN. 0348633, SWD. 0328190, VZL. 0023686.

3,542,466.—DEVELOPMENT APPARATUS. NOV. 24, 1970. AUS. 0428620, BEL. 0725611, CAN. 0884213, FRA. 1598505, GRB. 1203167, ITL. 0870661, JAP. 0641479, SPN. 0361653, SWD. 0343694.

3,558,339.—METHOD OF AND APPARATUS FOR STIPPLING. JAN. 26, 1971. CAN. 0871649, GRB. 1266969.

3,574,301.—DEVELOPING APPARATUS. APR. 13, 1971. AUS. 0449350, BEL. 0748073, CAN. 0873249, FRA. 7011549 GRB. 1303493, ITL. 0899146, JAP. 0715126, STZ. 0518579, SWD. 0356379, USR. 0331581.

3,592,167.—APPARATUS FOR LOADING TONER ON A DEVELOPING BRUSH. JULY 13, 1971.

3,613,638.—MATERIALS FOR FIBROUS DEVELOPMENT. OCT. 19, 1971. CAN. 0910736.

3,632,370.—MULTIPLE BRUSH DEVELOPMENT. JAN. 4, 1972.

3,636,924.—FUR BRUSH DEVELOPING APPARATUS. JAN. 25, 1972. CAN. 0912811, GRB. 1340060, JAP. 0751882.

3,638,613.—TONER DEVELOPER SYSTEM. FEB. 1, 1972. AUS. 0445403, BEL. 0747124, CAN. 0889762, EGR. 0081783, FRA. 7007651, GRB. 1294603, ITL. 0898243, SPN. 0377302, STZ. 0520960, SWD. 0354363, TIW. 0006827.

3,687,106.—DONOR APPARATUS AND METHOD. AUG. 29, 1972. ARG. 0185079, BEL. 0753207, CAN. 0911706, FRA. 7027124, GRB. 1314862, ITL. 0900444, JAP. 0733285, MEX. 0117318, PNM. 0002237, VZL. 0027517.

3,692,402.—MATERIALS FOR FIBROUS DEVELOPMENT AND CLEANING MEMBER. SEPT. 19, 1972.

3,847,306.—DEVELOPING APPARATUS. NOV. 12, 1974. CAN. 0966998, GRB. 1353651.

Class 5C

3,648,657.—ELECTROSTATIC IMAGE DEVELOPMENT APPARATUS. MAR. 14, 1972.

3,805,739.—CONTROLLING MULTIPLE VOLTAGE LEVELS FOR ELECTROSTATIC PRINTING. APR. 23, 1974. CAN. 0972552, GRB. 1382710.

3,854,449.—DEVELOPMENT APPARATUS. DEC. 17, 1974. ARG. 0195893, BEL. 0797447, CAN. 0982886, FRA. 7243003, GRB. 1435761, ITL. 0987768, MEX. 0130638, SAF. 0733407, SPN. 0414805, STZ. 0551030, SWD. 7307101, VZL. 0032067.

3,967,892.—A DEVELOPMENT SYSTEM. JULY 6, 1976.

3,981,272.—MAG BRUSH HOUSING WITH DETACHABLE SUMP SECTION. BEL. 0835755. SEPT. 21, 1976.

3,998,537.—SPLIT DEVELOPER HOUSING WITH INTERLOCKED FLOW GATE & CATCH. DEC. 21, 1976. BEL. 0835370.

4,027,621.—DEVELOPING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES. JUNE 7, 1977.

4,039,102.—DEVELOPER DOOR WITH USE COUNTER ON DOOR. AUG. 2, 1977.

4,095,883.—MAGNETIC MIXING APPARATUS AND PROCESS. JUNE 20, 1978.

4,118,115.—ROLL DEVELOPER DRIVE. OCT. 3, 1978.

4,146,323.—AUGER FOR A DEVELOPMENT SYSTEM. MAR. 27, 1979.

Class 5C 1

3,113,042.—XEROGRAPHIC APPARATUS WITH MAGNETIC CONVEYOR. DEC. 3, 1963. CAN. 0738917, GRB. 0987985.

3,176,652.—XEROGRAPHIC DEVELOPING APPARATUS. APR. 6, 1965. CAN. 0737851, GRB. 1018787, JAP. 0627140.

3,570,453.—DEVELOPMENT APPARATUS. MAR. 16, 1971. ARG. 0181813, AUS. 0429322, BEL. 0737102, CAN. 0885918, CZC. 0161861, EGR. 0081317, FRA. 6927184, GRB. 1256282, ITL. 0869726, JAP. 0716364, SPN. 0370289, STZ. 0496263, SWD. 0353165, TIW. 0005357, USR. 0380031.

3,572,288.—DEVELOPMENT APPARATUS. MAR. 23, 1971. CAN. 0885917.

3,572,289.—MAGNETIC BRUSH DEVELOPMENT APPARATUS. MAR. 3, 1971.

3,575,139.—ELECTROSTATIC MAGNETIC DEVELOPER UNIT GATING APPARATUS. APR. 20, 1971. CAN. 0930538.

3,583,364.—DEVELOPMENT APPARATUS. JUNE 8, 1971. BEL. 0738574, CAN. 0883725, FRA. 6930427, GRB. 1273187, ITL. 0871550, JAP. 0674394.

3,608,522.—XEROGRAPHIC DEVELOPMENT CONTROL APPARATUS. SEPT. 28, 1971. CAN. 0911704.

3,640,248.—ELECTROSTATIC MAGNETIC DEVELOPING APPARATUS—MULTIPLE MAGNETIC BRUSH UNIT. FEB. 8, 1972. ARG. 0184080, ATR. 0312419, AUS. 0437486, BEL. 0751486, BRA. 0088030, CAN. 0929337, CHL. 0026193, EGR. 0084331, FRA. 7020260, GRB. 1251477, ITL. 0893838, MEX. 0117951, NOR. 0133049, PNM. 0002537, SAF. 0703774, SPN. 0380378, STZ. 0509614, SWD. 0359664, TIW. 0007168, USR. 0499061, VZL. 0025834.

3,641,980.—DEVELOPMENT APPARATUS. FEB. 15, 1972. ARG. 0185081, AUS. 0445430, BEL. 0757698, CAN. 0913354, EGR. 0085713, FRA. 7038237, GRB. 1273456, ITL. 0909031, JAP. 0720627, MEX. 0118187, SPN. 0384576, STZ. 0516183, SWD. 0362510, TIW. 0006205.

3,665,891.—MAGNETIC BRUSH DEVELOPMENT APPARATUS. MAY 30, 1972. CAN. 0914904, GRB. 1347138, JAP. 783770.

3,683,406.—MAGNETIC INCREMENTAL CASCADE DEVELOPMENT SYSTEM. AUG. 8, 1972. CAN. 0945200, GRB. 1335995, JAP. 0752521.

3,690,912.—METHOD FOR MAGNETIC DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE. SEPT. 12, 1972.

3,697,050.—CROSS MIXING BAFFLE. OCT. 10, 1972. CAN. 0951110.

3,709,713.—METHOD FOR MAGNETIC DEVELOPMENT. JAN. 9, 1973.

3,724,422.—MAGNETIC BRUSH DEVELOPING APPARATUS. APR. 3, 1973. ARG. 0190744, AUS. 0457858, BEL. 0776598, CAN. 0951111, EGR. 0097962, FRA. 7145341, GRB. 1373010, ITL. 0943877, MEX. 0124647, SPN. 0397854, SWD. 0365880, USR. 0459904.

3,788,275.—MAGNETIC SHIELDING APPARATUS. JAN. 29, 1974. BEL. 0801242, CAN. 0973703, GRB. 1438332, ITL. 0990692.

3,828,728.—XEROGRAPHIC DEVELOPMENT SYSTEM. AUG. 13, 1974. BEL. 0791193, CAN. 0980635, FRA. 7240058, GRB. 1413337, ITL. 0970350, SWD. 7214311.

3,866,564.—MAGNETIC BRUSH DEVELOPING APPARATUS FOR COPIERS. FEB. 18, 1975.

3,872,830.—MAGNETIC BRUSH DEVELOPING APPARATUS. MAR. 25, 1975.

3,880,517.—REPRODUCTION MACHINE DEVELOPER APPARATUS. APR. 29, 1975.

3,880,518.—FLOATING DEVELOPER PLATEN FOR REPRODUCTION APPARATUS. APR. 29, 1975.

3,887,367.—METHOD FOR TEMPERATURE STABLIZING PHOTORECEPTORS. JUNE 3, 1975.

3,893,815.—MAGNETIC BRUSH SUPPORT MEMBER. JULY 8, 1975.

3,906,121.—ELECTROSTATIC DEVELOPMENT METHOD USING MAGNETIC BUSH CONFIGURATION TRANSPORT. SEPT. 16, 1975. CAN. 0970631, GRB. 1381049.

3,906,898.—MAGNETIC BRUSH DEVELOPING APPARATUS. SEPT. 23, 1975.

3,911,864.—TONER PRELOADED MAGNETIC BRUSH DEVELOPMENT SYSTEM. OCT. 14, 1975. BEL. 0809859, STZ. 0568594.

3,915,121.—DEVELOPMENT APPARATUS. OCT. 28, 1975

3,920,329.—BACKGROUND REMOVAL APPARATUS. NOV. 18, 1975.

3,921,577.—MAGNETIC DEVELOPMENT UNIT. NOV. 25, 1975.

3,926,516.—DEVELOPMENT APPARATUS FOR AN ELECTROSTATOGRAPHIC PRINTING MACHINE. DEC. 16, 1975.

3,927,640.—DEVELOPER SHUT-OFF APPARATUS. DEC. 23, 1975.

3,934,549.—TRANSFER APPARATUS. JAN. 27, 1976.

3,945,342.—MAGNETIC BRUSH SUPPORT MEMBER. MAR. 23, 1976.

3,948,217.—MAGNETIC BRUSH DEVELOPMENT SYSTEM WITH FLOATING DEVELOPMENT ROLLS. APR. 6, 1976. BEL. 0835370.

3,949,704.—MAGNETIC BRUSH DEVELOPING APPARATUS. APR. 13, 1976.

3,950,089.—COATED ROLL FOR MAGNETIC BRUSH DEVELOPMENT & CLEANING SYSTEMS. APR. 13, 1976.

3,953,121.—ARTICULATED DEVELOPMENT APPARATUS. APR. 27, 1976. IRN. 0013434.

3,962,003.—METHOD OF FORMING MAGNETIC BRUSH SUPPORT MEMBER. JUNE 8, 1976.

3,968,773. JULY 13, 1976.

3,982,498.—DEVELOPMENT APPARATUS. SEPT. 28, 1976. FRA. 7436713.

3,991,713.—DEVELOPMENT APPARATUS FOR AN ELECTROSTATOGRAPHIC PRINTING MACHINE. NOV. 16, 1976.

3,996,892.—SPATIALLY PROGRAMMABLE ELECTRODE TYPE ROLL FOR ELECTROSTATOGRAPHIC PROCESSORS AND THE LIKE. DEC. 14, 1976.

4,033,293.—A DEVELOPING DEVICE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 5, 1977.

4,033,294.—DEVELOPER MIXING AND TRANSPORTING AUGER FOR MAGNETIC BRUSH DEVELOPING APPARATUS. JULY 5, 1977.

4,034,709.—AN IMPROVED DEVELOPER ROLL. JULY 12, 1977.

4,044,719.—DEVELOPING APPARATUS IN ELECTROCOPYING MACHINES. AUG. 30, 1977.

4,050,413.—MAGNETIC BRUSH CROSSMIXING SYSTEM. SEPT. 27, 1977.

4,057,666.—MAGNETIC BRUSH DEVELOPER ROLL FOR ELECTROSTATIC REPRODUCTION MACHINES. NOV. 8, 1977.

4,077,358.—DEACTIVATING DEVICE FOR A MAGNETIC BRUSH DEVELOPER USED IN A MULTICOLOR ELECTROPHOTOGRAPHIC. MAR. 7, 1978.

4,078,520.—VIBRATING SCREEN FILTER FOR TONER DENSITY MEASURING APPARATUS. MAR. 14, 1978.

4,084,542.—POSITIONING APPARATUS FOR MAGNETIC BRUSH DEVELOPING DEVICE. APR. 18, 1978.

4,086,006.—PURGING SYSTEM FOR A DEVELOPMENT APPARATUS. APR. 25, 1978.

4,096,826.—MAGNETIC BRUSH DEVELOPMENT SYSTEM FOR FLEXIBLE PHOTORECEPTORS. JUNE 27, 1978.

4,098,228.—HIGH SPEED MAGNETIC BRUSH DEVELOPMENT SYSTEM. JULY 4, 1978.

4,116,555.—BACKGROUND REMOVAL APPARATUS. SEPT. 26, 1978.

4,117,803.—DEVELOPER FLOW REGULATOR FOR A MAGNETIC BRUSH DEVELOPING DEVICE. OCT. 3, 1978.

4,118,115.—ROLL DEVELOPER DRIVE. OCT. 3, 1978.

4,127,327.—APPARATUSES INCORPORATING A COMPOSITE SUPPORT MEMBER. NOV. 28, 1978.

4,131,357.—SEQUENTIALLY ACTIVATED DEVELOPMENT SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTER. DEC. 26, 1978.

4,155,329.—MAGNETIC BRUSH DEVELOPING DEVICE. MAY 22, 1979.

Class 5C 1A

3,584,601.—MAGNETIC BRUSH BELT DEVELOPMENT. JUNE 15, 1971. CAN. 0884799, GRB. 1238277.

3,592,166.—APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES. JULY 13, 1971. CAN. 0887598, GRB. 1275822, JAP. 1162298.

3,638,614.—ELECTROSTATIC LATENT IMAGE DEVELOPMENT APPARATUS. FEB. 1, 1972. CAN. 0929338, GRB. 1304236, JAP. 0808219.

3,741,790.—METHOD FOR MAGNETICALLY DEVELOPING ELECTROSTATIC IMAGES. JUNE 26, 1973.

3,823,688.—MAGNETIC BRUSH ASSEMBLY. JULY 16, 1974. BEL. 0794507, CAN. 0989607, FRA 7302247, GRB 1394502, SWD 7301014.

3,965,862.—XEROGRAPHIC DEVELOPMENT SYSTEM. JUNE 29, 1976.

Class 5C 1B

3,532,071.—DEVELOPMENT APPARATUS. OCT. 6, 1970 CAN. 0883763, GRB. 1227549, JAP. 0650630.

3,552,355.—DEVELOPMENT APPARATUS. JAN. 5, 1971 ARG. 0175330, ATR. 0300575, AUS. 0441519, BEL. 0730371, CAN. 0914005, CZC. 0161850, DNK. 0129880, EGR. 0077412, EIR. 0032786, FRA. 6909741, GRB. 1263566, GRK. 0039919, IND. 0120212, ISR. 0031757, ITL. 0860255, LXB. 0058295, MEX. 0111374, NOR. 0128037, NZL. 0155695, PAK. 0120989, PLD. 0017651, PLP 0006606, PNM. 0001723, PTG. 0051392, RHD. 1156947, SAF. 0691728, SPN. 0365439, STZ. 0499140, SWD 0341530, TIW. 0006602, UAR. 0009242, USR. 0383338, VTM. 0001829, VZL. 0023745.

3,645,770.—METHOD FOR DEVELOPING XEROGRAPHIC IMAGES. FEB. 29, 1972.

3,893,414.—METHOD AND APP FOR VARYING DEVELOPER BANDWIDTH. JULY 8, 1975.

3,908,596.—SEGMENTED GATE DEVELOPER FLOW CONTROLLER. SEPT. 30, 1975.

3,930,466.—SEGMENTED GATE DEVELOPER FLOW CONTROLLER. JAN. 6, 1976.

3,990,393.—APPARATUS FOR DEPOSITING MAGNETIC MATERIAL ON AN IMAGE BEARING MEMBER NOV. 9, 1976.

3,998,184.—A DEVELOPMENT APPARATUS DEC 21, 1976.

4,025,179.—PASSIVE CROSS MIXING SYSTEM MAY 24, 1977

Class 5C 2

3,508,823.—DUPLICATING APPARATUS APR 28, 1970.

3,836,244.—COLOR XEROGRAPHY SEPT 17, 1974.

3,941,280.—APPARATUS FOR CONTROLLING DEVELOPER EFFICIENCY. MAR. 2, 1976.

3,965,862.—XEROGRAPHIC DEVELOPMENT SYSTEM JUNE 29, 1976.

4,053,218.—DEVELOPMENT SYSTEM. OCT. 11, 1977

4,082,061.—MULTI-COLOR DEVELOPMENT SYSTEM APR. 4, 1978.

4,087,168.—CHARGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. MAY 2, 1978.

4,131,357.—SEQUENTIALLY ACTIVATED DEVELOPMENT SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTER. DEC. 26, 1978.

Class 5C 3

3,906,897.—DEVELOPMENT APPARATUS. SEPT 23, 1975 ARG. 0195893, BEL. 0797447, CAN. 0982886, FRA 7243003, GRB. 1435761, ITL. 0987768, MEX. 0130638, SAF. 0733407, SPN 0414905, STZ. 0551030, SWD 7307101, VZL. 0032067.

3,940,272.—METHOD OF DEVELOPING AN ELECTROSTATIC LATENT IMAGE. FEB. 24, 1976. ARG. 0195893, BEL. 0797447, CAN. 0982886, FRA. 7243003, GRB. 1435761, ITL. 0987768, MEX. 0130638, SAF. 0733407, SPN. 0414905, STZ. 0551030, SWD. 7307101, VZL. 0032067.
4,102,305.—DEVELOPMENT SYSTEM WITH ELECTRICAL FIELD GENERATING MEANS. JULY 25, 1978.
4,150,173.—PROCESS OF PREPARING TRANSPARENT COLORED MAGNETIC MATERIALS. MAY 17, 1979.
4,199,614.—TRANSPARENT COLORED MAGNETIC MATERIALS AND ELECTROSTATOGRAPHIC PROCESS. APR. 22, 1980.

Class 5D

3,768,904.—PRINTING APPARATUS INCLUDING REGISTRATION CONTROL. OCT. 30, 1973.
3,793,985.—IMAGING SYSTEM. FEB. 26, 1974.
3,924,944.—SPLIT DEVELOPER HOUSING. DEC. 9, 1975.
4,015,561.—ANTI-GRAVITATIONAL CASCADE DEVELOPMENT FOR ELECTROSTATIC PROCESSOR. APR. 5, 1977.
4,095,883.—MAGNETIC MIXING APPARATUS AND PROCESS. JUNE 20, 1978.

Class 5D 1

3,219,014.—MECHANICAL SHIELD TO PROTECT MAGNETIC CORE IN XEROGRAPHIC DEVELOPING APPARATUS. NOV. 23, 1965. CAN. 0757573, FRA. 1393298, GER. 1497076, GRB. 1034099, ITL. 0710188, JAP. 0477812.
3,685,488.—XEROGRAPHIC DEVELOPMENT. AUG. 22, 1972.
3,884,571.—LEAKAGE DEVELOPER RECIRCULATION. MAY 20, 1975. HOL. 3884571.
3,999,512.—ELECTROSTATIC DEVELOPMENT SYSTEM WITH PASSIVE STORAGE CAPACITY. DEC. 28, 1976. BEL. 0823656.
4,033,293.—A DEVELOPING DEVICE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 5, 1977.

Class 5D 1A

3,067,720.—XEROGRAPHIC DEVELOPING APPARATUS. DEC. 11, 1962. ARG. 0175377, BEL. 0750689, PNM. 0002011, VZL. 0025828.
3,095,325.—TONER DISPENSER DRIVE MECHANISMS. JUNE 25, 1963.
3,190,264.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 22, 1965. CAN. 0733036.
3,303,817.—XEROGRAPHIC DEVELOPING APPARATUS. FEB. 14, 1967.
3,472,657.—XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. OCT. 14, 1969. AUS. 0418178, BEL. 0680374, CAN. 0813843, FRA. 1477370, GRB. 1141167, ITL. 0766858, JAP. 0537665, MEX. 0091119, SWD. 0330833.
3,593,838.—CONVEYOR BELT. JULY 20, 1971. CAN. 0883720.
3,635,553.—CASCADE DEVELOPING APPARATUS UTILIZING A ROTARY WHEEL WITH SCOOPS. JAN. 18, 1972.
3,649,262.—SIMULTANEOUS DEVELOPMENT-CLEANING OF SAME AREA OF AN ELECTROSTATOGRAPHIC IMAGE SUPPORT SURFACE. MAR. 14, 1972. AUS. 0445365, BEL. 0743661, CAN. 0916232, FRA. 6944511, GRB. 1296997, ITL. 0882670, USR. 0358873.
3,662,711.—DEVELOPMENT APPARATUS. MAY 16, 1972. CAN. 0945757, GRB. 1345253.
3,663,291.—CASCADE DEVELOPMENT. MAY 16, 1972.
3,678,896.—CONVEYOR SYSTEM. JULY 25, 1972. CAN. 0952465, GRB. 1325831.

Class 5D 1B

3,122,454.—XEROGRAPHIC DEVELOPING APPARATUS. FEB. 25, 1964.
3,435,803.—LIFTING APPARATUS. APR. 1, 1969. CAN. 0937394, FRA. 1511169, GER. 1456806, GRB. 1165378, ITL. 0788954, JAP. 0542586, MEX. 0095039.
3,448,724.—DEVELOPING APPARATUS. JUNE 10, 1969. ARG. 0174576, AUS. 0430081, BEL. 0726573, CAN. 0884214, CZC. 0157054, EGR. 0077413, FRA. 1598024, GRB. 1258781, ITL. 0854008, JAP. 0665972, MEX. 0107603, PNM. 0001429, RMN. 0054735, SAF. 0069179, SPN. 0362358, STZ. 0486057, SWD. 0338507, USR. 0410595, VZL. 0023716.
3,472,657.—XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. OCT. 14, 1969. AUS. 0418178, BEL. 0680374, CAN. 0813843, FRA. 1477370, GRB. 1141167, ITL. 0766858, JAP. 0537665, MEX. 0091119, SWD. 0330833.
3,606,533.—XEROGRAPHIC DEVELOPMENT. SEPT. 20, 1971.
3,661,118.—ELECTROSTATIC DEVELOPMENT. MAY 9, 1972. CAN. 0951107, GRB. 1359234.
3,695,224.—CASCADE DEVELOPMENT. OCT. 3, 1972.
3,835,811.—DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 17, 1974.
3,888,578.—DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 10, 1975.
3,900,255.—PADDLE-WHEEL DEVELOPMENT SYSTEM. AUG. 19, 1975.

Class 5D 1C

3,117,891.—XEROGRAPHIC APPARATUS. JAN. 14, 1964. CAN. 0740394, GRB. 1006078.
3,287,150.—CASCADE DEVELOPMENT PROCESS W/ TWO-COMPONENT DEVELOPER. NOV. 22, 1966.
3,415,224.—MAGNETIC CASCADE DEV APPARATUS. DEC. 10, 1968. AUS. 0423497, BEL. 0725943, CAN. 0852660, COR. 000948A, EGR. 0074432, FRA. 1603904, GRB. 1217281, ITL. 0849521, LXB. 0057873, MRC. 0014726, PTG. 0051108, SAF. 0688440, SPN. 0361840, STZ. 0493872, SWD. 0345753, SYA. 0002440, ZMB. 0166972.
3,667,427.—CASCADE APPARATUS. JUNE 6, 1972. CAN. 0951112, GRB. 1377152.
3,678,897.—DEVELOPER MIXING APPARATUS. JULY 25, 1972. BEL. 0778426, CAN. 0951113, FRA. 7203212, GRB. 1377151, ITL. 0946909.
3,741,372.—CONVEYOR FOR DEVELOPER APPARATUS. JUNE 26, 1973.

Class 5D 1D

3,550,555.—XEROGRAPHIC DEVELOPER SEPARATION. DEC. 29, 1970. CAN. 0855652, GRB. 1238032.

Class 5D 2

3,105,770.—CASCADE DEVELOPMENT IMPROVEMENT. OCT. 1, 1963. AUS. 0252867, BEL. 0749545, CAN. 0746453, FRA. 1286397, GER. 1278244, GRB. 0986844, ITL. 0648862, JAP. 0517396.
3,375,807.—XEROGRAPHIC DEVELOPER. APR. 2, 1968. CAN. 0819049, MEX. 0092092, VZL. 0024448.
3,542,579.—ELECTROSTATIC IMAGE DEVELOPMENT. NOV. 24, 1970.
3,973,517.—DEVELOPMENT DEVICE AND METHOD. AUG. 10, 1976.

Class 5D 3

3,336,905.—XEROGRAPHIC DEVELOPER APPARATUS. AUG. 22, 1967. CAN. 0793223, GRB. 1123059, JAP. 0508405.
3,428,025.—XEROGRAPHIC DEVELOPMENT APPARATUS-POWDER CLOUD BY CHARGE BREAKDOWN. DEC. 18, 1969.
3,638,610.—DEVELOPMENT APPARATUS. FEB. 1, 1972. CAN. 0916432, FRA. 7041622.
3,638,611.—ELECTRODED DEVELOPMENT DEVICE. FEB. 1, 1972. ARG. 0184658, ATR. 0308537, AUS. 0446323, BEL. 0752936, CAN. 0913893, CHL. 0025914, DNK. 0129305, EGR. 0084129, FRA. 7024067, GRB. 1258738, GUA. 0002615, IND. 0127311, ITL. 0900196, JAP. 0719143, MEX. 0115403, NOR. 0130134, NZL. 0160644, PLD. 0081287, PLP. 0006288, PNM. 0002266, PTG. 0054072, SAF. 0704532, SPN. 0381383, STZ. 0520961, SWD. 0359386, TIW. 0005923, USR. 0414818.
3,682,132.—AUTOMATIC DEVELOPER CONTROLLER. AUG. 8, 1972.

Class 5D 4

3,347,691.—XEROGRAPHIC DEVELOPMENT. OCT. 17, 1967. ARG. 0168482, CAN. 0827608, FRA. 1497061, GRB. 1166464, ITL. 0788454, JAP. 0589492, MEX. 0093822, VZL. 0032595.
3,412,710.—CLEAN UP ELECTRODE. NOV. 26, 1968. BEL. 0704923, CAN. 0867283, FRA. 1540699, GRB. 1196637, ITL. 0814605, JAP. 0585018.
3,620,191.—BIASED INPUT CHUTE. NOV. 16, 1971. ARG. 0199542, ATR. 0324837, AUS. 0446250, BEL. 0752943, CAN. 0918411, CHL. 0025871, DNK. 0128800, EGR. 0083704, FRA. 7024665, GRB. 1310444, GUA. 0002727, IND. 0127313, ITL. 0900192, JAP. 0731612, MEX. 0114979, NOR. 0132115, NZL. 0160647, PLP. 0008638, PNM. 0002269, PTG. 0054075, SAF. 70/4534, SPN. 0381382, STZ. 0528761, SWD. 0349387, TIW. 0007164, USR. 0358874.
3,669,072.—DEVELOPER APPARATUS. JUNE 13, 1972. CAN. 0930539, GRB. 1343141.
3,682,538.—XEROGRAPHIC PICK-OFF PLATE. AUG. 8, 1972. ARG. 0186267, BEL. 0764562, CAN. 0935635, FRA. 7110750, GRB. 1349272, ITL. 0922348, MEX. 0119677, USR. 0426387.
3,682,677.—BACKGROUND REMOVAL. AUG. 8, 1972.
3,795,222.—DEVELOPMENT ELECTRODE SYSTEM. MAR. 5, 1974.
3,807,997.—PLURAL ELECTRODE DEVELOPMENT METHODS FOR LATENT ELECTROSTATIC IMAGES. APR. 30, 1974. CAN. 0979299, GRB. 1381910.
3,808,026.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE. APR. 30, 1974.
3,834,930.—METHOD OF DEVELOPING ELECTROSTATOGRAPHIC IMAGE. SEPT. 10, 1974.
3,907,695.—LIQUID DEVELOPER. SEPT. 23, 1975
4,197,211.—LIQUID ELECTROPHOTOGRAPHIC DEVELOPERS. APR. 8, 1980.

Class 5D 5

3,223,548.—XEROGRAPHIC DEVELOPING MACHINE AND METHOD. DEC. 14, 1965.
3,316,878.—CASCADE DEVELOPING APPARATUS. MAY 2, 1967.

Class 5E

3,357,399.—COMBINED FLUIDIZED BED AND INVERTED CASCADE DEVELOPMENT APPARATUS. DEC. 12, 1967. ARG. 0171121, CAN. 0821473, CHL. 0022944, MEX. 0096075, PRU. 0009332, URG. 0008548, VZL. 0021060.
3,677,633.—PORTABLE DOCUMENT ABSTRACTOR. JULY 18, 1972.
3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATINAIN. JUNE 12, 1973.
3,748,126.—MULTIPLE COPY SELECTIVE RE-WETTING PRINTING. JULY 24, 1973.
3,748,127.—TREATMENT OF REUSABLE PHOTOCONDUCTIVE SURFACES WITH LEWIS ACIDS OR BASES. JULY 24, 1973.
3,776,631.—LIQUID DEVELOPER CLEANING SYSTEM. DEC. 4, 1973.
3,865,611.—METHOD FOR ELECTROSTATIC IMAGE DEVELOPMENT EMPLOYING TONER AND CARRIER SUPPORTED BY CONDUCTIVE. FEB. 11, 1975.
3,893,854.—PHOTOGRAPHIC ARTICLES WITH GAPS FOR PROCESSING FLUIDS. JULY 8, 1975.
3,918,809.—APPARATUS FOR CLEANING A SURFACE SUPPORT. NOV. 11, 1975, GRB. 1438660.
3,927,934.—ELECTROSTATOGRAPHIC REPRODUCTION MACHINES. DEC. 23, 1975.
3,940,282.—BLADE CLEANING OF SURFACE WITH REVERSE MOVEMENT. FEB. 24, 1976.
3,951,653.—METHOD OF PREVENTING TONER BUILD-UP ON ELECTRODES DURING LIQUID DEVELOPMENT. APR. 20, 1976.
3,973,699.—LIQUID DISPENSING APPARATUS UTILIZING DOUBLE ACTING PISTON. AUG. 10, 1976, GRB. 1455885.
3,974,554.—QUANDRANGULAR TRIHETICORD GRAVURE ROLL. AUG. 17, 1976. BEL. 0841855.
3,978,817.—PATTERNED GRAVURE & DOCTORING MEANS THEREFOR. SEPT. 7, 1976. BEL. 0841855.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
4,017,174.—DEVELOPER ASSEMBLY SUPPORT. APR. 12, 1977.
4,020,788.—DOCTORING MEANS. MAY 3, 1977.
4,023,900.—VARIABLE SPEED LIQUID DEVELOPMENT ELECTROSTATOGRAPHIC APPARATUS. MAY 17, 1977.
4,024,834.—TEMPERATURE COMPENSATED DOCTOR BLADE. MAY 24, 1977. GRB. 1430518.
4,037,952.—METHOD OF PREVENTING TONER BUILD-UP ON ELECTRODES DURING LIQUID DEVELOPMENT. JULY 26, 1977.
4,068,938.—ELECTROSTATIC COLOR PRINTING USING DISCRETE POTENTIALS. JAN. 17, 1978. GRB. 1442234.
4,126,711.—CHARGE PATTERN DEVELOPMENT METHOD & APPARATUS. NOV. 21, 1978. GRB. 1484712.
4,161,360.—LIQUID DEVELOPMENT APPARATUS. JULY 17, 1979.
4,210,080.—IMAGING METHOD AND APPARATUS. JULY 1, 1980.

Class 5E 2

3,730,708.—ELECTROPHOTOGRAPHIC MULTI-COLOR PROCESS EMPLOYING LIQUID DEVELOPER. MAY 1, 1973.
3,776,723.—LIQUID TRANSFER ELECTROPHOTOGRAPHIC DEVELOPMENT PROCESS. DEC. 4, 1973.
3,862,618.—LIQUID DEVELOPING APPARATUS DEVELOPING AN ELECTROSTATIC IMAGE. JAN. 28, 1975.
3,960,444.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
4,007,401.—ELECTROPHOTOGRAPHIC PRINTING METHOD. FEB. 8, 1977.

Class 5E 4

3,129,115.—XEROGRAPHIC DEVELOPING APPARATUS. APR. 14, 1964. GRB. 1008004.
3,251,688.—LIQUID TRANSFER DEVELOPMENT. MAY 17, 1966. CAN. 0765523, FRA. 1362253, GRB. 1032013.
3,270,637.—ELECTROVISCOUS RECORDING. SEPT. 6, 1966. AUS. 0403009, CAN. 0740112, FRA. 1414126, GER. 1497109, GRB. 1086197, HOL. 0141644, ITL. 0738077, JAP. 0508403, NOR. 0127882, STZ. 0472710, SWD. 0331032.
3,281,241.—METHOD OF FORMING A VISUAL RECORD OF A LATENT IMAGE RECEIVING WEB. OCT. 25, 1966. AUS. 0275028, CAN. 0766420, FRA. 1362254, GER 1303008, GRB. 1035236, ITL. 0699412, JAP. 0470426.
3,284,224.—CONTROLLED XEROGRAPHIC DEVELOPMENT. NOV. 8, 1966. CAN. 0751349, GRB. 1038801, JAP. 0640353.
3,334,613.—XEROGRAPHIC DEVELOPMENT APPARATUS. AUG. 8, 1967. CAN. 0787870, GRB. 1125628, JAP. 0546654.
3,369,918.—DEV OF LATENT ELECTROSTATIC IMGS W/ CREATED WAVES OF LIQUID DEVELOPER. FEB. 20, 1968.
3,576,623.—DEVELOPMENT SYSTEM EMPLOYING A CORONODE IMMERSED IN A LIQUID DEVELOPER. APR. 27, 1971. AUS. 0434437, CAN. 0872191, GER 1908292, GRB. 1259880, JAP. 0675662.
3,577,259.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES UTILIZING A TONER-FREE ZONE. MAY 4, 1971.
3,592,678.—LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING. JULY 13, 1971.
3,620,800.—CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID. NOV. 16, 1971. CAN. 0933997.
3,627,410.—REPRODUCTION APPARATUS WITH LIQUID. DEC. 14, 1971. CAN. 0886508.
3,627,557.—LIQUID DVLPMNT BY REDUCING VISCOSITY OF DVLPR ON ROLLER APPLICATION PRIOR TO DEVELOPMENT. DEC. 14, 1971
3,628,981.—LIQUID TONER DEVELOPMENT DEC 21, 1971. ARG. 0181932, MEX. 0116451.
3,642,471.—LIQUID DEVELOPING PROCESS IN AN ELECTROSTATOGRAPHIC IMAGING SYSTEM FEB. 15, 1972.
3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB 15, 1972.
3,652,319.—CYCLIC IMAGING SYSTEM. MAR 28, 1972 AUS. 0441527, BEL. 0761029, CAN. 0944010, FRA 7047634, GRB. 1336739, ITL. 0913957, JAP. 0771819, SWD. 0363175.
3,656,948.—SELECTED REMOVAL OF LIQUID DVLPR IN CYCLICAL ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. CAN. 0906335, GRB. 1335054, JAP. 0760503.
3,671,290.—IMAGING SYSTEM. JUNE 20, 1972.
3,672,884.—ELECTROSTATIC PRINTING. JUNE 27, 1972.
3,692,520.—DVLPNG ELCTRSTIC IMGS EMPLYNG FATTY ACD ESTRS INHBT DVLPR BUILD-UP SEPT. 19, 1972. CAN. 0940361, GRB 1332674.
3,784,397.—IMAGING SYSTEM. JAN. 8, 1974.
3,800,744.—ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS. APR. 2, 1974.
3,804,510.—IMAGING DEVELOPING SYSTEM APR 16, 1974.
3,808,025.—LIQUID DEVELOPING METHOD FOR ELECTROPHOTOGRAPHY. APR. 30, 1974.
3,816,114.—ELECTRO-PHOTOGRAPHIC METHOD JUNE 11, 1974.
3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS JUNE 18, 1974.

3,832,975.—ELECTROPHOTOGRAPHIC APPARATUS. SEPT. 3, 1974.
3,836,384.—IMAGING SYSTEMS. SEPT. 17, 1974.
3,841,893.—CHARGE CONTROL AGENTS FOR LIQUID DEVELOPERS. OCT. 15, 1974.
3,849,171.—METHOD FOR CLEANING BACKGROUND AREAS FROM DEVELOPED RECORDING SURFACES. NOV. 19, 1974. CAN. 0941882.
3,862,619.—ELECTRO-PHOTOGRAPHIC APPARATUS. JAN. 28, 1975.
3,864,125.—ELECTROPHOTOGRAPHIC METHOD OF MAKING AN IMAGING MASTER. FEB. 4, 1975.
3,870,514.—LIQUID DEVELOPMENT FOR THE ELECTRONIC PHOTOGRAPHY. MAR. 11, 1975.
3,877,934.—INDUCTION IMAGING WITH IN-PLACE DEVELOPMENT. APR. 15, 1975.
3,890,040.—INDUCTION IMAGING APPARATUS. JUNE 17, 1975.
3,913,524.—LIQUID DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHY. OCT. 21, 1975.
3,926,825.—LIQUID DEVELOPER COMPOSITION AND PROCESS FOR PREPARING SAME. DEC. 16, 1975.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.
3,942,474.—DEVELOPING SYSTEMS. MAR. 9, 1976. ARG. 0181931, ATR. 0311971, AUS. 0457519, BEL. 0752802, CAN. 0904108, CHL. 0026275, EGR. 0084325, FRA. 7024068, GRB. 1320509, ITL. 0894828, JAP. 0815361, MEX. 0116454, SAF. 0704474, SPN. 0381297, STZ. 0513437, SWD. 0357269, TIW. 0006614, 0033335.
3,943,268.—LIQUID DEVELOPER PROCESS AND APP FOR ELECTROSTATOGRAPHY. MAR. 9, 1976. CAN. 0904683.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.
3,968,044.—MILLED LIQUID DEVELOPER. JULY 6, 1976.
3,970,043.—ELECTROPHOTOGRAPHIC DEVICE FOR LIQUID DEVELOPMENT. AUG. 20, 1976.
3,971,659.—COLOR ELECTROPHOTOGRAPHIC PROCESS USING PHOTO CONDUCTIVE PARTICLES IN LIQUID DEVELOPER. JULY 27, 1976.
3,972,305.—IMAGING SYSTEM. AUG. 3, 1976. CAN. 0904683.
3,976,808.—IMAGING SYSTEMS. AUG. 24, 1976.
3,986,968.—MILLED AND POLAR SOLVENT EXTRACTED LIQUID DEVELOPER. OCT. 19, 1976.
4,183,818.—COLOR ELECTROPHOTOGRAPHIC LIQUID DEVELOPER OF COLORED PARTICLES AND ZINC OXIDE. JAN. 15, 1980.

Class 5F.5

3,372,027.—XEROGRAPHIC LIQUID DEVELOPMENT. MAR. 5, 1968. CAN. 0800963, GRB. 1091169, ITL. 0760712, JAP. 0571175.
3,652,319.—CYCLIC IMAGING SYSTEM. MAR. 28, 1972. AUS. 0441527, BEL. 0761029, CAN. 0944010, FRA. 7047634, GRB. 1336739, ITL. 0913957, JAP. 0771819, SWD. 0363175.
3,667,428.—DEVELOPING SYSTEMS. JUNE 6, 1972. ARG. 0195534, ATR. 0312420, AUS. 0456202, BEL. 0752805, CAN. 0904107, CHL. 0026274, CZC. 0164275, DNK. 0126528, EGR. 0083514, FRA. 7024066, GRB. 1320232, ITL. 0894827, JAP. 0745765, MEX. 0114978, PNM. 0002541, SAF. 0704475, SPN. 0194607, STZ. 0543753, SWD. 0366126, TIW. 0006616, USR. 0420196.
3,676,215.—IMAGING SYSTEM. JULY 11, 1972. ARG. 0182525, AUS. 0430692, BEL. 0732139, CAN. 0900770, FRA. 6913232, GRB. 1272306, ITL. 0857440, JAP. 0698292, MEX. 0109289, PNM. 0001433, SPN. 0386902, SWD. 0352117, USR. 0309549.
3,692,520.—DVLPNG ELCTRSTIC IMGS EMPLYNG FATTY ACD ESTRS INHBT DVLPR BUILD-UP. SEPT. 19, 1972. CAN. 0940361, GRB. 1332674.
3,712,728.—REVERSAL DEVELOPMENT. JAN. 23, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,729,419.—LIQUID DEVELOPER. APR. 24, 1973.
3,772,012.—REVERSAL DEVELOPMENT USING POLAR LIQUID DEVELOPERS. NOV. 13, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,776,723.—LIQUID TRANSFER ELECTROPHOTOGRAPHIC DEVELOPMENT PROCESS. DEC. 4, 1973.
3,795,530.—ELECTROSTATIC LATENT IMAGE DEVELOPMENT. MAR. 5, 1974.
3,806,354.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES. APR. 23, 1974.
3,817,748.—CONTRAST CONTROL IN ELECTROSTATIC COPYING UTILIZING LIQUID DEVELOPMENT. JUNE 18, 1974. GRB. 1406794.
3,834,930.—METHOD OF DEVELOPING ELECTROSTATOGRAPHIC IMAGE. SEPT. 10, 1974.
3,856,519.—TRANSFER OF TONER USING A VOLATILE INSULATING LIQUID. DEC. 24, 1974.
3,900,405.—CASSETTE OPENING MECHANISM. AUG. 19, 1975. CAN. 0926460, GRB. 1362697.
3,907,694.—NON-VOLATILE CONDUCTIVE INKS. SEPT. 23, 1975.
3,907,695.—LIQUID DEVELOPER. SEPT. 23, 1975.
3,918,400.—BLADE MOUNTING ASSEMBLIES. NOV. 11, 1975. BEL. 0816534, FRA. 7421752, GRB. 1419417.
3,918,807.—CLEANING BLADE FOR PHOTOCOPIER. NOV. 11, 1975.
3,942,349.—CROWN DIE FOR THREAD ROLLING OF APPLICATOR ROLLS. MAR. 9, 1976.
3,942,474.—DEVELOPING SYSTEMS. MAR. 9, 1976. ARG. 0181931, ATR. 0311971, AUS. 0457519, BEL. 0752802, CAN. 0904108, CHL. 0026275, EGR. 0084325, FRA. 7024068, GRB. 1320509, ITL. 0894828, JAP. 0815361, MEX. 0116454, SAF. 0704474, SPN. 0381297, STZ. 0513437, SWD. 0357269, TIW. 0006614, VZL. 0033335.
3,954,640.—ELECTROSTATIC PRINTING INKS. MAY 4, 1976. BEL. 0816553, GRB. 1452556.
3,978,817.—PATTERNED GRAVURE AND DOCTORING MEANS THEREFOR. SEPT. 7, 1976. BEL. 0841855.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
3,985,663.—CONDUCTIVE INKS CONTAINING QUATERNARY AMMONIUM COMPOUNDS. OCT. 12, 1976.
3,993,023.—COATED FILAMENT WOUND INK APPLICATOR ROLL. NOV. 23, 1976.
3,993,024.—FILAMENT WOUND INK APPLICATOR ROLL. NOV. 23, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. NOV. 30, 1976. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,004,931.—CONSTANT VISCOSITY INKS. JAN. 25, 1977.
4,007,983.—IMPROVED LIQUID DEVELOPER CLEANING MEANS. FEB. 15, 1977.
4,017,174.—DEVELOPER ASSEMBLY SUPPORT. APR. 12, 1977.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. BEL. 0819537, GRB. 1429518.
4,024,292.—PROCESS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES WITH INK. MAY 17, 1977. BEL. 0816553, GRB. 1452556.
4,024,838.—DEVELOPER LIQUID SUPPLY DEVICE. MAY 24, 1977.
4,027,964.—IMAGING METHOD AND APPARATUS. JUNE 7, 1977. ARG. 0190535, BEL. 0777714, CAN. 0949825, FRA. 7201000, GRB. 1374501, ITL. 0946355, MEX. 0124981.
4,040,827.—DEVELOPMENT IMAGING METHODS. AUG. 9, 1977.
4,042,415.—METHOD FOR SCRAPING LIQUIDS FROM A MOVING SURFACE. AUG. 16, 1977.
4,043,657.—BLADE FOR METERING LIQUID DEVELOPER. AUG. 23, 1977. GRB. 1501464.
4,047,943.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH CONDUCTIVE LIQUID DEVELOPER. SEPT. 13, 1977.
4,049,344.—ELECTROSTATIC IMAGING SYSTEM. SEPT. 20, 1977.
4,059,444.—LIQUID DEVELOPMENT USING CONDUCTIVE INKS. NOV. 22, 1977. GRB. 1495785.
4,089,683.—LIQUID DEVELOPER CLEANING MEANS. MAY 16, 1978.
4,105,445.—RESILIENT ARCUATE SURFACE CONTAINING PHOTOCONDUCTOR. AUG. 8, 1978. GRB. 1476355.
4,126,711.—CHARGE PATTERN DEVELOPMENT METHOD & APPARATUS. NOV. 21, 1978. GRB. 1484712.
4,161,360.—LIQUID DEVELOPMENT APPARATUS. JULY 17, 1979.

Class 5F

3,124,483.—APPARATUS FOR TRANSFERRING POWDER IMAGES AND METHOD THEREFOR. MAR. 10, 1964. CAN. 0843622.
3,166,432.—IMAGE DEVELOPMENT. JAN. 19, 1965. CAN. 0675704, FRA. 1260844, GER. 1185062, GRB. 0959668, JAP. 0401040.
3,203,394.—XEROGRAPHIC DEVELOPMENT APPARATUS. AUG. 31, 1965. CAN. 0757572, GER. 1497070, GRB. 1026704, JAP. 0464922.

3,216,844.—METHOD OF DEVELOPING ELECTROSTATIC IMAGES WITH PHOTOCONDUCTIBLE DONOR MEMBER. NOV. 9, 1965. CAN. 0794035, GRB. 1024983.
3,301,152.—XEROGRAPHIC COPYING APPARATUS. JAN. 31, 1967.
3,332,396.—XEROGRAPHIC DEVELOPING APPARATUS WITH CONTROLLED CORONA MEANS. JULY 25, 1967. AUS. 0287695, BEL. 0656893, CAN. 0775061, FRA. 1419973, GER. 1288915, GRB. 1060679, ITL. 0745583.
3,375,806.—XEROGRAPHIC DONOR DEVELOPMENT APPARATUS. APR. 2, 1968.
3,376,852.—DIELECTRIC BELT DEVELOPING. APR. 9, 1968. CAN. 0859028, GRB. 1214512, JAP. 0919364.
3,405,682.—XEROGRAPHIC DEVELOPMENT APPTS WITH WEB LOADING MEANS TO REMOVE RESIDUAL DEVELOPER. OCT. 15, 1968. GRB. 1102282.
3,606,864.—DONOR ASSEMBLY. SEPT. 21, 1971. CAN. 0903461, GRB. 1280951, MEX. 0116025.
3,613,636.—ELECTROGRAPHIC DEVELOPER. OCT. 19, 1971. GRB. 1282991.
3,635,196.—PNEUMATICALLY CONTROLLED SEAL. JAN. 18, 1972.
3,645,618.—VACUUM NOZZLE TO REMOVE AGGLOMERATES ON A TONER APPLICATOR. FEB. 29, 1972. CAN. 0949823.
3,696,783.—AUTOMATED TOUCHDOWN DEVELOPMENT SYSTEM. OCT. 10, 1972. CAN. 0949822, GRB. 1373666.
3,696,785.—DEVELOPMENT APPARATUS. OCT. 10, 1972. CAN. 0949824, GRB. 1373665.
3,697,169.—ELECTROSTATIC RECORDING APPARATUS AND METHOD. OCT. 10, 1972. CAN. 0954292, GRB. 1322681.
3,703,157.—MTHD/APPRTS FOR FRMNG UNFRM LYR OF PWDR DVELPR ON A SURFACE. NOV. 21, 1972.
3,707,389.—LATENT ELECTROSTATIC IMAGE DEVELOPMENT. DEC. 26, 1972. AUS. 0457281, BEL. 0777721, CAN. 0949827, FRA. 7201007, GRB. 1375048, ITL. 0946354.
3,729,334.—IMAGING PROCESS. APR. 24, 1973.
3,739,748.—DONOR FOR TOUCHDOWN DEVELOPMENT. JUNE 19, 1973.
3,759,222.—MICROFIELD DONOR WITH CONTINUOUSLY REVERSING MICROFIELDS. SEPT. 18, 1973. BEL. 0780091, CAN. 0951596, FRA. 7208102, GRB. 1385966, ITL. 0949779.
3,848,566.—DONOR APPARATUS. NOV. 19, 1974.
3,866,574.—XEROGRAPHIC DEVELOPING APPARATUS. FEB. 18, 1975, FRA. 7405248, GRB. 1458766.
3,881,927.—HALF TONE DEVELOPMENT PROCESS FOR TOUCHDOWN SYSTEM IN ELECTROSTATIC IMAGING. MAY 6, 1975. GRB. 1419926.
3,884,185.—COATED WIRE DEVELOPER BRUSH. MAY 20, 1975.
3,890,929.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 24, 1975.
3,893,418.—XEROGRAPHIC DEVELOPING APPARATUS. JULY 8, 1975.
3,900,002.—DONOR APPARATUS. AUG. 19, 1975.
3,914,460.—DEVELOPMENT UTILIZING ELECTRIC FIELDS. OCT. 21, 1975.
3,929,098.—TONER LOADING FOR TOUCHDOWN DONOR. DEC. 30, 1975.
3,970,042.—COLOR DEVELOPMENT APPARATUS. JULY 20, 1976.
3,997,688.—DEVELOPING AN ELECTRICAL IMAGE. DEC. 14, 1976.
3,998,185.—MICROFIELD DONORS WITH TONER AGITATION AND THE METHODS OF THEIR MANUFACTURE. DEC. 21, 1976.
3,999,515.—SELF SPACING MICROFIELD DONORS. DEC. 28, 1976.
3,999,849.—TOUCHDOWN AMBIPOLAR DEVELOPMENT. DEC. 28, 1976.
4,003,333.—DEVELOPMENT SYSTEM. JAN. 18, 1977.
4,006,981.—HALF TONE DEVELOPMENT FOR TOUCHDOWN SYSTEM. FEB. 8, 1977. GRB. 1419926.
4,011,834.—TOUCHDOWN ELECTROSTATIC DEVELOPMENT APPARATUS. MAR. 15, 1977.
4,017,648.—TONER AGITATION THROUGH MICROFIELD DONOR. APR. 12, 1977.
4,025,185.—APPLICATOR MEMBER. MAY 24, 1977. GRB. 1436098.
4,040,827.—DEVELOPMENT IMAGING METHODS. AUG. 9, 1977.
4,067,295.—MAGNETIC MICROFIELD DONOR SYSTEM. JAN. 10, 1978.
4,092,165.—METHOD OF MAKING A DONOR MEMBER MOLD. MAY 30, 1978.
4,105,445.—RESILIENT ARCUATE SURFACE CONTAINING PHOTOCONDUCTOR. AUG. 8, 1978. GRB. 1476355.
4,114,261.—METHOD OF MANUFACTURE OF A XEROGRAPHIC MICROFIELD DONOR. SEPT. 19, 1978. GRB. 1515938.
4,136,637.—CONTINUOUS CONTRAST DEVELOPMENT SYSTEM. JAN. 30, 1979.
4,144,061.—TRANSFER DEVELOPMENT USING A FLUID SPACED DONOR MEMBER. MAR. 13, 1979.
4,149,486.—TRANSFER DEVELOPMENT APPARATUS USING SELF-SPACING DONOR MEMBER. APR. 17, 1979.
4,164,372.—OUT OF CONTACT TOUCHDOWN. AUG. 14, 1979. CAN. 1044958. GRB. 1484417.

Class 5G

3,380,437.—TRANSVERSELY RECIPROCATING FLUIDIZED BED DEVELOPMENT APPARATUS. APR. 30, 1968. ARG. 0179553, BRA. 0088502, CAN. 0821491, CHL. 0022941, CLB. 0016330, MEX. 0095936, PRU. 0009315, URG. 0008636, VZL. 0020996.
3,393,662.—FLUIDIZING ELECTRODE DEVELOPMENT APPARATUS. JULY 23, 1968. ARG. 0171118, AUS. 0411962, BEL. 0701467, CAN. 0821472, CHL. 0024009, CLB. 0017645, CZC. 0157025, DNK. 0123998, EGR. 0072982, FRA. 1531274, GRB. 1193443, ISR. 0028298, ITL. 0805956, LXB. 0054062, MEX. 0095697, NOR. 0127834, NZL. 0149432, PLD. 0069038, PTG. 0048069, SAF. 0674268, SPN. 0343103, STZ. 0481406, SWD. 0322414, USR. 0353449, VZL. 0021059.
3,396,700.—XEROGRAPHIC TONER DISPENSING APPARATUS. AUG. 13, 1968. CAN. 0852126, GRB. 1231868, JAP. 0752503.
3,574,660.—ORBITAL DEVELOPER STREAM DEVELOPMENT. APR. 13, 1971. CAN. 0845076, GRB. 1193277.
3,641,977.—APPARATUS FOR AGITATING DEVELOPER MATERIAL WITHIN A HOUSING. FEB. 15, 1972. CAN. 0917405, GRB. 1342684.
3,682,137.—J-SHELL DEVELOPER HOUSING. AUG. 8, 1972. CAN. 0949820, GRB. 1342782.
3,900,001.—DEVELOPING APPARATUS. AUG. 19, 1975. CAN. 0970631, GRB. 1381049.

Class 5H

3,484,265.—TRANSVERSELY RECIPROCATING FLUIDIZED BED DEVELOPMENT METH. DEC. 16, 1969.
3,503,776.—XEROGRAPHIC DEVELOPMENT. MAR. 31, 1970. CAN. 0828694, FRA. 1511809, GRB. 1182291, ITL. 0793692, MEX. 0098765.
3,611,991.—VIBRATING BED DEVELOPING APPARATUS WITH ELECTROMAGNETIC DEVELOPER AGITATOR. OCT. 12, 1971. AUS. 0445409, BEL. 0755605, CAN. 0911707, EGR. 0083516, FRA. 7032503, GRB. 1264780, ITL. 0907435, JAP. 0745766, SPN. 0383333, STZ. 0521615, SWD. 0361956, TIW. 0007201, USR. 0371738.
3,613,637.—DEVELOPER FOR ELECTROSTATIC IMAGES. OCT. 19, 1971. AUS. 0448238, BEL. 0752034, CAN. 0911702, FRA. 7021987, GRB. 1301157, ITL. 0894180, SWD. 0358975.
3,621,816.—INTERLACED VIBRATING ELECTRODE. NOV. 23, 1971. CAN. 0914397, GRB. 1316614, JAP 0835102.
3,623,454.—FLUIDIZED BED DEVELOPMENT APPARATUS. NOV. 30, 1971. CAN. 0895208, GRB 1272373, JAP 0731616.
3,654,900.—FLUIDIZED DEVELOPMENT OF ELECTROSTATIC IMAGES. APR. 11, 1972. CAN. 0949821, GRB 1357149.
3,685,486.—FLUIDIZED DEVELOPMENT APPARATUS. AUG. 22, 1972. CAN. 0921693, GRB. 1316306, JAP 0746925.
3,754,531.—FLUIDIZED DEVELOPMENT APPARATUS. AUG. 28, 1973.
3,844,252.—SHEET REMOVAL DEVICE. OCT. 29, 1974. BEL. 0814943, CAN. 1000749, FRA. 7415957, ITL. 1012669, PNM. 0003193, PTG. 0061701, SPN. 0426423, SWD. 7406337.

Class 5I

3,838,922.—APPARATUS FOR SENSING THE QUANTITY OF RECLAIMED DEVELOPER MATERIAL. OCT. 1, 1974. CAN. 0992600, GRB. 1414319.
3,841,265.—DEVELOPER ASSEMBLY FOR ELECTROSTATIC COPIER. OCT. 15, 1974.
3,844,252.—SHEET REMOVAL DEVICE. OCT. 29, 1974. BEL. 0814943, CAN. 1000749, FRA. 7415957, ITL. 1012669, PNM. 0003193, PTG. 0061701, SPN. 0426423, SWD. 7406337.

3,873,197.—APPARATUS FOR REGULATING THE TONER CONCENTRATION IN A ELECTROPHOTOGRAPHIC DEVICE. MAR. 25, 1975.
3,926,338.—THERMALLY INSENSITIVE PARTICLE CONCENTRATION CONTROLLER. DEC. 16, 1975.
4,065,031.—PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM. DEC. 27, 1977.

Class 5I 1

3,316,875.—XEROGRAPHIC DEVELOPING APPARATUS. MAY 2, 1967.
3,331,355.—XEROGRAPHIC DEVELOPING APPARATUS. JULY 18, 1967. CAN. 0793224, FRA. 1465811, GRB. 1069351, ITL. 0778708.
3,349,750.—XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 31, 1967. CAN. 0819050, FRA. 1516053, GRB. 1165377, ITL. 0788953, JAP. 0547202, MEX. 0093862.
3,356,248.—CONTAINER WITH A ROTATABLE CLOSURE. DEC. 5, 1967. CAN. 0825091, GRB. 1166618.
3,550,556.—DEVELOPMENT APPARATUS. DEC. 29, 1970. ARG. 0180677, AUS. 0442279, BEL. 0726571, BRA. 6905449, CAN. 0882576, CZC. 0157055, EGR. 0076888, FRA. 1604314, GRB. 1252494, ITL. 0854006, JAP. 0731247, MEX. 0109983, PNM. 0001770, RMN. 0054558, SAF. 0069180, SPN. 0362037, STZ. 0498431, SWD. 0351059, USR. 0372851, VZL. 0023724.
3,661,118.—ELECTROSTATIC DEVELOPMENT. MAY 9, 1972. CAN. 0951107, GRB. 1359234.
3,662,711.—DEVELOPMENT APPARATUS. MAY 16, 1972. CAN. 0945757, GRB. 1345253.
3,663,291.—CASCADE DEVELOPMENT. MAY 16, 1972.
3,687,270.—CONVEYOR ASSEMBLY. AUG. 29, 1972. CAN. 0952464, GRB. 1376231.
3,717,122.—MAGNETIC GATE. FEB. 20, 1973. CAN. 0960031, GRB. 1377023.
3,943,887.—HYBRID CROSSMIXER. MAR. 16, 1976.
3,947,107.—PARTIALLY SUBMERGED ACTIVE CROSSMIXER. MAR. 30, 1976. BEL. 0835370.
3,973,518.—CROSS MIXING BLENDING CHAMBER FOR ELECTROSTATIC PROCESSORS AND THE LIKE. AUG. 10, 1976.
3,995,590.—BLENDING CHAMBER FOR ELECTROSTATIC PROCESSORS. DEC. 7, 1976.
3,999,512.—ELECTROSTATIC DEVELOPMENT SYSTEM WITH PASSIVE STORAGE CAPACITY. DEC. 28, 1976. BEL. 0823656.
4,040,386.—RETRACTABLE EDGE SEALS FOR ELECTROSTATOGRAPHIC DEVELOPMENT SYSTEMS. AUG. 9, 1977.
4,056,076.—DEVELOPER MIXING SYSTEM. NOV. 1, 1977.

Class 5I 2

3,941,280.—APPARATUS FOR CONTROLLING DEVELOPER EFFICIENCY. MAR. 2, 1976.
3,983,841.—TONER RECLAIM CONVEYOR. OCT. 5, 1976.
4,011,835.—TONER CONVEYOR. MAR. 15, 1977.
4,133,458.—TONER DISPENSER ARRANGEMENT. JAN. 9, 1979.
4,133,459.—DEFORMABLE TONER DISPENSER WITH FLOW RATE CONTROLLER. JAN. 9, 1979.
4,135,642.—WIPER ARRANGEMENT FOR TONER LEVEL SENSOR. JAN. 23, 1979.
4,142,655.—TONER DISPENSING AND SUPPLY ARRANGEMENT. MAR. 6, 1979.
4,188,907.—PARTICLE DISPENSER WITH A MAGNETICALLY DRIVEN AGITATOR. FEB. 19, 1980.

Class 5I 2A

3,122,455.—XEROGRAPHIC TONER DISPENSER. FEB. 25, 1964.
3,135,433.—XEROGRAPHIC TONER DISPENSING APPARATUS. JUNE 2, 1964. CAN. 0701240.
3,149,760.—POWDER DISPENSING APPARATUS. SEPT. 22, 1964.
3,250,439.—XEROGRAPHIC TONER DISPENSER. MAY 10, 1966. CAN. 0815453, GRB. 1126197, JAP. 0512654.
3,337,072.—LOADER. AUG. 22, 1967. CAN. 0825092, GRB. 1166619, JAP. 0605648.
3,385,500.—TONER PACKAGE. MAY 28, 1968. CAN. 0864337, GRB. 1189147, JAP. 0931680.
3,619,279.—TONER RECEIVING MEMBER. NOV. 9, 1971.
3,622,054.—TONER DISPENSER IMPROVEMENT. NOV. 23, 1971. CAN. 0911705.
3,722,471.—TONER METER DEVICE. MAR. 27, 1973. CAN. 0951108, GRB. 1370009.
3,740,288.—METHOD OF PREPARING A TONER DISPENSER. JUNE 19, 1973.
3,920,155.—PARTICLE LEVEL INDICATOR. NOV. 18, 1975.
3,924,566.—REPRODUCTION MACHINE WITH MEANS FOR SOLIDIFYING THE RECLAIM TONER. DEC. 9, 1975.
3,941,470.—A TONER PARTICLE DISPENSER. MAR. 2, 1976.
3,951,539.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED TONER DISPENSING APPARATUS. APR. 20, 1976.
3,954,331.—TONER DISPENSER. MAY 4, 1976.
3,979,022.—MONITORING DEVICE—MAGNETIC POWERED ALARM DEVICE. SEPT. 7, 1976. BEL. 0801607, CAN. 0982841, FRA. 7300103, GRB. 1431574, ITL. 0990693, SWD 7308931.
4,034,701.—PARTICLE DISPENSER—01TONER DISPENSER—EPIC. JULY 12, 1977. BEL. 0801243, CAN. 0979209, FRA. 7323735, GRB. 1,438,799, ITL. 0990691, SWD. 7,308,929.

Class 5I 2B

3,389,863.—XEROGRAPHIC TONER DISPENSER. JUNE 25, 1968. CAN. 0835862, FRA. 1497062, GRB. 1171303, ITL. 0787552, JAP. 0589523, MEX. 0093821, VZL. 0024004.
3,390,664.—XEROGRAPHIC TONER DISPENSING APPARATUS. JULY 2, 1968. CAN. 0852124, GRB. 1208593, JAP. 0608323.
3,619,279.—TONER RECEIVING MEMBER. NOV. 9, 1971.

Class 5I 2C

3,951,539.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED TONER DISPENSING APPARATUS. APR. 20, 1976.
3,956,108.—ANTI-PLUGGING DEVICE FOR AUTOMATIC DEVELOPABILITY CONTROL SYSTEMS. MAY 11, 1976.
3,958,878.—ELECTROSTATIC PROCESSOR HOUSING INTERCHANGABLE RESERVOIRS FOR SUPPING & RECLAIMING TONER. MAY 25, 1976.
3,974,944.—TONER DISPENSER. AUG. 17, 1976.
4,065,031.—PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM. DEC. 27, 1977.
4,163,614.—CLOSED LOOP PARTICLE DISPENSER. AUG. 7, 1979.
4,173,294.—DISPENSER HAVING RECIPROCATING PADDLES FOR DISCHARGING PARTICLES THEREFROM. NOV. 6, 1979.

Class 5I 2C 1

RE.27,876.—DISPENSING APPARATUS. JAN. 8, 1974. CAN. 0868818.
3,300,101.—TONER DISPENSER. JAN. 24, 1967. CAN. 0800856, GRB. 1152671, JAP. 0524530.
3,339,807.—TONER CONTAINER AND DISPENSER. SEPT. 5, 1967. CAN. 0842133, GRB. 1165953, JAP. 0547201.
3,396,700.—XEROGRAPHIC TONER DISPENSING APPARATUS. AUG. 13, 1968. CAN. 0852126, GRB. 1231868, JAP. 0752503.
3,453,045.—XEROGRAPHIC DEVELOPMENT APPARATUS. JULY 1, 1969. CAN. 0852125, FRA. 1559973, GRB. 1213493, HUN. 0156188, ITL. 0832847, JAP. 0602169, USR. 0371739.
3,538,887.—ELECTROSCOPIC TONER POWDER DISPENSER. NOV. 10, 1970.
3,542,089.—TONER DISPENSER. NOV. 24, 1970. CAN. 0885916.
3,596,807.—DISPENSING APPARATUS—REISSUED D2184R RE27876. AUG. 3, 1971. CAN 0868818.
3,608,792.—APPARATUS FOR DISPENSING FINELY DIVIDED PARTICULATE MATERIAL. SEPT. 28, 1971. ARG. 0182132, ATR. 0311790, AUS. 0456817, BEL. 0745602, CAN. 0869923, CHL. 0025844, DNK. 0128336, FRA. 7003984, GRB. 1302401, GUA. 0002512, ITL. 0886722, MEX. 0119828 NZL. 0159117, PNM. 0002240, SAF. 0700806, SPN. 0376265, STZ. 0526801, SWD. 7001426, TIW. 0005927, VZL. 0032924.
3,654,900.—FLUIDIZED DEVELOPMENT OF ELECTROSTATIC IMAGES. APR. 11, 1972. CAN. 0949821, GRB. 1357149.
3,655,033.—VIBRATORY BOWL—TONER DISPENSER. APR. 11, 1972.
3,752,576.—TRANSPORT FOR PARTICULATE MATERIAL. AUG. 14, 1973.
3,896,279.—TNE LVL DETCTR ASSEMBLY INC MAGNETICLY RESPONSIVE SWITCH ACTUATD BY DFERENTL LOADED BLADE TYPE. JULY 22, 1975.
3,901,187.—DEVELOPER RETONING APPARATUS. AUG. 26, 1975.
3,920,154.—TONER LEVEL DETECTOR. NOV. 18, 1975.

3,951,539.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED TONER DISPENSING APPARATUS. APR. 20, 1976.

Class 5I 2C 2

3,348,522.—AUTOMATIC TONER CONTROL SYSTEM. OCT. 24, 1967. CAN. 0799397, GRB. 1135743, JAP. 0942998, MEX. 0089292.
3,348,523.—AUTOMATIC TONER CONTROL SYSTEM. OCT. 24, 1967. CAN. 0799399, GRB. 1139299, JAP. 5371200.
3,376,853.—ELECTROSTATIC TONER CONTROL. APR. 9, 1968. CAN. 0819051, GRB. 1177232, JAP. 0568731.
3,376,854.—AUTOMATIC TONER DISPENSING CONTROL—SEE D2425 FOR RE27480. APR. 9, 1968. ARG. 0164003, ATR. 0279352, AUS. 0416453, BEL. 0699115, CAN. 0866349, CHL. 0022942, CLB. 0016441, CZC. 0160633, DNK. 0116114, EGR. 0067870, EIR. 0031100, FRA. 1524678, GRB. 1186775, GRK. 0033692, IND. 0110760, ISR. 0028022, ITL. 0796438, JAP. 0800113, LXB. 0053713, MEX. 0099990, NOR. 0128039, NZL. 0148850, PAK. 0118694, PLD. 0069794, PLP. 0005554, PRU. 0009348, PTG. 0047758, SAF. 0673111, SPN. 0340983, STZ. 0473409, SWD. 6707266, TRK. 0014624, UAR. 0008620, URG. 0008538, USR. 0494887, VZL. 0023661.
3,430,606.—ELECTROSCOPIC PARTICLE SENSOR. MAR. 4, 1969. BEL. 0726274, BRA. 6805010, CAN. 0891683, FRA. 1597321, ITL. 0866513, MEX. 0107599, PNM. 0001400, USR. 0336895, VZL. 0023727.
3,498,500.—LEVEL SENSOR. MAR. 3, 1970. CAN. 0912851, GRB. 1251128, JAP. 0663856.
3,520,445.—DIELECTRIC LEVEL SENSOR. JULY 14, 1970. CAN. 0895527, GRB. 1239856, JAP. 0663857.
3,526,338.—METHOD AND CONTROLLER FOR DISPENSING ELECTROSCOPIC MATERIAL—AUTOMATIC TONER DISPENSER CONTROL—24. SEPT. 1, 1970. ARG. 0181603, AUS. 0436922, BEL. 0726274, BRA. 6804852, CAN. 0895526, GRB. 1216690, ITL. 0866513, JAP. 0752505, MEX. 0107687, PNM. 0001419, SPN. 0362036, SWD. 0355090, USR. 0336895, VZL. 0023723.
3,527,387.—DEVELOPER REPLENISHING PROGRAMMING SYSTEM. SEPT. 8, 1970. CAN. 0922772, GRB. 1233814, JAP. 0758340.
3,536,042.—XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 27, 1970.
3,604,939.—TONER SENSING APPARATUS—TONER SENSOR ASSEMBLY-GENIE. SEPT. 14, 1971. CAN. 0915751, GRB. 1260379, JAP. 0752502.
3,635,373.—AUTOMATIC DEVELOPABILITY CONTROL APPARATUS. JAN. 18, 1972. ARG. 0190708, AUS. 0445334, BEL. 0760748, CAN. 0923546, CHL. 0025916, EGR. 0091983, FRA. 7047630, GRB. 1336590, GUA. 0002624, ITL. 0913903, JAP. 0795149, MEX. 0116721, PNM. 0002092, SPN. 0386750, STZ. 0524843, SWD. 0362511, TIW. 0007197.
3,659,556.—PROGRAMMABLE TONER DISPENSER. MAY 2, 1972. BEL. 0771423, CAN. 0936681, FRA. 7130743, GRB. 1358448, ITL. 0934010.
3,692,403.—AUTOMATIC CONTROL OF TONER CONCENTRATIONS. SEPT. 19, 1972. CAN. 0979635, GRB. 1409578.
3,693,581.—TONER DISPENSER CIRCUIT FOR ELECTROSTATOGRAPHIC APPARATUS. SEPT. 26, 1972.
3,727,065.—AUTOMATIC DEVELOPABILITY CONTROL SYSTEM. APR. 10, 1973. ARG. 0185080, AUS. 0440458, BEL. 0757430, CAN. 0934806, CHL. 0025915, CZC. 0169811, FGR. 0086755, FRA. 7038235, GRB. 1318895, ITL. 0908953, JAP. 0795148, MEX. 0116873, PNM. 0002179, SPN. 0384593, STZ. 0514168, SWD. 0369114, TIW. 0007196, VZL. 0032004.
3,754,821.—AUTOMATIC DEVELOPMENT CONTROL. AUG. 28, 1973. ARG. 0195188, AUS. 0467463, BEL. 0793425, CAN. 1004725, FRA. 7246724, GRB. 1411448, ITL. 0972845, JAP. 0552838, MEX. 0128209, NZL. 0169419, SAF. 7219030, SPN. 0410096, STZ. 0552838, SWD. 7216891, VZL. 0032066.
3,757,999.—AUTOMATIC DEVELOPABILITY CONTROL SYSTEM FOR ELECTROSTATIC RECORDING APPARATUS. SEPT. 11, 1973. ARG. 0185080, AUS. 0440458, BEL. 0757430, CAN. 0934806, CHL. 0025915, CZC. 0169811, EGR. 0086755, FRA. 7038235, GRB. 1318895, ITL. 0908953, JAP. 0795148, MEX. 0116873, PNM. 0002179, SPN. 0384593, STZ. 0514168, SWD. 0369114, TIW. 0007196, VZL. 0032004.
3,778,146.—ILLUMINATING APPARATUS. DEC. 11, 1973.
3,801,196.—TONER CONCENTRATION REGULATING APPARATUS. APR. 2, 1974.
3,814,516.—HUMIDITY COMPENSATED CONTROL DEVICE. JUNE 4, 1974. CAN. 1012202, GRB. 1458558.
3,825,337.—COLOR BALANCE DISPLAY. JULY 23, 1974. CAN. 1006766.
3,834,806.—PARTICLE LEVEL INDICATOR. SEPT. 10, 1974.
3,872,825.—PARTICLE CONCENTRATION DETECTOR. MAR. 25, 1975. CAN. 1014598.
3,873,002.—TONER DISPENSER LOGIC CONTROL. MAR. 25, 1975. BEL. 0813798, CAN. 1008915, GRB. 1457565, ITL. 1009837.
3,893,408.—TONER DISPENSER SYSTEM. JULY 8, 1975.
3,894,799.—APPARATUS FOR MONITORING COPY QUALITY. JULY 15, 1975.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.
3,936,176.—DEVICE FOR MAINTAINING A DEVELOPABILITY REGULATING APPARATUS CONTAMINANT FREE. FEB. 3, 1976.
3,960,444.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
3,969,114.—METHOD FOR MONITORING COPY QUALITY. JULY 13, 1976.
3,999,119.—MEASURING TONER CONCENTRATION. DEC. 21, 1976.
4,026,643.—APP & MTHD FOR MEASUREMENT OF THE RTO OF TNR PRTLCS ELCTRSTATC CHRGE TO TNR PRTLE MASS IN ELCTSTC. MAY 31, 1977.
4,032,225.—COPYING MACHINES. JUNE 28, 1977.
4,043,293.—DEVELOPABILITY REGULATING APPARATUS. AUG. 23, 1977.
4,076,149.—SLAVE DRIVER FOR TONER DISPENSER WITH STRIKER. FEB. 28, 1978.
4,079,266.—ELECTRONIC CONTROL FOR AUTOMATIC DEVELOPABILITY SYSTEM. MAR. 14, 1978.
4,082,445.—TONER CONTROL SYSTEM FOR AN ELECTROSTATIC REPRODUCTION MACHINE. APR. 4, 1978. BEL. 848542.
4,111,151.—MULTI-PARTICLE DEVELOPABILITY REGULATING SYSTEM. SEPT. 5, 1978.
4,113,371.—A COLOR DEVELOPMENT SYSTEM. SEPT. 12, 1978.

Class 5J

3,804,510.—IMAGING DEVELOPING SYSTEM. APR. 16, 1974.
3,889,637.—SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME. JUNE 17, 1975. FRA. 7422700, GRB. 1464886.
3,893,415.—DEVELOPING APPARATUS. JULY 8, 1975. ARG. 0204387, BEL. 0789238, BRA. 0088405, CAN. 0991394, FRA. 7232380, GRB. 1409815, ITL. 0970948, MEX. 0128578, SPN. 0408654, STZ. 0554551, SWD. 7214863, VZL. 0033578.
3,908,037.—IMAGE DEVELOPING TECHNIQUES. SEPT. 23, 1975. CAN. 0980181, GRB. 1406292.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.

Class 5J 1

3,147,147.—XEROGRAPHIC DEVELOPING APPARATUS AND ELECTRODE. SEPT. 1, 1964. CAN. 0738918, GRB. 1007167.
3,241,466.—ELECTROSTATIC PHOTOGRAPHY. MAR. 22, 1966.
3,424,131.—ELECTRODED CASCADE DEVELOPMENT SYSTEM. JAN. 28, 1969. CAN. 0848084, FRA. 1463050, GER. 1497214, GRB. 1123618, ITL. 0729637, JAP. 0499007.
3,606,863.—DEVELOPMENT ELECTRODE. SEPT. 21, 1971. CAN. 0905099, GRB. 1296756, JAP. 0774497.
3,611,992.—CLEANUP ELECTRODE. OCT. 12, 1971 CAN 0916431.
3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972.
3,648,658.—DEVELOPING APPARATUS. MAR. 14, 1972
3,651,784.—LOW POTENTIAL DEVELOPMENT ELECTRODE. MAR. 28, 1972. CAN. 0917900.
3,670,700.—DEVELOPMENT ELECTRODE. JUNE 20, 1972. ARG. 0185528, ATR. 0324836, AUS. 0445848, BEL. 0752935, CAN. 0916430, CHL. 0025837, DNK. 0126729, EGR. 0085926, FRA. 7024671, GRB. 1304065, IND 0127310, ITL. 0900194, JAP. 0731613, MEX. 0115164, NOR. 0131437, NZL. 0160642, PLP. 0006295, PNM 0001951, PTG. 0054071, SAF. 0704531, SPN. 0381380, STZ. 0513439, SWD. 0358976, TIW. 0007161, USR 0503555, VZL. 30684.
3,741,156.—XEROGRAPHIC DEVELOPMENT APPARATUS. JUNE 26, 1973.
3,778,144.—XEROGRAPHIC DEVELOPMENT ELECTRODE APPARATUS. DEC. 11, 1973. CAN 0972550, GRB. 1393144.
3,784,299.—DARK DECAY RETARDATION. JAN. 8, 1974

3,790,397.—RETONING CARRIER BEADS IN THE DEVELOPMENT ZONE. FEB. 5, 1974.
3,795,222.—DEVELOPMENT ELECTRODE SYSTEM. MAR. 5, 1974.
3,816,114.—ELECTRO-PHOTOGRAPHIC METHOD. JUNE 11, 1974.
3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974.
3,832,975.—ELECTROPHOTOGRAPHIC APPARATUS. SEPT. 3, 1974.
3,955,976.—DEVELOPING METHOD IN ELECTROPHOTOGRAPHY-DEVELOPING METHOD IN ELECTROPHOTOGRAPHY. MAY 11, 1976. GRB. 1329143.

Class 5J 2

3,416,494.—XEROGRAPHIC DEVELOPMENT ELECTRODE. DEC. 17, 1968. CAN. 0882575, GER. 1816690, GRB. 1249664, JAP. 0653014.
3,621,816.—INTERLACED VIBRATING ELECTRODE. NOV. 23, 1971. CAN. 0914397, GRB. 1316614, JAP. 0835102.

Class 5J 3

3,349,676.—XEROGRAPHIC DEVELOPMENT ELECTRODE APPARATUS. OCT. 31, 1967. CAN. 0814087, FRA. 1473662, GER. 1522685, GRB. 1144766, ITL. 0764006, JAP. 0513609, MEX. 0090133.
3,866,572.—FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM. BEL. 0815546, CAN. 1009503, FRA. 7418641, GRB. 1448386, ITL. 1012842, SPN. 0426760.

Class 5J 4

3,105,777.—XEROGRAPHIC DEVELOPING APPARATUS. OCT. 1, 1963, CAN. 0700762.

Class 5J 5

3,284,224.—CONTROLLED XEROGRAPHIC DEVELOPMENT. NOV. 8, 1966. CAN. 0751349, GRB. 1038801, JAP. 0640353.
3,438,705.—AUTOMATIC XEROGRAPHIC DEVELOPMENT CONTROL. APR. 15, 1969. GRB. 1207830.
3,611,982.—DEVELOPMENT ELECTRODE CONTROL APPARATUS. OCT. 12, 1971. ARG. 0185532, AUS. 0450067, BEL. 0755383, BRA. 0088402, CAN. 0913353, CHL. 0025834, EGR. 0090283, FRA. 7032350, GRB. 1303148, ITL. 0901777, JAP. 0758461, MEX. 0117918, PLD. 80986, PNM. 0002245, SPN. 0383058, STZ. 0523526, SWD. 0361750, TIW. 0007514, USR. 0473382, VZL. 0032598.
3,696,784.—XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 10, 1972. BEL. 0776601, CAN. 0951109, FRA. 7146241, GRB. 1369648, ITL. 0943905.
3,719,169.—PLURAL ELECTRODE DEVELOPMENT APPARATUS. MAR. 6, 1973. CAN. 0979299, GRB. 1381910.
3,784,397.—IMAGING SYSTEM. JAN. 8, 1974.
3,788,739.—IMAGE COMPENSATION METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHIC DEVICES. JAN. 29, 1974.
3,805,739.—CONTROLLING MULTIPLE VOLTAGE LEVELS FOR ELECTROSTATIC PRINTING. APR. 23, 1974. CAN. 0972552, GRB. 1382710.
3,810,165.—ELECTRONIC DISPLAY DEVICE. MAY 7, 1974.
3,815,988.—IMAGE DENSITY CONTROL APPARATUS. JUNE 11, 1974. ARG. 0205710, BEL. 0815209, FRA. 7416693, GRB. 1458707, ITL. 1012346, SAF. 0743132.
3,818,864.—IMAGE DEVELOPING APPARATUS. JUNE 25, 1974. CAN. 0980181, GRB. 1406292.
3,888,666.—REVERSAL DEVELOPING METHOD USING PHOTOCONDUCTIVE DEVELOPING ELECTRODE. JUNE 10, 1975.
3,889,637.—SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME. JUNE 17, 1975. FRA. 7422700, GRB. 1464886.
4,084,538.—AMBIENT TEMPERATURE COMPENSATING DEVICE FOR POWER SOURCE APPARATUS FOR DEVELOPING ELECTRODE. APR. 18, 1978.

Class 5K

3,212,889.—XEROGRAPHIC CONTRAST CONTROL. OCT. 19, 1965. GRB. 1008897.
3,251,685.—METHOD OF CONTROLLING CONTRAST IN A XEROGRAPHIC REPRODUCTION PROCESS. MAY 17, 1966. CAN. 0707047, GER. 1265583, JAP. 0446813.
3,540,806.—HALF TONING METH AND APPARATUS FOR SOLID AREA COVERAG. NOV. 17, 1970. CAN. 0892754, GRB. 1253888.
3,669,072.—DEVELOPER APPARATUS. JUNE 13, 1972. CAN. 0930539, GRB. 1343141.
3,707,947.—CROSS-CHANNEL MIXER. JAN. 2, 1973. ARG. 0200109, ATR. 0322982, AUS. 0457444, BEL. 0776661, CAN. 0946145, CHL. 0027259, DNK. 0132048, EGR. 0099026, FRA. 7145340, GRB. 1372731, ITL. 0943876, MEX. 0127352, PNM. 0002585, SAF. 0718308, SPN. 0397852, STZ. 0557554, TIW. 0005832, USR. 0402245.
3,808,026.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE. APR. 30, 1974.
3,817,748.—CONTRAST CONTROL IN ELECTROSTATIC COPYING UTILIZING LIQUID DEVELOPMENT. JUNE 18, 1974. CAN. 0991246, GRB. 1406794.
3,865,080.—TONER PICKOFF APPARATUS. FEB. 11, 1975. GRB. 1430876.
3,865,612.—XEROGRAPHIC DEVELOPMENT METHOD. FEB. 11, 1975.
3,887,367.—METHOD FOR TEMPERATURE STABILIZING PHOTORECEPTORS. JUNE 3, 1975.
3,889,637.—SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME. JUNE 17, 1975. FRA. 7422700, GRB. 1464886.
3,893,413.—XEROGRAPHIC DEVELOPING APPARATUS. JULY 8, 1975.
3,911,865.—TONER PICKOFF APPARATUS. OCT. 14, 1975.
3,946,920.—VACUUM SYSTEM CONTROL. MAR. 30, 1976.
3,960,444.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.
3,994,725.—MEANS FOR ENHANCING REMOVAL OF BACKGROUND TONER PARTICLE. NOV. 30, 1976.
3,997,259.—APPARATUS FOR REDUCING IMAGE BACKGROUND IN ELECTROSTATIC REPRODUCTION MACHINES. DEC. 14, 1976.
4,023,900.—VARIABLE SPEED LIQUID DEVELOPMENT ELECTROSTATOGRAPHIC APPARATUS. MAY 17, 1977.

Class 5K 5

4,161,357.—PHOTORECEPTOR HEATING APPARATUS. JULY 17, 1979.

Class 5L

3,245,823.—ELECTROSTATIC IMAGE DEVELOPMENT APPARATUS. APR. 12, 1966.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.

Class 5M

3,712,728.—REVERSAL DEVELOPMENT. JAN. 23, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,772,012.—REVERSAL DEVELOPMENT USING POLAR LIQUID DEVELOPERS. NOV. 13, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,800,744.—ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS. APR. 2, 1974.
3,877,963.—REVERSAL LIQUID DEVELOPING USING A DEVELOPMENT ELECTRODE AND CORONA CHARGING. APR. 15, 1975.
3,888,666.—REVERSAL DEVELOPING METHOD USING PHOTOCONDUCTIVE DEVELOPING ELECTRODE. JUNE 10, 1975.
3,901,698.—METHOD OF REVERSAL DEVELOPMENT USING TWO ELECTROSTATIC DEVELOPERS. AUG. 26, 1975.

Class 5N

3,907,693.—LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY. SEPT. 23, 1975.
3,907,694.—NON-VOLATILE CONDUCTIVE INKS. SEPT. 23, 1975.
3,954,640.—ELECTROSTATIC PRINTING INKS. MAY 4, 1976. BEL. 0816553, GRB. 1452556.
3,963,486.—ELECTROPHOTOGRAPHIC IMAGING PROCESS EMPLOYING EPOXY-ESTER CONTAINING LIQUID DEVELOPER. JUNE 15, 1976.
4,024,292.—PROCESS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES WITH INK. MAY 17, 1977. BEL. 0816553, GRB. 1452556.
4,047,943.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH CONDUCTIVE LIQUID DEVELOPER. SEPT. 13, 1977.

4,075,391.—PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIAL HAVING IMPROVED PROPERTIES. FEB. 21, 1978. BEL. 847571, FRA. 7632899, SPN. 452858.
4,076,640.—PREPARATION OF SPHEROIDIZED PARTICLES. FEB. 28, 1978. SPN. 445496.
4,077,804.—METHOD OF PRODUCING TONER PARTICLES BY IN-SITU POLYMERIZATION AND IMAGING PROCESS. MAR. 7, 1978.

Class 5N 1A

3,609,082.—ELECTROSTATIC DEV PARTICLS CONTAING RESIN, COLORANT, METAL SALT AND PHTHALATE. SEPT. 28, 1971. ARG. 0165457, BAH. 0000094, BOL. 3389B, CAN. 0902985, CHL. 0023567, CLB. 0017680, DOR. 0001462, ECD. 0000168, ELS. 0001065. JAM. 0001897, MEX. 0100808, PNM. 0002016, PRU. 0009862, TRK. 0015594, URG. 0009288.
3,720,617.—AN ELECTROSTATIC DEVELOPER CONTAINING MODIFIED SILICON DIOXIDE PARTICLES. MAR. 13, 1973. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 2131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149, USR. 0460634, VZL. 0032423.
3,819,367.—IMAGING SYSTEM. JUNE 25, 1974. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 0131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149, USR. 0460634, VZL. 0032423.
3,820,986.—LIQUID DEVELOPMENT METHOD AND MATERIALS. JUNE 28, 1974.
3,833,364.—METHOD OF DEVELOPING ELECTROSTATIC IMAGE CHARGE. SEPT. 3, 1974.
3,850,830.—LIQUID DEVELOPER CONTAINING EXTENDER BODY PARTICLES. NOV. 26, 1974.
3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924.
4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.

Class 5N 1B

3,577,345.—SOLID XEROGRAPHIC DEVELOPER. MAY 4, 1971. ARG. 0172448, ATR. 0325417, AUS. 0424173, BAH. 0000095, BEL. 0716084, BOL. 003270B, CAN. 0902983, CHL. 0025923, CLB. 0017674, DOR. 0001461, ELS. 0001064, FRA. 1567731, GRB. 1232117, GRK. 0037628, GUA. 0002003, HOL. 0148714, IND. 0116209, ISR. 0030116, ITL. 0851653, JAM. 0001848, JAP. 0623002, LXB. 0056197, MEX. 0119320, NOR. 0131653, NZL. 0164353, PNM. 0002062, PRU. 0009911, PTG. 0049749, SPN. 0354686, STZ. 0516180, SWD. 0338238, TIW. 0005096, TRD. 0000057, TRK. 0015620, URG. 0009286, VZL. 0023666.
3,590,000.—SOLID DEVELOPER FOR LATENT ELECTROSTATIC IMAGES. JUNE 29, 1971. ARG. 0172453, ATR. 0288860, AUS. 0480033, BAH. 0000093, BEL. 0716083, BOL. 3399B, CAN. 0902984, CHL. 0024050, DOR. 0001460, ECD. 0000198, ELS. 0001062, FRA. 1567721, GER. 1772570, GRB. 1232118, GRK. 0037629, GUA. 0002095, HOL. 0151523, IND. 0116210, ISR. 0030117, ITL. 0851651, JAM. 0002094, JAP. 0655407, LXB. 0056196, MEX. 0104566, NZL. 0164356, PLP. 0007690, PNM. 0002083, PRU. 0009495, PTG. 0049748, SPN. 0354685, STZ. 0519737, SWD. 0357071, TIW. 0004940, TRD. 0000058, TRK. 0015606, URG. 0009287, VZL. 0032392.
3,609,082.—ELECTROSTATIC DEV PARTICLS CONTAING RESIN, COLORANT, METAL SALT AND PHTHALATE. SEPT. 28, 1971. ARG. 0165457, BAH. 0000094, BOL. 3389B, CAN. 0902985, CHL. 0023567, CLB. 0017680, DOR. 0001462, ECD. 0000168, ELS. 0001065, JAM. 0001897, MEX. 0100808, PNM. 0002016, PRU. 0009862, TRK. 0015594, URG. 0009288.
3,635,704.—IMAGING SYSTEM. JAN. 18, 1972. ALB. 0004133, ARG. 0176978, ATR. 0303521, AUS. 0440759, BEL. 0727560, BRA. 0088093, BUR. 0000042, CAM. 0000463, CAN. 0867697, CHL. 0026254, COR. 000949A, DNK. 0131403, EGR. 0078899, EIR. 0032632, FRA. 6902174, GNR. 0000042, GRB. 1259514, GRK. 0039240, IND. 0119583, ISR. 0031503, ITL. 0871510, LAS. 0000199, LIB. 00P7269, LXB. 0057849, MEX. 0106332, MLG. 0003056, MLW. 00MW869, MNC. 8156975, MRC. 0014724, NZL. 0155208, PAK. 0120859, PLP. 0008511, PNM. 0001676, PRU. 0010443, PTG. 0051063, RHD. 4169529, RMN. 0055464, SAF. 0069995, SPN. 0363127, STZ. 0513431, SWD. 0342921, SYA. 0002477, TGR. 0000551, TIW. 0005257, UAR. 0009525, USR. 0396887, VTM. 0001805, VZL. 0023744, ZMB. 0186974.
3,652,319.—CYCLIC IMAGING SYSTEM. MAR. 28, 1972. AUS. 0441527, BEL. 0761029, CAN. 0944010, FRA. 7047634, GRB. 1336739, ITL. 0913957, JAP. 0771819, SWD. 0363175.
3,653,893.—IMAGING SYSTEM. APR. 4, 1972.
3,655,374.—IMAGING PROCESS EMPLOYING NOVEL SOLID DEVELOPER MATERIAL. APR. 11, 1972.
3,681,107.—DEVELOPMENT OF ELECTROSTATOGRAPHIC IMAGES. AUG. 1, 1972.
3,748,127.—TREATMENT OF REUSABLE PHOTOCONDUCTIVE SURFACES WITH LEWIS ACIDS OR BASES. JULY 24, 1973.
3,820,778.—VACUUM STRIPPING ROLL WITH ROTARY PICKUP SLOTS. JUNE 28, 1974. CAN. 1010081, GRB. 1430856.
3,856,692.—LIQUID ELECTROSTOGRAPHIC DEVELOPER COMPOSITIONS. DEC. 24, 1974. CAN. 0940361, GRB. 1332674.
3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924, SPN. 0435074.
3,900,589.—AN ELECTROSTATOGRAPHIC IMAGING PROCESS. AUG. 19, 1975. AUS. 0467835, BEL. 0802879, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,948,654.—ELECTROSTATOGRAPHIC PROCESS. APR. 6, 1976.
3,983,045.—THREE COMPONENT DEVELOPER COMPOSITION. SEPT. 28, 1976. ARG. 0194232, ATR. 0334199, AUS. 0462045, BEL. 0789987, CHL. 0027625, FRA. 7236617, GRB. 1402009, ITL. 0968815, MEX. 0125231, NZL. 0168638, PNM. 0002796, SAF. 0727225, SPN. 0407564, STZ. 0028096, SWD. 7213035, TIW. 0007666, VZL. 0012802.
4,002,570.—ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLLIDENE FLUORIDE ADDITIVE. JAN. 11, 1977.
4,072,521.—AMIDES OF W AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT. FEB. 7, 1978.
4,073,649.—DI CARBOXYLIC ACID BIS AMIDES AND IMPROVED IMAGING PROCESS. FEB. 14, 1978.
4,076,641.—W- AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS. FEB. 28, 1978.
4,099,968.—DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES.
4,147,541.—ELECTROSTATIC IMAGING MEMBER WITH ACID LUBRICANT. APR. 3, 1979. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.

Class 5N 2

3,844,815.—FORON YELLOW AS A TONER COLORANT OCT. 29, 1974. BEL. 808754, CAN. 1003264, FRA. 7345058, ITL. 1000870.
4,078,930.—DEVELOPER COMPOSITIONS COMPRISING TONER AND CARRIER. MAR. 14, 1978. FRA. 763634

Class 5N 2A

3,723,114.—THERMOSETTING ELCTRSTGRPHC DVLPR OF CARRIER/PREPOLYMER OF DIALLYL PHTHALATE ISOPHTHALATE AND MXTR. MAR. 27, 1973 ARG. 0185089, BEL. 0762507, CAN. 0970195, FRA 7104349, GRB. 1344197, ITL. 0918244, MEX. 0122234.
3,806,339.—LIQUID DEVELOPER COMPOSITION. APR 23, 1974.
3,900,800.—HIGH VOLTAGE AMPLIFIER. AUG. 19, 1975
3,903,320.—ELECTROSTATOGRAPHIC DEVELOPMENT METHOD FOR PRESSURE FIXABLE TONERS SEPT. 2, 1975.
3,909,259.—COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS UTILIZING SPECIFIC CARRIER-TOWER COMBINATIONS. SEPT. 30, 1975. CAN 1005678, FRA. 7345057, GRB. 1435218.
3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.
3,965,021.—ELECTROSTATOGRAPHIC DEVELOPMENT-POLYBLEND TONERS. JUNE 22, 1976.
3,967,962.—DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS. JULY 6, 1976.
3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.
4,013,572.—HYBRID FIX SYSTEM INCORPORATING PHOTOGRADABLE POLYMERS. MAR. 22, 1977.
4,049,447.—IMAGING SYSTEM. SEPT. 20, 1977. ARG 195092, AUS. 468938, BEL 791376, CAN. 986768, FRA

7239133, GRB. 1411446, ITL. 972536, MEX. 131270, SPN. 409973, STZ. 28528, VZL. 33138.
4,104,066.—COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE. AUG. 1, 1978.
4,186,003.—HYBRID FIX SYSTEM INCORPORATING PHOTODEGRADABLE POLYMERS. JAN. 29, 1980.

Class 5N 2A 1

RE.25,136.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR-RE OF 2,940,934-D432. MAR. 13, 1962.
3,079,342.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR. FEB. 26, 1963. ARG. 0157131, CAN. 0726134, GUA. 0001817.
3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 5N 2A 2

3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 5N 2B

3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.
3,591,503.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 6, 1971. ARG. 0172143, ATR. 0287491, AUS. 0418556, BEL. 0713751, CAN. 0879020, CHL. 0024256, CLB. 0017933, FRA. 1560849, GRB. 1225980, GRK. 0038397, IND. 0115457, ITL. 0833710, LXB. 0055904, MEX. 0111625, NOR. 0128297, NZL. 0152196, PLP. 0008847, PRU. 0009319, PTG. 0049455, SAF. 0682386, SPN. 0352810, STZ. 0508903, SWD. 0333868, URG. 0009139, VZL. 0023688.
3,595,794.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 27, 1971. ARG. 0169109, ATR. 0290986, AUS. 0418156, BEL. 0713752, CAN. 0879021, CHL. 0024482, FRA. 1582855, GRB. 1227471, IND. 0115458, ITL. 0883043, LXB. 0055894, MEX. 0115899, NOR. 0128036, NZL. 0152195, PLP. 0007966, PRU. 0009335, PTG. 0049154, SAF. 0682358, SPN. 0352811, STZ. 0505410, SWD. 0331633, URG. 0009283, VZL. 0023687.
3,627,522.—DEVELOPER COMPOSITION AND METHOD OF USE. DEC. 14, 1971.
3,672,928.—ELECTROSTATOGRAPHIC DEVELOPERS HAVING CARRIERS COMPRISING POLYSTER COATED CORES. JUNE 27, 1972. ARG. 0184669, BEL. 0762415, CAN. 0941209, FRA. 7103845, GRB. 1344365, ITL. 0918191, JAP. 0764506.
3,704,066.—REFLEX ESPOSURE MEDIUM. NOV. 28, 1972.
3,725,283.—ELECTROSTATOGRAPHIC DEVELOPER CONTAINING UNCOATED GLASS CERAMIC CARRIER PARTICLES. APR. 3, 1973. BEL. 0777720, CAN. 0973745, FRA. 7201006, GRB. 1376457, ITL. 0946358.
3,767,578.—CARRIER MATERIAL FOR ELECTROSTATOGRAPHIC. OCT. 23, 1973. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.
3,847,604.—ELECTROSTATIC IMAGING PROCESS USING MODULAR CARRIERS. NOV. 12, 1974. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.
3,849,127.—AN ELECTROSTATOGRAPHIC PROCESS IN WHICH COATED CARRIER PARTICLES ARE USED. NOV. 19, 1974.
3,857,792.—ELECTROSTATIC DEVELOPER MIXTURE WITH A COATED CARRIER. DEC. 31, 1974.
3,914,181.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURES COMPRISING FERRITE CARRIER BEADS. OCT. 21, 1975. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.
3,923,503.—ELECTROSTATIC LATEN IMAGE DEVELOPMENT EMPLOYING STEEL CARRIER PARTICLES. DEC. 2, 1975. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.
3,939,086.—HIGHLY CLASSIFIED OXIDIZED DEVELOPER MATERIAL. FEB. 17, 1976. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.
3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.
4,018,601.—ELECTROSTATOGRAPHIC MAGNETIC BRUSH IMAGING PROCESS EMPLOYING CARRIER BEADS COMPRISING HIGH NICK. APR. 19, 1977.
4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.
4,065,305.—XEROGRAPHIC DEVELOPER. DEC. 27, 1977.
4,206,065.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITIONS USING TERPOLYMER COATED CARRIER. JUNE 3, 1980.

Class 5N 3

4,185,916.—COMPOSITE DEVELOPER PARTICLES AND APPARATUS FOR USING SAME. JAN. 29, 1980.

Class 5N 4

3,467,634.—ORGANOSILICON TERPOLYMERS AND PROCESS. SEPT. 16, 1969. ARG. 0165758, AUS. 0417109, BEL. 0702403, BRA. 6790950, CAN. 0857389, FRA. 1534183, GRB. 1200756, HOL. 0826202, ITL. 0826202, JAP. 0671041, MEX. 0100136, NOR. 0125392, SPN. 0343902, STZ. 0484210, SWD. 0339752, VZL. 0025437.
3,526,533.—COATED CARRIER PARTICLES. SEPT. 1, 1970. ARG. 0161341, AUS. 0418867, BEL. 0702404, CAN. 0878413, FRA. 1534184, GRB. 1205051, ITL. 0826203, JAP. 0578401, MEX. 0120334, NOR. 0122818, SPN. 0343903, STZ. 0486054, SWD. 0308987, VZL. 0032393.
3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.
3,713,819.—XEROGRAPHIC IMAGING AND DEVELOPMENT USING METAL OXIDE CARRIER PART. JAN. 30, 1973.
3,730,707.—METHOD OF DEVELOPING LATENT IMAGES. MAY 1, 1973.
3,752,666.—ELECTROSTATIC IMAGING PROCESS USING CARRIER BEADS CONTAINING CONDUCTIVE PARTICLES. AUG. 14, 1973.
3,833,366.—CARRIER COMPOSITIONS. SEPT. 3, 1974. BEL. 0748633, CAN. 0904641, FRA. 7012584, GRB. 1319787, ITL. 0899337, JAP. 0709043.
3,839,029.—ELECTROSTATOGRAPHIC DEVELOPMENT WITH FERRITE DEVELOPER MATERIALS. OCT. 1, 1974. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.
3,849,182.—HIGHLY SHAPE-CLASSIFIED OXIDIZED LOW CARBON HYPEREUTECTOID ELECTROSTATOGRAPHIC STEEL CARRIER PA. NOV. 19, 1974. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,850,663.—CELLULOSE COATED CARRIERS. NOV. 26, 1974. ARG. 0183677, AUS. 0458322, BEL. 0763987, CAN. 0941210, EGR. 0091603, FRA. 7108585, GRB. 1345027, ITL. 0922292, MEX. 0120027, PNM. 0002440, SAF. 0711547, STZ. 0557050, SWD. 0359940, TIW. 0008177, VZL. 0032931.
3,850,676.—COATED CARRIER PARTICLES FOR ELECTROSTATOGRAPHIC DEVELOPMENT. NOV. 26, 1974.
3,900,587.—IMAGING PROCESS EMPLOYING TREATED CARRIERS PARTICLES. AUG. 19, 1975.

3,903,320.—ELECTROSTATOGRAPHIC DEVELOPMENT METHOD FOR PRESSURE FIXABLE TONERS. SEPT. 2, 1975.
3,916,064.—DEVELOPER MATERIAL. OCT. 28, 1975.
3,916,065.—ELECTROSTATOGRAPHIC CARRIER PARTICLES. OCT. 28, 1975.
3,929,657.—STOICHIOMETRIC FERRITE CARRIERS. DEC. 30, 1975. BEL. 0819535.
3,945,823.—ELECTROSTATOGRAPHIC REVERSAL DEVELOPMENT WITH DEVELOPER COMPRISING POLY(P-XYLYLENE) COATED CARR. MAR. 23, 1976. BEL. 0807597, CAN. 1003262, GRB. 1453595, MEX. 0133543, SPN. 0420696.
3,947,371.—DEVELOPER MATERIAL WITH POLYPXYLYLENE-COATED CARRIER. MAR. 30, 1976. BEL. 0807597, CAN. 1003262, GRB. 1453595, MEX. 0133543, SPN. 0420696.
3,989,648.—IMAGING SYSTEM. NOV. 2, 1976. CAN. 1007923.
3,996,392.—HUMIDITY-INSENSIVE FERRITE DEVELOPER MATERIALS. DEC. 7, 1976. BEL. 0847571.
4,007,293.—MECHANICALLY VIABLE DEVELOPER MATERIALS. FEB. 8, 1977.
4,019,903.—ELECTROSTATIC DEVELOPMENT. APR. 26, 1977. BEL. 0777715, CAN. 0973746, FRA. 7201001, GRB. 1376456, ITL. 0946359.
4,035,520.—IMAGING SYSTEMS. JULY 12, 1977.
4,039,331.—CARRIER BEAD COATING COMPOSITIONS. AUG. 2, 1977.
4,040,969.—HIGH SURFACE AREA CARRIER. AUG. 9, 1977. BEL. 829639, GRB. 1497732, SPN. 438084.
4,042,517.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE CONTAINING A THERMOSET ACRYLIC RESIN COATED CARRIER. AUG. 16, 1977.
4,042,518.—STOICHIOMETRIC FERRITE CARRIERS. AUG. 16, 1977. BEL. 819535, CAN. 1033978, FRA. 7429829, GRB. 1468841, SPN. 429670.
4,043,929.—ELECTROSTATOGRAPHIC CARRIER COMPOSITION. AUG. 23, 1977.
4,053,310.—DURABLE CARRIER COATING COMPOSITIONS COMPRISING POLYSULFONE. OCT. 11, 1978.
4,057,426.—MAGNETIC TONER WITH A COATED CARRIER. NOV. 8, 1977.
4,058,397.—YELLOW DEVELOPER EMPLOYING A COATED CARRIER. NOV. 15, 1978.
4,065,585.—RENEWABLE CHOW FUSER COATING. DEC. 27, 1977. GRB. 1490252.
4,066,563.—COPPER-TETRA-4-(OCTADECYLSULFONOMIDO) PHTHALOCYANINE ELECTROPHOTOGRAPHIC CARRIER. JAN. 3, 1978.
4,073,965.—YELLOW DEVELOPER EMPLOYING A COATED CARRIER AND IMAGING PROCESS USING SAME. FEB. 14, 1978.
4,076,893.—TRIBO MODIFIED CARRIER MATERIALS VIA ACYLATION. FEB. 28, 1978.
4,078,926.—IMAGING METHOD UTILIZING FUNCTIONALIZED CARRIER MATERIALS. MAR. 14, 1978.
4,079,166.—AMINOLYZED CARRIER COATINGS. MAR. 14, 1978.
4,092,163.—IMAGING PROCESS UTILIZING SILYLATED COATED CARRIER. MAY 30, 1978.
4,094,803.—DEVELOPER COMPOSITION COMPRISING AMINOLYZED COATED CARRIER. JUNE 13, 1978.
4,104,066.—COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE. AUG. 1, 1978.
4,122,024.—CLASSIFIED TONER MATERIALS. OCT. 24, 1978. BEL. 829719. CAN. 1043149. FRA. 7516758. GRB. 1497731.
4,124,385.—MAGNETIC GLASS CARRIER MATERIALS. NOV. 7, 1978.
4,124,735.—MAGNETIC GLASS CARRIER MATERIALS. NOV. 7, 1978.
4,125,667.—HIGH SURFACE AREA FERROMAGNETIC CARRIER MATERIALS. NOV. 14, 1978. BEL. 829639. CAN. 1041344. FRA. 7516181. GRB. 1497732. SPN. 438084. SWD. 75060434. USR. 623532.
4,126,437.—MAGNETIC GLASS CARRIER MATERIALS. NOV. 21, 1978.
4,126,454.—IMAGING PROCESS UTILIZING HIGH SURFACE AREA CARRIER MATERIALS. NOV. 21, 1978.
4,126,458.—INORGANIC REVERSAL CARRIER COATINGS. NOV. 21, 1978.
4,126,566.—ELECTROSTATIC DEVELOPER MATERIAL. NOV. 21, 1978. CAN. 1055761. GRB. 1494392.
4,147,540.—COLOR ELECTROPHOTOGRAPHIC DEVELOPER SYSTEM EMPLOYING ONE CARRIER HAVING A COATING OF RESIN. APR. 3, 1979. FRA. 7629316. GRB. 1526875.
4,152,279.—TRIBOELECTRIC MODIFIED CARRIER FOR ELECTROSTATOGRAHIC DEVELOPER. MAY 1, 1979.
4,156,607.—CARRIER COATED WITH ACYL MODIFIED STYRENE COPOLYMER, USED IN ELECTROSTATIC IMAGING PROCESS. MAY 29, 1979.
4,179,388.—DEVELOPER MATERIAL. DEC. 18, 1979.

Class 5N 5

3,788,994.—PRESSURE FIXABLE ELECTROSTATOGRAPHIC TONER. JAN. 29, 1974. ARG. 0200575, BEL. 0793247, CAN. 0985943, FRA. 7244381, GRB. 1406687, ITL. 0973323, SPN. 0410212, STZ. 0028529, VZL. 0032608.
3,804,764.—ELECTROSTATOGRAPHIC PRESSURE SENSITIVE POLYMERIC TONER. APR. 16, 1974. ARG. 0196320, AUS. 0464392, BEL. 0793554, CAN. 1011149, FRA. 7246575, GRB. 1417409, ITL. 0973325, SPN. 0410211, STZ. 0028568.
3,853,778.—TONER COMPOSITION EMPLOYING POLYMER WITH SIDE CHAIN CRYSTALLINITY. DEC. 10, 1974. AUS. 0465653, BEL. 0793639, CAN. 0998869, FRA. 7246888, GRB. 1423291, ITL. 0973330, SPN. 0410267, SWD. 7300003.
3,893,932.—PRESSURE FIXABLE TONER. JULY 8, 1975.
3,893,934.—SOLID DEVELOPER FOR ELECTROSTATIC LATENT IMAGES. JULY 8, 1975.
4,002,776.—IMAGING PROCESS EMPLOYING TONER PARTICLES CONTAINING ARYLSULPONAMIDE FORMALDEHYDE ADDUCT. JAN. 11, 1977.
4,027,048.—ELECTROSTATOGRAPHIC DEVELOPMENT. ARG. 0196318, AUS. 0467046, BEL. 0792115, CAN. 1001884, FRA. 7239134, ITL. 0973326, MEX. 0128788, SPN. 0410205, STZ. 0028567, VZL. 0033139.
4,049,447.—IMAGING SYSTEM. SEPT. 20, 1977. ARG. 195092, AUS. 468938, BEL. 791376, CAN. 986768, FRA. 7239133, GRB. 1411446, ITL. 972536, MEX. 131270, SPN. 409973, STZ. 28528, VZL. 33138.
4,070,186.—TRIBO MODIFIED TONER MATERIALS VIA SILYLATION AND ELECTROSTATOGRAPHIC IMAGING PROCESS. JAN. 24, 1978.
4,070,296.—TRIBOELECTRICALLY CONTROLLED COVAL- ENTLY DYED TONER MATERIALS. JAN. 24, 1978.
4,078,931.—AMINOLYZED TONER COMPOSITIONS AND IMAGING PROCESS USING SAME. MAR. 14, 1978.
4,079,166.—AMINOLYZED CARRIER COATINGS. MAR. 14, 1978.
4,104,066.—COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE. AUG. 1, 1978.
4,113482.—IMAGING COMPOSITIONS. SEPT. 12, 1978. CAN. 978790. GRB. 1418292.
4,134,760.—TRIBO MODIFIED TONER MATERIALS VIA ACYLATION. JAN. 16, 1979. GRB. 1525703.
4,135,925.—METHODS OF CHANGING COLOR BY IMAGE DISRUPTION. JAN. 23, 1979. CAN. 978790. GRB. 1418292.
4,139,483.—ELECTROSTATOGRAPHIC TONER COMPOSITION CONTAINING SURFACTANT. FEB. 13, 1979.
4,175,962.—ELECTROSTATOGRAPHIC TONER MATERIAL. NOV. 27, 1979.
4,198,477.—METHOD OF USING ELECTROSTATOGRAPHIC TONER COMPOSITION WITH SURFACTANT. APR. 15, 1980. SPN. 467191.

Class 5N 5A

3,729,419.—LIQUID DEVELOPER. APR. 24, 1973.
3,804,619.—COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS. APR. 16, 1974. CAN. 1005678, FRA. 7345057, GRB. 1435218.
3,836,244.—COLOR XEROGRAPHY. SEPT. 17, 1974.
3,841,893.—CHARGE CONTROL AGENTS FOR LIQUID DEVELOPERS. OCT. 15, 1974.
3,897,249.—TONERS FOR PHTHALOCYANINE PHOTORECEPTORS. JULY 29, 1975.
3,900,800.—HIGH VOLTAGE AMPLIFIER. AUG. 19, 1975.
3,909,259.—COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS UTILIZING SPECIFIC CARRIER-TONER COMBINATIONS. SEPT. 30, 1975. CAN. 1005678. FRA. 7345057, GRB. 1435218.
4,035,310.—YELLOW DEVELOPER. JULY 12, 1977.
4,052,207.—ELECTROSTATOGRAPHIC IMAGING PROCESS. OCT. 4, 1977. SPN. 450203.

Class 5N 5B

4,187,194.—ENCAPSULATION PROCESS. FEB. 5, 1980. BEL. 793327, CAN. 1008314, GRB. 1423292, SPN 410265.

Class 5N 6

3,755,177.—PROCESS OF MAKING LIQUID ELECTROSTATIC DEVELOPERS CONTAINING GELATIN. AUG. 28, 1973.

3,908,046.—P-XYLYENE VAPOR PHASE POLYMERIZATION COATING OF ELECTROSTATOGRAPHIC PARTICLES. SEPT. 23, 1975.
3,986,968.—MILLED AND POLAR SOLVENT EXTRACTED LIQUID DEVELOPER. OCT. 19, 1976.

Class 5N 6A

3,507,686.—METHOD OF COATING CARRIER BEADS. APR. 21, 1970. CAN. 0872190, GRB. 1239621, JAP. 0675782.
3,658,500.—METHOD OF PRODUCING GLASS BEADS FOR ELECTROSTATOGRAPHIC DEVELOPERS. APR. 25, 1972. CAN. 0916536, GRB. 1331485.
3,685,113.—DEVELOPER SYSTEM. AUG. 22, 1972. ARG. 0183679, BEL. 0764635, CAN. 0941211, FRA. 7110751, GRB. 1347568, ITL. 0922132, MEX. 0122432.
3,764,310.—METHOD OF PRODUCING ELECTROSTATOGRAPHIC DEVELOPER. OCT. 9, 1973.
3,789,796.—APPARATUS FOR PRODUCING DEVELOPER MATERIALS. FEB. 5, 1974.
3,989,435.—APPARATUS FOR FABRICATING SPHERICALLY SHAPED PARTICLES OF SMALL DIAMETER. NOV. 2, 1976.
4,019,842.—APPARATUS FOR FORMING MAGNETITE ELECTROSTATOGRAPHIC CARRIERS. APR. 26, 1977.
4,075,391.—PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIAL HAVING IMPROVED PROPERTIES. FEB. 21, 1978. BEL. 847571, FRA. 7632899, SPN. 452858.
4,076,640.—PREPARATION OF SPHEROIDIZED PARTICLES. FEB. 28, 1978. SPN. 445496.
4,129,136.—REJUVENATING ELECTROSTATOGRAPHIC CARRIER PARTICLES. DEC. 12, 1978.
4,209,550.—COATING CARRIER MATERIALS BY ELECTROSTATIC PROCESS. JUNE 24, 1980.

Class 5N 6B

3,326,848.—SPRAY DRIED LATEX TONERS. JUNE 20, 1967. AUS. 0409084, BEL. 0666056, CAN. 0866260, FRA. 1451366, GRB. 1115653, ITL. 0717377, MEX. 0088140, SWD. 0340046.
3,338,991.—METHOD OF FORMING ELECTROSTATIC TONER PARTICLES. AUG. 29, 1967. FRA. 1450642, GRB. 1115634, HOL. 0142251, ITL. 0717378, JAP. 0539572.
3,502,582.—IMAGING SYSTEMS. MAR. 24, 1970. ARG. 0171952, BEL. 0726571, CAN. 0873934, FRA. 1569382, GRB. 1237095, ITL. 0835554, MEX. 0100704, VZL. 0032414.
3,740,334.—PROCESS OF PREPARING SOLID DEVELOPERS FOR ELECTROSTATIC LATENT IMAGES. JUNE 19, 1973.
3,830,750.—ENCPSLING SBSTNLY SLUBL PRTN OF CORE MATL IN SBSTNLY SLBLE SHELL MATL OF DFRNT SOLUBLTY. AUG. 20, 1974. AUS. 0466018, BEL. 0793246, CAN. 0983328, GRB. 1411954, ITL. 0973317, SPN. 0410224, STZ. 0028527.
3,893,933.—PROCESS FOR PRODUCING ENCAPSULATED TONER COMPOSITION. JULY 8, 1975.
3,968,044.—MILLED LIQUID DEVELOPER. JULY 6, 1976.
3,990,797.—DIFFRACTION MONITORING OF RAYLEIGH MODE JETS. NOV. 9, 1976.
4,016,099.—METHOD OF FORMING ENCAPSULATED TONER PARTICLES. APR. 5, 1977.
4,097,404.—PROCESS FOR PROVIDING ENCAPSULATED TONER COMPOSITION-MICROENCAPSULATION. JUNE 27, 1978.
4,187,194.—ENCAPSULATION PROCESS. FEB. 5, 1980. BEL. 793327, CAN 1008314, GRB. 1423292, SPN. 410265.

Class 5O

3,641,981.—APPARATUS FOR CONTROLLING DEVELOPER CHARGE LEVEL. FEB. 15, 1972. CAN. 0914006, GRB. 1338417.
3,654,901.—TONER RECLAIMING SYSTEM. APR. 11, 1972. ATR. 0321720, AUS. 0459286, BEL. 0754425, CAN. 0941881, DNK. 0130262, EGR. 0085711, FRA. 7029147, GRB. 1325455, IND. 0127847, ITL. 0901160, JAP. 1143014, NOR. 0130609, PLD. 0080951, PLP. 0008671, PTG. 0054272, SAF. 0705408, SPN. 0382437, STZ. 0513441, SWD. 0361533, TIW. 0006725, USR. 0373974.
3,664,297.—CENTRIFUGAL DEVELOPMENT APPARATUS AND METHOD. MAY 23, 1972. GRB. 1315565, JAP. 0719144.
3,809,012.—DEVELOPER SEAL. MAY 7, 1974. CAN. 0984133.
3,872,826.—DEVELOPMENT SYSTEM SEAL. MAR. 25, 1975.
3,893,415.—DEVELOPING APPARATUS. JULY 8, 1975. ARG. 0204387, BEL. 0789238, BRA. 0088405, CAN. 0991394, FRA. 7232380, GRB. 1409815, ITL. 0970948, MEX. 0128578, SPN. 0408654, STZ. 0554551, SWD. 7214863, VZL. 0033578.
3,906,899.—DEVELOPER SEAL. SEPT. 23, 1975.
3,915,121.—DEVELOPMENT APPARATUS. OCT. 28, 1975.
3,924,566.—REPRODUCTION MACHINE WITH MEANS FOR SOLIDIFYING THE RECLAIM TONER. DEC. 9, 1975.
3,982,498.—DEVELOPMENT APPARATUS. SEPT. 28, 1976. FRA. 7436713.
4,029,047.—IMPROVED TONER HANDLING SYSTEM. JUNE 14, 1977.
4,039,102.—DEVELOPER DOOR WITH USE COUNTER ON DOOR. AUG. 2, 1977.
4,041,902.—FILTER APPARATUS. AUG. 16, 1977.
4,058,086.—EMISSION CONTROLLER FOR DEVELOPMENT APPARATUS. NOV. 15, 1977.
4,088,481.—EXTENDED RANGE COLOR ELECTROPHOTOGRAPHIC METHOD BY SUPERIMPOSING A HALF-TONE IMAGE ON A LOW. MAY 9, 1978.
4,100,611.—APPARATUS FOR CONTROLLING AIRBORNE PARTICLE EMISSION. JULY 11, 1978.
4,139,296.—CROSS MIXER. FEB. 13, 1979.

Class 5P

3,649,262.—SIMULTANEOUS DEVELOPMENT-CLEANING OF SAME AREA OF AN ELECTROSTATOGRAPHIC IMAGE SUPPORT SURFACE. MAR. 14, 1972. AUS. 0445365, BEL. 0743661, CAN. 0916232, FRA. 6944511, GRB. 1296997, ITL. 0882670, USR. 0358873.
4,029,047.—IMPROVED TONER HANDLING SYSTEM. JUNE 14, 1977.

Class 6

3,753,560.—AUXILIARY SHEET FEEDER-MULTI STATION AUXILIARY PAPER FEEDER-2400. AUG. 21, 1973. AUS. 0466179, BEL. 0793641, CAN. 1000750, FRA. 7300150, GRB. 1402971, ITL. 0973328, SPN. 0410322.
3,833,790.—HEATED PRESSURE FUSING SYSTEM. SEPT. 3, 1974, FRA. 7422884.
4,111,565.—APPARATUS FOR SENSING WHEN PAPER UTILIZED IN A PRINTER HAS BEEN DEPLETED. SEPT. 5, 1978.
4,161,362.—DOCUMENT CODING. JULY 17, 1979.

Class 6A

3,104,873.—PAPER SUPPLY TRAY. SEPT. 24, 1963. CAN. 0699129, GRB. 1016553.
3,153,534.—PAPER SUPPLY TRAY. OCT. 20, 1964.
3,154,356.—PAPER CATCH TRAY. OCT. 27, 1964. CAN. 0726574, GRB. 1032952, JAP. 0497185.
3,405,635.—PAPER SUPPORT TRAY FOR REPRODUCTION MACHINES. OCT. 15, 1968.
3,406,964.—ADJUSTABLE PACK HOLDER. OCT. 22, 1968. CAN. 0848822, GER. 1270049, GRB. 1158671, JAP. 0914623.
3,415,510.—AUXILIARY SHEET FEEDER. DEC. 10, 1968. CAN. 0831412, GRB. 1235158.
3,458,187.—SHEET HOLDER. JULY 29, 1969. CAN. 0879560, GRB. 1199947.
3,599,966.—SHEET HANDLING APPARATUS. AUG. 17, 1971. CAN. 0921504, JAP. 783765.
3,601,394.—SHEET RETAINING APPARATUS. AUG. 24, 1971. ARG. 0195162, AUS. 0437722, BEL. 0752940, CAN. 0966521, CHL. 0026165, CZC. 0164276, EGR. 0085710, FRA. 7024668, GRB. 1312304, ITL. 0900198, JAP. 0803409, MEX. 0116509, PLD. 0082760, PNM. 0002170, SPN. 0381385, STZ. 0547747, SWD. 0361648, TIW. 0005745, USR. 0493985.
3,651,933.—COPY SHEET PACKAGE. MAR. 28, 1972.
3,687,448.—SHEET FEEDING APPARATUS. AUG. 29, 1972. CAN. 9782161, GRB. 1373810.
3,847,385.—SHEET CONTAINER. NOV. 12, 1974. CAN. 0991208.
3,847,388.—SHEET STACKING METHOD AND APPARATUS. NOV. 12, 1974. CAN. 0996145, FRA. 7344220, GRB. 1440489, MEX. 0134934.
3,848,988.—MOISTURE CONTROL DEVICE. NOV. 19, 1974.
3,857,558.—PAPER CASSETTE DESIGN WITH IRREGULAR BOTTOM. DEC. 31, 1974, CAN. 1010083.
3,883,133.—MOVABLE PACK ADVANCER. MAY 13, 1975.
3,907,283.—SENSING SHEETS ON A SUPPORT SURFACE. SEPT. 23, 1975.
3,921,972.—SHEET STACK RECEPTACLE. NOV. 25, 1975.
3,926,519.—CONTROL DEVICE FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. DEC. 16, 1975.

3,934,870.—SHEET FEEDING DEVICES. JAN. 27, 1976.
3,936,044.—ADJUSTABLE SHEET GUIDE. FEB. 3, 1976.
3,957,366.—SHEET FEEDING APPARATUS. MAY 18, 1976.
3,995,951.—SHEET FEEDING APPARATUS & REPRODUCING MACHINE. DEC. 7, 1976.
4,008,957.—REPRODUCTION MACHINE CONTROL. FEB. 22, 1977.
4,014,537.—AIR FLOATATION BOTTOM FEEDER. MAR. 29, 1977.
4,060,233.—CASSETTE LOADED SHEET FEEDER FOR REPRODUCTION MACHINE. NOV. 29, 1977.
4,060,234.—CARTRIDGE TRAY FOR USE IN A COPYING MACHINE. NOV. 29, 1977.
4,075,391.—PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIAL HAVING IMPROVED PROPERTIES. FEB. 21, 1978. BEL. 847571, FRA. 7632899, SPN. 452858.
4,086,007.—DUAL PURPOSE DOCUMENT AND COPY SHEET FEED CASSETTE. APR. 25, 1978.
4,190,246.—PAPER FEEDING SYSTEM. FEB. 26, 1980.
4,191,467.—DUAL MODE CATCH TRAY. MAR. 4, 1980.

Class 6A 1

3,100,111.—SHEET FEED MECHANISM. AUG. 6, 1963. ARG. 0162642, CAN. 0683564, GRB. 1032956, IND. 0096309, JAP. 0478677.
3,301,551.—SHEET FEED MECHANISM. JAN. 31, 1967. CAN. 0811029, JAP. 0639312.
3,378,254.—PACK ADVANCER. APR. 16, 1968. CAN. 0815409, GER. 1289850, GRB. 1129872, JAP. 0615872.
3,402,928.—SHEET HANDLING APPARATUS. SEPT. 24, 1968. CAN. 0871575, GRB. 1203615, JAP. 0602168.
3,558,127.—SHEET HANDLING APPARATUS. JAN. 26, 1971. ARG. 0180315, AUS. 0443480, BEL. 0741889, CAN. 0928826, FRA. 6939710, GRB. 1282910, ITL. 0878226, JAP. 0791733, MEX. 0112773, SPN. 0373541, SWD. 6915742.
3,630,517.—COUNTER STACKER. DEC. 28, 1971.
3,768,806.—BI-DIRECTIONALLY MOVABLE PLATFORM CONTROL. OCT. 30, 1973. CAN. 0992113, GRB. 1403040.
3,820,777.—ELEVATOR ASSEMBLY POSITIONING CONTROL. JUNE 28, 1974. BEL. 0802196, CAN. 0999334, GRB. 1416470.
3,898,425.—FUSING APPARATUS. AUG. 5, 1975.
4,004,127.—IMPROVED ON LINE FUSING SYSTEM. JAN. 18, 1977.
4,033,578.—STACK ELEVATING APPARATUS. MAY 7, 1977.
4,147,342.—VIBRATING TAMPER. APR. 3, 1979.

Class 6B

3,847,388.—SHEET STACKING METHOD AND APPARATUS. NOV. 12, 1974. CAN. 0996145, FRA. 7344220, GRB. 1440489, MEX. 0134934.
3,958,989.—TRANSPARENCY SUPPORT MATERIAL FOR ELECTROPHOTOGRAPHIC PROCESS. MAY 25, 1976. BEL. 0815634, CAN. 1006012.
4,043,549.—IMPACT FEEDER. AUG. 23, 1977.
4,051,285.—TEARABLE EDGE STRIP FOR PLASTIC SHEET. SEPT. 27, 1977. BEL. 815634, CAN. 1006012, FRA. 7419536, ITL. 1014700.

Class 6B 1

3,062,533.—PAPER FEED APPARATUS. NOV. 6, 1962. CAN. 0712936.
3,062,534.—SHEET FEED MECHANISM. NOV. 6, 1962. GRB. 1016700.
3,083,962.—SHEET STRIPPER. APR. 2, 1963. ARG. 0165468, CAN. 0712935, GRB. 1032958, IND. 0096311, JAP. 0484728.
3,104,872.—EDGE DRAG DEVICE. SEPT. 24, 1963. CAN. 0699594.
3,241,830.—SHEET FEED MECHANISM. MAR. 22, 1966. ATR. 0276087, AUS. 0295720, CAN. 0765301, DNK. 0126493, EIR. 0028650, GER. 1197326, GRB. 1089538, ISR. 0030228, NZL. 0148732, STZ. 0457511.
3,251,594.—SHEET FEED MECHANISM. MAY 17, 1966. AUS. 0416589, CAN. 0785164, DNK. 131.557, EIR. 0029758, GRB. 1122623, ISR. 0034134, JAP. 0499006, NOR. 0125806, SWD. 0358480.
3,276,770.—SHEET FEEDING APPARATUS. OCT. 4, 1966. CAN. 0788346, FRA. 1459041, GER. 1237587, GRB. 1055215, ITL. 0726800, JAP. 0537118.
3,288,460.—PAPER FEED MECHANISM. NOV. 29, 1966. ATR. 0300566, CAN. 0792617, GRB. 1135746, JAP. 0630911, STZ. 0509924.
3,288,461.—SHEET FEEDING APPARATUS. NOV. 29, 1966. CAN. 0856098, GER. 1249887, GRB. 1123260, JAP. 0562385.
3,300,206.—ELECTRICALLY ENERGIZED CLUTCH FOR SHEET FEED CONTROL MECHANISM. JAN. 24, 1967. CAN. 0788344, GRB. 1135745, MEX. 0112221, STZ. 0513063.
3,406,960.—PAPER HANDLING APPARATUS. OCT. 22, 1968. CAN. 0907683, GRB. 1202218.
3,425,685.—PAPER FEED MECHANISM. FEB. 4, 1969. BEL. 0708498, CAN. 0847744, FRA. 1552327, GRB. 1165279, ITL. 0819625, JAP. 0972609, MEX. 0105134.
3,469,834.—SHEET FEEDER AND SEPARATOR APPARATUS. SEPT. 30, 1969. ARG. 0168907, CAN. 0847743, CHL. 0023614, CLB. 0017683, JAM. 0001852, MEX. 0102646, PRU. 0009339, URG. 0008981, VZL. 0023673.
3,524,639.—AUTOMATIC FEEDING DEVICE. AUG. 18, 1970. CAN. 0895184, FRA. 6906418, GRB. 1254784, ITL. 0875431, JAP. 0713806.
3,537,703.—MANIFOLD SHEET SEPARATING DEVICE. NOV. 3, 1970. CAN. 0923351, GRB. 1261077.
3,556,516.—SELF-ALIGNING FEED ROLLER. JAN. 19, 1971. CAN. 0899392, GRB. 1256265.
3,565,421.—FEEDING SYSTEM. FEB. 23, 1971.
3,567,214.—SHEET FEEDING AND SEPARATING APPARATUS. MAR. 2, 1971. BEL. 0734128, CAN. 0902124, FRA. 6919122, GER. 1929105, GRB. 1263193, HOL. 0144551, ITL. 0866188, SPN. 0368173, STZ. 0501501, SWD. 6908176.
3,578,317.—SHEET CONVEYOR APPARATUS FOR AUTOMATIC COPYING MACHINE. MAY 11, 1971. ARG. 0193800, ATR. 0307233, AUS. 0446229, BEL. 0750390, CAN. 0907682, EGR. 0082423, FRA. 7017317, GRB. 1284832, ITL. 0893096, JAP. 783766, MEX. 0117916, NZL. 0160102, SPN. 0379652, STZ. 0516404, SWD. 0361952, TIW. 0006833, VZL. 0025781.
3,580,565.—SHEET FEEDING APPARATUS. MAY 25, 1971.
3,592,462.—GATED PAPER SNUBBER. JULY 13, 1971. CAN. 0923922.
3,601,389.—SHEET FEEDING APPARATUS. AUG. 24, 1971. ARG. 0184657, BEL. 0752939, CAN. 0912055, CHL. 0026164, FRA. 7024666, GRB. 1306595, GUA. 0002508, ITL. 0907152, MEX. 0114977, PNM. 0002212, TIW. 0006720, VZL. 0032784.
3,618,752.—STACK OF IMAGE RECEIVING MEMBERS. NOV. 9, 1971.
3,655,183.—SHEET FEED APPARATUS. APR. 11, 1972.
3,664,663.—PAPER CASSETTE LOADING DEVICE. MAY 23, 1972. CAN. 0951342, GRB. 1351766.
3,713,645.—SHEET SEPARATING APPARATUS. JAN. 30, 1973. CAN. 0957392.
3,727,910.—SHEET SEPARATOR APPARATUS. APR. 17, 1973. CAN. 0956660, GRB. 1391198.
3,731,915.—FEED ROLL ABRASION ROLLER. MAY 8, 1973. ARG. 0194272, BEL. 0791064, CAN. 0966518, FRA. 7239549, GRB. 1389426, ITL. 0970223.
3,768,803.—SHEET FEEDER. OCT. 30, 1973. ARG. 0197314, BEL. 0795206, CAN. 0966158, FRA. 7304740, GRB. 1413541, ITL. 0978938, MEX. 0130347, SPN. 0411475, STZ. 5656860, SWD. 7301809, VZL. 0033780.
3,773,316.—SHEET FEEDER DRIVE MECHANISM. NOV. 20, 1973. CAN. 0994376, GRB. 1424580.
3,861,670.—SHEET FEEDING APPARATUS. JAN. 21, 1975. CAN. 1010080, GRB. 1435762.
3,866,901.—REVERSE BUCKLE FEEDER. FEB. 18, 1975, CAN. 1008893.
3,873,084.—PAPER FEEDER. MAR. 25, 1975.
3,893,663.—REVERSE BUCKLE SHEET FEEDING APPARATUS. JULY 8, 1975, CAN. 1005090, GRB. 1447909, MEX. 0135280.
3,895,791.—BOTTOM SHEET FEEDER USING SEPARATION BELT AND RETARD PAD. JULY 22, 1975, CAN. 1007255, GRB. 1443089.
3,934,869.—SHEET SEPARATING AND FEEDING APPARATUS. JAN. 27, 1976. GER. 7439833.
3,936,046.—FRONT AND SIDE SHEET REGISTERING APPARATUS. FEB. 3, 1976.
3,941,373.—FLOATING GATE SHEET SEPARATOR. MAR. 2, 1976.
3,947,018.—UNIVERSAL FEEDER-STACKER. MAR. 30, 1976. BEL. 0836262.
3,949,979.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. APR. 13, 1976.
3,966,189.—TOGGLING RETARD PAD. JUNE 29, 1976.
3,995,952.—SHEET FEEDING APPARATUS. DEC. 7, 1976.
4,023,792.—SHEET FEEDING APPARATUS. MAY 17, 1977. ARG. 0195877, AUS. 0462397, BEL. 0792370, CAN. 0978556, FRA. 7239132, GRB. 1410799, ITL. 0990513, MEX. 0128127, SPN. 0437744, STZ. 0546689.
4,030,725.—PAPER TRAY FOR COPYING MACHINES. JUNE 21, 1977.
4,043,549.—IMPACT FEEDER. AUG. 23, 1977.
4,053,152.—SHEET FEEDING DEVICE. OCT. 11, 1977.
4,058,305.—PAPER FEEDING DEVICE. NOV. 15, 1977.

4,166,614.—JOGGING AND NORMAL FORCE FOR SHEET FEEDING. SEPT. 4, 1979. BEL. 869792.
4,189,138.—PAPER FEEDER. FEB. 19, 1980. CAN. 1077980.
4,192,497.—COMPOSITION FOR THE SURFACE OF SHEET SEPARATING DEVICE. MAR. 11, 1980. CAN. 1043828, GRB. 1511502.

Class 6B 2

3,378,255.—PAPER HANDLING APPARATUS. APR. 16, 1968. CAN. 0836939, FRA. 1517333, GRB. 1181271, ITL. 0804517, JAP. 1052342, MEX. 099951.
3,547,431.—PNEUMATIC CUT SHEET FEEDER. DEC. 15, 1970.
4,043,549.—IMPACT FEEDER. AUG. 23, 1977.

Class 6C

3,120,446.—METHOD OF TRANSFERRING A DEVELOPED SOLID PARTICULATE IMAGE. FEB. 4, 1964.
3,519,124.—ARTICLE TO FACILITATE FEEDING OF IMAGE RECEIVING SHEETS. JULY 7, 1970. CAN. 0941879, FRA. 1568821, GRB. 1216347, ITL. 0870563.
3,589,809.—FEEDING SYSTEM. JUNE 29, 1971.
3,630,514.—SHEET FEEDING APPARATUS. DEC. 28, 1971. ARG. 0186214, AUS. 0452075, BEL. 0751309, CAN. 0921948, EGR. 0090063, FRA. 7019460, GRB. 1253503, ITL. 0893690, JAP. 783764, MEX. 0117507, SPN. 0380270, STZ. 0511759, SWD. 0363621, TIW. 0006836, USR. 0466680.
3,645,615.—COPYING APPARATUS. FEB. 29, 1972. ARG. 0185529, AUS. 0445849, BEL. 0752941, CAN. 0925927, CHL. 0025888, FRA. 7024670, GRB. 1312305, GUA. 0002324, ITL. 0900200, MEX. 0115165, PNM. 0002260, SPN. 0381387, STZ. 0525778, SWD. 7009063, TIW. 0007163, USR. 0535033, VZL. 0032783.
3,902,421.—METHOD FOR FORMING A PICTURE IMAGE. SEPT. 2, 1975.
4,190,354.—COPIER JOB RECOVERY SYSTEM. FEB. 26, 1980.

Class 6D

3,071,370.—SHEET FEEDING APPARATUS. JAN. 1, 1963. CAN. 0683900, GRB. 0999435.
3,071,374.—PAPER GRIPPER MECHANISM. JAN. 1, 1963.
3,078,770.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 26, 1963. CAN. 0701741.
3,095,194.—SHEET GUIDING APPARATUS. JUNE 25, 1963. CAN. 0713451, FRA. 1355072, GER. 1174334, GRB. 1026214, ITL. 0688494, JAP. 0457839.
3,100,109.—PAPER GRIPPER MECHANISM. AUG. 6, 1963. GRB. 1015634, JAP. 0471314.
3,100,112.—DOCUMENT FEED MECHANISM. AUG. 6, 1963. GRB. 1015635, JAP. 0478676.
3,137,495.—SHEET FEED MECHANISM. JUNE 16, 1964. GRB. 1015636, JAP. 0471315.
3,179,407.—SHEET FEED GUIDE. APR. 20, 1965. CAN. 0719606, FRA. 1355071, GER. 1179562, GRB. 1023036, ITL. 0688495, JAP. 0457850.
3,190,643.—SHEET GUIDING APPARATUS. JUNE 22, 1965.
3,199,866.—SHEET FEED MECHANISM. AUG. 10, 1965. CAN. 0742591, GRB. 1043646.
3,206,193.—XEROGRAPHIC REPRODUCING MACHINE CONTROL. SEPT. 14, 1965.
3,239,215.—DOCUMENT FEED MECHANISM. MAR. 8, 1966. CAN. 0741548, GRB. 1052820, JAP. 0497188.
3,239,220.—DOCUMENT CONVEYOR. MAR. 8, 1966. CAN. 0770495, FRA. 1434188, GRB. 1094188, ITL. 0742434.
3,245,311.—DOCUMENT CONVEYOR. APR. 12, 1966.
3,256,009.—SHEET REGISTRATION DEVICE. JUNE 14, 1966. CAN. 0777667.
3,281,144.—SHEET REGISTRATION DEVICE. OCT. 25, 1966. ARG. 0152212, AUS. 0423243, CAN. 0803888, DNK. 0122597, EIR. 0029757, GRB. 1122621, ISR. 0034133, JAP. 0512650, MEX. 0078899, NOR. 0126565, SWD. 0358034.
3,357,347.—PAPER FEEDING AND BREAKING MEANS FOR ELECTROGRAPHIC DEVICE. DEC. 12, 1967. CAN. 0863520, GRB. 1182684, JAP. 0582500.
3,374,732.—SELF-ALIGNING COPY DRUM STRIPOUT MECHANISM FOR REPRODUCTION MACH. MAR. 26, 1968.
3,375,781.—REGISTRATION MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,389,907.—DOCUMENT HANDLING APPARATUS. JUNE 25, 1968.
3,411,771.—SHEET TRANSPORT. NOV. 19, 1968. ARG. 0177552, ATR. 0284168, AUS. 0455833, CAN. 0869421, CHL. 0023101, CLB. 0016775, DNK. 0126100, EIR. 0031308, FIN. 0047867, GRB. 1193515, IND. 0112002, ISR. 0028520, JAP. 0604153, MEX. 0099909, NOR. 0127531, NZL. 0149790, PAK. 0119259, PLP. 0005199, PRU. 0009331, SAF. 0674988, SPN. 0344351, STZ. 0478048, SWD. 0343829, TRK. 0015345, URG. 0008858, VZL. 0026277.
3,422,756.—PAPER SUPPORT AND REGISTRATION MEANS FOR REPRODUCTION MACHINE. JAN. 21, 1969.
3,434,710.—SHEET HANDLING APPARATUS. MAR. 25, 1969. ARG. 0166613, CAN. 0830328, CHL. 0023568, CLB. 0017530, DNK. 0120163, GRB. 1206965, MEX. 0100814, PRU. 0009338, SPN. 0360895, STZ. 0502942. URG. 0008977, USR. 0433696, VZL. 0023674.
3,502,325.—CARD HANDLING APPARATUS. MAR. 24, 1970. ARG. 0168398, CAN. 0850515, CHL. 0024133, JAM. 0001890, MEX. 0105082, PRU. 0009337, URG. 0009016, VZL. 0027509.
3,509,780.—DOUBLE-ACTION ROTARY SOLENOID DRIVE MECHANISM. MAY 5, 1970.
3,517,923.—SHEET REGISTRATION APPARATUS. JUNE 30, 1970.
3,518,739.—TRACKING ROLLER. JULY 7, 1970. ARG. 0177437, AUS. 0437287, BEL. 0733662, BRA. 6908481, CAN. 0884215, FRA. 6917189, GRB. 1206750, ITL. 0865847, JAP. 0677424, MEX. 0111433, SPN. 0367807, SWD. 0356022, VZL. 0025065.
3,521,060.—METHOD FOR DETECTING MISROUTING OF TRANSPARENCIES DURING PROCESS OF IMAGING THEREON. JULY 21, 1970.
3,531,109.—SHEET MATERIAL TRANSPORT SYSTEM. SEPT. 29, 1970. ARG. 0177190, ATR. 0288161, AUS. 0446394, BEL. 0733197, CAN. 0899923, DNK. 0122717, FRA. 6916409, GER. 1925039, GRB. 1269100, ITL. 0863848, JAP. 0656986, MEX. 0110288, PNM. 0001431, SAF. 0693497, SPN. 0367408, SWD. 0355870.
3,536,320.—SHEET REGISTRATION DEVICE. OCT. 27, 1970.
3,556,511.—DOCUMENT FEED APPARATUS. JAN. 19, 1971. ARG. 0185791, BEL. 0741891, CAN. 0905439, FRA. 6939711, GER. 1957780, GRB. 1279129, HOL. 0144227, ITL. 0878272, JAP. 0854601, MEX. 0112825.
3,556,512.—DOCUMENT FEED APPARATUS. JAN. 19, 1971. CAN. 0905436, SWD. 6915838.
3,556,513.—DOCUMENT FEED APPARATUS. JAN. 19, 1971. CAN. 0905437.
3,601,392.—SHEET REGISTERING APPARATUS. AUG. 24, 1971. ARG. 0190238, AUS. 0446147, BEL. 0752933, CAN. 0923512, CHL. 0025789, EGR. 0084327, FRA. 7024672, GRB. 1262444, ITL. 0900199, JAP. 0803410, MEX. 0115310, PLD. 0002183, PNM. 0002050, SPN. 0381386, STZ. 0525780, SWD. 0356375, TIW. 0007194, USR. 0406343.
3,603,680.—ULTRASONIC PAPER DETACTION. SEPT. 7, 1971. CAN. 0915715, GRB. 1331457.
3,614,221.—IMAGING SYSTEM. OCT. 19, 1971. CAN. 0930540, GRB. 1343603, JAP. 0728865.
3,622,238.—COPIER MACHINE FEEDING MULTIPLE SIZE COPY SHEETS. NOV. 23, 1971. ARG. 0194337, AUS. 0451241, CAN. 0902127, JAP. 0512383, NZL. 0160105.
3,647,207.—SHEET FEEDING MECHANISM CENTERING DEVICE. MAR. 7, 1972. CAN. 0959934, GRB. 1351765.
3,694,712.—SPEED CONTROL APPARATUS. SEPT. 26, 1972. CAN. 0976641, GRB. 1339506.
3,796,486.—PROGRAMMING CONTROL SYSTEM FOR PRINTING MACHINE. MAR. 12, 1974.
3,804,516.—FIRE DETECTING DEVICE FOR A PHOTOGRAPHIC PRINTING MACHINE. APR. 16, 1974.
3,809,475.—COPIER FUSER PROTECTOR. MAY 7, 1974. FRA. 7343567.
3,815,380.—SHAFT COUPLING APPARATUS. JUNE 11, 1974, CAN. 0994121.
3,819,266.—COPIER JAM PROTECTION. JUNE 25, 1974, CAN. 1005510.
3,845,951.—FORAMINOUS SHEET REGISTRATION SYSTEM. NOV. 5, 1974, CAN. 0999316.
3,858,777.—PRINTING APPARATUS INCLUDING REGISTRATION CONTROL. JAN. 7, 1975.
3,861,673.—BI-DIRECTIONAL SHEET TRANSPORT. JAN. 21, 1975, CAN. 1004240.
3,876,317.—LATCH MECHANISM. APR. 8, 1975, CAN. 1005486.
3,888,579.—DIGITAL CONTROLLED DOCUMENT FEEDER. JUNE 10, 1975.
3,893,662.—SHEET FEEDING DEVICE. JULY 8, 1975.
3,902,421.—METHOD FOR FORMING A PICTURE IMAGE. SEPT. 2, 1975.
3,934,182.—SYNCHRONIZING APPARATUS. JAN. 20, 1976. CAN. 0957735, GRB. 1372568.
3,936,042.—SHEET FEEDING DEVICES. FEB. 3, 1976.
3,947,270.—REPRODUCING APPARATUS AND PROCESS FOR DUPLEX IMAGING IN A SINGLE PASS. MAR. 30, 1976.
3,948,511.—SHEET FEEDING DEVICES. APR. 6, 1976.

3,949,979.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. APR. 13, 1976
3,963,339.—SHEET FEEDING APPARATUS. JUNE 15, 1976.
3,984,098.—PNEUMATIC REGISTRATION AND CLAMPING APPARATUS. OCT. 5, 1976. BEL. 0848824.
4,003,568.—FLUID CONVEYER. JAN. 18, 1977.
4,025,187.—BUCKLE CONTROL SYSTEM. MAY 24, 1977.
4,036,421.—WEIGHTED PINCH ROLLS. JULY 19, 1977.
4,055,340.—ASSISTED PNEUMATIC TRANSPORT AND REGISTRATION APPARATUS. OCT. 25, 1977. BEL. 848823.
4,073,001.—APPARATUS FOR NEUTRALIZING AND REGISTERING AN ELECTROSTATICALLY CHARGED SHEET. FEB. 7, 1978.
4,077,519.—CURL DETECTOR AND SEPARATOR. MAR. 7, 1978.
4,090,704.—REGISTRATION STATION. MAY 23, 1978.
4,092,021.—UNFUSED IMAGE TRANSPORT. MAY 30, 1978.
4,128,327.—TRANSFER MATERIAL FEED APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES. DEC. 5, 1978.
4,134,671.—INTERSECTING OPTICAL AND COPY SHEET PATH METHOD AND APPARATUS. JAN. 16, 1979.
4,135,804.—REGISTRATION SYSTEM FOR A REPRODUCING DEVICE. JAN. 23, 1979.

Class 6D 1

RE.29,124.—SHEET TRANSPORT SYSTEM. JAN. 25, 1977. CAN. 1001104.
3,148,878.—SHEET FEED MECHANISM. SEPT. 15, 1964. CAN. 0715431, GER. 1222083, GRB. 1020933, JAP. 0481251.
3,240,486.—PAPER TRANSPORT MECHANISM. MAR. 15, 1966. CAN. 0766647.
3,275,318.—SHEET CONVEYING APPARATUS. SEPT. 27, 1966. MEX. 0085657.
3,408,633.—HIGH SPEED PRINTER SYSTEM. OCT. 29, 1968.
3,482,676.—DOCUMENT FEED BELT. DEC. 9, 1969. CAN. 0890297, GRB. 1253415.
3,642,362.—APPARATUS FOR CONVEYING SHEET MATERIAL. FEB. 15, 1972. GRB. 1307117.
3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047.
3,743,403.—TRANSPORT ASSEMBLY. JULY 3, 1973. CAN. 0983305, GRB. 1417018.
3,781,004.—CONVEYING SYSTEM FOR ELECTROSTATIC PRINTING MACHINES. DEC. 25, 1973. CAN. 1007287.
3,790,270.—REGISTRATION RESET SYSTEM. FEB. 5, 1974. GRB. 1439772, ITL. 0993064, SPN. 0418253.
3,804,507.—PROCESSING CONTROL DEVICE FOR PRINTING MACHINES. APR. 16, 1974.
3,808,658.—SNAP ROLLER. MAY 7, 1974, CAN. 1000637.
3,826,568.—SHEET TRANSPORT SYSTEM. JULY 30, 1974, CAN. 1001104.
3,832,053.—BELT TRANSFER SYSTEM. AUG. 27, 1974.
3,846,020.—ELECTROSTATIC SHEET TRANSPORT SYSTEM. NOV. 5, 1974.
3,854,566.—PHOTOELECTRIC TABULATING APPARATUS. DEC. 17, 1974. BEL. 0815420, CAN. 0982969, GRB. 1442450, ITL. 1012805, SWD. 7406400.
3,902,715.—SHEET REGISTRATION FOR PAPER HANDLING APPARATUS. SEPT. 2, 1975, CAN. 1003867, ITL. 0993066, SPN. 0418255.
3,918,705.—PROCESSING CONTROL DEVICE FOR PRINTING MACHINES. NOV. 11, 1975.
3,930,725.—MULTIPLE SHEET FEEDING SYSTEM FOR ELECTROSTATOGRAPHIC PRINTING MACHINES. JAN. 6, 1976. GRB. 1436457.
4,085,673.—SHEET FEEDING APPARATUS. APR. 25, 1978.
4,192,497.—COMPOSITION FOR THE SURFACE OF SHEET SEPARATING DEVICE. MAR. 11, 1980. CAN. 1043828, GRB. 1511502.

Class 6D 1E

4,171,131.—PNEUMATIC REGISTRATION APPARATUS. OCT. 16, 1979. CAN. 1059167, SAF. 6400, SPN. 452882.

Class 6D 2

3,112,819.—CLUTCH MECHANISM—914. DEC. 3, 1963. CAN. 0688810.
3,337,015.—LATCH OPERATED AND ONE WAY COIL CLUTCHES. AUG. 22, 1967. CAN. 0810494, JAP. 0914622.
3,840,100.—UNIDIRECTIONAL COUPLING APPARATUS. OCT. 8, 1974. CAN. 1006706.

Class 6E

RE29124.—SHEET TRANSPORT SYSTEM. JAN. 25, 1977. CAN. 1001104.
3,348,288.—DRUM CLAMP. OCT. 24, 1967. CAN. 0838542, GRB. 1123459.
3,357,325.—XEROGRAPHIC TRANSFER APPARATUS. DEC. 12, 1967. CAN. 0812525.
3,375,782.—PROGRAMMING MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,567,213.—CONTROL APPARATUS FOR REGISTER STOPS AND GRIPPER FINGERS. MAR. 2, 1971.
3,685,898.—PAPER FLIP CONTROL APPARATUS. AUG. 22, 1972.
3,717,801.—METHODS AND APPARATUS FOR ELCLRSTCLY PRFMNG A TCKING OPERATION. FEB. 20, 1973.
3,826,568.—SHEET TRANSPORT SYSTEM. JULY 30, 1974. CAN. 1001104.
3,841,751.—ELECTROSTATIC COLOR REPRODUCTION METHOD. OCT. 15, 1974. CAN. 0946463.
3,845,951.—FORAMINOUS SHEET REGISTRATION SYSTEM. NOV. 5, 1974. CAN. 0999316.
3,976,370.—BELT TRANSFER AND FUSING SYSTEM. AUG. 24, 1976.
3,993,124.—METH&APPRTS FOR SUSR ASSMBLY CLING IN ELCTROSTATOGRPC MACHNE-GAMMA METH&APPRTS FOR FUSER END CO. NOV. 23, 1976. BEL. 0793560, FRA. 7246728, ITL. 0973322, SWD. 7216976.
3,995,951.—SHEET FEEDING APPARATUS & REPRODUCING MACHINE. DEC. 7, 1976.
4,063,946.—ELECTROPHOTOGRAPHIC COLOR REPRODUCTION PROCESS EMPLOYING PHOTOCONDUCTIVE MATERIAL WITH DUAL. DEC. 20, 1977.
4,078,862.—APPARATUS FOR PRODUCING A COMPOSITE COPY OF AN ORIGINAL DOCUMENT ON SELECTIVELY POSITIONED. MAR. 14, 1978.
4,082,137.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING AN ELECTROSTATOGRAPHIC MACHINE. APR. 4, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,085,794.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE. APR. 25, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,138,102.—AUTOMATIC DOCUMENT PROCESSING DEVICE. FEB. 6, 1979.

Class 6F

3,249,354.—MULTIPLE SHEET DETECTING DEVICE. MAY 3, 1966. CAN. 0770494.
3,281,145.—PAPER REJECT MECHANISM. OCT. 25, 1966. CAN. 0770493.
3,288,462.—APPARATUS FOR HANDLING SUPERPOSED SHEETS. NOV. 29, 1966. AUS. 0422882, CAN. 0786210, EIR. 0029759, GRB. 1122625, ISR. 0034135, JAP. 0894757, NOR. 0124531.
3,301,975.—SENSING DEVICE FOR DETECTING A SHEET ON A TRANSPORT OR DRUM. JAN. 31, 1967. CAN. 0800094, FRA. 1487581, GER. 1522699, GRB. 1077117, ITL. 0774188, JAP. 0923304.
3,360,652.—FAIL SAFE PHOTOELECTRIC SHEET SENSING MACHINE CONTROL CIRCUIT. DEC. 26, 1967. CAN. 0775268, FRA. 1455478, GER. 1522805, GRB. 1121099, ITL. 0732531, JAP. 0503244, MEX. 0078869.
3,396,965.—SENSOR GAUGE. AUG. 13, 1968. CAN. 0822218, GRB. 1152538, JAP. 0587326.
3,504,911.—VACUUM POWERED MULTIPLE DOCUMENT DETECTOR. APR. 7, 1970. CAN. 0861362, FRA. 1589986, GER. 1804476, GRB. 1241968, ITL. 0845395, JAP. 0656984.
3,593,065.—SHEET DETECTION APPARATUS. JULY 13, 1971. CAN. 0923544, CZC. 0151559, EGR. 0100567, GRB. 1322794, JAP. 1162030, USR. 0365085.
3,614,419.—MULTIPLE SHEET DETECTION SYSTEM. OCT. 19, 1971. ARG. 0186441, BEL. 0765366, CAN. 0930052, FRA. 7113404, GRB. 1342656, ITL. 0922694, MEX. 0119754, VZL. 0021933.
3,627,311.—SHEET SENSOR. DEC. 14, 1971. CAN. 0871371, GRB. 1322258.
3,628,785.—GRIP FORCE DETECTION APPARATUS. DEC. 21, 1971. ARG. 0185946, AUS. 0455882, BEL.

0760750, CAN. 0923158, FRA. 7047695, GRB. 1340206, ITL. 0913997, MEX. 0117505, STZ. 0518227, SWD. 7017384, VZL. 0032788.
3,650,616.—MISPUFF DETECTOR. MAR. 21, 1972. BEL. 0778739, CAN. 0954181, FRA. 7203548, GRB. 1374923, ITL. 0947120.
3,650,617.—SWITCHING DETECTOR—A. MAR. 21, 1972.
3,650,618.—SWITCHING DETECTOR—B. MAR. 21, 1972.
3,650,619.—SWITCHING DETECTOR—C. MAR. 21, 1972.
3,684,890.—PHOTOSENSITIVE MISFEED DETECTOR. AUG. 15, 1972. CAN. 0929631, GRB. 1335444.
3,778,051.—SUPERPOSED SHEET DETECTOR. DEC. 11, 1973. CAN. 0975067.
3,791,729.—APPARATUS FOR MONITORING A SHEET TRANSPORT MECHANISM. FEB. 12, 1974. CAN. 0991244, GRB. 1413069.
3,882,308.—DETECTION SYSTEM FOR SUPERPOSED SHEETS. MAY 6, 1975. CAN. 0929632, GRB. 1342838.
3,932,755.—DEVICE FOR DETECTING DOUBLE SHEET FEEDING. JAN. 13, 1976.
3,948,508.—SHEET DETECTING APPARATUS. APR. 6, 1976.
4,025,187.—BUCKLE CONTROL SYSTEM. MAY 24, 1977.
4,077,519.—CURL DETECTOR AND SEPARATOR. MAR. 7, 1978.
4,203,586.—MULTIFEED DETECTOR. MAY 20, 1980.

Class 6G

3,152,757.—XEROGRAPHIC CONTROL APPARATUS. OCT. 13, 1964. JAP. 0494168.
3,260,455.—STEPPED COUNTING APPARATUS. JULY 12, 1966. ARG. 0157223, BRA. 0083779, CAN. 0760825, FRA. 1459930, GER. 1513422, GRB. 1113420, ITL. 0729650, MEX. 0094217.
3,301,126.—REPRODUCING APPARATUS. JAN. 31, 1967. CAN. 0777413, EIR. 0029760, GRB. 1122626, ISR. 0034136, JAP. 0669365, NOR. 0128732.
3,358,570.—COPY COUNTING SYSTEM. DEC. 19, 1967. CAN. 0842444, FRA. 1508192, GER. 1283855, GRB. 1165943, ITL. 0787991, JAP. 0572187.
3,375,780.—SHEET COUNTING MECHANISM FOR REPRODUCTION MACHINES. APR. 2, 1968.
3,375,783.—COPY INDICATING MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,588,472.—LOGIC CONTROL APPARATUS. JUNE 28, 1971. ARG. 0181590, ATR. 0279353, BEL. 0706629, BRA. 6793350, CAN. 0834957, FRA. 1567082, GRB. 1204719, ITL. 0815466, JAP. 0645591, LXB. 0054882, MEX. 0101675, VZL. 0023684.
3,655,281.—BILLING APPARATUS. APR. 11, 1972. BEL. 0760911, CAN. 0929013, FRA. 7047633, GRB. 1329579, ITL. 0913956, JAP. 0766713.
3,813,157.—CONTROL LOGIC FOR TROUBLE DETECTION AND RECOVERY. MAY 28, 1974. GRB. 1457781, ITL. 1009725, SPN. 0425049.
3,831,933.—TAMPER DETECTION AND RECOVERY. AUG. 27, 1974. GRB. 1457781, ITL. 1009725, SPN. 0425049.
3,909,128.—CONTROL LOGIC FOR CHARGING A MULTI-MODE COPIER DUPLICATOR FROM ONE MODE TO ANOTHER. SEPT. 30, 1975. BEL. 0819383.
3,916,171.—COUNTING CIRCUIT. OCT. 28, 1975.
3,989,368.—DUAL MODE CONTROL LOGIC FOR A MULTI-MODE COPIER DUPLICATOR. NOV. 2, 1976. BEL. 0819384.
4,019,028.—PRINTING MACHINE WITH VARIABLE COUNTER CONTROL SYSTEM. APR. 19, 1977. BEL. 0812560, GRB. 1451992, ITL. 1010688, SPN. 0424462.
4,057,341.—DUAL MODE CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. NOV. 8, 1977. AUS. 489874, BEL. 819384, CAN. 1029431, GRB. 1470598, MEX. 137406.
4,058,815.—METERING SYSTEM FOR A COPIER/DUPLICATOR MACHINE. NOV. 15, 1977. BEL. 824682, FRA. 7501637, GRB. 1451991.
4,173,408.—DEMAND PUBLISHING ROYALTY ACCOUNTING SYSTEM FOR AN ELECTROSTATIC COPIER. NOV. 6, 1979.
4,179,212.—DEMAND PUBLISHING ROYALTY ACCOUNTING SYSTEM. DEC. 18, 1979.
4,210,319.—COPY SET COUNTER DUPLEX TRAY. JULY 1, 1980.

Class 6H

3,339,069.—CORONA CHARGING DEVICE W/MEANS TO PREVENT TONER DUST CONTAMINATION. AUG. 29, 1967. CAN. 0788539, FRA. 1450010, GRB. 1116687, ITL. 0730715, JAP. 0875339, MEX. 0089459.
3,357,400.—ELECTROSTATIC APPARATUS FOR PAPER DETACKING. DEC. 12, 1967. CAN. 0841229, MEX. 0100315.
3,450,402.—SHEET STRIPPER APPARATUS. JUNE 17, 1969.
3,506,259.—ELECTROSTATIC SHEET DETACKING APPARATUS. APR. 14, 1970. ARG. 0177881, AUS. 0418161, BEL. 0721966, CAN. 0848612, FRA. 1585343, GRB. 1230113, ITL. 0895052, MEX. 0104231.
3,578,859.—MECHANICAL STRIPPING APPARATUS. MAY 18, 1971. ARG. 0185526, AUS. 0445289, BEL. 0752938, CAN. 0922771, CHL. 0025913, EGR. 0085002, FRA. 7024669, GRB. 1296763, GUA. 0002611, ITL. 0900197, MEX. 0117139, PLD. 0081340, PNM. 0002049, SPN. 0381384, STZ. 0523150, SWD. 0366849, TIW. 0007785, USR. 0443525, VZL. 0032781.
3,620,615.—SHEET STRIPPING APPARATUS. NOV. 16, 1971. CAN. 0927472, GRB. 1290518.
3,704,881.—TRANSFER SHEET PEELING DEVICE FOR XEROGRAPHIC APPARATUS. DEC. 5, 1972.
3,774,907.—VACUUM SHEET STRIPPING APPARATUS. NOV. 27, 1973. CAN. 0966519.
3,804,401.—PNEUMATIC STRIPPING APPARATUS. APR. 16, 1974. CAN. 0998705.
3,811,670.—ELECTROSTATOGRAPHIC APPARATUS WITH AIR BAFFLE. MAY 21, 1974.
3,819,175.—VACUUM STRIPPING ROLL WITH STATIONARY PICKUP SLOTS. JUNE 25, 1974.
3,820,778.—VACUUM STRIPPING ROLL WITH ROTARY PICKUP SLOTS. JUNE 28, 1974. CAN. 1010081, GRB. 1430856.
3,826,568.—SHEET TRANSPORT SYSTEM. JULY 30, 1974. CAN. 1001104.
3,837,640.—STRIPPER FINGER WITH AIR CUSHION. SEPT. 24, 1974. CAN. 1002077, FRA. 7338663, GRB. 1427058, ITL. 998964.
3,857,560.—ADHESIVE PAPER PICK-OFF SYSTEM. DEC. 31, 1974.
3,885,785.—VACUUM TRANSPORT. MAY 27, 1975. CAN. 1008892, FRA. 7437717.
3,885,786.—STRIPPER FINGER. MAY 27, 1975. GRB. 1402956.
3,891,206.—SHEET STRIPPING APPARATUS. JUNE 24, 1975. CAN. 1003868, GRB. 1449754.
3,895,793.—VACUUM SHEET STRIPPER. JULY 22, 1975. CAN. 1014179.
3,907,280.—FLEXIBLE SHEET HANDING DEVICE. SEPT. 23, 1975. FRA. 7322885.
3,940,126.—SHEET HANDLING MECHANISM. FEB. 24, 1976. GRB. 1450219.
3,948,507.—COPYING STRIPPER. APR. 6, 1976.
3,970,381.—METHOD AND APPARATUS FOR XEROGRAPHIC REPRODUCTION. JULY 20, 1976. BEL. 0811188, FRA. 7406478, GRB. 1451288, ITL. 1008269, SPN. 0423529, STZ. 5672880.
3,991,999.—REVOLVING STRIPPER FINGER. NOV. 16, 1976.
3,992,000.—SHEET STRIPPER. NOV. 16, 1976.
3,998,536.—METHOD & APPARATUS FOR ELECTROSTATIC PAPER STRIPPING. DEC. 21, 1976.
4,004,802.—SHEET STRIPPING DEVICE. JAN. 25, 1977.
4,017,065.—TRANSFER FUSING SPEED COMPENSATION. APR. 12, 1977.
4,017,067.—TRANSFER-FUSING SPEED COMPENSATION. APR. 12, 1977.
4,026,541.—SHEET STRIPPING DEVICE. MAY 31, 1977.
4,058,306.—DETACK AND STRIPPING SYSTEM. NOV. 15, 1977.
4,060,235.—SELF-LIFTING VACUUM STRIPPER. NOV. 29, 1977.
4,072,307.—CORNER SHEET STRIPPER. FEB. 7, 1978.
4,073,585.—SHEET REMOVING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 14, 1978.
4,092,021.—UNFUSED IMAGE TRANSPORT. MAY 30, 1978.
4,119,307.—SHEET STRIPPING APPARATUS. OCT. 10, 1978.
4,119,308.—SHEET STRIPPING APPARATUS. OCT. 10, 1978.

Class 6I

RE.27,720.—SIGNAL STORAGE DEVICE - RE OF 3,416,861-D1593. AUG. 7, 1973.
3,075,493.—XEROGRAPHIC APPARATUS WITH WEB CUTTING MEANS. JAN. 29, 1963. CAN. 0682231, FRA. 1280975, GER. 1177487, GRB. 0979161, JAP. 0502929.
3,105,425.—WEB MARKING AND CUTTING APPARATUS FOR XEROGRAPHIC REPRODUCING DEVICES. OCT. 1, 1963. CAN. 0701949.
3,135,179.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.

3,135,180.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,244,084.—WEB MARKING DEVICE FOR XEROGRAPHIC REPRODUCING APPARATUS. APR. 5, 1966.
3,401,613.—WEB CUTTER CONTROL DEVICE FOR XEROGRAPHIC REPRODUCING APPARATUS. SEPT. 17, 1968. CAN. 0786141, GRB. 1118217, JAP. 0517506.
3,402,628.—CUTTING APPARATUS. SEPT. 24, 1968. CAN. 0847666, GRB. 1137800.
3,416,061.—SIGNAL STORAGE DEVICE—REISSUED D72104—27,720. DEC. 17, 1968. CAN. 0824770, GER. 1524998, GRB. 1184579, JAP. 0571176.
3,418,046.—SIGNAL STORAGE DEVICE. DEC. 24, 1968. CAN. 0852814, GER. 1524999, GRB. 1190084, JAP. 0589515.
3,466,959.—WEB MATERIAL HANDLING APPARATUS. SEPT. 16, 1969.
3,485,622.—PRINTING OF TIMING MARKS IN XEROGRAPHIC PROCESS. DEC. 23, 1969. FRA. 1488142, GER. 1522700, GRB. 1047451, JAP. 0608701.
3,504,586.—ROLL CONVERTER CONTROL. APR. 7, 1970.
3,506,175.—ROLL STOCK CONVERTING APPARATUS. APR. 14, 1970.
3,585,289.—FACSIMILE RECORDING APPARATUS WITH CAM OPERATED PAPER CUTTER. JUNE 15, 1971.
3,591,279.—CUT AND DEFLECT WEB DRIVE APPARATUS. JULY 6, 1971. CAN. 0924635, FRA. 7019910, GRB. 1307549, ITL. 0893691.
3,639,053.—WEB CUTTING AND FEEDING APPARATUS. FEB. 1, 1972. ARG. 0192554, AUS. 0461657, BEL. 0749786, CAN. 0917974, FRA. 7015812, GRB. 1314727, ITL. 0900026, MEX. 0116866, SAF. 0703019, SPN. 0379248, STZ. 0516181, SWD. 7006081.
3,728,920.—CUT AND DEFLECT WEB DRIVE APPARATUS. APR. 24, 1973.
3,743,409.—CUTTER ASSEMBLY. JULY 3, 1973. BEL. 0784635, CAN. 0974447, FRA. 7220418, GRB. 1400465, ITL. 0956414.
3,855,890.—SLITTER/PERFORATOR APPARATUS. DEC. 24, 1974. BEL. 808873, CAN. 0996462, FRA. 7345296, GRB. 1423770, ITL. 1001152, USR. 0546267.
3,882,744.—ELECTROSTATOGRAPHIC WEB FEEDING APPARATUS. MAY 13, 1975. FRA. 7417339.
3,931,090.—RUBBER COMPOSITIONS FOR FLEXIBLE BELTS. JAN. 6, 1976.
4,043,233.—METHOD OF PREVENTING MULTI-SHEET FEEDING. AUG. 23, 1977.

Class 6J

3,380,733.—SHEET STRIPPING APPARATUS. APR. 30, 1968. ATR. 0268045, AUS. 0413138, BEL. 0689067, CAN. 0819593, DNK. 0112289, FRA. 1499560, GER. 1522704, GRB. 1157342, HOL. 0151191, ITL. 0788572, JAP. 0560087, LXB. 0052213, MEX. 0101989, NOR. 0122220, NZL. 0146848, PTG. 0046633, SAF. 0666572, SPN. 0332819, STZ. 0468661, SWD. 0326103, USR. 0261292.
3,416,791.—DOCUMENT INVERTING APPARATUS. DEC. 17, 1968. CAN. 0853562, GRB. 1210564, JAP. 0648074.
3,548,783.—PAPER TRANSPORT - SHEET TURNER - PAPER TRANSPORT-90 DEG TURN. DEC. 22, 1970.
3,627,312.—RESTACKING APPARATUS. DEC. 14, 1971. AUS. 0447183, BEL. 0752942, CAN. 0922747, CHL. 0025830, EGR. 0084128, FRA. 7024663, GRB. 1312303, GUA. 0002616, ITL. 0900193, JAP. 791920, MEX. 0114980, PLD. 0081346, PNM. 0001953, SPN. 0381379, STZ. 0525779, SWD. 0359381, TIW. 0022313, VZL. 0032782.
3,856,295.—INVERTER-REVERSER FOR A REPRODUCTION MACHINE. DEC. 24, 1974.
3,862,802.—SHEET REVERSING APPARATUS AND A DUPLEX REPRODUCING APPARATUS EMPLOYING SAME. JAN. 28, 1975. BEL. 0818894.
3,942,785.—SELF-ACTUATING SHEET INVERTER-REVERSER. MAR. 9, 1976.
3,944,212.—SHEET REVERSING MECHANISM. MAR. 16, 1976.
3,947,270.—REPRODUCING APPARATUS AND PROCESS FOR DUPLEX IMAGING IN A SINGLE PASS. MAR. 30, 1976.
4,040,616.—SHEET TURN AROUND INVERTER. AUG. 9, 1977. FRA. 7701111.
7,214,740.—SHEET REVERSING MECHANISM. JULY 29, 1980.

Class 6K

D.227,933.—SORTER. JULY 24, 1973.
D.230,515.—DOCUMENT REPRODUCING AND SORTING MACHINE. FEB. 26, 1974.
D.233,937.—SORTER. DEC. 17, 1974.
D.236,030.—PAPER TRAY. JULY 22, 1975.
3,395,913.—SHEET MATERIAL DISTRIBUTION SYSTEM. AUG. 6, 1968. AUS. 0409539, BEL. 0704922, CAN. 0832159, FRA. 1543565, GRB. 1193517, ITL. 0823413, JAP. 0645590, MEX. 0101165, USR. 0343419.
3,460,824.—MODULAR SHEET DISTRIBUTOR. AUG. 12, 1969. ARG. 0175858, ATR. 0304588, AUS. 0443802, CAN. 0871013, CHL. 0023362, CLB. 0016672, EIR. 0031307, FIN. 0047868, GRB. 1193514, IND. 0112001, ISR. 0028521, JAP. 0645589, MEX. 0099178, NOR. 0125174, NZL. 0149789, PAK. 0119258, PLP. 0006159, PRU. 0009362, SAF. 0674987, SPN. 0344350, STZ. 0478049, SWD. 0342203, TRK. 0014721, URG. 0008514, VZL. 0016672.
3,484,101.—SORTING APPARATUS FOR DOCUMENTS. DEC. 16, 1969. CAN. 0889441, GRB. 1246033.
3,552,739.—SHEET HANDLING APPARATUS. JAN. 5, 1971. BEL. 0738575, CAN. 0921945, FRA. 6930567, GRB. 1274277, ITL. 0871023.
3,565,420.—DOCUMENT FEEDING APPARATUS. FEB. 23, 1971. ARG. 0184075, AUS. 0453309, BEL. 0750391, CAN. 0922328, EGR. 0082941, FRA. 7017112, GRB. 1305825, ITL. 0893198, MEX. 0117914, PLD. 0082841, SPN. 0379694, STZ. 0513435, SWD. 0368797, USR. 0476767.
3,589,808.—REPRODUCING APPARATUS. JUNE 29, 1971. CAN. 0917482.
3,618,936.—JAM DETECTION SYSTEM FOR SORTING APPARATUS. NOV. 9, 1971. AUS. 0445492, BEL. 0758059, CAN. 0949671, EGR. 0088009, FRA. 7041622, GRB. 1324119, ITL. 0909902, PLD. 0081147, SPN. 0385034, STZ. 0525723, TIW. 0007648.
3,622,061.—STAPLE FEED AND FASTENING APPARATUS. NOV. 23, 1971.
3,630,607.—SET SEPARATION COPIER SYSTEM. DEC. 28, 1971.
3,649,006.—SHEET HANDLING APPARATUS. MAR. 14, 1972. BEL. 0762643, CAN. 0944310, FRA. 7104922, GRB. 1341286, ITL. 0918344, JAP. 0795150.
3,652,875.—CONTROL CIRCUIT FOR DRIVING STAPLING MECHANISM. MAR. 28, 1972.
3,669,447.—SHEET PROPELLING APPARATUS. JUNE 13, 1972. CAN. 0938624.
3,671,094.—COVER APPARATUS. JUNE 20, 1972.
3,682,328.—TRAY APPARATUS. AUG. 8, 1972.
3,685,712.—STAPLING APPARATUS. AUG. 22, 1972. CAN. 0953851.
3,690,537.—STAPLE FORMING AND FASTENING APPARATUS. SEPT. 12, 1972.
3,695,756.—SHEET STRIPPING APPARATUS. OCT. 3, 1972. BEL. 0774563, CAN. 0950931, FRA. 7139637, GRB. 1366909, ITL. 0937673.
3,707,418.—METHOD OF BINDING. DEC. 26, 1972. CAN. 0974723, EGR. 0094346, GRB. 1359338.
3,709,485.—CONTROL CIRCUIT FOR SORTING SYSTEM. JAN. 9, 1973.
3,709,492.—SORTING APPARATUS. JAN. 9, 1973. ARG. 0194366, AUS. 0457968, BEL. 0783854, CAN. 0968300, FRA. 7218317, GRB. 1365399, ITL. 0955692, MEX. 0127721, SPN. 0403108, STZ. 0555198.
3,719,266.—SHEET STACKING APPARATUS. MAR. 6, 1973.
3,735,978.—METHOD AND APPARATUS FOR STACKING COPY SHEETS. MAY 29, 1973. ARG. 0190825, BEL. 0772406, CAN. 0951340, FRA. 7133309, GRB. 1358420, ITL. 0936377, MEX. 0125745.
3,788,640.—MOVING BIN SORTING APPARATUS. JAN. 29, 1974. CAN. 0996495, FRA. 7346312, GRB. 1429726.
3,793,016.—ELECTROPHOTOGRAPHIC SHEET BINDING PROCESS. FEB. 19, 1974.
3,794,550.—SHEET BINDING. FEB. 26, 1974. CAN. 1012583, GRB. 1431286.
3,833,911.—REPRODUCTION SYSTEM AND METHOD WITH SIMPLEX AND DUPLEX MODES OF OPERATION. SEPT. 3, 1974.
3,841,754.—DUPLEX REPRODUCTION SYSTEM. OCT. 15, 1974.
3,841,827.—DUPLEX REPRODUCTION SYSTEM. OCT. 15, 1974. BEL. 0816155, FRA. 7419739, GER. 7409422, GRB. 1441370.
3,845,949.—SORTER CONTROL TO PREVENT OVERSTACKING IN THE SORTER TRAYS. NOV. 5, 1974. BEL. 808173, CAN. 1005511, FRA. 7342816, GRB. 1436599, ITL. 1002130, SPN. 0421148.
3,848,995.—COPIER/DUPLICATOR SYSTEM. NOV. 19, 1974. BEL. 0815548, GRB. 1450847, ITL. 1012907, SPN. 0426782.
3,861,219.—METHOD FOR MEASURING HEAT AND PRESSURE CHARACTERISTICS OF FUSING APP. JAN. 21, 1975. CAN. 1013807.
3,861,861.—FUSER ROLL CLEANING APPARATUS. JAN. 21, 1975.
3,866,904.—MULTIPLE FEED SORTING APPARATUS. FEB. 18, 1975. CAN. 1001109, GRB. 1432790.
3,868,019.—TRAY APPARATUS. FEB. 25, 1975. FRA. 7346312, CAN. 0996495, FRA. 7346912, GRB. 1429726.

3,870,295.—SORTER SUPPLEMENT CONTROL. MAR. 11, 1975. CAN. 1007283.
3,871,643.—SORTER CONTROL. MAR. 18, 1975. BEL. 808172, CAN. 1000647, GRB. 1422029, ITL. 1002129, SPN. 0421116.
3,878,818.—CLEANING APPARATUS FOR DRY FUSER ROLLS. APR. 22, 1975. FRA. 7427783, GRB. 1464759.
3,880,119.—DEVELOPMENT APPARATUS. APR. 29, 1975.
3,902,709.—BINLESS SORTER. SEPT. 2, 1975. FRA. 7436985.
3,907,276.—WOBBLE JOGGER. SEPT. 23, 1975.
3,908,978.—BINLESS SORTING APPARATUS. SEPT. 30, 1975. CAN. 0996586, GRB. 1426020.
3,917,256.—DUAL PURPOSE SHEET HANDLING APPARATUS. NOV. 4, 1975. CAN. 1014098.
3,917,257.—SHEET INVERTER APPARATUS. NOV. 4, 1975. CAN. 1005009, FRA. 7346309, GRB. 1430620.
3,938,802.—SHEET STACKING APPARATUS. FEB. 17, 1976. CAN. 1010462, GRB. 1431605.
3,941,369.—SHEET DISTRIBUTING APPARATUS. MAR. 2, 1976.
3,947,018.—UNIVERSAL FEEDER-STACKER. MAR. 30, 1976. BEL. 0836262.
3,953,023.—BIN INDICATOR DEVICE. APR. 27, 1976.
3,971,554.—SHEET STACKER. JULY 27, 1976.
3,973,769.—COMPACT SORTING APPARATUS. AUG. 10, 1976. BEL. 0836261.
3,977,667.—SORTING APPARATUS. AUG. 31, 1976.
3,988,817.—PRESSURE ROLL FOR FUSER APPARATUS. NOV. 2, 1976.
3,990,695.—SORTING APPARATUS. NOV. 9, 1976.
3,995,748.—SORTER APPARATUS. DEC. 7, 1976. BEL. 0844420.
4,011,952.—MANUAL SORTER. MAR. 15, 1977.
4,012,034.—MULTIPLE MODULAR SORTER ASSEMBLY. MAR. 15, 1977.
4,012,035.—SORTER CONTROL SYSTEM. MAR. 15, 1977.
4,015,841.—SORTER. APR. 5, 1977.
4,022,458.—SHEET DISTRIBUTION APPARATUS. MAY 10, 1977.
4,029,309.—SET TRANSPORT AND STACKER. JUNE 14, 1977. BEL. 0847844.
4,033,579.—AN OFFSET STACKER. JULY 5, 1977.
4,037,832.—IMPROVED SORTER APPARATUS. JULY 26, 1977.
4,038,594.—DISTORTIONLESS LINE WAVE AMPLIFICATION. JULY 26, 1977.
4,049,180.—STITCHING HEAD BYPASS APPARATUS. SEPT. 20, 1977.
4,055,339.—SORTER APPARATUS. OCT. 25, 1977.
4,069,728.—SHEET SLITTING APPARATUS. JAN. 24, 1978.
4,084,809.—SHEET STACKING APPARATUS. APR. 18, 1978.
4,087,087.—SHEET STACKING APPARATUS FOR SORTER. MAY 2, 1978.
4,111,410.—SORTING APPARATUS AND REPRODUCING MACHINE. SEPT. 5, 1978.
4,138,076.—STAPLE CASSETTE. FEB. 6, 1979.
4,151,944.—STAPLERS. MAY 1, 1979.
4,175,314.—PNEUMATICALLY CONTROLLED STAPLING SYSTEM. NOV. 27, 1979.
4,181,248.—FIXED STAPLER HEAD. JAN. 1, 1980.
4,184,622.—AN IMPROVED STAPLER HEAD. JAN. 22, 1980.
4,187,969.—FIXED STAPLER HEAD. FEB. 12, 1980.
4,190,247.—SHEET RECEIVING APPARATUS. FEB. 26, 1980. FRA. 7506684, GER. 2506736, GRB. 1494785.
4,194,666.—STAPLE CLINCHING MECHANISM. MAR. 25, 1980.
4,204,727.—MULTIMODE REPRODUCING APPARATUS. MAY 27, 1980.
4,214,746.—A SORTING APPARATUS. JULY 29, 1980.

Class 7

3,784,300.—PRE-TRANSFER STATION. JAN. 8, 1974. AUS. 0465154, BEL. 0789340, CAN. 1000782, EGR. 0106095, FRA. 7234200, GRB. 1379826, ITL. 0972691, MEX. 0128584, SPN. 0409975, STZ. 0557051, SWD. 7215168.
3,809,471.—PHOTOELECTROPHORETIC IMAGING APPARATUS WITH CORRECTION FOR PARALLAX. MAY 7, 1974.
3,819,263.—CLEANING APPARATUS. JUNE 25, 1974. ARG. 0200252, AUS. 0469469, BEL. 0796984, EGR. 0104374, FRA. 2177733, GRB. 1421929, ISR. 0041829, ITL. 0983618, MEX. 131438, SAF. 0732067, SPN. 0439774, STZ. 0556047, SWD. 7304022.

Class 7A

3,850,517.—HIGH SPEED PRINTOUT SYSTEM. NOV. 26, 1974.

Class 7A 1

3,148,581.—CYLINDRICAL SURFACE PROJECTION APPARATUS. SEPT. 15, 1964.
3,273,999.—IMAGE DEFORMATION UTILIZING A PRISM. SEPT. 20, 1966. AUS. 0274351, CAN. 0840628, FRA. 1367772, GRB. 1034097, ITL. 0699466, SAF. 0002971, SWD. 0306232.
3,320,061.—MASKING BY TOTAL INTERNAL REFLECTION FOR IMAGE REPRODUCTION AND DISPLAY. MAY 16, 1967. CAN. 0847533, FRA. 1401615, GER. 1497081, GRB. 1065986, ITL. 0729029, JAP. 0471308.
3,481,668.—IMAGE PROJECTION APPARATUS. DEC. 2, 1969.
3,510,660.—METHOD FOR VISUAL COMPARISON OF INFORMATION. MAY 5, 1970. CAN. 0848611, GRB. 1201376, JAP. 0595641.
3,519,344.—IMAGE PROJECTION. JULY 7, 1970.
3,622,217.—LIGHT PRODUCING SYSTEM. NOV. 23, 1971.

Class 7A 2

3,196,765.—IMAGE DEVELOPMENT AND PROJECTION. JULY 27, 1965.
3,355,308.—PROJECTION TRANSPARENCY HAVING A TRANSPARENT POWDER IMGE. NOV. 28, 1967.
3,607,256.—FULLY-ENCLOSED ELECTROPHORETIC IMAGING SYSTEM. SEPT. 21, 1971.

Class 7A 2A

3,999,038.—FLARED FUSER ROLLL. DEC. 21, 1976.

Class 7B

3,501,294.—METH OF TREATNG SURFACE OF XIC PLATE W/METAL SALT OF A FATTY ACID TO IMPROVE IMAGE TRANSFER. MAR. 17, 1970. ARG. 0168294, AUS. 0419434, BEL. 0706369, CAN. 0880230, CHL. 0027764, FRA. 1544449, GRB. 1209644, ITL. 0822799, MEX. 0102265, PNM. 0002797, SWD. 0340047, VZL. 0023670.
3,690,754.—CONTROL SYSTEM FOR AN OPTICAL IMAGING SYSTEM. SEPT. 12, 1972. CAN. 0949797, GRB. 1337420.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,973,843.—ELECTROSTATOGRAPHIC IMAGING APPARATUS. AUG. 10, 1976. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
4,064,285.—ELECTROPHOTOGRAPHIC DECALCOMANIAS. DEC. 20, 1977.
4,066,802.—COLORED XEROGRAPHIC IMAGE TRANSFER PROCESS. JAN. 3, 1978.
4,126,455.—ELECTROSTATOGRAPHIC IMAGING PROCESS AND RELATED APPARATUS. NOV. 21, 1978. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.

Class 7C

3,620,616.—TRANSFER DRUM WITHDRAWAL APPARATUS. NOV. 16, 1971. BEL. 0751487, CAN. 0923543, FRA. 7020458, GRB. 1300267, ITL. 0893835.
3,633,543.—BIASED ELECTRODE TRANSFER APPARATUS. JAN. 11, 1972. CAN. 0914398, GRB. 1337123, JAP. 783769.
3,781,105.—CONSTANT CURRENT BIASING TRANSFER SYSTEM. DEC. 25, 1973. FRA. 7341869, GRB. 1448385.
3,795,441.—TRANSFER ROLLER. MAR. 5, 1974.
3,822,093.—TRANSFER REGULATING APPARATUS. JULY 2, 1974. FRA. 7428422.
3,830,589.—CONDUCTIVE BLOCK TRANSFER SYSTEM. AUG. 20, 1974.
3,832,053.—BELT TRANSFER SYSTEM. AUG. 27, 1974.
3,832,055.—FORAMINOUS VACUUM BIAS ROLL TRANSFER SYSTEM. AUG. 27, 1974. CAN. 0999316.
3,837,741.—CONTROL ARRANGEMENT FOR TRANSFER ROLL POWER SUPPLY. SEPT. 24, 1974.
3,837,883.—IMAGE TRANSFER PROCESS. SEPT. 24, 1974. ARG. 0203811, AUS. 0461437, BEL. 0760456, CAN. 0947368, FRA. 7047140, GRB. 1339577, ITL. 0913634, MEX. 0119591, SWD. 7017139.
3,842,800.—TRANSFER ROLLER ASSEMBLY. OCT. 22, 1974. BEL. 0793553, CAN. 9780221, FRA. 7237770, GRB. 1412454, ITL. 0973320, SPN. 0410173, SWD. 7216978.
3,846,020.—ELECTROSTATIC SHEET TRANSPORT SYSTEM. NOV. 5, 1974.
3,847,119.—TRANSFER ROLLER ASSEMBLY. NOV. 12, 1974. ARG. 0196224, ATR. 327002, AUS. 0464751, BEL. 0796983, CAN. 0977206, EGR. 0103979, FRA. 7305277, GER. 0103979, GRB. 1413711, ISR. 0041830, ITL. 0983617, MEX. 131018, SAF. 0722068, SPN. 0413018, STZ. 0558033, SWD. 7304021.
3,847,478.—SEGMENTED BIAS ROLL. NOV. 12, 1974.
3,848,204.—PRESSURE ADJUSTABLE ELECTROPHOTOGRAPHIC PRINTING MACHINE TRANSFER APPARATUS. NOV. 12, 1974.
3,860,436.—CONSTANT CURRENT BIASING TRANSFER SYSTEM. JAN. 14, 1975. FRA. 7341869, GRB. 1448385.
3,866,572.—FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM. FEB. 18, 1975. BEL. 0815546, CAN. 1009503, FRA. 7418641, GRB. 1448386, ITL. 1012842, SPN. 0426760.
3,877,416.—HUMIDITY CORRECTED TRANSFER APPARATUS. APR. 15, 1975. BEL. 0814054, GRB. 1445671, ITL. 1009955, STZ. 0573612.
3,888,208.—IMAGE TRANSFER PROCESS. JUNE 10, 1975.
3,901,186.—TRANSFER ROLLER ASSEMBLY. AUG. 26, 1975. BEL. 0816848, FRA. 7423024.
3,924,943.—SEGEMENTED BIASED TRANSFER MEMBER. DEC. 9, 1975.
3,936,175.—INTERNALLY SHIELDED TRANSFER ROLLER. FEB. 3, 1976.
3,942,888.—STEPPED TRANSFER ROLLER. MAR. 9, 1976.
3,957,367.—A COLOR ELECTROSTATOGRAPHIC PRINTING MACHINE. MAY 18, 1976.
3,959,574.—BIASABLE MEMBER AND METHOD FOR MAKING. MAY 25, 1976.
3,994,579.—TRANSFER SYSTEM FOR ELECTROPHOTOGRAPHIC PRINTING. NOV. 30, 1976.
4,014,605.—TRANSFER SYSTEM WITH TAILORED ILLUMINATION. MAR. 29, 1977.
4,023,894.—TRANSFER APPARATUS. MAY 17, 1977.
4,025,182.—A TRANSFER APPARATUS FOR A COLOR ELECTROPHOGRAPHIC PRINTING MACHINE. MAY 24, 1977.
4,055,380.—TRANSFER CHARGE MAINTAINING SYSTEM. OCT. 25, 1977.
4,058,879.—COMPOSITIONS AND METHOD FOR ENHANCING ELECTRICAL LIFE OF POLYMERS USED IN XEROGRAPHIC DEVICE. NOV. 22, 1977.
4,062,812.—METHOD FOR EXTENDING THE FUNCTIONAL LIFE OF POLYMERS USED IN XEROGRAPHIC DEVICES. DEC. 13, 1977.
4,087,169.—TRANSFER ROLLER SYSTEM. MAY 2, 1978.
4,098,227.—BIASED FLEXIBLE ELECTRODE TRANSFER. JULY 4, 1978.
4,105,320.—TRANSFER OF CONDUCTIVE PARTICLES. AUG. 8, 1978.
4,110,024.—TRANSFER ASSEMBLY FOR ELECTROSTATIC TRANSFER OF A TONER IMAGE FROM A CURVILINEAR RECORDING. AUG. 29, 1978. BEL. 854404.
4,116,894.—COMPOSITIONS AND METHOD FOR ENHANCING ELECTRICAL LIFE OF COPOLYMERS. SEPT. 26, 1978.
4,134,147.—TRANSFER HUMIDITY CONTROL DEVICE. JAN. 9, 1979.
4,141,728.—TRANSFER OF DRY DEVELOPED ELECTROSTATIC IMAGE USING PLURAL OPPOSITELY CHARGED FIELDS. FEB. 27, 1979.
4,190,348.—LEAD EDGE TRANSFER SWITCHING. FEB. 26, 1980.
4,193,680.—TRANSFER SHEET DRYING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE. MAR. 18, 1980.

Class 7C 1

3,150,003.—APPARATUS FOR TRANSFERRING XEROGRAPHIC IMAGES. SEPT. 22, 1964.
3,150,004.—XEROGRAPHIC TRANSFER APPARATUS. SEPT. 22, 1964.
3,244,083.—XEROGRAPHIC DEVICE. APR. 5, 1966. AUS. 0284069, CAN. 0710975, FRA. 1379820, GRB. 1030449, JAP. 0654006.
3,339,069.—CORONA CHARGING DEVICE W/MEANS TO PREVENT TONER DUST CONTAMINATION. AUG. 29, 1967. CAN. 0788539, FRA. 1450010, GRB. 1116687, ITL. 0730715, JAP. 0875339, MEX. 0089459.
3,357,325.—XEROGRAPHIC TRANSFER APPARATUS. DEC. 12, 1967. CAN. 0812525.
3,444,369.—METHOD AND APPARATUS FOR SELECTIVE CORONA TREATMENT OF TONER PARTICLES. MAY 13, 1969. ARG. 0167581, ATR. 0288863, AUS. 0415969, BEL. 0704919, BRA. 6791610, CAN. 0845871, DNK. 0119094, FRA. 1540696, GER. 1597884, GRB. 1203811, HOL. 0152375, ITL. 0853627, JAP. 0587935, MEX. 0099470, SPN. 0345918, STZ. 0487438, SWD. 0337986, VZL. 0023669.
3,765,330.—XEROPRINTING EMPLOYING LETTER PRESS SURFACE COVERED WITH A LAYER OF RESISTIVE MATERIAL. OCT. 16, 1973. CAN. 0949806, GRB. 1374651.
3,850,519.—XEROGRAPHIC IMAGE TRANSFER APPARATUS. NOV. 26, 1974. ARG. 0202116, BEL. 0809579, GRB. 1446252, ITL. 1006786, MEX. 0135278, SPN. 0422230, STZ. 0567748, SWD. 7400197, VZL. 0033340.
3,870,515.—METHOD FOR ELECTROSTATIC PAPER STRIPPING BY NEUTRALIZATION OF TRANSFER CHARGE. MAR. 11, 1975.
3,877,417.—TRANSFER CORONA GENERATING DEVICE WITH SUPPORT BRUSHES. APR. 15, 1975.
3,918,403.—CORONA TRANSFER MECHANISM. NOV. 11, 1975.
3,920,325.—MOISTURE STABLE BIAS TRANSFER ROLL. NOV. 18, 1975.
3,966,199.—BELT TRANSFER LOADING SYSTEM. JUNE 29, 1976.
4,014,606.—REPRODUCTION MACHINE WITH TEXTURED TRANSFER ROLLER. MAR. 29, 1977.
4,017,065.—TRANSFER FUSING SPEED COMPENSATION. APR. 12, 1977.
4,017,067.—TRANSFER-FUSING SPEED COMPENSATION. APR. 12, 1977.
4,058,306.—DETACK AND STRIPPING SYSTEM. NOV. 15, 1977.
4,076,407.—DUPLEX COPYING TRANSFER SYSTEM. FEB. 28, 1978.
4,077,709.—TRANSFER CHARGE CONTROL SYSTEM. MAR. 7, 1978.
4,080,053.—TRANSFER APPARATUS AND METHOD. MAR. 21, 1978.

Class 7C 1A

3,319,604.—XEROGRAPHIC TRANSFER APPARATUS MAY 16, 1967.

Class 7C 2

3,132,037.—XEROGRAPHIC TRANSFER METHOD. MAY 5, 1964. CAN. 0727919.
3,132,050.—XEROGRAPHIC TRANSFER APPARATUS MAY 5, 1964.
3,795,441.—TRANSFER ROLLER. MAR. 5, 1974.
3,817,616.—THERMAL CHAMBER FOR DEVELOPABILITY REGULATING APPARATUS. JUNE 18, 1974. CAN. 0991247, GRB. 1439527.
3,838,918.—TRANSFER APPARATUS. OCT. 1, 1974. BEL. 0811434, GRB. 1445243, ITL. 1008903.
3,892,962.—THERMAL CHAMBER FOR A DEVELOPABILITY REGULATING APPARATUS. JULY 1, 1975. CAN. 0991247, GRB. 1439527.

Class 7C 3

3,244,083.—XEROGRAPHIC DEVICE. APR. 5, 1966. AUS. 0284069, CAN. 0710975, FRA. 1379820, GRB. 1030449, JAP. 0654006.
3,612,677.—ELECTROSTATIC TRANSFER APPARATUS. OCT. 12, 1971. CAN. 0941220, GRB. 1296742.
3,697,170.—AUTOMATIC DUPLEXING APPARATUS. OCT. 10, 1972. CAN. 0948269.
3,697,171.—SIMULTANEOUS IMAGE TRANSFER. OCT. 10, 1972. ARG. 0192330, AUS. 0461728, BEL. 0777015, CAN. 0948267, FRA. 7146256, GRB. 1368456, ITL. 0944212, MEX. 0124562, SWD. 0366123, VZL. 32765.
3,702,482.—BIAS ROLL TRANSFER. NOV. 7, 1972. ARG. 0191238, BEL. 0777017, CAN. 0962890, FRA. 7142257, GRB. 1368500, ITL. 0944209, MEX. 0126775.
3,734,015.—SINGLE PASS DUPLEXING BY SEQUENTIAL TRANSFER. MAY 22, 1973. ARG. 0192332, BEL. 7777018, CAN. 0948691, FRA. 7146258, GRB. 1368496, ITL. 0944211, MEX. 0124992.
3,902,801.—COLOR CORRECTED PRINTING SYSTEM. SEPT. 2, 1975. GRB. 1465590.
4,093,457.—METHOD OF TRANSFER.
4,188,213.—COLOR CORRECTED PRINTING SYSTEM. FEB. 12, 1980. CAN. 1037545, GRB. 1465590.

Class 7C 4

3,444,369.—METHOD AND APPARATUS FOR SELECTIVE CORONA TREATMENT OF TONER PARTICLES. MAY 13, 1969. ARG. 0167581, ATR. 0288863, AUS. 0415969, BEL. 0704919, BRA. 6791610, CAN. 0845871, DNK. 0119094, FRA. 1540696, FRA. 1540696, GRB. 1203811, HOL. 0152375, ITL. 0853627, JAP. 0587935, MEX. 0099470, SPN. 0345918, STZ. 0487438, SWD. 0337986, VZL. 0023669.
3,640,249.—TRANSFER APPARATUS. FEB. 8, 1972. BEL. 0758058.
3,647,292.—TRANSFER APPARATUS. MAR. 7, 1972. AUS. 0450919, BEL. 0759452, CAN. 0919004, FGR. 0086978, FRA. 7043065, GRB. 1319148, ITL. 0909441, JAP. 0773213, SPN. 0385845, STZ. 0519187, SWD 7015876.

3,650,617.—SWITCHING DETECTOR-A. MAR. 21, 1972.
3,650,618.—SWITCHING DETECTOR-B. MAR. 21, 1972.
3,687,545.—SHORT FOCAL LENTH OPTICAL IMAGING SYSTEM. AUG. 29, 1972. BEL. 0747977, CAN. 0913438, FRA. 7011547, GRB. 1300156, ITL. 0898935, JAP. 0731226.
3,729,311.—ELECTROSTATIC TRANSFER METHOD. APR. 24, 1973.
3,854,974.—METHOD FOR TRANSFERRING A TONER IMAGE. DEC. 17, 1974.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.
3,932,035.—APPARATUS FOR TRANSFERRING A TONER IMAGE. JAN. 13, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. NOV. 30, 1976. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. MAY 17, 1977. BEL. 0819537, GRB. 1429518.

Class 7E

3,132,050.—XEROGRAPHIC TRANSFER APPARATUS. MAY 5, 1964.
3,375,781.—REGISTRATION MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,375,782.—PROGRAMMING MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,422,756.—PAPER SUPPORT AND REGISTRATION MEANS FOR REPRODUCTION MACHINE. JAN. 21, 1969.
3,499,374.—XEROGRAPHIC PRINTER. MAR. 10, 1970. AUS. 0415164, BEL. 0677146, CAN. 0846424, FRA. 1470069, GRB. 1135603, ITL. 0762255, MEX. 0091183, SWD. 0327142.
3,687,541.—XEROGRAPHIC DUPLEX TECHNIQUE. AUG. 29, 1972. CAN. 0948268.
3,847,642.—METHOD FOR TRANSFERRING ELECTROSTATOGRAPHICALLY FORMED IMAGES. NOV. 12, 1974.
3,848,204.—PRESSURE ADJUSTABLE ELECTROPHOTOGRAPHIC PRINTING MACHINE TRANSFER APPARATUS. NOV. 12, 1974.
3,854,974.—METHOD FOR TRANSFERRING A TONER IMAGE. DEC. 17, 1974.
3,867,168.—TRANSPARENCY. FEB. 18, 1975.
3,888,208.—IMAGE TRANSFER PROCESS. JUNE 10, 1975.
3,932,035.—APPARATUS FOR TRANSFERRING A TONER IMAGE. JAN. 13, 1976.
3,936,174.—TRANSFER ROLLER WITH STATIONARY INTERNAL ELECTRODE. FEB. 3, 1976.
3,954,332.—REPRODUCTION MACHINE WITH IMPROVED TRANSFER ROLL. MAY 4, 1976.
3,954,333.—TRANSFER ROLL HAVING MEANS FOR MONITORING AND CONTROLLING THE RESITIVITY THEREOF. MAY 4, 1976.
3,977,779.—ELECTROSTATOGRAPHIC TRANSFER WITH AIR. AUG. 31, 1976. GRB. 1459450.

Class 7E 1

3,374,769.—TONER FUSING APPARATUS. MAR. 26, 1968. CAN. 0819836, FRA. 1396610, GER. 1522709, GRB. 1152067, JAP. 0534764.
3,685,896.—DUPLICATING METHOD AND APPARATUS. AUG. 22, 1972.
3,845,742.—FUSER ROLL CONSTRUCTION. NOV. 5, 1974. GRB. 1450882.
3,849,062.—REINFORCED FUSER ROLL CONSTRUCTION. NOV. 19, 1974.
4,064,285.—ELECTROPHOTOGRAPHIC DECALCOMANIAS. DEC. 20, 1977.
4,066,802.—COLORED XEROGRAPHIC IMAGE TRANSFER PROCESS. JAN. 3, 1978.

Class 7E 3

3,157,546.—IMAGE TRANSFER. NOV. 17, 1964. ATR. 0225034, BEL. 0602721 FRA. 1287124, GER. 1271547, GRB. 0985176, ITL. 0647042, JAP. 0414127, STZ. 0383417.
3,591,276.—METHOD AND APPARATUS FOR OFFSET XEROGRAPHIC REPRODUCTION. JULY 6, 1971. CAN. 0894931, GER. 1811893, GRB. 1245426, JAP. 0648075.
3,682,677.—BACKGROUND REMOVAL. AUG. 8, 1972.
3,690,252.—LITHOGRAPHIC INKING APPARATUS. SEPT. 12, 1972. CAN. 0919006.
4,064,285.—ELECTROPHOTOGRAPHIC DECALCOMANIAS. DEC. 20, 1977.

Class 8

3,961,236.—CONSTANT POWER REGULATOR FOR XEROGRAPHIC FUSING SYSTEM. JUNE 1, 1976.
4,027,138.—A FUSER RELEASE MATERIAL DISPENSER. MAY 31, 1977.
4,104,692.—DEVICE FOR DETECTING ABNORMAL TEMPERATURE IN FIXER. AUG. 1, 1978.

Class 8A

D.233,414.—TONER BOTTLE OR THE LIKE. OCT. 29, 1974.
3,130,064.—METHOD OF FORMING RESIN PATTERN ON A PAPER RECORD CARD. APR. 21, 1964.
3,778,222.—FIRE PREVENTION APPARATUS. DEC. 11, 1973.
3,830,590.—SORTER APPARATUS OF PRINTER SYSTEM. AUG. 20, 1974. AUS. 0466096, BEL. 0791361, CAN. 0998425, CHL. 0027890, EGR. 0102488, FRA. 7240557, GRB. 1400619, IND. 0137843, ISR. 0040831, ITL. 0970911, MEX. 0128646, NOR. 0135210, NZL. 0168971, PLP. 0008722, PTG. 0058789, SAF. 0728101, SPN. 0408628, STZ. 0560108.
3,834,861.—PRESSURE HEATED FUSER ASSEMBLY. SEPT. 10, 1974. GRB. 1424307.
3,847,391.—STACKING CONTROL APPARATUS. NOV. 12, 1974. ARG. 0194365, AUS. 0454812, BEL. 0783855, CAN. 0969205, FRA. 7218318, GRB. 1365400, ITL. 0955693, MEX. 0128712, SPN. 0403109, STZ. 0557242.
3,848,868.—SHEET SORTING APPARATUS. NOV. 19, 1974. CAN. 1005387, GRB. 1440557.
3,856,461.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974.
3,856,462.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974. BEL. 0821050, FRA. 7435222.
3,868,744.—CLEANING APPARATUS FOR HEATED PRESSURE ROLL FUSER. MAR. 4, 1975. AUS. 0466542, BEL. 0794569, CAN. 1007407, FRA. 7302888, GRB. 1424132, ITL. 0978560, SPN. 0410976, SWD. 7301015.
3,883,921.—CLEANING ROLL APPARATUS HAVING REJUVENATED CLEANING SURFACE. MAY 20, 1975.
3,936,658.—FUSER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. FEB. 3, 1976. BEL. 0844831.
3,998,450.—IMPROVED SORTING APPARATUS. DEC. 21, 1976. GRB. 1433088.
4,004,549.—ROLL FUSER. JAN. 25, 1977.
4,006,985.—XEROGRAPHIC APPARATUS HAVING TIME CONTROLLED FUSING. FEB. 8, 1977.
4,032,746.—CONTROL SYSTEM FOR A FUSING APPARATUS. JUNE 28, 1977.
4,035,140.—FIXING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 12, 1977.
4,045,163.—HEATED FUSER RELEASE AGENT CONTAINER. AUG. 30, 1977.
4,063,530.—IMAGE FIXING. DEC. 20, 1977.
4,065,586.—FIXING METHOD USING POLYARYLSILOXANES AS RELEASE AGENTS. DEC. 27, 1977.
4,078,286.—HEAT FIXING ROLL FOR ELECTROPHOTOGRAPHIC DUPLICATORS. MAR. 14, 1978.
4,078,948.—FIXING METHOD. MAR. 14, 1978.
4,133,522.—PIVOTING TRAY SORTING APPARATUS. JAN. 9, 1979. CAN. 1011681. GRB. 1455159.
4,144,835.—CONTACT HEAT FIXING APPARATUS. MAR. 20, 1979.
4,146,659.—FUSING TONER ON FUSER MEMBERS MADE OF NOBLE METALS AND ALLOYS THEREOF. MAR. 27, 1979.
4,170,957.—FIXING METHOD AND DEVICE USING POLYARYLSILOXANES AS A RELEASE AGENT. OCT. 16, 1979.
4,172,721.—DYE-AMPLIFIED IMAGING PROCESS. OCT. 30, 1979. AUS. 494739, BEL. 822400, CAN. 1033041, FRA. 7438506, GER. 7438730, GRB. 1484706, ITL. 1025877, SPN. 432205, SWD. 74144650.
4,185,140.—POLYMERIC RELEASE AGENTS FOR ELECTROSCOPIC THERMOPLASTIC TONERS. JAN. 22, 1980. BEL. 831662, FRA. 7523193, MEX. 140595.
4,188,423.—SOLVENT EXTRACTED HEAT FUSER MEMBER. FEB. 12, 1980.
4,196,256.—LONG LIFE FUSER ROLL. APR. 1, 1980.

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RE.28,802.—FUSING APPARATUS. MAY 4, 1976. CAN. 0990779, FRA. 7338110, GRB. 1436563.
3,219,326.—XEROGRAPHIC FUSING APPARATUS. NOV. 23, 1965. CAN. 0716212.
3,374,769.—TONER FUSING APPARATUS. MAR. 26, 1968. CAN. 0819836, FRA. 1396610, GER. 1522709, GRB. 1152067, JAP. 0534764.
3,396,401.—APPARATUS AND METHOD FOR MARKING OF INTELLIGENCE ON A RECORD MEDIUM. AUG. 6, 1968.
3,409,280.—POROUS DRUM FUSER. NOV. 5, 1968.
3,411,932.—QUALITY XEROGRAPHIC REPRODUCTIONS. NOV. 19, 1968. CAN. 0788948, FRA. 1459094, GER. 1497213, GRB. 1112000, ITL. 0725763, MEX. 0078900.
3,498,592.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIAL. MAR. 3, 1970. ARG. 0180584, AUS. 0432632, BEL. 0733403, CAN. 0878082, CZC. 0164830, FRA. 6917080, GRB. 1269716, ITL. 0864984, MEX. 0111516, PNM. 0001417, SPN. 0367614, STZ. 0506821, SWD. 0345328, TIW. 0006603, USR. 0340215.
3,519,253.—SELECTIVE XEROGRAPHIC FUSER. JULY 7, 1970. ARG. 0168753, ATR. 0293871, AUS. 0416089, BEL. 0704925, CAN. 0843377, CHL. 0023289, CLB. 0017682, DNK. 0123893, FRA. 1540701, GRB. 1193355, GUA. 0002145, HUN. 0157550, ITL. 0830722, JAM. 0001850, MEX. 0107890, PRU. 0009344, SAF. 0676018, SPN. 0345919, STZ. 0470698, SWD. 0322690, TRD. 0000113, URG. 0008846, USR. 0372852, VZL. 0026101.
3,535,492.—FUSING APPARATUS. OCT. 20, 1970. ARG. 0181204, BEL. 0733663, CAN. 0872978, FRA. 6917190, GRB. 1266932, HOL. 149013, ITL. 0865914, MEX. 0110755.
3,623,710.—FIXING ARRANGEMENT. NOV. 30, 1971.
3,648,991.—METHOD AND APPARATUS FOR SELECTIVE FUSING. MAR. 14, 1972.
3,667,742.—FIXING ARRANGEMENT. JUNE 6, 1972. BEL. 0777318, CAN. 0928766, FRA. 7147890, GRB. 1368307, ITL. 0944393.
3,765,828.—FUSING APPARATUS. OCT. 16, 1973. CAN. 0991256, GRB. 1428800.
3,770,346.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE. NOV. 6, 1973. CAN. 1002582, GRB. 1421863.
3,781,517.—FUSER THERMAL PROTECTOR. DEC. 25, 1973. GRB. 1441702.
3,792,227.—FUSER APPARATUS. FEB. 12, 1974.
3,819,259.—LIGHT ATTENUATOR. JUNE 25, 1974. GRB. 1428799.
3,826,892.—FUSING APPARATUS. JULY 30, 1974. CAN. 0990779, FRA. 7338110, GRB. 1436563.
3,849,905.—FUSING APPARATUS. NOV. 26, 1974.
3,849,907.—FUSING APPARATUS. NOV. 26, 1974.
3,869,696.—FUSER APPARATUS. MAR. 4, 1975.
3,874,892.—ELECTROSTATOGRAPHIC FUSING PROCESS EMPLOYING REPLACEABLE LINER. APR. 1, 1975. CAN. 0980405, GRB. 1374652.
3,898,424.—RADIANT FUSER XEROGRAPHIC REPRODUCING APPARATUS. AUG. 5, 1975.
3,907,492.—FUSING APPARATUS. SEPT. 23, 1975. CAN. 0990779, GRB. 1436563.
3,939,326.—DUAL RIBBON FUSER. FEB. 17, 1976.
3,944,784.—DUAL RIBBON FUSER. MAR. 16, 1976.
3,953,709.—TWO SOURCE RADIANT FUSER FOR XEROGRAPHIC REPRODUCING APPARATUS. APR. 27, 1976.
3,987,757.—PAPER HANDLING IMPROVEMENTS IN RADIANT FUSER VIA CORRUGATION OF PAPER. OCT. 26, 1976.
4,001,622.—DIRECTIONAL SOURCES OF ELECTROMAGNETIC RADIATION. JAN. 4, 1977. GRB. 1443340.
4,015,103.—A FUSER CONVEYOR BELT. MAR. 29, 1977.
4,021,641.—RADIANT FUSER FOR FIXING TONER IMAGES. MAY 3, 1977.
4,056,706.—APPARATUS & METHOD FOR EXTENDING FUSER RELEASE LIFE. NOV. 1, 1977.
4,064,313.—HEAT FIXING MEMBER FOR ELECTROPHOTOGRAPHIC COPIERS. DEC. 20, 1977.
4,078,285.—HARD ALLOY FUSER MEMBERS. MAR. 14, 1978.
4,092,099.—COPIER PAPER DELIVERY MEANS IN A HEAT-FIXING DEVICE OF A COPYING MACHINE. MAY 30, 1978.
4,102,681.—TRANSFER AND FUSING METHOD. JULY 25, 1978. CAN. 990779, FRA. 7338110.

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3,445,626.—FUSING APPARATUS WITH FLASH LAMP CIRCUIT. MAY 20, 1969. CAN. 0843525, GRB. 1180604, JAP. 1075585.
3,465,203.—FLASH LAMP FOR ELECTROSCOPIC TONER. SEPT. 2, 1969. CAN. 0843526, GER. 1589315, GRB. 1185687, JAP. 0758339.
3,474,223.—SELECTIVE FLASH FUSING. OCT. 21, 1969. CAN. 0851811, FRA. 1546257, GRB. 1208770, JAP. 0558445.
3,529,129.—REFLECTION TYPE FLASH FUSER. SEPT. 15, 1970. ARG. 0180678, BEL. 0728716, CAN. 0855311, FRA. 6004567, GRB. 1252465, ITL. 0866971, JAP. 0661180, MEX. 0107835.
3,566,076.—TONER FIXING APPARATUS. FEB. 23, 1971. CAN. 0913164, GRB. 1256471.
3,655,280.—XEROGRAPHIC FUSING METHOD AND APPARATUS. APR. 11, 1972.
3,765,828.—FUSING APPARATUS. OCT. 16, 1973. CAN. 0991256, GRB. 1428800.
3,792,227.—FUSER APPARATUS. FEB. 12, 1974.
3,819,259.—LIGHT ATTENUATOR. JUNE 25, 1974. GRB. 1428799.
3,865,081.—MAGNETIC BRUSH DEVELOPING APPARATUS. FEB. 11, 1975.
3,869,696.—FUSER APPARATUS. MAR. 4, 1975.
3,903,394.—READ/WRITE APPARATUS FOR MAGNETIC RECORDERS. SEPT. 2, 1975.
3,920,952.—DUPLEX FUSING APPARATUS AND METHOD. NOV. 18, 1975.
3,935,424.—FLASH FUSING APPARATUS. JAN. 27, 1976.
3,944,783.—HIGH EFFICIENCY NON CAVITY RADIANT METHOD AND APPARATUS. MAR. 16, 1976.
3,980,424.—FUSER CLEANING ROLLER. SEPT. 14, 1976.
4,001,541.—FLASH FUSING SYSTEM WITH ENERGY CONTROL. JAN. 4, 1977.
4,027,199.—FLASH LAMP MODULATOR SYSTEM. MAY 31, 1977.
4,039,770.—INTERFACE SYSTEM TO CONTROL FLASH LAMP. AUG 2, 1977.
4,050,801.—RELEASE AGENT APPLICATION SYSTEM FOR A HEATED FUSER ROLL. SEPT. 27, 1977.
4,050,803.—QUICK RELEASE MECHANISM FOR A BACKUP ROLL FUSER EMPLOYED IN A COPIER APPARATUS. SEPT. 27, 1977.
4,090,108.—INTERFACE SYSTEM TO CONTROL FLASH LAMP MAY 16, 1978.

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3,357,401.—XEROGRAPHIC FUSER MONITORING APPARATUS. DEC. 12, 1967.
3,432,639.—FUSING APPARATUS. MAR. 11, 1969. CAN. 0851810, GRB. 1194234, JAP. 0608702.
3,437,407.—XEROGRAPHIC FUSING SYSTEM. APR. 8, 1969. CAN. 0842370, JAP. 0758338.
3,445,626.—FUSING APPARATUS WITH FLASH LAMP CIRCUIT. MAY 20, 1969. CAN. 0843525, GRB. 1180604, JAP. 1075585.
3,449,546.—INFRA-RED HEATER. JUNE 10, 1969. ARG. 0170237, ATR. 0303518, AUS. 0402657, BEL. 0700101, BRA. 6788714, CAN. 0852819, CHL. 0023085, DNK. 0118703, FRA. 1527629, GRB. 1187481, ITL. 0805313, MEX. 0101251, NOR. 0123480, PLD. 0068551, PRU. 0009320, SAF. 0673601, SPN. 0341906, STZ. 0499143, SWD. 0332936, URG. 0008615, VZL. 0026103.
3,507,333.—FIRE PREVENTION SYSTEM. APR. 21, 1970. BEL. 0722599, CAN. 0910255, FRA. 1589864, GRB. 1229495, ITL. 0845253, JAP. 0752504.
3,558,853.—FUSER SYSTEM FOR COPYING MACHINE. JAN. 26, 1971. ARG. 0186145, ATR. 0309984, AUS. 0446113, BEL. 0750389, BRA. 7019023, CAN. 0874013, CZC. 0168526, EGR. 0083065, FRA. 7017316, GRB. 1309129, ITL. 0893097, JAP. 0836943, MEX. 0117915, NZL. 0160101, SPN. 0379651, STZ. 0506817, SWD. 0357840, TIW. 0006834, VZL. 0032597.
3,588,445.—FUSER CONTROL CIRCUIT. JUNE 28, 1971.
3,735,092.—FUSER CONTROL CIRCUIT FOR COPYING APPARATUS. MAY 22, 1973. CAN. 0991254, GRB. 1406655.
3,781,516.—FUSER CONTROL SYSTEM. DEC. 25, 1973. MEX. 0135422.
3,790,747.—REGULATOR FOR XEROGRAPHIC FUSING APPARATUS. FEB. 5, 1974. ARG. 0200245, AUS. 0467385, BEL. 0789329, CAN. 0991252, FRA. 7234199, GRB. 1397586, ITL. 0972690, MEX. 0129168, SPN. 0409974, STZ. 0554008, SWD. 7215167, VZL. 0032607.
3,833,794.—FIXING UNIT FOR USE IN A DUPLICATING APPARATUS. SEPT. 3, 1974.
3,851,144.—FEEDBACK FUSER FOR 730S. NOV. 26, 1974.

3,989,370.—ADAPTIVE FUSER CONTROLLER. NOV. 2, 1976.
3,989,926.—DEVICE FOR PREVENTING OVERHEATING OF ELECTROPHOTOGRAPHIC FIXING DEVICE. NOV. 2, 1976.
4,032,746.—CONTROL SYSTEM FOR A FUSING APPARATUS. JUNE 28, 1977.

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3,349,702.—FUSER HAVING HEATED AND UNHEATED PORTIONS FOR PRINT FIXING PURPOSES. OCT. 31, 1967. CAN. 0833789, MEX. 0096468.
3,356,831.—XEROGRAPHIC FUSING APPARATUS. DEC. 5, 1967. CAN. 0798466, FRA. 1465786, GER. 1497228, GRB. 1117339, ITL. 0749552, JAP. 0512652.
3,584,195.—HEAT FIXING APPARATUS. JUNE 8, 1971. GRB. 1322354.
3,718,390.—MICROFICHE INDEXER. FEB. 27, 1973. ARG. 0190620, BEL. 0768712, CAN. 0946659, GRB. 1350656, ITL. 0927453, MEX. 0121626, SWD. 7107727.
3,788,873.—FIXING METHOD UTILIZING INTERMEDIATE HEAT TRANSFER. JAN. 29, 1974.
3,810,735.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIAL. MAY 14, 1974.
3,849,628.—NON-CONTACT TEMPERATURE SENSOR FOR ROLL FUSER OF A XEROGRAPHIC REPRODUCTION APPARATUS. NOV. 19, 1974. CAN. 1002583, GRB. 1322612.
3,881,859.—STRIPPER FINGER DESIGN TO PREVENT OIL-ON-THE-COPY. MAY 6, 1975.
3,900,590.—XEROGRAPHIC FUSING APPARATUS. AUG. 19, 1975. CAN. 0992614, GRB. 1192444.
3,904,354.—RESILIENT STRIPPER MEMBERS FORMING A PART OF A FUSER ROLL. SEPT. 9, 1975.
3,937,637.—ROLL CONTACT FUSER. FEB. 10, 1976.
3,940,235.—IMMERSIONS FUSING. FEB. 24, 1976.
3,965,855.—IMMERSION FUSING. JUNE 29, 1976.
3,976,814.—FUSING DEVICE & METHOD. AUG. 24, 1976.
3,997,691.—FUSING SURFACE AND METHOD FOR FIXING TONER. DEC. 14, 1976.
4,000,339.—FUSING SURFACE & METHOD FOR FIXING XEROGRAPHIC TONER. DEC. 28, 1976.
4,015,103.—A FUSER CONVEYOR BELT. MAR. 29, 1977.
4,029,827.—MERCAPTO FUNCTIONAL POLYORGANOSILOKANE RELEASE AGENTS FOR FUSERS IN ELECTROSTATIC COPIERS. JUNE 14, 1977. SPN. 0439743.
4,054,410.—FUSING DEVICE. OCT. 18, 1977.
4,056,706.—APPARATUS & METHOD FOR EXTENDING FUSER RELEASE LIFE. NOV. 1, 1977. FRA 7611767.
4,075,390.—FUSING SURFACE AND METHOD FOR FIXING TONER. FEB. 21, 1978.
4,101,686.—METHOD OF FUSING TONER IMAGES USING FUNCTIONALIZED POLYMERIC RELEASE AGENTS. JULY 18, 1978. BEL. 831662, FRA. 7523193.
4,150,181.—FIXING METHOD USING POLYSILOXANE-FLUOROCARBON BLENDS AS RELEASE AGENTS. APR. 17, 1979.
4,193,680.—TRANSFER SHEET DRYING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE. MAR. 18, 1980.

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3,256,002.—XEROGRAPHIC FIXING DEVICE. JUNE 14, 1966. ADN. 0000470, AUS. 0295646, BRS. 00J3738, BRU. 0000569, CAN. 0796441, FIJ. 0000343, GHA. 0000995, GIB. 1089537, GIE. 0006669, GRB. 1089537, GUR. 1089537, HGK. 0009269, ISR. 0030229, JAP. 0537119, JER. 0000P98, KEN. 0001745, MAU. 1917571, MLS. 0015169, NIG. 0001618, NZL. 0148733, SBH. 0005369, SGP. 0008369, SHL. 0000018, SLN. 3677286, SRK. 0000386, STZ. 0458077, UGD. 0000369.
3,268,351.—XEROGRAPHIC FIXING METHOD AND APPARATUS. AUG. 23, 1966. JAP. 0489660.
3,291,466.—XEROGRAPHIC FIXING DEVICE. DEC. 13, 1966. CAN. 0800935, FRA. 1458647, GRB. 1122628, ITL. 0729649, JAP. 0524526, MEX. 0090836.
3,324,791.—XEROGRAPHIC ROLLER FUSER DRIVE APPARATUS. JUNE 13, 1967. CAN. 0825903, GRB. 1135744, JAP. 0512655, STZ. 0520889.
3,327,096.—TEMPERATURE CONTROL CIRCUIT. JUNE 20, 1967. CAN. 0797970, FRA. 1448641, GRB. 1113451, ITL. 0729649, JAP. 0572184, MEX. 0085994.
3,331,592.—XEROGRAPHIC FUSING APPARATUS. JULY 18, 1967. CAN. 0823589, JAP. 0512657, MEX. 0108575.
3,357,249.—TEMPERATURE SENSOR. DEC. 12, 1967. CAN. 0810332, GER. 1690654, GRB. 1171381.
3,435,500.—PRESSURE ROLL AND METHOD OF MANUFACTURING. APR. 1, 1969. ARG. 0153406, AUS. 0408490, BEL. 0670480, BRA. 0083780, CAN. 0832922, FRA. 1450156, GER. 1546792, GRB. 1124036, ITL. 0730679, JAP. 0669366, MEX. 0107366, VZL. 0024008.
3,437,032.—HEATED FUSER ROLL. APR. 8, 1969. ARG. 0155221, AUS. 0043081, BEL. 0683308, CAN. 0800936, FRA. 1484969, GRB. 1137227, ITL. 0773369, JAP. 1071499, MEX. 0093105, SPN. 0328427, STZ. 0467476, SWD. 0321410, VZL. 0023990.
3,449,548.—FUSING DEVICE. JUNE 10, 1969.
3,498,596.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIAL. MAR. 3, 1970. ARG. 0181805, AUS. 0428652, BEL. 0733408, BRA. 6909134, CAN. 0860450, CZC. 0150764, FRA. 6917085, GRB. 1258152, ITL. 0865073, MEX. 0111517, PLD. 0079991, PNM. 0002166, SPN. 0367312, STZ. 0505411, SWD. 0345329, TIW. 0006194, USR. 0230669, VZL. 0025073.
3,539,161.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIALS. NOV. 10, 1970. CAN. 0889987.
3,612,820.—HEAT FIXING APPARATUS FOR LENGTHY FUSIBLE MATERIALS. OCT. 12, 1971.
3,649,992.—CLEANING APPARATUS FOR FUSING SYSTEM. MAR. 21, 1972. CAN. 0980517, GRB. 1340684.
3,667,742.—FIXING ARRANGEMENT. JUNE 6, 1972. BEL. 0777318, CAN. 0928766, FRA. 7147890, GRB. 1368307, ITL. 0944393.
3,690,176.—TEMPERATURE SENSING APPARATUS. SEPT. 12, 1972. GRB. 1383087.
3,718,116.—OIL DISPENSING APPARATUS. FEB. 27, 1973. CAN. 0984895.
3,745,972.—WICKING APPARATUS. JULY 17, 1973. CAN. 0991251, GRB. 1397626.
3,751,216.—FUSER ROLL ASSEMBLY. AUG. 7, 1973.
3,754,819.—APPARATUS FOR PLACING ROLLERS IN CONTACT IN A PRESSURE FUSER ASSEMBLY. AUG. 28, 1973.
3,776,760.—METHOD FOR MANUFACTURING A TETRAFLUOPOETHLENE POLYMER-COATED ROLL. DEC. 4, 1973. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.
3,796,183.—FREE FLOATING PRESSURE BIASING APPARATUS FOR CLEANING ROLL FUSER. MAR. 12, 1974.
3,799,401.—SILICONE OIL CAPACITY CONTROL USING POLYURETHANE BELT. MAR. 26, 1974.
3,820,591.—APPARATUS FOR SENSING DIMENSION OF SHEETS OF MATERL TO BE TRNPRTD THROUGH ELCTRSTIC REPRDCTN M. JUNE 28, 1974. CAN. 1004290.
3,831,553.—WICK FOR OIL DISPENSING APPARATUS. AUG. 27, 1974. CAN. 0984895.
3,852,861.—SURFACES WITH FLUOROCARBON PROCESS FOR MULTIPLE COATING RESINS. DEC. 10, 1974. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.
3,861,860.—DRY FUSER ROLL CLEANING APPARATUS. JAN. 21, 1975.
3,881,085.—FUSER CONTROL CIRCUIT FOR COPYING APPARATUS. APR. 29, 1975. BEL. 0808310, GRB. 1447679.
3,883,291.—OIL APPLICATOR FOR REPRODUCTION MACHINE FUSER. MAY 13, 1975. BEL. 0822048, FRA. 7438048, SPN. 0432090.
3,883,292.—SLEEVELESS PRESSURE ROLL CLEANER. MAY 13, 1975.
3,883,293.—PRESSURE ROLL CONSTRUCTION. MAY 13, 1975.
3,902,845.—METAL FOAM UNDER CONFORMABLE SURFACE REPLACEABLE. SEPT. 2, 1975.
3,906,800.—REUSABLE NIP MEASURING DEVICE AND METHOD. SEPT. 23, 1975.
3,907,493.—VISCO-ELASTIC DAMPENER MECHANISM FOR FUSER ASSEMBLY. SEPT. 23, 1975.
3,908,589.—STRUCTURE FOR APPLYING RELEASE AGENT TO A HEATED FUSER ROLL STRUCTURE. SEPT. 30, 1975.
3,912,901.—PFA TEFLON SLEEVED CHOW PRESSURE ROLL. OCT. 14, 1975.
3,913,521.—COMPOSITE DOCTORING BLADE FOR A HEATED FUSER ROLL UTILIZED FOR FIXING TONER. OCT. 21, 1975.
3,918,397.—CONTACT FUSING APP FOR FIXING TONER IMAGES TO A SUPPORT MEMBER. NOV. 11, 1975.
3,918,804.—APP FOR APPLYING RELEASE MATERIAL TO A CONTACT FUSER ROLL MEMBER UTILIZED IN FIXNG TNR IMGS TO. NOV. 11, 1975.
3,921,573.—CLEANING SYSTEM FOR ELECTROSTATIC REPRODUCING APPARATUS. NOV. 25, 1975.
3,924,564.—FUSER APPARATUS HAVING AN ARTICULATED RELEASE MATERIAL DISPENSER. DEC. 9, 1975.

3,926,058.—CONTACT ARC REPLICATION DEVICE. DEC. 16, 1975.
3,929,094.—ROLL FUSER. DEC. 30, 1975.
3,929,095.—ROLL FUSER. DEC. 30, 1975.
3,929,096.—ROLL FUSER. DEC. 30, 1975.
3,934,113.—ROLL FUSER APPARATUS AND MOUNTING ARRANGEMENT THEREFOR. JAN. 20, 1976.
3,934,547.—RENEWABLE CHOW FUSER COATING. JAN. 27, 1976.
3,935,836.—METERING BLADE FOR A FUSER ROLL. FEB. 3, 1976.
3,938,950.—STRIPPING APPARATUS. FEB. 17, 1976.
3,940,238.—CLEANING STRUCTURE FOR AN ELASTOMERIC FUSER MEMBER. FEB. 24, 1976.
3,940,518.—BAKE TECHNIQUE FOR MANUFACTURING TETRAFLUOROETHYLENE COATED ROLLS. FEB. 24, 1976. GRB. 1452718.
3,941,558.—A CONTACT AND HEATING FIXING DEVICE FOR ELECTROPHOTOGRAPHY. MAR. 2, 1976.
3,942,887.—DRIVE MECHANISM FOR A ROLL FUSER EMPLOYED IN A COPIER APPARATUS. MAR. 9, 1976.
3,948,214.—INSTANT START FUSING APPARATUS. APR. 6, 1976.
3,951,538.—A PERMANENTLY NIPPED CONTACT IMAGE FUSER SYSTEM INCORPORATING A ONE-WAY CLUTCH. APR. 20, 1976.
3,955,916.—FUSER ROLL SHEET STRIPPING APPARATUS. MAY 11, 1976.
3,965,331.—DUAL MODE ROLL FUSER. JUNE 22, 1976.
3,965,332.—SELECTIVE FUSING APPARATUS. JUNE 22, 1976.
3,965,853.—CONTACT FUSER ASSEMBLY. JUNE 29, 1976.
3,965,973.—TEMPERATURE SENSING DEVICE. JUNE 29, 1976.
3,966,394.—PLURAL CLEANING ROLLS ASSEMBLY. JUNE 29, 1976.
3,968,343.—FUSER ROLL TEMPERATURE REGULATOR PROBE. JULY 6, 1976.
3,970,038.—ROLL FUSER. JULY 20, 1976.
3,973,844.—LATCHING MECHANISM FOR THE BACK-UP ROLL OF A ROLL FUSER EMPLOYED IN A COPIER APPARATUS. AUG. 10, 1976.
3,976,370.—BELT TRANSFER AND FUSING SYSTEM. AUG. 24, 1976.
3,980,423.—FUSER CLEANING ROLLER ASSEMBLY. SEPT. 14, 1976.
3,981,085.—AIR STRIPPING DEVICE FOR ELASTOMERIC SURFACE. SEPT. 21, 1976.
3,989,005.—IMPROVED OIL METERING BLADE DEVICE. NOV. 2, 1976.
3,993,124.—METH&APPRTS FOR SUSR ASSMBLY CLING IN ELCTROSTATOGRPC MACHNE-GAMMA METH&APPRTS FOR FUSER END CO. NOV. 23, 1976. BEL. 0793560, FRA. 7246728, ITL. 0973322, SWD. 7216976.
3,996,886.—IMPROVED OIL METERING BLADE HOLDER ASSEMBLY. DEC. 14, 1976.
3,996,887.—IMPROVED OIL METERING BLADE HOLDING DEVICE. DEC. 14, 1976.
3,999,510.—HIGH SURFACE ENERGY CLEANING ROLL. DEC. 28, 1976.
4,000,394.—FUSER THERMAL DETECTOR. DEC. 28, 1976.
4,000,957.—CONTACT FUSER AND RELEASE AGENT APPLICATOR THEREFOR. JAN. 4, 1977.
4,000,963.—CLEANING APPARATUS FOR A HEAT & PRESSURE FUSER. JAN. 4, 1977.
4,004,549.—ROLL FUSER. JAN. 25, 1977.
4,008,955.—FUSER ASSEMBLY FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 22, 1977.
4,011,831.—IMPROVED OIL METERING BLADE LOADING ASSEMBLY. MAR. 15, 1977.
4,013,400.—CLEANING APPARATUS FOR A HEAT & PRESSURE FUSER. MAR. 22, 1977.
4,018,555.—CLEANING APPARATUS FOR ROLL FUSER. APR. 19, 1977.
4,025,751.—FUSER ROLL SLEEVE. MAY 24, 1977.
4,026,238.—APP FOR APPLYING RELEASE MATERIAL TO A CONTACT FUSER ROLL MEMBER UTILIZED IN FIXING TONER IMAGE. MAY 31, 1977.
4,028,050—STRIPPER FINGER COMBINATION MOUNTING MEANS THEREFOR. JUNE 7, 1977.
4,034,188.—HEAT FIXING DEVICE FOR COPYING MACHINE. JULY 5, 1977.
4,034,706.—DUAL RELEASE AGENT CU-VITON FUSER. JULY 12, 1977.
4,042,804.—ROLL FUSER APPARATUS. AUG. 16, 1977.
4,043,747.—PRESSURE HEAT FIXING DEVICE. AUG. 23, 1977.
4,045,163.—HEATED FUSER RELEASE AGENT CONTAINER. AUG. 30, 1977.
4,045,164.—USE OF SILICONE OIL AS A POLYETHYLENE OXIDATION RETARDANT IN A TONER IMAGE FUSING APPARATUS. AUG. 30, 1977. GRB. 1498469
4,047,885.—ROTATING WICK OIL DISPENSING SYSTEM. SEPT. 13, 1977.
4,050,801.—RELEASE AGENT APPLICATION SYSTEM FOR A HEATED FUSER ROLL. SEPT. 27, 1977.
4,050,803.—QUICK RELEASE MECHANISM FOR A BACKUP ROLL FUSER EMPLOYED IN A COPIER APPARATUS. SEPT. 27, 1977.
4,050,886.—ROLL FUSER. SEPT. 27, 1977. BEL. 858880.
4,052,150.—OIL WETTED FUSER ROLL STRIPPING APPARATUS. OCT. 4, 1977.
4,062,534.—STRIPPER ARRANGEMENT FOR REMOVING VARIOUS SIZED COPY SHEETS FROM FUSER ROLL. DEC. 13, 1977.
4,064,313.—HEAT FIXING MEMBER FOR ELECTROPHOTOGRAPHIC COPIERS. DEC. 20, 1977.
4,071,735.—EXTERNALLY HEATED LOW-POWER ROLL FUSER. JAN. 31, 1978.
4,075,707.—PROGRAMMED DEVICE CONTROLLER. FEB. 21, 1978.
4,079,227.—CONTACT HEAT FIXING APPARATUS FOR ELECTROPHOTOGRAPHIC REPRODUCTION MACHINES. MAR. 14, 1978.
4,079,228.—PRESSURIZED SOLVENT FUSING. MAR. 14, 1978.
4,079,229.—CONTACTING AND FIXING HEATING APPARATUS. MAR. 14, 1978.
4,080,159.—TILTING PAD STRIPPER FINGER. MAR. 21, 1978.
4,081,213.—FUSER DRIVE SYSTEM. MAR. 28, 1978.
4,082,137.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING AN ELECTROSTATOGRAPHIC MACHINE. APR. 4, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,083,092.—SLEEVED ORGANIC RUBBER PRESSSURE ROLLS. APR. 11, 1978.
4,083,322.—FUSER WICK. APR. 11, 1978.
4,085,794.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE. APR. 25, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,087,676.—FIXING APPARATUS WITH HEAT AND PRESSURE FOR ELECTROPHOTOGRAPHIC COPIERS. MAY 2, 1978.
4,101,267.—ROLL FUSER CLEANING SYSTEM. JULY 18, 1978. BEL. 846861, FRA. 7630971.
4,114,021.—HEAT ROLL FIXING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE. SEPT. 12, 1978.
4,119,831.—CONTACT PRESSURE ADJUSTING DEVICE IN HEATING PRESSING FIXING APPARATUS FOR ELECTROPHOTOGRAPHIC. OCT. 10, 1978.
4,149,797.—SLEEVED ORGANIC RUBBER PRESSURE ROLLS. APR. 17, 1979.
4,156,524.—ROLL FUSER STRIPPING MECHANISM. MAY 29, 1979.
4,207,057.—FIXING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE. JUNE 10, 1980.
4,214,549.—ROLL FUSER APPARATUS AND RELEASE AGENT METERING SYSTEM THEREFOR. JULY 29, 1980.

Class 8A 3

3,180,971.—XEROGRAPHIC FUSING APPARATUS APR. 27, 1965. CAN. 0734734, GRB. 1027904, JAP. 0524355
3,219,799.—XEROGRAPHIC FUSING APPARATUS. NOV 23, 1965.
3,604,892.—FUSING APPARATUS. SEPT. 14, 1971.
3,856,460.—DEVELOPING SYSTEM FOR FILM BY ADIABACTIC HEAT FLOW. DEC. 24, 1974.

Class 8A 4

3,093,039.—APPARATUS FOR TRANSFERRING POWDER IMAGES AND METHOD THEREFOR. JUNE 11, 1963. CAN. 0744873.

Class 8B

3,117,847.—XEROGRAPHIC POWDER IMAGE FIXING APPARATUS. JAN. 14, 1964.
3,132,047.—XEROGRAPHIC FIXING APPARATUS. MAY 5, 1964. AUS. 0266991, CAN. 0713996, FRA. 1332228, GER. 1571130, GRB. 1012444, JAP. 0835352.
3,148,078.—XEROGRAPHIC FUSING METHOD. SEPT. 8, 1964.

3,149,931.—XEROGRAPHIC VAPOR FUSING APPARATUS. SEPT. 22, 1964. CAN. 0758318.
3,158,509.—XEROGRAPHIC FIXING APPARATUS. NOV. 24, 1964. CAN. 0762382, GRB. 1023052, JAP. 0456309.
3,215,116.—VAPOR FUSING APPARATUS. NOV. 2, 1965.
3,704,524.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. DEC. 5, 1972. ARG. 0188616, BEL. 0779806, CAN. 0950655, FRA. 7208101, GRB. 1385328, MEX. 0126261.
3,884,690.—POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS. MAY 20, 1975.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,934,546.—APPARATUS FOR FIXING WITH SOLVENT VAPORS. JAN. 27, 1976.
3,940,518.—BAKE TECHNIQUE FOR MANUFACTURING TETRAFLUOROETHYLENE COATED ROLLS. FEB. 24, 1976. GRB. 1452718.

Class 8B 1

3,140,159.—XEROGRAPHIC FUSING AND DRYING APPARATUS. JULY 7, 1964.
3,140,160.—XEROGRAPHIC FUSING AND DRYING APPARATUS. JULY 7, 1964.
3,199,223.—XEROGRAPHIC FUSING AND DRYING APPARATUS. AUG. 10, 1965.
3,288,624.—VAPOR FUSING METHOD FOR XEROGRAPHIC POWDER IMAGES. NOV. 29, 1966.

Class 8C

3,158,509.—XEROGRAPHIC FIXING APPARATUS. NOV. 24, 1964. CAN. 0762382, GRB. 1023052, JAP. 0456309.
3,386,822.—SOLVENT CAPSULE FIXING OF POWDER IMAGES. JUNE 4, 1968. CAN. 0712993, FRA. 1430471, GER. 1497196, GRB. 1087201, HOL. 0132775, ITL. 0745341, JAP. 0741995.
3,893,760.—TRANSFER APPARATUS. JULY 8, 1975.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.
3,940,235.—IMMERSIONS FUSING. FEB. 24, 1976.
3,965,855.—IMMERSION FUSING. JUNE 29, 1976.
4,063,530.—IMAGE FIXING. DEC. 20, 1977.
4,072,521.—AMIDES OF W AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT. FEB. 7, 1978.
4,073,649.—DI CARBOXYLIC ACID BIS AMIDES AND IMPROVED IMAGING PROCESS. FEB. 14, 1978.
4,076,641.—W- AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS. FEB. 28, 1978.
4,099,968.—DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES. NOV. 11, 1978.

Class 8D

3,493,412.—TRANSFERRING XEROGRAPHIC TONER IMAGES TO A SOLID CRYSTALLINE PLASTICIZER COATED RECEIVING SURFA. FEB. 3, 1970. CAN. 0880837, MEX. 0096609.
3,640,746.—ADHESIVE CONTACT ELECTRIFICATION IMAGING. FEB. 8, 1972.
3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975.

Class 8E

3,157,546.—IMAGE TRANSFER. NOV. 17, 1964. ATR. 0225034, BEL. 0602721, FRA. 1287124, GER. 1271547, GRB. 0985176, ITL. 0647042, JAP. 0414127, STZ. 0383417.
3,591,276.—METHOD AND APPARATUS FOR OFFSET XEROGRAPHIC REPRODUCTION. JULY 6, 1971. CAN. 0894931, GER. 1811893, GRB. 1245426, JAP. 0648075.
3,799,827.—PROCESS FOR PROTECTING THE SURFACE OF AN IMAGE. MAR. 26, 1974.
3,816,066.—XEROGRAPHIC FIXING DEVICE. JUNE 11, 1974.
3,861,219.—METHOD FOR MEASURING HEAT AND PRESSURE CHARACTERISTICS OF FUSING APP. JAN. 21, 1975. CAN. 1013807.
3,888,622.—TEMPERATURE SENSING DEVICE. JUNE 10, 1975.
3,928,656.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH PRESSURE SENSITIVE TONER. DEC. 23, 1975. ARG. 0196320, AUS. 0464392, BEL. 0793554, CAN. 1011149, FRA. 7246575, GRB. 1417409, ITL. 0973325, SPN. 0410211, STZ. 0028568.
3,934,477.—TEMPERATURE SENSING DEVICE. JAN. 27, 1976.
3,936,658.—FUSER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. FEB. 3, 1976. BEL. 0844831.
4,055,143.—RELEASE MATERIAL APPLICATION SEAL. OCT. 25, 1977.

Class 9

3,836,244.—COLOR XEROGRAPHY. SEPT. 17, 1974.
3,958,878.—ELECTROSTATIC PROCESSOR HOUSING INTERCHANGABLE RESERVOIRS FOR SUPPING AND RECLAIMING TONER. MAY 25, 1976.
3,980,494.—METHOD OF REDUCING FRICTION IN BLADE CLEANING OF IMAGING SURFACES. SEPT. 14, 1976.
3,983,841.—TONER RECLAIM CONVEYOR. OCT. 5, 1976.
4,093,369.—CLEANING SYSTEM. JUNE 6, 1978.

Class 9A

RE29818.—TONER-RECLAIMING SYSTEM-REISSUE OF PATENT 3,641,979 ISSUED FEB. 15, 1972. OCT. 31, 1978. CAN. 913351.
T.940,022.—PRESSURIZED AND FILTERED XEROGRAPHIC SYSTEM. NOV. 4, 1975.
3,552,850.—LUBRICATED BLADE CLEANING OF IMAGING PHOTOCONDUCTIVE MEMBERS. JAN. 5, 1971. ALB. 0003931, ARG. 0172544, ATR. 0300568, AUS. 0438884, BEL. 0727561, BRA. 6898275, BUR. 0000041, CAM. 0000453, CAN. 0869669, CHL. 0024409, CLB. 0017926, COR. 000947A, DNK. 0122738, EGR. 0075946, EIR. 0032784, FRA. 6902175, GNR. 0000043, GRB. 1259513, GRK. 0039239, IND. 0119582, ISR. 0031502, ITL. 0854622, LIB. P272693, LXB. 0057856, MEX. 0106799, MLG. 0003059, MLW. 00MW769, MNC. 8146975, MRC. 0014725, NOR. 0128683, NZL. 0155207, PAK. 0120897, PLD. 0017650, PLP. 0006639, PNM. 0001979, PRU. 0009588, PTG. 0051062, RHD. 5569489, SAF. 6970696, SPN. 0363130, STZ. 0493016, SWD. 0346398, TGR. 0000550, URG. 0009736, USR. 0385466, VTM. 0001840, VZL. 0023692, ZMB. 0176973.
3,635,704.—IMAGING SYSTEM. JAN. 18, 1972. ALB. 0004133, ARG. 0176978, ATR. 0303521, AUS. 0440759, BEL. 0727560, BRA. 0088093, BUR. 0000042, CAM. 0000463, CAN. 0867697, CHL. 0026254, COR. 000949A, DNK. 0131403, EGR. 0078899, EIR. 0032632, FRA. 6902174, GNR. 0000042, GRB. 1259514, GRK. 0039240, IND. 0119583, ISR. 0031503, ITL. 0871510, LAS. 0000199, LIB. 00P7269, LXB. 0057849, MEX. 0106332, MLG. 0003056, MLW. 00MW869, MNC. 8156975, MRC. 0014724, NZL. 0155208, PAK. 0120859, PLP. 0008511, PNM. 0001676, PRU. 0010443, PTG. 0051063, RHD. 4169529, RMN. 0055464, SAF. 0069995, SPN. 0363127, STZ. 0513431, SWD. 0342921, SYA. 0002477, TGR. 0000551, TIW. 0005257, UAR. 0009525, USR. 0396887, VTM. 0001805, VZL. 0023744, ZMB. 0186974.
3,717,409.—CLEANING OF ELECTROSTATOGRAPHIC SURFACES. FEB. 20, 1973.
3,724,019.—WIPER BLADE CLEANING APPARATUS FOR XEROGRAPHIC MACHINES. APR. 3, 1973. CAN. 991248.
3,724,020.—WIPER BLADE CLEANER FOR XEROGRAPHIC MACHINES. APR. 3, 1973. ARG. 0194951, BEL. 0783490, CAN. 0991249, FRA. 7216738, GER. 2220821, GRB. 1399156, ITL. 0955404, MEX. 0127875.
3,838,472.—TONER CLEANING APPARATUS. OCT. 1, 1974. BEL. 0789325, CAN. 0991694, FRA. 7233424, GER. 2239441, GRB. 1403439, ITL. 0967797, SWD. 7212456.
3,847,480.—CONTINOUS BLADE CLEANER. NOV. 12, 1974.
3,848,992.—DEVELOPER BLADE CLEANING. NOV. 19, 1974. FRA. 7415394, GRB. 1443128, ITL. 0010212.
3,848,993.—SUPPORTED DEVELOPER BLADE CLEANING. NOV. 19, 1974.
3,848,994.—LINE CHARGE TONER CLEANING. NOV. 19, 1974.
3,854,814.—TRANSLATING DWELL CLEANING SYSTEM. DEC. 17, 1974.
3,871,762.—BLADE CLEANING SYSTEM. MAR. 18, 1975.
3,918,807.—CLEANING BLADE FOR PHOTOCOPIER. NOV. 11, 1975.
3,918,809.—APPARATUS FOR CLEANING A SURFACE SUPPORT. NOV. 11, 1975.
3,927,937.—CLEANING ASSEMBLY FOR AN ELECTROSTATOGRAPHIC DEVICE. DEC. 23, 1975. SPN. 0420425.
3,940,282.—BLADE CLEANING OF SURFACE WITH REVERSE MOVEMENT. FEB. 24, 1976.
3,947,108.—CLEANING SYSTEM. MAR. 30, 1976.

3,950,092.—CLEANING TRANSPORTING & SORTING APPARATUS & REPRODUCING MACHINE. APR. 13, 1976.
3,957,509.—METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM AN ELECTROSTATIC IMAGING SURFACE. MAY 18, 1976.
3,973,845.—METHOD OF REDUCING FRICTION IN BLADE CLEANING OF IMAGING SURFACES. AUG. 10, 1976.
3,977,898.—METHOD FOR CLEANING A SURFACE SUPPORT. AUG. 31, 1976. GRB. 1438660.
3,992,091.—ROUGHENED IMAGING SURFACE FOR CLEANING. NOV. 16, 1976.
4,002,570.—ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLIDENE FLUORIDE ADDITIVE. JAN. 11, 1977.
4,007,982.—METHOD AND APPARATUS FOR ULTRASONICALLY CLEANING A PHOTOCONDUCTIVE SURFACE. FEB. 15, 1977.
4,030,824.—A REPRODUCING APPARATUS HAVING AN IMPROVED IMAGING SURFACE CLEANING SYSTEM. JUNE 21, 1977.
4,042,415.—METHOD FOR SCRAPING LIQUIDS FROM A MOVING SURFACE. AUG. 16, 1977.
4,043,659.—CLEANING BLADE TONER ARRESTOR. AUG. 23, 1977.
4,051,536.—ELECTRONIC HALFTONE IMAGING SYSTEM. SEPT. 27, 1977.
4,054,381.—TONER FILTER ARRANGEMENT. OCT. 18, 1977.
4,083,633.—BLADE CLEANING HOLDER. APR. 11, 1978.
4,111,545.—VIBRATING BLADE CLEANER. SEPT. 5, 1978.
4,123,154.—COMBINED CORONA GENERATOR AND IMAGING SURFACE CLEANER. OCT. 31, 1978.
4,131,359.—SENSITIVE MEDIUM CLEANER FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE. DEC. 26, 1978.
4,145,137.—ELECTROPHOTOGRAPHIC REPRODUCING MACHINE BLADE CLEANING APPARATUS. MAR. 20, 1979.
4,158,498.—BLADE DEVELOPING SYSTEM FOR A REPRODUCING APPARATUS. JUNE 19, 1979.
4,174,172.—CLEANING METHODS AND APPARATUS FOR A PHOTOCOPYING DEVICE. NOV. 13, 1979. GRB. 1511199.

Class 9A 1

3,099,856.—WEB CLEANER APPARATUS. AUG. 6, 1963. ARG. 0146853. CAN. 0760369, GRB. 1032957, IND. 0096310, JAP. 0481944.
3,149,356.—XEROGRAPHIC PLATE CLEANING APPARATUS. SEPT. 22, 1964.
3,186,838.—XEROGRAPHIC PLATE CLEANING METHOD UTILIZING THE RELATIVE MOVEMENT OF A CLEANING WEB. JUNE 1, 1965. CAN. 0858757, FRA. 1435510, GER. 1497242, GRB. 1094224, ITL. 0761145.
3,190,198.—XEROGRAPHIC CLEANING APPARATUS. JUNE 22, 1965.
3,337,891.—PLATE CLEANING AND TRANSPORTING APPARATUS. AUG. 29, 1967.
3,380,355.—XEROGRAPHIC CLEANING APPARATUS. APR. 30, 1968. CAN. 0819048.
3,405,682.—XEROGRAPHIC DEVELOPMENT APPTS WITH WEB LOADING MEANS TO REMOVE RESIDUAL DEVELOPER. OCT. 15, 1968. GRB. 1102282.
3,492,732.—WEB QUANTITY INDICATOR. FEB. 3, 1970. CAN. 0887178.
3,526,457.—CLEANING APPARATUS FOR ELECTROSTATIC COPYING MACHINES. SEPT. 1, 1970. CAN. 0880402, GRB. 1225287.
3,615,397.—METHOD OF CLEANING ELECTROSTATIC COPYING MACHINES. OCT. 26, 1971.
3,624,858.—CLEANING APPARATUS. DEC. 7, 1971.
3,664,300.—APPARATUS FOR TREATING THE SURFACE OF AN ELECTROSTATOGRAPHIC IMAGING PLATE. MAY 23, 1972.
3,725,059.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC SURFACE. APR. 3, 1973. GRB. 1337282.
3,781,107.—CLEANING APPARATUS. DEC. 25, 1973.
3,867,170.—METHOD FOR CLEANING LIQUID DEVELOPERS. FEB. 18, 1975. CAN. 0906336, GRB. 1339904.
3,879,785.—CLEANING APPARATUS. APR. 29, 1975.
4,007,983.—IMPROVED LIQUID DEVELOPER CLEANING MEANS. FEB. 15, 1977.
4,089,683.—LIQUID DEVELOPER CLEANING MEANS. MAY 16, 1978.
4,110,035.—CLEANING SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. AUG. 29, 1978.

Class 9A 2

3,477,450.—BRUSH RECLAIMING. NOV. 11, 1969. GRB. 1206539.
3,489,463.—BRUSH SIZING APPARATUS. JAN. 13, 1970. GRB. 1243233, JAP. 0810578.
3,493,269.—LOADING HEAD. FEB. 3, 1970. CAN. 0864392.
3,610,693.—METHOD OF MAKING A CYLINDRICAL BRUSH. OCT. 5, 1971. CAN. 0944415, GRB. 1332920, JAP. 0758464.
3,617,123.—XEROGRAPHIC CLEANING APPARATUS. NOV. 2, 1971.
3,634,077.—METHOD AND APPARATUS FOR REMOVING A RESIDUAL IMAGE IN AN ELECTROSTATIC COPYING SYSTEM. JAN. 11, 1972. BEL. 0737956, CAN. 0896611, FRA. 6929217, GRB. 1259960, ITL. 0870232, JAP. 0742513.
3,664,300.—APPARATUS FOR TREATING THE SURFACE OF AN ELECTROSTATOGRAPHIC IMAGING PLATE. MAY 23, 1972.
3,766,593.—CLEANING APPARATUS FOR INSULATING SURFACES. OCT. 23, 1973. ARG. 0194956, AUS. 0460978, BEL. 0784898, CAN. 0990017, FRA. 7219012, GRB. 1399900, ITL. 0960138, MEX. 0127720. SPN. 404266, STZ. 0538310, SWD. 7208414, VZL. 0032065.
3,947,108.—CLEANING SYSTEM. MAR. 30, 1976.
3,957,509.—METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM AN ELECTROSTATIC IMAGING SURFACE. MAY 18, 1976.
4,025,188.—PHOTOACTIVE DEVICE FOR XEROGRAPHY. MAY 24, 1977.
4,113,376.—CLEANING APPARATUS FOR REPRODUCING MACHINE. SEPT. 12, 1978.
4,134,673.—DUAL BRUSH CLEANING APPARATUS. JAN. 16, 1979.
4,205,911.—A CLEANING SYSTEM. JUNE 3, 1980.

Class 9A 2A

3,278,972.—XEROGRAPHIC PLATE CLEANING APPARATUS. OCT. 18, 1966. CAN. 0774795, FRA. 1458646, GER. 1497218, GRB. 1122624, ITL. 0729648, JAP. 0512649.
3,534,427.—CLEANING APPARATUS FOR ELECTROSTATIC PRINTING MACHINES. OCT. 20, 1970. AUS. 0425369, BEL. 0729977, CAN. 0873426, CZC. 0157666, FRA. 6907700, GRB. 1238117, HUN. 0158312, ITL. 0876795, JAP. 0645593, SPN. 0364889, SWD. 0345533, USR. 0372853.
3,590,412.—BRUSH CLEANING DEVICE FOR ELECTROSTATIC MACHINES. JULY 6, 1971. CAN. 0930107, GRB. 1248521, JAP. 0832526.
3,660,863.—CLEANING APPARATUS. MAY 9, 1972. ARG. 0188292, ATR. 0324838, AUS. 0445312, BEL. 0752937, CAN. 0925659, CHL. 0027132, DNK. 0129483, EGR. 0084130, FRA. 7024664. GRB. 1259446, GUA. 0002676, IND. 0127312, ITL. 0900201, MEX. 0115163, NOR. 0133164, NZL. 0160666, PLD. 0081341, PLP. 0007492, PNM. 0002014, PTG. 0054074, SAF. 0704533, SPN. 0381388, STZ. 0514165, SWD. 0359942, TIW. 0007784, USR. 0384250, VZL. 0032417.
3,692,402.—MATERIALS FOR FIBROUS DEVELOPMENT AND CLEANING MEMBER. SEPT. 19, 1972.
3,740,789.—XEROGRAPHIC ROLLER OSCILLATING CLEANING BLADE WITH DRIVE MECHANISM THEREFOR. JUNE 26, 1973. BEL. 0789327, CAN. 0991250, FRA. 7233724, GER. 2243491, GRB. 1403440, ITL. 0967796, SWD. 7212455.
3,742,551.—TONER CLEANING AND STORAGE APPARATUS. JULY 3, 1973. BEL. 0789325, CAN. 0991694, FRA. 7233424, GER. 2239441, GRB. 1403439, ITL. 0967797, SWD. 7212456.
3,788,454.—CHAIN BEAD DRIVE APPARATUS. JAN. 29, 1974. GRB. 1430379.
3,795,025.—ELECTROPHOTOGRAPHIC PHOTORECEPTOR CLEANING APPARATUS. MAR. 5, 1974.
3,807,853.—ELECTROPHOTOGRAPHIC CLEANING APPARATUS. APR. 30, 1974. GRB. 1439229.
4,032,228.—FOREIGN OBJECT DETECTOR BRUSH CLEANER. JUNE 28, 1977.

Class 9A 2B

3,404,418.—SHEET TRANSPORT APPARATUS. OCT. 8, 1968. CAN. 0859327.
3,572,923.—CLEANING METHOD AND APPARATUS FOR ELECTROSTATIC COPYING MACHINES. MAR. 30, 1971. ARG. 0172603, AUS. 0429490, BEL. 0737957, CAN. 0884822, FRA. 6929174, GRB. 1259890, ITL. 0870233, JAP. 0819708, MEX. 0113040, SPN. 0370878, SWD. 0348851.
3,655,373.—CLEANING METHOD FOR ELECTROSTATIC COPYING MACHINE. APR. 11, 1972.

3,668,008.—IONIZED AIR CLEANING DEVICE. JUNE 6, 1972. CAN. 0956406, GRB. 1310836.
3,722,018.—CLEANING APPARATUS. MAR. 27, 1973.
3,738,745.—FUR BRUSH ERASER. JUNE 12, 1973. CAN. 0970554, GRB. 1418036.
4,123,154.—COMBINED CORONA GENERATOR AND IMAGING SURFACE CLEANER. OCT. 31, 1978.

Class 9A 2B 1

3,128,683.—XEROGRAPHIC APPARATUS. APR. 14, 1964.

Class 9A 2C

3,252,274.—XEROGRAPHIC POWDER FILTER. MAY 24, 1966. CAN. 0712876, GER. 1278245, GRB. 1031634, JAP. 0502993.
3,410,060.—XEROGRAPHIC FILTER APPARATUS. NOV. 12, 1968. CAN. 0810976, FRA. 1458648, GRB. 1114505, ITL. 0729638, JAP. 0724232.
3,570,224.—FILTER FOR ELECTROSTATOGRAPHIC DEVELOPER. MAR. 16, 1971.
3,641,979.—TONER RECLAIMING SYSTEM. FEB. 15, 1972. CAN. 0913351.
3,793,986.—TONER RECLAIMING SYSTEM FOR ELECTROSTATIC PRINTING MACHINES. FEB. 26, 1974. ARG. 0194370, AUS. 0464194, BEL. 0784636, GER. 0978341, GRB. 1373721, ITL. 0956416, MEX. 0128265, SPN. 403.704, STZ. 0546970, VZL. 0033339.
3,816,157.—TONER RECLAIMING METHOD. JUNE 11, 1974.
4,046,682.—TONER RECLAIMING SYSTEM. SEPT. 6, 1977. CAN. 1030209.

Class 9B

3,332,328.—XEROGRAPHIC DEVELOPER SEAL AND PROCESS. JULY 25, 1967. CAN. 0792684, GRB. 1138394, JAP. 0512658, MEX. 0091318.
3,607,160.—LIGRCIN CONTAINING PUMICING COMPOSITION. SEPT. 21, 1971.
3,610,749.—IMAGING SYSTEM. OCT. 5, 1971. CAN. 0923541, GRB. 1339905, JAP. 0745767.
3,646,910.—DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGES. MAR. 7, 1972.
3,668,008.—IONIZED AIR CLEANING DEVICE. JUNE 6, 1972. CAN. 0956406, GRB. 1310836.
3,697,263.—METHOD OF CLEANING RESIDUAL LIQUID DEVELOPER FROM ELECTROPHOTOGRAPHIC PLATES. OCT. 10, 1972. ARG. 0181940, AUS. 0455091, BEL. 0758060, CAN. 0906334, EGR. 0087483, FRA. 7041623, GRB. 1328406, ITL. 0916264, JAP. 0749381, MEX. 0116862, SPN. 0385000, STZ. 0519186, SWD. 0365624, TIW. 0006850, USR. 0349206, VZL. 0032211.
3,834,804.—COPYING MACHINE WITH MEANS FOR MOUNTING CARRIER BEAD PICKOFF ROLLER THEREIN. SEPT. 10, 1974.
4,026,701.—GAS IMPINGMENT & SUCTION CLEANING APPARATUS. MAY 31, 1977.
4,111,546.—ULTRASONIC CLEANING APPARATUS FOR AN ELECTROSTATOGRAPHIC REPRODUCING MACHINE. SEPT. 5, 1978.
4,121,947.—METHOD OF CLEANING A PHOTORECEPTOR. OCT. 24, 1978.

Class 9B 1

3,920,329.—BACKGROUND REMOVAL APPARATUS. NOV. 18, 1975.
4,108,546.—CLEANING APPARATUS AND ELECTROSTATORAPHIC REPRODUCING MACHINE. AUG. 22, 1978.
4,116,555.—BACKGROUND REMOVAL APPARATUS. SEPT. 26, 1978.
4,127,327.—APPARATUSES INCORPORATING A COMPOSITE SUPPORT MEMBER. NOV. 28, 1978.

Class 9B 2

RE.28,566.—CLEANING APPARATUS. OCT. 7, 1975. CAN. 0913310, MEX. 0113698.
3,424,615.—METHOD AND APPARATUS FOR CLEANING XEROGRAPHIC PLATES. JAN. 28, 1969. CAN. 0842022, GRB. 1158521, JAP. 0561239.
3,580,673.—CLEANING APPARATUS-REISSUED AS RE28566-D2266R. MAY 25, 1971. CAN. 0913310, MEX. 0113698.
3,615,398.—METHOD FOR ELECTROSTATIC COPYING INCLUDING AN IMPROVED PROCESS OF CLEANING PHOTOCONDUCTV SRFACE. OCT. 26, 1971.
3,625,683.—PROCESS FOR CLEANING A PHOTO-CONDUCTIVE DRUM OF RESIDUAL TONER PARTICLES AND REUSE OF THE SAME. DEC. 7, 1971. CAN. 0937800, GRB. 1329982.
3,628,950.—METHOD OF REMOVING THE RESIDUAL TONER PARTICLES FROM A PHOTOCONDUCTIVE SURFACE. DEC. 21, 1971.
3,640,707.—IMAGING SYSTEM. FEB. 8, 1972.
3,655,375.—INTERMITTENT GRIT REMOVAL PROCESS. APR. 11, 1972. CAN. 0924493, GRB. 1341404, JAP. 0746926.
3,656,948.—SELECTED REMOVAL OF LIQUID DVLPR IN CYCLICAL ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. CAN. 0906335, GRB. 1335054, JAP. 0760503.
3,776,631.—LIQUID DEVELOPER CLEANING SYSTEM. DEC. 4, 1973.

Class 9B 3

3,128,683.—XEROGRAPHIC APPARATUS. APR. 14, 1964.
3,483,034.—PROCESS OF CLEANING XEROGRAPHIC PLATES. DEC. 9, 1969. CAN. 0800825, FRA. 1463257, GER. 1497235, GRB. 1125594, ITL. 0750154.
3,592,678.—LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING. JULY 13, 1971.
3,620,800.—CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID. NOV. 16, 1971. CAN. 0933997.
3,628,981.—LIQUID TONER DEVELOPMENT. DEC. 21, 1971. ARG. 0181932, MEX. 0116451.
3,671,290.—IMAGING SYSTEM. JUNE 20, 1972.
3,702,303.—CLEANING OF PHOTOCONDUCTIVE INSULATING SURFACES. NOV. 7, 1972. CAN. 0944650, GRB. 1369451.
3,762,950.—CLEANING OF PARTICLES FROM A SURFACE. OCT. 2, 1973. ARG. 0195076, AUS. 0464713, BEL. 7916681, CAN. 0974009, FRA. 7241538, GRB. 1400238, ITL. 0971072, MEX. 0128580, SPN. 0408837, STZ. 0553433, SWD. 7215089, VZL. 0032005.
3,849,171.—METHOD FOR CLEANING BACKGROUND AREAS FROM DEVELOPED RECORDING SURFACES. NOV. 19, 1974. CAN. 0941882.
3,862,801.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC IMAGING SURFACE. JAN. 28, 1975. GRB. 1337282.
3,937,665.—PHOTORECEPTOR SOLVENT CLEANER. FEB. 10, 1976.
3,979,317.—VOLATILE CLEANING SOLUTION FOR PHOTORECEPTOR. SEPT. 7, 1976.
4,054,534.—VOLATILE CLEANING SOLUTION FOR MIRRORS AND LENSES. OCT. 18, 1977.

Class 10

3,945,728.—AN ALARM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 23, 1976.
4,089,515.—DOCUMENT STORAGE AND TRANSPORT APPARATUS. MAY 16, 1978. BEL. 850379.
4,109,903.—FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION. AUG. 29, 1978.

Class 10A

RE29,406.—DOCUMENT ORIGINAL HANDLING SYSTEM. SEPT. 20, 1977. FRA. 7442405.
D.230,085.—COPY PAPER CASSETTE. JAN. 22, 1974.
3,100,112.—DOCUMENT FEED MECHANISM. AUG. 6, 1963. GRB. 1015635, JAP. 0478676.
3,152,528.—DOCUMENT CARRIER. OCT. 13, 1964. CAN. 0707048, FRA. 1414049, GER. 1197744, GRB. 1032954, ITL. 0737307, JAP. 0471310.
3,220,275.—DOCUMENT DRIVE TRANSMISSION. NOV. 30, 1965.
3,239,215.—DOCUMENT FEED MECHANISM. MAR. 8, 1966. CAN. 0741548, GRB. 1052820, JAP. 0497186.
3,239,220.—DOCUMENT CONVEYOR. MAR. 8, 1966. CAN. 0770495, FRA. 1434188, GRB. 1094188, ITL. 0742434.
3,326,548.—CARD CONVEYING APPARATUS HAVING A ROTARY FRONT GAUGE. JUNE 20, 1967. CAN. 0793702, MEX. 0086197.
3,370,844.—CARD HANDLING-SCANNING DEVICE. FEB. 27, 1968.
3,409,356.—CONVEYOR FOR DOCUMENTS. NOV. 5, 1968. FRA. 1500227, GRB. 1162982, ITL. 0776597.
3,409,357.—APPARATUS FOR AN ELECTROSTATIC MACHINE. NOV. 5, 1968. CAN. 0816416, GRB. 1151104, JAP. 0542588.
3,419,264.—DOCUMENT HANDLING SYSTEM. DEC. 31, 1968. ARG. 0168399, CAN. 0831413, CHL. 0024536, JAM. 0002459, MEX. 0101167, PRU. 0009340, URG. 0009205, VZL. 0023735.
3,424,528.—DOCUMENT CONVEYOR UNIT. JAN. 28, 1969. CAN. 0842644, GRB. 1175596.

3,446,554.—XEROGRAPHIC REPRODUCING APPARATUS. MAY 27, 1969. ARG. 0171943, ATR. 0302040, AUS. 0451715, BEL. 0708649, CAN. 0880187, FRA. 1567148, GRB. 1223426, HUN. 0158170, ITL. 0823019, JAP. 0657008, LXB. 0055166, MEX. 0101029, NOR. 0127833, PLD. 0069795, SPN. 0348801, STZ. 0485581, SWD. 0354529, USR. 0259733, VZL. 0023685.
3,504,908.—DOCUMENT FEEDING APPARATUS CONTROL. APR. 7, 1970.
3,520,605.—DOCUMENT SCAN DRIVE AND RETURN APPARATUS. JULY 14, 1970. CAN. 0858848.
3,578,316.—DRIVING APPARATUS FOR ARTICLE FEEDERS. MAY 11, 1971. CAN. 0907653.
3,614,090.—DOCUMENT CONVEYOR. OCT. 19, 1971. ARG. 0183554, AUS. 0451766, BEL. 0751308, CAN. 0922330, EGR. 0081784, FRA. 7019911, GRB. 1311766, ITL. 0893688, MEX. 0118182, SPN. 0380271, STZ. 0512751, SWD. 0362150, TIW. 0007678, USR. 0349152, VZL. 0032780.
3,628,408.—STAMP DISPENSER. DEC. 21, 1971. CAN. 0931918, GRB. 1324699, JAP. 0755787.
3,628,786.—DOCUMENT HANDLING APPARATUS. DEC. 21, 1971. CAN. 0942552, GRB. 1329989.
3,630,515.—DOCUMENT HANDLING APPARATUS. DEC. 28, 1971.
3,630,519.—DOCUMENT FEED APPARATUS. DEC. 28, 1971. CAN. 0903779, GRB. 1329747.
3,649,447.—APPARATUS FOR DECURLING A PAPER WEB. MAR. 14, 1972. CAN. 0916185, GRB. 1288846.
3,674,363.—SHEET FEEDING APPARATUS. JULY 4, 1972. ARG. 0176106, ATR. 0307230, AUS. 0447387, BEL. 0734129, DNK. 0131336, FRA. 6919121, GRB. 1263192, ITL. 0866189, MEX. 0112842, SPN. 0368216, STZ. 0501500, SWD. 0356136, TIW. 0006604.
3,804,514.—DUAL FUNCTION DOCUMENT STOP FOR A COPYING DEVICE. APR. 16, 1974. FRA. 7334456, GRB. 1424060.
3,846,020.—ELECTROSTATIC SHEET TRANSPORT SYSTEM. NOV. 5, 1974.
3,860,339.—COPYING MACHINE. JAN. 14, 1975.
3,861,673.—BI-DIRECTIONAL SHEET TRANSPORT. JAN. 21, 1975.
3,874,651.—REGISTRATION EDGE FOR AUTOMATIC DOCUMENT HANDLER. APR. 1, 1975. GRB. 1467791.
3,884,408.—APPARATUS FOR EJECTING A STAPLED SET OF SHEETS SIDEWISE FROM THE COLLATING BINS. MAY 20, 1975.
3,885,782.—SHEET FEEDER. MAY 27, 1975. CAN. 3885782.
3,888,581.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,582.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,584.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,585.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,889,943.—PLATEN TRANSPORT FOR AUTOMATIC DOCUMENT HANDLER. JUNE 17, 1975.
3,900,258.—EXPOSURE APPARATUS. AUG. 19, 1975. AUS. 0474469, CAN. 1004724, GRB. 1424242, ITL. 0993030, SPN. 0418138, SWD. 7311579.
3,901,594.—SEMI-AUTOMATIC DOCUMENT HANDLER. AUG. 26, 1975.
3,909,129.—DOCUMENT FEEDING APPARATUS. SEPT. 30, 1975.
3,915,447.—HORIZONTAL PLATEN BELT TRANSPORT. OCT. 28, 1975.
3,941,376.—AUTOMATIC DOCUMENT HANDLER-ARDRI ADH PLATEN TRANSPORT MOUNTING. MAR. 2, 1976. BEL. 0799234, CAN. 0993906, FRA. 7316540, GRB. 1421427, ITL. 0987317, SPN. 0414541.
3,941,473.—MANUAL ASSIST DOCUMENT FEEDER. MAR. 2, 1976.
3,944,365.—DOCUMENT FEEDING APPARATUS AND LATCHING MECHANISM. MAR. 16, 1976.
3,944,794.—COPYING SYSTEM CONTROL. MAR. 16, 1976. ARG. 0204710, BEL. 0808230, CAN. 1007289, FRA. 7343289, GRB. 1450707, ITL. 1002162, MEX. 0135679, SPN. 0421150, STZ. 0577391, USR. 0543364.
3,947,111.—DOCUMENT FEEDING APPARATUS. MAR. 30, 1976.
3,953,122.—DOCUMENT ORIGINAL HANDLING SYSTEM. APR. 27, 1976.
3,954,259.—DOUBLE BAR SEPARATOR FOR A SHEET RECEIVING TRAY. MAY 4, 1976.
3,959,573.—COMPOSITIONS AND METHODS FOR MAKING BIASABLE MEMBERS. MAY 25, 1976.
3,963,345.—PRE-COLLATION COPYING. JUNE 15, 1976.
3,977,780.—ELECTROSTATIC REPRODUCTION METHOD AND APPARATUS. AUG. 31, 1976.
3,981,498.—NON-UNIFORM CHARGING OF SHEET MATERIAL. SEPT. 21, 1976.
3,982,832.—ELECTROSTATOGRAPHIC COPYING MACHINES. SEPT. 28, 1976.
3,984,099.—AN IMPROVED DOCUMENT FEEDING SYSTEM. OCT. 5, 1976.
3,988,065.—REFLECTIVE DOCUMENT FEEDER. OCT. 26, 1976.
3,997,263.—BI-DIRECTIONAL COPIER OUTPUT. DEC. 14, 1976. BEL. 0839792; SPN. 0445641.
4,000,943.—DUAL PURPOSE DOCUMENT HANDLING SYSTEM. JAN. 4, 1977. BEL. 0837235.
4,004,941.—CLEANING METHOD FOR AUTOMATIC DOCUMENT HANDLER. JAN. 25, 1977.
4,008,956.—DOCUMENT HANDLING SYSTEM FOR PRE-COLLATION COPYING. FEB. 22, 1977. BEL. 0839792, SPN. 0445641.
4,012,140.—COPIER DOCUMENT LOADING SYSTEM. MAR. 15, 1977. BEL. 0839792, SPN. 0445641.
4,017,172.—DOCUMENT FEEDING APPARATUS. APR. 12, 1977.
4,018,523.—REPRODUCING APPARATUS AND PROCESS FOR FORMING MULTIPLE COPIES OF A DOCUMENT. APR. 19, 1977. BEL. 0842928.
4,030,721.—AUTOMATIC MANUSCRIPT DISCHARGING DEVICE FOR COPYING MACHINES. JUNE 21, 1977.
4,033,694.—COPIER DOCUMENT EJECTOR. JULY 5, 1977.
4,034,869.—FLUID MEANS TO LOAD AND UNLOAD A VERTICALLY MOVABLE DOCUMENT STORAGE RACK. JULY 12, 1977.
4,040,615.—ORIGINAL DISCHARGING DEVICE FOR COPIERS. AUG. 9, 1977.
4,043,550.—IMPROVED REGISTRATION MEANS FOR AUTOMATIC DOCUMENT HANDLING APPARATUS. AUG. 23, 1977. BEL. 847626, FRA. 7631994, SPN. 452660.
4,043,664.—INTERLINEAR FEEDER FOR COPYING MACHINE. AUG. 23, 1977.
4,043,665.—COPIER DOCUMENT HANDLER. AUG. 23, 1977.
4,047,812.—DOCUMENT BELT WITH IMPERFORATE BANDS. SEPT. 13, 1977. GER. 7700998.
4,049,255.—APPARATUS FOR FEEDING DOCUMENTS TO AND FROM A COPIER. SEPT. 20, 1977. FRA. 7706823.
4,050,751.—DOCUMENT CAROUSEL. SEPT. 27, 1977.
4,050,816.—DOCUMENT HANDLING SYSTEM. SEPT. 27, 1977. BEL. 839792, SPN. 445641.
4,053,224.—DOCUMENT HANDLING SYSTEM. OCT. 11, 1977.
4,059,260.—DOCUMENT HANDLING APPARATUS. NOV. 22, 1977.
4,062,538.—SPEED REGULATED FLUIDIC SHEET TRANSPORT. DEC. 13, 1977. BEL. 850380.
4,078,786.—AUTOMATIC DOCUMENT RECIRCULATION SYSTEM. MAR. 14, 1978.
4,079,876.—COMPUTER FORMS FEEDER. MAR. 21, 1978.
4,080,063.—COPIER DOCUMENT HANDLING SYSTEM. MAR. 21, 1978.
4,086,007.—DUAL PURPOSE DOCUMENT AND COPY SHEET FEED CASSETTE. APR. 25, 1978.
4,087,172.—DOCUMENT HANDLING APPARATUS. MAY 2, 1978.
4,093,372.—PRE-SEPARATED RECIRCULATING DOCUMENT COPYING SYSTEM. JUNE 6, 1978.
4,097,146.—ORIGINAL HANDLING SYSTEM AND PROCESS. JUNE 27, 1978.
4,099,810.—UPRIGHT DOCUMENT CAROUSEL. JULY 11, 1978.
4,108,547.—DOCUMENT LOADING FOR COPYING. AUG. 22, 1978. BEL. 839792. GRB. 1524101. SPN. 445641.
4,110,028.—DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. AUG. 29, 1978. BEL. 844828.
4,126,817.—SERVO SYSTEM FOR MAINTAINING CONSTANT TENSION ON A WEB. NOV. 21, 1978.
4,132,401.—COPIER DOCUMENT SENSING AND CONTROL SYSTEM. JAN. 2, 1979. GRB. 1523900. USR. 604211.
4,145,041.—AUTOMATIC DOCUMENT HANDLING APPARATUS. MAR. 20, 1979.
4,146,220.—DOCUMENT HANDLING APPARATUS. MAR. 27, 1979.
4,146,326.—DOCUMENT HANDLING APPARATUS AND REPRODUCING MACHINE. MAR. 27, 1979.
4,159,824.—METHOD FOR REVERSING THE DIRECTION OF TRAVEL OF A SHEET. JULY 3, 1979.
4,160,547.—DOCUMENT HANDLING APPARATUS. JULY 10, 1979.
4,184,671.—AUTOMATIC DOCUMENT HANDLER IN DUPLEX COPYING MACHINE. JAN. 22, 1980.
4,185,908.—VERNIER BELT TENSIONING SYSTEM FOR A PHOTOCOPYING MACHINE. JAN. 29, 1980.
4,190,359.—COPIER DOCUMENT HANDLING SYSTEM. FEB. 26, 1980.

Class 10B

3,139,279.—RECORD CARD MAGAZINE. JUNE 30, 1964. CAN. 0717868.
3,180,637.—RECORD CARD FEEDING APPARATUS. APR. 27, 1965. CAN. 0806932.
3,357,574.—SEQUENTIAL CONTROL SYSTEM. DEC. 12, 1967. CAN. 0824898.
3,383,105.—CARD PICK-OFF APPARATUS. MAY 14, 1968. CAN. 0820743, GRB. 1193512, JAP. 0610154.
3,482,917.—CARD TRANSPORT APPARATUS. DEC. 9, 1969. CAN. 0842646, GRB. 1193516.
3,784,303.—AUTOMATIC MICROFICHE COPIER. JAN. 8, 1974. CAN. 1000779, GRB. 1412221.
4,095,732.—METHOD AND APPARATUS FOR ACCURATELY CONTROLLING THE POSITION OF A FILM TRANSPORT DEVICE. JUNE 20, 1978.

Class 10C

3,239,213.—DOCUMENT FEEDER. MAR. 8, 1966. CAN. 0766646, FRA. 1447269, GER. 1243698, GRB. 1087786, ITL. 0761046, JAP. 0497197.
3,506,257.—DOCUMENT FEEDING APPARATUS. APR. 14, 1970. CAN. 0885333, GRB. 1253416.
3,567,214.—SHEET FEEDING AND SEPARATING APPARATUS. MAR. 2, 1971. BEL. 0734128, CAN. 0902124, FRA. 6919122, GER. 1929105, GRB. 1263193, HOL. 0144551, ITL. 0866188, SPN. 0368173, STZ. 0501501, SWD. 6908176.
3,861,671.—LIFTABLE BAIL BAR FOR ALLOWING RETURN OF MULTIPLY SEPARATED SHEETS TO STACK. JAN. 21, 1975.
3,895,790.—MOVABLE BAIL BAR. JULY 22, 1975. BEL. 0815050, CAN. 1009267.
3,936,180.—XEROGRAPHIC APPARATUS WITH SAMPLE PRINT CAPABILITIES. FEB. 3, 1976. BEL. 0809398, ITL. 1006708.
3,968,364.—HEIGHT SENSING DEVICE. JULY 6, 1976.
3,993,300.—AUTOMATIC FEEDER FOR COMPOSITE COPYING. NOV. 23, 1976. BEL. 0815215, GRB. 1467996, STZ. 0561917.
4,025,068.—SHEET FEEDER. MAY 24, 1977.
4,054,284.—PAPER-ANTI-SKEW DEVICE. OCT. 18, 1977.
4,174,102.—IMPROVED SHUT SEPARATING AND FEEDING APPARATUS. NOV. 13, 1979.

Class 10D

3,239,213.—DOCUMENT FEEDER. MAR. 8, 1966. CAN. 0766646, FRA. 1447269, GER. 1243698, GRB. 1087786, ITL. 0761046, JAP. 0497197.
3,495,904.—RADIANT ENERGY PROTECTIVE APPARATUS. FEB. 17, 1970.
3,581,000.—INCREMENTAL STEPPING PAPER DRIVE. MAY 25, 1971.
3,618,123.—FACSIMILE DRUM CONVEYOR. NOV. 2, 1971. ARG. 0181314, BEL. 0743659, CAN. 0918186, FRA. 6944287, GER. 1963786, GRB. 1280340, ITL. 0880304, JAP. 0852728, MEX. 0122967, SPN. 0374915, SWD. 0363457, VZL. 0025438.
3,790,159.—AUTOMATIC DOCUMENT HANDLING DEVICE. FEB. 5, 1974. CAN. 1013377, GRB. 1417793.
3,815,899.—SHEET DELIVERY DEVICE. JUNE 11, 1974. CAN. 0994377, FRA. 7409303, GRB. 1456422.
3,854,715.—CAM. DEC. 17, 1974. CAN. 1007256, GRB. 1456576.

Class 10E

3,288,459.—DOCUMENT FEEDING APPARATUS. NOV. 29, 1966. CAN. 0788345, JAP. 0632541, MEX. 0086958.
3,300,208.—COPY POSITIONING APPARATUS AND METHOD. JAN. 24, 1967. CAN. 0817270, JAP. 0605646, MEX. 0090842.
3,473,035.—DOCUMENT TRANSPORT AND REGISTRATION SYS USING PHOTOCELLS. OCT. 14, 1969. ARG. 0170131, CAN. 0858983, CHL. 0024005, JAM. 0001926, MEX. 0101674, PRU. 0009301, URG. 0009238, VZL. 0023677.
3,510,125.—DOCUMENT REGISTRATION SYSTEM. MAY 5, 1970. BEL. 0726865, CAN. 0897195, FRA. 2000318, GER. 1902112, GRB. 1253417, ITL. 0854755, JAP. 0783473.
3,558,223.—DOCUMENT CENTERING APPARATUS. JAN. 26, 1971.
3,630,611.—DOCUMENT REGISTRATION APPARATUS. DEC. 28, 1971.
3,630,620.—PLATEN COVER FOR COPYING MACHINES. DEC. 28, 1971. CAN. 0921307, GRB. 1309313.
3,642,370.—DOCUMENT PRESENTATION DEVICE. FEB. 15, 1972. GRB. 1206633.
3,724,941.—ELECTROPHOTOGRAPHIC APPARATUS. APR. 3, 1973.
3,741,644.—ORIGINAL POSITION CONFIRMING MEANS FOR DUPLICATING APPARATUS. JUNE 26, 1973.
3,771,082.—COPYING APPARATUS WITH AUXILIARY LIGHT SOURCE FOR ILLUMINATING AN ORIGINAL TO BE REPRODUCED. NOV. 6, 1973.
3,829,082.—AUTOMATIC DOCUMENT HANDLER. AUG. 13, 1974. CAN. 0986958, GRB. 1421425.
3,854,715.—CAM. DEC. 17, 1974, CAN. 1007256, GRB. 1456576.
3,861,673.—BI-DIRECTIONAL SHEET TRANSPORT. JAN. 21, 1975. CAN. 1004240.
3,877,804.—CORNER REGISTRATION DEVICE FOR DOCUMENT FEEDER. APR. 15, 1975.
3,883,134.—DETECTING AND REMOVING APPARATUS FOR SKEW FED SHEETS. MAY 13, 1975.
3,915,447.—HORIZONTAL PLATEN BELT TRANSPORT. OCT. 28, 1975.
3,984,098.—PNEUMATIC REGISTRATION AND CLAMPING APPARATUS. OCT. 5, 1976. BEL. 0848824.
3,984,099.—AN IMPROVED DOCUMENT FEEDING SYSTEM. OCT. 5, 1976.
3,990,794.—COPYING MACHINE. NOV. 9, 1976. STZ. 0587508.
4,026,542.—DUAL REGISTRATION APPARATUS. MAY 31, 1977.
4,029,411.—VARIABLE MAGNIFICATION COPIER. JUNE 14, 1977. BEL. 0839792, SPN. 0445641.
4,033,574.—DOCUMENT HANDLING APPARATUS. JULY 5, 1977.
4,033,694.—COPIER DOCUMENT EJECTOR. JULY 5, 1977.
4,043,550.—IMPROVED REGISTRATION MEANS FOR AUTOMATIC DOCUMENT HANDLING APPARATUS. AUG. 23, 1977. BEL. 847626, FRA. 7631994, SPN. 452660.
4,043,665.—COPIER DOCUMENT HANDLER. AUG. 23, 1977.
4,047,812.—DOCUMENT BELT WITH IMPERFORATE BANDS. SEPT. 13, 1977. GER. 7700998.
4,050,688.—ORTHOGONAL DOCUMENT HANDLING APPARATUS. SEPT. 27, 1977.
4,054,285.—APPARATUS FOR REGISTERING AND INVERTING SHEETS. OCT. 18, 1977.
4,055,340.—ASSISTED PNEUMATIC TRANSPORT AND REGISTRATION APPARATUS. OCT. 25, 1977. BEL. 848823.
4,062,538.—SPEED REGULATED FLUIDIC SHEET TRANSPORT. DEC. 13, 1977. BEL. 850380.
4,066,254.—THREE-WAY PNEUMATIC REGISTRATION APPARATUS. JAN. 3, 1978.
4,073,001.—APPARATUS FOR NEUTRALIZING AND REGISTERING AN ELECTROSTATICALLY CHARGED SHEET. FEB. 7, 1978.
4,076,233.—DOCUMENT HANDLING APPARATUS. FEB. 28, 1978. BEL. 847625, FRA. 7631999, SPN. 452661.
4,090,704.—REGISTRATION STATION. MAY 23, 1978.
4,097,146.—ORIGINAL HANDLING SYSTEM AND PROCESS. JUNE 27, 1978.
4,116,431.—METHOD FOR TRANSPORTING AND REGISTERING STACKED SHEETS. SEPT. 26, 1978.
4,124,205.—DOCUMENT HANDLING. NOV. 7, 1978.
4,130,274.—PNEUMATIC REGISTRATION APPARATUS. DEC. 19, 1978. BEL. 847912. SAF. 6401.
4,143,960.—RETRACTABLE SUPPORT MEMBER. MAR. 13, 1979.
4,146,219.—DOCUMENT TRANSPORT APPARATUS. MAR. 27, 1979. GRB. 1529698. SPN. 452659.

Class 10F

3,288,464.—CARD INVERTING APPARATUS. NOV. 29, 1966. CAN. 0803316, JAP. 0547200.
3,408,140.—DOCUMENT HANDLING APPARATUS. OCT. 29, 1968. CAN. 0842643, GRB. 1143062.
3,416,791.—DOCUMENT INVERTING APPARATUS. DEC. 17, 1968. CAN. 0853562, GRB. 1210564, JAP. 0648074.
3,844,654.—DUPLEX COPYING SYSTEM. OCT. 29, 1974. FRA. 7340246, GRB. 1445854.
3,862,802.—SHEET REVERSING APPARATUS AND A DUPLEX REPRODUCING APPARATUS EMPLOYING SAME. JAN. 28, 1975. BEL. 0818894.
3,926,338.—THERMALLY INSENSITIVE PARTICLE CONCENTRATION CONTROLLER. DEC. 16, 1975.
3,980,406.—DUPLEX IMAGING SYSTEM. SEPT. 14, 1976.
4,040,616.—SHEET TURN AROUND INVERTER. AUG. 9, 1977. FRA. 7701111.
4,054,285.—APPARATUS FOR REGISTERING AND INVERTING SHEETS. OCT. 18, 1977.
4,089,515.—DOCUMENT STORAGE AND TRANSPORT APPARATUS. MAY 16, 1978. BEL. 850379.

4,111,547.—DUPLEX DOCUMENT COPYING. SEPT. 5, 1978.
4,184,671.—AUTOMATIC DOCUMENT HANDLER IN DUPLEX COPYING MACHINE. JAN. 22, 1980.
4,190,354.—COPIER JOB RECOVERY SYSTEM. FEB. 26, 1980.

Class 10G

3,419,265.—DOCUMENT STACKER APPARATUS. DEC. 31, 1968. ARG. 0171423, CAN. 0833415, CHL. 0024006, JAM. 0001859, MEX. 0100967, PRU. 0001930, URG. 0009140, VZL. 0023736.
3,460,825.—FAN FOLD STACKING APPARATUS. AUG. 12, 1969. CAN. 0855586, GRB. 1205418.
3,497,207.—SORTING APPARATUS FOR DOCUMENTS. FEB. 24, 1970. BEL. 0727203, CAN. 0895731, FRA. 6900957, GRB. 1245841, HOL. 0148006, ITL. 0854588.
3,630,517.—COUNTER STACKER. DEC. 28, 1971.
3,729,188.—DOCUMENT STACKER APPARATUS. APR. 24, 1973. CAN. 1000311, FRA. 0701711, GRB. 1303165, ITL. 0893040.
3,865,480.—ELECTROSTATIC CONTROL OF FAN FOLD PAPER STACKING. FEB. 11, 1975.
4,017,066.—SET SEPARATOR. APR. 12, 1977.
4,033,579.—AN OFFSET STACKER. JULY 5, 1977.
4,093,372.—PRE-SEPARATED RECIRCULATING DOCUMENT COPYING SYSTEM. JUNE 6, 1978.
4,132,400.—APPARATUS FOR ALIGNING A STACK OF SHEETS. JAN. 2, 1979.
4,166,614.—JOGGING AND NORMAL FORCE FOR SHEET FEEDING. SEPT. 4, 1979. BEL. 869792.

Class 10H

3,467,371.—SHEET DISTRIBUTOR. SEPT. 16, 1969. ARG. 0168293, ATR. 0294140, AUS. 0423257, BEL. 0702898, CAN. 0925803, CHL. 0023102, CLB. 0017542, DNK. 0124250, EIR. 0031306, FIN. 0047869, FRA. 1541084, GRB. 1193513, GRK. 0038675, IND. 0112000, ISR. 0028519, ITL. 0813836, JAP. 0645588, LXB. 0054335, MEX. 0099952, NOR. 0124920, NZL. 0149788, PAK. 0118964, PLP. 0006507, PRU. 0009477, PTG. 0048210, SAF. 0674986, SPN. 0344349, STZ. 0480253, SWD. 0337384, TRK. 0015492, URG. 0008974, VZL. 0026276.
3,815,896.—AUTOMATIC DOCUMENT HANDLER. JUNE 11, 1974. BEL. 0797889, CAN. 0984863, FRA. 7316287, GRB. 1421426, ITL. 0987316, SPN. 0414486.
3,884,408.—APPARATUS FOR EJECTING A STAPLED SET OF SHEETS SIDEWISE FROM THE COLLATING BINS. MAY 20, 1975.
3,907,277.—METHOD AND DEVICE FOR REMOVING DOCUMENTS FROM A PLATEN. SEPT. 23, 1975.
3,913,467.—COLLATING APPARATUS. OCT. 21, 1975.
3,944,207.—LIMITLESS SORTER. MAR. 16, 1976.
3,944,366.—SLIDING PLATEN COVER APPARATUS. MAR. 16, 1976.
3,963,345.—PRE-COLLATION COPYING. JUNE 15, 1976. BEL. 0839792, SPN. 0445641.
3,997,263.—BI-DIRECTIONAL COPIER OUTPUT. DEC. 14, 1976. BEL. 0839792, SPN. 0445641.
4,008,956.—DOCUMENT HANDLING SYSTEM FOR PRE-COLLATION COPYING. FEB. 22, 1977. BEL. 0839792, SPN. 0445641.
4,012,140.—COPIER DOCUMENT LOADING SYSTEM. MAR. 15, 1977. BEL. 0839792, SPN. 0445641.
4,050,816.—DOCUMENT HANDLING SYSTEM. SEPT. 27, 1977. BEL. 839792, SPN. 445641.
4,108,547.—DOCUMENT LOADING FOR COPYING. AUG. 22, 1978. BEL. 839792. GRB. 1524101. SPN. 445641.
4,120,580.—COLLATING SYSTEM FOR SLIDE REPRODUCTION. OCT. 17, 1978.

Class 10H 6K

4,212,457.—PRE/POST-COLLATION COPYING SYSTEM. JULY 15, 1980.

Class 10I

3,495,904.—RADIANT ENERGY PROTECTIVE APPARATUS. FEB. 17, 1970.
3,600,610.—TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS. AUG. 17, 1971.
3,609,737.—METHOD AND APPARATUS FOR ARTICLE DETECTION UTILIZING CORONA DISCHARG. SEPT. 28, 1971. CAN. 0872468, GER. 1932248, GRB. 1259998, JAP. 0657911.
3,672,760.—XEROGRAPHIC PLATE TRANSPORTING MECHANISM. JUNE 27, 1972. CAN. 0939555, GRB. 1359888.
3,674,363.—SHEET FEEDING APPARATUS. JULY 4, 1972. ARG. 0176106, ATR. 0307230, AUS. 0447387, BEL. 0734129, DNK. 0131336, FRA. 6919121, GRB. 1263192, ITL. 0866189, MEX. 0112842, SPN. 0368216, STZ. 0501500, SWD. 0356136, TIW. 0006604.
3,697,063.—DOCUMENT HANDLING APPARATUS. OCT. 10, 1972. GRB. 1369618.
3,744,047.—SUPERPOSED SHEET DETECTION. JULY 3, 1973. CAN. 0985762, FRA. 7231694, GRB. 1396560, ITL. 0967501.
3,748,088.—FUSER CONTROL APPARATUS. JULY 24, 1973.
3,778,618.—PHOTODETECTION OF NON-OPAQUE OBJECTS TRANSPRTD ALONG A CONVEYOR BY USE OF A LIGHT BLCKING OPAQU. DEC. 11, 1973. GRB. 1406170.
3,790,158.—AUTOMATIC DOCUMENT HANDLER. FEB. 5, 1974. GRB. 1421428.
3,894,513.—COPYING MACHINE WITH BEAD PICKOFF ROLLER. JULY 15, 1975. FRA. 7342586, GRB. 1441288.
3,945,546.—ZIG ZAG FOLDED STRIP BOTTOM FEEDER. MAR. 23, 1976.
4,116,431.—METHOD FOR TRANSPORTING AND REGISTERING STACKED SHEETS. SEPT. 26, 1978.
4,132,401.—COPIER DOCUMENT SENSING AND CONTROL SYSTEM. JAN. 2, 1979. GRB. 1523900. USR. 604211.
4,203,586.—MULTIFEED DETECTOR. MAY 20, 1980.

Class 12

4,027,138.—A FUSER RELEASE MATERIAL DISPENSER. MAY 31, 1977.
4,179,209.—MULTICOLOR LINE SCREEN. DEC. 18, 1979.

Class 12A

3,384,488.—POLYCHROMATIC PHOTOELECTROPHORETIC IMAGING COMPOSITION. MAY 21, 1968.
3,384,565.—PROCESS OF PHOTOELECTROPHORETIC COLOR IMAGING. MAY 21, 1968. ARG. 0149921, ATR. 0304268, AUS. 0414156, BEL. 0667116, BRA. 0087920, CAN. 0867678, CHL. 0021697, CLB. 0014706, FRA. 1450843, GER. 1497243, GRB. 1124626, GRK. 0030605, IND. 0119647, ISR. 0023973, ITL. 0744030, JAP. 681941, LXB. 0049058, MEX. 0091899, NOR. 0128733, NZL. 0142323, PPU. 0009538, PTG. 0044324, SAF. 653922, SPN. 0321858, STZ. 0481409, SWD. 6509579, URG. 0009540. VZL. 0017273.
3,384,566.—METHOD OF PHOTOELECTROPHORETIC IMAGING. MAY 21, 1968.
3,734,610.—MICROFICHE VIEWER-COPIER WITH BILLING DATA STORAGE. MAY 22, 1973. CAN. 1003025.
3,759,611.—MICROIMAGE RANSOM ACCESS AND RETRIEVAL PRINTER. SEPT. 18, 1973. CAN. 0987156, GRB. 1427017.

Class 12B

3,383,993.—PHOTOELECTROPHORETIC IMAGING APPARATUS. MAY 21, 1968. ARG. 0165160, AUS. 0419734, BEL. 0692048, CAN. 0866143, FRA. 1507051, GRB. 1158301, GRK. 0033285, HOL. 0150926, ITL. 0862555, LXB. 0052738, MEX. 0096357, PTG. 0044324, SAF. 0067022, SPN. 0335121, STZ. 0510901, VZL. 0024450.
3,610,748.—PHOTOELECTROPHORETIC IMAGING SYSTEM. OCT. 5, 1971. BEL. 0752438, CAN. 0922569, FRA. 7023045, GRB. 1319532, ITL. 0894621, JAP. 0739527.
3,656,847.—ELEVATOR MECHANISM. APR. 18, 1972.
3,663,396.—KINESCOPE PHOTOELECTROPHORETIC IMAGING METHODS AND SYSTEMS. MAY 16, 1972. ARG. 0196858, BEL. 0762417, CAN. 0935965, FRA. 7104350, GRB. 1345571, ITL. 0918121, JAP. 0743838, MEX. 0131834.
3,697,409.—BELT ELECTRODE IMAGING SYSTEM OCT. 10, 1972. ARG. 0183572, BEL. 0760077, BRA. 7023343, CAN. 0937803, FRA. 7045072, GRB. 1339734, ITL. 0913368, JAP. 0752721, MEX. 0119368, VZL. 0032930.
3,844,779.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING A BELT ELECTRODE. OCT. 29, 1974.
4,043,654.—DISPLAY SYSTEM. AUG. 23, 1977.
4,043,655.—PHOTOELECTROPHORETIC IMAGING REPRO- DUCTION DEVICE. AUG. 23, 1977.

Class 12C

3,427,242.—APPARATUS FOR CONTINUOUS PHOTOELECTROPHORETIC IMAGING. FEB. 11, 1969. BEL. 0743902, CAN. 0851701, FRA. 1521727, GER. 1572385, GRB. 1185932, ITL. 0794269, JAP. 0580245, MEX. 0097005.
3,474,019.—PHOTOELECTROPHORETIC IMAGING MTD INC. CONTACTNG IMGNG SUSPNSN W/ ALG SFC

OF FLEXIBLE ELECTRODE. OCT. 21, 1969. AUS. 0418224, BEL. 0692912, BRA. 6678842, CAN. 0834679, GRK. 0033301, LXB. 0052730, MEX. 0090286, PTG. 0046984, SAF. 0670024, SPN. 0335454.

3,551,320.—IMAGING APPARATUS. DEC. 29, 1970.

3,600,081.—IMAGING APPARATUS. AUG. 17, 1971. ARG. 0192211, ATR. 0324839, AUS. 0455820, BEL. 0758903, CAN. 0936732, CZC. 0164288, EGR. 0090482. FRA. 7041652, GRB. 1335990, ITL. 0909307, JAP. 0751878, MEX. 0122272, PNM. 0002094, SPN. 0385453, STZ. 0518582, SWD. 0362717, TIW. 0008461, USR. 0412697, VZL. 0032926.

3,609,028.—IMAGING APPARATUS. SEPT. 28, 1971. ARG. 0186570, ATR. 0319749, AUS. 0455572, BEL. 0758806, CAN. 0935012, EGR. 0086977, FRA. 7041648, GRB. 1335988, ITL. 0909306, MEX. 0121331, PLD. 0082852, PNM. 0002167, SPN. 0385452, STZ. 0518580, SWD. 0361753, TIW. 0007385, USR. 0465806, VZL. 30683.

3,622,691.—HIGH SPEED LIGHT RESPONSIVE TRANSFORM COMPUTER FOR A LIGHT-SENSITIVE PRINTING SYSTEM. NOV. 23, 1971. CAN. 0915813, GRB. 1335222, JAP. 0774709.

3,642,365.—AUTOMATED IMAGING MACHINE. FEB. 15, 1972. ARG. 0183571, ATR. 0324123, AUS. 0456428, BEL. 0758902, CAN. 0937440, EGR. 0091986, FRA. 7041647, GRB. 1337145, ITL. 0909311, JAP. 0758463, MEX. 0120289, PLD. 0082861, PNM. 0002255, SPN. 0385457. STZ. 0544327, SWD. 0367493, TIW. 0007386.

3,642,606.—APPARATUS FOR IMAGE FORMATION ON THE INSIDE OF A CYLINDER. FEB. 15, 1972. ARG. 0183573, BEL. 0760749, BRA. 7022094, CAN. 0938490, FRA. 7047632, GRB. 1339578, ITL. 0913902, JAP. 0752722, MEX. 0119589, VZL. 0032929.

3,644,035.—FLAT PLATE TRAVELING ROLLER IMAGING. FEB. 22, 1972. ARG. 0183670, AUS. 0456429, BEL. 0758904, BRA. 7023406, CAN. 0923356, EGR. 0090280, FRA. 7041653, GRB. 1335051, ITL. 0909308, JAP. 0751879, MEX. 0119530, PLD. 0082860, SPN. 0385454, STZ. 0528763, SWD. 0367074, TIW. 0008460, USR. 0404290, VZL. 30682.

3,645,616.—PHOTOELECTROPHORETIC IMAGE TRANSFER APPARATUS. FEB. 29, 1972. CAN. 0949049, GRB. 1337417, JAP. 783768.

3,647,290.—PHOTOELECTROPHORETIC IMAGING SYSTEM. MAR. 7, 1972. ARG. 0184762, AUS. 0454820, BEL. 0058902, CAN. 0939954, EGR. 0090483, FRA. 7061651, GER. 1337416, GRB. 1337416, ITL. 0909312, JAP. 0751880, MEX. 0119752, SPN. 0385458, STZ. 0530662, SWD. 0366850, TIW. 0007384, USR. 0419062, VZL. 30685.

3,667,842.—IMAGING APPARATUS. JUNE 6, 1972. ARG. 0193347, BEL. 0768538, CAN. 0953559, FRA. 7122750, GRB. 1350395, ITL. 0927384, MEX. 0123298.

3,703,335.—MULTIPLE EXPOSURE IMAGING APPARATUS. NOV. 21, 1972. BEL. 0760457, CAN. 0968605, FRA. 7047141, GRB. 1339550, ITL. 0913636, JAP. 0759479.

3,719,484.—PHOTOELECTROPHORETIC IMAGING METHOD. MAR. 6, 1973. CAN. 0957890, GRB. 1369701.

3,728,018.—IMAGING APPARATUS. APR. 17, 1973. CAN. 0924156, GRB. 1335697.

3,800,743.—MATERIALS APPLICATION APPARATUS. APR. 2, 1974.

3,860,336.—PHOTOELECTROPHORETIC IMAGING MACHINE AND APPTS FOR CONTACTING A ROLLER TO A SURFACE TO BE CONTACT. JAN. 14, 1975.

3,860,337.—MULTIPLE EXPOSURE METHOD AND APPARATUS. JAN. 14, 1975. CAN. 0957890, GRB. 1369701.

3,990,043.—CHARACTER CODING AND RECOGNITION SYSTEM. NOV. 2, 1976.

4,006,982.—PHOTOELECTROPHORETIC CONCURRENT PROCESS CYCLING. FEB. 8, 1977. BEL. 0841077.

4,009,466.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 22, 1977.

4,066,452.—VELOCITY COMPENSATION FOR BEAD BYPASS. JAN. 3, 1978.

4,084,896.—PHOTOELECTROPHORETIC WEB IMAGING APPARATUS. APR. 18, 1978. BEL. 841077, FRA. 7612178.

Class 12D

3,448,025.—PHOTOELECTROPHORETIC IMAGING SYSTEM UTILIZING A PROGRAMMED POTENTIAL APPLICATION. JUNE 3, 1969. ARG. 0167580, AUS. 0417981. BEL. 0719188, CAN. 0875492, FRA. 0095530, GER. 1797123, GRB. 1149666, ITL. 0890086, MEX. 0100805, VZL. 0025946.

3,485,738.—PHOTOELECTROPHORETIC IMG PROCESS EMPLOYNG LAYER OF INSULATNG LIQUID TO IMPROVE IMAGE QUALITY. DEC. 23, 1969. AUS. 0431891, BEL. 0743640, CAN. 0850591, GER. 1522751, GRB. 1174831, JAP. 0578397.

3,565,614.—IMAGE TRANSFER. FEB. 23, 1971. ARG. 0157773, AUS. 0413930, BEL. 0696853, CAN. 0890362, FRA. 1520919, GER. 1572384, GRB. 1185931, ITL. 0801198, JAP. 0586922, MEX. 0099070, SPN. 0349966, STZ. 0482230, SWD. 0332754, VZL. 0024013.

3,582,205.—IMAGING APPARATUS. JUNE 1, 1971.

3,616,398.—PHOTOELECTROPHORETIC IMAGING COMPOSITION CONTAINING B-CAROTENE. OCT. 26, 1971.

3,657,103.—ELECTRODE IMAGING SYSTEM. APR. 18, 1972. CAN. 0890360, GRB. 1309663, JAP. 0731609.

3,697,407.—PREVENTION OF ARCING IN AN ELECTRODE IMAGING SYSTEM. OCT. 10, 1972. CAN. 0884225, GRB. 1309127, JAP. 0731608.

3,697,408.—IMAGING SYSTEM. OCT. 10, 1972. CAN. 0890361, GRB. 1312733, JAP. 0731610.

3,708,286.—PHOTOELECTROPHORETIC IMAGING WITH ULTRASONIC VIBRATION DURING IMAGING. JAN. 2, 1973. ARG. 0174613, ATR. 0293874, AUS. 0455712, BEL. 0739747, CAN. 0922141, FRA. 6933738, GER. 1949416, GRB. 1279285, HOL. 0146950, ITL. 0877873, JAP. 0709042, MEX. 0108820.

3,853,556.—METHOD FOR ELIMINATING ELECTRICAL ARCING DURING PHOTOELECTROPHORETIC IMAGING. DEC. 10, 1974.

Class 12E

3,535,221.—PHOTOELECTROPHORETIC IMAGING SYSTEM EMPLOYING A PHOTOCONDUCTOR COATING FOR THE BLOCKING ELECTRO. OCT. 20, 1970. ARG. 0176485, AUS. 0448560, BEL. 0722301, CAN. 0891971, FRA. 1587938, GER. 1802988, GRB. 1236619, ITL. 0845022, JAP. 0693378, MEX. 0108364, VZL. 0023742.

3,595,771.—METHOD OF REMOVING ACCUMULATED CHARGES IN PHOTOELECTROPHORETIC IMAGING. JULY 27, 1971. ARG. 0198476, ATR. 0302041, AUS. 0448837, BEL. 0737549, CAN. 0922955, FRA. 6927969, GER. 1941463, GRB. 1267255, ITL. 0869935, JAP. 0704156, SWD. 0341726.

3,639,224.—PHOTOELECTROPHORETIC IMAGING SYSTEM. FEB. 1, 1972. CAN. 0922568, GRB. 1313683, JAP. 0739526.

3,657,103.—ELECTRODE IMAGING SYSTEM. APR. 18, 1972. CAN. 0890360, GRB. 1309663, JAP. 0731609.

3,669,872.—IMAGING SYSTEM. JUNE 13, 1972.

3,775,107.—IMAGING SYSTEM. NOV. 27, 1973.

3,859,576.—HIGH PERFORMANCE BLOCKING ELECTRODE FOR ELECTROPHOTOPHORESIS. JAN. 7, 1975. BEL. 0810802, ITL. 1006354.

3,866,572.—FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM. FEB. 18, 1975. BEL. 0815546, CAN. 1009503, FRA. 7418641, GRB. 1448386, ITL. 1012842, SPN. 0426760.

3,956,524.—METHOD FOR THE PREPARATION OF ELECTROSTATOGRAPHIC AND PHOTORECEPTORS. MAY 11, 1976.

3,966,466.—PHOTOELECTROPHORETIC IMAGING PROCESS USING DARK CHARGE INJECTING AGENT ON BLOCKING ELECTRODE. JUNE 29, 1976.

3,967,961.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING A DARK CHARGE INJECTING AGENT-AKLYD RESIN COATING. JULY 6, 1976.

3,980,477.—PHOTOELECTROPHORESIS WITH DARK CHARGE INJECTING ELEMENT. SEPT. 14, 1976.

Class 12F

3,695,755.—PHOTOELECTROPHORETIC CAMERA. OCT. 3, 1972. CAN. 0958580, GRB. 1359694.

3,702,289.—PHOTOELECTROPHORETIC PROC-ESS AND APPARATUS. NOV. 7, 1972. CAN. 0958579, GRB. 1359695.

3,705,766.—PHOTOELECTROPHORETIC APPARATUS. DEC. 12, 1972. CAN. 0955100, GRB. 1359862.

Class 12G

3,655,550.—ELECTROSTATIC PIGMENT FILTER. APR. 11, 1972.

3,656,200.—CLEANING APPARATUS. APR. 18, 1972.

3,658,687.—APPARATUS FOR FORMING IMAGES WITH APPLICATOR SHEARING SMOOTHING AND CLEANING MEANS. APR. 25, 1972. CAN. 0916433, GRB. 1337149, JAP. 0751881.

3,659,302.—CLEANING APPARATUS. MAY 2, 1972.

3,673,632.—CLEANING APPARATUS. JULY 4, 1972.

3,686,035.—CLEANING APPARATUS. AUG. 22, 1972. CAN. 0925660, GRB. 1335989.

3,821,027.—METHOD OF CLEANING ACCUMULATED MATERIAL FROM A SLOT. JUNE 28, 1974.

3,919,737.—CLEANING APPARATUS. NOV. 18, 1975.

3,945,724.—VELOCITY COMPOSITION FOR BEAD BYPASS. MAR. 23, 1976.

3,950,088.—VELOCITY COMPENSATION FOR BEAD BYPASS WITH SPEED REDUCTION. APR. 13, 1976.

3,986,772.—BEAD BYPASS. OCT. 19, 1976.

3,988,060.—BEAD BYPASS SPEED REDUCTION. OCT. 26, 1976.

3,989,365.—MOTION COMPENSATION FOR BEAD BYPASS. NOV. 2, 1976.

4,066,452.—VELOCITY COMPENSATION FOR BEAD BYPASS. JAN. 3, 1978.

Class 12H

3,505,131.—PROCESS FOR THE PREPARATION OF A CUPROUS IODIDE CONDUCTIVE FILM. APR. 7, 1970. CAN. 0876074, GER. 1800653, GRB. 1244012, JAP. 0615874.

3,623,680.—CLUTCH/BRAKE MECHANISM. NOV. 30, 1971.

3,623,805.—DRIVE MECHANISM FOR IMAGING APPARATUS. NOV. 30, 1971.

3,628,859.—IMAGING MACHINE IMPROVEMENT. DEC. 21, 1971. BEL. 0760455, CAN. 0937436, FRA. 7047139, GRB. 1339549, ITL. 0913635, JAP. 0764505.

3,630,615.—METHOD AND APPARATUS FOR TRANSPORTING SUPPORT MATERIAL. DEC. 28, 1971.

3,630,884.—TRANSPARENT ELECTRODE IMAGING IMPROVEMENT. DEC. 28, 1971. CAN. 0890359, GRB. 1313696, JAP. 0739525.

3,639,049.—COPY SYSTEM. FEB. 1, 1972.

3,640,616.—OPAQUE ILLUMINATION AND SCANNING SYSTEM. FEB. 8, 1972. CAN. 0926674, GRB. 1337418, JAP. 0731615.

3,647,294.—MATERIALS APPLICATION AND CLEANING APPARATUS FOR XEROGRAPHIC APPARATUS. MAR. 7, 1972. CAN. 0913355, GRB. 1337146, JAP. 0759478.

3,654,654.—CLEANING APPARATUS. APR. 11, 1972. CAN. 0925257, GRB. 1335850, JAP. 0791054.

3,673,632.—CLEANING APPARATUS. JULY 4, 1972.

3,681,064.—PHOTELCTROPHRTC IMNG PROCS EMPLYNG MULTI-COMPNT ELCTRCLY PHOTOSNTV PARTICLE. AUG. 1, 1972.

3,685,897.—PHOTOELECTROPHORETIC APPARATUS USING PYRAMID GEARS. AUG. 22, 1972. CAN. 0957542.

3,687,109.—MATERIALS APPLICATION APPARATUS. AUG. 29, 1972. CAN. 0915907, GRB. 1337148.

3,697,167.—OPTICAL PROJECTION APPARATUS. OCT. 10, 1972. BEL. 0772913, CAN. 0955090. FRA. 7134731, GRB. 1316023, ITL. 0936735.

3,703,459.—LIQUID APPLICATOR. NOV. 21, 1972.

3,718,393.—IMAGING APPARATUS. FEB. 27, 1973.

3,722,993.—MATERIALS APPLICATION APPARATUS. MAR. 27, 1973.

3,730,620.—FOCUSING METHOD. MAY 1, 1973.

3,737,221.—ROTATIONAL DRIVE MECHANISM. JUNE 5, 1973.

3,744,897.—TRANSPARENT ELECTRODE FOR ELECTROPHORETIC IMAGING. JULY 10, 1973.

3,769,850.—PHOTOELECTROPHORETIC APPARATUS USING PYRAMID GEARS. NOV. 6, 1973.

3,776,628.—PHOTOELECTROPHORETIC IMAGING SYSTEM. DEC. 4, 1973.

3,784,294.—IMAGE DENSITY CONTROL. JAN. 8, 1974.

3,840,299.—PHOTOELECTROPHORETIC IMAGING APP FOR VARYING ADVANCING RATE OF VELOCITY OF ROLLER ELECTRODES. OCT. 8, 1974.

3,844,651.—PHOTELCTRPHRTC IMG APP FOR CONTRLNG TIME INTRVL OF SUCSSV ROLLR ELCTRDS LEAVNG AND ENTERNG IMG RE. OCT. 29, 1974.

3,920,330.—ELECTROPHORETIC IMAGING APPARATUS. NOV. 18, 1975. BEL. 0777719, CAN. 0961334, FRA. 7201005, GRB. 1376241, ITL. 0946357.

3,944,353.—BACKGROUND REDUCTION. MAR. 16, 1976.

3,950,640.—LAMP CONTROL AND LAMP SWITCH CIRCUIT FOR CONTROLLING LIGHT BALANCE. APR. 13, 1976.

3,952,700.—LIQUID APPLICATOR. APR. 27, 1976.

3,954,465.—ELECTROPHORETIC IMAGING METHODS. MAY 4, 1976. BEL. 0777719, CAN. 0961334, FRA. 7201005, GRB. 1376241, ITL. 0946357.

3,957,510.—OVERFLOW PREVENTION FOR LIQUID BETWEEN FLEXIBLE LAYERS ON A SOLID SURFACE. MAY 18, 1976.

3,981,459.—PHOTOELECTROPHORETIC ELECTROSTATIC TACKING CAPSTAN WEB TENSION SYS. SEPT. 21, 1976.

3,982,710.—PHOTOELECTROPHORETIC WEB TENSION SYSTEM. SEPT. 28, 1976.

3,985,434.—PHOTOELECTROPHORETIC PIGMENT DISCHARGING WITH AC COROTRON OR UV ILLUMINATION. OCT. 12, 1976.

3,989,366.—PHOTOELECTROPHORETIC IMAGING APPARATUS HAVING A DEVICE FOR INCREASING THE FRICTION FORCE BETWEE. NOV. 2, 1976. BEL. 0841080.

3,989,367.—APPARATUS FOR CONTACTING A ROLLER TO A SURFACE TO BE CONTACTED. NOV. 2, 1976.

3,991,992.—PHOTOELECTROPHORETIC WEB MACHINE SERVO DRIVE SYSTEM. NOV. 16, 1976. BEL. 0841079.

4,049,343.—COMBINATION IMAGING AND GROUNDING ROLLER. SEPT. 20, 1977. BEL. 841076, FRA. 7612176.

4,059,443.—ELECTRICAL INFORMATION STORAGE SYSTEM. NOV. 22, 1977.

4,073,583.—PHOTOELECTROPHORETIC HEAT & PRESSURE TRANSFER MECHANISMS. FEB. 14, 1978. BEL. 841078, FRA. 7612171.

4,084,896.—PHOTOELECTROPHORETIC WEB IMAGING APPARATUS. APR. 18, 1978. BEL. 841077, FRA. 7612178.

Class 12I

3,681,064.—PHOTELCTROPHRTC IMNG PROCS EMPLYNG MULTI-COMPNT ELCTRCLY PHOTOSNTV PARTICLE. AUG. 1, 1972.

3,820,987.—PHOTOELECTROPHORETIC IMAGING WITH FIXING ON A SEPARATE ELECTRODE. JUNE 28, 1974.

4,172,721.—DYE-AMPLIFIED IMAGING PROCESS. OCT. 30, 1979. AUS. 494739, BEL. 822400, CAN. 1033041, FRA. 7438506, GER. 7438730, GRB. 1484706, ITL. 1025877, SPN. 432205, SWD. 74144650.

Class 12J

3,642,364.—TRANSFER APPARATUS. FEB. 15, 1972. AUS. 0455718, BEL. 0758808, CAN. 0918412, CZC. 0164906, EGR. 0087486, FRA. 7041650, GRB. 1336720, HUN. 0169308, ITL. 0909310, PLD. 0082862, SPN. 0385456, STZ. 0518581, USR. 0406387.

3,791,823.—PHOTOELECTROPHORETIC IMAGING TRANSFER METHOD. FEB. 12, 1974.

3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975.

3,897,143.—IMAGING SYSTEM. JULY 29, 1975.

4,065,304.—METHOD FOR FIXING INK IMAGES. DEC. 27, 1977. BEL. 848487.

Class 12K

3,510,419.—PHOTOELECTROPHORETIC IMAGING METHOD. MAY 5, 1970. ARG. 0165519, AUS. 0425666, BEL. 0717829. CAN. 0876044, FRA. 0095234, GRB. 1242262, ITL. 0896927, JAP. 0657876, MEX. 0102064, PNM. 0001975, PRU. 0010174, VZL. 0023693.

3,561,864.—ELECTROPHORETIC COATING DEVICE. FEB. 9, 1971. ARG. 0174608, ATR. 0302815, AUS. 0447649, BEL. 0739544, CAN. 0890357, FRA. 6933095, GER. 1949861, GRB. 1277806, ITL. 0873705, JAP. 0686763, MEX. 0113013.

3,609,029.—MATERIALS APPLICATION APPARATUS. SEPT. 28, 1971. BEL. 0772565, CAN. 0953097, FRA. 7133987, GRB. 1366382, ITL. 0936510.

3,619,053.—PHOTOELECTROPHORETIC IMAGING SYSTEM. NOV. 9, 1971. GRB. 1324102, JAP. 0759477.

3,620,948.—PHOTOELECTROPHORETIC IMAGING SYSTEM EMPLOYING PRELIMINARY ELECTROPHRIC DSPSTN OF IMAGNG SUSPENS. NOV. 16, 1971. ATR. 0326480, AUS. 0447819, BEL. 0739754, CAN. 0899137, FRA. 6933734, GRB. 1280027, HOL. 0146951, ITL. 0877872, JAP. 0709041, MEX. 0114889, SPN. 0372065, STZ. 0508232, SWD. 0341929, VZL. 0015070.

3,645,874.—IMAGE DENSITY CONTROL IN PHOTOELECTROPHORETIC IMAGING. FEB. 29, 1972. BEL. 0756899, CAN. 0922957, FRA. 7035803, GRB. 1331621, ITL. 0908434, JAP. 0743836.

3,658,687.—APPARATUS FOR FORMING IMAGES WITH APPLICATOR SHEARING SMOOTHING AND CLEANING MEANS. APR. 25, 1972. CAN. 0916433, GRB. 1337149, JAP. 0751881.

3,695,755.—PHOTOELECTROPHORETIC CAMERA. OCT. 3, 1972. CAN. 0958580, GRB. 1359694.

3,744,896.—IMAGING SYSTEM. JULY 10, 1973.

3,769,009.—INKING SYSTEM FOR LIQUID PARTICLE MIGRATION ON AUTOMATIC MACHINE. OCT. 30, 1973. HOL. 7216013.
3,938,088.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 10, 1976.
3,944,353.—BACKGROUND REDUCTION. MAR. 16, 1976.
3,968,271.—COATING APPARATUS AND USE THEREOF. JULY 6, 1976.
3,993,020.—BLADE APPLICATOR ASSEMBLY. NOV. 23, 1976.
4,019,816.—COATING SYSTEM HAVING A COMPOSITE APPLICATOR ASSEMBLY PROVIDED WITH A RECIPROCATING BLADE. APR. 26, 1977.

Class 12L

3,622,691.—HIGH SPEED LIGHT RESPONSIVE TRANSFORM COMPUTER FOR A LIGHT-SENSITIVE PRINTING SYSTEM. NOV. 23, 1971. CAN. 0915813, GRB. 1335222, JAP. 0774709.
3,649,515.—PHOTOGRAPHIC MASKING SYSTEM. MAR. 14, 1972. CAN. 0936733, GRB. 1349610, JAP. 0774711.
3,715,209.—ELECTRICAL COLOR MASKING FOR A PHOTOELECTROPHORETIC IMAGING PROCESS. FEB. 6, 1973. BEL. 0763539, CAN. 0938491, FRA. 7107557. GRB. 1347139, ITL. 0918979, JAP. 0752723, MEX. 0120935.
3,810,758.—PHOTOGRAPHIC MASKING SYSTEM. MAY 14, 1974.

Class 12M

RE.27,117.—METAL FREE PHTHALOCYANINE IN THE NEW X-FORM-RE OF 3,357,989-D1170. APR. 20, 1971.
3,384,632.—ARYLAZO-4-ISOPROPOXY-1-NAPHTHOL COMPOUNDS. MAY 21, 1968. BEL. 0743897, CAN. 0787920, FRA. 1473703, GER. 1644400, GRB. 1145374, ITL. 0764015, JAP. 0578398.
3,402,177.—SUBSTITUTED 1-CYANO-2, 3-PHTHALOYL-7, 8-BENZOPYRROCOLINES. SEPT. 17, 1968. AUS. 0435189, BEL. 0743896, CAN. 0812820, GRB. 1145373.
3,432,415.—ELECTROPHORETIC IMG. PROCESS USING PHOTOSENSITIVE XANTHENONIUM SALTS. MAR. 11, 1969. AUS. 0439502, BEL. 0743895, CAN. 0851118, GER. 1522701, GRB. 1155747, JAP. 0650631, MEX. 0104632.
3,442,781.—PHOTOELECTROPHORETIC AND XEROGRAPHIC IMG. PROC. EMPL. TRIPHENODLOXAZINES AS ELECTRIC. PHOTOSENSIT. MAY 6, 1969. AUS. 0445582, BEL. 0743894, CAN. 0855152, GRB. 0175452, JAP. 0611634.
3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.
3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.
3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.
3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPHTO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.
3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. AUS. 0445639, BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.
3,474,020.—PHOTOELECTROPHORETIC IMAGING PROCESS USING QUINACRIDONES. OCT. 21, 1969. ARG. 0154377, AUS. 0414491, BEL. 0683405, CAN. 0834673, FRA. 0090574, GRB. 1155403, ITL. 0842587, JAP. 0601872, MEX. 0088935, SPN. 0328503, SWD. 6608734, VZL. 0023989.
3,478,064.—1,5-BIS-SUBSTITUTED ALKYLAMINO-ANTHRAQUINONES. NOV. 11, 1969. ARG. 0145636, AUS. 0419687, BEL. 0683222, CAN. 0880309, FRA. 1484968, GRB. 0155985, ITL. 0771955, JAP. 0581828, MEX. 0092775, SPN. 0328428, STZ. 0461273, SWD. 0328188, VZL. 0021224.
3,485,633.—ELECTROPHORETIC IMG PROC EMPL METALLIC LAKES OF FLUORESCEIN DERIVATIVES AS ELECTRICLY PHOTOSENS. DEC. 23, 1969. AUS. 0444394, BEL. 0743641, CAN. 0848386, GER. 1572387, GRB. 1190965, JAP. 0586923.
3,492,308.—PROCESS FOR PREPARING METAL FREE PHTHALOCYANINES - SYNTHESIS OF METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0922708, GRB. 1216887, JAP. 0586926.
3,492,309.—SYNTHESIS OF ALPHA METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0894803, GRB. 1206306, JAP. 0604155.
3,531,309.—COMPOSITIONS COMPRISING 1-CYANO-2,3-PHTHALOYL-7,8-BENZOPYRROCOLINES AND A CARRIER. SEPT. 29, 1970.
3,546,085.—PHOTOELECTROPHORETIC IMAGING PROCESS AND SUSPENSION. DEC. 8, 1970. BEL. 0710052, CAN. 0875493, FRA. 1568088, GER. 1622380, GRB. 1208812, ITL. 0823929, JAP. 0594741.
3,560,360.—PHOTOELECTROPHORETIC IMAGING PROCESS AND ANTHRAQUINONES AS THE ELECTRICALLY PHOTOSENSITIVE PARTIC. FEB. 2, 1971. CAN. 0850590, MEX. 0096584.
3,562,248.—BISAZO PGMTS DRVD CPLRS OBTD CONDG 8-AMINO-2-NAPHTHOLS W/ DICARBOXYLIC ACID CHLORIDES. FEB. 9, 1971. ATR. 0302037, AUS. 0435392, BEL. 0743422, CAN. 0889836, FRA. 6944290, GER. 1717183, GRB. 1217905, ITL. 0879047, JAP. 0608727.
3,574,182.—CALCIUM SALT OF 6-BROMO-1-1-SULFO-2-NAPHTHYLAZO-2-NAPHTHOL. APR. 6, 1971. ARG. 0168131, ATR. 0302812, AUS. 0429649, BEL. 0710053, CAN. 0878483, CHL. 0024254, CLB. 0018785, DNK. 0128493, FIN. 0049711, FRA. 1556484. GRB. 1197374, GRK. 0036648, IND. 0114221, ISR. 0029376, ITL. 0823989, JAP. 0605213, LXB. 0055364, MEX. 0099564, NOR. 0129593, NZL. 0151403, PRU. 0009483, PTG. 0049036, SAF. 0068559, SPN. 0349965, STZ. 0524844, SWD. 0351737, URG. 0008893, VZL. 0032776.
3,594,163.—METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X FORM. JULY 20, 1971.
3,615,558.—PHOTOLECTROPHORETIC IMAGING PROCESS EMPLOYING A FINELY-DIVIDED PHTHALOCYANINE PIGMENT. OCT. 26, 1971. CAN. 0850022.
3,616,393.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING A PIGMENT HAVING THE FORMULA RNS. OCT. 26, 1971.
3,634,221.—PIGMENT RECLAIMING. JAN. 11, 1972. BEL. 0744760, CAN. 0921427, FRA. 7001822, GRB. 1301382, ITL. 0886625.
3,635,981.—PHOTOELECTROPHORETIC IMAGING PIGMENT COMPOSITION AND PROCESS. JAN. 18, 1972. ARG. 0193337, ATR. 0305459, AUS. 0448778, BEL. 0741064, CAN. 0953143, FRA. 6937772, GER. 1955001, GRB. 1285610, ITL. 0879711, JAP. 0685461, MEX. 0114879.
3,645,883.—PHTELCTRPHRTC IMGNG APRTUS EMPLYNG PHTSNSTV PRTCLS EXHBTG FATIGUE CHARACTERISTICS. FEB. 29, 1972.
3,652,438.—PHTELCTRPHRTC IMGNG PROCS USNG DIVLNT HVY MTL SLT OR 1-1-SULFO-2-NAPHYLZO-2-NAPHLS AS IMGNG MAT. MAR. 28, 1972.
3,658,675.—PHOTOELECTROPHORETIC IMAGING PROCESS USING BISAZO PIGMENTS. APR. 25, 1972.
3,692,517.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING AN INSULATING CARRIER LQD CNTNG UNSATURATED COMP. SEPT. 19, 1972. ARG. 0164485, AUS. 0430397, BEL. 0715670, CAN. 0913968, FRA. 1563583, GER. 1772522, GRB. 1225316, ITL. 0834948, JAP. 0641521, MEX. 0100255, VZL. 0032921.
3,705,901.—PHOTOELECTROPHORETIC IMAGING COMPOSTION. DEC. 12, 1972.
3,753,708.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING QUINACRIDONE PIGMENTS. AUG. 21, 1973.
3,758,305.—PHOTOELECTROPHORETIC IMAGING PROCESS. SEPT. 11, 1973.
3,825,422.—IMAGING PROCESS. JULY 23, 1974. CAN. 0984201, GRB. 1442667.
3,867,141.—PHOTOELCTRC AND ELCTRPHOTGRPHC PGMNTS COMPRISNG DERIVATIVS OF CNDNSD PLYCLC AROMTC HYDROCRBN ALDE. FEB. 18, 1975.
3,922,169.—PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC A. NOV. 25, 1975.
3,923,506.—PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC A. DEC. 2, 1975.
3,953,462.—IMAGING PROCESS. APR. 27, 1976. ARG. 0202139, BEL. 0821400, GRB. 1467999.
3,957,829.—CERTAIN DINAPHTHO (1,2-B;2',3'-D)-FURAN-7,12 DIONES. MAY 18, 1976.
4,012,252.—IMAGING PROCESS UTILIZING 3-BROMO-N-2"-PYRIDYL-8,13-DIOXODIMAPHTHO-(2,1-; 3',3'-)-FURON-6-CARBO. MAR. 15, 1977. ARG. 0202139, BEL. 0821400, GRB. 1467999.
4,017,311.—PHOTOELECTROPHORETIC IMAGING SUSPENSION. APR. 12, 1977.

4,032,339.—PHOTOSENSITIVE COMPOSITION CONTAINING VANADYL PHTHALOCYANINE FOR PHOTOELECTROPHORECTIC IMAGING. JUNE 28, 1977.
4,062,854.—PROCESS FOR PREPARING N-SUBSTITUTED-8,13-DIOXODINAPHTHO-(2,1-B; 2,3-D)FURAN-6-CARBOXAMIDE. DEC. 13, 1977. CAN. 1023360, FRA. 7423881.
4,076,527.—PHOTOSENSITIVE COMPOSITION USEFUL IN PHOTOELECTROPHORETIC IMAGING. FEB. 28, 1978.
4,104,064.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING DINAPHTHO-FURANDIONE PIGMENTS. AUG. 1, 1978.

Class 12N

3,446,722.—ELECTROPHORETIC REFINING OF PHOTOSENSITIVE PARTICLES. MAY 27, 1969. AUS. 0424699, BEL. 0743903, CAN. 0840368. GER. 1622376, GRB. 1189636.
3,473,940.—PREPARATION OF PHOTOELECTROPHORETIC IMAGING SUSPENSION. OCT. 21, 1969. BEL. 0743899, CAN. 0847808, FRA. 1524448, GER. 1572386, GRB. 1161780, ITL. 0794432, JAP. 0594583, MEX. 0097623.
3,477,934.—IMAGING PROCESS. NOV. 11, 1969. ARG. 0158372, AUS. 0416251, BEL. 0700645, CAN. 0850023, FRA. 1550998, GRB. 1196044, ITL. 0804665, JAP. 0725097, MEX. 0098737, SPN. 0342376, STZ. 0481408, SWD. 0336525, VZL. 0021263.
3,551,313.—IMAGE CONTRAST CONTROL IN PHOTOELECTROPHORETIC IMAGING - PHAROS CONTRAST CONTROL. DEC. 29, 1970. ATR. 0302814, AUS. 0448317, BEL. 0738218, CAN. 0899689, FRA. 6929449, GER. 1944510, GRB. 1274525, ITL. 0871538, JAP. 0708365, SWD. 0341130.
3,553,093.—COLOR PHOTOELECTROPHORETIC IMAGING PROCESS. JAN. 5, 1971. ATR. 0286783, AUS. 0416331, BEL. 0692911, CAN. 0818388, FRA. 1471745, GER. 1522743, GRB. 1149665, IND. 0104183, ISR. 0025304. ITL. 0762674, JAP. 0608337, MEX. 0089790, NOR. 0123368, NZL. 0144531, STZ. 0479099, SWD. 0334540.
3,586,615.—PHOTOELECTROPHORETIC IMAGING PROCESS INCLUDING THE USE OF AN ELECTRICALLY CHRGD SUSPNSN COATNG. JUNE 22, 1971. BEL. 0743921, CAN. 0891972, FRA. 6945567, GER. 1965460, GRB. 1284429, HOL. 1284429, ITL. 0880418, JAP. 0729281.
3,595,770.—SEQUENTIAL PHOTOELECTROPHORETIC IMAGING SYSTEM. JULY 27, 1971. ARG. 0176384, ATR. 0299697, AUS. 0429715, BEL. 0722300, BRA. 0087996, CAN. 0891970, CHL. 0024332, DNK. 0126879, FRA. 1589548, GRB. 1239259, ITL. 0845021, LXB. 0057101, MEX. 0103850, NZL. 0154114, PNM. 0001418, PTG. 0050485, SAF. 0686705, SPN. 0359239, STZ. 0496265, SWD. 0339172, URG. 0009317, VZL. 0023705.
3,601,483.—IMAGING APPARATUS. AUG. 24, 1971.
3,607,256.—FULLY-ENCLOSED ELECTROPHORETIC IMAGING SYSTEM. SEPT. 21, 1971.
3,616,390.—ELECTROPHORETIC IMAGING METHOD CHARACTERIZED BY EXPOSURE OF ELECTRCLY PHOTSNSTV PRTCLS AT LIQUI. OCT. 26, 1971. ATR. 0322980, AUS. 0448380. BEL. 0743423, CAN. 0890356, FRA. 6944288, GER. 1947105, GRB. 1249546, ITL. 0879048, JAP. 0688351.
3,616,395.—PHOTOELECTROPHORETIC IMAGING WITH CORONA FIELD APPLICATION. OCT. 26, 1971. CAN. 0922142, GRB. 1318565, JAP. 0756962.
3,620,950.—ELECTROPHORETIC IMAGING EMPLOYING PERIODIC ELECTROMAGNETIC RADIATION. NOV. 16, 1971. ATR. 0302045, AUS. 0449606, BEL. 0739750, CAN. 0887022, FRA. 5934262, GRB. 1283384, ITL. 0877875, JAP. 0718339.
3,634,221.—PIGMENT RECLAIMING. JAN. 11, 1972. BEL. 0744760, CAN. 0921427, FRA. 7001822, GRB. 1301382, ITL. 0886625.
3,642,598.—PHOTOELECTROPHORETIC IMAGING METHOD AND APPARATUS. FEB. 15, 1972. ARG. 0188632, BEL. 0756481, CAN. 0922144, FRA. 7034709, GRB. 1324105, ITL. 0908073, JAP. 0740359, MEX. 0115601, VZL. 0032786.
3,645,874.—IMAGE DENSITY CONTROL IN PHOTOELECTROPHORETIC IMAGING. FEB. 29, 1972. BEL. 0756899, CAN. 0922957, FRA. 7035803, GRB. 1331621, ITL. 0908434, JAP. 0743836.
3,645,883.—PHTELCTRPHRTC IMGNG APRTUS EMPLYNG PHTSNSTV PRTCLS EXHBTG FATIGUE CHARACTERISTICS. FEB. 29, 1972.
3,647,659.—PHTELCTRPHRTC IMGNG PRCS WHEREIN IMGNG ELCTRCL FLD APPLD SUBSEQUENT TO IMAGE WISE EXPOSURE. MAR. 7, 1972. BEL. 0772912, CAN. 0958581, FRA. 7134730, GRB. 1354798, ITL. 0936734.
3,657,091.—ELECTROPHORETIC IMAGING METHOD EMPLOYING A PERIODIC ELECTRIC FIELD. APR. 18, 1972. ARG. 0174612, ATR. 0302816, AUS. 0448524, BEL. 0739752, CAN. 0913970, FRA. 6933735, GRB. 1282469, ITL. 0889439, JAP. 0709039, MEX. 0114739.
3,663,396.—KINESCOPE PHOTOELECTROPHORETIC IMAGING METHODS AND SYSTEMS. MAY 16, 1972. ARG. 0196858, BEL. 0762417, CAN. 0935965, FRA. 7104350, GRB. 1345571, ITL. 0918121, JAP. 0743838, MEX. 0131834.
3,664,941.—PHTELCTRPHRTC REVERSAL IMGNG USNG SUSPENSION CONTAINING VITAMIN PRECURSOR, B-CAROTENE. MAY 23, 1972.
3,666,472.—ELECTROPHORETIC IMAGING COMPOSITION - IMPROVEMENT OF PHAROS POLYCHROME IMAGING SYSTEM. MAY 30, 1972. ATR. 0302042, AUS. 0455711, BEL. 0739753, CAN. 0899138, FRA. 6933736, GRB. 1279284, HOL. 0147548, ITL. 0889440, JAP. 0709040, MEX. 0116450.
3,669,872.—IMAGING SYSTEM. JUNE 13, 1972.
3,676,313.—REMOVING UNDESIRED POTENTIAL FROM BLOCKING ELECTRODE IN A PHOTOELECTROPHORETIC IMAGING SYSTEM. JULY 11, 1972.
3,681,221.—PHOTOELECTROPHORETIC IMAGING BY PHOSPHORESCENCE. AUG. 1, 1972. CAN. 0935013, GRB. 1348121.
3,696,020.—ELECTROPHORETIC IMGNG APRTS INCLUDING MEANS TO COAT AND ELCTRFY IMGNG ELCTRODE. OCT. 3, 1972.
3,723,288.—ELECTROPHORETIC IMAGING APPARATUS INCLUDING MEANS TO PROJECT AN IMAGE AT A LIQUID NIP. MAR. 27, 1973.
3,737,310.—BACKGROUND REDUCTION. JUNE 5, 1973.
3,741,639.—PHOTOELECTROPHORETIC IMAGING BY PHOSPHORESCENCE. JUNE 26, 1973.
3,741,760.—IMAGING SYSTEM. JUNE 26, 1973.
3,748,035.—METHOD FOR SEQUENTIAL ILLUMINATION IN A POLYCHROME PROCESS. JULY 24, 1973. CAN. 0960288, GRB. 1416328.
3,772,013.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING ELECTRICALLY PHOTOSENSITIVE PARTICLES AND INERT PA. NOV. 13, 1973. ARG. 0196295, ATR. 0327682, BEL. 0777724, CAN. 0957543, FRA. 7200998, GRB. 1370026, ITL. 0946356, JAP. 0759477, MEX. 0124561, SPN. 0398586, SWD. 0367075, VZL. 30687.
3,782,932.—ELECTROPHORETIC IMAGING PROCESS USING TRANSPARENT PARTICLES. JAN. 1, 1974. ATR. 0302043, AUS. 0446066, BEL. 0743424, CAN. 0913441, FRA. 6944289, GER. 1949149, GRB. 1280900, ITL. 0897053. JAP. 0699518.
3,785,816.—ELIMINATING CORONA ARCING IN PHOTOELECTROPHORETIC IMAGING. JAN. 15, 1974.
3,787,206.—PHOTOELECTROPHORETIC IMAGING METHOD INCLUDING AT LEAST ONE ELECTRODE CARRYING A PATTERN. JAN. 22, 1974.
3,801,195.—ELECTROPHORETIC IMAGING. APR. 2, 1974. ARG. 0174613, ATR. 0293874, AUS. 0455712, BEL. 0739747, CAN. 0922141, FRA. 6933738, GER. 1949416, GRB. 1279285, HOL. 0146950, ITL. 0877873, JAP. 0709042, MEX. 0108820.
3,804,620.—METHOD OF PRODUCING PLANOGRAPHIC PLATES BY PHOTOELECTROPHORETIC IMAGING. APR. 16, 1974.
3,811,764.—APPARATUS FOR PHOTOELECTROPHORETIC IMAGING USING A PERIODIC ELECTRIC FIELD. MAY 21, 1974.
3,850,627.—ELECTROPHORETIC IMAGING METHOD. NOV. 26, 1974. BEL. 0777719, FRA. 7201005, GRB. 1376241, ITL. 0946357.
3,857,549.—PHOTOELECTROPHORETIC IMAGING APPARATUS. DEC. 31, 1974.
3,857,707.—PHOTOELECTROPHORETIC IMAGING PROCESS USING DRY PIGMENT COATED SUBSTRATE. DEC. 31, 1974.
3,881,920.—PHOTOELECTROPHORETIC IMAGING PROCESS. MAY 6, 1975.
3,901,701.—PHOTOELECTROPHORETIC IMAGING PROCESS USING PHOTOCONDUCTIVE ELECTRODE WHICH ALTERS SPECTRAL RESPONSE. AUG. 26, 1975.
3,905,812.—IMAGING PROCESS. SEPT. 16, 1975. FRA. 7413994, GRB. 1443121.
3,920,330.—ELECTROPHORETIC IMAGING APPARATUS. NOV. 18, 1975. BEL. 0777719, CAN. 0961334, FRA. 7201005, GRB. 1376241, ITL. 0946357.

3,933,487.—IMAGING COMPOSITION FOR PHOTOELECTROPHORETIC IMAGING SYSTEM. JAN. 20, 1976. CAN. 0973005, GRB. 1375941.
3,954,465.—ELECTROPHORETIC IMAGING METHODS. MAY 4, 1976. BEL. 0777719, FRA. 7201005, GRB. 1376241, ITL. 0946357.
3,961,949.—PHOTOELECTROPHORETIC IMAGING METHOD PRODUCING A DESIRED IMAGE BORDER. JUNE 8, 1976.
3,967,960.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING DARK CHARGE INJECTING ELEMENT. JULY 6, 1976.
4,023,968.—PHOTOELECTROPHORETIC COLOOR IMAGING PROCESS IN WHICH BACK MIGRATION IS ELIMINATED. MAY 17, 1977.
4,069,047.—TRANSFER OF PHOTOELECTROPHORETIC IMAGES. JAN. 17, 1978.
4,078,928.—PHOTOELECTROPHORETIC IMAGING SYSTEM. MAR. 14, 1978.
4,172,721.—DYE-AMPLIFIED IMAGING PROCESS. OCT. 30, 1979. AUS. 494739, BEL. 822400, CAN. 1033041, FRA. 7438506, GER. 7438730, GRB. 1484706. ITL. 1025877, SPN. 432205, SWD. 74144650.

Class 12O

3,647,660.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING A HALOGEN CONTAINING SUSPENSION. MAR. 7, 1972.
3,869,286.—PHOTOELECTROPHORETIC IMAGING WITH COPPER-FREE CHLOROPHYLL IN THE CARRIER LIQUID. MAR. 4, 1975.

Class 12P

RE.28,260.—ELECTROPHORETIC IMAGING PROCESS INCLUDING APPL OF DYNAMIC STRESS ON THE PARTICLE SUSPENSION. DEC. 3, 1974. ARG. 0174614, ATR. 0302044, AUS. 0448318, BEL. 0739748, CAN. 0890358, FRA. 6934260, GER. 1949148, GRB. 1282736, HOL. 0146301, ITL. 0877874, JAP. 0718340, MEX. 0108886.
3,595,772.—METHOD OF BREAKING PARTICLE AGGLOMERATES IN THE PHOTO-ELECTROPHORETIC IMAGING SYSTEM. JULY 27, 1971. ARG. 0176808, ATR. 0293875, AUS. 0445175, BEL. 0739749, CAN. 0912398, FRA. 6934261, GRB. 1290370, ITL. 0887503, JAP. 0712831, MEX. 0127747.
3,616,391.—ELECTROPHRTC IMGNG PRCSS INC APPLCTN OF DYNAMIC STRESS ON PARTCL SUSPSN-REISSUED D 2177R. OCT. 26, 1971. ARG. 0174614, ATR. 0302044, AUS. 0448318, BEL. 0739748, CAN. 0890358, FRA. 6934260, GER. 1949148, GRB. 1282736, HOL. 0146301, ITL. 0877874, JAP. 0718340, MEX. 0108886.
3,666,472.—ELECTROPHORETIC IMAGING COMPOSITION - IMPROVEMENT OF PHAROS POLYCHROME IMAGING SYSTEM. MAY 30, 1972. ATR. 0302042, AUS. 0455711, BEL. 0739753, CAN. 0899138, FRA. 6933736, GRB. 1279284, HOL. 0147548, ITL. 0889440, JAP. 0709040, MEX. 0116450.
3,743,404.—PHTOELECTROPHORETIC IMGNG APPTS INCNG MEANS TO SIMULTNUSLY APPLY COMPRSVE STRESS AND SHEAR TO IMGNG. JULY 3, 1973.
3,784,302.—ELECTROPHORETIC IMAGE APPARATUS INCLUDING APPLICATION OF DYNAMIC STRESS ON THE PARTICLE SUSPENS. JAN. 8, 1974.
3,833,493.—IMAGING PROCESS. SEPT. 3, 1974.
3,943,049.—APPARATUS FOR SEPARATING AGGLOMERATED PARTICLES WITH SUSPENSION. MAR. 9, 1976.

Class 12Q

3,642,364.—TRANSFER APPARATUS. FEB. 15, 1972. AUS. 0455718, BEL. 0758808, CAN. 0918412, CZC. 0164906, EGR. 0087486, FRA. 7041650, GRB. 1336720, HUN. 0169308, ITL. 0909310, PLD. 0082862, SPN. 0385456, STZ. 0518581, USR. 0406387.
3,655,370.—PHOTOELECTROPHORETIC IMAGE TRANSFER. APR. 11, 1972.
3,705,797.—FIXING PROCESS FOR PHOTOELECTROPHORETIC IMAGING. DEC. 12, 1972.
3,711,196.—IMAGE TRANSFER. JAN. 16, 1973.
3,791,823.—PHOTOELECTROPHORETIC IMAGING TRANSFER METHOD. FEB. 12, 1974.
3,804,508.—PHOTOELECTROPHORETIC APPARATUS FOR HEAT FACING AN IMAGE. APR. 16, 1974.
3,897,143.—IMAGING SYSTEM. JULY 29, 1975.
4,065,304—METHOD FOR FIXING INK IMAGES. DEC. 27, 1977. BEL. 848487.

Class 12R

3,574,614.—PROCESS OF PREPARING MULTIPLE COPIES FROM A XEROPRINTING MASTER. APR. 13, 1971. ATR. 0305769, AUS. 0448396, BEL. 0743660, CAN. 0882599, FRA. 6944513, GRB. 1209060, ITL. 0899118, JAP. 0710908.
3,607,256.—FULLY-ENCLOSED ELECTROPHORETIC IMAGING SYSTEM. SEPT. 21, 1971.
3,682,628.—PHOTOELECTROPHORETIC FACSIMILE TRANSMISSION. AUG. 8, 1972. CAN. 0957889, GRB. 1365163.
3,800,302.—RECORDING OSCILLOGRAPH UTILIZING PHOTOELECTROPHORETIC TECHNIQUES. MAR. 26, 1974.
3,849,132.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING A CHROMOGENIC REACTION. NOV. 19, 1974. BEL. 0809399, GRB. 1447104.
3,938,088.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 10, 1976.

Class 15

3,693,517.—PRINTING APPARATUS—KALEIDOSCOPE PRINTER WITH CIRCUMFERENTIAL STRIPS. SEPT. 26, 1972. CAN. 0948265, GRB. 1330327.
3,801,319.—IMAGING METHOD UTILIZING CHEMICAL REACTIVITIES OF PHOTOEXCITED STATES OF AROMATIC HYDROXY COMPO. APR. 2, 1974. CAN. 1000549, GRB. 1429501.
3,847,644.—IMAGING BY PHASE AGGREGATION FROM BLOCK COPOLYMERS. NOV. 12, 1974.
3,851,584.—CHEMICAL REPRODUCTION SYSTEMS. DEC. 3, 1974.
3,888,670.—IMAGING METHOD. JUNE 10, 1975.
3,915,706.—IMAGING SYSTEM BASED ON PHOTODEGRADABLE POLYALDEHYDES. OCT. 28, 1975.
3,923,514.—METHOD FOR THE PREPARATION OF RELIEF PRINTING MASTERS. DEC. 2, 1975.
3,929,477.—IMAGE PRODUCING TECHNIQUES OF SUPERCONDUCTING MATERIAL IN A MAGNETIC FIELD. DEC. 30, 1975.
3,930,858.—HEAT DEVELOPMENT PROCESS UTILIZING A PHOTOSENSITIVE COMPOSITION CONTAINING A HALOGENATED POLYME. JAN. 6, 1976.
3,963,491.—IMAGING METHOD. JUNE 15, 1976.
3,986,874.—DRIOGRAPHIC IMAGING METHOD. OCT. 19, 1976.
3,990,043.—CHARACTER CODING AND RECOGNITION SYSTEM. NOV. 2, 1976.
4,009,466.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 22, 1977.
4,032,980.—RECORDED MAGNETIC MEMBER VIEWING APPARATUS. JUNE 28, 1977.
4,043,298.—MAGNETIC TONER SCAVENGING SYSTEM. AUG. 23, 1977.
4,064,453.—MAGNETIC FIELD DETECTOR. DEC. 20, 1977.
4,074,276.—MAGNETIC IMAGING SYSTEM USING HEAT. FEB. 14, 1978.
4,076,387.—MAGNETIC DISPLAY. FEB. 28, 1978.
4,089,684.—IMAGING METHOD UTILIZING THE CHEMICAL REACTIVITY OF DONOR-ACCEPTOR MIXTURES. MAY 16, 1978.
4,095,233.—METHOD FOR FORMING A CHARGE PATTERN. JUNE 13, 1978.
4,100,088.—IMAGING COMPOSITION. JULY 11, 1978.
4,101,943.—CONTROLLED-WIDTH-SYNCHRONIZATION OF RECORDED PIXELS. JULY 18, 1978.
4,115,786.—CONSTANT WAVELENGTH MAGNETIC RECORDING. SEPT. 19, 1978.
4,133,683.—AGGLOMERATION IMAGING METHOD. JAN. 9, 1979.
4,135,194.—ROTARY HEAD MAGNETIC RECORDING AT FIXED WAVELENGTH WITH VARYING SPEEDS. JAN. 16, 1979.
4,172,721.—DYE-AMPLIFIED IMAGING PROCESS. OCT. 30, 1979. AUS. 494739, BEL. 822400, CAN 1033041, FRA. 7438506, GER. 7438730, GRB. 1484706, ITL. 1025877, SPN. 432205, SWD. 74144650.
4,175,836.—METHOD AND APPARATUS FOR FORMING VISIBLE IMAGES. NOV. 27, 1979. GRB. 1558014.

Class 15A

3,320,060.—DEFORMATION IMAGE REPRODUCTION PROCESS UTILIZING A VOLTAGE THRESHOLD REDUCING SURFACTANT. MAY 16, 1967. CAN. 0807325, FRA. 1416119, GER. 1261867, GRB. 1097919, ITL. 0739830, JAP. 0519668.
3,338,710.—FROST THERMOGRAPHY. AUG. 29, 1967.
3,404,001.—THERMOPLASTIC DEFORMATION IMAGING WITH COLOR REAGENTS. OCT. 1, 1968. CAN. 0801265, FRA. 1459100, GER. 1497214, GRB. 1124925, ITL. 0725974, JAP. 0529727.
3,615,387.—STRIPPABLE LAYER RELIEF IMAGING PROCESS. OCT. 26, 1971. CAN. 0887033.
3,697,184.—APPARATUS FOR EVALUTING THE RECORDING CHARACTERISTICS OF A THERMOPLASTIC PHOTORECEPTOR. OCT. 10, 1972. CAN. 1083484, GRB. 1389471.
3,715,207.—ELCTRSTCLY DEFORMABLE THERMOPLASTIC LAYER CONTAINING A 1,4-DIALKYLAMINO-9, 10-ANTHRAQUINONE DYE. FEB. 6, 1973.
3,729,310.—SURFACE DEFORMABLE IMAGING PROCESS AND MEMBER. APR. 24, 1973.
3,741,759.—FROST IMAGING PROCESS. JUNE 26, 1973.
3,795,514.—DEFORMATION IMAGING METHOD. MAR. 5, 1974.
3,869,612.—COPY APPARATUS WITH MEANS TO EFFECT VISIBLE RAY IMAGING AND INFRARED RAY TRANSFIXING. MAR. 4, 1975. STZ. 0032775.
3,893,416.—DEVELOPMENT AND CLEANING APP FOR REVERSE PATH MACHINE. JULY 8, 1975.
3,902,062.—REVERSE PATH IMAGING AND TRANSFIXING COPYING METHOD. AUG. 26, 1975. BEL. 0823656.
3,904,875.—SINGLE RADIATION RAY PATH FOR THERMOGRAPHIC IMAGING & TRANSFIXING OR FUSING. SEPT. 9, 1975. ARG. 0207128.
3,906,896.—INK APPLICATOR. SEPT. 23, 1975. CAN. 0974753.
3,908,125.—REVERSE PATH IMAGING AND TRANSFIXING COPYING MACHINE. SEPT. 23, 1975.
3,909,613.—COPYING METHOD AND APP WITH MEANS TO EFFECT VISIBLE RAY IMAGING AND INFRARED RAY TRANSFIXING OR FUS. SEPT. 30, 1975.
3,923,004.—DEVELOPMENT AND CLEANING APPARATUS FOR REVERSE PATH MACHINE. DEC. 2, 1975. BEL. 0823656.
3,932,025.—IMAGING SYSTEM. JAN. 13, 1976.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,946,230.—COPY METHOD UTILIZING SINGLE RADIANT RAY PATH FOR IMAGING AND TRANSFIXING. MAR. 23, 1976.
3,949,160.—ELECTRO-OPTIC READ OUT OF THERMOPLASTIC DEFORMATION PATTERNS. APR. 6, 1976.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,984,262.—METHOD OF MAKING A SUBSTRATE STRIPED PLANAR LASER. OCT. 5, 1976.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,051,463.—METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN. SEPT. 27, 1977. FRA. 7701769.
4,063,222.—SELECTIVE ERASURE OF IMAGE RECORDING DEVICES. DEC. 13, 1977. FRA. 7701592.
4,099,262.—AUTOMATIC MEMORY CONTROL FEEDBACK SYSTEM FOR A CYCLING OPTICAL IMAGING SYSTEM. JULY 4, 1978.
4,109,316.—METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN. AUG. 22, 1978.
4,133,611.—TWO-PAGE INTERWEAVED RANDOM ACCESS MEMORY CONFIGURATION. JAN. 9, 1979.

Class 15B

3,350,205.—METHOD OF IMAGE REPRODUCTION BY PHOTOPOLYMERIZATION AND BLUSHING. OCT. 31, 1967. CAN. 0717934, GRB. 1095174, JAP. 0561238.
3,561,962.—METHOD OF IMAGE REPRODUCTION BY PHOTOPOLYMERIZATION AND BLUSHING. FEB. 9, 1971.
3,834,906.—LIGHT ACTIVATING IMAGING PROCESS. SEPT. 10, 1974.
3,885,963.—LIGHT ACTIVATING IMAGING PROCESS. MAY 27, 1975.
3,890,147.—LIGHT ACTIVATING IMAGING PROCESS. JUNE 17, 1975.
3,892,180.—LIGHT ACTIVATING IMAGING PROCESS. JULY 1, 1975.
3,892,570.—LIGHT ACTIVATING IMAGING PROCESS. JULY 1, 1975.

Class 15B 2

3,862,841.—POLYMERIZATION IMAGING BY CHARGE INJECTION FROM A PHOTOCONDUCTIVE LAYER. JAN. 28, 1975.

Class 15C

3,250,636.—MTD AND APTS IMAGE REPRODCTN W/ USE OF REUSABLE HEAT DEMAGNETIZABLE FERROMAGNETIC IMAGING LAYER. MAY 10, 1966. CAN. 0711404, GRB. 1070986, JAP. 0487336.
3,526,191.—DUPLICATING PROCESS EMPLOYING MAGNETIC DEVELOPER MATERIAL. SEPT. 1, 1970. CAN. 0903830, GER. 1671576, GRB. 1208307.
4,014,065.—MAGNETIC DEVELOPER REMOVAL SYSTEM. MAR. 29, 1977.
4,030,104.—THERMO-MAGNETIC IMAGE TRANSFER APPARATUS. JUNE 14, 1977.
4,032,923.—THERMOMAGNETIC IMAGING APPARATUS. JUNE 28, 1977.
4,035,810.—MAGNETIC INTERPOSITIVE METHOD WITH ELECTROSTATIC IMAGING. JULY 12, 1977.
4,038,665.—DONOR TRANSFER OF MAGNETIC TONER. JULY 26, 1977.
4,060,811.—MAGNETIC LATENT IMAGE CREATION. NOV. 29, 1977.
4,067,018.—EXCESSIVE MAGNETIC DEVELOPER DISPLACEMENT SYSTEM. JAN. 3, 1978.
4,092,954.—HIGH SPEED TANK DEVELOPMENT SYSTEM. JUNE 6, 1978.
4,096,485.—SUCCESSIVE DEVELOPMENT MAGNETIC IMAGING APPARATUS. JUNE 20, 1978.
4,101,320.—MAGNETIC IMAGING METHOD. JULY 18, 1978.
4,101,904.—MAGNETOGRAPHIC IMAGING MEMBER AND THE METHOD OF ITS USE. JULY 18, 1978.
4,101,943.—CONTROLLED-WIDTH-SYNCHRONIZATION OF RECORDED PIXELS. JULY 18, 1978.
4,108,111.—DEVELOPER HOUSING. AUG. 22, 1978.
4,108,112.—DEVELOPER HOUSING. AUG. 22, 1978.
4,112,156.—MAGNETIC TONER RECOVERY METHOD USING ALTERNATING MAGNETIC FIELD POLARITIES. SEPT. 5, 1978. GRB. 1530562.
4,115,786.—CONSTANT WAVELENGTH MAGNETIC RECORDING. SEPT. 19, 1978
4,121,261.—SYNCHRONOUS HELICAL SCAN-HELICAL RECORD MAGNETIC IMAGING. OCT. 17, 1978.
4,135,194.—ROTARY HEAD MAGNETIC RECORDING AT FIXED WAVELENGTH WITH VARYING SPEEDS. JAN. 16, 1979.
4,138,685.—RECORDING WITH IMAGEWISE ALTERATION OF MAGNETIC ATTRACTION OF DONOR. FEB. 6, 1979.
4,181,426.—RANDOM-DUMP STORAGE BUFFER FOR MOVING WEB. JAN. 1, 1980. GRB. 1554696.
4,199,766.—RANDOM-DUMP STORAGE BUFFER FOR MOVING WEB. APR. 22, 1980. GRB. 1554696.

Class 15D

3,441,410.—DEFORMATION IMAGING PROCESSES USING ELECTRICALLY PHOTOSENSITIVE PHOTOCHROMIC MATERIALS. APR. 29, 1969. CAN. 0801267, FRA. 1485348, GER. 1522696, GRB. 1156151, JAP. 0545759.
3,441,411.—IMAGE FORMATION THROUGH CHEMICAL REACTION OF PHOTOCHROMIC MATER. APR. 29, 1969. CAN. 0834676, GRB. 1165215.
3,442,646.—FRMATION OF LIGHT SCATTERING IMGS IN LAYERS COMPRSNG ORGANIC PHOTOCHROMIC MATERIALS. MAY 6, 1969. GRB. 1164484.
3,450,530.—PHOTOGRAPHIC IMAGING BY MEANS THE SURFACE TENSION CREATED BY PHOTOCHROMIC MATERIALS. JUNE 17, 1969.
3,450,531.—ADHESIVE IMAGING ON PHOTOCHROMIC LAYERS. JUNE 17, 1969.
3,450,533.—FORMATION OF LIGHT SCATTERING IMAGES IN PHOTOCHROMIC LAYERS. JUNE 17, 1969. CAN. 0875500.
3,451,811.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES USING ELECTRICALLY PHOTOSENSITIVE PHOTOCHROMIC MATERIALS. JUNE 24, 1969. CAN. 0828692, JAP. 0573734.
3,471,290.—PHOTOCHROMIC PHOTORESIST IMAGING. OCT. 7, 1969.
3,482,973.—IMAGING SYSTEM. DEC. 9, 1969.

3,967,964.—PHOTOSENSITIVE FILM COPRINSING AN ORGANOSELENIUM AND AN ORGANSMERCURY. JULY 6, 1976.
3,973,966.—PHOTOCHROMIC COMPOSITION CONTAINING A DIPHENYL DIBENZOCHRON-3-ENE. AUG. 10, 1976.
4,007,372.—IMPROVED METHOD & ARTICLE FOR IMAGE REPRODUCTION. FEB. 8, 1977.
4,050,937.—IMAGEWISE EXPOSING AND HEATING A MICROIMAGING FILM CONTAINING AN ORGANO DISELENIDE, A TERTI. SEPT. 27, 1977.
4,050,939.—MICROIMAGING FILM CONTAINING AN ORGANO DISELENDIE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN. SEPT. 27, 1977.
4,106,936.—MICROIMAGING FILM CONTAINING AN ORGANIC DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE & IN. AUG. 15, 1978.

Class 15D 3

4,133,611.—TWO-PAGE INTERWEAVED RANDOM ACCESS MEMORY CONFIGURATION. JAN. 9, 1979.

Class 15E

3,635,708.—VESICULAR IMAGING PROCESS. JAN. 18, 1972.
3,847,644.—IMAGING BY PHASE AGGREGATION FROM BLOCK COPOLYMERS. NOV. 12, 1974.

Class 15F

3,396,401.—APPARATUS AND METHOD FOR MARKING OF INTELLIGENCE ON A RECORD MEDIUM. AUG. 6, 1968.
3,671,237.—METHOD FOR PRODUCING IMAGES. JUNE 20, 1972. CAN. 0886492, GRB. 1317043.
3,753,705.—AGGLOMERATION IMAGING PROCESS USING HARDENABLE MATERIAL. AUG. 21, 1973. CAN. 0929350, GRB. 1330518.
4,029,502.—IMAGING SYSTEM CONTAINING AGGLOMERABLE MATERIAL. JUNE 14, 1977. ARG. 0172317, BEL. 0737813, CAN. 0884217, FRA. 6928725, GER. 1942380, GRB. 1286501, ITL. 0870234, SWD. 0340954.
4,082,549.—AGGLOMERATION IMAGING PROCESS. APR. 4, 1978.
4,084,966.—IMAGING SYSTEM USING AGGLOMERABLE MIGRATION MARKING MATERIAL. APR. 18, 1978.
4,133,683.—AGGLOMERATION IMAGING METHOD. JAN. 9, 1979.

Class 17

4,190,358.—APPARATUS FOR POSITIONING AN ORIGINAL IN REPRODUCING MACHINE. FEB. 26, 1980.

Class 17A

3,909,609.—LIGHT SOURCE MEASURING APPARATUS. SEPT. 30, 1975.

Class 17A 1

3,445,660.—METHOD FOR DETECTION OF ULTRAVIOLET RADIATION. MAY 20, 1969.

Class 17A 2

3,330,700.—SOLAR-CELL PANELS. JULY 11, 1967.
3,359,137.—SOLAR CELL CONFIGURATION. DEC. 19, 1967.
3,513,040.—RADIATION RESISTANT SOLAR CELL. MAY 19, 1970.

Class 17A 3

3,351,493.—DIFFUSED RADIATION TRACKING TRANSDUCER HAVING A LATERAL PHOTO VOLTAGE JUNCTION. NOV. 7, 1967.
3,443,102.—SEMICONDUCTOR PHOTOCELL DETECTOR WITH VARIABLE SPECTRAL RESPONSE. MAY 6, 1969.

Class 17A 4

3,901,607.—HIGH APERTURE REFLECTION PHOTODETECTOR APPARATUS. AUG. 26, 1975.
4,085,321.—MULTIPHASE PHOTOACTIVATED SWITCH. APR. 18, 1978.

Class 17B

3,650,604.—INTER-FERAMETRIC SCANNING APPARATUS AND METHOD. MAR. 21, 1972. CAN. 0954354, GRB. 1363263.
3,650,605.—INTERFERAMETRIC APPARATUS WITH CONTROLLED SCANNING MEANS. MAR. 21, 1972. CAN. 0952749.
3,902,061.—DIGITAL OPTICAL COMPUTER TECHNIQUES. AUG. 26, 1975.
3,978,342.—DUAL MODE RADIATION TRANSMITTING APPARATUS. AUG. 31, 1976.
3,987,685.—CURSOR POSITION DEVICE. OCT. 26, 1976.
4,162,118.—WAVEGUIDE IMAGING SYSTEM. JULY 24, 1979.

Class 17B 1

3,476,473.—FONT INDICATOR. NOV. 4, 1969.
3,481,668.—IMAGE PROJECTION APPARATUS. DEC. 2, 1969.
3,501,838.—PANTOGRAPHIC IMPLEMENTED OVERHEAD PROJECTOR. MAR. 24, 1970.
3,670,633.—RECORDING APPARATUS. JUNE 20, 1972.
3,677,148.—OPTICAL RECORDER. JULY 18, 1972.
3,678,820.—OPTICAL SYSTEM FOR PROJECTION RECORDING APPARATUS. JULY 25, 1972.
3,685,406.—OPTICAL RECORDER. AUG. 22, 1972. BEL. 0777014, CAN. 0960743, FRA. 7146254, GRB. 1372379, ITL. 0944111.
3,695,161.—ALPHANUMERIC PROJECTION DISC ASSEMBLY. OCT. 3, 1972.
3,700,325.—OPTICAL SYSTEM FOR PHOTOCOPYING APPARATUS. OCT. 24, 1972. BEL. 0764830, CAN. 0931409, FRA. 7111622, GRB. 1337447, ITL. 0922162.
3,705,543.—OPTICAL RECORDER. DEC. 12, 1972. CAN. 0948266, GRB. 1372378.
3,759,149.—MULTIPLE FLASH LAMP ALPHANUMERIC PROJECTION DISC ASSEMBLY. SEPT. 18, 1973. CAN. 1002363.
3,759,612.—OPTICAL SYSTEM. SEPT. 18, 1973. BEL. 0792669, CAN. 0972193, FRA. 7243897, GRB. 1395580, ITL. 0984616, SWD. 7216146.
3,768,384.—PROJECTION ASSEMBLY. OCT. 30, 1973.
3,873,207.—POLARIZING INTERFEROMETER. MAR. 25, 1975.
3,880,497.—METHOD OF STORING OPTICAL INFORMATION ON A RANDOM CARRIER. APR. 29, 1975. CAN. 1004887, FRA. 7408054.
3,883,244.—APERTURE ADJUSTMENT IN OPTICAL ASSEMBLY. MAY 13, 1975.
3,897,136.—POLARIZATION-GRATING MOIRE. JULY 29, 1975.
3,909,103.—LENS SCAN MECHANISM. SEPT. 30, 1975.
4,035,068.—SPECKLE MINIMIZATION IN PROJECTION DISPLAYS BY REDUCING SPATIAL COHERENCE OF IMAGE LIGHT. JULY 12, 1977.
4,082,450.—COMPACT ILLUMINATION SYSTEM FOR OPTICALLY PROVIDING A STRUCTURED PHOTORECEPTOR CHARGE DIST. APR. 4, 1978.
4,082,451.—COMPACT ILLUMINATION SYSTEM FOR OPTICALLY PROVIDING A STRUCTURED PHOTORECEPTOR CHARGE DISTR. APR. 4, 1978.
4,110,023.—OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE. AUG. 29, 1978.
4,113,370.—OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE. SEPT. 12, 1978.
4,143,943.—REAR PROJECTION SCREEN SYSTEM. MAR. 13, 1979.
4,162,118.—WAVEGUIDE IMAGING SYSTEM. JULY 24, 1979.

Class 17B 2

3,355,308.—PROJECTION TRANSPARENCY HAVING A TRANSPARENT POWDER IMGE. NOV. 28, 1967.
3,476,478.--APPARATUS FOR CHANGING MAGNIFICATION OF PHOTOCOPIER W/O CHANGING CONJUGATE LENGTH OF OPTICAL SY. NOV. 4, 1969. ARG. 0172460, AUS. 0415808, BEL. 0708650, BRA. 6795668, CAN. 0845405, FRA. 1552364, GER. 1297981, GRB. 1223427. ITL. 0821929, MEX. 0100019, VZL. 0023689.
3,508,812.—HIGHLY CORRECTED SIX ELEMENT GAUSS TYPE LENS. APR. 28, 1970.
3,510,219.—OPTICAL ALIGNMENT SYSTEM. MAY 5, 1970. ARG. 0172455, BRA. 6793791, CAN. 0881018, CHL. 0023570, GRB. 1206966, MEX. 0101166, PRU. 0009329, SPN. 0360896, STZ. 0501233, SWD. 0359168, URG. 0008831, VZL. 0025783.

3,591,256.—VARIABLE MAGNIFICATION LENS SYSTEM. JULY 6, 1971. BEL. 0731553, CAN. 0881019, FRA. 6911559, GRB. 1234515, ITL. 0857660, JAP. 0857539.
3,592,531.—SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM. JULY 13, 1971. CAN. 0929389.
3,600,066.—OPTICAL ASSEMBLY WITH SUPPLEMENTAL LENS MEANS. AUG. 17, 1971. CAN. 0943792, GRB. 1261159, JAP. 0728824.
3,612,662.—EYEPIECE HAVING A WIDE FIELD OF VIEW AND A LARGE EYE RELIEF. OCT. 12, 1971.
3,620,603.—OFF-CENTER FOCUSING SYSTEM. NOV. 16, 1971.
3,630,599.—MECHANICALLY COMPENSATED ZOOM LENS SYSTEM. DEC. 28, 1971. CAN. 0960891, GRB. 1363113.
3,640,605.—MECHANICALLY COMPENSATED ZOOM LENS SYSTEM. FEB. 8, 1972.
3,659,922.—SYMMETRICAL HALF-LENS OPTICAL SYSTEM. MAY 2, 1972.
3,672,748.—SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM. JUNE 27, 1972. ATR. 0322874, AUS. 0467299, BEL. 0783478, CAN. 0960495, GRB. 1358349, ITL. 0955474, SPN. 0402705, STZ. 0544315, SWD. 7206274.
3,741,621.—ADD LENS PROJECTION SYSTEM WITH BALANCED PERFORMANCE. JUNE 26, 1973. BEL. 0781514, CAN. 0963300, FRA. 7208375, GRB. 1393151, ITL. 0950848.
3,817,599.—PROJECTION LENS WITH ADD LENS ELEMENTS. JUNE 18, 1974. CAN. 1008710.
3,865,470.—VARIABLE MAGNIFICATION LENS SYSTEM. FEB. 11, 1975. BEL. 0819497, FRA. 7429827, SPN. 0429431.
3,865,471.—LENS SYSTEM FOR PHOTOELECTROPHORETIC COPYING MACHINE. FEB. 11, 1975.
3,880,498.—ZOOM LENS ASSEMBLY. APR. 29, 1975.
3,907,401.—HIGH PERFORMANCE OPTICAL OBJECTIVE. SEPT. 23, 1975.
3,975,289.—CHARGE TRANSFER COMPLEXEX OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.

Class 17B 3

3,393,956.—UNIFORM-FIELD KERR CELL. JULY 23, 1968.
3,408,133.—KERR-CELL CAMERA SHUTTER. OCT. 29, 1968.

Class 17B 4

3,358,081.—FACSIMILE PRINTER WITH FERROELECTRIC MODULATOR. DEC. 12, 1967. CAN. 0898336, GRB. 1128973.
3,360,323.—TRANSVERSE MAGNETO-OPTICAL ROTATOR WITH COMPENSATION OF PHASE BETA RDATION. DEC. 26, 1967.
3,601,468.—OPTICAL LIGHT WAVE MODULATOR FOR REPRESENTING A FIRST COLOR LIGHT WAVE AS SECOND COLOR LIGHT WA. AUG. 24, 1971.
3,938,881.—ACOUSTO-OPTIC MODULATION DEVICE. FEB. 17, 1976.
4,011,009.—REFLECTION DIFFRACTION GRATING HAVING A CONTROLLABLE BLAZE ANGLE. MAR. 8, 1977.
4,050,027.—OPTICAL SIGNAL AMPLIFIER. SEPT. 20, 1977.
4,077,700.—WAVEGUIDE ADDRESSING AND MODULATING METHOD AND APPARATUS. MAR. 7, 1978.
4,106,848.—ELASTOMER WAVE GUIDE OPTICAL MODULATORS. AUG. 15, 1978. GRB. 1531900.
4,128,299.—WAVEGUIDE OPTICAL MODULATOR. DEC. 5, 1978.
4,170,028.—FACET TRACKING IN LASER SCANNING. OCT. 2, 1979. BEL. 865751.
4,196,977.—ELECTRO-OPTIC MODULATOR DEFLECTOR. APR. 8, 1980. GRB. 1557484.

Class 17C

3,870,921.—IMAGE INTENSIFIER TUBE WITH IMPROVED PHOTOEMITTER SURFACE. MAR. 11, 1975.
4,074,143.—OPTOELECTRONIC DEVICE WITH OPTICAL FEEDBACK. FEB. 14, 1978. FRA. 7631992.
4,138,190.—GEOMETRICAL TRANSFORMATIONS IN OPTICS. FEB. 6, 1979. GRB. 1502127.

Class 17C 1

3,277,297.—ION IMAGE TO ELECTRON IMAGE CONVERTER. OCT. 4, 1966.
3,322,999.—IMAGE-INTENSIFIER TUBE. MAY 30, 1967.
3,519,870.—SPIRLD STRIP MATRL HAVNG PRLEL GROVS FRMNG PLURALITY OF ELCTRN MULTIPLIER CHANNELS. JULY 7, 1970.
3,983,045.—THREE COMPONENT DEVELOPER COMPOSITION. ARG. 0194232, ATR. 0334199, AUS. 0462045, BEL. 0789987, CHL. 0027625, FRA. 7236617, GRB. 1402009, ITL. 0968815, MEX. 0125231, NZL. 0168638, PNM. 0002796, SAF. 0727225, SPN. 0407564, STZ. 0028096, SWD. 7213035, TIW. 0007666, VZL. 0012802.

Class 17C 2

3,368,077.—INFRA-RED IMAGE INTENSIFIER HAVING A TUNNEL-EMISSION CATHODE HAVING A CONDUCTIVE MOSAIC. FEB. 6, 1968.
3,949,225.—INFRARED IMAGING APPARATUS. APR. 6, 1976.

Class 17C 3

3,446,561.—PASSIVE BRIGHT PATTERN RETICLE. MAY 27, 1969.
3,837,732.—PARTIALLY TRANSPARENT PLATED FOR INCREASED IMAGE CONTRAST. SEPT. 24, 1974. CAN. 0893234, GRB. 1237697, JAP. 0645592.

Class 17C 4

3,441,736.—IMAGE INTENSIFIER INCLUDING SEMICONDUCTOR AMPLIFIER LAYER. APR. 29, 1969.

Class 17D

D.235,655.—DISPLAY DEVICE. JULY 1, 1975.
3,987,413—DETECTION SYSTEM. OCT. 19, 1976.
4,035,061.—HONEYCOMB DISPLAY DEVICES. JULY 12, 1977.
4,111,538.—PROJECTION SYSTEM OF HIGH EFFICIENCY. SEPT. 5, 1978.
4,126,528.—ELECTROPHORETIC COMPOSITION AND DISPLAY DEVICE. NOV. 21, 1978.
4,126,854.—TWISTING BALL PANEL DISPLAY. NOV. 21, 1978.
4,143,103.—METHOD OF MAKING A TWISTING BALL PANEL DISPLAY. MAR. 6, 1979.
4,182,553.—HONEYCOMB DISPLAY DEVICES. JAN. 8, 1980.
4,185,256.—MODE CONTROL OF HETEROJUNCTION INJECTION LASERS AND METHOD OF FABRICATION. JAN. 22, 1980.

Class 17D 1

3,422,737.—VARIABLE FONT CHARACTER GENERATOR. JAN. 21, 1969. ARG. 0157019, BRA. 0087922, CAN. 0788611, CHL. 0022222, FRA. 1506176, GRB. 1162840, ITL. 0788951, JAP. 0590133, MEX. 0094427.
3,519,867.—ELECTRIC DISCHARGE TUBE FOR DISPLAYING ALPHNUMERIC CHARACTER SYMBOLS. JULY 7, 1970.
3,564,319.—CATHOD RAY TUBE W/MATRIX FRMG ELEMNTL ELECTRN BEAMS AND MEANS SELECTVLY FRMG INTO CHAR AT FACE PLA. FEB. 16, 1971.
3,587,083.—CHARACTER GENERATION AND DISPLAY SYSTEM. JUNE 22, 1971. CAN. 0858092, FRA. 1582728. GER. 1774884, GRB. 1234580, ITL. 0846528, JAP. 0678504.
3,641,557.—CIRCUIT ARRANGEMENT FOR AN ELECTRIC DISCHARGE TUBE. FEB. 8, 1972.
3,742,484.—CHARACTER GENERATING APPARATUS EMPLOYING BIT STEAM LENGTH CORRECTION. JUNE 26, 1973.
3,781,848.—DISPLAY SYSTEM - CHARACTER GENERATOR SYSTEM A. DEC. 25, 1973.
3,810,165.—ELECTRONIC DISPLAY DEVICE. MAY 7, 1974.
3,830,646.—IMAGE REGISTRATION CORRECTION FOR NON-IMPACT PRINTERS. AUG. 20, 1974. CAN. 0986764, FRA. 7339099, GRB. 1440507.
3,911,419.—CONTROLLER FOR CURSOR POSITIONING ON A DISPLAY MEDIUM. OCT. 7, 1975.
3,952,296.—VIDEO SIGNAL GENERATING APPARATUS WITH SEPARATES PROCESSING OF ODD AND EVEN VIDEO BITS. APR. 20, 1976.
4,103,331.—DATA PROCESSING DISPLAY SYSTEM. JULY 25, 1978.

Class 17D 2

RE.28,360.—ELECTROPHORETIC COLOR DISPLAY DEVICE. MAR. 4, 1975.
3,524,022.—ELECTRO-OPTICAL DISPLAY SYSTEM. AUG. 11, 1970.
3,588,584.—APPARATUS FOR POSITIONING A LIGHT SPOT ONTO A CHARACTER MASK. JUNE 28, 1971.
3,612,758.—COLOR DISPLAY DEVICE - REISSUED D 2717R. OCT. 12, 1971.

Class 17D 3

3,198,976.—ELECTRIC DISCHARGE TUBES AND APPLICATIONS THEREOF. AUG. 3, 1965.
3,264,638.—ELECTRONIC CODE TRANSLATION. AUG. 2, 1966. CAN. 0740559.
3,349,677.—ALPHA NUMERIC CHARACTER PRINTER. OCT. 31, 1967.
3,403,390.—MESSAGE STORAGE. SEPT. 24, 1968. GRB. 1078401.
3,861,804.—INFEROMETRY READOUT OF PHASE INFORMATION. JAN. 21, 1975. CAN. 0980745, GRB. 1387905.
3,898,377.—VIDEO MIXER. AUG. 5, 1975.

Class 17D 4

3,478,659.—APPARATUS FOR JUSTIFYING A REPRODUCED LINE OF CHARACTERS. NOV. 18, 1969.

Class 17D 5

3,330,190.—PRINTING APPARATUS. JULY 11, 1967. CAN. 0758791, GER. 1280282, GRB. 1102419, JAP. 0529726.

Class 17E

3,852,775.—MOVING BELT SCANNING PRINTER. DEC. 3, 1974.
4,027,961.—COPIER/PASTER SCAN APPARATUS. JUNE 7, 1977.
4,080,633.—TWISTING GEOMETRY SCANNER. MAR. 21, 1978.
4,135,812.—MAGNIFICATION CHANGE MECHANISM. JAN. 23, 1979.
4,155,620.—ROTATING MIRROR OPTICAL SCANNER WITH FLAT SCAN AND LINEAR SCAN RATE. MAY 22, 1979.
4,160,939.—MOTOR SPEED CONTROL SYSTEM. JULY 10, 1979.
4,174,174.—COMPOSING REDUCING CAMERA. NOV. 13, 1979.
4,178,064.—REAL TIME GRATING CLOCK FOR GALVANOMETER SCANNERS IN LASER SCANNING SYSTEMS. DEC. 11, 1979.
4,204,233.—ELECTRONIC FACET ERROR CORRECTION FOR LASER SCANNING. MAY 20, 1980.

Class 17E 1

3,337,718.—LIGHT SCAN RECORDING AND READOUT. AUG. 22, 1967. CAN. 0794443, GRB. 1070030.
3,426,144.—TRANSCEIVER APPARATUS FOR TRANSMITTING AND RECORDING OPTICAL INFORMATION. FEB. 4, 1969. CAN. 0810757, GRB. 1158568, JAP. 0579399.
3,426,354.—ELECTROSTATIC CHARGE IMAGE RECORDER. FEB. 4, 1969. AUS. 0295167, BEL. 0664729, CAN. 0739120, DNK. 0115269, FRA. 1455131, GER. 1280281, GRB. 1084494, HOL. 0136720, ITL. 0761085, JAP. 0492014, STZ. 0444906, SWD. 0338117.
3,548,195.—RADIATION SENSITIVE DOCUMENT SCANNING MEANS. DEC. 15, 1970. CAN. 0901968, FRA. 1592840, GER. 1809854, GRB. 1230836, ITL. 0848026, JAP. 0587941.
3,553,463.—RADIATION SENSITIVE DOCUMENT SCANNING APPARATUS USING HELICAL SCANNER. JAN. 5, 1971.
3,775,559.—APERTURE DESIGNS FOR FACSIMILE SCANNING APPARATUS. NOV. 27, 1973. CAN. 0960770, GRB. 1376189.
3,820,900.—INSTRUMENT FOR SCANNING DOCUMENT FOR QUALITY. JUNE 28, 1974.
3,867,571.—FLYING SPOT SCANNER. FEB. 18, 1975. CAN. 0995351.
3,898,470.—SCANNING ARRANGEMENT FOR MULTIFUNCTION OPERATION. AUG. 5, 1975.
3,922,485.—FLYING SPOT SCANNER WITH SCAN DETECTION. NOV. 25, 1975.
3,944,323.—VARIABLE SPOT SIZE SCANNING. MAR. 16, 1976. BEL. 0835552.
3,946,150.—OPTICAL SCANNER. MAR. 23, 1976.
3,962,538.—FLYING SPOT SCANNING SYSTEM WITH VIRTUAL SCANNERS. JUNE 8, 1976.
3,966,319.—FLAT FIELD SCREENING MIRROR. JUNE 29, 1976.
3,970,359.—FLYING SPOT FLAT FIELD SCANNER. JULY 20, 1976.
3,973,825.—FLAT FIELD SCANNING SYSTEM. AUG. 10, 1976. BEL. 0836735.
3,974,506.—SCANNING SYSTEM FOR IMAGING CHARACTERS COMBINED WITH GRAPHIC CURVES. AUG. 10, 1976.
3,997,721.—FLYING SPOT SCANNING SYSTEM WITH REDUCED SCAN ANGLE. DEC. 14, 1976.
4,006,299.—FLAT FILLED SCANNING SYSTEM. FEB. 1, 1977. BEL. 0836543.
4,012,585.—INPUT AND OUTPUT FLYING SPOT SCANNING SYSTEM. MAR. 15, 1977.
4,015,081.—MULTIFUNCTION SCANNING SYSTEM. MAR. 29, 1977. BEL. 0836790.
4,021,897.—A PROCESS FOR PROVIDING CEMENTED GLASS FLATS TO PROVIDE HIGH SPEED MULTIFACETED POLYGONAL SCAN. APR. 10, 1977.
4,034,408.—FLYING SPOT SCANNER. JULY 5, 1977. GRB. 1452300.
4,047,793.—POLYGON SCANNER WITH ANNULAR LIP. SEPT. 13, 1977.
4,052,715.—DIGITAL HALF-TONE GREY SCALE EXPANSION SYSTEM. OCT. 4, 1977.
4,067,639.—HOLOGRAPHIC SCANNING SPINNER. JAN. 10, 1978.
4,070,089.—TWO DIMENSIONAL LASER SCANNER WITH MOVABLE CYLINDER LENS. JAN. 24, 1978.
4,071,754.—BEAM ALIGNMENT DETECTOR. JAN. 31, 1978.
4,080,633.—TWISTING GEOMETRY SCANNER. MAR. 21, 1978.
4,092,632.—CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS. MAY 30, 1978.
4,093,350.—A SYSTEM FOR CENTRIFUGALLY CASTING A THIN FILM PLASTIC IN A REPLICA PROCESS FOR PROVIDING M. JUNE 6, 1978.
4,101,365.—PROCESS OF MAKING HIGH SPEED MULTIFACETED POLYGONAL SCANNERS. JULY 18, 1978.
4,122,352.—SCANNING ARRAY CONFIGURATION. OCT. 24, 1978.
4,140,903.—PRECISION SPEED CONTROL FOR OPTICAL SCANNERS. FEB. 20, 1979.
4,143,311.—HYSTERESIS SYNCHRONOUS MOTOR RATE SERVO SYSTEM. MAR. 6, 1979.
4,146,786.—SCANNER WITH MODULAR ARRAY OF PHOTOCELLS. MAR. 27, 1979.
4,149090.—CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS. APR. 10, 1979.
4,149,091.—SCANNING APPARATUS. APR. 10, 1979.
4,150,402.—METHOD AND APPARATUS FOR REDUCING THE EFFECT OF LASER NOISE IN A SCANNING LASER READ SYSTEM. APR. 17, 1979.
4,162,121.—LINEAR ARRAY MODULATOR. JULY 24, 1979.
4,179,620.—CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS. DEC. 18, 1979.
4,179,621.—SCANNING APPARATUS. DEC. 18, 1979.
4,200,788.—MODULAR ARRAY. APR. 29, 1980.
4,204,230.—HIGH RESOLUTION INPUT SCANNER USING A TWO DIMENSIONAL DETECTOR ARRAY. MAY 20, 1980.
4,205,100.—A SYSTEM FOR PROVIDING ELECTROLESSLY NICKEL COATED POLISHED HIGH SPEED MULTI-FACETED POLYGONAL SCANNER. MAY 27, 1980.
4,213,157.—SELF TRACKING LASER SCANNING APPRATUS. JULY 15, 1980.

Class 17E 2

3,407,329.—SCANNED CONVERSION TUBE. OCT. 22, 1968. CAN. 0836783, GER. 1639461, GRB. 1190967, JAP. 0565840.
3,437,408.—MULTIPLE COPY ELECTROSTATIC IMAGING APPARATUS. APR. 8, 1969. ARG. 0164840, ATR. 0283115, AUS. 0410817, BEL. 0704323, CAN. 0831674, CZC. 0156411, EGR. 0065587, FRA. 1538197, GER. 1597879, GRB. 1202583, HUN. 0161168, ITL. 0822157, JAP. 0582502, MEX. 0099950, SPN. 0345482, STZ. 0484459, SWD. 0331795, USR. 0353450, VZL. 0023662.
3,474,417.—FIELD EFFECT SOLID STATE IMAGE PICKUP AND STORAGE DEVICE. OCT. 21, 1969. CAN. 0869188, GER. 1549144, GRB. 1203095, JAP. 0568732.
3,523,188.—SEMICONDUCTOR CURRENT CONTROL DEVICE AND METHOD. AUG. 4, 1970.

4,147,928.—SCANNING ARRAY CONFIGURATION. APR. 3, 1979.

Class 17E 3

3,485,945.—ELECTRONIC LENTICULAR RECORDING SYSTEM. DEC. 23, 1969.
3,510,570.—ELECTRONIC LENTICULAR DISPLAY SYS. MAY 5, 1970.
3,650,621.—OPTICAL IMAGING SYSTEM. MAR. 21, 1972. BEL. 0747978, CAN. 0927470, FRA. 7011548, GRB. 1297907, ITL. 0898936, JAP. 0731225.
3,655,284.—LONGITUDINALLY INSENSITIVE LENS STRIP IMAGING DEVICE. APR. 11, 1972.
3,827,062.—OPTICAL ARRANGEMENT FOR HIGH SPEED PRINTOUT SYSTEM. JULY 30, 1974.
3,853,387.—VARIABLE MAGNIFICATION LENS ASSEMBLY HAVING TWO ADD LENSES. DEC. 10, 1974.
3,865,470.—VARIABLE MAGNIFICATION LENS SYSTEM. FEB. 11, 1975. BEL. 0819497, FRA. 7429827, SPN. 0429431.

Class 17E 4

3,279,342.—COMMUNICATION PRINTER. OCT. 18, 1966. CAN. 0767902, GRB. 1120446, JAP. 0698291.
3,481,668.—IMAGE PROJECTION APPARATUS. DEC. 2, 1969.
3,485,546.—FIELD FLATTENER SCANNING MEANS. DEC. 23, 1969. CAN. 0850916, GRB. 1196373, JAP. 0667705.
3,504,960.—SAGITTAL RAY APERTURE STOP. APR. 7, 1970. AUS. 0413558, BEL. 0704924, CAN. 0849815, FRA. 1540700, GRB. 1209472, ITL. 0814606, JAP. 0972613.
3,532,425.—GRAPHIC DISTORTION APPARATUS. OCT. 6, 1970.
3,544,190.—LENS STRIP OPTICAL SCANNING SYSTEM. DEC. 1, 1970. CAN. 0904070, GRB. 1278336.
3,584,950.—LENS STRIP OPTICAL SCANNING SYSTEM. JUNE 15, 1971.
3,584,952.—LENS STRIP OPTICAL SCANNING SYSTEM - REISSUED D 2074R. JUNE 15, 1971.
3,584,953.—SHORT FOCAL OPTICAL LENGTH SCANNING SYSTEM. JUNE 15, 1971.
3,963,343.—CAMMING SYSTEMS. JUNE 15, 1976. BEL. 0824049.
4,006,648.—CAMMING SYSTEM. FEB. 8, 1977. BEL. 0824049.
4,054,359.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR USING PULLEYS. OCT. 18, 1977.
4,067,640.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR. JAN. 10, 1978.
4,130,838.—SPEED CONTROL APPARATUS FOR SCANNING SYSTEM. DEC. 19, 1978.
4,170.028.—FACET TRACKING IN LASER SCANNING. OCT. 2, 1979. BEL. 865751.

Class 17E 5

3,155,022.—BUFFER FOR ELECTRONIC DISPLAY READOUT. NOV. 3, 1964. CAN. 0773751, GRB. 1056114, JAP. 0542586.
3,219,993.—IMAGE FORMATION AND DISPLAY UTILIZING A THERMOTROPICALLY COLOR REVERSIBLE MATERIAL. NOV. 23, 1965. CAN. 0762159, GER. 1222795, ITL. 0753655, JAP. 0474129.
3,249,757.—THERMAL IMAGING DEVICE. MAY 3, 1966.
3,995,278.—SUPERCONDUCTIVE MAGNETOSTATIC PRINTER. NOV. 30, 1976.

Class 17E 6

3,456,074.—IMAGE STABILIZATION OF OPTICAL IMAGING SYSTEMS. JULY 15, 1969.
3,461,227.—MECHANICAL JITTER EQUALIZER. AUG. 12, 1969. CAN. 0824819, GRB. 1198303.
3,873,189.—ADJUSTABLE-POSITION OPTICAL SYSTEM. MAR. 25, 1975.

Class 17F 1

3,325,674.—MOVING TARGET DISPLAY INDICATOR. JUNE 13, 1967.
3,340,419.—ELECTRIC DISCHARGE TUBES. SEPT. 5, 1967. CAN. 0773690.
3,447,026.—CRT SCAN STABILIZER. MAY 27, 1969. GER. 1490986.
3,483,414.—STORG TUBE HVG FLD EFF LAYR W/ CONDCTG PINS EXT TO LAYR THAT READOUT NOT ERASE CHG PATTERN. DEC. 9, 1969. CAN. 0850846, GER. 1537566, GRB. 1203432, JAP. 0565841.

Class 17F 2

3,153,785.—TIME COMPRESSED DISPLAY. OCT. 20, 1964. CAN. 0708306, GRB. 1008993.
3,579,024.—SELECTIVE BLANKING CONTROL CIRCUIT. MAY 18, 1971.

Class 17G

3,619,714.—PANEL DISPLAY DEVICE. NOV. 9, 1971.
4,003,742.—VELOCITY COMPENSATION FOR BEAD BYPASS WITH SPEED REDUCTION. JAN. 18, 1977.

Class 17G 1

3,459,946.—SOLID STATE STORAGE DEVICE. AUG. 5, 1969.
3,510,660.—METHOD FOR VISUAL COMPARISON OF INFORMATION. MAY 5, 1970. CAN. 0848611, GRB. 1201376, JAP. 0595641.
3,539,862.—DUAL CONDUCTOR STORAGE PANEL. NOV. 10, 1970. ARG. 0175067, AUS. 0414034, BEL. 0723721, CAN. 0878168, FRA. 1591040, GER. 1808238, GRB. 1235310, HOL. 0150616, ITL. 0847618, JAP. 0742515, MEX. 0111871, SPN. 0360366, STZ. 0493930, SWD. 0345341, VZL. 0023718.
4,002,998.—EXTERNALLY CONTROLLABLE MINIATURE LASERS. JAN. 11, 1977.
4,085,321.—MULTIPHASE PHOTOACTIVATED SWITCH. APR. 18, 1978.

Class 17G 2

3,531,647.—DEVICE AND PROCESS FOR REDUCTION OF BACKGROUND LIGHT IN SOLID STATE STORAGE PANELS. SEPT. 29, 1970. CAN. 0862333, FRA. 1540063, GER. 1549143, GRB. 1201375, ITL. 0818126, MEX. 0101197.
3,531,648.—SOLID STATE STORAGE PANEL FOR COLOR REPRODUCTION. SEPT. 29, 1970. CAN. 0846433, GRB. 1201377.
3,540,008.—SOLID STATE STORAGE DEVICES HAVING NON-CORONA EXTINCTION CAPABILITY. NOV. 10, 1970. ARG. 0166245, AUS. 0424286, BEL. 0725616, CAN. 0897827, FRA. 1599275, GER. 1815243, GRB. 1250023, ITL. 0849327, JAP. 0742516, MEX. 0106020, SPN. 0361652, STZ. 0504755, SWD. 0361123, VZL. 0023729.
3,561,964.—METHOD FOR PRODUCTION OF SOLID STATE STORAGE PANELS. FEB. 9, 1971. ARG. 0184633, AUS. 0427883, BEL. 0736077, CAN. 0866994, FRA. 6924001, GER. 1935763, GRB. 1270845, HOL. 0150271, ITL. 0870080, JAP. 0681942, MEX. 0113574, SPN. 0369656, STZ. 0513430, SWD. 0358991, VZL. 0023743.
3,594,610.—DISPLAY PANEL WITH CORONA DISCHARGE CONTROL. JULY 20, 1971.

Class 17G 3

3,154,636.—THREE DIMENSIONAL DISPLAY DEVICE. OCT. 27, 1964. CAN. 0794989, GRB. 1029611, JAP. 0462394.
3,205,403.—ELECTROLUMINESCENT DISPLAY SYSTEMS. SEPT. 7, 1965.
3,221,335.—ELECTRO-OPTICAL RECORDING AND VISUAL DISPLAY SYSTEMS. NOV. 30, 1965. AUS. 0226551, CAN. 0801882, FRA. 1202340, GER. 1107705, GRB. 0880692, JAP. 0306714.
3,989,355.—ELECTRO-OPTIC DISPLAY SYSTEM. NOV. 2, 1976.

Class 17G 4

3,293,441.—IMAGE INTENSIFIER WITH FERRO-ELECTRIC LAYER AND BALANCED IMPEDANCES. DEC. 20, 1966.
3,300,645.—FERROELECTRIC IMAGE INTENSIFIER INCLUDING INVERSE FEEDBACK MEANS. JAN. 24, 1967.
3,440,428.—IMAGE CONVERTER USING CHARGED PHOTOEMISSIVE LAYER. APR. 22, 1969. CAN. 0858119, GER. 1639462, GRB. 1202049, JAP. 0565839.
3,441,736.—IMAGE INTENSIFIER INCLUDING SEMICONDUCTOR AMPLIFIER LAYER. APR. 29, 1969.
3,531,646.—ENHANCEMENT OF ELECTROSTATIC IMAGES. SEPT. 29, 1970. CAN. 0892186, GRB. 1199462, JAP. 0641476.
3,543,032.—DEVICE AND PROCESS FOR AMPLIFYING AND STORING AN IMAGE. NOV. 24, 1970. ARG. 0177440, CAN. 0880586, MEX. 0111518, PNM. 0001809, VZL. 0027508.

Class 17H

3,742,281.—CONTROLLED SPECTRUM FLASH LAMP. JUNE 26, 1973.
3,949,979.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. APR. 13, 1976.
3,995,110.—FLYING SPOT SCANNER WITH PLURAL LENS CORRECTION. NOV. 30, 1976.
4,021,845.—A LASER FOR GENERATING WHITE LIGHT. MAY 3, 1977. BEL. 0846954.
4,040,096.—FLYING SPOT SCANNER WITH RUNOUT CORRECTION. AUG. 2, 1977.
4,065,731.—TANDEM LASER ASSEMBLY. DEC. 27, 1977.
4,084,197.—FLYING SPOT SCANNER WITH SCAN DETECTION. APR. 11, 1978.
4,132,960.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. JAN. 2, 1979.
4,184,170.—LIGHT EMITTING DIODE. JAN. 15, 1980.

Class 17H 1

3,427,564.—HIGH-POWER IONIZED GAS LASER STRUCTURE. FEB. 11, 1969.
3,437,950.—ION LASER HAVING A METAL TUBE SHRINK-FITTED ONTO THE CERAMIC DISCHARGE TUBE. APR. 8, 1969.
3,523,256.—HEAT PUMPED LASER. AUG. 4, 1970.
3,529,261.—LASR HVNG ACTV MEDIUM WHCH IS AN EXCTD HALOGN WHSE LOWR ENRGY ST IS DEPLETD BY REACTNG W/ALKAL. SEPT. 15, 1970. CAN. 0816276, FRA. 1446601, GER. 1299367, GRB. 1124346, ITL. 0726918.
3,562,173.—LASER MATERIALS. FEB. 9, 1971.
3,860,888.—TIME-SHARING TWO FREQUENCY LASER. JAN. 14, 1975.
3,954,534.—LIGHT EMITTING DIODE ARRAY WITH DOME GEOMETRY. MAY 4, 1976.
3,969,686.—BEAM COLUMNATION USING MULTIPLE COUPLED ELEMENTS. JULY 13, 1976.
3,970,958.—ELECTRICALLY PUMPED SOLID-STATE DISTRIBUTED FEEDBACK LASER WITH PATICULAR GRATING SPACING. JULY 20, 1976. BEL. 0834484.
3,978,428.—BURIED-HETEROSTRUCTURE DIODE INJECTION LASER. AUG. 31, 1976.
4,006,432.—INTEGRATED GRATING OUTPUT COUPLER IN DIODE LASERS. FEB. 1, 1977. BEL. 0834480.
4,023,993.—METHOD OF MAKING AN ELECTRICALLY PUMPED SOLID STATE DISTRIBUTED FEEDBACK LASER. MAY 17, 1977. BEL. 0832000, SPN. 0440361.
4,033,796.—METHOD OF MAKING BURIED-HETEROSTRUCTURE DIODE INJECTION LASER. JULY 5, 1977.
4,045,749.—CORRUGATION COUPLED TWIN GUIDE LASER. AUG. 30, 1977.
4,052,680.—METAL VAPOR LASER HAVING CAPTAPHORESIS MEANS. OCT. 4, 1977.
4,063,189.—LEAKY WAVE DIODE LASER. DEC. 13, 1977.
4,099,999.—METHOD OF MAKING ETCHED-STRIPED SUBSTRATE PLANAR LASER. JULY 11, 1978.
4,105,954.—DOUBLE-CONFINED MULTIPLE ANODE HOLLOW CATHODE LASER. AUG. 8, 1978.
4,111,521.—SEMICONDUCTOR LIGHT REFLECTOR/LIGHT TRANSMITTER. SEPT. 5, 1978.
4,112,389.—DIODE LASER WITH RING REFLECTOR. SEPT. 5, 1978.
4,122,409.—METHOD AND APPARATUS FOR CONTROLLING THE INTENSITY OF A LASER OUTPUT BEAM. OCT. 24, 1978. BEL. 852044.
4,149,779.—INTERNAL LASER MIRROR ALIGNMENT FIXTURE. APR. 17, 1979.
4,185,256.—MODE CONTROL OF HETEROJUNCTION INJECTION LASERS AND METHOD OF FABRICATION. JAN. 22, 1980.
4,187,474.—IMPROVED METAL VAPOR LASER DISCHARGE TUBE. FEB. 5, 1980.
4,193,042.—SELF-CONFINED HOLLOW CATHODE LASER. MAR. 11, 1980.

Class 17H 2

3,296,541.—BROADBND TRVLNG WAVE MASER W/BOTH MASER AND ISOLATOR CRYSTALS CUT ATDFRNT ANGLES TO OPTICAL AXIS. JAN. 3, 1967.
3,983,509.—DISTRIBUTED FEEDBACK DIODE LASER. SEPT. 28, 1976.

Class 17H 3

3,258,597.—LASER HETERODYNE COMMUNICATION SYSTEM. JUNE 28, 1966.
3,465,166.—FAR INFRA-RED COHERENT LIGHT GENERATOR. SEPT. 2, 1969.
3,499,159.—POLYCHROMATIC LASER AEROSOL SIZING AND RANGING-PLASAR-TECHNIQUE. MAR. 3, 1970.
3,500,236.—LASER STABILIZING SYSTEM. MAR. 10, 1970.
3,534,289.—LASER SYSTEM WITH OPTICAL DISCRIMINATOR. OCT. 13, 1970.
3,753,144.—GAS LASER STRUCTURE. AUG. 14, 1973.
3,909,254.—LASER RECORDING METHOD. SEPT. 30, 1975.
4,012,776.—LUMINESCENT SCREEN LASER SCANNING TECHNIQUE. MAR. 15, 1977.
4,070,089.—TWO DIMENSIONAL LASER SCANNER WITH MOVABLE CYLINDER LENS. JAN. 24, 1978.
4,100,408.—SIGNAL GENERATOR FOR RASTER TYPE SCANNERS. JULY 11, 1978.
4,106,844.—LASER SCANNING SYSTEM USING COMPUTER-GENERATED HOLOGRAMS. AUG. 15, 1978.
4,143,311.—HYSTERESIS SYNCHRONOUS MOTOR RATE SERVO SYSTEM. MAR. 6, 1979.
4,169,275.—REPRODUCTION SCANNING SYSTEM HAVING INTERMEDIATE STORAGE BETWEEN INPUT AND OUTPUT SCANNING STATIONS. SEPT. 25, 1979.
4,170,028.—FACET TRACKING IN LASER SCANNING. OCT. 2, 1979. BEL. 856751.
4,205,348.—LASER SCANNING UTILIZING FACET BRACKING AND ACOUSTAL PULSE IMAGING TECHNIQUES. MAY 27, 1980.
4,205,350.—REPRODUCTION SCANNING SYSTEM HAVING INTERMEDIATE STORAGE BETWEEN INPUT AND OUTPUT SCANNING STATIONS. MAY 27, 1980.
4,213,158.—OPTICAL DATA RECORDING SYSTEM UTILIZING ACOUSTIC PULSE IMAGING TO MINIMIZE IMAGE BLUR. JULY 15, 1980.

Class 17I

3,630,598.—OPTICAL DEMODULATION FILTER. DEC. 28, 1971. BEL. 0761134, CAN. 0904628, GRB. 1330709, ITL. 0914073, JAP. 0770139.
3,650,605.—INTERFERAMETRIC APPARATUS WITH CONTROLLED SCANNING MEANS. MAR. 21, 1972. CAN. 0952749.
3,687,535.—OPTICAL DEMODULATION SYSTEM. AUG. 29, 1972. BEL. 0762859, CAN. 0944075, FRA. 7105649, GRB. 1343483, ITL. 0918450.
3,689,267.—SCREEN MAKING PROCESS UTILIZING ROTATION OF OPTICAL PLATE. SEPT. 5, 1972. CAN. 0950736.
3,697,184.—APPARATUS FOR EVALUATING THE RECORDING CHARACTERISTICS OF A THERMOPLASTIC PHOTORECEPTOR. OCT. 10, 1972. CAN. 1003484, GRB. 1389471.
3,776,995.—METHOD OF PRODUCING X-RAY DIFFRACTION GRATING. DEC. 4, 1973. CAN. 0944871, GRB. 1363262.
4,066,335.—VARIABLE DENSITY LENS. JAN. 3, 1978.

Class 17I 1

3,191,440.—PRESSURE GAUGE INSTRUMENT. JUNE 29, 1965.
3,249,760.—PRESSURE GAUGE INSTRUMENT. MAY 3, 1966.

Class 17I 2

3,416,865.—OPTICAL DENSITY MEASURING SYSTEM. DEC. 17, 1968.
3,609,047.—SINGLE BEAM PHOTOMETER SYSTEM WHEREIN THE ABSORBANCE OF A SAMPLE IS DETERMINED RELATIVE TO REFE. SEPT. 28, 1971.
4,054,391.—SPECULAR REFLECTANCE MICRODENSITOMETER. OCT. 18, 1977.

Class 17I 3

3,560,085.—APPARATUS FOR GRAPHIC DISTORATION. FEB. 2, 1971.
3,697,063.—DOCUMENT HANDLING APPARATUS. OCT. 10, 1972. GRB. 1369618.
4,128,332.—ILLUMINATOR. DEC. 5, 1978. GRB. 1494424.

Class 17J

D.236,733.—CURSOR POSITION CONTROLLER. SEPT. 9, 1975.
3,447,030.—COLD SEAL LAMP PRESSURE REGULATION. MAY 27, 1969.
3,642,377.—COLOR PRINTING SYSTEM. FEB. 15, 1972.
3,733,123.—METHOD AND APPARATUS FOR ENCLOSING A LAMP. MAY 15, 1973. ARG. 0198292, AUS. 0466394, BEL. 0789338, FRA. 7234198, GRB. 1410046, ITL. 0967625, MEX. 0128585, SPN. 0409972, STZ. 0549825, SWD. 0360935.
3,775,006.—APPARATUS FOR OPTICAL COLOR SEPARATION. NOV. 27, 1973.
3,795,805.—APPARATUS FOR TESTING A CREDIT CARD. MAR. 5, 1974.
3,873,813.—CREDIT CARD. MAR. 25, 1975.
3,892,963.—TRANSDUCER FOR A DISPLAY-ORIENTED POINTING DEVICE. JULY 1, 1975. FRA. 7440265.
3,915,553.—ELECTROOPTIC COLOR FILTER SYSTEM. OCT. 28, 1975.
3,936,179.—SUPPORT STRUCTURE FOR A DUPLICATOR OPTICAL SYSTEM. FEB. 3, 1976.
3,951,521.—REVERSIBLE RADIANT ENERGY FILTER AND PROCESS OF USING SAME. APR. 20, 1976.
3,977,785.—METHOD & APP FOR INHIBITING THE OPERATION OF A COPYING MACHINE. AUG. 31, 1976.
4,071,323.—DIFFUSION CRUCIBLE AND SLAB MEMBER WITH COMMON METAL COMPONENT IN THE VAPOR PHASE. JAN. 31, 1978.
4,071,396.—CONTROLLED ATMOSPHERE PROCESS FOR ALTERING THE NONSTOICHIOMETRY OF CRYSTALLINE MEMBERS. JAN. 31, 1978.
4,183,094.—OPTICAL STORAGE MEDIUM USING THE FREQUENCY DOMAIN. JAN. 8, 1980.
4,184,170.—LIGHT EMITTING DIODE. JAN. 15, 1980.

Class 18

3,736,133.—TRANSPARENT INK - ABSORBENT LAQUERS. MAY 29, 1973. ARG. 0193996, CAN. 0985583. GRB. 1390137, MEX. 0127276. VZL. 0033577.
3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATINAIN. JUNE 12, 1973.
3,860,484.—ENZYME STABILIZATION. JAN. 14, 1975.
3,985,666.—PLASTIC MATERIALS MIXED WITH POLAR GROUP CONTAINING MATERIALS. OCT. 12, 1976. ARG. 0195541, BEL. 0781970, CAN. 0976742, FRA. 7213873, GRB. 1396141, ITL. 0951326, MEX. 0126158, VZL. 0032937.
4,080,332.—ELECTRICALLY CONDUCTIVE COMPOUNDS. MAR. 21, 1978.

Class 18A

3,238,150.—PHOTOCONDUCTIVE CADMIUM SULFIDE POWDER AND METHOD FOR THE PREPARATION THEREOF. MAR. 1, 1966. CAN. 0712516, GRB. 1062022, JAP. 0486530.
3,402,177.—SUBSTITUTED 1-CYANO-2,3-PHTHALOYL-7,8-BENZOPYRPOCOLINES. SEPT. 17, 1968. AUS. 0435189, BEL. 0743896, CAN. 0812820, GRB. 1145373.
3,471,290.—PHOTOCHROMIC PHOTORESIST IMAGING. OCT. 7, 1969.
3,478,064.—1,5-BIS-SUBSTITUTED ALKYLAMINO-ANTHRAQUINONES. NOV. 11, 1969. ARG. 0145636, AUS. 0419687, BEL. 0683222, CAN. 0880309, FRA. 1484968, GRB. 1155986, ITL. 0771955, JAP. 0581828, MEX. 0092775, SPN. 0328428, STZ. 0461273, SWD. 0328188, VZL. 0021224.
3,482,973.—IMAGING SYSTEM. DEC. 9, 1969.
3,485,633.—ELECTROPHORETIC IMG PROC EMPL METALLIC LAKES OF FLUCRESCEIN DERIVATIVES AS ELECTRICLY PHOTOSENS. DEC. 23, 1969. AUS. 0444394, BEL. 0743641, CAN. 0848386, GER. 1572387, GRB. 1190965. JAP. 0586923.
3,562,248.—BISAZC FGMTS DRVD CPLRS CBTC CONDG 8-AMINO-2-NAPHTHOLS W/ DICARBOXYLIC ACID CHLORIDES. FEB. 9, 1971. ATR. 0302037, AUS. 0435392, BEL. 0743422, CAN. 0889836, FRA. 6944290, GER. 1717183, GRB. 1217905, ITL. 0879047, JAP. 0608727.
3,667,943.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972. ARG. 0184823, AUS. 0452663, BEL. 0737810, CAN. 0877882, EGR. 0077411, FRA. 6928700, GRB. 1278702, ITL. 0888005, JAP. 0683893, SPN. 0370720, STZ. 0519183, SWD. 0346396, TIW. 0005517, USR. 0351396.
3,667,944.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC RECORDING. JUNE 6, 1972. ARG. 0177369, AUS. 0452031, BEL. 0741159, CAN. 0884807, FRA. 6937223, GRB. 1286079, ITL. 0879710, JAP. 0693421, MEX. 0115407.
3,667,945.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972.
3,671,467.—SELENIUM CONTAINING POLYMERS. JUNE 20, 1972. ARG. 0190619, BEL. 0770689, CAN. 0941544, FRA. 7128500, GRB. 1364297, ITL. 9308410, SPN. 0393651. VZL. 0029342.
3,694,201.—METHOD FOR PHOTOCONDUCTIVE POWDER. SEPT. 26, 1972. BEL. 0777717, CAN. 0982808, FRA. 7201003, GRB. 1381162, ITL. 0946352.
3,708,292.—PI-FORM METAL PHTHALOCYANINE. JAN. 2, 1973. ARG. 0194234, BEL. 0783793, CAN. 0996931, GRB. 1396922, ITL. 0955644, MEX. 0128928.
3,708,293.—PI-FORM METAL-FREE PHTHALOCYANINE. JAN. 2, 1973. ARG. 0195167, BEL. 0783792, CAN. 0995211, GRB. 1395769, ITL. 0955643, MEX. 0131970, VZL. 0034272.
3,837,850.—PHOTOCONDUCTIVE BUTILE TITANIUM DIOXIDE. SEPT. 24, 1974.
3,867,145.—METHANOL AND HEAT TREATED ZINC OXIDE. FEB. 18, 1975.
3,905,958.—SELENIUM COMPOUNDS. SEPT. 16, 1975.
3,965,049.—ONE-STEP SYNTHESIS OF AROMATIC ORGANIC DISELENIDES. JUNE 22, 1976.
4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.
4,007,100.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,007,101.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,013,528.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,529.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,530.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,014,768.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 29, 1977.
4,016,058.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. APR. 5, 1977.
4,028,203.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 7, 1977.
4,030,991.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,992.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,993.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.
4,047,947.—PROCESS FOR THE PREPARATION OF TRANSPARENCIES BY SELECTIVE DECOMPOSITION OF AN ORGANOSELENI. SEPT. 13, 1977.
4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1978.
4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.
4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.
4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.
4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.
4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.
4,172,933.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS—PROCESS FOR PREPARATION AND USE. OCT. 30, 1979.

Class 18A 1

3,384,488.—POLYCHROMATIC PHOTOELECTROPHORETIC IMAGING COMPOSITION. MAY 21, 1968.

3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.
3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MITS IN ELCPHG. JUNE 3, 1969.
3,531,309.—COMPOSITIONS COMPRISING 1-CYANO-2,3-PHTHALOYL-7,8-BENZOPYRROCOLINES AND A CARRIER. SEPT. 29, 1970.
3,546,085.—PHOTOELECTROPHORETIC IMAGING PROCESS AND SUSPENSION. DEC. 8, 1970. BEL. 0710052, CAN. 0875493, FRA. 1568088, GER. 1622380, GRB. 1208812, ITL. 0823929, JAP. 0594741.

Class 18A 2

3,492,308.—PROCESS FOR PREPARING METAL FREE PHTHALOCYANINES - SYNTHESIS OF METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0922708, GRB. 1216887, JAP. 0586926.
3,492,309.—SYNTHESIS OF ALPHA METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0894803, GRB. 1206306, JAP. 0604155.
3,509,146.—PROCESS OF PREPARING PHTHALOCYANINE AND HETEROCYCLIC ANALOGUES. APR. 28, 1970. CAN. 0865117, GRB. 1232241, JAP. 0587395.
3,672,979.—METHOD OF PRODUCING A PHTHALOCYANINE PHOTOCONDUCTIVE LAYER. JUNE 27, 1972. ARG. 0184673, AUS. 0457271, BEL. 0761135, CAN. 0951697, FRA. 7047702, GRB. 1334060, ITL. 0914074, JAP. 0753795, MEX. 0119529, PLD. 0082204, PNM. 0002191, SPN. 0386759, STZ. 0571731, TIW. 0007180, VZL. 0032789.
3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973.
4,107,389.—FUSING SURFACE. AUG. 15, 1978. GRB. 1511272.
4,126,722.—FUSING SURFACE. NOV. 21, 1978. GRB. 1511272.
4,197,242.—POTASSIUM PHTHALOCYANINE COMPLEXES, METHOD OF PREPARATION, AND PHTHALOCYANINE PURIFICATION PROCESSES. APR. 8, 1980.

Class 18A 2A

RE.27,117.—METAL FREE PHTHALOCYANINE IN THE NEW X-FORM-RE OF 3,357,989-D1170. APR. 20, 1971.
3,594,163.—METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X FORM. JULY 20, 1971.
3,657,272.—PROCESS FOR PREPARING X-FORM METAL FREE PHTHALOCYANINE. APR. 18, 1972.
3,816,118.—ELECTROPHOTOGRAPHIC ELEMENT CONTAINING PHTHALOCYANINE. JUNE 11, 1974. ARG. 0156316, CAN. 0890855, FRA. 0091579, GRB. 1175451, ITL. 0809972, JAP. 0820183, MEX. 0115884, VZL. 0024012.
3,862,127.—PROCESS. JAN. 21, 1975. AUS. 0453518, BEL. 0754407, FRA. 7028418, GRB. 1268574, ITL. 0929169, JAP. 0727963, SPN. 0382366.
3,903,107.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL CONTAINING PHTHALOCYANINE. SEPT. 2, 1975. BEL. 0815632, SAF. 0743536.
3,927,026.—PROCESS OF MAKING X-FORM METAL PHTHALOCYANINE. DEC. 16, 1975. CAN. 0916703, GRB. 1312946, JAP. 0693981.
3,932,180.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. BEL. 0815632, SAF. 0743536.
3,932,454.—PROCESS OF MAKING HEXAGONAL ALPHA METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. CAN. 0918152, GRB. 1327084, JAP. 0752724.
4,031,109.—METHOD FOR THE PREPARATION OF X-FORM METAL PHTHALOCYANINE AND X-FORM METAL FREE COMPOUNDS. JUNE 21, 1977. ARG. 0188048.
4,098,795.—METHOD FOR THE PREPARATION OF X-FORM METAL FREE PHTHALOCYAMINE. JULY 4, 1978. ARG. 182328, BEL. 737989, CAN. 899870, FRA. 6928871, GER. 1943381, GRB. 1280843, ITL. 870314, JAP. 654041, MEX. 116011.

Class 18A 3

3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.
3,448,028.—N-SBSTUD-8, 13-DIOXODINAPHTHO-2-1-B, 2, 3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.

Class 18A 4

3,384,632.—ARYLAZO-4-ISOPROPOXY-1-NAPHTHOL COMPOUNDS. MAY 21, 1968. BEL. 0743897, CAN. 0787920, FRA. 1473703, GER. 1644400, GRB. 1145374, ITL. 0764015, JAP. 0578398.
3,574,182.—CALCIUM SALT OF 6-BROMO-1-1-SULFO-2-NAPHTHYLAZO-2-NAPHTHOL. APR. 6, 1971. ARG. 0168131, ATR. 0302812, AUS. 0429649, BEL. 0710053, CAN. 0878483, CHL. 0024254, CLB. 0018785, DNK. 0128493, FIN. 0049711, FRA. 1556484, GRB. 1197374, GRK. 0036648, IND. 0114221, ISR. 0029376, ITL. 0823989, JAP. 0605213, LXB. 0055364, MEX. 0099564, NOR. 0129593, NZL. 0151403, PRU. 0009483, PTG. 0049036, SAF. 0068559, SPN. 0349965, STZ. 0524844, SWD. 0351737, URG. 0008893, VZL. 0032776.

Class 18B

3,467,634.—ORGANOSILICON TERPOLYMERS AND PROCESS. SEPT. 16, 1969. ARG. 0165758, AUS. 0417109, BEL. 0702403, BRA. 6790950, CAN. 0857389, FRA. 1534183, GRB. 1200756, HOL. 0826202, ITL. 0826202, JAP. 0671041. MEX. 0100136, NOR. 0125392, SPN. 0343902, STZ. 0484210, SWD. 0339752, VZL. 0025437.
3,671,467.—SELENIUM CONTAINING POLYMERS. JUNE 20, 1972. ARG. 0190619, BEL. 0770689, CAN. 0941544, FRA. 7128500, GRB. 1364297, ITL. 9308410, SPN. 0393651, VZL. 0029342.
3,725,505.—PYRENE CONTAINING POLYMERS PREPARED BY ANIONIC POLYMERIZATION. APR. 3, 1973. ARG. 0183776, AUS. 0459733, BEL. 0770501, CAN. 0986650, FRA. 7127963, GRB. 1359045, ITL. 0930707, MEX. 0120152, SPN. 0393582, VZL. 0031959.
3,776,760.—METHOD FOR MANUFACTURING A TETRAFLUOROETHLENE POLYMER-COATED ROLL. DEC. 4, 1973. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.
3,852,861.—SURFACES WITH FLUOROCARBON PROCESS FOR MULTIPLE COATING RESINS. DEC. 10, 1974. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.
3,860,484.—ENZYME STABILIZATION. JAN. 14, 1975.
3,864,144.—PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS. FEB. 4, 1975. FRA. 7408936, GRB. 1414158, ITL. 1010695, TIW. 0008534.
3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436, FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.
3,879,198.—ELECTROPHOTOGRAPHIC AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. APR. 22, 1975. FRA. 7403086, GRB. 1446966.
3,882,087.—ORGANIC PHOTOCONDUCTIVE MATERIAL. MAY 6, 1975.
3,883,488.—2-VINYL-9-DICYANOMETHYLENE-FLUORENE AND DERIVATIVES THEREOF. MAY 13, 1975.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 099593, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382..
3,895,945.—PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION. JULY 22, 1975.
3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975. ITL. 1010430.
3,943,108.—PHOTOCONDUCTIVE COMPOSITION OF AN ALDEHYDE CONDENSATE. MAR. 9, 1976.
3,950,168.—FIXING POWDER IMAGES-FUSING AIDES FOR HYBRID FIX. APR. 13, 1976.
3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.
3,954,906.—AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. MAY 4, 1976. FRA. 7403086, GRB. 1446966.
3,965,049.—ONE-STEP SYNTHESIS OF AROMATIC ORGANIC DISELENIDES. JUNE 22, 1976.
3,967,962.—DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS. JULY 6, 1976.
3,970,602.—COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF. JULY 20, 1976. BEL. 0812436. FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.
3,994,994.—IMPROVED PROCESS FOR PREPARATION OF BLOCK COPOLYMERS FROM VINYLCARBOZOLES & OTHER ADDITION MONO. NOV. 30, 1976.

4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.
4,009,151.—POLYMERS OF 2-VINLYFLUORENONE AND DERIVATIVES THEREOF. FEB. 22, 1977.
4,011,266.—2-VINYL-FLUORENONE AND DERIVATIVES THEREOF. MAR. 8, 1977.
4,045,413.—POSSIBLE ACTIVE MATRIX POLYMERS. AUG. 30, 1977. FRA. 7432710.
4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.
4,071,670.—METHOD OF SIZING MONOMER DROPLETS FOR SUSPENSION POLYMERIZATION TO FORM SMALL PARTICLES. JAN. 31, 1978. BEL. 857223.
4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1978.
4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.
4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.
4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.
4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.
4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.
4,172,933.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS—PROCESS FOR PREPARATION AND USE. OCT. 30, 1979.

Class 18C

4,074,143.—OPTOELECTRONIC DEVICE WITH OPTICAL FEEDBACK. FEB. 14, 1978. FRA. 7631992.

Class 18C 1

RE.27,480.—AUTOMATIC DEVELOPMENT CONTROLLER -RE OF 3,376,854-D986. SEPT. 19, 1972.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835. BEL. 0802879, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.

Class 18C 1A

3,720,617.—AN ELECTROSTATIC DEVELOPER CONTAINING MODIFIED SILICON DIOXIDE PARTICLES. MAR. 13, 1973. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 0131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149, USR. 0460634, VZL. 0032423.
3,819,367.—IMAGING SYSTEM. JUNE 25, 1974. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 0131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149. USR. 0460634, VZL. 0032423.
3,820,986.—LIQUID DEVELOPMENT METHOD AND MATERIALS. JUNE 28, 1974.
3,833,364.—METHOD OF DEVELOPING ELECTROSTATIC IMAGE CHARGE. SEPT. 3, 1974.
3,850,830.—LIQUID DEVELOPER CONTAINING EXTENDER BODY PARTICLES. NOV. 26, 1974.
3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924, SPN. 0435074.
4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.

Class 18C 1B

3,577,345.—SOLID XEROGRAPHIC DEVELOPER. MAY 4, 1971. ARG. 0172448, ATR. 0325417, AUS. 0424173, BAH. 0000095, BEL. 0716084, BOL. 0032708, CAN. 0902983, CHL. 0025923, CLB. 0017674, DOR. 0001461, ELS. 0001064, FRA. 1567731, GRB. 1232117, GRK. 0037628, GUA. 0002003, HOL. 0148714, IND. 0116209, ISR. 0030116, ITL. 0851653, JAM. 0001848, JAP. 0623002, LXB. 0056197, MEX. 0119320, NOR. 0131653, NZL. 0164353, PNM. 0002062. PRU. 0009911, PTG. 0049749, SPN. 0354686, STZ. 0516180, SWD. 0338238, TIW. 0005096, TRD. 0000057, TRK. 0015620, URG. 0009286, VZL. 0023666.
3,590,000.—SOLID DEVELOPER FOR LATENT ELECTROSTATIC IMAGES. JUNE 29, 1971. ARG. 0172453, ATR. 0288860, BAH. 0000093, BEL. 0716083, BOL. 33998, CAN. 0902984, CHL. 0024050, DOR. 0001460, ECD. 0000198, ELS. 0001062, FRA. 1567721, GER. 1772570, GRB. 1232118, GRK. 0037629, GUA. 0002095, HOL. 0151523, IND. 0116210, ISR. 0030117, ITL. 0851651, JAM. 0002094, JAP. 0655407, LXB. 0056196, MEX. 0104566, NZL. 0164356, PLP. 0007690, PNM. 0002083, PRU. 0009495, PTG. 0049748, SPN. 0354685, STZ. 0519737, SWD. 0357071, TIW. 0004940, TRD. 0000058, TRK. 0015606, URG. 0009287, VZL. 0032392.
3,653,893.—IMAGING SYSTEM. APR. 4, 1972.
3,655,374.—IMAGING PROCESS EMPLOYING NOVEL SOLID DEVELOPER MATERIAL. APR. 11, 1972.
3,681,107.—DEVELOPMENT OF ELECTROSTATOGRAPHIC IMAGES. AUG. 1, 1972.
3,856,692.—LIQUID ELECTROSTOGRAPHIC DEVELOPER COMPOSITIONS. DEC. 24, 1974. CAN. 0940361, GRB. 1332674.
3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924, SPN. 0435074.
3,900,589.—AN ELECTROSTATOGRAPHIC IMAGING PROCESS. AUG. 19, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
4,002,570.—ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLIDENE FLUORIDE ADDITIVE. JAN. 11, 1977
4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.
4,147,541.—ELECTROSTATIC IMAGING MEMBER WITH ACID LUBRICANT. APR. 3, 1979. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.

Class 18C 2

4,038,076.—ELECTROSTATOGRAPHIC DEVELOPMENT. JULY 26, 1977. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD 7216977.

Class 18C 2A

3,723,114.—THERMOSETTING ELCTRSTGRPHC DVLPR OF CARRIER/PREPOLYMER OF DIALLYL PHTHALATE ISOPHTHALATE AND MXTR. MAR. 27, 1973. ARG. 0185089, BEL. 0762507, CAN. 0970195, FRA. 7104349, GRB. 1344197, ITL. 0918244, MEX. 0122234.
3,806,339.—LIQUID DEVELOPER COMPOSITION. APR. 23, 1974.
3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.
3,965,021.—ELECTROSTATOGRAPHIC DEVELOPMENT-POLYBLEND TONERS. JUNE 22, 1976.
3,967,962.—DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS. JULY 6, 1976.
3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.

Class 18C 2A 1

RE.25,136.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR-RE OF 2,940,934-D432. MAR. 13, 1962.
3,079,342.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR. FEB. 26, 1963. ARG. 0157131, CAN. 0726134, GUA. 0001817.
3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 18C 2A 2

3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 18C 2B

3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.
3,591,503.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 6, 1971. ARG. 0172143, ATR. 0287491, AUS. 0418556, BEL. 0713751, CAN. 0879020, CHL. 0024256, CLB. 0017933, FRA. 1560849, GRB. 1225980, GRK. 0038397, IND. 0115457, ITL. 0833710. LXB. 0055904, MEX. 0111625, NOR. 0128297, NZL. 0152196, PLP. 0008847, PRU. 0009319, PTG. 0049455, SAF. 0682386, SPN. 0352810, STZ. 0508903, SWD. 0333868, URG. 0009139, VZL. 0023688.

3,595,794.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 27, 1971. ARG. 0169109, ATR. 0290986, AUS. 0418156, BEL. 0713752, CAN. 0879021, CHL. 0024482, FRA. 1582855, GRB. 1227471, IND. 0115458, ITL. 0883043, LXB. 0055894, MEX. 0115899, NOR. 0128036, NZL. 0152195, PLP. 0007966, PRU. 0009335, PTG. 0049154, SAF. 0682358, SPN. 0352811, STZ. 0505410, SWD. 0331633, URG. 0009283, VZL. 0023687.

3,627,522.—DEVELOPER COMPOSITION AND METHOD OF USE. DEC. 14, 1971.

3,672,928.—ELECTROSTATOGRAPHIC DEVELOPERS HAVING CARRIERS COMPRISING POLYSTER COATED CORES. JUNE 27, 1972. ARG. 0184669, BEL. 0762415, CAN. 0941209, FRA. 7103845, GRB. 1344365, ITL. 0918191, JAP. 0764506.

3,704,066.—REFLEX EXPOSURE MEDIUM. NOV. 28, 1972.

3,725,283.—ELECTROSTATOGRAPHIC DEVELOPER CONTAINING UNCOATED GLASS CERAMIC CARRIER PARTICLES. APR. 3, 1973. BEL. 0777720, CAN. 0973745, FRA. 7201006, GRB. 1376457, ITL. 0946358.

3,767,578.—CARRIER MATERIAL FOR ELECTROSTATOGRAPHIC. OCT. 23, 1973. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.

3,847,604.—ELECTROSTATIC IMAGING PROCESS USING MODULAR CARRIERS. NOV. 12, 1974. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.

3,849,127.—AN ELECTROSTATOGRAPHIC PROCESS IN WHICH COATED CARRIER PARTICLES ARE USED. NOV. 19, 1974.

3,857,792.—ELECTROSTATIC DEVELOPER MIXTURE WITH A COATED CARRIER. DEC. 31, 1974.

3,914,181.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURES COMPRISING FERRITE CARRIER BEADS. OCT. 21, 1975. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.

3,923,503.—ELECTROSTATIC LATENT IMAGE DEVELOPMENT EMPLOYING STEEL CARRIER PARTICLES. DEC. 2, 1975. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.

3,939,086.—HIGHLY CLASSIFIED OXIDIZED DEVELOPER MATERIAL. FEB. 17, 1976. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155. SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.

3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.

3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.

4,018,601.—ELECTROSTATOGRAPHIC MAGNETIC BRUSH IMAGING PROCESS EMPLOYING CARRIER BEADS COMPRISING HIGH NICK. APR. 19, 1977.

Class 18C 4

3,467,634.—ORGANOSILICON TERPOLYMERS AND PROCESS. SEPT. 16, 1969. ARG. 0165758, AUS. 0417109, BEL. 0702403, BRA. 6790950, CAN. 0857389, FRA. 1534183, GRB. 1200756, HOL. 0826202, ITL. 0826202, JAP. 0671041, MEX. 0100136, NOR. 0125392, SPN. 0343902, STZ. 0484210, SWD. 0339752, VZL. 0025437.

3,526,533.—COATED CARRIER PARTICLES. SEPT. 1, 1970. ARG. 0161341, AUS. 0418867, BEL. 0702404, CAN. 0878413, FRA. 1534184, GRB. 1205051, ITL. 0826203, JAP. 0578401, MEX. 0120334, NOR. 0122818, SPN. 0343903, STZ. 0486054, SWD. 0308987, VZL. 0032393.

3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.

3,713,819.—XEROGRAPHIC IMAGING AND DEVELOPMENT USING METAL OXIDE CARRIER PART. JAN. 30, 1973.

3,730,707.—METHOD OF DEVELOPING LATENT IMAGES. MAY 1, 1973.

3,752,666.—ELECTROSTATIC IMAGING PROCESS USING CARRIER BEADS CONTAINING CONDUCTIVE PARTICLES. AUG. 14, 1973.

3,839,029.—ELECTROSTATOGRAPHIC DEVELOPMENT WITH FERRITE DEVELOPER MATERIALS. OCT. 1, 1974. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.

3,849,182.—HIGHLY SHAPE-CLASSIFIED OXIDIZED LOW CARBON HYPEREUTECTOID ELECTROSTATOGRAPHIC STEEL CARRIER PA. NOV. 19, 1974. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978. SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.

3,850,663.—CELLULOSE COATED CARRIERS. NOV. 26, 1974. ARG. 0183677, AUS. 0458322, BEL. 0763987, CAN. 0941210, EGR. 0091603, FRA. 7108585, GRB. 1345027, ITL. 0922292, MEX. 0120027, PNM. 0002440, SAF. 0711547, STZ. 0557050, SWD. 0359940, TIW. 0008177, VZL. 0032931.

3,850,676.—COATED CARRIER PARTICLES FOR ELECTROSTATOGRAPHIC DEVELOPMENT. NOV. 26, 1974.

3,856,519.—TRANSFER OF TONER USING A VOLATILE INSULATING LIQUID. DEC. 24, 1974.

3,900,587.—IMAGING PROCESS EMPLOYING TREATED CARRIER PARTICLES. AUG. 19, 1975. CAN. 1007923.

3,916,064.—DEVELOPER MATERIAL. OCT. 28, 1975.

3,916,065.—ELECTROSTATOGRAPHIC CARRIER PARTICLES. OCT. 28, 1975.

3,989,648.—IMAGING SYSTEM. NOV. 2, 1976. CAN. 1007923.

4,019,903.—ELECTROSTATIC DEVELOPMENT. APR. 26, 1977. BEL. 0777715, CAN. 0973746, FRA. 7201001, GRB. 1376456, ITL. 0946359.

4,035,520.—IMAGING SYSTEMS. JULY 12, 1977

4,040,969.—HIGH SURFACE AREA CARRIER. AUG. 9, 1977. BEL. 829639, GRB. 1497732, SPN. 438084.

4,042,517.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE CONTAINING A THERMOSET ACRYLIC RESIN COATED CARRIER. AUG. 16, 1977.

4,065,585.—RENEWABLE CHOW FUSER COATING. DEC. 27, 1977. GRB. 1490252.

4,066,563.—COPPER - TETRA - 4 - (OCTADECYLSULFONOM- IDO) PHTHALOCYANINE ELECTROPHOTOGRAPHIC CARRIER. JAN. 3, 1978.

4,122,024.—CLASSIFIED TONER MATERIALS. OCT. 24, 1978. BEL. 829719. CAN. 1043149. FRA. 7516758. GRB. 1497731.

4,126,454.—IMAGING PROCESS UTILIZING HIGH SURFACE AREA CARRIER MATERIALS. NOV. 21, 1978.

Class 18C 5

3,788,994.—PRESSURE FIXABLE ELECTROSTATOGRAPHIC TONER. JAN. 29, 1974. ARG. 0200575, BEL. 0793247, CAN. 0985943, FRA. 7244381, GRB. 1406687, ITL. 0973323, SPN. 0410212, STZ. 0028529, VZL. 0032608.

3,804,764.—ELECTROSTATOGRAPHIC PRESSURE SENSITIVE POLYMERIC TONER. APR. 16, 1974. ARG. 0196320, AUS. 0464392, BEL. 0793554, CAN. 1011149, FRA. 7246575, GRB. 1417409, ITL. 0973325, SPN. 0410211, STZ. 0028568.

3,853,778.—TONER COMPOSITION EMPLOYING POLYMER WITH SIDE CHAIN CRYSTALLINITY. DEC. 10, 1974. AUS. 0465653, BEL. 0793639, CAN. 0998869, FRA. 7246888, GRB. 1423291, ITL. 0973330, SPN. 0410267, SWD. 7300003.

3,893,932.—PRESSURE FIXABLE TONER. JULY 8, 1975.

3,893,934.—SOLID DEVELOPER FOR ELECTROSTATIC LATENT IMAGES. JULY 8, 1975.

3,910,846.—METHOD OF PREPARING ELECTROSCOPIC TONER PARTICLES. OCT. 7, 1975. CAN. 0984074.

3,974,078.—AN ELECTROSTATE GRAPHIC DEVELOPMENT OF ENCAPSULATED MATERIALS. AUG. 10, 1976. ARG. 0196318, AUS. 0467046, BEL. 0792115, CAN. 1001884, FRA. 7239134, ITL. 0973326, MEX. 0128768, SPN. 0410205, STZ. 0028567, VZL. 0033139.

4,002,776.—IMAGING PROCESS EMPLOYING TONER PARTICLES CONTAINING ARYLSULPONAMIDE FORMALDEHYDE ADDUCT. JAN. 11, 1977.

4,161,454.—COATING MAGNETITE WITH POLYACID. JULY 17, 1979.

4,176,078.—FIELD DEPENDENT TONER HAVING CHROME COMPLEX COATED MAGNETIC PARTICLES. NOV. 27, 1979.

Class 18C 5A

3,345,293.—COLORED ELECTROSTATOGRAPHIC TONERS CONTAINING ORGANIC DYE PIGMENTS. OCT. 3, 1967. CAN. 0834674, GRB. 1074147, JAP. 0788652.

3,864,125.—ELECTROPHOTOGRAPHIC METHOD OF MAKING AN IMAGING MASTER. FEB. 4, 1975.

3,897,249.—TONERS FOR PHTHALOCYANINE PHOTORECEPTORS. JULY 29, 1975.

4,126,565.—TONERS FOR COLOR FLASH FUSERS CONTAINING A PERMANENT COLORANT AND A HEAT SENSITIVE DYE. NOV. 21, 1978.

Class 18C 5B

3,080,250.—SELF-TACKIFYING XEROGRAPHIC TONER. MAR. 5, 1963.

3,080,318.—THREE-COMPONENT XEROGRAPHIC TONER. MAR. 5, 1963.

Class 18C 6

3,755,177.—PROCESS OF MAKING LIQUID ELECTROSTATIC DEVELOPERS CONTAINING GELATIN. AUG. 28, 1973.

3,790,485.—PROCESS FOR PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPER. FEB. 5, 1974.

3,812,037.—LIQUID DEVELOPER COMPOSITION. MAY 21, 1974.

Class 18C 6A

3,507,686.—METHOD OF COATING CARRIER BEADS. APR. 21, 1970. CAN. 0872190, GRB. 1239621, JAP. 0675782.

3,658,500.—METHOD OF PRODUCING GLASS BEADS FOR ELECTROSTATOGRAPHIC DEVELOPERS. APR. 25, 1972. CAN. 0916536, GRB. 1331485.

3,685,113.—DEVELOPER SYSTEM. AUG. 22, 1972. ARG. 0183679, BEL. 0764635, CAN. 0941211, FRA. 7110751, GRB. 1347568, ITL. 0922132, MEX. 0122432.

3,764,310.—METHOD OF PRODUCING ELECTROSTATOGRAPHIC DEVELOPER. OCT. 9, 1973.

3,789,796.—APPARATUS FOR PRODUCING DEVELOPER MATERIALS. FEB. 5, 1974.

3,908,046.—P-XYLYENE VAPOR PHASE POLYMERIZATION COATING OF ELECTROSTATOGRAPHIC PARTICLES. SEPT. 23, 1975.

3,940,514.—METHOD OF COATING ELECTROSTATOGRAPHIC CARRIER PARTICLES. FEB. 24, 1976.

Class 18C 6B

3,326,848.—SPRAY DRIED LATEX TONERS. JUNE 20, 1967. AUS. 0409084, BEL. 0666056, CAN. 0866260. FRA. 1451366, GRB. 1115653, ITL. 0717377, MEX. 0088140, SWD. 0340046.

3,338,991.—METHOD OF FORMING ELECTROSTATIC TONER PARTICLES. AUG. 29, 1967. FRA. 1450642, GRB. 1115634, HOL. 0142251, ITL. 0717378, JAP. 0539572.

3,502,582.—IMAGING SYSTEMS. MAR. 24, 1970. ARG. 0171952, BEL. 0726571, CAN. 0873934, FRA. 1569382, GRB. 1237095, ITL. 0835554, MEX. 0100704, VZL. 0032414.

3,740,334.—PROCESS OF PREPARING SOLID DEVELOPERS FOR ELECTROSTATIC LATENT IMAGES. JUNE 19, 1973.

3,830,750.—ENCPSLTNG SBSTNLY SLUBL PRTN OF CORE MATL IN SBSTNLY SLBLE SHELL MATL OF DFRNT SOLUBLTY. AUG. 20, 1974. AUS. 0466018, BEL. 0793246, CAN. 0983328, GRB. 1411954, ITL. 0973317, SPN. 0410224, STZ. 0028527.

3,936,517.—METHOD FOR REDUCING PARTICLE SIZE. FEB. 3, 1976.

4,016,099.—METHOD OF FORMING ENCAPSULATED TONER PARTICLES. APR. 5, 1977.

4,071,670.—METHOD OF SIZING MONOMER DROPLETS FOR SUSPENSION POLYMERIZATION TO FORM SMALL PARTICLES. JAN. 31, 1978. BEL. 857223.

4,077,804.—METHOD OF PRODUCING TONER PARTICLES BY IN-SITU POLYMERIZATION AND IMAGING PROCESS. MAR. 7, 1978.

4,097,620.—MAGNETIC TONER PARTICLE COATING PROCESS. JUNE 27, 1978.

4,142,981.—TONER COMBINATION FOR CARRIERLESS DEVELOPMENT. MAR. 6, 1979.

4,148,741.—POLYMERIZATION AND ATTRITION METHOD FOR PRODUCING TONER WITH REDUCED PROCESSING STEPS. APR. 10, 1979.

4,171,274.—ALTERATION OF TESSELATED MAGNETIC PARTICLES OF FRACTURE. OCT. 16, 1979.

4,192,902.—IN SITU COATING THEN SPRAY DRYING OF MAGNETIC TONER. MAR. 11, 1980.

Class 18D

3,150,446.—BRAZING METHOD AND COMPOSITION. SEPT. 29, 1964.

3,666,429.—MATALLIZED AND BRAZED CERAMICS. MAY 30, 1972.

3,959,934.—COMPOSITION AND METHOD FOR REPAIRING SELENIUM PHOTORECEPTOR. JUNE 1, 1976.

3,971,169.—A METHOD FOR REPAIRING SELENIUM PHOTOCONDUCTORS. JULY 27, 1976.

4,062,658.—COMPOSITION & METHOD FOR REPAIRING SELENIUM PHOTORECEPTORS. DEC. 13, 1977.

Class 18E

3,950,168.—FIXING POWDER IMAGES-FUSING AIDES FOR HYBRID FIX. APR. 13, 1976.

4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.

Class 20

3,916,167.—COUNTERS. OCT. 28, 1975.

Class 20A

3,751,693.—MOVING COIL MOTOR WITH NO SPRAY FLUX. AUG. 7, 1973. AUS. 3467604, BEL. 0795400, CAN. 0980395, GRB. 1424622, ITL. 0979062, SPN. 0411470.

3,769,467.—VIBRATION DAMPED TRANSDUCER HEAD ASSEMBLY. OCT. 30, 1973. ARG. 0195905, AUS. 0476996, BEL. 0795401, CAN. 0995355, GRB. 1417764, ITL. 0979063, MEX. 0135598, SPN. 0411538, STZ. 0558582, SWD. 7301915.

4,046,105.—LAMINAR DEEP WAVE GENERATOR. SEPT. 6, 1977.

4,076,417.—INTERLOCKING APPARATUS FOR AN OPTICAL SYSTEM AND REPRODUCING MACHINE. FEB. 28, 1978. HAT. 1604.

Class 20A 1

RE.27,313.—BELT TRACKING SYSTEM - RE OF 3,500,694-D2586. MAR. 21, 1972.

3,435,693.—BELT TRACKING DEVICE. APR. 1, 1969. ARG. 0168295, ATR. 0283116, AUS. 0421893, BEL. 0705641, CAN. 0853440, CHL. 0023084, CLB. 0017528, DNK. 0117047, FRA. 1543079, GRB. 1180659, ITL. 0827782, MEX. 0100320, NOR. 0124530, PRU. 0009336, SAF. 0676414, SPN. 0346430, STZ. 0471736, URG. 0009729, USR. 0321984, VZL. 0023676.

3,500,694.—BELT TRACKING SYSTEM — SEE 03286 FOR RE27313. MAR. 17, 1970.

3,592,071.—BELT TRACKING APPARATUS. JULY 13, 1971. ARG. 0179666, BEL. 0751117, CAN. 0925118, FRA. 7019040, GRB. 1298926, ITL. 0893540, JAP. 0770135, MEX. 0118981, SPN. 0380136.

3,593,838.—CONVEYOR BELT. JULY 20, 1971. CAN. 0883720.

Class 20A 2

3,498,148.—CHAIN TRAIN. MAR. 3, 1970.

3,509,780.—DOUBLE-ACTION ROTARY SOLENOID DRIVE MECHANISM. MAY 5, 1970.

3,844,179.—GEAR DRIVE FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. OCT. 29, 1974. ARG. 203483, BEL. 0816382, CAN. 1007075, GRB. 1467714, STZ. 5786990, VZL. 0033061.

3,982,831.—ELECTROSTATOGRAPHIC REPRODUCTION APP & DRIVE THEREFOR. SEPT. 28, 1976

3,985,277.—WEB HANDLING DEVICE. OCT. 12, 1976.

4,110,028.—DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. AUG. 29, 1978. BEL. 844828.

Class 20A 3

3,405,564.—PULLEY. OCT. 15, 1968. CAN. 0850353.

3,505,716.—ROLL APPARATUS. APR. 14, 1970.

3,791,243.—METHOD AND APPARATUS FOR FORMING EDGES OF AN ENDLESS BELT. FEB. 12, 1974.

3,932,177.—COLLAR AND METHOD OF MAKING SAME. JAN. 13, 1976.

Class 20A 4

3,329,029.—OFF-CENTER LOAD MOVING ASSEMBLY. JULY 4, 1967.

3,337,072.—LOADER. AUG. 22, 1967. CAN. 0825092, GRB. 1166619, JAP. 0605648.
3,493,269.—LOADING HEAD. FEB. 3, 1970. CAN. 0864392.
3,777,578.—LINEAR ACTUATOR. DEC. 11, 1973. CAN. 9783901.

Class 20A 5

3,112,819.—CLUTCH MECHANISM - 914. DEC. 3, 1963. CAN. 0688810.
3,213,645.—TORQUE LIMITING MECHANISM. OCT. 26, 1965. CAN. 0729978, GRB. 1035547, JAP. 0548690.
3,623,680.—CLUTCH/BRAKE MECHANISM. NOV. 30, 1971.
3,686,974.—MECHANICAL DRIVE ARRANGEMENT. AUG. 29, 1972.

Class 20A 6

3,351,831.—MOTOR SPEED CONTROL UTILIZING LIGHT SENSITIVE CONDUCTIVE AND RESISTIVE ELEMENTS. NOV. 7, 1967.
3,388,875.—WEB TRANSPORT CONTROL ASSEMBLY. JUNE 18, 1968.
3,418,046.—SIGNAL STORAGE DEVICE. DEC. 24, 1968. CAN. 0852814, GER. 1524999, GRB. 1190084, JAP. 0589515.
3,552,221.—SPEED CONVERTING MECHANISM. JAN. 5, 1971.
3,858,777.—PRINTING APPARATUS INCLUDING REGISTRATION CONTROL. JAN. 7, 1975.
3,870,934.—WEB TENSION CONTROLLER. MAR. 11, 1975.
3,909,125.—STEPPER MOTOR CONTROL. SEPT. 30, 1975.
3,917,400.—METHOD & APPARATUS FOR MAINTAINING A PREDETERMINED PHASE RELATIONSHIP BETWEEN TWO SIGNALS. NOV. 4, 1975.
3,921,043.—METHOD & APPARATUS FOR MAINTAINING SUBSTANTIALLY CONSTANT TORQUE IN A WEB TRANSPORT APPARATUS. NOV. 18, 1975.
3,944,896.—PHASE SYNCHRONIZATION SYSTEM WITH START-UP SEQUENCING AND AUTOMATIC SHUTDOWN. MAR. 16, 1976.
3,991,355.—STEPPER MOTOR CONTROL NOV. 9, 1976.
4,110,028.—DRIVE SYSTEM FOR MULTIMODE REPRODUCING APPARATUS. AUG. 29, 1978. BEL. 844828.

Class 20B

3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,942,349.—CROWN DIE FOR THREAD ROLLING OF APPLICATOR ROLLS. MAR. 9, 1976.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.
4,040,827.—DEVELOPMENT IMAGING METHODS. AUG. 9, 1977.

Class 20B 1

3,094,248.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 18, 1963. CAN. 0678004, GRB. 0985306.
3,129,850.—POWDER CLOUD GENERATING APPARATUS. APR. 21, 1964. CAN. 0693933, GER. 1497044, GRB. 1001237, JAP. 0436042.

Class 20B 2

3,094,248.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 18, 1963. CAN. 0678004, GRB. 0985306.
3,122,455.—XEROGRAPHIC TONER DISPENSER. FEB. 25, 1964.
3,356,248.—CONTAINER WITH A ROTATABLE CLOSURE. DEC. 5, 1967. CAN. 0825091, GRB. 1166618.
3,477,568.—ELECTROSTATIC SEPARATION OF ROUND AND NONROUND PARTICLES. NOV. 11, 1969.
3,478,600.—PARTICLE SIZE AND DISTRIBUTION ANALYZING APPARATUS. NOV. 18, 1969. CAN. 0871819, GRB. 1196449, JAP. 0667702.
3,694,068.—ROLLER RETRACTION MECHANISM IN A MULTIPLE ROLLER BELT ASSEMBLY. SEPT. 26, 1972. CAN. 0946322, GRB. 1370798.
3,698,540.—WEB SENSING MECHANISM FOR TRACKING SYSTEM. OCT. 17, 1972. CAN. 0946926.
3,702,131.—BELT TRACKING SYSTEM. NOV. 7, 1972. ARG. 1949380, AUS. 0459379, BEL. 0777321, CAN. 0953673, FRA. 7147892, GRB. 1381720, ITL. 0944435, MEX. 0126336, PNM. 0002633, SPN. 0398380.
3,740,288.—METHOD OF PREPARING A TONER DISPENSER. JUNE 19, 1973.
3,840,879.—EXCESS TONER SHIELD FOR ELECTROGRAPHIC APPARATUS. OCT. 8, 1974.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.

Class 20B 3

3,410,060.—XEROGRAPHIC FILTER APPARATUS. NOV. 12, 1968. CAN. 0810976, FRA. 1458648, GRB. 1114505, ITL. 0729638, JAP. 0724232.
3,570,224.—FILTER FOR ELECTROSTATOGRAPHIC DEVELOPER. MAR. 16, 1971.
3,662,884.—METHOD AND APPARATUS FOR ELECTROSTATICALLY CLASSIFYING TONER PARTICLES. MAY 16, 1972. CAN. 0956273, GRB. 1327942.
3,740,735.—AIR CIRCULATION APPARATUS. JUNE 19, 1973. CAN. 1014265, GRB. 1322612, JAP. 0840915.
3,909,383.—CLEANING PROCESS. SEPT. 30, 1975. CAN. 0905883.
3,544,458.—METHOD OF FILTERING. DEC. 1, 1970. BEL. 732578, CAN. 888335.

Class 20 C

3,698,540.—WEB SENSING MECHANISM FOR TRACKING SYSTEM. OCT. 17, 1972. CAN. 0946926.

Class 20C 1

3,498,500.—LEVEL SENSOR. MAR. 3, 1970. CAN. 0912851, GRB. 1251128, JAP. 0663856.
3,520,445.—DIELECTRIC LEVEL SENSOR. JULY 14, 1970. CAN. 0895527, GRB. 1239856, JAP. 0663857.

Class 20C 2

3,357,249.—TEMPERATURE SENSOR. DEC. 12, 1967. CAN. 0810332, GER. 1690654, GRB. 1171381.
3,723,980.—TEMPERATURE COMPENSATION SYSTEM FOR MAGNETIC DISK MEMORY UNIT. MAR. 27, 1973. ARG. 0195985, AUS. 0471633, BEL. 0791363, FRA. 7240560, GRB. 1408778, ITL. 0970913, MEX. 0129694, SPN. 0408629, STZ. 0028456, SWD. 7214693, VZL. 0032424.

Class 20C 3

3,492,732.—WEB QUANTITY INDICATOR. FEB. 3, 1970. CAN. 0887178.

Class 20C 4

3,191,440.—PRESSURE GAUGE INSTRUMENT. JUNE 29, 1965.
3,249,760.—PRESSURE GAUGE INSTRUMENT. MAY 3, 1966.
3,907,421.—TRANSFER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. SEPT. 23, 1975.
4,138,635.—ALTERNATING CURRENT GENERATOR USING LIGHT DEPENDENT RESISTOR. FEB. 6, 1979.

Class 20C 5

3,216,247.—WIND-MEASURING METER DEVICE. NOV. 9, 1965.

Class 20C 6

3,502,163.—EQUAL ARM BALANCE WITH C-SHAPED FULCRUM SLEEVE FORMED ON BEAM. MAR. 24, 1970.
3,583,505.—SPRING SCALE. JUNE 8, 1971. CAN. 0902123, GRB. 1295477.
3,878,358.—DIGITAL POWER CONTROL. APR. 15, 1975.

Class 20C 7

3,396,965.—SENSOR GAUGE. AUG. 13, 1968. CAN. 0822218, GRB. 1152538, JAP. 0587326.

Class 20D

3,746,502.—EVAPORATION CRUCIBLE. JULY 17, 1973. GRB. 1411236.
3,765,638.—SUCTION MOUNT. OCT. 16, 1973.
3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.

Class 20D 1

3,379,855.—FLUID FEED SYSTEM. APR. 23, 1968.
3,407,018.—TWO-AXIS ANGULAR POSITIONING APPARATUS FOR ADJUSTING THE POSITION OF AN OPTICAL ELEMENT. OCT. 22, 1968.

3,436,071.—WORK HOLDER. APR. 1, 1969. CAN. 0856095, GRB. 1174795, JAP. 0642773.
3,440,859.—CORNER FORMING APPARATUS. APR. 29, 1969. CAN. 0866532.
3,475,936.—TRANSPORT SYSTEM. NOV. 4, 1969. GRB. 1179749.
3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,901,647.—LOW RADIATION OPEN-BOAT CRUCIBLES. AUG. 26, 1975.
4,016,470.—TRANSDUCER BORING SYSTEM. APR. 5, 1977.
4,018,414.—HOLDING FIXTURES. APR. 19, 1977.
4,143,960.—RETRACTABLE SUPPORT MEMBER. MAR. 13, 1979.

Class 20D 2

3,341,681.—XEROGRAPHIC PLATE FABRICATION. SEPT. 12, 1967. CAN. 0780598, FRA. 1415795, GRB. 1070555, HOL. 0144068, IND. 0094992, ITL. 0738063.
3,876,317.—LATCH MECHANISM. APR. 8, 1975. CAN. 1005486.

Class 20D 3

3,258,281.—HERMETIC SEALED COUPLING FOR CONDUITS. JUNE 28, 1966.
3,317,224.—FLANGED PIPE COUPLING HAVING METALLIC SEAL MEANS. MAY 2, 1967.
3,366,343.—DEVICE FOR FASTENING A SHAFT TO A REEL. JAN. 30, 1968.
3,604,737.—METHOD OF JOINING MATERIALS. SEPT. 14, 1971.

Class 20D 4

3,532,863.—DYNAMIC CAM TESTER. OCT. 6, 1970. CAN. 0835529.
3,843,233.—ALIGNING AGENT FOR LOWRNG THRSHLD VOLTG REQUIRD TO EFFECT OPTCLY NEQTV TO OPTCLY POSITIVE PHASE. OCT. 22, 1974.

Class 20D 5

3,596,316.—BLOW MOLDING APPARATUS. AUG. 3, 1971.

Class 20D 6

3,384,107.—BAKEABLE VACUUM VALVE. MAY 21, 1968.

Class 20D 7

3,489,463.—BRUSH SIZING APPARATUS. JAN. 13, 1970. GRB. 1243233, JAP. 0810578.

Class 20E

3,217,328.—ANTENNA WITH WIRE MESH REFLECTOR COLLAPSING IN A PINWHEEL MANNER. NOV. 9, 1965.

Class 20F

3,390,693.—PURE FLUID AMPLIFIER. JULY 2, 1968.
3,413,993.—FLUID DEVICE. DEC. 3, 1968.
3,417,770.—FLUID AMPLIFIER SYSTEM. DEC. 24, 1968.
3,459,205.—MAGNETICALLY CONTROLLED FLUID AMPLIFIER. AUG. 5, 1969.
3,496,955.—ELECTRICALLY ACTUATED BISTABLE FLUID AMPLIFIER. FEB. 24, 1970.
3,726,588.—WEB TRACKING SYSTEM. APR. 10, 1973.

Class 20 G

3,217,328.—ANTENNA WITH WIRE MESH REFLECTOR COLLAPSING IN A PINWHEEL MANNER. NOV. 9, 1965.
3,549,059.—TRIGGERING APPARATUS AND WORK LOCATING MEANS FOR AEROSOL SPRAY CANS. DEC. 22, 1970.
3,555,725.—SELF-TRAVELLING WHEEL. JAN. 19, 1971. CAN. 0900718, GRB. 1289331, JAP. 0713807.
3,688,415.—VIBRATION DEMONSTRATION. SEPT. 5, 1972.
3,747,589.—REACTION TIME TESTING APPARATUS. JULY 24, 1973.
3,818,391.—TRACKING ASSEMBLY FOR AN ENDLESS BELT ELECTROSTATOGRAPHIC MACHINE. JUNE 18, 1974. CAN. 1010107.
3,840,879.—EXCESS TONER SHIELD FOR ELECTROGRAPHIC APPARATUS. OCT. 8, 1974.
3,907,421.—TRANSFER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. SEPT. 23, 1975.
3,941,006.—FREE FLOATING BELT TENSIONER. MAR. 2, 1976.
3,946,920.—VACUUM SYSTEM CONTROL. MAR. 30, 1976.
3,982,753.—COMBINED BACKSTOP & BRAKE-COMBINED BACKSTOP & BRAKE FOR ALBERT. SEPT. 28, 1976. BEL. 0812180, CAN. 1004161, FRA. 7407806, GRB. 1443088.
3,994,053.—DRUM SUPPORT APPARATUS. NOV. 30, 1976.
4,040,157.—DRUM SUPPORT APPARATUS. AUG. 9, 1977.
4,040,678.—BEARING ASSEMBLY. AUG. 9, 1977.
4,105,345.—EXPANDABLE PHOTORECEPTOR END-BELLS. AUG. 8, 1978.
4,120,576.—DRUM SUPPORT APPARATUS. OCT. 17, 1978.
4,135,805.—COUNTERBALANCING APPARATUS. JAN. 23, 1979.
4,143,960.—RETRACTABLE SUPPORT MEMBER. MAR. 13, 1979.

Class 21

D.240,557.—TRAY RACK. JULY 13, 1976.
3,942,349.—CROWN DIE FOR THREAD ROLLING OF APPLICATOR ROLLS. MAR. 9, 1976.
D245,667.—WIRE CUTTER. SEPT. 6, 1977.

Class 21A

3,905,400.—ELECTROFORMING MANDREL. SEPT. 16, 1975.
4,067,782.—METHOD OF FORMING AN ELECTROFORMING MANDREL. JAN. 10, 1978.

Class 21A 1

3,316,158.—FOAM METAL CONSTRUCTION AND A METHOD FOR MAKING IT. APR. 25, 1967.
3,378,469.—ELECTROFORMING TECHNIQUE AND STRUCTURE FOR REFLECTING MIRRORS. APR. 16, 1968.
3,428,533.—HIGH QUALITY SUB-MASTERS AND METHOD FOR PRODUCING THEM. FEB. 18, 1969.
3,472,679.—COATING SURFACES. OCT. 14, 1969. CAN. 0896992.
3,505,177.—ELECTROFORMING PROCESS. APR. 7, 1970.
3,520,780.—MAGNESIUM ELECTRODEPOSITION. JULY 14, 1970.
3,844,906.—DYNAMIC BATH CONTROL PROCESS. OCT. 29, 1974. BEL. 0799236, FRA. 7316539, GRB. 1421818.
3,853,614.—CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD. DEC. 10, 1974. ARG. 0196734, AUS. 0461213, BEL. 0777320, CAN. 0953990, FRA. 7147891, GRB. 1380057, ITL. 0944392, MEX. 0131400, SPN. 0398306.
3,876,510.—PROCESS FOR ELECTROFORMING A FLEXIBLE BELT. APR. 8, 1975.
3,905,685.—ZOOM LENS FOR FIXED CONJUGATES. SEPT. 16, 1975. CAN. 0995039, GRB. 1451781.
3,954,568.—ELECTROFORMING AN ENDLESS FLEXIBLE SEAMLESS XEROGRAPHIC BELT. MAY 4, 1976. ARG. 0185811, AUS. 0449005, BEL. 0762249, CAN. 0889781, EGR. 0094306, FRA. 7103844, GRB. 1288717, HUN. 0169866, ITL. 0918048, MEX. 0119465, PLD. 0081712, PNM. 0002384, SPN. 0387636, STZ. 0521612, SWD. 0360753, TIW. 0007843, VZL. 0027666.
3,959,109.—METHOD AND APPARATUS FOR ELECTROFORMING. MAY 25, 1976.
3,963,587.—PROCESS FOR ELECTROFORMING NICKEL FOILS. JUNE 15, 1976.
4,043,876.—METHOD AND APPARATUS FOR ELECTROFORMING. AUG. 23, 1977.

Class 21A 2

3,316,158.—FOAM METAL CONSTRUCTION AND A METHOD FOR MAKING IT. APR. 25, 1967.
3,378,469.—ELECTROFORMING TECHNIQUE AND STRUCTURE FOR REFLECTING MIRRORS. APR. 16, 1968.
3,428,533.—HIGH QUALITY SUB-MASTERS AND METHOD FOR PRODUCING THEM. FEB. 18, 1969.
3,577,323.—HIGH QUALITY SUBMASTERS. MAY 4, 1971.
3,927,463.—METHOD OF MAKING A CYLINDRICALLY SHAPED, HOLLOW ELECTROFORMING MANDREL. DEC. 23, 1975.
3,950,839.—ELECTROFORMING MANDREL. APR. 20, 1976.

Class 21A 3

3,352,482.—ION SPUTTER PUMPING COLLECTOR. NOV. 14, 1967.
3,437,568.—APPARATUS AND METHOD FOR DETERMINING AND CONTROLLING STRESS IN AN ELECTROFORMED PART. APR. 8, 1969.
3,799,859.—ELECTROFORMING SYSTEM. MAR. 26, 1974. GRB. 1427544.
4,043,876.—METHOD AND APPARATUS FOR ELECTROFORMING. AUG. 23, 1977.

Class 21B

3,223,878.—METHOD OF FABRICATING FINE GRIDS. DEC. 14, 1965.
3,276,919.—PROCESS FOR FORMING METAL STRUCTURES HAVING VERY FINE PORES. OCT. 4, 1966.
3,360,347.—PRODUCTION OF POUROUS MATERIALS. DEC. 26, 1967.
3,494,748.—OXIDATION RESISTANT COATING AND ARTICLE. FEB. 10, 1970.
3,666,429.—MATALLIZED AND BRAZED CERAMICS. MAY 30, 1972.
3,708,306.—METHOD OF HERMETICALLY SEALING SILICON TO A LOW EXPANSION ALLOY. NOV. 21, 1972.
3,740,830.—BRAZING CERAMICS. JUNE 26, 1973.
3,825,724.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER. JULY 23, 1974. CAN. 0995295, GRB. 1406047.
3,851,985.—COLLAR AND METHOD OF MAKING SAME. DEC. 3, 1974.
3,885,923.—GENERATION OF CURVED SURFACES ON A WORKPIECE. MAY 27, 1975.
3,911,163.—SOLDER COATING PROCESS AND APPARATUS. OCT. 7, 1975.
4,083,323.—PNEUMATIC SYSTEM FOR SOLDER LEVELING APPARATUS. APR. 11, 1978.
4,114,431.—METHOD OF FORMING TUBULAR METAL PRODUCTS. SEPT. 19, 1978.

Class 21C

3,653,885.—PROCESS OF STABILIZING A MIGRATION IMAGE COMPRISING SELENIUM PARTICLES. APR. 4, 1972. CAN. 0937437.
4,112,841.—RESILIENT LITHOGRAPHIC MASTERS FOR DIRECT PRINTING. SEPT. 12, 1978.
4,114,535.—RESILIENT LITHOGRAPHIC MASTERS FOR DIRECT PRINTING. SEPT. 19, 1978.
4,123,283.—SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS. OCT. 31, 1978. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.
4,135,926.—MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET. JAN. 23, 1979. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.
4,202,932.—MAGNETIC RECORDING MEDIUM. MAY 13, 1980.

Class 22

D244,280.—SORTER WITH BIN INDICATOR. MAY 10, 1977.
D247,243.—SORTER CONTROLLER. FEB. 14, 1978.
D.252,275.—SUBSTRATE CLAMP FOR A SLITTING APPARATUS. JULY 3, 1979.

Class 22A

3,473,388.—ISOKINETIC PARTICLE SAMPLER. OCT. 21, 1969. CAN. 0852475, GRB. 1194569.
3,478,600.—PARTICLE SIZE AND DISTRIBUTION ANALYZING APPARATUS. NOV. 18, 1969. CAN. 0871819, GRB. 1196449, JAP. 0667702.
3,544,458.—METHOD OF FILTERING. DEC. 1, 1970. CAN. 0888335.
3,940,997.—APPARATUS AND METHOD FOR MEASURING ANGLE OF REPOSE. MAR. 2, 1976.

Class 22B

3,938,993.—XEROGRAPHIC METHOD FOR MAKING A RESPONSIVE ANSWER SYSTEM. FEB. 17, 1976. CAN. 0858780, GRB. 1235941, JAP. 0688426.
3,972,715.—PARTICLE ORIENTATION IMAGING SYSTEM. AUG. 3, 1976.

Class 22B 1

3,497,320.—AUTOMATED CHEMICAL ANALYZER - FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336, ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,504,376.—AUTOMATED CHEMICAL ANALYZER. MAR. 31, 1970. ARG. 0177588, ATR. 0300733, AUS. 0441839, BEL. 0722721, CAN. 0921812, FIN. 0050908, FRA. 1584398, GRB. 1218750, IND. 0113631, ITL. 0856574, LXB. 0057969, MEX. 0112300, NOR. 0131259, NZL. 0155344, PNM. 0001667, SAF. 0690934, SPN. 0362595, STZ. 0526109, SWD. 0365310, VZL. 0027510.
3,508,879.—ALIQUOTTING DEVICE. APR. 28, 1970. ATR. 0280666, AUS. 0429344, BEL. 0722722, CAN. 0883952, FRA. 1578475, GER. 1673343, GRB. 1218747, ITL. 0862567, LXB. 0057971, MEX. 0101480, NOR. 0131257, NZL. 0155346, SAF. 0069936, SPN. 0363624, STZ. 0494403, SWD. 0342699.
3,526,480.—AUTOMATED CHEMICAL ANALYZER. SEPT. 1, 1970. ARG. 0174584, AUS. 0452281, BEL. 0728248, CAN. 0950341, FRA. 1584397, GER. 1673340, GRB. 1218749, HOL. 1467250, ITL. 0865002, MEX. 0118203, PNM. 0001668, SPN. 0381340, STZ. 0501922, SWD. 0359925, VZL. 0025782.
3,582,283.—CHEMICAL PACKAGE. JUNE 1, 1971.

Class 22B 1A

3,477,821.—CHEMICAL PACKAGE. NOV. 11, 1969. ARG. 0169582, AUS. 0433117, BEL. 0725955, CAN. 0876261, FRA. 1596338, GER. 1816225, GRB. 1245780, HOL. 0141402, ITL. 0852626, JAP. 0805178, MEX. 0108467. PNM. 0001764, SPN. 0361841, STZ. 0531895, SWD. 0345742, VZL. 0023719.
3,477,822.—CHEMICAL PACKAGE. NOV. 11, 1969. ARG. 0169541, AUS. 0433116, BEL. 0725958, CAN. 0904725, FRA. 1596340, GRB. 1251680, HOL. 0141098, ITL. 0852625, JAP. 0802751, MEX. 0108998, PNM. 0001662, SPN. 0361844, STZ. 0530223, SWD. 0346384, VZL. 0023725.
3,480,398.—CHEMICAL PACKAGE. NOV. 25, 1969. ARG. 0169487, AUS. 0433114, BEL. 0725956, CAN. 0885006, FRA. 1596337, GER. 1816228, GRB. 1257336, HOL. 0141797, ITL. 0856875, JAP. 0805177, MEX. 0108468, PNM. 0001663, SPN. 0361842, STZ. 0530637, SWD. 0345012, VZL. 0023722.
3,480,399.—CHEMICAL PACKAGE. NOV. 25, 1969. ARG. 0169540, AUS. 0433115, BEL. 0725957, CAN. 0906891, FRA. 1596339, GER. 1816227, GRB. 1251679, HOL. 0141099, ITL. 0852624, JAP. 0802750. MEX. 0108997, PNM. 0001669, SPN. 0361843, STZ. 0526106, VZL. 0023720.
3,497,320.—AUTOMATED CHEMICAL ANALYZER - FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336, ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,504,376.—AUTOMATED CHEMICAL ANALYZER. MAR. 31, 1970. ARG. 0177588, ATR. 0300733, AUS. 0441839, BEL. 0722721, CAN. 0921812, FIN. 0050908, FRA. 1584398, GRB. 1218750, IND. 0113631, ITL. 0856574, LXB. 0057969, MEX. 0112300, NOR. 0131259, NZL. 0155344, PNM. 0001667, SAF. 0690934, SPN. 0362595, STZ. 0526109, SWD. 0365310, VZL. 0027510.
3,545,934.—CHEMICAL PACKAGE. DEC. 8, 1970. BEL. 0739751, CAN. 0887759. FRA. 6933737, GER. 1950067, GRB. 1257337, HOL. 150690, ITL. 0873750.
3,545,935.—DISPOSABLE REACTION CONTAINER FOR AN AUTOMATIC CHEMICAL ANALYZER. DEC. 8, 1970. ARG. 0179456, AUS. 0447958, BEL. 0741890, CAN. 0933494, FRA. 6939709, GER. 1957735, GRB. 1257338, HOL. 0145773, ITL. 0878322, MEX. 0113681, SPN. 0373794, STZ. 0500010, SWD. 0353399.
3,554,705.—CHEMICAL PACKAGE. JAN. 12, 1971.
3,582,283.—CHEMICAL PACKAGE. JUNE 1, 1971.
3,582,285.—CHEMICAL PACKAGE. JUNE 1, 1971.

Class 22B 1B

3,497,320.—AUTOMATED CHEMICAL ANALYZER - FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336, ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573,

LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,508,879.—ALIQUOTTING DEVICE. APR. 28, 1970. ATR. 0280666, AUS. 0429344, BEL. 0722722, CAN. 0883952, FRA. 1578475, GER. 1673343, GRB. 1218747, ITL. 0862567, LXB. 0057971, MEX. 0101480, NOR. 0131257, NZL. 0155346, SAF. 0069936, SPN. 0363624, STZ. 0494403, SWD. 0342699.
3,526,480.—AUTOMATED CHEMICAL ANALYZER. SEPT. 1, 1970. ARG. 0174584, AUS. 0452281, BEL. 0728248, CAN. 0950341, FRA. 1584397, GER. 1673340, GRB. 1218749, HOL. 1467250, ITL. 0865002, MEX. 0118203, PNM. 0001668, SPN. 0381340, STZ. 0501922, SWD. 0359925, VZL. 0025782.
3,586,446.—FLAME PHOTOMETER. JUNE 22, 1971. ARG. 0183956, BEL. 0720577, CAN. 0876239, FRA. 1581844, GER. 1798234, GRB. 1246633, ITL. 0864506, JAP. 0835088, MEX. 0103300, SWD. 0342326, VZL. 0023659.

Class 22B 2

3,497,320.—AUTOMATED CHEMICAL ANALYZER - FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336. ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,504,376.—AUTOMATED CHEMICAL ANALYZER. MAR. 31, 1970. ARG. 0177588, ATR. 0300733, AUS. 0441839, BEL. 0722721, CAN. 0921812, FIN. 0050908, FRA. 1584398, GRB. 1218750, IND. 0113631, ITL. 0856574, LXB. 0057969, MEX. 0112300, NOR. 0131259, NZL. 0155344, PNM. 0001667, SAF. 0690934, SPN. 0362595, STZ. 0526109, SWD. 0365310, VZL. 0027510.
3,520,659.—METHOD AND APPARATUS FOR USE IN DETERMINING PROTHROMBIN TIME OF A BLOOD SAMPLE. JULY 14, 1970. ARG. 0176972, AUS. 0421560, BEL. 0722360, CAN. 0892696, FRA. 1588701, GER. 1804292, GRB. 1244355, HOL. 0142783, ITL. 0862597, MEX. 0105611, SPN. 0359312, SWD. 0345744, VZL. 0023706.
3,705,013.—ANALYTICAL PROCEDURES AND COMPOSITIONS THEREFOR. DEC. 5, 1972.

Class 24

D.249,695.—REMOVABLE UNDERSIZE SHEET EDGE GUIDE SHEET FEED CASSETTE. SEPT. 26, 1978.
3,888,892.—LIQUID CRYSTALLINE COMPOUNDS. JUNE 10, 1975.
4,126,711.—CHARGE PATTERN DEVELOPMENT METHOD & APPARATUS. NOV. 21, 1978. GRB. 1484712.

Class 24A 1

3,289,211.—ELECTRICAL RECORDING PEN. NOV. 29, 1966. ARG. 0144972, AUS. 0283737, BEL. 0663614, CAN. 0755964. FRA. 1444045, GER. 1498264, GRB. 1064344, HOL. 0145955, ITL. 0760432, JAP. 0704598, MEX. 0084384, NOR. 0121120, NZL. 0141445, SPN. 0312594, STZ. 0430241, SWD. 0336857, VZL. 0017268.
3,308,475.—ELECTROVISCOUSLY CONTROLLED RECORDER. MAR. 7, 1967.
3,359,566.—MOTOR ACTION CAPILLARY. DEC. 19, 1967. CAN. 0831673, GER. 1537562, GRB. 1196932, JAP. 0583415.
3,375,528.—RECORDING PEN HAVING A PLURALITY OF CLOSELY SPACED WIRES. MAR. 26, 1968. AUS. 0284067, BEL. 0680693, CAN. 0834975, FRA. 0089948, GER. 1548876, GRB. 1148771, HOL. 0150907, ITL. 0809504, JAP. 0773176, MEX. 0091261, SPN. 0326324, STZ. 0457888, SWD. 0325719.
3,484,162.—ELECTROVISCOUS RECORDING. DEC. 16, 1969.
3,512,173.—ALPHANUMERIC INK DROPLET RECORDER. MAY 12, 1970. ARG. 0180676, BEL. 0725960, CAN. 0879917, FRA. 1603645, GER. 1816194, GRB. 1227600, ITL. 0849703, JAP. 0770832, MEX. 0109982.
3,512,177.—INK RECORDING SYSTEM. MAY 12, 1970.
3,848,258.—MULTI-JET INK PRINTER. NOV. 12, 1974. BEL. 0819105, CAN. 1000778, FRA. 7419592.
3,893,131.—INK PRINTER. JULY 1, 1975. BEL. 0819105, CAN. 1000778, FRA. 7419592.
4,014,693.—ELECTROVISCOUS RECORDING. MAR. 29, 1977.

Class 24A 2

3,329,964.—FACSIMILE RECORDING APPARATUS. JULY 4, 1967. CAN. 0809338, GRB. 1095098.
3,334,354.—DOTTING INK RECORDER. AUG. 1, 1967. CAN. 0792422.
3,627,908.—HIGH-SPEED COLOR CORRECTING SCANNER FOR MAKING COLOR PRINTING PLATES. DEC. 14, 1971. CAN. 0923428, GRB. 1335980, JAP. 0774708.
4,024,544.—MENISCUS DAMPENING DROP GENERATOR. MAY 17, 1977.
4,032,929.—HIGH DENSITY LINEAR ARRAY INK JET ASSSEMBLY. JUNE 28, 1977.
4,057,807.—SEPARABLE LIQUID DROPLET INSTRUMENT AND MAGNETIC DRIVER THEREFOR. NOV. 8, 1977.
4,104,645.—COINCIDENCE INK JET. AUG. 1, 1978. SAF. 6469.
4,112,433.—MENISCUS DAMPENING DROP GENERATOR. SEPT. 5, 1978. STZ. 609915.
4,115,789.—SEPARABLE LIQUID DROPLET INSTRUMENT AND PIEZOELECTRIC DRIVERS THEREFOR. SEPT 19, 1978. BEL. 850334.
4,121,227.—INK JET ARRAY WITH ISOLATED FLUID RECTIFIER LAYERS. OCT. 17, 1978.
4,199,769.—COINCIDENCE GATE INK JET WITH INCREASED OPERATING PRESSURE WINDOW. APR. 22. 1980.
4,199,770.—COINCIDENCE GATE INK JET WITH INCREASED OPERATING PRESSURE WINDOW. APR. 22, 1980.
4,201,995.—COINCIDENCE GATE INK JET WITH INCREASED OPERATING PRESSURE WINDOW. MAY 6, 1980.

Class 24A 3

3,287,734.—MAGNETIC INK RECORDING. NOV. 22, 1966. CAN. 0808834, FRA. 1490442, GRB. 1102505, HOL. 0150643, ITL. 0784569, JAP. 0571140.
3,334,000.—METHOD FOR SIMULTANEOUS PRODUCTION OF A PLURALITY OF MICROCIRCUIT WAFERS. AUG. 1, 1967.

Class 24A 4

3,480,962.—FACSIMILE RECORDING SYS. NOV. 25, 1969.
3,484,162.—ELECTROVISCOUS RECORDING. DEC. 16, 1969.
3,484,793.—IMAGE RECORDING APPARATUS INK DROPLET RECORDER WITH OPTICAL INPUT. DEC. 16, 1969.
3,553,708.—APPARATUS AND METHOD EMPLOYING PHOTOELECTROVISCOUS INK. JAN. 5, 1971.

Class 24B

3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.
4,080,054.—DEVICE FOR REPLENISHING TONER PARTICLES. MAR. 21, 1978.
4,096,294.—PROCESS FOR PREPARING WATERLESS PRINTING MASTERS COMPRISING COPOLYMER OF SILOXANE AND CRYST. JUNE 20, 1978.

Class 24B 1

3,833,293.—METHOD OF CREATING COLOR TRANSPARENCIES. SEPT. 3, 1974.
4,047,947.—PROCESS FOR THE PREPARATION OF TRANSPARENCIES BY SELECTIVE DECOMPOSITION OF AN ORGANOSELENI. SEPT. 13, 1978.
4,055,424.—NOVEL MICROFILM AND PROCESS FOR PREPARATION. OCT. 25, 1977.

Class 24B 1B 1

3,528,355.—CAMERA-PROCESSOR. SEPT. 15, 1970. ARG. 0184627, ATR. 0303513, AUS. 0426557, BEL. 0720022, BRA. 6800654, CAN. 0864811, CHL. 0024251, CLB. 0018453, FRA. 1586179, GER. 1797177, GRB. 1244641, IND. 0117458. ITL. 0839895, LXB. 0056774, MEX. 0103737, NOR. 0128296, NZL. 0153587, PLP. 0006313, PNM. 0001980, PRU. 0010212, PTG. 0050229, SPN. 0357651, STZ. 0516171, SWD. 0338503, URG. 0009309, VZL. 0023698.

Class 24B 1B 3

3,459,888.—SELECTIVE PHOTOCOPIER. AUG. 5, 1969.
3,537,788.—AUTOMATIC DISCRIMINATION TECHNIQUE FOR SELECTIVE PHOTOCOPYING. NOV. 3, 1970.

Class 24B 1C

3,393,362.—PROCESS FOR DETECTING IRREGULARITIES IN A METALLIC SURFACE. JULY 16, 1968.
3,480,965.—APPARATUS FOR PYROGENICALLY RECORDING ON TRANSPARENCIES. NOV. 25, 1969.

Class 24B 1D

3,435,243.—FILM FRAME DETECTION SYSTEM. MAR. 25, 1969.

Class 24B 2A

3,349,980.—VACUUM TRANSPORT DEVICE. OCT. 31, 1967.
3,388,875.—WEB TRANSPORT CONTROL ASSEMBLY. JUNE 18, 1968.

Class 24B 2B

3,409,364.—GATE ASSEMBLY. NOV. 5, 1968.
3,409,365.—CONTACT PRINTER. NOV. 5, 1968. AUS. 0425973, JAP. 0613746.

Class 24B 2C

3,379,110.—EXPOSURE CONTROL SYSTEM. APR. 23, 1968.
3,479,119.—EXPOSURE CONTROL APPARATUS. NOV. 18, 1969.

Class 24B 4

3,510,216.—PROJECTION APPARATUS. MAY 5, 1970.

Class 24C

4,007,682.—REVERSE ANGLE MOUNTED INK-SPLITTING DOCTOR BLADE. FEB. 15, 1977.

Class 24C 1

3,843,407.—BLADE CLEANING WITH REVERSE MOVEMENT. OCT. 22, 1974.

Class 24C 1A

3,170,395.—DUPLICATING. FEB. 23, 1965. AUS. 0410880, CAN. 0768079, FRA. 1414985, GRB. 1059659, ITL. 0740682, JAP. 0511405.
3,332,347.—DUPLICATING. JULY 25, 1967. AUS. 0271226, CAN. 0761868, FRA. 1367474, GER. 1471696, GRB. 1029997, ITL. 0730203.
3,357,353.—VAPOR THERMOGRAPHY RECORDING PROCESS AND RECORDING MEMBER USED THEREIN. DEC. 12, 1967.

Class 24C 1B

3,336,867.—DUPLICATING PROCESS. AUG. 22, 1967. CAN. 0796971, GRB. 1149056.

Class 24C 1C

3,487,775.—IMAGING SYSTEM. JAN. 6, 1970. CAN. 0873983.

Class 24C 1D

3,408,216.—IMAGE REPRODUCTION. OCT. 29, 1968. CAN. 0806942, GRB. 1127218, JAP. 0742511.
3,792,266.—THERMOGRAPHIC RECORDING USING VAPORIZED MATERIAL AND COLORED PARTICLE DEVELOPMENT. FEB. 12, 1974.

Class 24C 1E 1

3,402,660.—DRUM SUPPORT AND DRIVE SYSTEM FOR REPRODUCTION MACHINES. SEPT. 24, 1968.
3,427,965.—SHEET GRIPPER MEANS FOR REPRODUCTION MACHINE OF THE PRESSURE TRANSFER TYPE. FEB. 18, 1969.
3,429,259.—PRESSURE TRANSFER REPRODUCTION MACHINE. FEB. 25, 1969.
3,460,472.—TRANSFER SHEET CLAMPING MECHANISM FOR A REPRODUCTION MACHINE. AUG. 12, 1969.

Class 24C 1E 2

3,433,154.—PRESSURE PRODUCING MEANS FOR REPRODUCTION MACHINE. MAR. 18, 1969.

Class 24C 1E 3

3,374,732.—SELF-ALIGNING COPY DRUM STRIPOUT MECHANISM FOR REPRODUCTION MACH. MAR. 26, 1968.
3,375,780.—SHEET COUNTING MECHANISM FOR REPRODUCTION MACHINES. APR. 2, 1968.
3,380,379.—SHEET GUIDING MECHANISM FOR A REPRODUCTION MACHINE. APR. 30, 1968.
3,405,635.—PAPER SUPPORT TRAY FOR REPRODUCTION MACHINES. OCT. 15, 1968.
3,427,966.—PRESSURE TRANSFER TYPE REPRODUCTION MACHINE. FEB. 18, 1969.
3,430,558.—SHEET COUNTING SYSTEM IN A REPRODUCTION MACHINE. MAR. 4, 1969.

Class 24C 1E 4

3,375,779.—PROGRAMMING CONTROL FOR REPRODUCTION MACHINES. APR. 2, 1968.

Class 24C 1E 5

3,548,748.—DUPLICATING METHOD EMPLOYING SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND EXPOSURE TO RADIATION. DEC. 22, 1970. CAN. 0882051, GRB. 1227394, JAP. 0752522.
3,565,612.—DUPLICATING MASTERS BY THE MANIFOLD PROCESS. FEB. 23, 1971. ARG. 0193797, AUS. 0411612, BEL. 0708974, CAN. 0873277, FRA. 1549964, GER. 1671590, GRB. 1215956, ITL. 0823464, MEX. 0106608, VZL. 0023681.
3,681,065.—DYE TRANSFER COLOR PHOTOGRAPHY. AUG. 1, 1972.

Class 24C 1E 6

3,527,163.—SILK SCREEN MASTER. SEPT. 8, 1970.
4,199,359.—PHOTOGRAPHIC SCREEN STENCIL PRINTING PROCESS. APR. 22, 1980.

Class 24C 1E 7

3,357,354.—REPRODUCTION METHOD. DEC. 12, 1967.
3,406,137.—IMAGING MATERIAL. OCT. 15, 1968. AUS. 0409415, BEL. 0680375, CAN. 0815085, FRA. 1477912, GER. 1571874, GRB. 1149055, ITL. 0766799, JAP. 0594685, MEX. 0090845, SWD. 0336860.
3,415,186.—DUPLICATING SYSTEM. DEC. 10, 1968.
3,436,234.—DUPLICATING INK. APR. 1, 1969. AUS. 0408998, BEL. 0680377, CAN. 0806568, FRA. 1477914, GER. 1571875, GRB. 1151495, ITL. 0765635, JAP. 0594687, MEX. 0090362, SWD. 0336421.
3,446,646.—PRESSURE SENSITIVE RECEIVING AND TRANSFER SHEET. MAY 27, 1969. AUS. 0417562, BEL. 0680376, CAN. 0865673, FRA. 1477913, GER. 1571922, GRB. 0115076, ITL. 0765634, JAP. 0575982, MEX. 0090589, SWD. 0333578.

Class 24D

3,275,436.—METHOD OF IMAGE REPRODUCTION UTILIZING A UNIFORM RELEASABLE SURFACE FILM. SEPT. 27, 1966. AUS. 0296158, CAN. 0811877, FRA. 1371894, GRB. 1033523, ITL. 0702168, JAP. 0508402.
3,422,759.—LITHOGRAPHIC IMAGING SYSTEM USING PHOTOCHROMIC AND THERMOCHROMIC MATERIALS. JAN. 21, 1969. CAN. 0855648, GRB. 1190102.
3,460,476.—IMAGING PROCESS. AUG. 12, 1969. ARG. 0164839, AUS. 0418783, BEL. 0691755, CAN. 0882050, FRA. 1511173, GRB. 1168268, ITL. 0787662, JAP. 0562388, MEX. 0108240, SPN. 0346128, STZ. 0480672, SWD. 0331794. VZL. 0024009.
3,547,627.—LITHOGRPHC PRINTG MASTER AND METHOD EMPLOYING A CRYSTALLINE PHOTOCONDUCTIVE IMAGING LAYER. DEC. 15, 1970.
3,554,125.—METHOD OF MAKING A LITHOGRAPHIC MASTER AND METHOD OF PRINTING THEREWITH. JAN. 12, 1971. CAN. 0882052, GER. 1772302, GRB. 1219849.
3,718,087.—APPARATUS FOR APPLYING INK AND IMMISSIBLE FLUID TO A PRINTING SURFACE. FEB. 27, 1973. ARG. 0185945, AUS. 0449639, BEL. 0759110, CAN. 0919007, FRA. 7042608, GRB. 1330183, ITL. 0912865, MEX. 0120782.
3,878,168.—SILICONE ELASTOMERS. APR. 15, 1975.
3,901,151.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. AUG. 26, 1975.
3,907,562.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. SEPT. 23, 1975.

3,909,256.—ELECTROSTATOGRAPHIC PROCESS FOR PREPARING SCREEN PRINTING MEMBER. SEPT. 30, 1975.
3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975. GRB. 1461872.
3,948,655.—ELECTROSTATOGRAPHIC PROCESS FOR PREPARING GRAVURE PRINTING MEMBER. APR. 5, 1976.
3,951,060.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. APR. 20, 1976.
3,951,063.—PROCESS FOR PREPARING REVERSIBLE CURE WATERLESS LITHOGRAPHIC MASTERS. APR. 20, 1976.
3,957,349.—IMAGING METHOD. MAY 18, 1976.
3,961,947.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. JUNE 8, 1976.
3,968,278.—IMAGING METHOD. JULY 6, 1976.
3,971,316.—PROCESS FOR SMOOTHING WATERLESS LITHOGRAPHIC MASTERS. JULY 27, 1976.
3,995,554.—PROCESS FOR PREPARING RESILIENT IMAGED PRINTINGS MASTERS. DEC. 7, 1976.
3,999,481.—METHOD OF MAKING A MASTER. DEC. 28, 1976.
4,003,312.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC PRINTING MASTERS BY INK JET PRINTING MEANS. JAN. 18, 1977.
4,005,654.—PROCESS FOR SHALLOW RELIEF PRINTING. FEB. 1, 1977. BEL. 0792620, FRA. 7244602, GRB. 1416158, ITL. 0971749.
4,007,041.—ELECTROPHOTOGRAPHIC PRINTING METHOD. FEB. 8, 1977.
4,009,032.—PROCESS FOR PREPARING WATERLESS PRINTING MASTERS COMPRISING COPOLYMER OF SILOXANE AND THERMOPLA. FEB. 22, 1977.
4,009,660.—INKING IN LITHO PRINTING THROUGH A NON-IMAGED SCREEN. MAR. 1, 1977.
4,010,687.—PLANOGRAPHIC PRINTING MASTER-MULTI PHASE TONERS & MULTI PHASE ADHESIVE LAYERS. MAR. 8, 1977. BEL. 0813293, CAN. 0988364, GRB. 1458725, ITL. 1006438, PTG. 61726.
4,012,254.—NOVEL PHOTOCONDUCTIVE WATERLESS LITHOGRAPHIC PRINTING MASTERS & PROCESS OF PREPARATION. MAR. 15, 1977.
4,016,814.—PLANOGRAPHIC PRINTING MASTER — SPONGY IMAGE PATTERNS. APR. 12, 1977. CAN. 0985952, ITL. 1006441.
4,019,437.—PLANOGRAPHIC PRINTING MASTER TONER INDUCED POROUS SPONGE IMAGES TIPSI. APR. 26, 1977. BEL. 0813159, CAN. 1014416, GRB. 1458723, ITL. 1006440, NZL. 0173942.
4,030,416.—WATERLESS PRINTING MASTER. JUNE 21, 1977.
4,064,312.—NONIMAGED WATERLESS LITHOGRAPHIC MASTER WITH CURABLE SILICONE ELASTOMER AND A CURED INK REL. DEC. 20, 1977.
4,077,324.—METHOD OF FOUNTAINLESS LITHOGRAPHY. MAR. 7, 1978. FRA. 7520962.
4,077,325.—PROCESS FOR PREPARING WATERLESS PRINTING MASTERS. MAR. 7, 1978.
4,078,927.—PHOTOCONDUCTIVE PRINTING MASTER. MAR. 14, 1978.
4,080,897.—SELECTIVE TACK IMAGING AND PRINTING. MAR. 28, 1978.
4,081,572.—PREPARATION OF HYDROPHILIC LITHOGRAPHIC PRINTING MASTERS. MAR. 28, 1978.
4,077,073.—PROCESS FOR PREPARING INK RELEASING STENCIL. MAY 9, 1978.
4,097,138.—PHOTOCONDUCTIVE BELT INCREMENTING APPARATUS. JUNE 27, 1978.
4,100,135.—NOVEL ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS. JULY 11, 1978.
4,103,616.—ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS. AUG. 1, 1978.

Class 24E

3,315,602.—FORMING OF PRINTING PLATES. APR. 25, 1967. CAN. 0852683, GER. 1267227, GRB. 1132071, JAP. 0532965.
3,443,517.—ELECTROSTATIC DUPLICATION SYSTEM EMPLOYING RELIEF PRINTING PLATE. MAY 13, 1969. CAN. 0873982, GRB. 1212370, JAP. 0641477.
3,456,586.—PROCESS FOR MAKING AND USING A RELIEF PRINTING MASTER. JULY 22, 1969.
3,589,290.—RELIEF IMAGING PLATES MADE BY REPETITIVE XEROGRAPHIC PROCESSES. JUNE 29, 1971. CAN. 0896949.
3,957,348.—METHOD FOR ALTERING ELLIPTICALLY POLARIZED LIGHT. MAY 18, 1976.
3,964,907.—METHOD FOR THE PREPARATION OF RELIEF PRINTING MASTERS. JUNE 22, 1976.
4,017,581.—PROCESS FOR PREPARING PRINTING MASTERS & MOLDS. APR. 12, 1977.

Class 24F

3,445,226.—FROST GRAVURE PRINT MASTER. MAY 20, 1969. CAN. 0842443, FRA. 1480896, GRB. 1136029, ITL. 0771305, JAP. 0605647, MEX. 0093298.
3,559,570.—METHOD OF PREPARING AND USING A GRAVURE PRINTING PLATE. FEB. 2, 1971. CAN. 0844544, GRB. 1198142.
3,561,358.—GRAVURE IMAGING SYSTEM. FEB. 9, 1971. CAN. 0908257, GRB. 1201819, JAP. 0594737.
3,638,567.—METHOD OF PREPARING AND UTILIZING A GRAVURE PRINTING MASTER. FEB. 1, 1972.
3,801,315.—GRAVURE IMAGING SYSTEM. APR. 2, 1974. CAN. 0991245, GRB. 1411237.
3,918,400.—BLADE MOUNTING ASSEMBLIES. NOV. 11, 1975. BEL. 0816534, FRA. 7421752, GRB. 1419417.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
4,024,838.—DEVELOPER LIQUID SUPPLY DEVICE. MAY 24, 1977.

Class 24G

3,565,978.—REPLICATION OF SURFACE DEFORMATION IMAGES. FEB. 23, 1971. AUS. 0417038, BEL. 0710829, CAN. 0879916, FRA. 1583418, GER. 1621783, GRB. 1221342, ITL. 0863054, MEX. 0096672.
3,592,114.—APPARATUS FOR JUSTIFYING A REPRODUCED LINE OF CHARACTERS. JULY 13, 1971.
3,678,850.—POROUS PRINTING PLATE PREPARED FROM PARTICULATE PHOTOSENSITIVE RESINOUS MATERIAL. JULY 25, 1972. CAN. 0844327, GRB. 1188376, JAP. 0635879.
4,059,554.—STABILIZE EMULSION INKS. NOV. 22, 1977.
4,068,588.—PRINTING USING AN ELECTROCHROMIC IMAGE. JAN. 17, 1978.
4,093,371.—COMPOSING MACHINE. JUNE 6, 1978.

Class 25

3,692,659.—ELECTROLYTIC REVERSIBLE COLOR DISPLAY DEVICE. SEPT. 19, 1972. CAN. 0932427, GRB. 1356187.
4,056,822.—LOW PROFILE SINGLE CHANNEL THERMAL ANALOG RECORDER. NOV. 1, 1977.
4,056,823.—ANALOG CHART RECORDER EMPLOYING THERMAL PRINTING MEANS. NOV. 1, 1977.
4,099,071.—MONOLITHIC ELECTRONIC SCANNING DEVICE. JULY 4, 1978.
4,104, 515.—CONSUMABLE CREDIT CARD. AUG. 1, 1978.
4,118,112.—METHOD FOR REDUCING POWER DISSIPATION IN TAPERED RESISTOR DEVICES. OCT. 3, 1978.
4,121,153.—TAPERED RESISTOR METER. OCT. 17, 1978.
4,126,824.—PROGRESSIVELY SHORTED TAPERED RESISTANCE DEVICE. NOV. 21, 1978.

Class 25A

3,692,404.—STRIPPABLE LAYER RELIEF PRINTING. SEPT. 19, 1972.
3,900,817.—SPHERICAL POTENTIOMETER WITH BALL CONTACT MEANS. AUG. 19, 1975.
3,990,072.—ACOUSTIC RESIDUE ALGEBRA DECORDER. NOV. 2, 1976.

Class 25A 1

3,207,127.—APPARATUS FOR FORMING COATINGS ON PRINTED CIRCUIT BOARDS. SEPT. 21, 1965. CAN. 0733463, FRA. 1374360, GER. 1490985, GRB. 1053284, ITL. 0696974.
3,217,209.—PRINTED CIRCUITS WITH RESISTIVE AND CAPACITIVE ELEMENTS. NOV. 9, 1965. CAN. 0782178, FRA. 1300771, GER. 1202853, GRB. 0978571, ITL. 0647493, JAP. 0430795.
3,219,509.—AN APPARATUS FOR AUTOMATIC FABRICATION OF MICROCIRCUITRY. NOV. 23, 1965. CAN. 0785448, GRB. 1031288, JAP. 0477810.
3,288,639.—METHOD FOR MAKING A PLURAL LAYERED PRINTED CIRCUIT BOARD. NOV. 29, 1966.
3,485,934.—CIRCUIT BOARD. DEC. 23, 1969.
3,893,409.—APPARATUS FOR SOLDER COATING PRINTED CIRCUIT. JULY 8, 1975.
3,990,024.—MICROSTRIP STRIPLINE IMPEDANCE TRANSFORMER. NOV. 2, 1976.

4,018,414.—HOLDING FIXTURES. APR. 19, 1977.
4,024,631.—PRINTED CIRCUIT BOARD PLATING PROCESS. MAY 24, 1977.
4,029,373.—MEANS FOR WIRING INTO A SEALED ENCLOSURE. JUNE 14, 1977. CAN. 0995367, GRB. 1444032.
3,134,930.—MICROMINIATURE CIRCUITRY. MAY 26, 1964.
4,046,105.—LAMINAR DEEP WAVE GENERATOR. SEPT. 6, 1977.
4,048,718.—PIN CRIMPING APPARATUS AND PRODUCT THEREFROM. SEPT. 20, 1977.
4,083,323.—PNEUMATIC SYSTEM FOR SOLDER LEVELING APPARATUS. APR. 11, 1978.
4,125,136.—CUT AND CLINCH MECHANISM. NOV. 14, 1978.
4,179,797.—METHOD OF MAKING A RESISTOR ARRAY. DEC. 25 1979.

Class 25A 2

3,134,930.—MICROMINIATURE CIRCUITRY. MAY 26, 1964.
3,164,750.—ELECTRONIC PACKAGING APPARATUS. JAN. 5, 1965.
3,445,926.—PRODUCTION OF SEMICONDUCTOR DEVICES BY USE OF ION BEAM IMPLANTATION. MAY 27, 1969.
3,906,537.—SOLID STE ELMNT CMPRSNG SMICNDCTVE GLS CMPSTN EXHBING NGTVE INCRMNTL RSISTNCE AND TRSHLD SWTCHNG. SEPT. 16, 1975. BEL. 0820772, CAN. 1005929.
3,956,042.—SELECTIVE ETCHANTS FOR THIN FILM DEVICES. MAY 11, 1976.
4,181,913.—RESITIVE ELECTRODE AMORPHOUS SEMICONDUCTOR NEGATIVE RESISTANCE DEVICE. JAN. 1, 1980.
4,215,354.—SUPPRESSION OF CROSS-COUPLING IN MULTI-ORIFICE PRESSURE PULSE DROP-EJECTOR SYSTEMS. JULY 29, 1980.

Class 25A 3

3,244,556.—ABRASION FOR THIN FILM RESISTANCE CONTROL. APR. 5, 1966. CAN. 0788954, FRA. 1385420, GER. 1490986, GRB. 1054076, ITL. 0705899, JAP. 0453904.
3,274,372.—SOLID VAPORIZATION. SEPT. 20, 1966.
3,287,161.—METHOD FOR FORMING A THIN FILM RESISTOR. NOV. 22, 1966. CAN. 0819895, ITL. 0705900, JAP. 0499787.
3,352,731.—THIN FILM PRINTED CIRCUIT. NOV. 14, 1967. AUS. 0296168, CAN. 0790796, FRA. 1419084, GER. 1490987, GRB. 1077686, ITL. 0739442, JAP. 0537661.
3,413,716.—THIN FILM INDUCTOR ELEMENTS. DEC. 3, 1968. CAN. 0841245, FRA. 1476476, GRB. 1149759.
3,832,766.—APPARATUS FOR ASSEMBLING A PLATED WIRE MEMORY PLANE. SEPT. 3, 1974. CAN. 0942420, GRB. 1376654.

Class 25A 4

3,317,656.—ELECTRICAL CONNECTION FOR SHEATHED CONDUCTORS. MAY 2, 1967.
3,603,357.—BACKWIRING. SEPT. 7, 1971.
3,644,659.—CABLE CONSTRUCTION. FEB. 22, 1972.
3,792,227.—FUSER APPARATUS. FEB. 12, 1974.
3,847,479.—COVER FOR WIRE WRAPPED CARD CHASSIS. NOV. 12, 1974.
3,861,775.—MULTIPLE CIRCUIT BOARD CONNECTOR. JAN. 21, 1975. GRB. 1419580.
3,869,696.—FUSER APPARATUS. MAR. 4, 1975.
3,903,937.—BACK WIRING. SEPT. 9, 1975.
4,045,750.—ELECTRICAL CABLE AND COUPLING ARRANGEMENT. AUG. 30, 1977. FRA. 7631197.

Class 25B

3,688,127.—DIGITAL CIRCUIT LOGIC. AUG. 29, 1972.
3,937,986.—LINEAR WAVEFORM GENERATOR. FEB. 10, 1976.
3,975,755.—STABLE NON-CRYSTALLINE MATERIAL FOR SWITCHING DEVICES. AUG. 17, 1976.
4,095,020.—PROCESS FOR CONTROLLED PHASE TRANSFORMATION OF ALPHA PHASE OF POLY (VINYLIDENE FLUORIDE) TO. JUNE 13, 1978.

Class 25B 1

3,384,792.—STACKED ELECTRODE FIELD EFFECT TRIODE. MAY 21, 1968.
3,584,268.—INVERTED SPACE CHARGE LIMITED TRIODE. JUNE 8, 1971.
3,599,321.—INVERTED SPACE CHARGE LIMITED TRIODE. AUG. 17, 1971.

Class 25B 2

3,510,735.—HIGH SPEED SEMICONDUCTOR. MAY 5, 1970.
3,673,572.—ELECTROLUMINESCENT DEVICE. JUNE 27, 1972. CAN. 0919286.
3,697,163.—PLUG-IN VACUUM AND CIRCUIT SYSTEM FOR ELECTROSTATIC PRINTING MACHINES. OCT. 10, 1972. CAN. 0941883.

Class 25B 3

3,551,727.—THERMIONIC CONVERTER HAVING A LOW FUNCTION COLLECTOR ELECTRODE. DEC. 29, 1970.
3,928,812.—PROGRAMMABLE BIT CLOCK OSCILLATOR FOR CONTROLLING THE PROCESSING OF BINARY DIGITS. DEC. 23, 1975. CAN. 0997434.

Class 25B 4

3,579,031.—ZERO ARC DROP THYRATRON. MAY 18, 1971.

Class 25C

3,911,420.—DISPLAY SYSTEM INCLUDING A HIGH-RESOLUTION CHARACTER GENERATOR. OCT. 7, 1975.
3,937,937.—PRIMARY POWER FAULT DETECTOR. FEB. 10, 1976. CAN. 1011818.
4,045,750.—ELECTRICAL CABLE AND COUPLING ARRANGEMENT. AUG. 30, 1977. FRA. 7631197.
4,136,277.—EXPOSURE CONTROL SYSTEM FOR A DOCUMENT COPYING MACHINE. JAN. 23, 1979. GRB. 1529220.

Class 25C 1

3,296,483.—WIDEBND AMPLER UTLZNG COMN ELCTRN BEAM FR INTRACTN W/HIFRQCY TRVLGWAVE LINE AND W/LOWFRQCY ELCTRN M. JAN. 3, 1967.
3,299,367.—FEEDBACK AMPLIFIER. JAN. 17, 1967.
3,404,341.—ELECTROMETER UTILIZING A DUAL PURPOSE FIELD-EFFECT TRANSISTOR. OCT. 1, 1968.
3,457,520.—FIELD EFFECT TRANSISTOR BUFFER AMPLIFIER. JULY 22, 1969. CAN. 0830628, FRA. 1541017, GER. 1562109, GRB. 1189515, ITL. 0806188, JAP. 0573712.
3,525,948.—SEISMIC AMPLIFIERS. AUG. 25, 1970.
3,594,654.—DIRECT COUPLED DIFFERENTIAL AMPLIFIER. JULY 20, 1971.
3,790,288.—PHOTOMETER INCLUDING VARIABLE AMPLIFICATION AND DARK CURRENT COMPENSATION. FEB. 5, 1974.

Class 25C 2

3,316,495.—LOW LEVEL COMMUTATOR. APR. 25, 1967.
3,426,259.—ELECTRIC CONTROL CIRCUITS FOR SEQUENTIAL OPERATION OF MOTIVE MEANS. FEB. 4, 1969.
3,454,884.—DUTY CYCLE CONTROL CIRCUIT. JULY 8, 1969. CAN. 0859886, GRB. 1195983, JAP. 0576017.
3,612,907.—SELF-CHECKING FLIP-FLOP. OCT. 12, 1971.
3,668,414.—TRANSITION INTEGRATION SWITCHING AMPLIFIER. JUNE 6, 1972. ARG. 0183473, AUS. 0460647, BEL. 0765005, CAN. 0930432, FRA. 7111626, GRB. 1334407, ITL. 0921529, MEX. 0119755, USR. 0420197, VZL. 0027511.
3,795,857.—ELECTRICAL CONNECTOR TESTING APPARATUS HAVING A PLURALITY OF AND GATES. MAR. 5, 1974.
3,806,242.—APPARATUS FOR REGULATING OPERATION OF DEV IN ACCORDANCE W SUPPLY OF MATERIAL UPON WHICH DEV OPER. APR. 23, 1974. CAN. 1004288, GRB. 1387190.
3,828,222.—FLASH LAMP CIRCUIT. AUG. 6, 1974.
3,856,997.—INDICATING AND SWITCHING APPARATUS. DEC. 24, 1974. BEL. 0809124, CAN. 1004261, ITL. 1002375, MEX. 0135820, SPN. 0421710.
3,866,051.—DIGITAL INTERFACE MODULE. FEB. 11, 1975. BEL. 0810490, GBR. 1455213.
3,932,770.—CONTROL CIRCUIT FOR SWITCHING TRIACS. JAN. 13, 1976.
4,119,840.—FAST-ACTING GAIN PHOTOCURRENT DEVICE. OCT. 10, 1978.

Class 25C 3

3,311,810.—STATIC FREQUENCY MULTIPLIER UTILIZING A PLURALITY OF SATURABLE MAGNETIC CORES. MAR. 28, 1967.
3,340,416.—RADIATION GENERATOR HVNG A CONDCTV COATNG ON A PIEZO-ELCTRC DIFFRCTN GRATING FOR VARYNG OTPT FR. SEPT. 5, 1967.
3,373,377.—SELF-ADJUSTING VARIABLE FREQUENCY SAWTOOTH GENERATOR. MAR. 12, 1968.
3,543,080.—CRT PINCUSHION DISTORTION CORRECTION APPARATUS. NOV. 24, 1970.
3,659,207.—MULTI-WAVE FORM GENERATION FROM A SINGLE TAPPED DELAY LINE. APR. 25, 1972.
4,048,571.—FREQUENCY DOUBLER. SEPT. 13, 1977.

Class 25C 4

RE.27,720.—SIGNAL STORAGE DEVICE - RE OF 3416,861-D1593. AUG. 7, 1973.
3,280,309.—LOGARITHMIC PULSE COUNTER. OCT. 18, 1966.
3,416,861.—SIGNAL STORAGE DEVICE—REISSUED D72104-27,720. DEC. 17, 1968. CAN. 0824770, GER. 1524998, GRB. 1184579, JAP. 0571176.
3,422,287.—PULSE STRETCHING CIRCUIT FOR GENERATING PULSES OF MINIMUM WIDTH. JAN. 14, 1969. AUS. 0408950, CAN. 0814593, GRB. 1087749, ITL. 0773401, SWD. 0337041.
3,593,043.—PULSE SHAPING CIRCUIT. JULY 13, 1971.
3,600,610.—TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS. AUG. 17, 1971.
3,757,032.—METHOD AND APPARATUS FOR SELECTIVELY ENABLING A REMOTE RECEIVER. SEPT. 4, 1973.
3,781,548.—CONTROL SYSTEM. DEC. 25, 1973.
3,816,727.—ECHO CHECK CIRCUIT. JUNE 11, 1974. CAN. 0999463, FRA. 7341866, GRB. 1422835.
3,839,665.—APP MEASRNG RELTV VELCTY MOVBL MEMBR INCLDNG MEANS TO DETECT VELCTY FROM POSITION ENCODER. OCT. 1, 1974. CAN. 0980409, GRB. 1290090, JAP. 0832378.
3,863,143.—APP FOR RECORDING THE OCCURRENCE OF A PREDETERMINED OPERATION BY SENSING MAGNETIC FIELD OPERATION. JAN. 28, 1975.
3,875,387.—MAGNETIC OPERATIONS MONITOR. APR. 1, 1975.
3,931,580.—DIGITAL LINE RECEIVER CIRCUIT. JAN. 6, 1976.
3,953,708.—THERMAL PRINTER USING AMORPHOUS SEMICONDUCTOR DEVICES. APR. 27, 1976.
3,971,919.—PROGRAMMABLE BILLING SYSTEM. JULY 27, 1976. BEL. 0812673, FRA. 7409746, GRB. 1451993, ITL. 1007663, SPN. 0424543.
3,983,315.—ELECTROMAGENTIC COUNTER CIRCUIT. SEPT. 28, 1976.
3,987,311.—SHIFT REGISTER UTILIZING AMORPHOUS SEMICONDUCTOR THRESHOLD SWITCHE. OCT. 19, 1976.
3,989,930.—MULTI-MODE BILLING SYSTEM CONTROLLED BY COPY SIZE AND DOCUMENT ORIGINAL SIZE. NOV. 2, 1976.
4,119,907.—POWER FACTOR CORRECTOR FOR A RESISTIVE LOAD. OCT. 10, 1978.
4,140,962.—HIGH VOLTAGE REGULATOR USING LIGHT DEPENDENT RESISTOR. FEB. 20, 1979. BEL. 867865.

Class 25C 5

3,275,837.—XEROGRAPHIC CHARGING APPARATUS. SEPT. 27, 1966. ARG. 0158430, ATR. 0242511, AUS. 0276177, BEL. 0642095, CAN. 0753356, FRA. 1385736, GER. 1488286, GRB. 1040264, ITL. 0712888, JAP. 0477814, MEX. 0075819, STZ. 0460930, SWD. 0314133.
3,496,385.—HIGH VOLTAGE COMPENSATED TRANSISTORIZED SWITCHING APPARATUS. FEB. 17, 1970. CAN. 0853862, FRA. 1521443, GRB. 1181718, ITL. 0793728, JAP. 0592682.
3,522,509.—FLOATING POWER SUPPLY. AUG. 4, 1970.
3,809,916.—DUAL CORD INTERLOCK. MAY 7, 1974. CAN. 1004283, GRB. 1423758.
3,870,903.—PHASE CONTROLLED POWER SUPPLY. MAR. 11, 1975.
3,922,595.—HIGH POWER REGULATED D C SUPPLY. NOV. 25, 1975.
3,961,236.—CONSTANT POWER REGULATOR FOR XEROGRAPHIC FUSING SYSTEM. JUNE 1, 1976.
4,004,209.—WIDE RANGE POWER CONVERSION SYSTEM. JAN. 18, 1977.

Class 25C 6

3,192,519.—DIGITAL TRANSIENT ANALYZER. JUNE 29, 1965.
3,376,490.—SYNTHESIZED WAVE STATIC INVERTERS. APR. 2, 1968.
3,508,080.—BRIDGE GATING NETWORK HAVING POWER GAIN. APR. 21, 1970.
3,555,540.—DIGITAL TO ANALOG CONVERTER WITH SMOOTHED RECOVERY. JAN. 12, 1971.
3,599,037.—GAS LAMP LEAD BALLAST CIRCUIT HAVING FEED CONTROL. AUG. 10, 1971. ARG. 0182960, BEL. 0749784, CAN. 0907126, FRA. 7015813, GRB. 1308525, ITL. 0900023, MEX. 0116550.
3,638,089.—SPEED CONTROL SYSTEM HAVING HIGH AND LOW LEVEL SPEED MEANS. JAN. 25, 1972. GRB. 1322611.
3,670,269.—AUTOMATIC TRANSVERSAL EQUALIZER. JUNE 13, 1972. CAN. 0932412, GRB. 1353018.
3,689,915.—ENCODING SYSTEM. SEPT. 5, 1972. CAN. 0870252, GER. 1562051, GRB. 1207701, JAP. 0675600.
3,691,542.—MAGNETIC MEMORY DISK DRIVE APPARATUS WITH REDUCED R.F. NOISE. SEPT. 12, 1972. GRB. 1328717, JAP. 0840914.
3,699,555.—APPARATUS FOR RAPID ACTION DISPLACEMENT CONTROL. OCT. 17, 1972. CAN. 985413, GRB. 1366124.
3,737,569.—TRANSMISSION DEVICE. JUNE 5, 1973.
3,742,374.—TRANSDUCER DEVICE. JUNE 26, 1973.
3,761,799.—CURRENT STABILIZING CIRCUIT HAVING MINIMAL LEAKAGE CURRENT EFFECTS. SEPT. 25, 1973. BEL. 0792285. FRA. 7243406, GRB. 1395600, ITL. 0971515, MEX. 131737.
3,778,817.—OUTPUT KEYBOARD APPARATUS AND SIGNAL TRANSLATING METHODS THEREFOR. DEC. 11, 1973.
3,795,857.—ELECTRICAL CONNECTOR TESTING APPARATUS HAVING A PLURALITY OF AND GATES. MAR. 5, 1974.
3,818,297.—MOTOR CONTROL APPARATUS. JUNE 18, 1974. CAN 1004296, GRB. 1454269.
3,832,065.—DRUM TRACK DETECTOR. AUG. 27, 1974. GRB. 1458283.
3,880,516.—DIAGNOSTIC CIRCUIT BOARD. APR. 29, 1975. BEL. 0808231, FRA. 7342590, GRB. 1447394, ITL. 1002163, SPN. 421149.
3,904,922.—LAMP CONTROL AND LAMP SWITCH CIRCUIT. SEPT. 9, 1975.
3,906,194.—SIGNAL PROCESSOR. SEPT. 16, 1975.
3,909,125.—STEPPER MOTOR CONTROL. SEPT. 30, 1975.
3,918,046.—DIGITAL TO ANALOG CONVERTER. NOV. 4, 1975. ARG. 0197211, BEL. 0795801, FRA. 7305890, GRB. 1417772, ITL. 0979289, MEX. 131264, SPN. 0411883, STZ. 0564887.
3,922,595.—HIGH POWER REGULATED D C SUPPLY. NOV. 25, 1975.
3,928,772.—TIME DEPENDENT FAULT DETECTOR. DEC. 23, 1975. BEL. 0826690.
3,989,371.—CYCLE-OUT LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. NOV. 2, 1976.
3,991,355.—STEPPER MOTOR CONTROL. NOV. 9, 1976.
4,002,409.—CHAIN-FEED CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. JAN. 11, 1977. BEL. 0840300.
4,074,147.—SWITCHING AMPLIFIERS. FEB. 14, 1978.
4,101,788.—MOS BUFFER CIRCUIT. JULY 18, 1978.
4,103,252.—CAPACITIVE TOUCH-ACTIVATED TRANSDUCER SYSTEM INCLUDING A PLURALITY OF OSCILLATORS. JULY 25, 1978.
4,129,807.—CURRENT REGULATING CIRCUIT FOR MAGNETIC DEFLECTION SYSTEMS. DEC. 12, 1978.
4,163,988.—SPLIT GATE V GROOVE FET. AUG. 7, 1979.
4,177,421.—CAPACITIVE TRANSDUCER. DEC. 4, 1979.
4,193,079.—MESFELT WITH NON-UNIFORM DOPING. MAR. 11, 1980.

Class 26

D.225,572.—BOOK STACKING UNIT FOR XEROGRAPHIC REPRODUCTION MACHINE. DEC. 19, 1972.
D.231,127.—COPYING MACHINE-LARGE DOCUMENT COPYING FRAME-DECOY. APR. 2, 1974.
D.231,128.—COPYING MACHINE. APR. 2, 1974.
D.231,129.—COPYING MACHINE. APR. 2, 1974.
D.231,564.—COPYING MACHINE. APR. 30, 1974.
D.236,030.—PAPER TRAY. JULY 22, 1975.
D.236,446.—CART. AUG. 26, 1975.
D.236,491.—COMPUTER CABINET. AUG. 26, 1975.
D.236,897.—COMPUTER CABINET. SEPT. 23, 1975.
D.236,961.—BALANCE SCALE. SEPT. 30, 1975.
D.238,450.—PAPER CASSETTE. JAN. 13, 1976.
D.238,966.—COPIER EVENT RECORDER. FEB. 24, 1976.

D.239,063.—STORAGE UNIT. MAR. 9, 1976.
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D.239,066.—STORAGE UNIT. MAR. 9, 1976.
D.239,067.—STORAGE AND DISPLAY UNIT. MAR. 9, 1976.
D.239,106.—SEMICONDUCTOR EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,107.—PARALLEL RL/RC CIRCUITS EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,108.—RLC CIRCUITS EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,109.—SERIES RL AND RC CIRCUITS EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,110.—EDUCATIONAL DEVICE FOR LEARNING ABOUT RECTIFIERS AND FILTERS. MAR. 9, 1976.
D.239,351.—STORAGE AND DISPLAY UNIT. MAR. 30, 1976.
D.239,392.—COMPUTER CABINET. MAR. 30, 1976.
D.239,750.—STORAGE UNIT. MAY 4, 1976.
D.239,995.—STORAGE UNIT. MAY 25, 1976.
D.240,192.—DESIGN FOR MICROFILM REEL. JUNE 8, 1976.
D.240,540.—COMPUTER TERMINAL. JULY 13, 1976.
D.240,554.—DUPLICATING MACHINE WITH SORTER. JULY 13, 1976.
D.240,555.—SORTER. JULY 13, 1976.
D.240,557.—TRAY RACK. JULY 13, 1976.
D.240,965.—COIN OPERATED REPRODUCTION MACHINE. AUG. 10, 1976.
D.241,982.—ADAPTER FOR COMPRESSING HUMAN BODY ORGANS FOR X-RAY TREATMENT OR THE LIKE. OCT. 19, 1976.
D.246,226.—TONER CONTAINER OR THE LIKE. NOV. 1, 1977.
D.247,673.—STRIPPER PAD. APR. 4, 1978.
D.247,674.—STRIPPER PAD. APR. 4, 1978.
D.247,675.—STRIPPER PAD. APR. 4, 1978.
D.248,765.—MICROFICHE COPIER. AUG. 1, 1978.
D.250,765.—FANFOLD SHEET STACKING TRAY. JAN. 9, 1979.

Class 26A

D.200,130.—XEROGRAPHIC CAMERA. JAN. 19, 1965.
D.200,448.—DOCUMENT REPRODUCING APPARATUS. FEB. 23, 1965.
D.205,806.—REPRODUCTION MACHINE. SEPT. 20, 1966.
D.227,933.—SORTER. JULY 24, 1973.
D.236,850.—CONTROL PANEL FOR A COPIER. SEPT. 16, 1975.
D.237,905.—CONTROL PANEL OF A COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. DEC. 2, 1975.
D.238,779.—DOCUMENT TRAY. FEB. 10, 1976.
D.238,818.—PLATEN COVER FOR COPIER. FEB. 10, 1976.
D.239,138.—XEROGRAPHIC COPIER. MAR. 9, 1976.

Class 26A 1

D.200,272.—DOCUMENT REPRODUCING APPARATUS. FEB. 9, 1965. CAN. 2092730.
D.200,448.—DOCUMENT REPRODUCING APPARATUS. FEB. 23, 1965.
D.205,558.—REPRODUCTION MACHINE. AUG. 16, 1966.
D.205,806.—REPRODUCTION MACHINE. SEPT. 20, 1966.
D.208,337.—XEROGRAPHIC DOCUMENT REPRODUCING APPARATUS OR SIMILAR ARTICLE. AUG. 15, 1967.
D.210,558.—DOCUMENT REPRODUCING MACHINE. MAR. 19, 1968.
D.210,630.—DOCUMENT REPRODUCING APPARATUS. MAR. 26, 1968.
D.210,856.—DOCUMENT REPRODUCING APPARATUS. APR. 23, 1968.
D.214,699.—DOCUMENT REPRODUCING MACHINE. JULY 15, 1969. ARG. 0011028, CAN. 2543184, MEX. 0011135.
D.218,199.—DOCUMENT REPRODUCING MACHINE. JULY 28, 1970. CAN. 0033011, GRB. 0946459.
D.218,201.—REPRODUCTION MACHINE. JULY 28, 1970. ARG. 0014313, BEL. 0017005, CAN. 0033518, CHL. 0000996, GRB. 0946818, JAP. 0363075, MEX. 0011194, PNM. 0002073, VZL. 0000744.
D.219,889.—XEROGRAPHIC PROCESSOR HOUSING. FEB. 9, 1971.
D.221,694.—XEROGRAPHIC PROCESS HOUSING. AUG. 31, 1971.
D.227,931.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JULY 24, 1973.
D.230,513.—REPRODUCTION MACHINE. FEB. 26, 1974.
D.238,737.—COPYING MACHINE STAND. FEB. 10, 1976.
D.243,008.—COIN OPERATED REPRODUCTION MACHINE. JAN. 11, 1977.

Class 26A 2

D.214,959.—AUTOMATIC DOCUMENT FEEDING APPARATUS FOR XEROGRAPHIC REPRODUCING MACHINES OR THE LIKE. AUG. 12, 1969. CAN. 0032540, GER. DES5715, GRB. 0942720.
D.227,034.—DOCUMENT FEEDER FOR A XEROGRAPHIC REPRODUCTION. MAY 29, 1973.
D246,373.—PAPER OVERFEED TRAY. NOV. 15, 1977.

Class 26A 3

D.200,129.—XEROGRAPHIC TRANSFER AND FUSING APPARATUS. JAN. 19, 1965.
D.233,481.—XEROGRAPHIC VAPOR FUSING APPARATUS. OCT. 29, 1974.

Class 26A 4

D.201,405.—XEROGRAPHIC PRINTER. JUNE 15, 1965.
D.220,188.—MOBILE PRINTER. MAR. 16, 1971. CAN. 0033207, GER. 0MR6294, GRB. 0946460, JAP. 0443861.
D.230,517.—COMPUTER OUTPUT PRINTER. FEB. 26, 1974.
D.232,125.—CHARACTER PRINT MEMBER. JULY 16, 1974.
D.237,010.—COMBINED RIBBON AND CARTRIDGE THEREFOR. SEPT. 30, 1975. FRA. 0073134, GRB. 0967791, ITL. 0010845.
D.238,904.—CHARACTER PRINT MEMBER. FEB. 17, 1976.
D.238,968.—CHARACTER PRINT MEMBER. FEB. 24, 1976. FRA. 0073135, GER. 0009989, GRB. 0967792, ITL. 0010846.
D.250,950.—CONTROL CONSOLE MODULE FOR A COMPUTER PRINTER. JAN. 30, 1979.
D.250,952.—MODULAR COMPUTER PRINTER. JAN. 30, 1979.
D.250,953.—MODULAR COMPUTER PRINTER. JAN. 30, 1979.
D.250,954.—MODULAR COMPUTER PRINTER. JAN. 30, 1979.

Class 26A 5

D.200,130.—XEROGRAPHIC CAMERA. JAN. 19, 1965.

Class 26B

D.209,408.—CABINET FOR SORTING AND HOLDING SHEETS OF PRINTED MATERIAL. NOV. 28, 1967.
D.209,409.—MODULAR CABINET FOR SORTING AND HOLDING SHEETS OF PRINTED MATERIAL. NOV. 28, 1967.
D.209,872.—DOCUMENT REPRODUCING AND SORTING MACHINE. JAN. 9, 1968.
D.212,227.—A TAPE CONTRL UNIT FOR AN AUTOMATIC SORTER OR THE LIKE. SEPT. 17, 1968.
D.224,054.—XEROGRAPHIC REPRODUCTION MACHINE OR THE LIKE. JUNE 27, 1972.
D.230,515.—DOCUMENT REPRODUCING AND SORTING MACHINE. FEB. 26, 1974.
D.236,330.—REPRODUCTION MACHINE STACKING CART. AUG. 19, 1975.
D.236,924.—PAPER HANDLING STAND. SEPT. 30, 1975.
D.237,871.—REPRODUCTION MACHINE STACKING CART. DEC. 2, 1975.
D.238,779.—DOCUMENT TRAY. FEB. 10, 1976.

Class 26C

D.205,910.—A CAN. OCT. 4, 1966.
D.208,377.—CONTAINER FOR XEROGRAPHIC TONER POWDER. AUG. 22, 1967.
D.211,928.—BOTTLE. AUG. 13, 1968.
D.218,152.—CONTAINER FOR XEROGRAPHIC POWDER. JULY 28, 1970. CAN. 0032629, GRB. 0944047.
D.236,694.—DEVELOPER MIX STORAGE CONTAINER. SEPT. 9, 1975.
D.240,201.—TONER PARTICLE STORAGE CONTAINER-DESIGN FOR TONER CARTRIDGE. JUNE 8, 1976.
D.244,007.—TONER BOTTLES. APR. 12, 1977.
D.252,557.—TONER CONTAINER. AUG. 7, 1979.

Class 26D

D.216,647.—SPRING SCALE. FEB. 24, 1970. CAN. 0032577, GRB. 0943939.
D.220,011.—ARTICLE ADDRESSING MACHINE. FEB. 23, 1971.

3,666,948.—LIQUID CRYSTAL INFRARED IMAGING SYSTEM HAVING AN UNDISTURBED IMAGE ON A DISTURBED BACKGROUND. MAY 30, 1972. CAN. 0964455, GRB. 1387276.
3,737,896.—APPARATUS FOR RECOVERY OF RECORDED BIT INFORMATION IN A MAGNETIC RECORDING MEDIUM. JUNE 5, 1973. AUS. 0471989, BEL. 0790688, CAN. 1008967, STZ. 0563642.
D.246,102.—FILM REEL (DESIGN). OCT. 18, 1977.

Class 26E

D.200,128.—FACSIMILE RECEIVER. JAN. 19, 1965.

Class 26E 1

D.200,127.—FACSIMILE TRANSMITTER. JAN. 19, 1965.
D.200,128.—FACSIMILE RECEIVER. JAN. 19, 1965.
D.215,218.—FACSIMILE TRANSCEIVER. SEPT. 16, 1969. ARG. 0010244, BEL. 0016600, CAN. 2493134, FRA. 0096592, GER. 0005411, GRB. 0939330, ITL. 0134198. MEX. 0010900.
D.218,170.—FACSIMILE TRANSCEIVER. JULY 28, 1970. GRB. 0944047.
D.225,860.—HOUSING FOR ELECTRONIC APPARATUS. JAN. 9, 1973.
D.225,861.—HOUSING FOR ELECTRONIC APPARATUS. JAN. 9, 1973.
D.225,867.—UNATTENDED TELEPHONE ANSWERING APPARATUS OR SIMILAR ARTICLE. JAN. 9, 1973.
D.227,121.—FACSIMILE TRANSCEIVER APPARATUS. JUNE 5, 1973.
D.227,122.—FACSIMILE TRANSCEIVER APPARATUS. JUNE 5, 1973.

Class 26E 2

D.215,849.—A ROLL-FEED APPARATUS FOR A FACSIMILE TRANSCEIVER. NOV. 4, 1969. ARG. 0011067, BEL. 0016764, CAN. 0032344, GER. DES5719, GRB. 0942723, ITL. 0138774, MEX. 0010975, PNM. 0001983, VZL. 0000663.
D.216,123.—FLEXIBLE SHEET MATERIAL GUIDE FOR A FACSIMILE TRANSCEIVER OR SIMILAR ARTICLE. NOV. 25, 1969. GRB. 0942748.
D.216,564.—GUIDE FOR FLEXIBLE SHEET MATERIAL FOR FACSIMILE TRANSCEIVER OR SIMILAR ARTICLE. FEB. 10, 1970. ARG. 0011068, BEL. 0016763, GER. DES5716, GRB. 0942723, ITL. 0138775, MEX. 0011018, PNM. 0001401, VZL. 0000662.
D.249,688.—PAPER TAKE UP REEL OR SIMILAR ARTICLE FOR A WEB FED FACSIMILE TRANSCEIVER OF THE LIKE. SEPT. 26, 1978.

Class 26E 3

D.210,589.—ELECTRONIC ADAPTER FOR FACSIMILE COMPUTER SYSTEM. MAR. 26, 1968.

Class 26F

D.203,012.—DESIGN FOR A MACHINE FOR APPLYING INTELLIGENCE TO A MOVING ARTICLE. NOV. 23, 1965.
D.244,943.—FILM REEL (DESIGN). JULY 5, 1977.
D.246,102.—FILM REEL (DESIGN). OCT. 18, 1977.
D.247,667.—FILM REEL (DESIGN). APR. 4, 1978.

Class 26F 1

D.202,746.—MICROFICHE PRINTER. NOV. 2, 1965.
D.217,739.—COMBINED MICROFILM VIEWER AND REPRODUCING MACHINE ACCESSORY. JUNE 2, 1970. CAN. 0032698.
D.218,782.—PROJECTION VIEWER. SEPT. 22, 1970. CAN. 0033031, GER. OMR6147, GRB. 0945494, JAP. 413894.
D.218,783.—COMBINATION FILM VIEWING AND REPRODUCING MACHINE. SEPT. 22, 1970. CAN. 0033032, GER. OMR6146, GRB. 0945495, JAP. 0377263.
D.233,369.—MICROFILM XEROGRAPHIC MACHINE. OCT. 22, 1974.
D.236,544.—MICROFORM VIEWER. AUG. 26, 1975.
D.239,055.—HAND-HELD VIEWER FOR MICROFORMS. MAR. 2, 1976.
D.239,056.—HAND-HELD VIEWER FOR MICROFORMS. MAR. 2, 1976.
D.247,295.—MULTICOLOR TRANSPARENCY REPRODUC-TION MACHINE. FEB. 21, 1978.

Class 26G

D.225,643.—REACTION TESTING DEVICE. DEC. 26, 1972.
D.225,681.—SUCTION MOUNTING DEVICE. DEC. 26, 1972.
D.226,662.—EDUCATIONAL DEVICE FOR DEMONSTRATING MOMENTUM. APR. 10, 1973.
D.232,030.—EDUCATIONAL AID FOR DEMONSTRATING PRINCIPLES IN PHYSICS. JULY 9, 1974.
D.232,031.—COLLISION DEMONSTRATION TEACHING AID. JULY 9, 1974.
D.232,098.—TEACHING AID FOR DEMONSTRATING PRINCIPLES IN PHYSICS. JULY 16, 1974.
D.232,698.—CLAMP. SEPT. 10, 1974.
D.233,432.—TEACHING AID FOR DEMONSTRATING PRINCIPLES OF PHYSICS. OCT. 29, 1974.
D.233,654.—CONTAINER FOR BOOKLETS OR THE LIKE. NOV. 19, 1974.
D.233,658.—BALANCE SCALE. NOV. 19, 1974.
D.233,935.—EDUCATIONAL DEVICE FOR TEACHING ARITHMETIC. DEC. 17, 1974.
D.234,546.—CARRYING CASE. MAR. 18, 1975.
D.235,440.—EDUCATIONAL PLUG-IN BOARD. JUNE 17, 1975.
D.235,441.—BASIC MEASUREMENT EDUCATIONAL BOARD. JUNE 17, 1975.
D.236,028.—MAGNIFIER. JULY 22, 1975.
D.236,729.—EDUCATIONAL PLUG-ON BOARD. SEPT. 9, 1975.
D.236,730.—EDUCATIONAL PLUG-ON BOARD. SEPT. 9, 1975.
D.236,978.—SWITCHING EDUCATIONAL BOARD. SEPT. 30, 1975.
D.236,979.—EDUCATIONAL MEASURING DEVICE BOARD. SEPT. 30, 1975.
D.237,020.—COMBINED SUPPORT AND STORAGE TRAY FOR AN EDUCATIONAL KIT OR SIMILAR ARTICLE. SEPT. 30, 1975.
D.237,877.—MOTOR AND GENERATOR EDUCATIONAL BOARD. DEC. 2, 1975.
D.237,878.—MULTI-METER EDUCATIONAL BOARD. DEC. 2, 1975.
D.237,879.—EDUCATIONAL DEVICE FOR LEARNING MAGNETISM & INDUCTION. DEC. 2, 1975.
D.237,880.—EDUCATIONAL DEVICE FOR LEARNING BASIC HAND TOOLS. DEC. 2, 1975.
D.242,787.—AN EDUCATIONAL AIDE FOR MEASURING MASS. DEC. 21, 1976.
D.242,793.—EDUCATIONAL AIDE FOR TEACHING PHYSICAL PROPERTIES OF LIGHT. DEC. 21, 1976.

Class 26G 1

D.216,157.—BALANCE SCALE. NOV. 25, 1969. BEL. 0016761, CAN. 0032611, GER. DES5718, GRB. 0942720, ITL. 0138772, JAP. 0337548.
D.236,731.—CURCUIT TESTING EDUCATIONAL BOARD. SEPT. 9, 1975.

Class 26H

D.236,556.—CARRYING CASE FOR COLORISTS MATERIALS OR THE LIKE. AUG. 26, 1975.

Class 26H 1

D.215,294.—HOUSING FOR ELECTRONIC APPARATUS. SEPT. 23, 1969. ARG. 0011066, BEL. 0016760, GER. 0005765, GRB. 0942725, ITL. 0138776, MEX. 0010934, PNM. 0001839, VZL. 0000664.
D.215,660.—HOUSING FOR ELECTRONIC APPARATUS. OCT. 21, 1969.
D.234,700.—DISC DRIVE CABINET. APR. 1, 1975.
D.238,494.—CONTROL PANEL FOR DISK FILE. JAN. 20, 1976.
D.238,495.—DISK MEMORY MODULE FRONT PANEL. JAN. 20, 1976.
D.240,632.—CABINET FOR ELECTRONIC EQUIPMENT. JULY 20, 1976.
D.241,446.—SINGLE MAGNETIC CARD CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.241,447.—SINGLE MAGNETIC TAPE CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.241,448.—DUAL MAGNETIC TAPE CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.241,449.—DUAL MAGNETIC CARD CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.254,492.—DUAL MAGNETIC DISC-CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. MAR. 18, 1980.

Class 26H 2

D.221,228.—KEYBOARD FOR A COMPUTER OR THE LIKE. JULY 20, 1971.

Class 26H 3

D.221,229.—SEND/RECEIVE DATA PRINTER TERMINAL. JULY 20, 1971.
D.224,019.—XEND/RECEIVE DATA PRINTER TERMINAL. JUNE 27, 1972.
D.236,129.—INPUT/OUTPUT TERMINAL. JULY 29, 1975.

Class 26H 4

D.212,692.—TELEPHONE ACOUSTIC COUPLER. NOV. 12, 1968. ARG. 0010245, BEL. 0016601, CAN. 2503147, FRA. 0096593. GER. 0005410, GRB. 0939331, ITL. 1341991, MEX. 0010845.
D.224,025.—ACOUSTIC COUPLER. JUNE 27, 1972.

Class 26H 5

D.204,319.—HOLLOW CORNER PRISM. APR. 5, 1966.
D.206,956.—HOLLOW CORNER PRISM. FEB. 14, 1967.
D.237,849.—COOLING RACK. DEC. 2, 1975.

Class 26H 6

D.221,108.—PAPER SHREDDER. JULY 6, 1971. CAN. 0033939.

Class 26H 7

D.221,901.—OVERHEAD PROJECTOR. SEPT. 14, 1971. CAN. 0033920.
D.231,800.—RIBBON CARTRIDGE. JUNE 11, 1974.
D.236,787.—BOOKCASE OR SIMILAR ARTICLE. SEPT. 16, 1975.
D.239,419.—TAPE CASSETTE STORAGE UNIT. MAR. 30, 1976.
D.239,472.—MAGNETIC CARD STORAGE TRAY. APR. 6, 1976.
D.239,531.—COPY HOLDER. APR. 13, 1976.
D.239,872.—CAMERA/PROJECTOR. MAY 11, 1976.
D.241,774.—PRINTER/KEYBOARD APPARATUS FOR ELECTRONIC TYPING SYSTEM OR SIMILAR ARTICLE. OCT. 5, 1976.
D.242,101.—FILE UNIT OR SIMILAR ARTICLE. NOV. 2, 1976.
D.242,102.—TABLE OR SIMILAR ARTICLE. NOV. 2, 1976.

Class 27A

3,615,614.—LIGHT DEV DIRCT PRINT SILVER HALIDE EMULSION SENSITIZD W/ COMBINTN OF COPPER, LEAD, BROMIDE AND THIOU. OCT. 26, 1971.
3,660,100.—DIRECT-PRINT LIGHT DEVELOPABLE EMULSION. MAY 2, 1972.
3,725,073.—LIGHT DEVELOPABLE DIRECT WRITING, SILVER HALIDE EMULSIONS CONTAINING GOLD, IODINE, LEAD AND COP. APR. 3, 1973. CAN. 0882613.
3,782,960.—DRCT-PRNT LIGHT-DVLPBL EMULSN CNTAING SILVER HALIDE GRAINS SNSTZD SENSTZD ON THE SURFACES W/SI. JAN. 1, 1974. BEL. 0780680, CAN. 0994590, GRB. 1384081, ITL. 0950280.
3,849,146.—DIRECT-PRINT LIGHT-DEVELOPBL SILVER HALIDE EMULSION CONTAINING CYCLIC DIOXIDE OR SELENONE AS SEN. NOV. 19, 1974.

Class 27B

3,631,232.—APPARATUS FOR SIMULATING THE ELECTRICAL CHARACTERISTICS OF A NETWORK. DEC. 28, 1971. CAN. 0951429, GRB. 1267785.
4,125,318.—TIR MODULATOR. NOV. 14, 1978.

Class 27C

3,736,133.—TRANSPARENT INK—ABSORBENT LACQUERS. MAY 29, 1973. ARG. 0193996, CAN. 0985583, GRB. 1390137, MEX. 0127276, VZL. 0033577.
3,773,513.—DIMENSIONALLY STABLE PHOTOGRAPHIC PAPER CONTAINING GLASS FIBERS. NOV. 20, 1973.

Class 27D

3,393,362.—PROCESS FOR DETECTING IRREGULARITIES IN A METALLIC SURFACE. JULY 16, 1968.

Class 27H 1

4,077,019.—TRANSVERSE MODE CONTROL IN DOUBLE-HETEROSTRUCTURE LASERS UTILIZING SUBSTRATE LOSS. FEB. 28, 1978.

Class 30

3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975.

Class 30A

3,573,904.—COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING. APR. 6, 1971. ARG. 0188621, AUS. 0408972, BEL. 0708975, CAN. 0883746, FRA. 1563782, GER. 1671591, GRB. 1215957, ITL. 0822303, JAP. 0620886, MEX. 0100810, VZL. 0023682.
3,707,368.—MANIFOLD IMAGING PROCESS. DEC. 26, 1972.
3,741,762.—MANIFOLD IMAGING MEMBER AND PROCESS. JUNE 26, 1973. CAN. 0961909, GRB. 1376391.
3,955,975.—MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A METAL SOAP. MAY 11, 1976.

Class 30B

3,642,363.—MANIFOLD IMAGING SYSTEM. FEB. 15, 1972. CAN. 0960289, GRB. 1328405, JAP. 0770137.
3,661,454.—COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING. MAY 9, 1972.
3,684,362.—TRANSPARENT ELECTRODE. AUG. 15, 1972. CAN. 0932378, GRB. 1340685, JAP. 0758465.
3,741,641.—MANIFOLD IMAGING APPARATUS. JUNE 26, 1973.
3,748,034.—MANIFOLD IMAGING MACHINE. JULY 24, 1973. BEL. 0777713, CAN. 0948694, FRA. 7200999, GRB. 1376661, ITL. 0946353, SPN. 0398585, SWD. 7200573.
3,761,174.—MANIFOLD WEB HANDLING. SEPT. 25, 1973.
3,768,902.—MANIFOLD IMAGING. OCT. 30, 1973.
3,876,937.—LAYER TRANSFER IMAGING SYSTEM. APR. 8, 1975. CAN. 0933996, GRB. 1282725, JAP. 0726369.
3,963,340.—IMAGING APPARATUS. JUNE 15, 1976.
4,103,995.—IMAGING APPARATUS. AUG. 1, 1978.

Class 30C

3,615,393.—MANIFOLD IMAGING PROCESS EMPLOYING STATIC CHARGE FIELD APPLICATION. OCT. 26, 1971. BEL. 0746582, CAN. 0965829, FRA. 7007627, GRB. 1295533, ITL. 0886478, JAP. 0727962.
3,653,892.—MANIFOLD IMAGING PROCESS WHEREIN THE IMAGED ELEMENTS MAY BE RECOMBINED AND REUSED. APR. 4, 1972. CAN. 0916967, GRB. 1320407, JAP. 0731611.
3,676,116.—IMAGE REVERSAL IN MANIFOLD IMAGING USING ELECTRICALLY CONDUCTIVE RECEIVER SHEET. JULY 11, 1972.
3,684,362.—TRANSPARENT ELECTRODE. AUG. 15, 1972. CAN. 0932378. GRB. 1340685, JAP. 0758465.
3,692,516.—MANIFOLD IMAGING METHOD - PHAROS MANIFOLD IMAGING REVERSAL. AUG. 19, 1972. CAN. 0929204, GRB. 1320012, JAP. 0759476.
3,692,518.—MANIFOLD IMAGING PROCESS. SEPT. 19, 1972. ARG. 0191965, BEL. 0749174, CAN. 0916496, FRA. 7013872, GRB. 1309649, ITL. 0899700, JAP. 0731228, MEX. 0116175.
3,718,462.—MANIFOLD ELECTRIFICATION PROCESS. FEB. 27, 1973. CAN. 0947366, GRB. 1313712, JAP. 0739530.
3,737,311.—ELECTROSTATIC PARTICLES TRANSFER IMAGING PROCESS. JUNE 5, 1973.
3,756,812.—MANIFOLD IMAGING PROCESS. SEPT. 4, 1973.
3,761,258.—IMAGING PROCESS EMPLOYING CHARGED DONOR AND RECEIVER SHEETS. SEPT. 25, 1973.
3,776,721.—MANIFOLD IMAGING. DEC. 4, 1973.
3,844,780.—IMAGING PROCESS. OCT. 29, 1974.
3,846,127.—IMAGING SYSTEM. NOV. 5, 1974.
3,850,626.—IMAGING MEMBER AND METHOD. NOV. 26, 1974. GRB. 1464653.
3,854,943.—MANIFOLD IMAGING METH AND MEMBR EMPLOYING FUNDAMENTAL PARTICLES OF ALPHA METAL FREE PhTHALOCYANINE. DEC. 17, 1974. CAN. 0988766, GRB. 1424234.
3,861,910.—MANIFOLD IMAGING PROCESS. JAN. 21, 1975. ARG. 0198477, BEL. 0744343, CAN. 0947363, FRA. 7001127, GRB. 1284521, ITL. 0885940, JAP. 0727960, MEX. 0111440.
3,909,257.—MANIFOLD IMAGING PROCESS WITH SPOOL ELECTRODE. SEPT. 30, 1975.

Class 30D

3,598,581.—MANIFOLD IMAGING METHOD. AUG. 10, 1971. ARG. 0198157, AUS. 0413154, BEL. 0713100, BRA. 6795099, CAN. 0889250, CHL. 0024249, CLB. 0017928, FRA. 1560020, GER. 1772114, GRB. 1200712, HOL. 0149611, ITL. 0829693, JAP. 0626106, LXB. 0055806,

MEX. 0100797, NOR. 0128040, PRU. 0009737, SPN. 0352316, STZ. 0474097, SWD. 0340404, URG. 0009203, VZL. 0023690.
3,723,112.—MANIFOLD IMAGING METHOD WHEREIN THE ACTIVATOR CARRIES A PLASTIC COATING MATERIAL. MAR. 27, 1973.
3,741,762.—MANIFOLD IMAGING MEMBER AND PROCESS. JUNE 26, 1973. CAN. 0961909, GRB. 1376391.
3,907,558.—MANIFOLD IMAGING UTILIZING SILICA GEL ACTIVATING LAYER. SEPT. 23, 1975.
3,912,504.—MANIFOLD IMAGING WITH THERMAL ACTIVATOR CONTAINED IN A SILICA GEL LAYER. OCT. 14, 1975.
3,955,975.—MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A METAL SOAP. MAY 11, 1976.
3,964,904.—MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A DARK CHARGE INJECTING LAYER. JUNE 22, 1976. BEL. 0832405.
4,015,983.—A METHOD OF ERASING MANIFOLD IMAGES. APR. 5, 1977.
4,108,655.—METHOD OF MAKING A THERMO ACTIVE IMAGING MEMBER. AUG. 22, 1978.

Class 30E

3,653,889.—METHOD OF FIXING MANIFOLD IMAGES. APR. 4, 1972. BEL. 0754024, CAN. 0921745, FRA. 7028279, GRB. 1322772, ITL. 0900939, JAP. 0739529.
3,658,519.—IMAGE TRANSFER PROCESS FROM CONDUCTIVE SUBSTRATES. APR. 25, 1972. ARG. 0195536, AUS. 0456406, BEL. 0760747, BRA. 7022093, CAN. 0960290, FRA. 7047144, GRB. 1337590, ITL. 0913848, MEX. 0119590, SWD. 7017293.
3,706,553.—TRANSFER OF IMAGES TO A NON-CONDUCTIVE SUBSTRATE. DEC. 19, 1972. ARG. 0203811, AUS. 0461437, BEL. 0760456, CAN. 0947368, FRA. 7047140, GRB. 1339577, ITL. 0913634, MEX. 0119591, SWD. 7017139.
3,708,288.—IMAGE TRANSFER PROCESS. JAN. 2, 1973. CAN. 0882053, GRB. 1298922, JAP. 0757867.
3,723,112.—MANIFOLD IMAGING METHOD WHEREIN THE ACTIVATOR CARRIES A PLASTIC COATING MATERIAL. MAR. 27, 1973.
3,746,538.—IMAGE TRANSFER PROCESS. JULY 17, 1973. CAN. 0951781, GRB. 1374841.
3,793,017.—IMAGING FIXING METHOD. FEB. 19, 1974.
3,819,368.—MANIFOLD IMAGING MEMBER EMPLOYING A FIXATIVE LAYER. JUNE 25, 1974.
3,825,423.—IMAGE TRANSFER PROCESS. JULY 23, 1974.
3,888,208.—IMAGE TRANSFER PROCESS. JUNE 10, 1975.

Class 30F

3,548,748.—DUPLICATING METHOD EMPLOYING SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND EXPOSURE TO RADIATION. DEC. 22, 1970. CAN. 0882051, GRB. 1227394, JAP. 0752522.
3,554,125.—METHOD OF MAKING A LITHOGRAPHIC MASTER AND METHOD OF PRINTING THEREWITH. JAN. 12, 1971. CAN. 0882052, GER. 1772302, GRB. 1219849.
3,565,612.—DUPLICATING MASTERS BY THE MANIFOLD PROCESS. FEB. 23, 1971. ARG. 0193797, AUS. 0411612, BEL. 0708974, CAN. 0873277, FRA. 1549964, GER. 1671590, GRB. 1215956, ITL. 0823464, MEX. 0106608, VZL. 0023681.
3,573,904.—COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING. APR. 6, 1971. ARG. 0188621, AUS. 0408972, BEL. 0708975, CAN. 0883746, FRA. 1563782, GER. 1671591, GRB. 1215957, ITL. 0822303, JAP. 0620886, MEX. 0100810, VZL. 0023682.

Class 30G

3,655,372.—IMAGE REVERSAL IN MANIFOLD IMAGING. APR. 11, 1972.
3,901,697.—MANIFOLD IMAGING PROCESSUSING ELECTRONICS PHOTOSENSITIVE MATERIAL SUBJECT TO LIGHT FATIGUE. AUG. 26, 1975.

Class 30H

3,649,117.—IMAGING PROCESS. MAR. 14, 1972. BEL. 0761133, CAN. 0985732, FRA. 7047700, GRB. 1340679, ITL. 0914070, JAP. 0759480.
3,918,967.—CONTACT REFLEX MANIFOLD IMAGING PROCESS. NOV. 11, 1975. ARG. 0183676, BEL. 0761132, CAN. 0949120, FRA. 7047699, GRB. 1340207, ITL. 0914069, JAP. 0770143, MEX. 0119757, VZL. 0032600.

Class 30I

3,556,783.—COLOR MANIFOLD IMAGING PROCESS. JAN. 19, 1971.
3,853,555.—METHOD OF COLOR IMAGING A LAYER OF ELECTRICALLY PHOTOSENSITIVE AGGLOMERATES. DEC. 10, 1974.
3,854,943.—MANIFOLD IMAGING METH AND MEMBR EMPLOYING FUNDAMENTAL PARTICLES OF ALPHA METAL FREE PHTHALOCYANINE. DEC. 17, 1974. CAN. 0988766, GRB. 1424234.

Class 31

3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047.
4,078,923.—MIGRATION IMAGING WITH SURFACTANT-MODIFIED SOLVENT DEVELOPMENT. MAR. 14, 1978.
4,123,283.—SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS. OCT. 31, 1978. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.
4,135,926.—MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET. JAN. 23, 1979. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

Class 31A

3,520,681.—PHOTOELECTROSOLOGRAPHY. JULY 14, 1970. BRA. 0084241, CAN. 0852692, MEX. 0085656.
3,801,314.—IMAGING SYSTEM. APR. 2, 1974.
3,975,195.—MIGRATION IMAGING SYSTEM. AUG. 17, 1976.
4,009,028.—REVERSE MIGRATION IMAGING SYSTEM. FEB. 22, 1977. BEL. 0827065.
4,013,462.—MIGRATION IMAGING SYSTEM. MAR. 22, 1977.
4,040,826.—IMAGING SYSTEM OF MIGRATION MATERIAL IN SOFTENABLE LAYER. AUG. 2, 1977.
4,062,680.—IMAGING PROCESS EMPLOYING ELECTRICAL OR MAGNETIC REVERSE MIGRATION FORCE AND SOFTENABLE MAT. DEC. 13, 1977. BEL. 827065, FRA. 7509299, GRB. 1497825.
4,157,259.—ERASURE IN MIGRATION IMAGING SYSTEM. JUNE 5, 1979. BEL. 827065. GRB. 1497825.

Class 31B

3,528,355.—CAMERA-PROCESSOR. SEPT. 15, 1970. ARG. 0184627, ATR. 0303513, AUS. 0426557, BEL. 0720022, BRA. 6800654, CAN. 0864811, CHL. 0024251, CLB. 0018453, FRA. 1586179, GER. 1797177, GRB. 1244641, IND. 0117458, ITL. 0839895, LXB. 0056774, MEX. 0103737, NOR. 0128296, NZL. 0153587, PLP. 0006313, PNM. 0001980, PRU. 0010212, PTG. 0050229, SPN. 0357651, STZ. 0516171, SWD. 0338503, URG. 0009309, VZL. 0023698.
3,542,465.—CAMERA WITH DEVELOPMENT MEANS. NOV. 24, 1970. CAN. 0918739, GRB. 1241846, JAP. 0650672.
3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047.
3,770,554.—APPARATUS FOR SPLITTING A SOFTENABLE FILM COMPRISING BITE ROLLERS. NOV. 6, 1973.
3,878,816.—IMAGING SYSTEM. APR. 22, 1975.
3,910,475.—SYSTEM FOR ELECTRICALLY GROUNDING OR BIASING A MEMBER. OCT. 7, 1975. FRA. 7404995. ITL. 1007663.
3,951,324.—CAMERA/PROCESSOR/PROJECTOR & SUBSYSTEMS. APR. 20, 1976. FRA. 7439865.
4,025,183.—CAMERA/PROCESSOR/PROJECTOR & SUBSYSTEMS. MAY. 24, 1977. FRA. 7439865.

Class 31C

3,556,781.—MIGRATION IMAGING PROCESS. JAN. 19, 1971. ARG. 0175887, AUS. 0425096, BEL. 0722718, CAN. 0874909, CHL. 0024333, FRA. 1587222, GER. 1804475, GRB. 1250526, GUA. 0002124, ITL. 0855511, MEX. 0103409, PNM. 0001949, PRU. 0010349, SPN. 0359501, STZ. 0506818, SWD. 0340750, URG. 0009365, VZL. 0023713.
3,615,400.—MIGRATION IMAGING SYSTEM EMPLOYING CARBON LAYER BETWEEN SOLVENT SOLUBLE LAYR AND CONDUCTIVE LAYER. OCT. 26,

1971. ATR. 0306509, AUS. 0433959, BEL. 0726279, CAN. 0874906, DNK. 0129015, FRA. 1598889, GRB. 1261360, ITL. 0850165, LXB. 0057703, NOR. 0127265, NZL. 0154928, SAF. 0688514, SPN. 0380191, STZ. 0512755, SWD. 7210413.

3,653,885.—PROCESS OF STABILIZING A MIGRATION IMAGE COMPRISING SELENIUM PARTICLES. APR. 4, 1972. CAN. 0937437.

3,656,990.—ELECTROSOLOGRAPHY. APR. 18, 1972. ARG. 0152723, BRA. 0084169, CAN. 0800550, CHL. 0025766. CLB. 0014944, MEX. 0086246, PNM. 0002518, PRU. 0009465, URG. 0008153, VZL. 0023999.

3,664,834.—MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER. MAY 23, 1972. CAN. 0890353, GER. 1964201, GRB. 1291848, JAP. 0726370.

3,713,818.—MIGRATION IMAGING SYSTEM WITH MOLTEN LIQUID DEVELOPMENT. JAN. 30, 1973. CAN. 0933580, GRB. 1358566, USR. 0463275.

3,719,482.—IMAGING SYSTEM. MAR. 6, 1973.

3,720,513.—MIGRATION IMAGING METHOD INVOLVING SOLVENT WASH-AWAY OF UNMIGRATED PARTICLES. MAR. 13, 1973.

3,723,113.—POLYCHROMATIC ELECTROSOLOGRAPHIC. MAR. 27, 1973.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,741,757.—MIGRATION IMAGE DEVELOPMENT BY SPLITTING OR ABRADING SOFTENABLE LAYER. JUNE 26, 1973. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,753,706.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD WHEREIN AN ABSORBENT MATERIAL IS USED. AUG. 21, 1973. CAN. 0945796, GRB. 1334141, JAP. 0766711.

3,791,822.—REMOVAL OF BACKGROUND FROM AN IMAGED MIGRATION LAYER. FEB. 12, 1974. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,795,512.—IMAGING SYSTEM. MAR. 5, 1974. ARG. 0188187, ATR. 0301340, AUS. 0429441, BEL. 0725617, BRA. 0088091, CAN. 0883747, DNK. 0131212, FRA. 1599277, GER. 1815217, GRB. 12571189, ITL. 0849328, JAP. 0686721, LXB. 0057585, MEX. 0101986, NOR. 0128084, NZL. 0154842, PTG. 0050858, SAF. 0688365, SPN. 0361650, STZ. 0523523, SWD. 0341128, VZL. 0023715.

3,798,030.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD UTILIZING POWDER PARTICLES. MAR. 19, 1974.

3,820,984.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD USING FUSIBLE PARTICLES. JUNE 28, 1974.

3,836,362.—IMAGING METHOD. SEPT. 17, 1974.

3,839,030.—MIGRATION IMAGING PROCESS WITH UNIFORM EXPOSURE BEFORE OR DURING THE SOFTENING STEP. OCT. 1, 1974. BEL. 0715790. CAN. 0890853, FRA. 1572571, GER. 1772523, GRB. 1234652, ITL. 0834777, JAP. 0620888.

3,839,031.—ELECTRODE DEVELOPMENT MIGRATION IMAGING METHOD. OCT. 1, 1974. ARG. 0184241, AUS. 0456843, BEL. 0755599, CAN. 0947367, FRA. 7032000, GRB. 1326950, ITL. 0907387, JAP. 0766709, MEX. 0120156, SPN. 0383314, SWD. 0369115.

3,840,397.—PARTICLE PLACING SYSTEM. OCT. 8, 1974. ARG. 0175888, ATR. 0300561, AUS. 0427473, BEL. 0724135, CAN. 0868305, DNK. 0126727, FRA. 1593258, GER. 1810079, GRB. 1254448, ITL. 0948025, JAP. 0708364, LXB. 0057367, MEX. 0107468, NOR. 0127216, NZL. 0154542, PNM. 0002048, PTG. 0050687, SAF. 0687633, SPN. 0360458, STZ. 0501251, SWD. 0341724, VZL. 0023710.

3,866,236.—IMAGING PROCESS USING VERTICAL PARTICLE MIGRATION. FEB. 11, 1975. CAN. 0936735, GRB. 1360623.

3,873,309.—IMAGING METHOD USING MIGRATION MATERIAL. MAR. 25, 1975. CAN. 978008, GRB. 1357143.

3,878,816.—IMAGING SYSTEM. APR. 22, 1975.

3,894,869.—A POLYCHROMATIC MIGRATION IMAGING SYSTEM. JULY 15, 1975.

3,901,699.—MIGRATION AND AGGLOMERATION IMAGING METHOD. AUG. 26, 1975.

3,910,475.—SYSTEM FOR ELECTRICALLY GROUNDING OR BIASING A MEMBER. OCT. 7, 1975. FRA. 7404995, ITL. 1007663.

3,912,505.—COLOR IMAGING METHOD EMPLOYING A MONOLAYER OF BEADS. OCT. 14, 1975. ARG. 0179561, AUS. 0426600, BEL. 0723097, CAN. 0890354, CHL. 0024276, FRA. 1587252, GRB. 1248744, GUA. 0002327, HOL. 0151526, ITL. 0845607, JAP. 0731223, MEX. 0107801, PNM. 0001814, PRU. 0010425, SPN. 0377583, STZ. 0526138, SWD. 0351501, URG. 0009366, VZL. 0023708.

3,917,880.—ELECTROPHOTETIC IMAGING SYSTEM. NOV. 4, 1975. GRB. 1459468.

3,918,969.—MIGRATION IMAGING METHOD EMPLOYING A UNIFORM EXPOSURE STEP. NOV. 11, 1975. ARG. 0172557, ATR. 0300565, AUS. 0430615, BEL. 0726282, CAN. 0883748, DNK. 0124046, FRA. 1598888, GER. 1817222, GRB. 1257030, ITL. 0850166, JAP. 0665999, LXB. 0057692, MEX. 0107941, NOR. 0127264, NZL. 0154930. PNM. 0001958, SAF. 0688516, SPN. 0362041, STZ. 0506822, SWD. 0340953, VZL. 0023721.

3,933,491.—IMAGING SYSTEM. JAN. 20, 1976.

3,950,167.—IMAGING SYSTEM. APR. 13, 1976. FRA. 7432507.

3,960,555.—PROCESS-PESO WITH CONDUCTORLESS BASE. JUNE 1, 1976. BEL. 0713103, BRA. 0088021, CAN. 0890858, CHL. 0023981, FRA. 1576403, IND. 0115236, ITL. 0829694, LXB. 0055807, MEX. 0096676, PRU. 0009941, SAF. 68/2105, SPN. 0352317, URG. 0009135, VZL. 0023691.

3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,967,959.—MIGRATION IMAGING SYSTEM. JULY 6, 1976.

3,970,453.—IMAGING BY SELECTIVE STRIPPING OUT AREAS OF LAYER. JULY 20, 1976.

3,975,739.—MIGRATION IMAGING SYSTEM USING SHAPED ELECTRODE. AUGUST 17, 1976.

3,976,483.—FRASING PROCESS - XDM LATENT IMAGE ERASING. AUG. 24, 1976. ARG. 0184682, AUS. 0458164, BEL. 0761130, CAN. 0946911, FRA. 7047697, GRB. 1339715, ITL. 0914071, JAP. 0770138, MEX. 0119758, VZL. 0032932.

3,979,210.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. SEPT. 7, 1976.

3,982,936.—DEFORMATION IMAGING SYSTEM. SEPT. 28, 1976.

3,982,939.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. SEPT. 28, 1976. BEL. 0773383, CAN. 0946672, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,985,560.—IMAGING SYSTEM. OCT. 12, 1976.

4,007,042.—MIGRATION IMAGING METHOD. FEB. 8, 1977.

4,012,250.—IMAGING SYSTEM-MIGRATION IMAGE CONVERSION BY DYE TRANSFER. MAR. 15, 1977. CAN. 0972208, GRB. 1341405, JAP. 0770142.

4,014,695.—IMAGING SYSTEM. MAR. 29, 1977.

4,021,110.—PHOTOCOPYING CAMERA AND PROCESSING DEVICE. MAY 3, 1977.

4,028,101.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. JUNE 7, 1977.

4,055,418.—MIGRATION IMAGING METHOD USING AN IMAGING MEMBER EMPLOYING A SURFACE SKIN. OCT. 25, 1977.

4,081,273.—MIGRATION IMAGING METHOD. MAR. 28, 1978.

4,084,966.—IMAGING SYSTEM USING AGGLOMERABLE MIGRATION MARKING MATERIAL. APR. 18, 1978.

4,101,321.—IMAGING SYSTEM. JULY 18, 1978.

4,123,283.—SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS. OCT. 31, 1978. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

4,135,926.—MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET. JAN. 23, 1979. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

Class 31D

3,573,906.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. APR. 6, 1971. ARG. 0177890, AUS. 0441534, BEL. 0725173, BRA. 0088092, CAN. 0906801, CZC. 0157053, FRA. 1594981, GRB. 1217726, ITL. 0852743, MEX. 0106441, SPN. 0379204, SWD. 0335063, USR. 0448658. VZL. 0029780.

3,615,400.—MIGRATION IMAGING SYSTEM EMPLOYING CARBON LAYER BETWEEN SOLVENT SOLUBLE LAYER AND CONDUCTIVE LAYER. OCT. 26, 1971. ATR. 0306509, AUS. 0433959, BEL. 0726279, CAN. 0874906, DNK. 0129015, FRA. 1598889, GRB. 1261360, ITL. 0850165, LXB. 0057703, NOR. 0127265, NZL. 0154928, SAF. 0688514, SPN. 0380191, STZ. 0512755, SWD. 7210413.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,740,223.—MIGRATION IMAGING STRUCTURE. JUNE 19, 1973. BRA. 6897135, CAN. 0855151, MEX. 0100800, PNM. 0002192, PRU. 0009484, VZL. 0032425.

3,753,706.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD WHEREIN AN ABSORBENT MATERIAL IS USED. AUG. 21, 1973. CAN. 0945796, GRB. 1334141, JAP. 0766711.

3,801,314.—IMAGING SYSTEM. APR. 2, 1974.

3,820,984.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD USING FUSIBLE PARTICLES. JUNE 28, 1974.

3,836,364.—PHOTOELECTROSOLOGRAPHIC PROCESS FOR MAKING MULTIPLE IMAGES. SEPT. 17, 1974. CAN. 0914519, GRB. 1344482, JAP. 0770140.

3,839,031.—ELECTRODE DEVELOPMENT MIGRATION IMAGING METHOD. OCT. 1, 1974. ARG. 0184241, AUS. 0456843. BEL. 0755599, CAN. 0947367, FRA. 7032000, GRB. 1326950, ITL. 0907387, JAP. 0766709, MEX. 0120156, SPN. 0383314, SWD. 0369115.

3,873,309.—IMAGING METHOD USING MIGRATION MATERIAL. MAR. 25, 1975. CAN. 978008, GRB. 1357143.

3,901,702.—MIGRATION IMAGING ELEMENT WITH ABSORBENT BLOTTER OVERLAYER. AUG. 26, 1975. CAN. 0945796, GRB. 1334141, JAP. 0766711.

3,933,491.—IMAGING SYSTEM. JAN. 20, 1976.

3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,975,195.—MIGRATION IMAGING SYSTEM. AUG. 17, 1976.

3,982,939.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. SEPT. 28, 1976. BEL. 0773383, CAN. 0946672, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,985,560.—IMAGING SYSTEM. OCT. 12, 1976.

3,998,635.—IMAGING SYSTEM. DEC. 21, 1976.

4,007,042.—MIGRATION IMAGING METHOD. FEB. 8, 1977.

4,009,028.—REVERSE MIGRATION IMAGING SYSTEM. FEB. 22, 1977. BEL. 0827065.

4,012,250.—IMAGING SYSTEM-MIGRATION IMAGE CONVERSION BY DYE TRANSFER. MAR. 15, 1977. CAN. 0972208, GRB. 1341405, JAP. 0770142.

4,013,462.—MIGRATION IMAGING SYSTEM. MAR. 22, 1977.

4,040,826.—IMAGING SYSTEM OF MIGRATION MATERIAL IN SOFTENABLE LAYER. AUG. 2, 1977.

4,062,680.—IMAGING PROCESS EMPLOYING ELECTRICAL OR MAGNETIC REVERSE MIGRATION FORCE AND SOFTENABLE MAT. DEC. 13, 1977. BEL. 827065, FRA. 7509299, GRB. 1497825.

4,072,517.—MIGRATION IMAGING METHOD. FEB. 7, 1978.

4,081,273.—MIGRATION IMAGING METHOD. MAR. 28, 1978.

4,102,682.—IMAGING MEMBER. JULY 25, 1978.

4,157,259.—ERASURE IN MIGRATION IMAGING SYSTEM. JUNE 5, 1979. BEL. 827065. GRB. 1497825.

Class 31E

3,598,644.—IMAGING MEMBER FABRICATION. AUG. 10, 1971.

3,671,282.—METHOD OF MAKING AN IMAGING MEMBER. JUNE 20, 1972. BEL. 0755384, FRA. 7031999, GRB. 1326056, ITL. 0901735.

3,971,334.—COATING DEVICE. JULY 27, 1976.

4,009,028.—REVERSE MIGRATION IMAGING SYSTEM. FEB. 22, 1977. BEL. 0827065.

4,062,680.—IMAGING PROCESS EMPLOYING ELECTRICAL OR MAGNETIC REVERSE MIGRATION FORCE AND SOFTENABLE MAT. DEC. 13, 1977. BEL. 827065, FRA. 7509299, GRB. 1497825.

4,157,259.—ERASURE IN MIGRATION IMAGING SYSTEM. JUNE 5, 1979. BEL. 827065. GRB. 1497825.

Class 31F

3,520,681.—PHOTOELECTROSOLOGRAPHY. JULY 14, 1970. BRA. 0084241, CAN. 0852692, MEX. 0085656.

3,780,307.—LIQUID CRYSTALLINE COMPOSITIONS HAVING INDUCED OPTICAL ACTIVITY. DEC. 18, 1973. CAN. 1000484, GRB. 1408059.

3,909,262.—IMAGING MIGRATION MEMBER EMPLOYING A GELATIN OVERCOATING. SEPT. 30, 1975.

3,933,491.—IMAGING SYSTEM. JAN. 20, 1976.

3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.

4,065,307.—IMAGED AGGLOMERABLE ELEMENT AND PROCESS OF IMAGING. DEC. 27, 1977. CAN. 929350, GRB. 1330518.

4,101,321.—IMAGING SYSTEM. JULY 18, 1978.

Class 31G

3,664,834.—MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER. MAY 23, 1972. CAN. 0890353, GER. 1964201, GRB. 1291848, JAP. 0726370.

3,723,113.—POLYCHROMATIC ELECTROSOLOGRAPHIC. MAR. 27, 1973.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,741,757.—MIGRATION IMAGE DEVELOPMENT BY SPLITTING OR ABRADING SOFTENABLE LAYER. JUNE 26, 1973. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,741,758.—MIGRATION IMAGING EMPLOYING PRESSURE NIP DEVELOPMENT. JUNE 26, 1973.

3,753,706.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD WHEREIN AN ABSORBENT MATERIAL IS USED. AUG. 21, 1973. CAN. 0945796, GRB. 1334141. JAP. 0766711.

3,770,554.—APPARATUS FOR SPLITTING A SOFTENABLE FILM COMPRISING BITE ROLLERS. NOV. 6, 1973.

3,791,822.—REMOVAL OF BACKGROUND FROM AN IMAGED MIGRATION LAYER. FEB. 12, 1974. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,836,364.—PHOTOELECTROSOLOGRAPHIC PROCESS FOR MAKING MULTIPLE IMAGES. SEPT. 17, 1974. CAN. 0914519, GRB. 1344482, JAP. 0770140.

3,876,445.—MIGRATION IMAGING BY SPLITTING A SOFTENABLE MATERIAL. APR. 8, 1975. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,979,210.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. SEPT. 7, 1976.

4,014,695.—IMAGING SYSTEM. MAR. 29, 1977.

4,028,101.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. JUNE 7, 1977.

4,055,418.—MIGRATION IMAGING METHOD USING AN IMAGING MEMBER EMPLOYING A SURFACE SKIN. OCT. 25, 1977.

4,101,321.—IMAGING SYSTEM. JULY 18, 1978.

Class 31H

3,795,512.—IMAGING SYSTEM. MAR. 5, 1974. ARG. 0188187, ATR. 0301340, AUS. 0429441, BEL. 0725617, BRA. 0088091, CAN. 0883747, DNK. 0131212, FRA. 1599277, GER. 1815217, GRB. 1257189, ITL. 0849328, JAP. 0686721, LXB. 0057585, MEX. 0101986, NOR. 0128084, NZL. 0154842, PTG. 0050858, SAF. 0688365, SPN. 0361650, STZ. 0523523, SWD. 0341128, VZL. 0023715.

3,839,031.—ELECTRODE DEVELOPMENT MIGRATION IMAGING METHOD. OCT. 1, 1974. ARG. 0184241. AUS. 0456843, BEL. 0755599, CAN. 0947367, FRA. 7032000, GRB. 1326950, ITL. 0907387, JAP. 0766709, MEX. 0120156, SPN. 0383314, SWD. 0369115.

Class 31I

3,861,911.—IMAGING FIXING METHOD. JAN 21, 1975.

Class 31J

3,648,607.—IMAGING SYSTEM-MASTER MAKING BY BINDER PESO. MAR. 14, 1972. CAN 0920410, GRB. 1322946, JAP. 0770136.

3,664,834.—MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER. MAY 23, 1972. CAN. 0890353, GER. 1964201, GRB. 1291848, JAP. 0726370.

3,723,113.—POLYCHROMATIC ELECTROSOLOGRAPHIC. MAR. 27, 1973.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,820,984.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD USING FUSIBLE PARTICLES. JUNE 28, 1974.

3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975.
3,985,560.—IMAGING SYSTEM. OCT. 12, 1976.

Class 31K

3,873,309.—IMAGING METHOD USING MIGRATION MATERIAL. MAR. 25, 1975. CAN. 978008, GRB. 1357143.
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DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 4, 1980

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T100,001

SUCTION DEVICE

Roy M. Frazer, Hitchin, England, assignor to Imperial Chemical Industries Limited, London, England

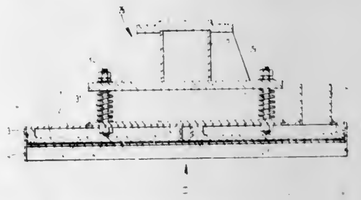
Filed Jul. 20, 1979, Ser. No. 59,447

Claims priority, application United Kingdom, Apr. 11, 1979, 12741/79; Jun. 25, 1979, 22060/79

Int. Cl.³ B66C *1/02*

U.S. Cl. 294—64 R

5 Sheets Drawing. 16 Pages Specification



A suction device suitable for gripping porous sacks filled with free-flowing particulate materials is disclosed. The device comprises a vacuum chamber with a porous base and a rigid wall extending continuously around the periphery of the base on the side remote from the chamber. In use the device is placed on the sack and suction is applied until the sack and its contents rigidify as the air is drawn out from between the particles, through the porous sack. With the suction device attached to a robot arm, crane hoist or other lifting means, the rigidified sacks can be readily handled, e.g. during palletizing and depalletizing operations. The device may also be adapted for gripping filled sacks which are not naturally porous, for instance polyethylene sacks, by incorporating means, such as a knife, for piercing the sack within the area bounded by the rigid wall. For safety reasons, the piercing means preferably has associated protection which permits piercing of the sack but which shields it at other times.

REISSUES

NOVEMBER 4, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,424

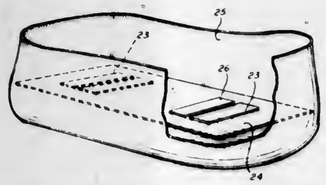
LITTER PACKAGES

Ladd L. Heldenbrand, 2 Bay Rd., South Portland, Me. 04106

Original No. 3,978,818, dated Sep. 7, 1976, Ser. No. 510,002, Sep. 27, 1974, Continuation-in-part of Ser. No. 412,700, Nov. 5, 1973, abandoned. Application for reissue Sep. 1, 1978, Ser. No. 938,959

Int. Cl.[2] **A01K** *29/00*

U.S. Cl. 119—1 **19 Claims**



13. An absorbent material package adapted for use for receiving animal litter comprising at least one container for said absorbent material, said container adapted for enclosing within the same for storage, use, and disposal said absorbent material, said container adapted for opening and for receiving litter from said animal within said absorbent material, said container further adapted for closure and/or discharge of said litter within said absorbent material.

Re. 30,425

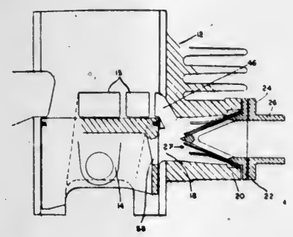
ENGINE VALVE MEANS AND PORTING

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Original No. 4,000,723, dated Jan. 4, 1977, Ser. No. 416,213, Nov. 15, 1973, Division of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and Ser. No. 361,407, May 8, 1973, abandoned. Application for reissue Sep. 24, 1979, Ser. No. 78,499

Int. Cl.[3] **F02B** *33/00*

U.S. Cl. 123—73 AA **1 Claim**



1. A variable speed two-cycle crankcase compression internal combustion engine comprising a cylinder, a piston movable in the cylinder, a fuel intake system including an intake tract at one side of the cylinder and having reed valve means for controlling the flow through the intake tract, and said intake system including porting in the cylinder wall and in the piston located at the same side of the cylinder as the intake tract, *the intake tract, the reed valve means and the intake system porting in the cylinder wall all being located to confront the bottom dead center position of the piston,* the piston and the cylinder and piston porting being located and proportioned axially of the cylinder to provide flow channel means of substantial cross sectional flow area between the intake tract and the crankcase of the engine throughout the entire cycle of the engine including the bottom dead center position of the piston and thereby provide uninterrupted fuel intake during the stroke of the piston from bottom dead center to top dead center position, *the piston porting including at least one port opening and every such piston port opening being positioned axially of the piston so that substantially the entire flow area of the piston port opening communicates with the cylinder porting in bottom dead center position of the piston,* and a fuel transfer system for transferring fuel from the crankcase of the engine to the combustion side of the piston including a transfer passage communicating with the crankcase and having a transfer port through the cylinder wall and axially positioned to be closed by the piston in the region of top dead center position of the piston, said transfer port being offset from the cylinder and piston intake porting circumferentially of the cylinder so that a fuel flow path is provided in the transfer system from the crankcase to the cylinder at the combustion side of the piston independently of the intake tract.

Re. 30,426

I.C. ENGINES

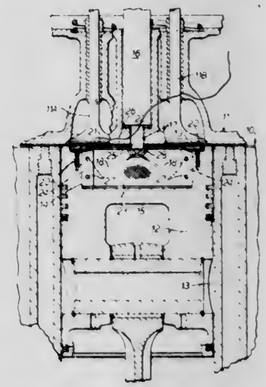
Robert A. Haslett, Shoreham-by-Sea, England, assignor to Ricardo Consulting Engineers Limited, Sussex, England

Original No. 4,092,967, dated Jun. 6, 1978, Ser. No. 730,071, Oct. 6, 1976. Application for reissue Feb. 28, 1979, Ser. No. 15,884

Claims priority, application United Kingdom, Jun. 10, 1976, 24156/76

Int. Cl.[2] **F02B** *75/12*

U.S. Cl. 123—143 B **14 Claims**



1. An internal combustion engine of reciprocating-piston type having a cylinder with a combustion chamber, and a piston with a crown in the cylinder, the major portion of the volume of said combustion chamber being afforded by a recess formed in the crown of the piston, the recess *having an open mouth at its upper side and* having a bottom, a catalytic element *of foraminous sheet construction through whose thickness gas can flow freely, said element being carried* in the cylinder [carried] by the piston, [and] *said catalytic element being effective without additional ignition means to initiate combustion of a fuel vapour and air mixture and having a cover portion extending crosswise of said recess, said cover portion being* mounted in a position overlying *and spaced from* the bottom of said recess

and enclosing a space beneath it within the recess, and said element having at least one portion depending from said covered portion towards the bottom of said recess, means for introducing combustion air into the combustion chamber, and means for injecting fuel into *said space enclosed by said cover portion in* said recess, when the piston is at about its top-dead-centre position, *in a manner* [direction] such that substantially the whole of the injected fuel will *travel into* contact *with* the surface of the catalytic element to initiate its combustion.

Re. 30,427

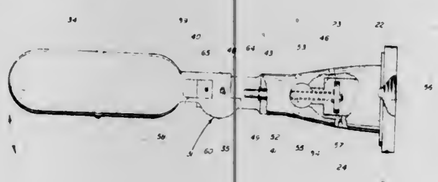
MAXIMUM LIQUID LEVEL CONTROL VALVE

Harley D. Brown, P.O. Box 844, Bedford, Ind. 47421, and Harley Brown, Bedford, Ind., assignors to Harley D. Brown, Bedford, Ind.

Original No. 4,142,552, dated Mar. 6, 1979, Ser. No. 778,371, Mar. 17, 1977. Application for reissue May 25, 1979, Ser. No. 42,365

Int. Cl.[2] **F16K** *33/18, 33/00*

U.S. Cl. 137—446 **11 Claims**



11. A valve for limiting the flow of liquid into a tank which comprises:

a valve body including a valve seat and a passage for liquid to flow therethrough, said valve body being mountable to the side wall of a tank;

a float pivotally attached to said valve body;

a normally open closure element positioned within said valve body and movable toward said valve seat to a closed position against said seat and away from said valve seat to an open position, said closure element being movable to said closed position under incoming liquid pressure thereby closing said passage;

a spring disposed between said valve body and said closure element, said spring being operable to return said closure element to said open position from said closed position once said incoming liquid pressure ceases to be present thereby opening said passage; and

a single cam member movable by said float to a suitable orientation relative to said closure element and locking said closure element against any movement toward said closed position when said float is below a maximum fluid level.

Re. 30,428

MAGNETICALLY ACTUATED VISCOUS FLUID COUPLING

Rodney H. Detty, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 4,056,178, dated Nov. 1, 1977, Ser. No. 681,106, Apr. 28, 1976. Application for reissue Mar. 14, 1979, Ser. No. 20,282

Int. Cl.[3] **F16D** *35/00, 43/25*

U.S. Cl. 192—58 B **29 Claims**

19. A viscous fluid clutch comprising:

a first member rotatable about an axis;

a second member rotatably disposed on said axis relative to said first member;

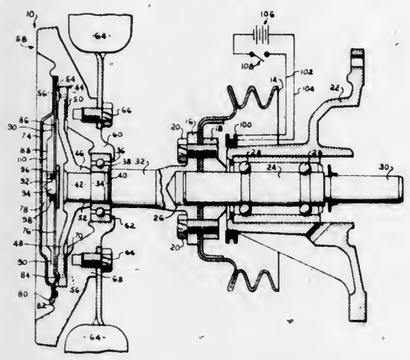
shear surfaces disposed on said first and second members and forming an operating chamber therebetween;

a fluid storage chamber adjacent said operating chamber;

a shaft made of a magnetic material and mounted on one of said members for rotation about said axis;

means for selectively inducing a magnetic field in said shaft;

valve means effecting selective communication between said storage chamber and said operating chamber and including a valve member, including an armature made of a magnetic material and located adjacent said shaft, movable in response to the induction of said magnetic field in said shaft from a first position to a second position, one of said positions providing communication between said storage chamber and said



operating chamber and the other of said positions blocking such communication;

fluid means disposed within said storage chamber and being selectively displaced into said operating chamber when said valve member is in said one position to provide in said operating chamber a medium to transmit rotational movement from one of said members to the other of said members; and

pump means in said operating chamber to displace said fluid means from said operating chamber to said storage chamber.

Re. 30,429

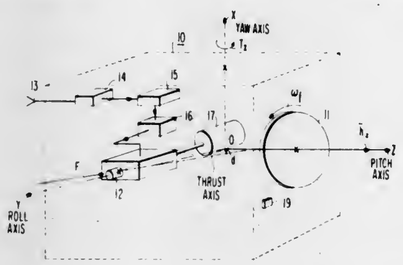
MINIMIZATION OF RESIDUAL SPACECRAFT NUTATION DUE TO DISTURBING TORQUES

Kevin J. Phillips, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Original No. 3,997,137, dated Dec. 14, 1976, Ser. No. 423,441, Dec. 10, 1973. Application for reissue Dec. 12, 1978, Ser. No. 968,799

Int. Cl.[3] **B64G** *1/26*

U.S. Cl. 244—169 **14 Claims**



8. A method for reducing nutation caused by a thrust force not passing through the center of gravity of a spacecraft of the dual spin type having a spin axis and a characteristic nutation period and further having a platform despun from a spinning member, comprising the steps of:

transmitting signals to spacecraft receiver means causing a receiver means output signal;

coupling said receiver output signal to logic circuit means causing a logic circuit means output signal;

activating a force generating means mounted on said platform for producing said thrust force a first time for a predetermined operating period T_1 in response to said logic circuit output signal, said predetermined operating period determined by said logic means to be a predetermined portion of said nutation period of said spacecraft;

deactivating said force generating means for a waiting period T_w in response to said logic circuit means output signal at the end of said predetermined operating period T_1;

activating said force generating means automatically for producing said thrust force a second time in response to said logic circuit means output signal for said predetermined operating period T_1 after said waiting period T_w, wherein said waiting period, T_w, is determined by:

$$T_w = \frac{2}{\omega_n} - \tan^{-1}\frac{1+\cos\omega_n T_1}{\sin\omega_n T_1}$$

where ω_n is the spacecraft nutation frequency and T_1 is said force generating means operating period.

Re. 30,430

CATALYST TREATMENT

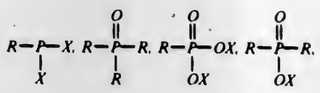
Ralph O. Kerr, Bloomington, Ind., assignor to Denka Chemical Corporation, Houston, Tex.

Original No. 4,006,168, dated Feb. 1, 1977, Ser. No. 563,740, Mar. 31, 1975. Application for reissue Feb. 26, 1979, Ser. No. 14,833

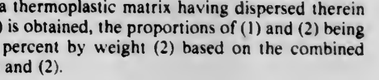
Int. Cl.[3] **C07D** *307/60*

U.S. Cl. 260—346.75 **13 Claims**

1. In a process for the vapor phase oxidation of C_4 to C_8 hydrocarbons to dicarboxylic [acids] *anhydrides* wherein said hydrocarbon is contacted with a vanadium-molybdenum-oxygen catalyst wherein said catalyst gradually decreases in activity, the improvement comprising adding to said catalyst, after said decrease in activity, *a compound of a phosphorus halide or an organo-phosphorus compound selected from the group consisting of*



-continued



wherein R is phenyl or an alkyl radical of one to 6 carbon atoms and X is H or R, and thereafter adding to said catalyst a volatilized compound of molybdenum, nickel, cobalt, manganese, uranium or mixtures thereof.

Re. 30,431

TOUGHENED MERCAPTOSILOXANE MODIFIED EMULSION POLYMERIZED VINYLIC POLYMERS

James R. Falender, Sanford; Claudia M. Mettler, and John C. Saam, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Original No. 4,071,577, dated Jan. 31, 1978, Ser. No. 679,595, Apr. 23, 1976. Application for reissue Aug. 21, 1978, Ser. No. 935,447

Int. Cl.[3] **C08L** *35/04, 25/12, 81/00*

U.S. Cl. 525—479 **4 Claims**

1. A thermoplastic vinylic polymer having improved impact strength made by the method which comprises polymerizing (1) [a vinylic monomer selected from the group consisting of styrenic monomers, methyl methacrylate,] mixtures of major amounts of styrenic monomers and minor amounts of [monomers selected from the group consisting of acrylic monomers, alpha-methylstyrene, vinyl halide monomers, vinyl acetate, butadiene monomers and] acrylonitrile monomers [and mixtures of major amounts of methyl methacrylate and minor amounts of monomers selected from the group consisting of other acrylic monomers, styrenic monomers, butadiene monomers, vinyl halide monomers, vinyl acetate, alpha-methylstyrene, and acrylonitrile monomers,] in an aqueous emulsion of (2) a copolymer of dimethylsiloxane, from 0.3 to 10 mol percent mercaptosiloxane of the unit formula $HSR'SiR_nO_{3-n/2}$ in which R' is a divalent or trivalent saturated aliphatic hydrocarbon radical of 1 to 18 carbon atoms, two valences of R' being attached to the same silicon atom when R' is trivalent, R is a monovalent hydrocarbon radical free of aliphatic unsaturation of 1 to 6 carbon atoms and n is 0 to 2 and sufficient $R''SiO_{3/2}$ or SiO_2 units to give a percent volume swell of the copolymer of 500 to 1,600 percent in benzene, R'' being of the group HSR'— and R groups, in the presence of a free radical generator, whereby a thermoplastic matrix having dispersed therein particles of (2) is obtained, the proportions of (1) and (2) being from 1 to 40 percent by weight (2) based on the combined weights of (1) and (2).

PLANT PATENTS

GRANTED NOVEMBER 4, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,607

PLANT OF THE BROMELIACEAE FAMILY

Barnell L. Cobia, P. O. Box 1307, Winter Garden, Fla. 32707

Filed May 7, 1979, Ser. No. 36,542

Int. Cl.[3] **A01H** *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the Bromeliaceae family substantially as shown and described herein.

4,608

Patent Not Issued For This Number

PATENTS

GRANTED NOV. 4, 1980

ERRATA

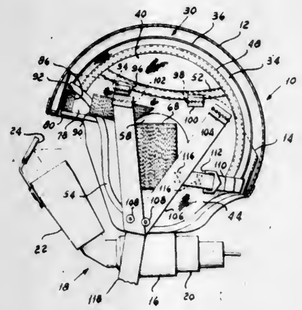
For CLASS	See PATENT NO.
474–080	4,231,264
474–152	4,231,265
440–043	4,231,315
440–086	4,231,316
440–050	4,231,317
493–426	4,231,559
493–029	4,231,560
414–343	4,231,708
414–458	4,231,709
414–475	4,231,710
430–059	4,231,799
564–073	4,231,960
564–065	4,231,961
564–272	4,231,962
564–443	4,231,963
564–305	4,231,964
568–327	4,231,965
568–396	4,231,966
568–433	4,231,967
570–109	4,231,968
570–223	4,231,969
370–024	4,232,188
370–097	4,232,197
370–079	4,232,266
370–029	4,232,318

PATENTS

GRANTED NOVEMBER 4, 1980

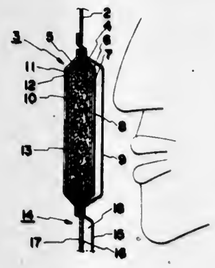
GENERAL AND MECHANICAL

4,231,117
HELMET ASSEMBLY FOR ACCURATELY POSITIONING VISUAL DISPLAY SYSTEM
Jackson A. Alleo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Filed Jan. 15, 1979, Ser. No. 3,195
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—6 **9 Claims**



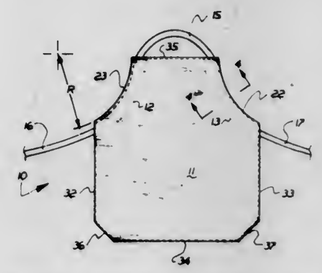
7. A helmet assembly for use with a portable visual display unit including in combination a rigid outer shell, an inner subassembly adapted to fit relatively closely over the wearer's head, said outer shell and said inner subassembly having portions overlying the forehead of the wearer, means for mounting said display unit on said outer shell, and means for adjustably securing said outer shell to said inner subassembly along said portions to position said visual display unit in a predetermined desired relationship relative to the eye of the wearer.

4,231,118
HEAD AND FACE PROTECTING HOOD
Yoshimasa Nakagawa, Urawa, Japan
Filed Apr. 10, 1979, Ser. No. 28,799
Claims priority, application Japan, Apr. 10, 1978, 53-46922; Apr. 10, 1978, 53-46923
Int. Cl.[3] A42B *1/04*; A62C *39/00*; A62B *23/00*
U.S. Cl. 2—7 **5 Claims**



1. A head and face protecting hood comprising:
an outer cover body made up of a front wall and a rear wall, said walls being attached to each other at edges thereof except at the bottom edges through which the wearer's head fits for putting the hood on;
said front and rear walls having an outer layer which is made of a laminate of non-flammable polyvinyl chloride sheet and non-flammable fiber sheet and having an inner layer spaced from said outer layer attached to the edges of said front and rear wall outer layer, said inner layer being made of adiabatic material and extending so as to cover the whole head and face of the wearer; and
an eyepiece positioned in front of the eyes which is secured to said front wall of said cover body, said front wall having an opening for fitting said eyepiece being made of a non-flammable transparent polyvinyl chloride material for allowing vision therethrough.

4,231,119
ADJUSTABLE APRON OF VINYL LAMINATE
Daniel P. Quinn, 4802 Krueger Ave., Parma, Ohio 44134
Filed Aug. 22, 1979, Ser. No. 68,506
Int. Cl.[3] A41B *13/10*
U.S. Cl. 2—48 **1 Claim**



1. An adjustable apron to fit a person chosen from a wide range of body shapes and sizes, said apron comprising,
(a) a body member of soft, flexible vinyl laminate of poly(vinyl chloride) bonded to a woven cotton fabric,
(b) two separate identical quarter-ring-shaped arm cut-out strips of said vinyl laminate,
(c) a single flat continuous tape snugly and slidably held in said apron so as to be frictionally engaged therein for arcuate movement only upon exertion of a force, said tape forming an adjustable neck loop and waist-tying ends,
(d) two arcuate hems to permit support of said apron on the person's pelvic region, each hem being formed by sewing one of said arm cut-out strips to said body member on opposite sides thereof, said hem including
(i) an arcuate hidden reinforcing seam having a radius from about 25 cm to about 40 cm, said seam being formed with a first top-stitch which compresses vinyl surfaces of said body member and an arm cut-out strip in abutting relationship between their woven cotton fabric surfaces so as to hinder propagation of punctures caused by said first top-stitch,
(ii) a second top-stitch fastening said body member and said arm cut-out strip and compressing their cotton fabric surfaces in abutting relationship between their vinyl surfaces, and
(iii) a third top-stitch which secures said hidden reinforcing seam tightly between said arm cut-out strip and said body member, so as to form
(iv) an edge-rubbing surface against which the upper edge of said tape rubs when the apron is adjusted for use, and against which edge-rubbing surface the tape is stressed when the apron is in use,
whereby, the apron is fixedly removably secured on the body of its wearer by tying a knot in said waist-tying ends so as to tension said tape without forming stress creases in said body member in the areas where said tape exits said hems.

4,231,120

ENDOPROSTHETIC ORTHOPAEDIC DEVICES

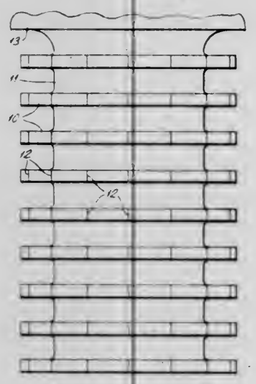
William H. Day, London, England, assignor to National Research Development Corporation, London, England

Filed Sep. 18, 1978, Ser. No. 943,648

Claims priority, application United Kingdom, Sep. 22, 1977, 39553/77

Int. Cl.³ A61F 1/24

U.S. Cl. 3—1.91 **7 Claims**



1. An endoprosthetic orthopaedic component of non-rigid synthetic thermoplastic material, comprising:

a body;

at least one elongate member projecting from said body and formed in one piece therewith;

said member having a generally cylindrical solid core portion with a relieved structure over a major proportion of its longitudinal extent;

said structure being defined by a plurality of like fins circumscribing said core portion;

said fins being successively spaced from one another by a distance longitudinally of said core portion which is greater than the individual thicknesses of the respective fins in the same direction;

each said fin being subdivided into a plurality of angularly discrete portions; and

each said fin having a radial height from said core portion greater than said thickness.

4,231,121

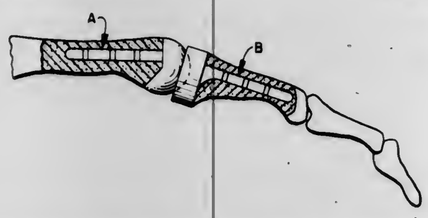
METACARPAL-PHALANGEAL PROSTHESIS

Frank M. Lewis, Cordova, Tenn., assignor to Wright Dow Corning, Arlington, Tenn.

Filed Jul. 5, 1979, Ser. No. 55,054

Int. Cl.³ A61F 1/24

U.S. Cl. 3—1.91 **1 Claim**



1. An artificial joint for implantation into the living body to provide a total joint, consisting of:

(a) a first component commprising:

i. a stem for intramedullary implantation into a bone,

ii. a head formed integrally with the stem and transversely disposed thereto at one end thereof and being of cylindrical configuration with its axis parallel to the axis of the stem and laterally offset with respect thereto in one aspect and aligned therewith in an aspect turned 90°,

iii. the outer surface of the head having a concentrically positioned concave depression therein of part-spherical shape, and

(b) a second component comprising:

i. a head formed integrally with a stem and being defined by:

ii. a part-spherical convex outer surface and two flat surfaces which form a dihedral angle of 225°, and

iii. a stem for intramedullary implantation into a bone formed integrally with the head and extending at right angles from one of the surfaces,

iiii. the axis of the stem being within a plane bisecting the surface to which the stem is connected and being displaced laterally from a plane which includes the apex of the dihedral angle and is parallel to the stem,

(c) the concave part-spherical surface of the first component and the convex part-spherical surface of the second component having the same radii and forming complementary articulating surfaces on implantation.

4,231,122

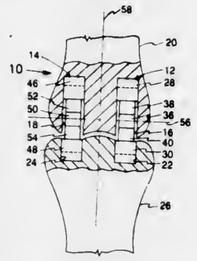
KNEE JOINT PROSTHESIS

James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Nov. 16, 1977, Ser. No. 852,111

Int. Cl.³ A61F 1/03

U.S. Cl. 3—1.911 **5 Claims**



1. A joint prosthesis for use in replacement of a skeletal knee joint which joint permits movement of adjacent body members in flexion about a flexion axis and in rotation relative to each other about an axis extending longitudinally through at least one of the body members perpendicular to said flexion axis, comprising:

first joint component means for connection with one body member, and second joint component means for connection with said adjacent body member;

first and second pivot members, said first and second pivot members being spaced apart on opposite sides of said longitudinal axis and disposed between said first and second joint component means; and

securing means including a pair of first bodies of elastomeric material and a pair of second bodies of elastomeric material, said pair of first bodies of elastomeric material being disposed between and attaching to said first joint component means and respective ones of said pivot members, said pair of second bodies of elastomeric material being disposed between and attaching to said second joint component means and respective ones of said pivot members, said first pair of bodies of elastomeric material and said second pair of bodies of elastomeric material being spaced apart and suspending said pivot members between said first and second joint component means to permit motion of said first and second joint component means relative to each other about said flexion axis in response to flexion movement of said adjacent body members, said pivot members pivoting about axes parallel to said longitudinal axis and independently rotating in opposite directions about axes in a plane normal to said longitudinal axis in response to rotational movement of said adjacent body members relative to each other, said pivot members cooperating with said first and second bodies of elastomeric material in simulating the operation of a knee joint in the human body.

4,231,123

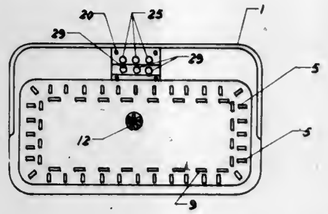
ENAMELLED BASIN STRUCTURE

Yao-Hui Cheng, No. 1, Alley 1, lane 774 Kuo Hwa St., Chiyi, Taiwan

Filed Dec. 28, 1978, Ser. No. 974,114

Int. Cl.³ A47K 1/04; E03C 1/18

U.S. Cl. 4—651 **6 Claims**



1. An enamelled bowl shaped basin having a drain at the bottom connected to a drain line and a continuous external supply of water comprising a first passageway integrally enclosed within the rim portion of the basin connected to the external water supply, a first row of holes spaced around the inside of said basin near the rim communicating with said first passageway, a second passageway integrally enclosed within the rim portion of the basin connected to the drain line, a second row of holes spaced around the inside of said basin above said first row of holes and communicating with said second passageway, at least one water supply line connected to said first passageway, valve means in said water supply line for controlling the flow of water therein, and push button means connected to said valve means for selectively positioning the valve means.

4,231,124

HOSPITAL BEDS

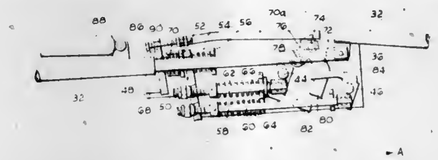
John M. Croxton, Birmingham, England, assignor to J. Nesbit-Evans & Co. Ltd., Wednesbury, England

Filed Mar. 14, 1979, Ser. No. 20,271

Claims priority, application United Kingdom, Apr. 1, 1978, 12843/78

Int. Cl.³ A61G 7/00, 7/10

U.S. Cl. 5—63 **6 Claims**



4. A hopsital bed or the like comprising a base, a top, and two sets of swinging links disposed between the base and the top, said links being coupled to opposite ends of a main shaft of a mechanical jack system including said main shaft extending through a pair of first and second canting plates of which the first plate is arranged to be displaced with the main shaft by a first operating member when said first plate is in wedging position on said main shaft to displace said shaft in one direction and the second plate is arranged to wedge the shaft against return movement, said second plate being arranged to be returned to a non-wedging position by a second operating member coupled to the second plate when return movement is required, characterised in that said second operating member is also coupled to said first plate so that the first plate is displaced at least to the wedging position on the main shaft when the second plate is to be released ready for the return movement, movement of the main shaft in said one direction raising the top of the bed relative to said base and movement of the main shaft in said return movement lowering the top of the bed relative to said base.

4,231,125

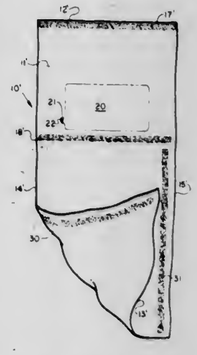
BEACH TOWEL FOR USE WITH A PILLOW

Joseph F. Tittl, 1405 Eastcrest Dr., Apt. 201, Charlotte, N.C. 28205

Filed Jun. 27, 1979, Ser. No. 52,565

Int. Cl.³ A47G 9/06

U.S. Cl. 5—419 **2 Claims**



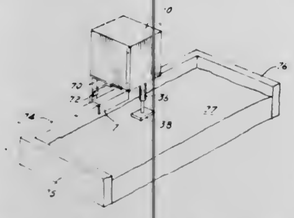
1. A beach towel for use with a pillow, and characterized by simplicity and economy of construction, and the use of elements not susceptible to corrosion by salt or damage from sand, comprising:

(a) an elongate, substantially rectangular fabric piece defining opposing, laterally extending top and bottom end edges and opposing, longitudinally extending side edges;

(b) a pair of longitudinaly space-apart and laterally extending attachment members secured to said fabric piece proximate the top end thereof for permitting the top end of said fabric piece to be folded over itself and releasably attached in such position to form a tube for enclosing a pillow, one of said attachment members comprising a patch having numerous rows of hooklike projections, and the other of said pair of attachment members comprising a patch of loose, fibrous non-woven material for releasably interlocking with said hook-like projections; and

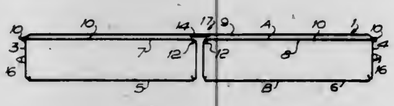
(c) means for releasably attaching a plurality of said towels together side to side to form an oversized towel for use by several persons and to aid in preventing blowing of said towels by wind, said means comprising a patch of hook-like projections secured to one face of said fabric piece closely adjacent one side edge thereof, and a patch of loose, fibrous non-woven material secured to the other face of said fabric piece closely adjacent the other side edge thereof, whereby one of said towels may be releasably secured to another of said towels by overlapping their ajoining side edges and releasably interlocking said patch of hook-like projections with said patch of loose, fibrous non-woven material.

4,231,126
WATER BED WAVE GENERATOR
Earl Hurkett, 1201 W. 92nd #309, Denver, Colo. 80221
Filed Jan. 19, 1979, Ser. No. 4,685
Int. Cl.³ A47C 27/08; A61H 1/00
U.S. Cl. 5—451 **8 Claims**



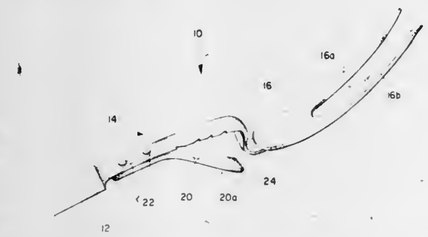
1. A wave generator for water beds, comprising:
(a) housing means;
(b) mounting means to mount the housing to the frame of a water bed, said mounting means adapted to vary the height of the housing means relative to the top surface of a water bed;
(c) reciprocable pad means mounted for contact with the top surface of a water bed and arranged to press into the water bed to displace a substantial quantity of water in the water bed;
(d) reciprocating actuating means in said housing;
(e) connecting means between said reciprocating actuating means and said reciprocable pad means for pressing said pad means into the water bed; and,
(f) means for periodically operating said reciprocating actuating means for periodically reciprocating said pad means, thereby periodically forming waves in the water of said water bed.

4,231,127
FOLDABLE CUSHIONING AND SUPPORT
Abraham D. Bendell, 1 Kirkstone Ave., Cullercoats, Whitley Bay, Tyne and Wear, England
Filed Aug. 17, 1978, Ser. No. 934,473
Int. Cl.² A47C 23/00
U.S. Cl. 5—462 **9 Claims**



1. Foldable cushioning comprising:
a pair of separate cushioning members, each cushioning member having opposed faces and peripheral side regions extending between said opposed faces, said cushioning members being disposed side by side with respective portions of said side regions being disposed adjacent to and extending substantially parallel to each other;
a pair of border strips, each border strip extending around and over a respective cushioning member side region and having first and second edges;
a pair of inner skins, each inner skin overlying one face of a respective cushioning member and being secured to the second edge of a respective border strip;
a pair of cover sheets, each cover sheet overlying the other face of a respective cushioning member and being secured to the first edge of a respective border strip; and
a further largest cover sheet overlying both of said inner skins, said further cover sheet having a peripheral edge which is secured to at least a portion of the second edges of the respective border strips in a manner such that a pouch is defined between said further cover sheet and each of said inner skins and such that the portion of said further cover sheet extending between the adjacent portions of the side regions of said cushioning members comprises a band-like portion constituting a hinge-like fold zone.

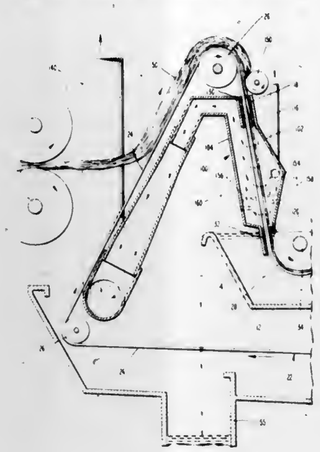
4,231,128
COOKING UTENSIL WITH INTEGRALLY FORMED POT ATTACHING MEANS
Donald E. James, P.O. Box 64223, Fayetteville, N.C. 28306
Filed Jan. 29, 1979, Ser. No. 7,772
Int. Cl.³ B25F 1/00
U.S. Cl. 7—112 **10 Claims**



1. A cooking tool provided with means for enabling the same to be secured or rested in a balanced position about the upper edge of the wall structure of a pot or pan, said cooking tool comprising a handle end, a working end and an intermediate shank portion extending between said handle end and said working end; attaching means formed about said intermediate shank portion for enabling said cooking tool to be secured about the upper edge of a pan or pot's retaining wall, said attaching means including at least one transverse groove formed across one side of said intermediate shank portion; a holding member having one end secured to said intermediate shank portion and extending therefrom to where a terminal end thereof terminates in spaced apart relationship with said intermediate shank portion so as to define an open area between the intermediate shank portion of said cooking tool and said holding member; and means projecting downwardly from said intermediate shank portion, forwardly of the at least one transverse groove, towards said terminal end of said holding member wherein said downwardly projecting means, said holding member, and said intermediate shank portion define a receiving area for receiving the upper edge of a pot or pan's retaining wall and wherein said holding member is cooperable with either the at least one groove or said downwardly projecting means to secure said cooking tool about the upper edge of a respective pot or pan's retaining wall.

4,231,129
APPARATUS AND METHOD FOR IMPREGNATING A DRY FIBER BATT
Allen R. Winch, Westfield, N.J., assignor to Cotton, Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 859,167, Dec. 9, 1977, Pat. No. 4,158,297. This application Mar. 28, 1979, Ser. No. 24,533
Int. Cl.³ D06B 5/08, 21/00, 23/18
U.S. Cl. 8—149.1 **24 Claims**

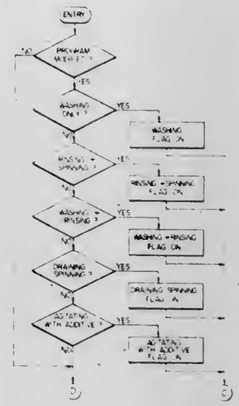
1. An apparatus for impregnating a dry, moving fabric with liquid, comprising:
tank means for containing a supply of the liquid;
means for conveying the fabric into and out of the tank means; and
purging means for urging a condensable gas through the dry fabric immediately prior to entry of the fabric into the supply of the liquid, the purging means including both first chamber means for communicating the condensable gas with one side of the dry fabric and means for providing a pressure differential through the fabric, said means for providing the pressure differential including means for substantially sealing the dry fabric with respect to the first chamber means.



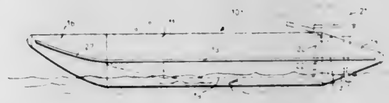
4,231,130
AUTOMATIC WASHING MACHINE AND METHOD FOR OPERATING THE SAME
Hideyuki Tobita, Hitachi, and Toshio Mori, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Mar. 16, 1979, Ser. No. 21,187
Claims priority, application Japan, Mar. 20, 1978, 53-30949
Int. Cl.³ D06F 33/02
U.S. Cl. 8—159 **5 Claims**

1. An automatic washing machine comprising a cabinet, an outer tub supported within said cabinet, a spinning and washing perforated tub supported rotatably within said outer tub, a rotatable agitator agitating articles to be washed together with water filled within said spinning and washing tub, drive means for driving said rotatable agitator during a washing operation and a rinsing operation and driving said spinning and washing tub during a spinning operation, a water feed system feeding water into said outer tub, a water drain system draining water from within said outer tub, memory means for programming and storing the operating durations and the operating sequence of said drive means, said feed system and/or said drain system, means for selecting a desired operation program from those stored in said memory means, and control means for controlling said drive means, said feed system and/or said drain system in accordance with the operation program selected by said selecting means thereby carrying out the programmed sequence of the washing, rinsing and spinning operations, said selecting means including operation selector switch means for selecting the combination of the washing operation, the rinsing operation and/or the spinning operation in the selected operation program as desired and also for making a mid-course modification of the already selected operation program, wherein said control means comprises means for comparing a newly selected operation program with the already selected operation program whereby, when the already selected operation program includes an operation included in the newly selected operation program, the operation in the already selected program corresponding to that included in the newly selected operation program is only continuously carried out for the predetermined run duration.

4. A method for operating an automatic washing machine which is provided with operation selector switch means for selecting the combination of a washing operation, a rinsing operation and/or a spinning operation in a selected operation program as desired and also for making a mid-course modification of the already selected operation program, said method comprising the step of comparing a newly selected operation program with the already selected operation program whereby, when the already selected operation program includes an operation included in the newly selected operation program, the operation in the already selected operation program corresponding to that included in the newly selected operation program is only continuously carried out for the predetermined run duration.



4,231,131
INFLATABLE HIGH SPEED BOAT
Eldon L. Young, 3236 Wesleyan Dr., Anchorage, Ak. 99504
Filed Oct. 2, 1978, Ser. No. 947,955
Int. Cl.³ B63B 7/08
U.S. Cl. 9—2 C **7 Claims**



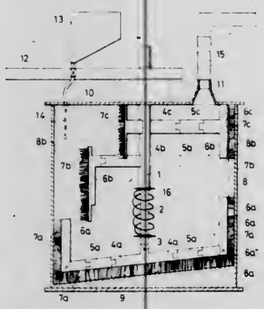
1. A collapsible inflatable boat for high-speed travel, comprising in combination:
a pair of inflatable tubes arranged in parallel, spaced-apart relationship;
a floor member connecting said tubes and disposed so as to extend above the water when said tubes are on a body of water, said floor member having permanently attached, rigid, spaced-apart support members extending laterally of said floor member between said pair of tubes;

a third inflatable member permanently attached to the underside of said floor member for support and extending longitudinally of the boat to the rearward edge of said floor member;
a rigid, hinged upper transom member permanently attached to the rearward edge of said floor member and which is foldable forwardly against the upper side of said floor member when not in use;
A rigid, hinged lower transom member permanently attached to the rearward edge of said third inflatable member below said upper transom member, and which is foldable forwardly when not in use; and
a leading edge bow member disposed at the forward end of said floor member.

4,231,132
APPARATUS FOR CLEANING INNER SURFACES OF HOLLOW CYLINDRICAL CONTAINER

Makoto Watanabe, 1070-4 Oaza Shiba, Kawaguchi Saitama-ken, Japan (332)

Filed Dec. 20, 1978, Ser. No. 971,167
Claims priority, application Japan, Jul. 31, 1978, 53-92473
Int. Cl.³ B08B *9/08*
U.S. Cl. 15—56 **9 Claims**



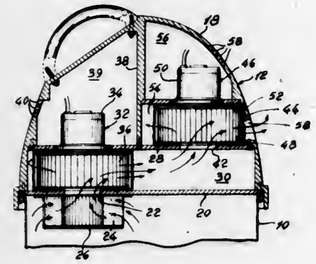
1. An apparatus, for washing and polishing inner surfaces of a hollow cylindrical container, comprising:
(i) a support
(ii) a shaft carried in rotatable manner by said support, said shaft having its axis of rotation vertical when in use,
(iii) drive means coupled to said shaft for rotating it,
(iv) at least one arm secured at one of its ends to said shaft for rotation therewith,
(v) brush means carried at the other end of said arm for contacting the inner surface of the hollow cylindrical container, said arm including along its length a plurality of arm portions coupled serially end to end by pivot means, the axis of each said pivot means being parallel to the axis of said shaft, whereby the radial extent of each said arm is variable by relative pivoting of adjacent coupled arm portions and each arm portion is supported against gravity, and the radial extent of said arm may be varied by centrifugal force to urge the brush means against the inner surface of the hollow cylindrical container when the shaft and arm are rotated.

4,231,133
WET VACUUM MACHINE

Miroslav Probost, Pincourt, Canada, assignor to Deep Steam Extraction (1974) Ltd., Montreal, Canada

Filed Mar. 19, 1979, Ser. No. 21,340
Int. Cl.³ A47L *9/22*
U.S. Cl. 15—300 A **6 Claims**

1. A suction power unit for use with a wet vacuum machine comprising a housing, a first electric motor-centrifugal fan arrangement provided in the housing, the first centrifugal fan having an axis of rotation, inlet means communicating axially with the fan, an exhaust chamber defined radially of the centrifugal fan, means hermetically isolating the motor of said first centrifugal fan from said exhaust chamber, the exhaust chamber being defined by walls of the housing including a top wall in a plane at right angles to the axis of the first centrifugal fan, an inlet aperture defined in the top wall of the exhaust chamber, a second centrifugal fan arranged in said housing having

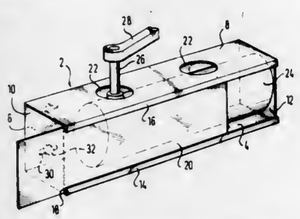


an axis of rotation parallel to but spaced from the axis of rotation of the first centrifugal fan, the inlet aperture communicating axially with the second centrifugal fan, a second exhaust chamber formed radially of the second centrifugal fan, and means hermetically isolating the motor of the second centrifugal fan from the second exhaust chamber, and exhaust ports communicating said second chamber with the atmosphere.

4,231,134
AUTOMATIC DOOR CLOSING ARRANGEMENT

Hans Schoker, Vaduz, Liechtenstein, assignor to Casma Di V. Marinoni & Figli, Magenta, Italy

Filed Apr. 20, 1978, Ser. No. 898,140
Int. Cl.² E05F *3/00*
U.S. Cl. 16—49 **2 Claims**

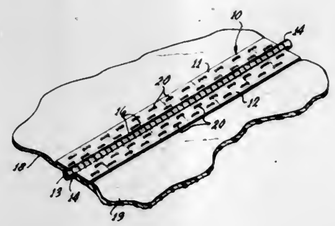


1. An automatic door closing assembly particularly adapted to be operatively mounted between a door member and a frame member defining an aperture to be opened and closed by said door member and operating to automatically actuate said door member to the closed position, said assembly being structured to enable selective connection thereof in operative engagement with door members irrespective of the side thereof upon which said door member is hinged to said frame member, said assembly comprising:
an elongated trilateral casing member formed of sheet material having first, second and third integrally joined angularly offset longitudinal walls, with one of a pair of longitudinal flanges extending coextensively with and generally perpendicularly from each of said first and third longitudinal walls, said first and third longitudinal walls from which said flanges extend being located on opposite sides of said casing member with each of said flanges projecting from the associated wall toward the flange on the opposite one of said longitudinal walls;
said flanges defining therebetween an elongated opening spaced opposite to said second longitudinal wall;
a pair of end walls located on opposite ends of said casing member extending transversely to said elongated opening and affixed to said casing member to close the ends thereof;
each of said end walls having edges spaced from each of said pair of flanges to define therebetween guide slots adapted to have a panel member slideably engaged therein for longitudinal sliding movement along said casing member to open and close said opening defined between said pair of flanges;
fastening means for fixedly fastening said casing member to one of said door member and said frame member;
a panel member replaceably fitted within said guide slots between said flanges and said edges of said end walls to close said opening defined between said flanges, said panel member being decoratively arrayed and adapted to be replaced by another panel member to change the decorative effect of said assembly;
an automatic door closing mechanism including a motor portion and an output member projecting from said motor portion and operating to automaticly close said door member when operatively engaged between said door member and said frame member;
mounting means for fixedly mounting said closing mechanism within said casing member, said casing member together with said end walls and said panel member forming a decorative housing for said closing mechanism; and
means defining a plurality of openings located at predetermined positions in at least one of said first and said third longitudinal walls of said casing member, each of said openings being sized to permit said output member to project therethrough for operative connection with the other of said door member and said frame member when said closing member is mounted within said decorative housing in any one of a plurality of operative positions;
said mounting means being arranged to selectively enable mounting of said closing member within said decorative housing in any one of a plurality of operative positions depending upon the operating conditions within which said assembly is to be mounted and the particular arrangement whereby said door member is hinged relative to said frame member, said means defining said plurality of openings and said mounting means being cooperatively related to permit said assembly to be adapted for operative mounting between said door member and said frame member in any one of a plurality of said operating conditions.

4,231,135
FLEXIBLE AND SEWABLE HINGE

Raymond Fradin, 2006 Navy St., Santa Monica, Calif. 90405

Filed Apr. 30, 1979, Ser. No. 34,626
Int. Cl.³ E05D *3/02, 5/02*
U.S. Cl. 16—150 **5 Claims**

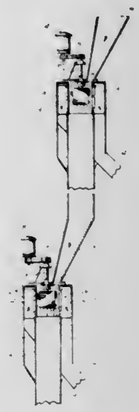


1. A flexible and sewable hinge comprising: a pair of elongated generally flat flanges of a resilient, flexible and pliable material, an aligned series of evenly spaced tubular cylindrical knuckles formed integrally with one elongated edge of each said flange with the spacing of the knuckles in the second flange to be inserted into the spaces between the knuckles in the first flange whereby upon such insertion, the tubular portion of all of the knuckles in both of said flanges are in an aligned relationship, a flexible and pliable hinge pin with a tubular cross section and sized to be inserted through the tubular portion of all of said knuckles of both flanges when they are in said aligned relationship, means for retaining said pin in the aforestated position, and an elongated rod sized to be slideably inserted substantially through the entire tubular center of said hinge pin.

4,231,136
BAGASSE DEPITHING

Eduardo J. Villavicencio, Mexico City, Mexico, assignor to Process Evaluation & Development Corporation, Dallas, Tex.

Continuation of Ser. No. 811,090, Jun. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 624,686, Oct. 22, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,575
Int. Cl.² D01B *1/30, 1/38, 1/50*
U.S. Cl. 19—7 **8 Claims**

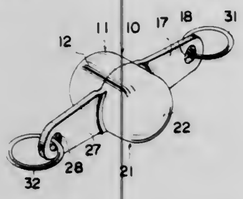


1. An improvement in the method of processing fibrous vegetable materials containing pith for the separation of the pith from the fiber which method comprises feeding said fibrous vegetable materials into the upper inlet end of a first vertical depither consisting essentially of a cylindrical screen element having disposed therein a rotating element having an array of hammers, repeatedly contacting said fibrous vegetable materials with said array of hammers thereby vertically orienting said fibers on said screen element, separating and removing pith from said fibers by forcing said pith through said screen element and moving said fibers downwardly while vertically oriented, collecting depithed fibers exiting from a lower fiber outlet end of said first vertical depither, and subsequently as a separate operation feeding said fibers which have had a portion of pith removed therefrom into a second vertical depither for further separation of pith from said fiber, the improvement comprising, arranging said first vertical depither above said second vertical depither and interconnecting the lower fiber outlet end of said first vertical depither to the upper fiber inlet end of said second vertical depither whereby the fibers in a vertical orientation exiting the outlet end of said first depither fall downwardly and enter said second vertical depither while remaining in such vertical orientation thereby enhancing pith removal in said second vertical depither.

4,231,137
CLASP FOR PERSONAL ORNAMENTS OR FURNISHINGS

Toshio Fujimoto, 7-6, Ochayasho-cho, Nishinomiya-shi, Hyogo-ken, Japan

Filed Jan. 23, 1979, Ser. No. 5,831
Claims priority, application Japan, Jun. 29, 1978, 53-90276[U]
Int. Cl.[3] A44B *17/00*
U.S. Cl. 24—201 B 7 Claims

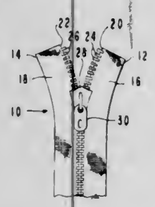


1. A clasp for personal ornaments or furnishings, the clasp comprising two metallic parts at least one of which attracts the other by virtue of magnetic property, said metallic parts can be removeably coupled together, one of the said metallic parts having an annular projection formed on the coupling surface thereof, the other of said metallic parts having an annular groove formed in the coupling surface thereof, so that when the said two metallic parts are coupled together, said annular projection is fitted in said annular groove, said one of said parts and said other of said parts being free to rotate with respect to one another when coupled together, each of said metallic parts being formed with a respective flange which extends laterally in the same plane as that of the respective said coupling surfaces of said metallic parts, said two metallic parts being of substantially identical external shape, each said metallic part having an approximately cylindrical portion adjacent its said coupling surface and an approximately semispherical end opposite its said coupling surface such that when said two metallic parts are coupled together, the length of the clasp from end-to-end is longer than the diameter of said approximately cylindrical portions, whereby the coupling direction can be extended along a surface of a wearer's body with the cylindrical portions resting against the user.

4,231,138
SLIDE FASTENER

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 17, 1978, Ser. No. 961,449
Int. Cl.[2] A44B *19/02*
U.S. Cl. 24—205.16 R 9 Claims

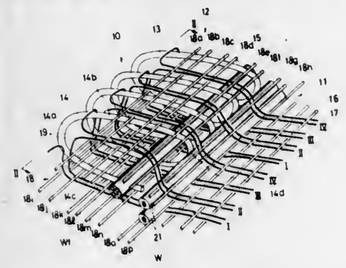


1. A slide fastener comprising
a pair of mounting tapes having adjacent side edges;
a warpless area formed in each mounting tape proximate the adjacent side edge thereof;
a plurality of coupling elements mounted on the adjacent side edges of each of the mounting tapes; and
interconnecting straps connecting each of the coupling elements with each of the adjacent coupling elements, the interconnecting straps being formed of the material from which the coupling elements are formed being filled into the warpless areas of the respective mounting tapes.

4,231,139
WOVEN STRINGER FOR SLIDE FASTENERS

Noritaka Tsubata, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 18, 1979, Ser. No. 49,474
Claims priority, application Japan, Jul. 3, 1978, 53-80767
Int. Cl.[3] A44B *19/00*
U.S. Cl. 24—205.16 R 5 Claims



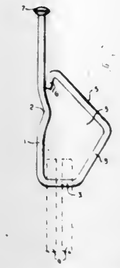
1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section and interengageable with another row on a mating stringer by the action of a slider, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction, and a heel portion remote from said head connected to a next adjacent one of said successive loops; a plurality of covering warp threads overlying and underlying said loops; a stuffing cord extending longitudinally of the tape through said row of loops; at least one guide cord having a knit structure wound around a core and extending longitudinally of the tape in abutting conforming engagement with the outer peripheral surfaces of said heel portions; and a binding weft thread continuing from said foundation and interwoven with said covering warp threads in said woven filament section, said binding weft thread being tensioned to bite into the material of said stuffing cord and deform said guide cord to produce a rigid guide surface for the slider, said stuffing cord being thermally expandable to augment the effective bite of said binding weft thread into the material of the stuffing cord.

4,231,140
KEY CLIP ADAPTED FOR A KEY CASE

Mark A. Ebreo, Putnam, and Andrew Koches, Old Saybrook, both of Conn., assignors to William Prym, Inc., Dayville, Conn.

Filed Jan. 10, 1979, Ser. No. 2,461
Int. Cl.[2] A44B *13/02*
U.S. Cl. 24—237 1 Claim

1. A bent-wire key clip for a key case comprising:
a generally straight relatively long first arm having a boss at one end adapted to be received in a key case;
a straight relatively short second arm extending at a right angle to said first arm at the opposite end thereof and coplanar therewith;
a straight third arm shorter than said first arm and longer than said second arm and including a first obtuse angle with said second arm;
a straight fourth arm shorter than said first arm and longer than said second arm and bent at a second obtuse angle to said third arm, said fourth arm approaching said first arm in the region of the center thereof, all of said arms being coplanar, said first arm having an indent bent inward toward said third and fourth arms between said region and said opposite end; and

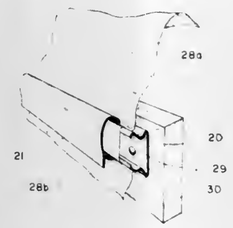


a finger bent at an acute angle from said fourth arm toward said indent and resiliently bearing upon said first arm adjacent said indent and between said indent and said boss.

4,231,141
ATTACHMENT DEVICE FOR FLEXIBLE FILMS AND FABRICS

Danny O. Derrick, 5935 McMillan Cir., Columbia, S.C. 29210, and Donald F. Looney, P.O. Box 685, Irmo, S.C. 29063

Filed Jul. 26, 1978, Ser. No. 928,180
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—243 K 5 Claims

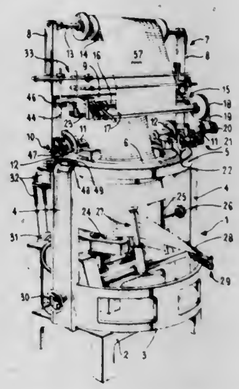


1. In a two piece separable device for securely holding flexible material having an inner and an outer surface, the combination comprising complementary inferior male means beneath said inner surface and superior female means above said outer surface which releasably mate together by flex action to capture said material between said means, said male means being provided with an arcuate concave groove opening outward in opposite directions on each of its two outwardly extending sides, one of said grooves being larger than the other with said larger groove being disposed towards the body of said material, and said female means being substantially even and regular in cross-section and having a symmetrical arcuate bead on each edge of its two dependent sides, said beads having a cross-section complementary to the smaller of said concave grooves and said larger groove having sufficient larger size relative to said engaging bead to permit said female means to be rotationally displaced by a tension load placed on said flexible material while being sufficiently small in size to prevent rotational disengagement of said bead due to said tension load, thereby clamping said material between said female and said male means without permitting rotational disengagement of said bead due to said tension load, said grooves and said beads being arranged to engage each other so as to interlock and thereby securely clamp said material between said male and said female means in response to said rotational displacement.

4,231,142
STOP MOTION FOR BAND CUTTING DEVICE

Luigi Pisani, Cilavegna, Italy, assignor to Officina Meccanica Pisani Luigi, Pavia, Italy

Filed Sep. 20, 1977, Ser. No. 835,021
Claims priority, application Italy, Oct. 29, 1976, 28835 A/76
Int. Cl.[2] B21D *43/26*; B26D *3/16*
U.S. Cl. 29—2.16 4 Claims



1. In a band cutting machine comprising a stationary lower frame having a central axis, a cloth-feeding mechanism for advancing tubular material to be cut into strips supported by said frame, a cutting apparatus mounted on said frame to cut out said strips from said cloth-feeding mechanism, a driving device for the cloth feeding mechanism and the cutting apparatus and an upper frame carried on said stationary lower frame, said upper frame being rotatable about the central axis of the lower frame and supporting a roll for cloth to be cut into strips and a roller stretcher which serves as a means for guiding said cloth as it is drawn from said roll and an advancer to the cutting apparatus, the improvement which comprises a stop switch positioned on said lower frame, a vertically movable actuator means above said switch and a pivotable stretch detector means carried on said upper rotatable frame, said stretch detector means governing the vertical movement of said actuator means, said detector means pivoting when the cloth is no longer in a stretched condition when passing through the roller stretcher to lower said actuator which actuates the stop switch for arresting operation of the band cutting machine.

4,231,143
ELECTRODE AND APPARATUS FOR FORMING THE SAME

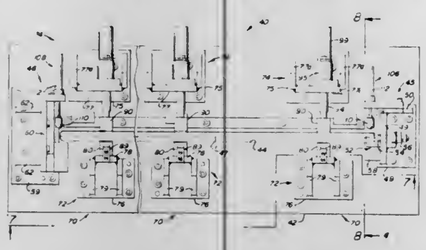
Gerald R. Pohto, and Richard O. Olson, both of Mentor, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 791,725, Apr. 28, 1977, Pat. No. 4,129,292.
This application Oct. 16, 1978, Ser. No. 951,582
Int. Cl.[3] B25B *27/14*
U.S. Cl. 29—281.5 4 Claims

1. Apparatus for forming an electrode subassembly of the type including a generally cylindrical riser member and a pair of longitudinally extending V-shaped connector members which have their bight portions joined to the riser member on diametrically opposite sides with the leg portions extending radially, said apparatus comprising:
a base member having a longitudinally extending through groove;
pairs of cooperating clamp members located on said base on opposite sides of said through-groove, at least one clamp member of each pair being mounted for movement toward said groove;
first support means associated with said base for supporting a first V-shaped connector member with its bight portion

aligned with said groove and its legs extending toward said base and on opposite sides of said groove;

second support means for supporting a riser member over said groove and in axial alignment therewith, said second support means adapted to hold a cylindrical riser member over and in engagement with the bight portion of a connector member supported on said first support means;



said clamp members including contoured surfaces for supporting a second connector member with its bight portion aligned with said groove and its legs extending away from said base; and,

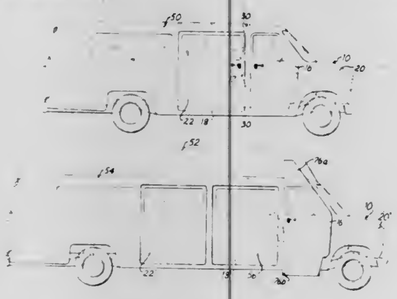
means for actuating said clamp members for positively holding the connector members in position relative to the riser member.

4,231,144

METHOD OF CONVERTING A VAN-TYPE VEHICLE TO A MULTI-PASSENGER COMMERCIAL TRANSPORTATION VEHICLE

George Bernacchia, Jr., Yonkers, N.Y., assignor to National Custom Van Corp., Yonkers, N.Y.

Filed Jan. 31, 1979, Ser. No. 7,940
Int. Cl.[2] B23P *6/00, 17/00, 19/00*
U.S. Cl. 29—401.1 **11 Claims**



1. A method of converting a van-type vehicle to a multi-passenger commercial transportation vehicle, said vehicle having front and rear wheels, a chassis mounted on said wheels carrying a vehicle body and having two or more longitudinally extending support members, said vehicle body having a driver door, and a passenger door adjacent the front seats of said vehicle, and an auxiliary cargo door and cargo door entrance way on one side of said vehicle behind either of said driver or said passenger door, comprising the steps of:

(a) cutting, in a plane substantially transverse of said longitudinal support members, both said chassis and said vehicle body into a forward section and a rear section, said plane lying between the forward and rear wheels of the vehicle;

(b) separating longitudinally said forward and rear sections;

(c) attaching coaxially a chassis extension support member between the forward and rear sections of each said longitudinal support member;

(d) cutting off the roof portion of said vehicle body along the periphery of the upper vehicle body;

(e) attaching an upwardly enlarged roof portion to said vehicle body along said periphery;

(f) attaching fixed side wall members, flush with the side walls of said forward and rear sections, to said cargo door entrance and to said vehicle body on either side thereof and fitted to extend between said forward and rear sections;

(g) removing said passenger's seat and attaching a step well means to said vehicle frame adjacent said passenger door and forming a continuation of the passenger door opening for permitting step up into said vehicle;

(h) forming a roof cutout extending partially upward from said periphery in said roof portion in the area above said step well means as a continuation of the passenger door opening to provide uninhibited passenger boarding and unboarding to and from said vehicle;

(i) providing door extension means on the upper and lower ends of said passenger door for closing said passenger door opening when said door is closed; and

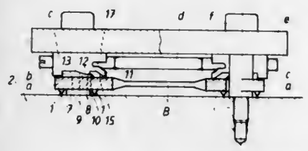
(j) attaching door opening means operable from the driver's seat for opening said passenger door.

4,231,145

METHOD AND APPARATUS FOR ATTACHING TWO OBJECTS

Orvar Dahle; Olov Einarsson; Folke Lindkvist, and Stefan Valdemarsson, all of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Dec. 7, 1978, Ser. No. 967,509
Claims priority, application Sweden, Dec. 13, 1977, 7714103
Int. Cl.[3] B23P *11/00, 19/00;* **B21D** *39/00*
U.S. Cl. 29—432 **7 Claims**



1. Method for attaching a deformation transducer to a measured object without creep, the transducer being arranged in a space between a plate clamped relative to the measured object, the deformation transducer having at least two attachments formed by a number of points or the like at each attachment and with a deformation-sensing element between the said attachments, comprising the steps of:

providing a normal force securing the transducer by a clamping force determined by mutually movable pressure surfaces included in each attachment, the points being pressed into the measured object to a depth determined by the pressure surfaces; and

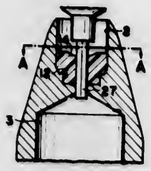
at least partially disengaging the pressure surfaces to reduce the clamping force to such a value that the stresses in the material in the measured object making contact with the surfaces of the points are reduced to such an extent below the yield point that an additional force from the deformation-sensing element perpendicular to the normal force cannot again increase the stress in the material of the measured object at the surfaces of the points to above the yield point.

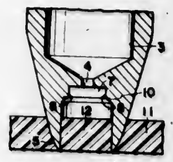
4,231,146

METHOD OF MAKING A TIP FOR A BALL POINT PEN

Elshiro Nakagawa, Ageo; Taketoshi Miyamoto, Tokyo; Naozi Umino, Koshigaya, and Hirosi Oyama, Soka, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 776,372, Mar. 10, 1977, abandoned. This application Feb. 15, 1979, Ser. No. 12,553
Claims priority, application Japan, Mar. 19, 1976, 51-32283; Feb. 17, 1977, 52-16449
Int. Cl.[3] B23P *11/00*
U.S. Cl. 29—432 **11 Claims**





1. In a method of making a tip for a ball point pen including forming a cylindrical metallic tip body having a pointed end, a ball receiving hole having the opening thereof at the pointed end of the tip body and a bore for delivering ink to the ball receiving hole and having the opening thereof at the end of the tip body opposite to the pointed end, inserting a ball supporting seat of a plastic into the bottom of the ball receiving hole, putting a ball on the ball supporting seat in the ball receiving hole, and forming the pointed end of the tip body over the ball for holding the ball in the tip body; the improvement comprising the steps of, after forming the tip body,

forming a recess in the bottom surface of the ball receiving hole, said recess having at least one angular portion,

applying the pointed end of the tip body onto a sheet of a plastic for the ball supporting seat to thereby cut out a portion of the plastic and transfer said portion of the plastic to the opening of the ball receiving hole,

forcing the thus cut out portion of the plastic deep into the bottom of the ball receiving hole and deforming the portion of the plastic to fill all the corners of the bottom of the hole including said recess,

punching both a portion of the ball supporting seat and the bottom of the hole at the same time thereby forming an ink guiding groove between the ball receiving hole and the ink delivering bore through the ball supporting seat, and then putting the ball on the ball supporting seat.

4,231,147

METHODS AND APPARATUS FOR INSTALLING CLUTCHES IN AUTOMATIC TRANSMISSIONS

David Witt, 1731 Marian Dr., Norman, Okla. 73069

Filed Nov. 30, 1978, Ser. No. 964,878
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—433 **5 Claims**

1. A method of installing second and third clutch assemblies in an automatic transmission, said method comprising the steps of:

placing a first cylindrical alignment tool, having a plurality of external splines, within a clutch housing of a first clutch assembly;

placing a plurality of annular clutch plates about said first alignment tool, said plates having radially inner teeth engaging said splines of said first alignment tool;

applying fluid under pressure to a piston of said first clutch assembly to apply an axial compressive force to said plates;

removing said first alignment tool, while said axial compressive force is being applied;

engaging an externally axial splined portion of said second clutch assembly with said plates while said axial compressive force is being applied, said splines of said second clutch assembly engaging said inner teeth of said clutch plates of said first clutch assembly;

placing a second cylindrical alignment tool, having a plurality of external splines, within a plurality of annular clutch plates of said second clutch assembly, said plates having radially inner teeth engaging said splines of said second alignment tool;

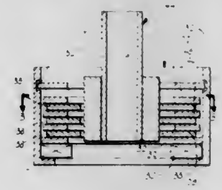
applying fluid under pressure to a piston of said second clutch assembly to apply an axial compressive force to said plates of said second clutch assembly;

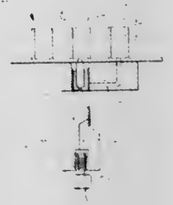
removing said second alignment tool, while said axial compressive force is being applied to said second clutch assembly plates; and

engaging an externally splined portion of said third clutch assembly with said plates of said second clutch assembly, while said axial compressive force is being applied to said second clutch assembly plates, said splines of said third clutch assembly engaging said inner teeth of said clutch plates of said second clutch assembly;

wherein said steps of applying fluid under pressure to pistons of said first and second clutch assemblies comprise the steps of:

inserting a valve, having first and second outlet nozzles,





into a valve body of said transmission, said first and second nozzles communicating with a center support orifice and a direct clutch apply orifice, respectively;

moving said valve to a first position directing fluid under pressure to said first outlet nozzle; and

moving said valve to a second position directing fluid under pressure to said second outlet nozzle.

3. Apparatus for installing a second clutch assembly in an automatic transmission comprising:

a first cylindrical alignment tool, having a plurality of axial splines for engagement with teeth of a stack of clutch plates of a first clutch assembly of said automatic transmission;

a second cylindrical alignment tool, having a plurality of axial splines for engagment with teeth of a stack of clutch plates of said second clutch assembly; and

valve means, variable between a first position for directing fluid under pressure to a piston of said first clutch assembly to apply an axial compressive force to said stack of clutch plates thereof to retain said teeth of said clutch plates of said first clutch assembly in axial alignment when said first alignment tool is removed so that an axially splined cylindrical portion of said second clutch assembly may be inserted in the position previously occupied by

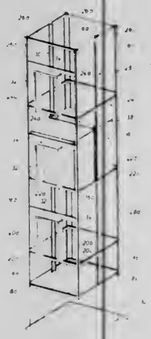
said first alignment tool, and a second position for directing fluid under pressure to a piston of said second clutch assembly to retain teeth of said stack of clutch plates of said second clutch assembly in axial alignment after said second alignment tool is removed so that an axially splined cylindrical body may be inserted in the position previously occupied by said second alignment tool.

4,231,148

ELEVATOR ERECTION METHOD

Allen W. Harding, Seabrook, Tex., assignor to ABC Elevators, Inc., Seabrook, Tex.

Filed Mar. 9, 1978, Ser. No. 884,982
Int. Cl.[3] E04B *1/00*
U.S. Cl. 29—469 **17 Claims**



1. A method of erecting an elevator system for a building comprising the steps of:
fabricating an elongate elevator shaft framework section;
mounting said framework section in an upright position at the site of said building
constructing at least a part of said building around said mounted framework section;
and subsequently securing an upper part of said framework section to said building.

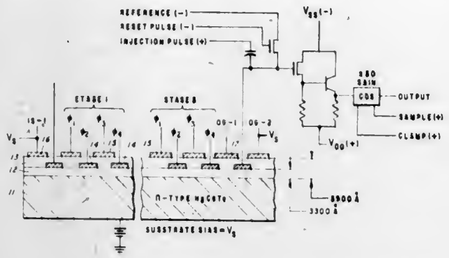
4,231,149

NARROW BAND-GAP SEMICONDUCTOR CCD IMAGING DEVICE AND METHOD OF FABRICATION

Richard A. Chapman, Dallas; Dennis D. Buss, Richardson, and Michael A. Kinch, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 10, 1978, Ser. No. 950,191
Int. Cl.[3] B01J *17/00*
U.S. Cl. 29—578 **6 Claims**

1. A process for fabricating an infrared CCD imager comprising the steps of:
(a) oxidizing the surface of a monocrystalline HgCdTe body to form an oxide layer 500–1000 angstroms thick;
(b) selectively removing predetermined portions of said oxide layer to form apertures therein;
(c) forming suitable doped regions in said apertures to form junction diodes with the HgCdTe surface;
(d) depositing a layer of zinc sulfide to cover the oxide-conductor composite layer;
(e) depositing and patterning a channel-stop conductor on said zinc sulfide to define the CCD channel;
(f) depositing and patterning a second zinc sulfide layer to overlap said channel-stop conductor;
(g) depositing and patterning a first plurality of metal gates on said second zinc sulfide layer;
(h) depositing a third layer of zinc sulfide to cover said gate;
(i) depositing and patterning a second plurality of metal gates on said third zinc sulfide layer;



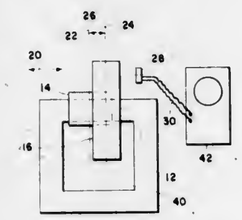
(j) selectively removing portions of each zinc sulfide layer to form contact vias exposing selected gate and substrate locations; and
(k) then forming conductive contacts to said exposed locations.

4,231,150

METHOD OF TUNING A FLYBACK TRANSFORMER FOR MINIMUM RINGING

Forrest E. Brooks, Raleigh, N.C., assignor to Telex Computer Products, Inc., Raleigh, N.C.

Filed Dec. 4, 1978, Ser. No. 966,511
Int. Cl.[3] H01F *41/02*
U.S. Cl. 29—593 **2 Claims**



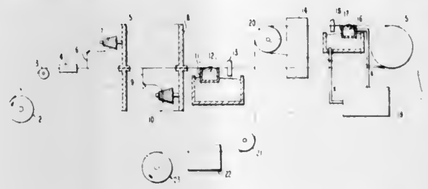
1. The method of optimizing a flyback transformer in a cathode ray tube control system for minimum ringing, comprising the steps of;
(a) placing in said system a standard flyback transformer having a core, a primary or low voltage coil, and a secondary or high voltage coil;
(b) placing a suitable sensor in the vicinity of said high voltage coil to pick up a signal, which is a function of the voltage waveshape in said high voltage coil, and displaying said pickup signal on a cathode ray oscilloscope;
(c) positioning said primary at a selected position, and relatively displacing and adjusting the central plane of said high voltage coil laterally with respect to the central plane of said primary coil, while noting the amplitude of ringing in said pickup signal, until a selected relative position is reached, where said ringing is a minimum; and
(d) locking said high voltage and low voltage coils against relative lateral movement at said selected position with respect to each other and to said core.
whereby said flyback transformer will be tuned for minimum ringing.

4,231,151

METHOD AND APPARATUS FOR MANUFACTURING A FILAMENT SERVED BONDABLE CONDUCTOR

Norman G. Haderer, and J. Harold Troy, both of Bristol, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1978, Ser. No. 948,138
Int. Cl.[3] H01F *41/06*
U.S. Cl. 29—605 **11 Claims**



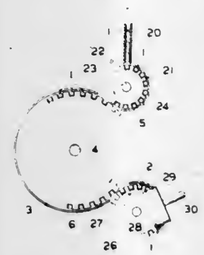
1. A method of making a fused coil comprising:
(1) wrapping a metal wire with an insulating yarn;
(2) suspending said wire between a first support and a second support, there being no support in between said first support and said second support;
(3) immersing said wire in a heat curable varnish after said wire passes over said first support;
(4) wiping excess varnish off said wire;
(5) heating said wire in an oven to cure said varnish before said wire passes over said second support;
(6) suspending said wire between a third support and a fourth support, there being no support in between said third and fourth supports;
(7) immersing said wire in a heat curable enamel after said wire passes over said third support;
(8) wiping excess enamel off said wire;
(9) heating said wire in said oven sufficiently to cure said enamel to a nontacky B-stage before said wire passes over said fourth support;
(10) winding said wire to form said coil; and
(11) heating said coil to cure and fuse said enamel.

4,231,152

METHOD AND APPARATUS FOR PRESS-FITTING CAPS ON ELECTRONIC PARTS AND THE LIKE

Shigeru Kubota, Tokyo; Seiji Kano, Yokohama, and Masahiro Kubo, Machidashi, all of Japan, assignors to Nitto Kogyo K.K., Tokyo, Japan

Filed Jan. 4, 1979, Ser. No. 881
Claims priority, application Japan, Jan. 19, 1978, 53/4456
Int. Cl.[3] H01C *17/28*
U.S. Cl. 29—621 **6 Claims**



1. A method of press-fitting caps on electronic parts and the like, comprising the steps of:
feeding component rods of electronic parts laterally from a supply into transverse notches of a rod guiding wheel, and from the rod guiding wheel into transverse notches of a rod conveying wheel;
rotating a pair of cap conveying wheels in synchronization with the rod conveying wheel and disposing the cap conveying wheel symmetrically and obliquely with respect to the rod conveying wheel on opposite sides thereof and in contacting relationships therewith on the opposite sides of the bottom part of the rod conveying wheel;
feeding caps from a supply into a plurality of transverse notches in the inner peripheral part of each cap conveying wheel;
pressing the caps onto the ends of the rods as the rod and cap conveying wheels are rotated;
feeding the assembled rods and caps one-by-one and sequentially from the notches of the cap conveying wheel into corresponding transverse notches of a take-up wheel rotated in synchronized, opposed relation to the rod conveying wheel; and
pressing the caps firmly onto the rods with a pair of press rollers rotated in pressing contact with the caps at opposite sides of the take-up wheel.

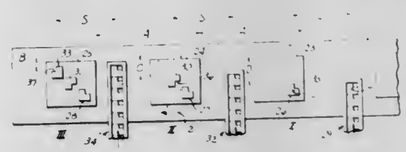
5. An apparatus for press-fitting caps on electronic parts and the like, comprising;
a rod feeding device for feeding component rods of electronic parts;
a rod conveying wheel provided on its circumference with lateral grooves disposed at predetermined intervals and adapted to receive and convey said rods fed from said rod-feeding device;
a device for feeding caps;
a pair of cap conveying wheels each provided on one side of its circumference with lateral grooves disposed at predetermined intervals so as to receive and convey the caps fed from said cap-feeding device;
said cap conveying wheels being arranged symmetrically and obliquely with respect to said rod conveying wheel on opposite sides thereof so that the lower ends thereof come in contact with the lower end of said rod conveying wheel, thereby press-fitting the caps on both ends of the respective rods to form rod and cap assemblies;
a rod and cap assembly take-up wheel positioned adjacent the lower end of the rod conveying wheel and provided on its circumference with lateral grooves disposed at predetermined intervals for receiving the rod and cap assemblies from said rod conveying wheel one-by-one;
press rollers provided at both sides of and in the vicinity of said wheel for completely press-fitting the caps on the rods by externally pressing both ends of the respective rod and cap assemblies while being conveyed by said take-up wheel;
and a drive means for rotating all of said wheel in synchronization with one another and at the same circumferential speed.

4,231,153

ARTICLE PLACEMENT SYSTEM

Lawrence T. Browne, 690 El Rancho Rd., Santa Barbara, Calif. 93108

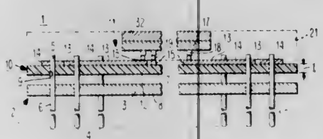
Filed Feb. 22, 1979, Ser. No. 13,818
Int. Cl.[3] B23P *19/00, 21/00*
U.S. Cl. 29—739 **13 Claims**



1. An article placement system for applying a plurality of articles to a substrate, each article being placed at a different location on said substrate, said system comprising:
a base;

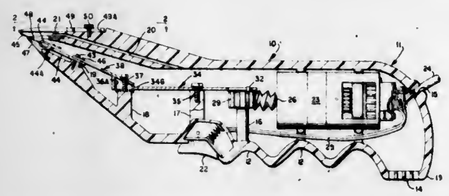
a walking beam mounted to the base, said walking beam having an axis of bi-directional movement, and a dimension of length along said axis;
a plurality of article transfer members mounted to said walking beam at axially spaced-apart locations from one another;
conveyor means extending axially beneath said article transfer members for conveying substrates to positions beneath successive ones of said article transfer means;
a plurality of article supply members, each having a respective delivery point where it provides an article to a respective one of said article transfer members;
drive means axially bi-directionally moving said walking beam, and thereby all of the article transfer members simultaneously by a unit distance, between a respective delivery point and a respective deposit point and reversely;
stepper means intermittently moving said conveyor means by an indexing distance, whereby to move all substrates simultaneously beneath successive deposit points;
supply positioning means mounting each said article supply member to the base whereby its respective delivery point is axially and laterally adjustable;
transfer positioning means mounting each said article transfer member to said walking beam for axial and lateral adjustment to meet the respective delivery point;
whereby said stepper means intermittently operates to cause the conveyor means to move the substrates beneath successive deposit points, and the walking beam oscillates to move the article transfer means from the delivery point of their respective article supply member where they pick up an article, to their respective deposit point where they deposit it.

4,231,154
ELECTRONIC PACKAGE ASSEMBLY METHOD
Charles E. Gazdik, Endicott, and Donald G. McBride, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 10, 1979, Ser. No. 2,473
Int. Cl.³ H05K *3/06, 3/10, 3/34*
U.S. Cl. 29—840 **10 Claims**



1. The method for making at least one electronic package assembly, said assembly having at least an insulator pin carrier member, plural conductive elongated pluggable pins carried by said member, each of said pins being extended through said member to provide first and second extensions past first and second surfaces, respectively, of said member, a thin flexible printed circuit conductive member having a polyimide substrate of a predetermined thickness of substantially 5 microns, a printed circuit pattern of plural conductors supported by said substrate, said first extensions being bonded to predetermined ones of said plural conductors, and at least one electronic circuit chip having input/output terminals bonded to preselected ones of said plural conductors, said method comprising the steps of:
providing temporary planar support means,
forming an integral layer of uncured liquid polyimide on one surface of said support means sufficient to provide said predetermined thickness when said polyimide is subsequently cured,
curing said polyimide layer,
circuitizing the outer surface of said cured polyimide layer with said plural conductors of said predetermined circuit pattern,
providing said insulator pin carrier member and said plural pins carried thereby,
providing said electronic circuit chip,
bonding said terminals of said chip to said preselected ones of said conductors,
selectably removing portions of said temporary support means from said polyimide layer,
forming holes in said polyimide layer to said predetermined ones of said conductors,
inserting said first extensions of said pins through said holes, and
bonding said first extensions of said pins of said pin carrier member to said predetermined ones of said conductors.

4,231,155
ELECTRICALLY POWERED PAINT SCRAPING TOOL
Bruce Johne, 211 Ramsay Alley, Alexandria, Va. 22314
Filed May 10, 1979, Ser. No. 37,664
Int. Cl.³ A47L *11/12*
U.S. Cl. 30—169 **7 Claims**

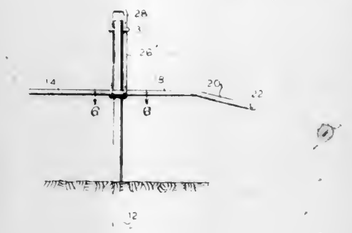


1. An electric paint scraping tool comprising:
(a) a support casement,
(b) an electric motor mounted in said casement having a rotary drive shaft extending therefrom,
(c) a worm gear secured to said drive shaft,
(d) a pair of worm pinions in mesh with said worm gear,
(e) a pair of primary arms pivotally mounted to said casement and connected to be driven by said worm pinions at one side of said pivot and having a slotted end at the other side of said pivot,
(f) a blade holder member,
(g) a pair of L-shaped bell crank secondary arms pivotally mounted to said blade holder member proximate the juncture of the leg and foot of said L-shaped bell crank and connected to reciprocatingly drive said blade holder member,
(h) said secondary bell crank arms being connected to be driven by said primary arms,
(i) a razor blade mounted on the free end of blade holder member,
(j) a blade limiting guard adjustably mounted on said casement and positioned to limit the operating surface of the blade to protect support surfaces of the area to be cleaned by said razor blade,
(k) and trigger switch means carried by said casement and connected in circuit with said electric motor to start and stop said motor.

4,231,156
GUIDE LINE HOLDER
Izates C. Cooper, El Cajon, Calif., assignor to Lawrence F. Myers, El Cajon, Calif.
Filed May 24, 1979, Ser. No. 41,906
Int. Cl.³ G01C *15/00*
U.S. Cl. 33—1 LE **6 Claims**

1. A guide line support tool for lines used to guide paving operations and the like, said line support tool comprising:
(a) a ground stake

(b) a line holder comprising an elongated bar having means for direct attachment of a line thereto;
(c) clamp means for mounting said line holder on said stake so as to be adjustable in three modes, longitudinally of the



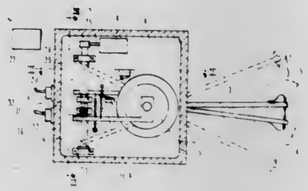
stake, transversely of of the stake by movement of the holder longitudinally of itself, and rotationally of the stake, said clamp means frictionally binding said bar against a side of said stake when adjusted in all said three modes.

4,231,157
DRAPERY CLAMPING DEVICE
Michael E. Tuskos, 5719 W. Highway 22, Crestwood, Ky. 40014
Filed Jul. 5, 1979, Ser. No. 55,030
Int. Cl.³ B43L *13/00*
U.S. Cl. 33—18 R **12 Claims**



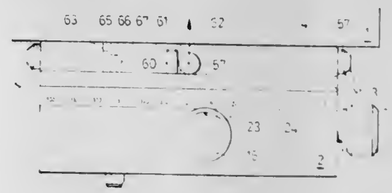
1. A drapery manufacturing device including: an upstanding frame having first and second generally parallel spaced, vertical plane defining guide tracks; horizontally disposed trolly means adapted for vertical movement on said guide means including a transverse member adapted to carry fastener means to secure one end of a length of fabric; drive means to move said trolley means vertically with respect to said frame; reference means defining a horizontal reference plane adjacent the lower end of said frame; carriage means mounted adjacent the lower end of said frame and mounted for horizontal movement in relation to said frame adjacent said reference means; marker means adapted to be carried by said carriage means; an improvement comprising: elongate clamping means located adjacent the lower end of said frame to secure the lower end of said fabric as it is being marked, including clamping base means adjacent the lower end of said frame, horizontally extending elongate clamping bar means located adjacent the lower end of said frame, elongate clamping bracket means pivotably connected to said clamping base means at two pivot points to pivot between a first position adjacent said frame to retain said fabric between said clamping bar means and said elongate clamping bracket means and a second position where said elongate clamping bracket means are disengaged from said clamping bar means to release said fabric; and actuator means to selectively operate said clamping bracket means between said first and second positions.

4,231,158
ELECTRONIC APPARATUS FOR CHECKING THE LINEAR DIMENSIONS OF MECHANICAL WORKPIECES
Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino, Italy
Filed Dec. 1, 1978, Ser. No. 965,528
Claims priority, application Italy, Dec. 7, 1977, 3637 A/77
Int. Cl.³ G01B *5/08, 7/12*
U.S. Cl. 33—149 J **12 Claims**



1. An electronic apparatus for checking the linear dimensions of mechanical workpieces in a wide range of operation including: a frame; two parallel shafts supported by the frame; two arms fixed to the shafts and rotating with them; transducer means to supply a signal responsive to the reciprocal movements of the two arms; a processing, indication and control unit; and control means to command the movements of the two arms comprising two measuring heads adapted to co-operate with the workpiece, arranged at the ends of said arms, said transducer means including a rotary transducer with two elements fixed to said shafts, said processing, indication and control unit being connected to the measuring heads and to the rotary transducer in order to provide signals responsive to the dimensions to be checked and to said control means, in order to activate the same control means.

4,231,159
INDEXING DEVICES
Heinz Ditzel, and Werner Ditzel, both of Hainstrasse 27-29, 6369 Schoneck 1, Fed. Rep. of Germany
Division of Ser. No. 628,649, Nov. 4, 1975, Pat. No. 4,108,024.
This application Mar. 20, 1978, Ser. No. 888,562
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1974, 2452340; May 6, 1975, 2520022
Int. Cl.³ B25H *1/10*
U.S. Cl. 33—174 TD **5 Claims**



1. An indexing device comprising: first, second and third discs substantially co-axial with one another; first and second engagement means of said first and second discs, respectively interengageable to releasably latch said first and second discs in any selected one of a number of relative angular positions thereof; gage means, respective abutment surfaces of the second and third disc, whereby said second and third discs can be angularly positioned relative to each other, said gage means being disposed between said abutment surfaces of said second and third discs, and being adapted to abut both of said abutment surfaces; clamping means including a clamping member movable in an axial direction of the discs to clamp said second

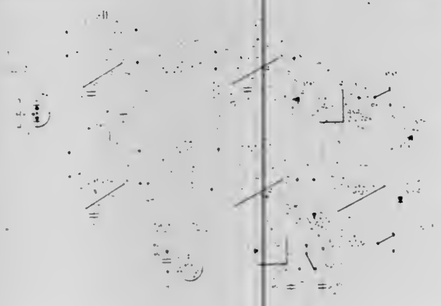
and third discs against turning relative to each other; and a disc means for use with said device disposed above said indexing device, accommodating a tool, said disc means being provided with depending skirt means surrounding said device and a lower plate positioned below said indexing device to permit access to said indexing device.

4,231,160

APPARATUS AND METHOD FOR MEASURING STATIC DEFLECTION OF RUNWAY SURFACE UNDER AIRCRAFT LOADING

Roger F. Johnson, Seattle, and Allen M. Mitzel, Sumner, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 7, 1979, Ser. No. 46,518
Int. Cl.³ G01B *11/30*
U.S. Cl. 33—174 P **4 Claims**



1. In an aircraft runway surface deflection measuring system including a reference potential, a detector circuit and a display device, said detector circuit coupled to said display device, said detector circuit comprising:

photodiode target means responsive to a reference beam of light for providing first and second output currents;

sum and difference amplifier circuits responsive to said first and second output currents for providing sum and difference signals;

analog divider circuit means responsive to said sum and difference signals for providing an output voltage;

circuit means for calibrating said display device;

said circuit means coupled between said analog divider circuit means and said display device; and,

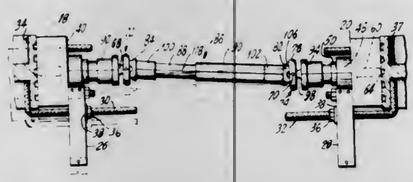
measuring speed control circuit means for providing fast or slow measuring speeds, said measuring speed control circuit means connected between said circuit means and said display device, and said reference potential.

4,231,161

ALIGNMENT TOOL

Flavio Belfiore, 36 Maybury Ct., Staten Island, N.Y. 10306

Filed Apr. 18, 1979, Ser. No. 31,327
Int. Cl.³ G01B *3/30*
U.S. Cl. 33—181 R **5 Claims**



1. An alignment tool for aligning a pair of pulleys comprising:

(a) first and second clamping means attached to the face of the first and second pulleys;

(b) first and second members mounted to said first and second clamping means, said first and second members constructed and arranged to extend normally to the face of said first and second pulleys;

(c) first and second universal joints disposed on the ends of said first and second members;

(d) a link joining said first and second universal joints;

(e) first and second slidable guides disposed on said first and second members, said first and second guides having a face normal to said first and second members;

(f) third and fourth guides slidably disposed on said link, each said member having a face normal to said link and oppositely disposed to said faces of said first and second guides;

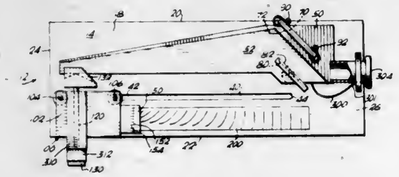
(g) said guides thereby indicating centerline alignment of said first and second pulleys when each said face of said guide is parallel to the other of said faces of said guides.

4,231,162

RANGE FINDER

Peter A. Button, P.O. Box 560578, 13010 SW. 85 Ave. Rd., Miami, Fla. 33156

Filed Feb. 26, 1979, Ser. No. 15,169
Int. Cl.³ G01C *3/00*
U.S. Cl. 33—284 **13 Claims**



1. An apparatus for determining the distance on the earth between (a) a point below an observation point at a known height and (b) the base of an object of a known height, the apparatus comprising;

a base having an A and B mirror pivot hole, said pivot holes being spaced from one another, a first and a second lever arms each having a straight bottom edge,

the first lever arm being pivotally mounted to the base for swinging movement about the A mirror pivot hole, and the second lever arm being pivotally mounted to the base for swinging movement about the B mirror pivot hole,

an A and a B planar mirror each having a reflective surface,

the second lever arm including the B mirror and the first lever arm including the A mirror, the reflective surfaces of each of said mirrors facing one another and being substantially parallel,

an object height adjustment assembly comprising, a carriage,

the base including guide means defining an elongate track being a longitudinal center line and, means connected for movement along the track of the base,

the carriage including a member having a first end perpendicular to the center line of the elongate track, means on the carriage captivating the member for movement perpendicular to the center line of the track, the first end of the member bearing against each of the lever arms for tilting the levers upon movement of the member, and biasing means on the base normally urging the lever arms into engagement with the member,

the member having a second end comprising an operator means for moving the member, and including reference markings,

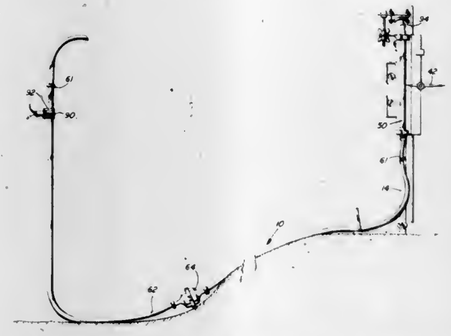
an elongate previously calculated distance scale on the base adjacent the elongate track, and the carriage including reader indicia having a first reference line perpendicular to the elongate track, and the reader indicia further including a cross-referenced line perpendicular to the reference line and intersecting with the reference line.

4,231,163

LEVEL INDICATING AND ELEVATION INDICATING DEVICE

Harry E. Turloff, 3378 Clyde Dr., Port Huron, Mich. 48060

Continuation-in-part of Ser. No. 776,907, Mar. 11, 1977, abandoned. This application Feb. 9, 1979, Ser. No. 10,969
Int. Cl.³ G01C *5/04, 9/22*
U.S. Cl. 33—367 **11 Claims**



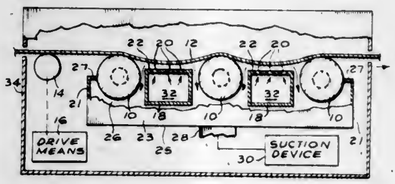
5. An elevation indicating device including elongated liquid conduit means having transparent opposite end portions and including at least a midportion disposed between said opposite end portions which is flexible, one of said end portions having a float loosely received therein for free vertical shifting in response to increases and decreases in the level of liquid in said one end portion, support means for support from a suitable supportive structure, means stationarily supporting said one end portion from said support means, switch means stationarily supported on said one end portion relative to said float, and with which said float is operatively associated for opening and closing said switch means in response to vertical oscillation of said liquid in said one end portion, indicating means including electrical signal generator means supported on the other of said end portions, only, and with which said switch means is electrically connected for sole controlling actuation and deactuation of said signal generator means, through said switch means, responsive to vertical oscillation of said float in said one end portion.

4,231,164

APPARATUS AND METHOD FOR UNIFORMLY HEATING OR COOLING A MOVING WEB

Eugene H. Barbee, East Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,612
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—16 **15 Claims**



1. A method for changing the temperature of a web, the method comprising the steps of:

(a) conveying the web with one side of the web in contact with at least two spaced parallel rollers;

(b) establishing a fluid pressure differential at opposite sides of the web which tends to deflect a web section extending between the rollers in a direction to produce a predetermined angle of contact of the web with the rollers; and

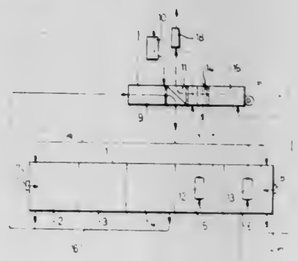
(c) producing a flow of fluid having a temperature different from that of the web in a direction substantially longitudinally of the web along and in engagement with the entire width of the one side of the web section.

4,231,165

PROCESS FOR HEAT-TREATING A FABRIC WEB

Harry Gresens, Benningen, and Manfred Schuierer, Michelstadt, both of Fed. Rep. of Germany, assignors to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,532
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2727971; Mar. 23, 1978, 2812966
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—28 **7 Claims**



1. In a process for heat treating a fabric web to be dried and fixed wherein the web is moved through a treatment unit to pass successively through a drying zone and then through a fixing zone, said web being exposed to a hot gas stream circulated through said unit; the improvement comprising the steps of removing gas from each of said drying and fixing zones in separate respective first and second component waste gas streams, condensing condensible constituents in the first gas stream, burning combustible constituents in the second gas stream,, reheating the first gas stream following the condensing step by transfer of heat from the second gas stream, and discharging the second stream to atmosphere following the reheating of the first gas stream.

4,231,166

AUTOMATIC CONTROL FOR A CLOTHES DRYER

Stephen L. McMillan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 9, 1979, Ser. No. 82,838
Int. Cl.³ F26B *11/04, 21/10, 21/12*
U.S. Cl. 34—48 **5 Claims**

1. An automatic control system for a clothes dryer of the type having a clothes drum, an air flow system for passing drying air through the drum and a heater for heating the air at the inlet side of the drum to enhance the drying effect of the air during the drying cycle, the drying cycle having an initial warm-up period, followed by a period of a relatively constant moisture removal rate followed by a period of a decreasing moisture removal rate, the control system comprising:

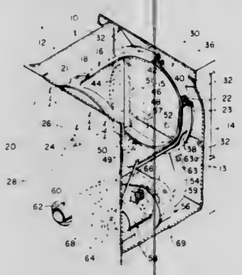
means for sensing the drum inlet air temperature;

means for sensing the drum outlet air temperature;

air flow control means for holding the volumetric flow rate of air through the drum normally at a first predetermined rate for the duration of the drying cycle and being responsive to the inlet air temperature sensing means to increase the volumetric air flow rate through the drum, only dur-

ing the warm-up and constant moisture rate periods, when the inlet air temperature exceeds a predetermined elevated temperature level corresponding to a maximum safe operating condition for fabrics in the drum;

means responsive to the inlet and outlet temperature sensing means and to the air flow control means for controlling the heater to normally supply a predetermined high rate of heat to the dryer air and for reducing the heat rate when



the inlet air temperature reaches said predetermined elevated temperature level, said heat rate reduction adapted during the warm-up and constant moisture removal rate periods to occur only when increased air flow rate exists but fails to hold inlet air temperature below said elevated temperature level;

and means for terminating the dryer operation at the conclusion of the drying cycle.

4,231,167

APPARATUS FOR HEAT TREATMENT OF CONTINUOUS TEXTILE PRODUCTS

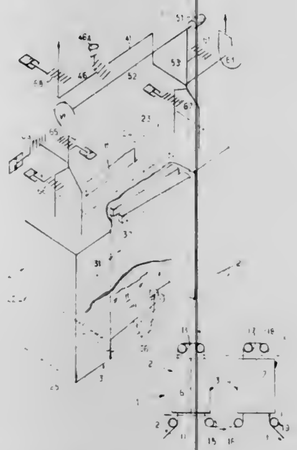
Jean Duris, Habsheim, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse, France

Filed Apr. 6, 1979, Ser. No. 27,887

Claims priority, application France, Apr. 7, 1978, 78 10367

Int. Cl.³ F26B *19/00*

U.S. Cl. 34—66 **6 Claims**



1. Apparatus for heat treatment of continuous textile products, such as yarn, ribbon or strip material, comprising an arrangement of vertical furnaces through which the product successively passes, each furnace having two vertically extending horizontally spaced ducts defining a space therebetween, air blowing nozzles and suction nozzles alternately supported, in pairs, within said space by respective ducts and being connected to said ducts, the upper part of the ducts of a furnace being respectively connected to a blowing fan and to an exhaust fan, the last furnace having means adapted to constitute a height adjustable partition which divides each of the two ducts of this last furnace into an upper part for hot air treatment and a lower part for cold air treatment, said lower part being also equipped with a blowing fan and an exhaust fan, wherein said means is constituted by a series of horizontal first baffles distributed throughout the height of the corresponding duct and selectively operable such that one of said baffles in a closed position forms said movable partition, the other baffles being in an open position.

4,231,168

INSTRUMENT PANEL TEACHING AID

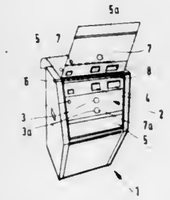
Frank Nippel, Waldbronn, Fed. Rep. of Germany, assignor to Deutsche Nemectron GmbH, Fed. Rep. of Germany

Filed Aug. 28, 1978, Ser. No. 937,096

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 2738694

Int. Cl.³ G09B *19/00*

U.S. Cl. 35—39 **12 Claims**



1. A teaching aid for instructing use or operation of equipment having an instrument panel provided with at least one of operating elements and diagnostic instruments, the teaching aid comprising:

chart means for providing information regarding predetermined instructional levels, said chart means being adapted to be mounted in an overlying relationship on the instrument panel, and

wherein a plurality of such chart means are provided so as to provide a plurality of individual instructional levels as the respective chart means are removed in a predetermined sequence; and

means on said chart means for exposing only the operating elements or diagnostic instruments corresponding to a particular instructional level of said chart means.

4,231,169

INSOLE AND METHOD OF PRODUCING THE SAME

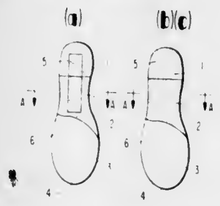
Takashi Toyama, Koganei, and Yasuo Kogo, Shizuoka, both of Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1978, Ser. No. 917,769

Claims priority, application Japan, Jun. 21, 1977, 52-80582[U]; Jan. 7, 1978, 53-655

Int. Cl.² A43B *13/41*

U.S. Cl. 36—43 **21 Claims**



1. An insole having a shank comprising a sheet of a synthetic resin reinforced with fibers wherein said fibers have a specific modulus of elasticity of at least about 6×10^9 mm and a specific strength of at least about 5×10^7 mm and comprise carbon fibers or a combination of carbon fibers with glass fibers or aromatic polyamide fibers, wherein said combination comprises at least 10% by volume of carbon fibers, and wherein the volume ratio of said fibers in said synthetic resin is about 30 to about 85% by volume, said shank being put on the insole.

4,231,170

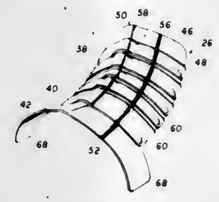
INSTEP PROTECTOR FOR SAFETY SHOES

Frank B. Griswold, R.F.D. 4, Bethlehem, Pa. 18015

Filed Feb. 2, 1979, Ser. No. 8,975

Int. Cl.² A43C *13/14*

U.S. Cl. 36—72 R **10 Claims**



1. In a safety shoe having an instep guard of compound curvature conforming generally to the shape of the human instep and secured to the shoe adjacent at least the lower end of the guard, the guard extending upwardly from the region of the toes of a person wearing the shoe and including a plurality of elongated, generally arch-shaped rigid strips extending transversely of the guard and of the instep of a person wearing the shoe, rivet means articulately interconnecting the plurality of rigid strips in generally side by side relation with their adjacent longitudinal side edges overlapping one another, the improvement comprising, an upwardly extending, generally arcuate arch formed in each said rigid strip and extending transversely thereof, the arcuate arches of adjacent rigid strips overlapping and cooperating to form a continuous upwardly projecting reinforcing ridge throughout substantially the full length of said instep guard.

4,231,171

METHOD AND APPARATUS FOR MINING NODULES FROM BENEATH THE SEA

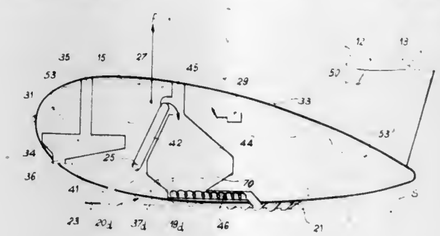
Pierre Balligand, Sceaux; Yves Corfa, Nantes; Pierre Lemercier, Grenoble; Paul Marchal, Gif-sur-Yvette, and Jean Vertut, Issy les Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Jan. 13, 1978, Ser. No. 869,148

Claims priority, application France, Jan. 18, 1977, 77 01288

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—54 **10 Claims**



1. A method of exploitation of a deposit of polymetallic nodules on a sea floor from a platform located at the surface of the sea, said polymetallic nodules comprising metallic material and sterile material, said nodules being adapted to be treated for separating the sterile material from the metallic material, said method including the steps of,

(a) charging with energy a plurality of self-propelled vehicles, said vehicles being provided with means for dredging and stocking said nodules, and loading said vehicles with releasable ballast,

(b) downwardly displacing said vehicles into the sea from the platform under the action of excess ballast,

(c) releasing a portion of said excess ballast at the vehicles' approach to the sea floor to make softer the landing of the vehicle on the sea floor,

(d) propelling said vehicles on the sea floor by self-propelling means carried by the vehicles, the self-propelling means consisting of at least two supporting units of revolutions, each said unit being provided with at least one helical propulsion fin, in order to dredge and stock said nodules, and simultaneously and progressively releasing said ballast so that said released ballast permanently compensates for the added weight of the stocked nodules,

(e) upwardly displacing said vehicles back to the platform by releasing the remaining portion of ballast,

(f) discharging the stocked nodules on said platform.

4,231,172

FLOATING DREDGER AND TREATMENT PLANT

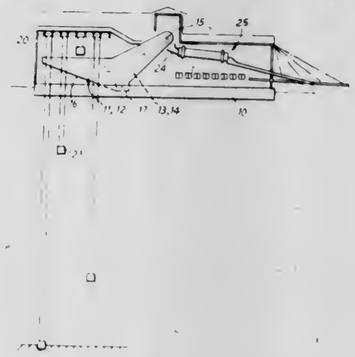
James A. Hewitt, Chislehurst, England, assignor to F. W. Payne & Son (Bickley) Limited, Kent, England

Filed Feb. 26, 1979, Ser. No. 15,136

Claims priority, application United Kingdom, Mar. 7, 1978, 8947/78

Int. Cl.³ E02F *1/00*

U.S. Cl. 37—71 **5 Claims**



1. A dredging and treatment apparatus comprising in combination,

(a) a buoyant elongated body having longitudinal extending sides,

(b) a container mounted on said buoyant body towards one end thereof,

(c) a plurality of rails extending transversely of the longitudinal axis of the body between positions laterally of the longitudinal side of the buoyant body and positions above the container,

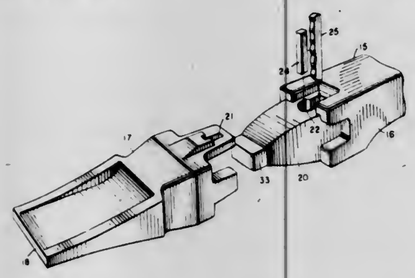
(d) a plurality of grab units capable of moving along said rails between said positions laterally of said longitudinal side, where the grabs of said units can be lowered for charging with material and raised with the charge, and said positions over said container where the grabs can be discharged,

(e) support means on said buoyant body,

(f) an inclined bucket elevator pivoted to said support means at its upper end on an axis about which the buckets pass at the upper end of said elevator, the lower end of said bucket elevator being movable towards and away from the bottom of the container according to the level of the material therein, and

(g) a treatment plant mounted on said buoyant body towards the other end thereof for receiving the material delivered from the upper end of the bucket elevator, and
(h) outlet means from said treatment plant.

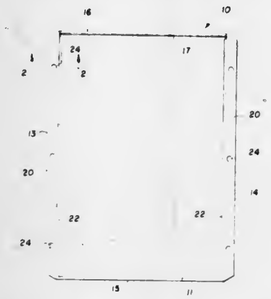
4,231,173
EXCAVATING TOOTH
Kerwin L. Davis, Meridian, Miss., assignor to Esco Corporation, Portland, Oreg.
Continuation-in-part of Ser. No. 769,857, Feb. 18, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,517
Int. Cl.³ E02F 9/28
U.S. Cl. 37—142 R **4 Claims**



1. In an excavating device having a front end loader bucket, a plurality of teeth secured to said bucket and projecting forwardly therefrom, each of said teeth including an adapter fixed to said bucket and equipped with a forwardly projecting nose, a point releasably mounted on said nose, said point including a relatively elongated metal body having a transverse penetrating edge at the forward end and an adapter nose-receiving socket at the rear end, said socket being defined by top, bottom and sidewalls in said body corresponding to confronting walls on said nose with said socket top and bottom walls being forwardly convergent and said socket walls terminating forwardly in a generally box-shaped apex providing generally parallel upper and lower apex surfaces, each upper and lower surface having a length dimension and a transverse dimension with the transverse dimension being parallel to said penetrating edge, said transverse dimension being approximately 2.5 times said length dimension, said upper and lower apex surfaces being vertically spaced apart to provide a transverse dimension to the spaced apart dimension in the ratio of approximately 1.8, each of said socket walls in the point being rearwardly extended to form integral ears, said adapter being equipped with recesses to receive said ears, the ears associated with said top and bottom walls being equipped with aligned openings for the receipt of a lock means, said adapter being equipped with a vertically extending opening aligned with said ear openings, and a lock means removably mounted in the said aligned openings.

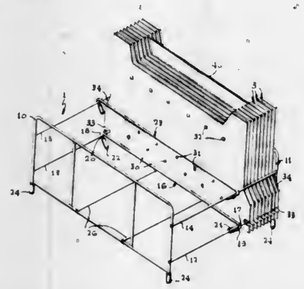
4,231,174
PROTECTIVE HOLDER FOR SHEET MATERIAL
Earl C. Thompson, Drawer A, Hewitt, Tex. 76643
Filed Nov. 21, 1977, Ser. No. 853,230
Int. Cl.³ G09F 3/18
U.S. Cl. 40—10 A **13 Claims**

1. In combination with a support member, a protective holder for sheet material comprising
a flat rectangular envelope having three closed edges and one open edge; at least one wall of said envelope being fabricated from a transparent material;
said envelope having elongated mounting margins at opposite side edges thereof; said mounting margins each having a plurality of longitudinally spaced mounting apertures;
said mounting apertures including two spaced pairs, each pair including apertures adjacent to adjacent corners thereof;
tie means for securing said envelope to said support member, including a plurality of support cords mounted on said member in parallel relation to each other;
said envelope disposed in generally overlying relation to said member, with each aperture pair disposed for coacting relation with a respective cord pair; one cord of each cord



pair passing through one mounting aperture of a respective aperture paid and overlying one face of said envelope, in the same manner; and the other cord of each cord pair passing through the other mounting aperture of a respective aperture paid and overlying the other face of said envelope, in the same manner; said cord pairs and said envelope aperture pairs coacting to enable said envelope to be flip-flopped relative to said support member and to said support cords.

4,231,175
VARIABLE-VISIBILITY FILING SYSTEM
Kenneth W. Baxter, N. Hollywood, Calif., assignor to Baxter Associates, Inc., Burbank, Calif.
Filed May 30, 1978, Ser. No. 910,236
Int. Cl.³ G09F 19/00
U.S. Cl. 40—374 **10 Claims**



1. A variable-visibility information storage and retrieval system for holding and displaying information cards between file segregators, comprising;
a multiplicity of generally planar file segregators having top, bottom and side edges;
enclosure means for supporting and retaining said file segregators in a row, one in front of another, said enclosure means having front and back ends;
engaging means for releasably securing said file segregators to said enclosure means, said engaging means comprising a first pair of parallel rails mounted to the enclosure means longitudinally with respect to the row of segregators, and notches defined in the edges of said segregators releasably and slidingly engaging said rails; and

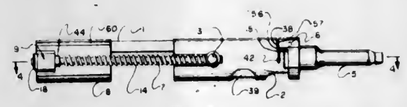
compression means for controllably bending and fanning said file segregators, said compression means comprising separate, spaced lower and upper independently adjustable compressors mounted to said enclosure means and controllably compressing said segregators together against one end of said enclosure means along a first line near said bottom edges and along a second line more distant from said bottom edges, respectively.

4,231,176
VISIBLE INDEXES
Keith Ryan, 121 Parkside Way, Harrow, Middlesex, HA2 6DB, England
Filed Jun. 12, 1978, Ser. No. 914,866
Claims priority, application United Kingdom, Jun. 15, 1977, 25063/77; Nov. 11, 1977, 47141/77; Apr. 12, 1978, 14334/787
Int. Cl.³ G09F 7/22
U.S. Cl. 40—395 **6 Claims**



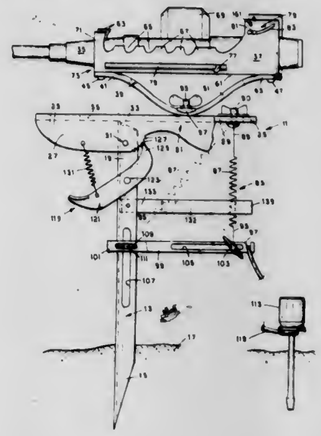
1. A visible index comprising a plurality of carriers each comprising an elongate substantially V-shaped channel portion having an apex, a record retaining flange extending inwardly towards the apex of the channel, and a spacer portion which projects beyond the apex of the channel, each said carrier being dimensioned to internest in the channel portion of an identical carrier, in combination with a plurality of records each having an upper edge portion folded over to provide a hook portion which is hooked on to the retaining flange of a respective carrier, the carriers being arranged one above the other in internested relationship so that the records hooked thereon are arranged in overlapping array and are further inhibited from detachment from a retaining flange by the records being between the inner surface of the channel to which it is attached and the outer surface of the carrier therebeneath.

4,231,177
AUTOMATIC AND SEMIAUTOMATIC SMALL CALIBER CONVERSION SYSTEM
John P. Foote, Marietta, Ga., assignor to U.S. Armament Corporation, Gretna, La.
Division of Ser. No. 627,743, Oct. 31, 1975, Pat. No. 4,098,016. This application Jun. 22, 1978, Ser. No. 917,917
Int. Cl.³ F41C 11/00
U.S. Cl. 42—16 **1 Claim**



1. In an adapter for converting a firearm adapted for automatic feed of ammunition, the firearm having a firearm receiver with a first and second end and a firearm barrel extending from the second end, the adapter having a fixed adapter receiver with a first portion located at the first end of the firearm receiver and a barrel insert at the second end of the firearm receiver, the barrel insert extending into the firearm barrel, the improvement comprising:
connection means for loosely pinning the barrel insert to the adapter receiver for permitting the barrel insert to center in the firearm barrel;
a rail on the adapter receiver having a hole therethrough; the barrel insert having a groove therein sized to receive said rail and having a hole therethrough; and
a pin fitting through said holes with said pin having a tight fit with the barrel insert and a loose fit with said rail.

4,231,178
AUTOMATIC FISH SNATCHER
Donald L. Black, Rte. 29, Trotter Rd., Knoxville, Tenn. 37920
Filed Nov. 29, 1978, Ser. No. 964,629
Int. Cl.³ A01K 91/06
U.S. Cl. 43—16 **3 Claims**



1. A hook setting apparatus which supports a fishing rod connected to a hook through a fishing line and automatically jerks the rod in a direction opposed to the direction a fish tugs on the line such that the hook is set in the fish's mouth, said apparatus comprising:
a first support member having a first end portion and a further end portion,
a second member pivotally mounted on said further end portion of said support member,
rod holder means mounted on said second member and proportioned for receiving and supporting the handle portion of a rod therein,
a tension spring assembly biasing said second member in a predetermined pivotal direction for setting the hook in a fish's mouth, said tension spring assembly includes a tension spring secured at one of its end portions to said second member and secured at its opposite end to said first support member, the position of at least one end of said tension spring being adjustable for varying the biasing force against the second member;
audible alarm means comprising an elongated arm defining a first end portion secured to said first support member said arm extending outwardly in a cantilevered manner from said support member and defining an opposite end portion which frictionally engages the tension spring of said tension spring assembly whereby the rubbing of said spring against said arm generates an audible alarm responsive to the contraction of said spring; and
a trigger assembly which maintains said second member in a predetermined pivotal position by counteracting the forces applied to said second member by said tension spring assembly, said trigger assembly releasing said sec-

ond member responsive to said second member being pivoted by a fish in a direction opposite to the pivotal direction said second member is urged by said tension spring assembly such that said rod holder and rod are pivoted in a direction opposite to the direction said pole is jerked by a fish whereby said hook is set in the fish's mouth.

4,231,179

COMBINATION TAIL-WIGGLING ARTIFICIAL BAIT AND STABILIZER PLUG

Gene G. Hillesland, 275 NE. 9th St., Homestead, Fla. 33030

Continuation-in-part of Ser. No. 899,715, Apr. 24, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 63,995

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.06 **5 Claims**



1. A fishing lure comprising a hook having a shank, an artificial tail-wiggling worm formed of soft, pliable plastic having a bulbous head threaded onto the shank of said hook and a flat, thin crescent-shaped tail sized to extend behind the hook, and a stabilizer plug providing non-spinning and non-surface-skimming capability to the lure, said plug having a tubular wall and a large axial bore extending therethrough between opposite leading and trailing ends, the leading end of the tubular wall being inclined rearwardly from an apex, means connecting said apex to a fishing line, said fish hook shank being connected to the trailing end of said tubular wall at a point on a straight line of attachment extending along said tubular wall parallel to the longitudinal axis of said bore and passing through said apex, said hook and tail being orientated to extend in co-planar relation with the diametric plane of said straight line of attachment of said plug, the hook curving away from the plug and the tail being co-planar with the hook, said plug being self-orientating below the surface of the water with the straight line of attachment located on the underside of the plug and disposing said planes vertically when the lure is pulled through the water enabling the crescent shape of said tail to straighten causing undulation and lateral swinging of the tail as fish attracting motion.

4,231,180

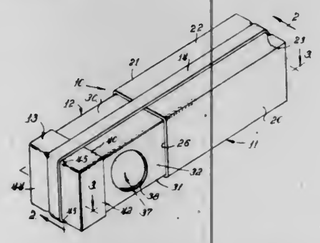
DISPOSABLE ANIMAL TRAP

W. Wayne Bare, R.R. #2-Beal Rd., Princeville, Ill. 61559, assignor to W. Wayne Bare, Wyoming, Ill.

Filed Oct. 25, 1978, Ser. No. 954,431

Int. Cl.³ A01M *23/02*

U.S. Cl. 43—61 **5 Claims**



1. A trap for the live entrapment of small animals, such as mice, comprising: a pair of co-axially interfitting hollow members, namely, a hollow plunger member and a hollow housing member; said plunger member being walled on all sides to provide an internal entrapment chamber substantially enclosed except for an animal entrance opening through one side thereof; said housing member being enclosed on all sides except for one open end through which said plunger member is removably received; said members having mating cross-sectional configurations whereby said plunger member fits closely within the interior of said housing member for co-axial sliding movement therealong and whereby said animal entrance is closed by an opposing wall of said housing member as said plunger member moves into said housing member; thrust imposing means engaging the exterior of said two members and operable to move said plunger member rapidly into said housing member, one-piece trigger means comprising an elongated member mounted to extend between the closed end of said housing member and the interior of said entrapment chamber; and detent means cooperating with said trigger means and plunger member to releasably hold the latter in position for thrust imposed movement into said housing member when released from said detent means, said plunger member when in said position having said animal entrance opening therein accessibly located outwardly of said housing member.

4,231,181

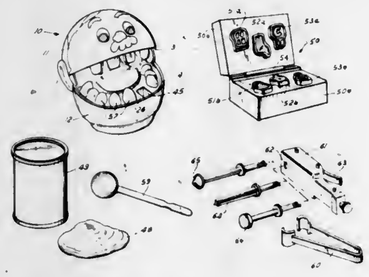
DENTAL TOY

Norman Fabricant, 94-19 64th Rd., Rego Park, N.Y. 11374

Filed Mar. 5, 1979, Ser. No. 17,306

Int. Cl.³ A63H *13/00*

U.S. Cl. 46—116 **12 Claims**



1. A dental toy comprising:

(a) at least one simulated jaw,

(b) a series of tooth-retaining means carried by said jaw,

(c) means for making soft and moldable simulated teeth cooperable with said tooth-retaining means, and

(d) at least one simulated dental tool for operating on a simulated tooth to alter the contour of the tooth while it is retained by said retaining means,

whereby the toy can be used to simulate drilling, filling, and other dental work performed by a dentist on real teeth.

4,231,182

TOY VEHICLE HAVING REVERSING MECHANISM

Toshiaki Kurita, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 21, 1978, Ser. No. 972,018

Claims priority, application Japan, Jun. 13, 1978, 53-71636

Int. Cl.³ A63H *17/40*

U.S. Cl. 46—212 **14 Claims**

1. A toy vehicle which comprises:

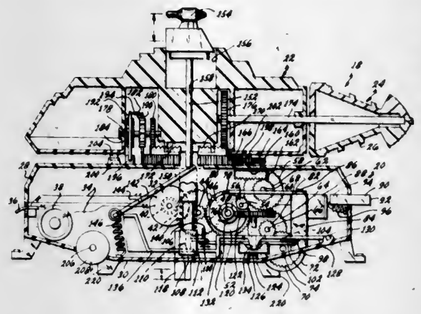
a vehicle body;

movable support means movably supporting said vehicle body on a support surface;

locomotion means including portions having relative movement with respect to each other for moving said vehicle along said support surface;

direction changing means operatively connected to said locomotion means for changing the direction of movement along said support surface by reversing the direction of said relative movement of at least a portion of said locomotion means;

said direction changing means including a switch means for controlling the direction of said movement, said switch means having at least two positions, a first of said positions corresponding to the movement of said vehicle in one direction and a second of said positions corresponding to movement of the vehicle in another direction, said switch means moving between said positions in response to stimulation of said switch means by a stimulus external to said vehicle body;



exposure means for exposing said switch means alternately between an exposed position, wherein said switch means can be acted upon by said stimulus external to said vehicle body changing the direction of movement of said vehicle body in response to movement of said switch means between said first of said positions corresponding to the movement of the vehicle in one direction and said second of said positions corresponding to movement of the vehicle in another direction, and a protected position wherein said switch means cannot be acted on by said stimulus to change the direction of movement of said vehicle.

4,231,183

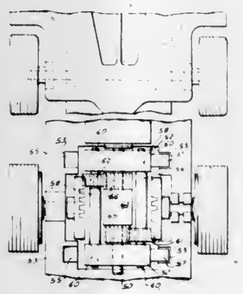
DIFFERENTIAL GEAR DRIVE

Robert G. Lahr, Reseda, Calif., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Jun. 22, 1979, Ser. No. 51,260

Int. Cl.³ A63H *17/36, 18/12*; A63F *9/14*

U.S. Cl. 46—262 **13 Claims**



5. In a toy vehicle including a frame, a body mounted on said frame, a plurality of ground engaging wheels mounted in said frame and including a pair of drive wheels; means for mounting said drive wheels in said frame for rotation in laterally spaced vertical planes; a reversible electric motor mounted in said frame having an output shaft and drive transmission means mounted in said frame for drivingly connecting said motor output shaft to the respective drive wheels, wherein the improvement comprises said transmission means including a transmission frame movably mounted in the vehicle frame for movement between first and second positions in response to the direction of rotation of the output shaft, a pair of idler gears mounted on the transmission frame for rotation therewith and positioned to selectively drivingly engage said drive wheels in said first and second positions of said transmission frame; and a pair of gear elements rotatably mounted in said transmission frame in respective driving engagement with said idler gears and drivingly engaged with said output shaft; said gear elements having different numbers of gear teeth whereby during operation of said motor both of said drive wheels are driven but one drive wheel will be driven at a great rotary speed than the other depending upon the direction of rotation of said output shaft.

4,231,184

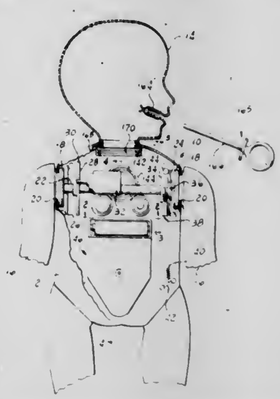
REMOTE-CONTROL DOLL ASSEMBLY

Charles J. Corris, Irmo; Charles M. Hollingsworth, West Columbia; Witold W. Kosicki, and Robert T. Potter, both of Columbia, all of S.C., assignors to Horsman Dolls Inc., Columbia, S.C.

Filed Jul. 7, 1977, Ser. No. 813,499

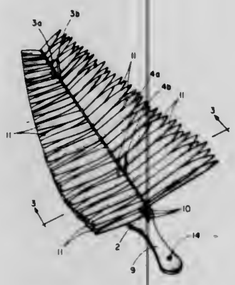
Int. Cl.³ A63H *11/00*

U.S. Cl. 46—265 **2 Claims**



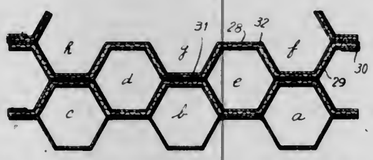
1. A remote-control-doll assembly including in combination a doll having arms and means for rotatably receiving said arms, a toy separate from said doll, selectively operable means on said toy for radiating a control signal, and means on said doll responsive to said control signal for actuating said doll to simulate a human action, said actuating means comprising a motor having a shaft, means for coupling said motor shaft to said arms, means responsive to said control signal for energizing said motor, an additional shaft coupled to at least one of said arms, a wheel carried by said additional shaft having a grooved rim, a fixed limit stop disposed so as to abut said wheel at the limits of a predetermined arc to limit the angular movement of said arms, and a spring having one end secured to said wheel, said spring wrapping around said rim as said additional shaft is rotated to exert a torque on said shaft.

4,231,185
FOLIAGE GUIDE
Jerry Adams, 2003 Waterloo Rd. A-12, Cedar Fall, Iowa 50613
Filed Sep. 25, 1978, Ser. No. 945,204
Int. Cl.³ A01G *3/08, 5/00*
U.S. Cl. 47—1 R **3 Claims**



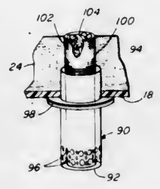
1. A foliage guide for holding one or more pieces of central stem supported foliage, such as palm leaves or ferns for floral trimming, comprising elongated support means, a first guide having a set of closely spaced elongated rodlike posts fixed to the support means, and a second guide having a set of closely spaced elongated rodlike posts fixed to the support means with both guides being symmetrically disposed along a longitudinal centerline of the support means with the posts of each guide set being fixed closely adjacent the centerline and being substantially removed from the elongated edges of the support means and so spaced to confine substantially all central stems from lateral movement and with both guides being substantially separated from one another to receive and closely guide between the two sets of posts one or more of the stems carrying foliage, with substantial portions of the foliage projecting beyond the support means so that it may be cut away from the support means, and a handle fixed to the support and extending beyond the portion of the support carrying the two sets of guide posts.

4,231,186
GROUP OF POTS FOR NURSING AND REPLANTING PLANTS
Mauno Ruuska, Säkylä, Finland, assignor to Lannen Tehtaat Oy, Iso Vimma, Finland
Continuation of Ser. No. 804,568, Jun. 8, 1977, abandoned. This application Apr. 16, 1979, Ser. No. 30,007
Claims priority, application Finland, Jun. 9, 1976, 761655
Int. Cl.³ A01G *23/02*
U.S. Cl. 47—74 **8 Claims**



1. A group of adjoining enclosures for nursing and replanting plants comprising a plurality of parallel rows of enclosures, each of said enclosures formed by the union of two wall layers of non-woven fabric consisting essentially of a highly porous network of artificial fiber, and separated in the region between adjoining enclosures in one row by said wall layers superimposed and permanently bound to each other, one of said wall layers of one parallel row separated from an adjacent wall layer of an adjacent parallel row by an intermediate layer of decomposable material laminated to the outer layers of non-woven fabric to form a laminated wall construction, said outer fabric layers of the laminated wall construction being decomposable upon exposure to soil and water during the nursing stage of said plants at a slower rate than said intermediate layer, and wherein the ends of the outer layers at one end of each laminated wall construction are permanently fastened to each other, and wherein the fastening points of the laminated wall constructions at the ends of two adjoining wall constructions are always placed at opposite sides of the group of enclosures so that a single chain of enclosures is formed after said intermediate layer has decomposed.

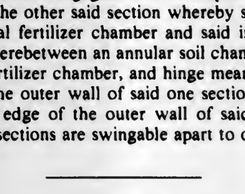
4,231,187
AGRICULTURAL DEVICE HAVING AIR-WATER-SOIL STRATA
George Greenbaum, 790 Boylston St., Boston, Mass. 01299
Filed Nov. 17, 1978, Ser. No. 961,669
Int. Cl.³ A01G *27/00*
U.S. Cl. 47—80 **4 Claims**



1. An agricultural device which comprises
(a) a reservoir having a base and sides adapted to receive a strata of water;
(b) a soil bed having a fluid permeable floor and walls defining a stratum of soil and defining between the soil stratum and the water stratum an air stratum, each distinct from the other;
(c) a sheath-like cylindrical column, the lower end thereof being fluid permeable and received in the base of the reservoir, the column including a flange secured thereto and supportingly engaging the floor, the column extending through the floor and into the soil bed, the column including an open upper end lying in a plane substantially parallel to the floor
a removable porous walled cartridge member received in the column in non-sealing engagement therewith, the cartridge member comprising hydrophilic material and extending from the bottom of the column to beyond the upper end of the column whereby water is transferred through the cartridge member at a rate and amount dependent upon the material in the cartridge member into the soil bed.

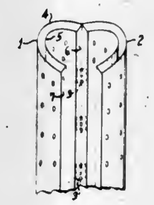
4,231,188
METHOD AND SYSTEM FOR PROPAGATING OF PLANTS
John J. McGuire, 37 Earles Court Rd., Narragansett, R.I. 02882, and Edward J. Auger, 1301 Bald Hill Rd., Warwick, R.I. 02886
Filed Dec. 26, 1978, Ser. No. 972,812
Int. Cl.³ A01G *27/00*
U.S. Cl. 47—80 **10 Claims**

1. A plant growing system which comprises:
a. a layer of inert water-transmitting particles,
b. said layer of particles being supported on a water-impermeable support,
c. a sheet of opaque, water-impermeable plastic positioned to cover the top surface of said layer of particles,
d. means for delivering water into said layer of particles, and
e. at least one container housing a plant having at least one hollow prong extending from the bottom of said container, said prong having a length to permit extension into



said layer of particles without contacting the water-impermeable support.

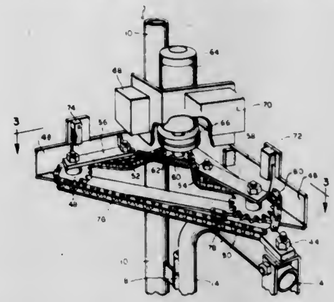
4,231,189
PLANT GROWING ASSEMBLY
Mordecai Hochberg, Old Kfar-Aharon near Ness-Ziona, Israel
Filed Oct. 2, 1978, Ser. No. 947,514
Claims priority, application Israel, Oct. 27, 1977, AD.50469; Nov. 28, 1977, AD.50469
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—83 **2 Claims**



1. A plant growing assembly comprising two upright sections, each section comprising a generally semi-cylindrical perforate outer wall and a generally semi-cylindrical perforate inner wall spaced therefrom, each said wall having opposite, side edges, means joining each side edge of said inner wall to a corresponding said side edge of said outer wall, said sections being arranged in juxtaposed parallel positions with said side edges of one section engaged with corresponding respective side edges of the other said section whereby said inner walls define a central fertilizer chamber and said inner and outer walls define therebetween an annular soil chamber outwardly around said fertilizer chamber, and hinge means connecting a side edge of the outer wall of said one section to the corresponding side edge of the outer wall of said other section whereby said sections are swingable apart to open said fertilizer chamber.

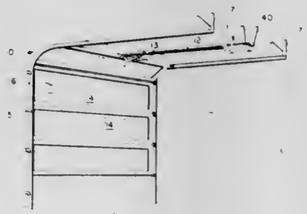
4,231,190
REMOTELY CONTROLLED GATE OPENER
James Tieben, Dodge City, Kans., assignor to My-D-Han-D Manufacturing Co., Dodge City, Kans.
Filed Oct. 4, 1978, Ser. No. 948,388
Int. Cl.² E05F *15/20*
U.S. Cl. 49—25 **14 Claims**

1. A remotely controlled gate opener for use with a gate pivotably mounted to a gate support structure, said gate opener comprising:
a frame mounted adjacent the gate support structure;
a motor mounted on the frame;
a drive member rotatably driven by the motor;
a positioning member mounted on the frame;
a closed loop drive linkage mounted around the drive member and the positioning member, said drive linkage drivingly engaged with the drive member such that the motor operates to propel the drive linkage;
means for maintaining the drive linkage in tension;
means for attaching the drive linkage to the gate at a point spaced from the pivot axis of the gate such that the gate causes the attaching means to move along a curved line as



the gate pivots, thereby causing the contour of the drive linkage to change as the gate pivots; and
remotely controlled switching means for selectively activating the motor to open and close the gate.

4,231,191
AUTOMATIC DOOR OPENER SYSTEM
John W. Ellmore, West Chester, Pa., assignor to Challenger. Inc., Greenbrook, N.J.
Filed Jun. 12, 1978, Ser. No. 914,420
Int. Cl.³ E05F *15/10*
U.S. Cl. 49—28 **12 Claims**



1. A door opener system, which includes,
a pair of guide rails disposed in parallel relationship with each other,
adjustable bracket means movable along the guide rails for mounting said guide rails to a structure,
a compact unit having a motor with a driving gear extending therefrom,
means for removably connecting the compact unit to the guide rails so that the driving gear meshes with the driven gear,
a chain driven means unit cooperatively associated with the driven gear and operative in response to the operation of said driven gear,
trolley means connected to the chain driven means for quick release from the chain driven means and manually operable in case of a power failure,
a draw bar unit interconnecting the chain driven means unit to a door to be opened and closed, and
electromechanical means connected to the system frame and cooperatively associated with the chain driven means unit for controlling the operation of the motor for starting and stopping the chain driven means unit, said electromechanical means including a pair of switches, each switch having a contact actuator therefor; a cam actuator operative in alternate first and second positions and having respective first and second actuator contacting surfaces, each actuator contacting surface movable into engagement

with one-half of the surface area of its respective switch contact actuator; and, a load responsive lever operative in alternate first and second positions, and having first and second actuator contacting surfaces, each of the aforesaid actuator contacting surfaces movable into engagement with the other half of the surface area of its respective switch contact actuator.

4,231,192

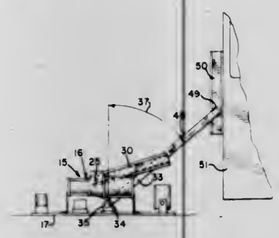
LINEAR OUTPUT FORCE DOOR OPERATOR

Kristupas Daugiras, Wilmette, and Samir M. Elguindy, Roselle, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 794,842, May 9, 1977, Pat. No. 4,134,231. This application Jan. 12, 1979, Ser. No. 2,887

Int. Cl.³ E05F *11/12*

U.S. Cl. 49—363 **21 Claims**



1. In a door operator for driving a door between open and closed positions which operator includes a series wound electric motor driving an output shaft and a linkage arrangement interconnecting the output shaft and the door, the linkage arrangement including a drive arm rotatable with said output shaft, a multiplying lever pivotally mounted at one end, means slidably connecting said door to said multiplying lever and means slidably connecting said drive arm to said multiplying lever, the improvement being in the electric motor having an open circuit saturation curve where at about 50 percent of maximum rated voltage the field current will be about 40 percent of maximum rated and which includes an armature with ten windings of 24-gauge wire and a field of 40 to 80 windings of 26-gauge wire, whereby a substantially constant force is applied to the door by the operator between the open and closed positions.

4,231,193

VERTICAL BELT SANDING APPARATUS

John R. Siegel, 4444 Burnley Dr., Bloomfield Township, Oakland County, Mich. 48013

Filed Dec. 22, 1978, Ser. No. 972,476

Int. Cl.³ B24B *21/00*

U.S. Cl. 51—141 **8 Claims**



1. A vertical belt sanding apparatus comprising:
a plurality of roller means for supporting a sanding belt;
each said roller means being provided with antifriction bearing means at each end thereof;
a first said roller means being supported by a first frame member;
a second said roller means being supported by a second frame member;
means for connecting said first and second frame members for automatically compensating for differences in length across the width of said sanding belt; and
vacuum means for firmly holding a moving sanding belt against a platen attached to said first frame member.

4,231,194

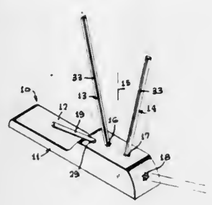
BLADE SHARPENER

Louis S. Glesser, P.O. Box. 800, Golden, Colo. 80401

Filed Jan. 2, 1979, Ser. No. 62

Int. Cl.³ B24B *3/54*

U.S. Cl. 51—211 R **6 Claims**



1. A blade sharpener comprising the combination of:
a base;
a pair of relatively wide and flat but elongated sharpening elements mounted in said base to extend upwardly from said base in acute angular relationship to said base;
said wide and flat sharpening elements lying in substantially the same plane, and the acute angle between each rod and said base being the same as that of the other one of said elements and said base;
each of said elements leaning in an opposite direction from said base, wherein said elements are mounted in said base in spaced diverging relation to each other and wherein upper portions of said elements terminated in spaced apart relationship;
each of said sharpening elements includes at least two broad, flat surfaces extending along opposite sides thereof;
said element includes a grooved slot of V-shaped cross section provided in a selected one of said broad, flat surfaces mid-way between the opposite sides of said selected element;
each of said elements includes a triangular cross section and said base includes a pair of openings diverging outwardly with respect to each other for insertably receiving each of said elements respectively; and wherein;
each of said openings is configured to correspond to said triangular cross of each of said elements, and
each of said openings is configured to present a six-sided star so that each of said elements may assume a position of opposing flat surfaces or opposing corner edges.

4,231,195

POLYCRYSTALLINE DIAMOND BODY AND PROCESS

Robert C. DeVries, Burnt Hills; Minyoung Lee, Schenectady; Lawrence E. Szala, Scotia, and Roy E. Tuft, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

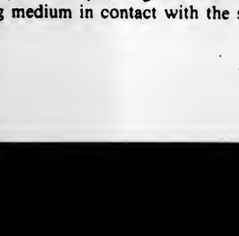
Filed May 24, 1979, Ser. No. 42,237

The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.

Int. Cl.³ B24D *3/02*

U.S. Cl. 51—307 **10 Claims**

1. A process for preparing a polycrystalline diamond body which consists essentially of confining within a reaction chamber a charge composed of solid eutectiferous silicon-rich alloy, or solid components for providing eutectiferous silicon-rich alloy, and a mass of diamond crystals in contact with said mass of solid eutectiferous silicon-rich alloy, or with at least one of said components for providing eutectiferous silicon-rich alloy, and hexagonal boron nitride in contact or in association with said alloy or with at least one of its components, said eutectiferous silicon-rich alloy consists essentially of silicon and a metal which forms a silicide with said silicon and which is selected from the group consisting of cobalt, chromium, iron, hafnium, manganese, molybdenum, niobium, nickel, palladium, platinum, rhenium, rhodium, ruthenium, tantalum, thorium, titanium, uranium, vanadium, tungsten, yttrium, zirconium and alloys thereof, said hexagonal boron nitride being present in an amount of at least about 5% by weight of the mass of diamonds, applying a pressure of at least about 25 kilobars to said confined charge compressing the mass of diamond crystals to a density higher than 90% by volume of the resulting compressed means of diamond crystals, maintaining said applied pressure, heating the pressure-maintained charge to an infiltration temperature sufficient to melt said alloy and at which no significant graphitization of the diamond occurs whereby said alloy is infiltrated through the interstices between said compressed means of diamond crystals, said alloy being used in an amount sufficient to fill the interstices of said compressed mass of diamond crystals, said infiltrating silicon-rich alloy encapsulating the surfaces of the compressed diamond crystals reacting with diamond surfaces or any non-diamond elemental carbon producing a carbide which at least in major amount is silicon carbide, ceasing the input of heat into the resulting infiltrated diamond mass, removing said pressure and recovering the resulting polycrystalline diamond body comprised of diamond crystals bonded together by a silicon atom-rich bonding medium wherein the diamond crystals are present in an amount ranging from at least 90% by volume up to about 95% by volume of the total volume of said body.



5. A polycrystalline diamond body consisting essentially of a mass of diamond crystals adherently bonded together by a bonding medium consisting essentially of silicon carbide and a carbide and/or silicide of a metal component which forms a silicide with silicon, said metal component of said metal silicide being selected from the group consisting of cobalt, chromium, iron, hafnium, manganese, molybdenum, niobium, nickel, palladium, platinum, rhenium, rhodium, ruthenium, tantalum, thorium, titanium, uranium, vanadium, tungsten, yttrium, zirconium and alloys thereof, said metal component of said metal carbide being selected from the group consisting of chromium, hafnium, titanium, zirconium, tantalum, vanadium, tungsten, molybdenum and alloys thereof, said diamond crystals ranging in size from about 1 micron to about 1000 microns, the volume of said diamond crystals ranging from at least 90% by volume up to about 95% by volume of said body, said bonding medium being present in an amount ranging up to about 10% by volume of said body, said bonding medium being distributed at least substantially uniformly throughout said body, the portion of said bonding medium in contact with the surfaces of said diamond crystals being at least in a major amount silicon carbide, said diamond body being at least substantially pore-free.

4,231,196

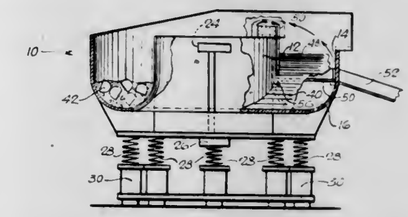
METHOD OF TREATING PARTS BY VIBRATORY ACTION

George F. Jones, Mishawaka, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Division of Ser. No. 887,758, Mar. 17, 1978, Pat. No. 4,161,848, which is a continuation of Ser. No. 748,953, Dec. 9, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,119

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—313 **1 Claim**



1. A method of treating the surface of parts comprising introducing said parts and a finishing media into a first zone at normal level, subjecting said mixture of parts and media to vibratory action whereby said parts and media travel in one direction in an orbital path, introducing a barrier across the path of travel of the parts and media whereby the parts and media pile up in advance of the barrier to an upper level above the normal level to clear the barrier, allowing the parts and media to fall sharply from the upper level to a lower level below normal level upon clearance of the barrier, screening the parts and media immediately beyond the barrier at a level below normal level but above the lower level to separate the parts on the surface of the screen while enabling the media to pass therethrough for return to normal level.

4,231,197

BUILDING SYSTEM EMPLOYING PREFABRICATED WALL PANELS

Sidney W. Caplan, Mayfield, and William N. Molson, Cleveland, both of Ohio, assignors to Component Systems, Inc., Cleveland, Ohio

Filed Feb. 21, 1978, Ser. No. 879,194

Int. Cl.² E04H *1/00*; E04B *2/72*

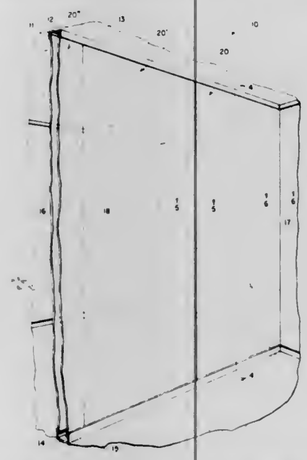
U.S. Cl. 52—36 **37 Claims**

22. A system for forming a wall of a building which has preexisting floor and ceiling structures, the system comprising:
(a) a plurality of substantially dimensionally identical, substantially rectangular, wall panels each including a pair of facing sheets secured to and held in spaced relationship by spacer means, the facing sheets each having front and back surfaces interconnected by top and bottom end surfaces and by first and second opposed side surfaces, the facing sheets of each panel extending in overlying relationship with their associated side and end surfaces being aligned and cooperating to define top and bottom ends and first and second sides of their wall panel, the spacer means of each wall panel extending between the back surfaces of the associated facing sheets at positions spaced inwardly from the aligned side surfaces of the facing sheets whereby first and second sidewardly facing channels are provided along the first and second sides of each wall panel, such wall panels being installable side-by-side to form a substantially continuous wall;
(b) preformed ceiling and floor runner structures, wherein:
(i) the ceiling runner structure being configured to be secured to the ceiling structure, being configured to

receive the top end region of at least one of the wall panels, and having a pair of depending portions configured to extend from the ceiling structure to positions overlying top portions of the front surfaces of both facing sheets on such wall panel;

(ii) the floor runner structure being configured to be secured to the floor structure, being configured to receive the bottom end of at least one of the wall panels, having supporting formations adapted to support the bottom end of such wall panel at a position above the floor structure, and having a pair of upwardly extending portions adapted to extend from the floor to positions overlying bottom portions of the front surfaces of both facing sheets on such wall panel;

(c) a plurality of juncture members, each being configured to extend between the installed ceiling and floor runner structures and each being configured to be received in one of the side channels of one of the wall panels, with opposed surfaces of the juncture member frictionally engaging the back surfaces of the facing sheets of such wall panel, each further being configured to be positioned within communicating side channels of two abutting wall panels bridging the plane of juncture between the abutting wall panels and with opposed surfaces of the juncture



member frictionally engaging the back surfaces of the facing sheets of both abutting wall panels.

(d) the spacer means comprising a plurality of elongate spacer members extending between the facing sheets of their associated panel and cooperating to support such facing sheets in spaced, rigidly interconnected, overlying relationship, the spacer members extending parallel to the sides of the panels;

(e) the spacer members within each panel including a pair of outer spacers which are inset from the two sides of the panel and which cooperate with back surfaces of the facing sheets to define first and second side channels between the facing sheets, and at least one inner spacer located between the outer spacers;

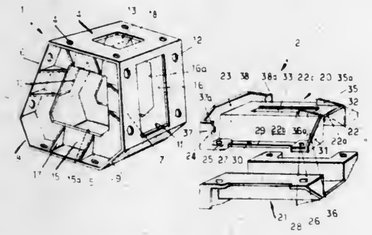
(f) the at least one inner spacer being located at different distances from the two sides of its panel such that, if less than a full panel width is needed to complete a wall being built, and if the required panel width as measured from one of the panel's sides causes a proposed line-of-cut to intersect such at least one inner spacer, then such line-of-cut can be repositioned by measuring the required panel width from the opposite panel side, and such repositioned line-of-cut will no longer intersect such at least one inner spacer.

4,231,198

JOINTING DEVICE FOR LONG-LIMBED FRAMEWORK ELEMENTS IN REINFORCED CONCRETE AND FRAMEWORK COMPRISING FRAMEWORK ELEMENTS JOINTED BY SUCH DEVICES

Robert Augier; Jean P. Carbonari, both of Sorgues, and Jean Eliche, Les Angles, all of France, assignors to Societe Anonyme de Recherche et d'Etudes Techniques, Le Pontet, France

Filed Dec. 21, 1978, Ser. No. 971,842
Claims priority, application France, Dec. 29, 1977, 77 39653
Int. Cl.³ E04B *7/02, 7/12*
U.S. Cl. 52—91 **37 Claims**



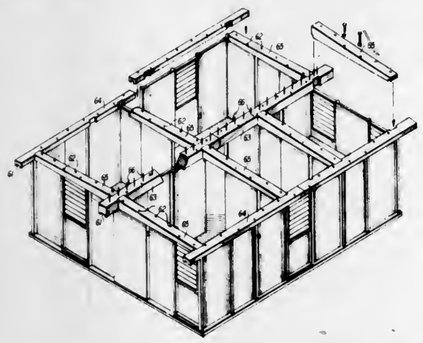
1. A device for jointing together at least two reinforced concrete long-limbed construction elements or sections, comprising a body, at least two sleeves connected to said body, and means for tightening said sleeves so as to respectively clamp construction elements or sections therebetween.

4,231,199

METHOD AND COMPONENTS FOR CONSTRUCTION OF BUILDING FROM CONCRETE SLABS

Nicolas Q. Gomez, and Raul Martin, both of P.O. Box 8157, Santurce, P.R. 00910

Continuation of Ser. No. 717,684, Aug. 25, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,177
Claims priority, application Dominican Republic, Aug. 26, 1975, 2313
Int. Cl.² E04B *7/04, 1/04*
U.S. Cl. 52—91 **25 Claims**



1. A single story building which comprises: a plurality of load-bearing walls each consisting of a plurality of pre-cast concrete load-bearing wall panels; said wall panels having substantially identical horizontal cross-sections and having substantially thicker portions in their vertical edges than between said portions; a substantially horizontal concrete framework which continuously defines on its lower side longitudinally disposed channels receiving the upper edges of said wall panels of said plurality of walls; said wall panels being assembled in an overlapping relationship and alternately offset relative to the longitudinal horizontal centerline of said wall in

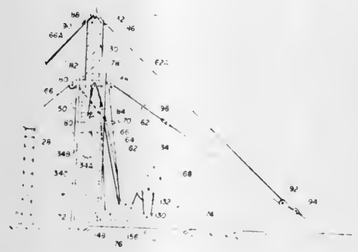
which they are contained and overlapping with adjacent wall panels in the same wall whereby a vertical plane may be received in each said wall of the building whereby said wall panels are alternately spaced from said plane except at said vertical edge portions which are overlapping, said edge portions of all said wall panels being intersected by said plane; a substantially horizontal floor slab which continuously defines recesses in its upper side, said recesses being spaced vertically directly under and corresponding to said channels, said wall panels having their lower edges secured to said floor slab in said recesses and their upper edges secured to said framework in said channels; a roof secured on top of said concrete framework; said recesses and said channels for each corresponding wall comprised of wall panels secured therein continuously receiving said vertical plane for said corresponding wall; said roof and said framework being substantially entirely supported from said slab by said wall panels.

4,231,200

METHOD AND APPARATUS FOR ASSEMBLING A PORTABLE TOWER

Dennis Henderson, c/o Netco Systems, S. Highway 36, Caddo Mills, Tex. 75005

Filed Apr. 17, 1978, Ser. No. 896,927
Int. Cl.² E04H *12/34*
U.S. Cl. 52—111 **3 Claims**



1. A sectional tower assembly comprising, in combination:

a plurality of tower sections each triangular in section;

an upright guide member comprising an elongate frame, triangular in section, having side portions enclosing a channel through which a tower section may be extended or retracted, each side of the elongate frame having a plurality of rollers mounted at vertically spaced locations near the upper end of the upright guide member for engaging the exterior of tower sections which are extended or retracted through the channel;

hoist means carried on said guide member for engaging the lower end of a first of each pair of successive tower sections for moving said first tower section to a first elevated position on the guide member to receive a second of each pair of successive tower sections in upright position beneath its lower end;

means engageable with the adjacent ends of successive tower sections for locking the successive tower sections together, end to end, prior to each successive extension of the tower;

a plurality of sheaves attached to the guide member;

a corresponding number of anchors symmetrically disposed at radially spaced locations relative to the guide member and a sheave attached to each anchor;

a winch; and,

a plurality of guy wires each having a first end portion attached to said upper tower section, a first intermediate portion coupled in reeved engagement with one of the anchor sheaves, a second intermediate portion coupled in reeved engagement with one of the tower sheaves, and a second end portion coupled to said winch,

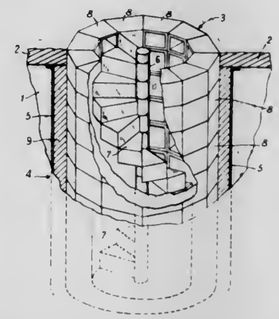
said winch being operable to maintain a tension load on each guy wire as said assembled tower sections are extended or retracted relative to the guide member.

4,231,201

METHOD AND DEVICE FOR ARRANGING A STORAGE AREA

Georges A. Harnois, 22, rue des Paquerettes, 91540-Mennecy, France

Filed Sep. 20, 1978, Ser. No. 943,970
Claims priority, application France, Nov. 10, 1977, 77 33887
Int. Cl.³ E04F *11/00*
U.S. Cl. 52—169.6 **11 Claims**



1. A method for constructing a cellar or storage area underneath an already existing building the foundation of which comprises a concrete flooring on which the building rests on the ground comprising the steps of:

making an opening through said concrete flooring to gain access to the earth below the building;

excavating a well in the earth through said opening in the concrete flooring;

introducing through said opening in said flooring a plurality of prefabricated storage bin elements which when assembled form an envelope comprising said storage area, and

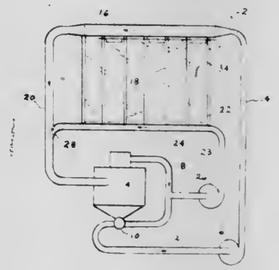
assembling said prefabricated elements within said well to form said envelope conforming to the shape of said well.

4,231,202

DOUBLE-GLAZED BUILDING PANEL AND FILLING SYSTEM

Marcel Dube, 757 Cecile, Hawkesbury, Ontario, Canada K6A 1P2

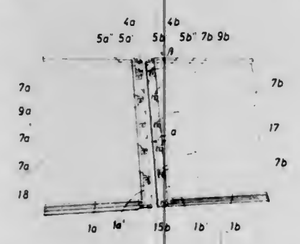
Filed Dec. 22, 1978, Ser. No. 972,266
Claims priority, application Canada, Jan. 24, 1978, 295516
Int. Cl.³ E04B *2/40;* **E04C** *1/42;* **E06B** *3/66*
U.S. Cl. 52—171 **10 Claims**



1. A double-glazed panel structure and a system for selectively filling and evacuating the panel structure with granular material comprising:

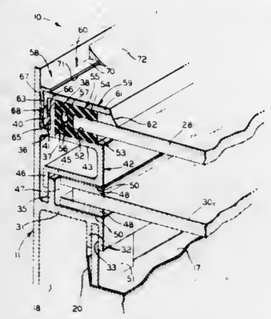
(a) a double-glazed panel structure having an interspace vertically extending at an angle exceeding the angle of repose of the granular material, an upper edge portion and a lower edge portion, and having an inlet in the upper edge portion and an outlet in the lower edge portion for the passage of the granular material in and out of the interspace respectively;
(b) a container for operatively storing the granular material;
(c) a duct-like header for the through flow of the gas conveyed granular material and the settling of at least a portion of the conveyed granular material, said header defining an inlet and an outlet end aperture in the opposite ends thereof and a bottom duct-like portion intermediate the inlet and the outlet end apertures and overlying the upper edge portion of the panel said intermediate bottom portion also having outlet means at the bottom thereof communicating with the inlet in the upper edge portion of the panel; and
(d) means connected to the container and to the inlet and the outlet end apertures of the header and constructed and arranged for in the filling mode gas conveying the granular material from the container to the inlet end aperture and through the header wherein at least a portion of the granular material settles to the bottom of the header and into the interspace of the panel and for returning the conveying gas and ay unsettled or excess granular material outwardly through the outlet end aperture back to the container; and
(e) an evacuating duct underlying the lower edge portion of the panel, having an inlet end aperture and an opposite outlet end aperture for the through flow of the conveying gas and also having aperture means in the top thereof communicating with the outlet in the lower edge portion of the panel; and
(f) controllable retaining means located between the outlet in the lower edge portion of the panel and the aperture means in the top of the evacuation duct for selectively retaining the granular material in the panel in the filling mode and for opening in the evacuating mode whereby the granular material is allowed to drain at a controlled rate in to the evacuation duct; and
(g) gas conveying means connected to the outlet end aperture of the evacuation duct and to the container whereby in the evacuating mode, upon operation thereof, air is admitted at the inlet end of the evacuation duct and flows through the evacuation duct conveying the granular material through the outlet end aperture of the evacuation duct back to the container.

4,231,203
UNIT JOINT FOR CONNECTING TWO ANGULARLY ARRANGED PANEL UNITS
Henrik Mikkelsen, Copenhagen, and Bjarne B. Andersen, Holte, both of Denmark, assignors to Inter-Ikea A/S, Humlebaek, Denmark
Filed Aug. 21, 1978, Ser. No. 935,177
Claims priority, application Denmark, Jun. 15, 1978, 2700/78
Int. Cl.[2] E04B *5/00*
U.S. Cl. 52—284 **10 Claims**



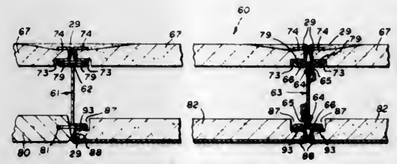
1. In combination: two panel units arranged at an angle with respect to each other, each panel unit having a relatively narrow edge surface and a wall surface projecting beyond said edge surface towards the other unit, each edge surface comprising at least one rib having an angle guide surface abutting the angle guide surface on a corresponding rib on the other panel unit so as to define a mutualangle at which said panel units abut, a plurality of coupling projections at said edge surfaces of each panel unit and at the wall surface of each panel unit, said projections having apertures substantially coaxially arranged, said projections on one unit projecting between the projections on the other panel unit, and a common locking rod extending through said apertures, each coupling projection being substantially rectangular and firmly connected to the narrow edge surface and wall surface of the respective panel unit, and substantially filling up the cross section of a channel defined by the narrow edge surfaces and wall surfaces when the angle guide surfaces on both panel units abut each other, each coupling projection having integrally connected thereto an auxiliary rib provided with an inclined auxiliary angle guide surface cooperating with a corresponding inclined auxiliary angle guide surface on a corresponding auxiliary rib on the other panel unit.

4,231,204
SOLAR ENERGY COLLECTOR
Wallace F. Krueger, Toledo, and Anthony R. Shaw, Waterville, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Mar. 31, 1978, Ser. No. 892,110
Int. Cl.[3] E04B *1/62*; F24J *3/02*
U.S. Cl. 52—397 **9 Claims**



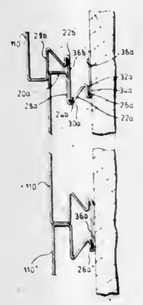
1. A solar energy collector comprising an enclosure including an outer peripheral wall having spaced first and second protrusions formed integral therewith, said protrusions having extensions generally parallel to said wall in spaced relation thereto, said first protrusion extension defining the end wall of a channel and terminating in an enlarged formation, a support member affixed to said second protrusion extension and having a supporting surface defining one side wall of said channel, at least one glazing panel within said enclosure, and detachable retainer means for securing said glazing panel in place and comprising a first element mechanically interlocked with said enlarged formation and having a portion defining the other side wall of said channel and overlying the marginal edge of said glazing panel, a sealing member disposed in said channel about the marginal edge of said glazing panel, said retainer means including a second element urging said first element in interlocked relation with said enlarged formation of said first protrusion.

4,231,205
STEEL EDGE GYPSUM WALL PANEL
Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Filed Dec. 18, 1978, Ser. No. 970,073
Int. Cl.[3] E04B *2/08*
U.S. Cl. 52—481 **27 Claims**



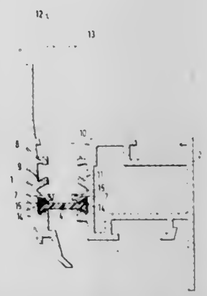
1. A steel edged gypsum wall panel engageable by flanged studs, said panel having substantially flush planar front and back surfaces and comprising:
a body portion of from about 5/16 inches to about ¾ inches thick having; front and back faces, and opposite marginal side edges, said front and back faces both having reduced portions adjacent said marginal side edges;
steel edges having a channel shape and comprising;
a front flange, a back flange,
a web portion integrally connecting said flanges and adapted to contact said marginal edge,
wherein said back flange terminates in a return flange providing an engageable slot therebetween and, wherein at each steel edge said front flanges and return flanges are spaced apart a distance no greater than the distance between said front flush planar surface and said back flush planar surface wherein said back flanges contact said reduced portions adjacent said marginal side edges.

4,231,206
SIDING STRUCTURE
Joseph A. Hafner, 91 Dover Dr., StoneyCreek, Canada
Continuation-in-part of Ser. No. 804,192, Jun. 6, 1977, abandoned. This application Dec. 12, 1978, Ser. No. 968,717
Int. Cl.[2] E04D *1/00*
U.S. Cl. 52—529 **7 Claims**



1. A construction panel of relatively thin material for use with other such panels to selectively apply lapped and flush siding on a building structure, the panel being elongated with a substantially constant transverse cross-section and comprising:
a main portion having a front surface which is apparent after assembly on the building structure;
a first marginal portion extending generally rearwardly from a longitudinal side extremity of the main portion and defining a first land extending generally rearwardly from said side extremity, a channel immediately adjacent a rearward extremity of the land and proportioned such that the land of an adjacent panel can be contained in the channel to locate the adjacent panel, and a tongue lying rearwardly of and immediately adjacent the channel, the tongue being generally parallel to the main portion and projecting outwardly for use in attaching the panel to the building structure;
a second marginal portion also extending rearwardly and being connected to the main portion at a further longitudinal side extremity of the main portion such that the first and second marginal portions are generally parallel to one another, the second marginal portion being a mirror image of the first marginal portion and defining a second land, a second channel, and a second tongue, the respective channels also being adapted to receive tongues of other such panels to permit selective assembly either in the flush or lap arrangement, whereby in the lap arrangement one of the first and second channels receives a tongue of an adjacent panel with the land adjacent the channel positioned in the associated channel of the adjacent panel so that the thickness of the assembly is essentially twice the width of the land.

4,231,207
HEAT-INSULATED STRUCTURAL SECTION ASSEMBLY
Horstmar Kern, and Helmut Botzenhardt, both of Ulm, Fed. Rep. of Germany, assignors to Wieland-Werke Aktiengesellschaft, Ulm, Fed. Rep. of Germany
Filed Dec. 7, 1978, Ser. No. 967,533
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755697
Int. Cl.[3] E04C *3/30*
U.S. Cl. 52—730 **1 Claim**



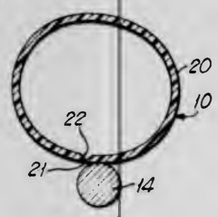
1. In a structural section assembly for use in manufacturing window and door frames consisting of two structural metal sections made from a metal selected from the group consisting of aluminum or aluminum alloy and having integral flanges defining opposed longitudinally extending grooves together with the webs of the respective structural metal sections, and connected to each other by a pair of plastic heat-insulating bars, said structural metal sections defining an enclosed air space together with said heat-insulating bars and said flanges being adapted to clamp the ends of said heat-insulating bars within said opposed grooves, wherein the improvement comprises the feature that the opposed flanges clamping one of the heat-insulating bars are made longer than the flanges for clamping the other heat-insulating bar, the arrangement being such that longer flanges during assembly are first bent by pressure rollers against the heat-insulating bar.

4,231,208

GUY GUARD AND METHOD OF INSTALLING SAME

J. Hebden Willox, 917 Newcastle Ave., Westchester, Ill. 60153

Filed Apr. 16, 1976, Ser. No. 677,566
Int. Cl.[2] E04H *12/20*
U.S. Cl. 52—741 2 Claims



1. A method of assembling a guy guard over a guy assembly of a utility pole or the like, comprising the steps of extruding a generally cylindrical length of an elongated plastic guard member with an elongated frangible web, differentially stressing said guard member to bias said guard member to a tendency to wrap upon itself, and progressively fracturing said frangible web simultaneously forcing the guy wire through said frangible web when installing, whereupon the longitudinal edges of said frangible web will wrap and overlap themselves to securely fasten said guard member around said guy assembly.

4,231,209

SELF-SYNCHRONIZING BOTTLE CARRIER APPLICATOR

Maurice Walker; Buren R. Wheeley, both of Memphis, Tenn., and Charles A. Glass, Horn Lake, Miss., assignors to Royal Crown Cola Company, Atlanta, Ga.

Filed Jul. 10, 1979, Ser. No. 56,383
Int. Cl.[3] B65B *21/02*
U.S. Cl. 53—48 10 Claims



1. In a machine for forcibly applying a series of molded plastic carriers having at least one row of aligned holes therein to a series of upright container bottles moving along a horizontal bottle path, said machine including:

a hopper for supporting at least one stack of carriers above said bottle path,

means for removing in serial fashion carriers from the bottom of said stack and feeding them along a corresponding carrier path leading from said stack of carriers and which intersects the underlying bottle movement path such that movement of said bottles causes the tops of the bottles to pull the carriers over and across the tops of the bottles passing thereunder, and

an applicator wheel mounted for rotation about a horizontal axis, downstream of the intersection of the carrier path and the bottle path, and being positioned above said bottles and said carriers and means for forcibly applying said wheel into peripheral contact with said carriers to press said carriers onto the bottles to the extent that the bottle tops project through said holes,

the improvement wherein:

said means for feeding said carriers along a carrier path comprises a gravity chute longitudinally aligned with said bottle path and being inclined downwardly and away from said at least on carrier stack and terminating in an open discharge end just above the tops of said bottles, and wherein said bottle path is formed by a horizontal powered conveyor means beneath said chute with its discharge end terminating upstream of the discharge end of said gravity chute and a table having a top aligned with said horizontal powered conveyor means and extending downstream therefrom from the discharge end of said horizontal powered conveyor means to a point underlying said applicator wheel, and

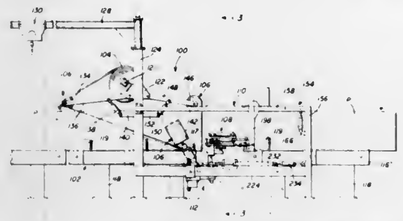
individual open top cartons of predetermined size carrying a predetermined number of said upright bottles in row and column positions therewithin corresponding to the position and spacing of said holes within said carriers such that regardless of random movement of said cartons of bottles along said horizontal bottle path by said horizontal power conveyor means, said cartons are moved over said table beneath the discharge end of said chute and to said applicator wheel in end-to-end contact solely by the force of cartons discharging onto said table top from said powered conveyor means such that carriers are always in proper alignment with said upright bottles whereby multi-bottle carrier packs are readily assembled with carrier portions encircling the bottle necks and with the carriers embracing a selected group of container bottles.

4,231,210

PACKAGE WRAPPING MACHINE

Gerald E. Nagode, 17920 S.W. Frances, Aloha, Oreg. 97005

Filed Apr. 24, 1979, Ser. No. 32,939
Int. Cl.[3] B65B *11/08, 27/10*
U.S. Cl. 53—397 24 Claims



15. A method for wrapping five sides of a six sided package, comprising the steps of:

holding wrapping material in an inverted U configuration in a holding apparatus, said U-configuration having two parallel material portions and a connecting portion;

conveying a package to be wrapped to a first work station beneath the connecting portion and between the parallel portions of the held wrapping material;

moving the holding apparatus with the wrapping material over the package leading end to thereby fold the material over the leading end;

stapling the folded wrapping material to the package leading end;

conveying the package forward, drawing the wrapping material with it until the package trailing end is positioned forward of the initial position of the package leading end;

cutting the wrapping material;

moving the holding apparatus with the wrapping material over the package trailing end to thereby fold the material over the trailing end; and

stapling the package trailing end to secure the wrapping material to the package.

4,231,211

METHOD AND APPARATUS FOR SEALING THE FILL OPENINGS OF HARD GELATINE CAPSULES FILLED WITH LIQUID

Armin Strampfer, Waiblingen, and Guenther Voegele, Schönaich, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,930
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2747696
Int. Cl.[3] B65B *3/02, 3/14*
U.S. Cl. 53—452 3 Claims



1. A method for filling and sealing hard gelatine capsules or the like having a dome-shaped end wall comprising the steps of, forming a spherical depression in said capsule end wall, inserting a hollow needle through said capsule end wall centrally of said spherical depression to form a fill opening, introducing a medicant into the interior of said capsule through said hollow needle, and filling said spherical depression with a sealing mass to seal said fill opening and conform said end wall containing said spherical depression to substantially its original shape.

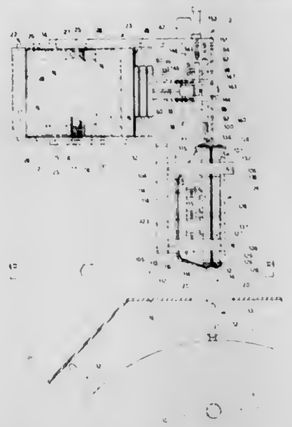
4,231,212

VALVE BAG FEEDING METHOD AND MACHINE FOR POWDER MATERIAL PACKAGING APPARATUS

Angelo Raiteri, Turin, Italy, assignor to UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta S.p.A., Casale Monferrato and Andrea Doria, Turin, both of, Italy, part interest to each

Continuation of Ser. No. 833,526, Sep. 15, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,705
Int. Cl.[3] B65B *43/26*
U.S. Cl. 53—459 16 Claims

14. Method for placing on a spout of a powder material packaging apparatus, a bag having at one edge of fold flange forming two wings and a valve which can be opened by pushing the two wings one toward the other, characterized by the step of picking up the bags one at a time from a magazine, the step of bringing the picked up bag to the entrance of a stationary shaping tube having a substantially horizontal axis aligned with said spout, the step of causing the valve flange of said bag to cross said tube, said tube having a section continuously variable through its length as to push the two wings of the flange one towards the other to cause said valve to be opened, and by the step of hurling said bag when crossing said tube at



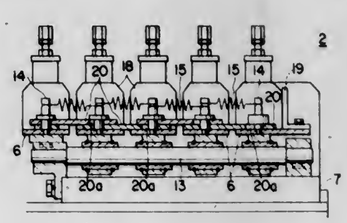
such a speed as to assure that said valve be placed on the spout substantially when said valve flange has left said tube.

4,231,213

BOX PACKING MACHINE

Gosei Okazaki, Komatsu, Japan, assignor to Shibuya Kogyo Kabushikigaisha, Ishikawa, Japan

Filed May 30, 1979, Ser. No. 43,720
Int. Cl.[3] B65B *57/14, 21/20*
U.S. Cl. 53—497 12 Claims



1. A box packing machine for placing containers of a given number into a box comprising a machine housing, a container space regulating unit which is movable reciprocatingly between the first and second positions defined in said machine housing, container supply means for supplying containers of a given number to said container space regulating unit while being located at the first position, arranging means provided on said container space regulating unit for arranging the containers to a desired format while said container space regulating unit advances from the first position to the second position, and a holder head, disposed vertically movably at the second position, which includes a plurality of holders for individually holding the upper portions of said containers in a desired format.

4,231,214

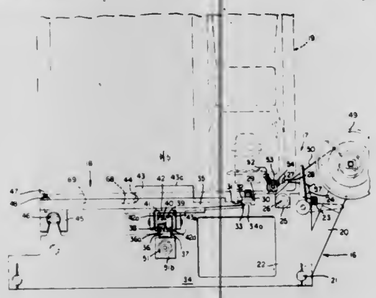
DEVICE FOR INSERTING A MICROFILM INTO MICROFILM JACKETS IN SERIES

Paul A. Kiejzik, 2907 Monterey Ct., Springfield, Pa. 19064

Continuation-in-part of Ser. No. 611,004, Sep. 8, 1975, Pat. No. 4,003,187, which is a division of Ser. No. 845,482, May 13, 1976, Pat. No. 4,123,891, and Ser. No. 845,483, May 13, 1976, Pat. No. 4,173,837. This application Feb. 15, 1978, Ser. No. 878,007

Int. Cl.³ B65B *63/00, 43/26*

U.S. Cl. 53—520 **3 Claims**



1. A device for inserting microfilm strip into microfilm jackets, comprising in combination: jacket supports means including separate first and second platform structures mounted in series with one-another, each platform structure being adapted to fixedly support microfilm jackets in predetermined support positions having jacket-channels of a first microfilm jacket when mounted on the first platform structure, substantially in parallel alignment with jacket-channels of a second microfilm jacket when mounted on the second platform structure, and the platform structure being further adapted for an insert-opening portion of the first microfilm jacket to receive a microfilm strip when one of said first and second platform structures is positioned at a first of said predetermined support-positions at substantially a predetermined edge of the first platform structure; and said first and second platform structures and said predetermined support positions being adapted such that a microfilm jacket opposite-end outlet-portion of the first microfilm jacket is in insert-communication with an insert opening portion of the second microfilm jacket.

4,231,215

SINGLE BELT DRIVE FOR A THREE-SPINDLE ROTARY MOWER

Kenneth H. Klas, Port Washington, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 19, 1979, Ser. No. 31,400

Int. Cl.³ A01D *35/26*

U.S. Cl. 56—11.6 **10 Claims**

1. In a power transmission for a mower movable in a predetermined forward direction of mowing operation having a downwardly open housing with a generally horizontal deck, the combination comprising:

three vertical spindles rotatably supported on said deck in a triangular pattern with upper ends disposed above said deck and lower ends disposed below said deck, one of said spindles being disposed forward of the other two spindles and said other two spindles being disposed on laterally opposite sides of said one spindle,

a cutting blade secured to said lower end of each of said spindles for rotation therewith,

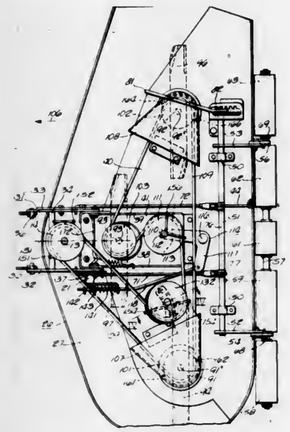
a driven pulley secured to said upper end of each of said spindles for rotation therewith,

a drive pulley disposed on a vertical axis spaced forwardly of said triangular pattern and said one spindle,

grooves in each of said driven and drive pulleys adapted to receive a V-belt,

a clutch idler lever pivotally mounted on said housing for rotation about a generally upright axis between a drive establishing position in which said belt is tightened and a nondriving position in which said belt is relaxed, said lever having a radially extending arm,

a clutch idler pulley rotatably supported on said arm for movement about an axis spaced from said upright axis and from the axes of rotation of said spindles said clutch idler pulley being disposed rearwardly of said one spindle,



a single continuous V-belt trained around said pulleys and having but a single arc of contact with each pulley, respectively, said V-belt having tapered driving surfaces in contact with said grooves of said drive and driven pulleys and a flat backside in contact with said clutch idler pulley, said belt being free of severe twists and crossovers in its installed condition on said pulleys and sequentially engaging said pulley on said one spindle and said clutch idler pulley.

4,231,216

MOWER WITH BOTTOM-DRIVEN CUTTER DISCS

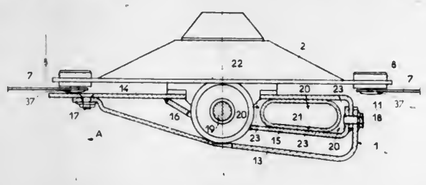
Marcel Weber, Marmoutier, France, assignor to Societe Samibem, S.A., Marmoutier, France

Filed Jun. 6, 1978, Ser. No. 913,074

Claims priority, application France, Jun. 15, 1977, 77-18776

Int. Cl.³ A01D *55/26, 35/264*

U.S. Cl. 56—13.6 **3 Claims**



1. A mower comprising a plurality of bottom driven discs, cutters on said discs, screws securing said cutters on said discs, an elongated housing disposed beneath said discs, transmission means in said housing for driving said discs in rotation, and a hollow beam for increasing the rigidity of said housing, said beam being disposed in the housing at least at one end of said housing, at least one of said beam and housing being filled with hardened expanded synthetic resin thereby to reduce drum resonance effect, means at said one end of said housing for connecting said mower to a drive vehicle, said beam being

disposed between the axes of rotation of the discs and the axes of said screws when said screws are disposed farthest to the rear in their paths of rotation.

4,231,217

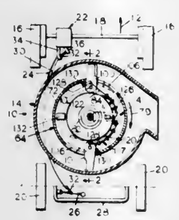
LAWN MOWER SAFETY DEVICE

Frank J. Lucas, 302 N. Center St., Box 316, LaGrange, Ohio 44050

Continuation-in-part of Ser. No. 45,348, Jun. 4, 1979, abandoned. This application Jul. 27, 1979, Ser. No. 61,360

Int. Cl.³ A01D *75/20*

U.S. Cl. 56—17.4 **7 Claims**



1. In a lawn mower having wheels and an engine for propelling it, the combination comprising,

a clutch/transmission unit for selectively interconnecting the engine and the wheels,

manually actuated means for controlling said unit,

a rotor rotatable on a vertical axis and driven by the engine,

cutting blades on the rotor and movable between an active position extending radially beyond the rotor and an inactive position within the perimeter of the rotor, and

means operably controlled by the manually actuated means for moving the cutting blades to active position.

4,231,218

RAKE WITH PIVOTABLE ARMS

Luis D. Delgado, Palencia, Spain, assignor to Vicon España S.A., Palencia, Spain

Continuation of Ser. No. 546,866, Feb. 4, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,193

Int. Cl.³ A01D *78/04*

U.S. Cl. 56—377 **24 Claims**



1. A rake comprising at least one main frame provided with wheels, a subframe pivotally connected with said main frame for up and down swinging movement relative thereto, two board supports pivotally connected with said subframe for seesaw movement relative thereto and a plurality of rake boards rotatably arranged on the board supports, characterized in that the subframe is formed mainly by relatively independently pivotable arms secured to the main frame.

4,231,219

METHOD AND APPARATUS FOR ALLEVIATING TIGHT SPOTS IN FALSE TWIST TEXTURED YARN

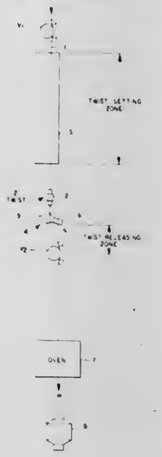
Ernest J. Griset, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jun. 4, 1979, Ser. No. 44,995

Int. Cl.³ D02G *1/20, 1/04*

U.S. Cl. 57—290 **11 Claims**

1. A method for alleviating tight spots in false twist textured yarn which comprises, feeding a thermoplastic multi-filament yarn to a false twister, imparting a false twist to the yarn in one direction, setting the twist to provide a torque in the yarn, and then passing the yarn around a tapered flange of a freely rotatable roller to impart a twist in the yarn of a direction opposite



to that of the false twist imparted by the twister and of a magnitude sufficient to alleviate tight spots occurring in the yarn during passage through said false twister without substantially reducing said torque.

4,231,220

SECONDARY AIR CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

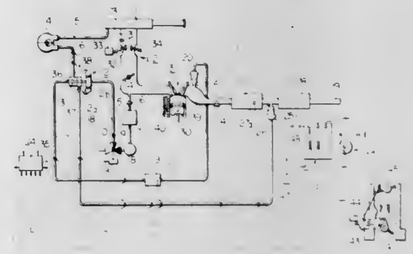
Keiso Takeda, Susono, Japan, assignor to Toyota Kidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 9, 1978, Ser. No. 932,189

Claims priority, application Japan, Aug. 17, 1977, 52-97877

Int. Cl.³ F01N *3/15, 3/10;* **F02B** *75/10*

U.S. Cl. 60—276 **6 Claims**



1. A secondary air control system in an exhaust gas purifying system for an internal combustion engine including a three-way catalyzer in an exhaust passage of the engine and a secondary air feed device for feeding secondary air via a secondary air passage into said exhaust passage upstream of said catalyzer, said secondary air control system comprising:

a control valve in said secondary air passage for regulating the flow rate of the secondary air fed therethrough;

means for generating a signal indicative of a desired quantity of the secondary air determined by the quantity of an intake air supplied into the engine via a carburetor, the basic air-fuel ratio set by said carburetor and the desired air-fuel ratio for said catalyzer;

first feedback means for generating a signal indicative of an

actual quantity of the secondary air fed via said secondary air valve;

means for generating a signal indicative of the desired air-fuel ratio;

second feed back means for generating a signal indicative of an actual air-fuel ratio in the exhaust passage between the secondary air feeding position and said catalyzer;

means responsive to said actual secondary air quantity signal and said desired secondary air quantity signal for generating a first error signal indicative of a deviation of the actual secondary air quantity from the desired secondary air quantity;

means responsive to said actual air-fuel ratio signal and said desired air-fuel ratio signal for generating a second error signal indicative of a deviation of the actual air-fuel ratio from the desired air-fuel ratio; and

actuator means responsive to said first and second error signals for operating said secondary air valve, said system further comprising means for generating an auxiliary signal, and signal selector means responsive to a temperature of said catalyzer for interrupting the feeding of said second error signal to said actuator means when the catalyzer temperature rises higher than a predetermined temperature, while feeding said auxiliary signal to said actuator means, so as to effect the secondary air control to prevent said catalyzer from being overheated.

4,231,221

EXHAUST SILENCER FOR EXHAUST SYSTEMS OF INTERNAL COMBUSTION ENGINES, PARTICULARLY INTERNAL COMBUSTION ENGINE-OPERATED MANUAL APPLIANCES

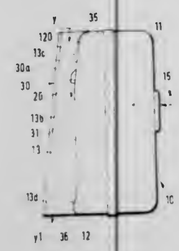
Manfred Mäthner, Hamburg, and Peter Thomsen, Quickborn, both of Fed. Rep. of Germany, assignors to Dolmar Maschinenfabrik GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,672

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 7810865[U]

Int. Cl.³ F01N 5/04, 1/14

U.S. Cl. 60—319 **8 Claims**



1. An exhaust muffler comprising first and second shell members connected to each other to form an inner region, an inlet formed on said first shell member for admitting exhaust gases from an internal combustion engine into said inner region, a number of discharge ports formed on a wall part of said second shell member which faces said inlet, a cover shell extending over the outside of said wall part of said second shell member for forming therewith an elongated cooling channel having an air inlet opening at one end and a diffusing outlet opening at the other end in the axial direction of said cooling channel, a discharge hood associated with each of said discharge ports for deflecting exhaust gases flowing out of said discharge ports from said inner region into said cooling channel in the direction of said diffusing outlet opening, said cover shell and said wall part together defining a Venturi tube in the longitudinal cross-section of said channel, said discharge hoods being arranged successively in the longitudinal direction of said cooling channel wherein said wall part deflects in the direction opposite from said cover shell by an angle (α) of about 2° to 8° after the last successive one of said discharge hoods in the direction of said diffusing outlet opening of said channel for maintaining gas flow in said cooling channel contiguous to said wall part.

4,231,222

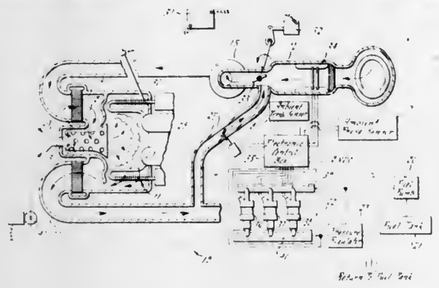
AIR FUEL CONTROL SYSTEM FOR STIRLING ENGINE

James E. Fenton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 18, 1978, Ser. No. 943,593

Int. Cl.³ F02G 1/04

U.S. Cl. 60—524 **10 Claims**



1. In an apparatus for maintaining the temperature of a heater head of a hot gas engine at a substantially constant temperature, the engine having a combustion chamber and the apparatus having a temperature responsive element giving a signal in accordance with the temperature of the heater head, said apparatus further having a servo-system governed by said signal and a regulating means including a combustion air blower driven by the engine governing the rate of delivery of combustion air from the blower operable by said servo-system, the improvement comprising:

(a) means responsive to the rate of flow of combustion air from the blower including a plurality of differentially sized fuel injectors effective to continuously introduce fuel through one or more of said injectors to the air delivered by said blower for combustion, said injectors being effective to meter fuel over a range of 0.4–15 grams per second; and

(b) a pressure regulator to regulate the pressure of said fuel delivered to said plurality of fuel injectors, whereby a constant uniform pressure drop is experienced across all said fuel injectors.

4,231,223

THERMAL ENERGY SCAVENGER (ROTATING WIRE MODULES)

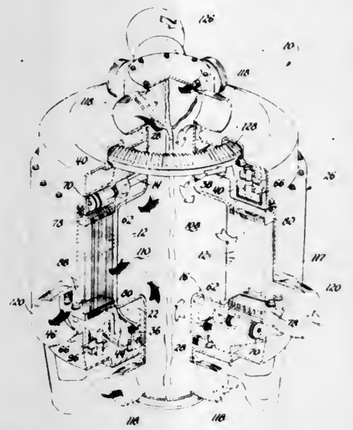
William L. Pringle, 999 Lake Shore Rd., Grosse Pointe Shores, Mich. 48236; Peter A. Hochstein, 14020 Fifteen Mile Rd., Sterling Heights, Mich. 48077, and Harold W. Milton, Jr., 3318 Tothill Rd., Troy, Mich. 48084

Filed Jun. 9, 1978, Ser. No. 914,030

Int. Cl.³ F03G 7/06

U.S. Cl. 60—527 **17 Claims**

1. A thermal energy scavenger assembly comprising: a plurality of temperature-sensitive elements made of material which exhibits shape memory due to thermoelastic, martensitic phase transformation; said elements being elongated with first and second ends; reaction means reacting with said elements for applying a stress to said elements to strain said elements during a first phase and for responding to the unstraining of said elements during a second phase; carriage means supporting said first and second ends of said elements for allowing said elements to be placed in tension while reacting with said reaction means; said carriage means including a plurality of independent modules; each of said modules supporting a group of said elements so that each group of said elements react collectively with said reaction means and independently of the groups of other modules; said elements in each of said groups being parallel to one another; said reaction means comprising cam means disposed about a central axis with at least one cam surface disposed about the periphery of said cam means; support means supporting said cam means and said carriage means



for allowing relative movement between said cam means and said carriage means to extract energy as said elements unstrain and shorten in length during said second phase; each of said modules including a cam follower for engaging said cam means, and hydraulic means disposed between each of said cam followers and said group of elements of each module for transferring reaction forces between said cam means and said elements of each group.

4,231,224

MASTER CYLINDER ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

Roy E. Edwards, Warley; Anthony G. Price, Birmingham, and John R. Rees, Halesowen, all of England, assignors to Girling Limited, Birmingham, England

Filed Oct. 12, 1977, Ser. No. 841,287

Claims priority, application United Kingdom, Oct. 12, 1976, 42254/76

Int. Cl.³ F15B 7/00

U.S. Cl. 60—581 **2 Claims**



1. An hydraulic master cylinder assembly for a vehicle braking system comprising two separate first and second master cylinders, each said master cylinder comprising a piston adapted to work in a bore, a pressure space in said bore in front of said piston, means defining a transfer chamber, a recuperation port for connection to a reservoir for fluid and a transfer valve which is movable between a fully open position by movement of said piston in a direction to pressurize hydraulic fluid in said pressure space and a closed position to isolate said transfer chamber of that master cylinder from said recuperation port therefor, and said transfer chambers are connected by a transfer passage, wherein said transfer valves are normally open and said transfer valve of each master cylinder incorporates pressure-responsive means responsive to pressure in said transfer chamber of a corresponding one of said master cylinders, said pressure-responsive means in said first master cylinder being operative to urge said transfer valve of said first master cylinder into said closed position when pressure in said transfer chamber of said first master cylinder is increased by pressurization of hydraulic fluid in said pressure space of said second master cylinder by transfer of hydraulic fluid through said transfer chamber when said second master cylinder is operated on its own, and said pressure-responsive means in said second master cylinder being operative to urge said transfer valve of said second master cylinder into said closed position when pressure in said transfer chamber of said second master cylinder is increased by pressurization of hydraulic fluid in said pressure space of said first master cylinder by transfer of hydraulic fluid through said transfer chamber when said first master cylinder is operated on its own, and wherein each of said transfer valves comprises a seating, a member which is movable in a brake-applying direction when that master cylinder is operated carrying said seating, said member including an axial extension, a valve member responsive to pressure in said transfer chamber and extending into said extension, a first spring for biassing said valve member normally away from said seating, and means defining a restricted flow path between said transfer chamber and said recuperation port when said valve member is biassed away from said seating, and wherein said member carrying said seating comprises the forward end of said pedal-operated piston of said master cylinder, and an axially extending rod is coupled for relative axial movement through a limited distance at one end to said valve member, said valve member surrounding said rod and the other opposite end of said rod remote from said piston carrying a head for engagement with a seating surrounding said recuperation port, said rod carrying a stop and said first spring acting between said valve member and said rod normally to urge said valve member into engagement with said stop, said stop defining a distance by which said valve member can be moved away from said seating, and said seating being movable relatively away from said valve member in response to movement of said piston in a brake applying direction to pressurize fluid in said pressure space and after said head has engaged with said seating surrounding said recuperaton port to isolate said reservoir from said pressure space.

4,231,225

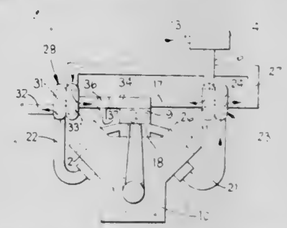
TURBOCHARGED ENGINE WITH PRESSURIZED GAS RECIRCULATION

Kazim K. Aya, 105 N. Kendall, Apt. 3R, Kalamazoo, Mich. 49007

Filed Feb. 5, 1979, Ser. No. 9,646

Int. Cl.³ F02B 37/00

U.S. Cl. 60—612 **6 Claims**



1. In an internal combustion engine having a plurality of piston-containing cylinders each defining a combustion chamber, intake manifold means communicating with said combustion chambers, an intake conduit communicating with said intake manifold means for supplying air thereto, an exhaust manifold communicating with said combustion chambers for receiving therefrom the hot exhaust gases, and first turbocharger means for pressurizing the air supplied to said intake

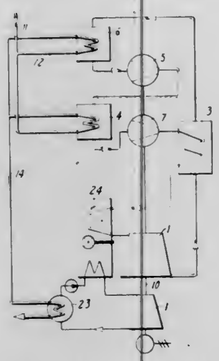
manifold means, said first turbocharger means including a rotatable turbine section drivingly connected to and rotatably driving a compressor section, said compressor section being associated with said intake conduit for pressurizing the air which is supplied to said intake manifold means, and a first exhaust conduit providing communication between said exhaust manifold means and said turbine section for rotatably driving said turbine section by the hot exhaust gases which flow through said first exhaust conduit, the improvement comprising second turbocharger means for pressurizing and supplying at least a part of the hot exhaust gases to said intake manifold means, said second turbocharger means including a rotatable turbine part drivingly connected to a rotatable compressor part, a second exhaust conduit communicating between said exhaust manifold means and said turbine part for supplying at least a part of the hot exhaust gases to said turbine part for rotatably driving same, intermediate passage means connected between the discharge of said turbine section and the inlet of said compressor part for supplying the exhaust gases from said first turbocharger means to the compressor part of said second turbocharger means for effecting pressurization of said exhaust gases, and an inlet conduit connected between said compressor part and said intake manifold means for supplying said pressurized exhaust gases from said compressor part to said intake manifold means for mixing with the pressurized air supplied through said intake conduit, the pressurized mixture of exhaust gases and air within said intake manifold means being supplied to said combustion chambers.

4,231,226

METHOD AND APPARATUS FOR VAPORIZING LIQUID NATURAL GASES

Hartmut Griepentrog, Oberhausen, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 684,646, May 10, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 895,043
Claims priority, application Fed. Rep. of Germany, May 28, 1975, 2523672
Int. Cl.³ F01K *17/00*
U.S. Cl. 60—648 **2 Claims**



1. A system for increasing the thermal efficiency of a closed-circuit engine operated by heated operating fluid circulating in the closed circuit and for vaporizing liquefied natural gas and heating the vaporized gas to a delivery temperature suitable for delivery of the gas to a gas pipeline network, said device comprising, in combination:

said closed circuit comprising a turbine having a heated operating fluid supply inlet and an operating fluid exhaust outlet; a low pressure compressor in said closed circuit; a high pressure compressor in said closed circuit; an operating fluid heater having a heated operating fluid discharge connected to said fluid supply inlet of said turbine to drive said turbine, a first connecting line connecting said turbine exhaust outlet to the inlet of said first low pressure compressor, a second connecting line connecting the outlet of said first low pressure compressor to the inlet of said second high pressure compressor, and a third connecting line connecting the outlet of said second high pressure compressor to the inlet of said operating fluid heater;

driving means connecting said turbine to said compressors to drive said compressors;

a first heat exchanger connected to said first connecting line and in said third connecting line for preheating, by means of operating fluid discharged from said turbine exhaust outlet, the compressed operating fluid entering said operating fluid heater from said second high pressure compressor;

a second heat exchanger in said first connecting line between said first heat exchanger and said first low pressure compressor to receive the operating fluid from the first heat exchanger at a temperature greater than 15° C.;

at least a third heat exchanger in said second connecting line between said first and second compressors;

a liquefied natural gas supply line;

natural gas connection means connected to said supply line and dividing the supplied liquefied natural gas into first and second portions connected, respectively, to said second and third heat exchangers to receive heat from the operating fluid flowing through said second and third heat exchangers for vaporizing of the liquefied natural gas and heating of the vaporized gas by said operating fluid flowing through said first and second connecting lines of said closed circuit with resultant substantial cooling, by said liquefied natural gas, of said operating fluid entering said first and second compressors;

a natural gas discharge line connected to both of said second and third heat exchangers to receive at least partially vaporized natural gas therefrom; and

after-heater means operatively associated with said natural gas discharge line for further heating the natural gas flowing through said natural gas discharge line to such delivery temperature, said after-heater means comprising, a fourth heat exchanger, a second turbine, and a second closed circuit carrying a fluid operating medium for said second turbine, said second closed circuit comprising said second turbine, said fourth heat exchanger, and heat exchange means associated with said operating fluid heater to receive heat from said heater, said fourth heat exchanger comprising a heat transfer line connected in series with said natural gas discharge line to transfer heat from said operating fluid medium to said natural gas.

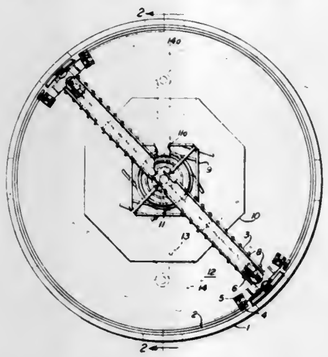
4,231,227

PRILL TOWER RAKE

Robert M. Stewart, and Robert W. Schwartz, both of Memphis, Tenn., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 832,933, Sep. 13, 1977, Pat. No. 4,160,631. This application Mar. 26, 1979, Ser. No. 23,911
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—57 **1 Claim**

1. The process of cooling and collecting urea prills that have fallen through a circular prilling tower without subsequently passing them through a separate cooler which comprises collecting said prills on a flat, substantially circular fluidized bed of prills about one inch thick fluidized by ambient air at about 0° to 120° F. whereby the prills are cooled to about 100° to 140° F.; rotating a multi-bladed rake through the bed to further mix



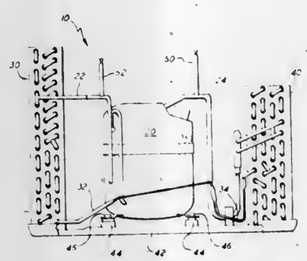
the prills and to sweep them toward a collection exit; and collecting the thus cooled prills.

4,231,228

COMBINATION PROCESS TUBE AND VIBRATION ATTENUATOR FOR A REFRIGERATION CIRCUIT

Michael E. Galvin, Clay, and Robert J. Whitwell, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 3, 1979, Ser. No. 63,623
Int. Cl.³ F25B *45/00*
U.S. Cl. 62—77 **7 Claims**



1. A vapor compression refrigeration circuit having components including an evaporator, a condenser, a compressor and an expansion device which comprises:

a refrigerant line connecting at least two of said components, said line having a process opening therein; and

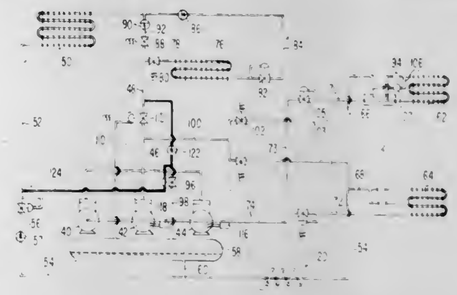
means acting as a combination process tube and refrigerant pressure variation attenuator, said means being attached to the refrigerant line to be in communication with the refrigerant flowing therethrough via the process opening, said means being configured to attenuate pressure variations within the refrigerant flowing through the refrigeration circuit and said means further serving to provide apparatus for charging the refrigeration circuit with refrigerant.

4,231,229

ENERGY CONSERVATION SYSTEM HAVING IMPROVED MEANS FOR CONTROLLING RECEIVER PRESSURE

Benjamin R. Willitts, Lawrenceville, N.J., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 21, 1979, Ser. No. 22,583
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—196 A **8 Claims**



1. In a refrigeration system including a compressor, a condenser, a receiver, an evaporator, a discharge line extending from the compressor to the condenser, a liquid line extending from the condenser to the evaporator, a connecting line between the liquid line and the receiver, a return line extending from the evaporator to the compressor, an inlet pressure regulating valve in the liquid line adapted to establish and maintain pressures in the liquid and discharge lines at pre-selected, different operating levels, and a receiver pressure control line connected between the compressor discharge line and the receiver, the improvement comprising a differential pressure regulating valve that controls communication between the discharge line and the receiver through the receiver pressure control line, and that is sensitive to the pressure differential between the liquid and discharge lines to establish and maintain the receiver pressure at a valve which is a function of said pressure differential, said differential pressure regulating valve being mounted in the receiver pressure control line to control flow therethrough.

4,231,230

REFRIGERANT ACCUMULATOR AND METHOD OF MANUFACTURE THEREOF

Nelson R. Gratzer, Germantown, Tenn., and William E. Wright, East Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 11, 1979, Ser. No. 28,932
Int. Cl.³ F25B *43/00*
U.S. Cl. 62—503 **6 Claims**

1. An accumulator for receiving a two phase fluid mixture of refrigerant, for storing liquid refrigerant and for discharging gaseous refrigerant which comprises:

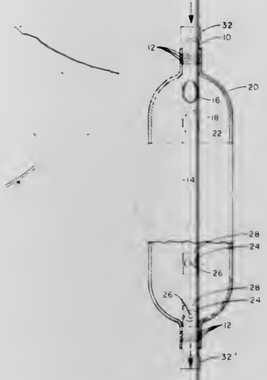
a tube mounted in a generally vertical direction having an upper end and a lower end, said tube receiving a two phase fluid mixture of refrigerant at the upper end and discharging gaseous refrigerant at the lower end;

a shell formed about and connected to the tube intermediate the ends thereof forming a container of a selected volume;

said tube having a discharge opening located near the top of the container to allow the refrigerant mixture entering the upper end of the tube to flow into the container;

said tube having an inlet opening communicating the container with the tube for discharging gaseous refrigerant from the lower end of the tube, said inlet openings being located below the discharge opening and spaced above the bottom of the container such that liquid refrigerant may collect in the lower portion of the container without being discharged from the container; and

diverting means mounted in the tube between the inlet opening and the discharge opening, said diverting means acting to prevent flow of refrigerant directly from the upper end of the tube to the lower end of the tube whereby refrigerant entering the upper end of the tube flows through the discharge opening into the container and may then flow from the container through the inlet opening to the lower end of the tube.

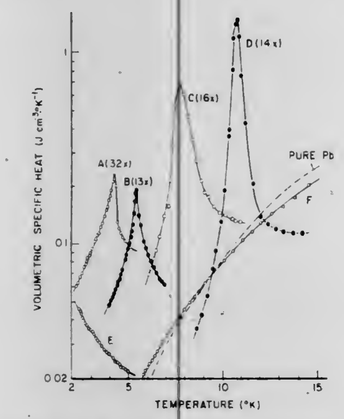


4,231,231

CRYOGENIC CERAMIC AND APPARATUS

William N. Lawless, Westerville, Ohio, assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 13, 1979, Ser. No. 29,554
Int. Cl.³ C04B *35/42*; C09K *5/00*; F25B *19/00*; F28D *17/00*
U.S. Cl. 62—514 R **22 Claims**



8. In cryogenic refrigeration apparatus comprising a load to be refrigerated,

a refrigerant adapted to refrigerate the load at temperatures below 15° K.,

thermal energy absorbing elements associated with the refrigerant and adapted to function at temperatures below 15° K.,

wherein the improvement comprises at least one of the thermal energy absorbing elements being composed of ceramic material:

(a) characterized by

(1) being a dielectric insulator and

(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those sampe temperatures, and p2 (b) consisting essentially of a crystalline phase with a composition defined by the molar formula AB_2O_4 where

A is selected from one or more of Group 2b metal ions alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is Group 2b metal ion or ions, and

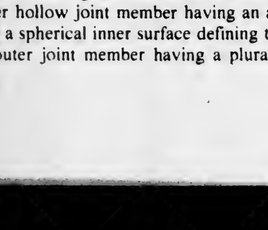
B is either Cr ion or Cr ion plus one or more of other trivalent metal ions where at least about 90 mole % of B is Cr ion.

4,231,232

CONSTANT VELOCITY UNIVERSAL JOINT

Nobuyuki Otsuka, Kawagoe, and Seiichi Hirai, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,800
Claims priority, application Japan, Dec. 15, 1977, 52-167663[U]
Int. Cl.³ F16D *3/33*
U.S. Cl. 64—21 **6 Claims**



1. An improved constant velocity universal joint having an outer member and an inner member each mounted through a ball cage having a plurality of balls mounted in respective ball windows, said balls being in engagement with respective pairs of longitudinally extending ball grooves formed in mutually facing spherical surfaces of the respective inner and outer members, said ball cage having front and rear edges and being inserted front edge first into said outer member, the improvement wherein the ball cage has an outer spherical surface in contact with the spherical inner surface of the outer member and is provided with respective longitudinally extending cut-out grooves continuing from each of the respective ball windows, said cut-out grooves being relatively small in size with contours substantially conforming to respective partition walls disposed between respective adjacent ball grooves in said outer member, said ball windows having front and rear edge portions, said cut-out grooves each being provided only at one said rear edge portion of each of said ball windows and extending longitudinally towards the rear edge of said ball cage, and each partition wall of the outer member is insertable in each cut-out groove.

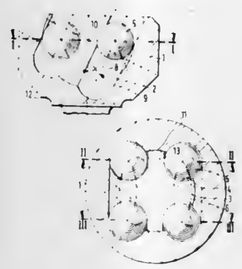
4,231,233

RIGID NON-SLIDING HOMOKINETIC UNIVERSAL JOINT

Werner Krude, Neunkirchen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Lohmar, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,706
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1978, 2804042
Int. Cl.³ F16D *3/30*
U.S. Cl. 64—21 **5 Claims**

1. Rigid (non-sliding) homokinetic universal joint comprising an outer hollow joint member having an axes of rotation and having a spherical inner surface defining the hollow interior, said outer joint member having a plurality of grooves formed into said inner surface, an inner joint member having an axis of rotation angularly displaceable relative to the axis of rotation of said outer joint member and positioned within said outer hollow joint member and having a spherical outer surface, said inner joint member having a plurality of grooves formed into said outer surface and the number of said grooves corresponds to the number of said grooves formed into said outer joint member, said grooves in said outer joint member and said inner joint member are arranged in opposed pairs one in each of the joint members, a ball is seated in each opposed pairs of said grooves for transmitting torque therebetween, each of said grooves having a center line and the center lines of



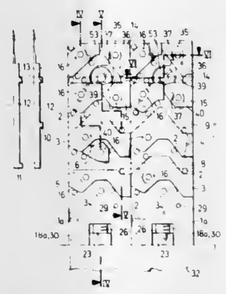
each opposed pair of grooves cross one another and form an angle therebetween, the centers of said balls guided in said opposed pairs of grooves being guided in a plane bisecting the angle between the axis of rotation of said inner and outer joint members, the spherical outer surface of said inner joint member is guided in the spherical inner surface of said outer joint member, the axis of rotation of said inner joint member and outer joint member intersecting at the center of the joint, wherein the improvement comprises that the center line of each of said grooves in said inner and outer joint members extends along a circular arc and a plane containing the circular arc intersects the axes of rotation of the joint member containing the groove at a location spaced from the center of the joint.

4,231,234

ASSEMBLY PLATE FOR ASSEMBLING CAM PARTS OF A KNITTING MACHINE

Manfred Schmid, Bempflingen; Martin Elsaber, Stuttgart, and Manfred Weik, Echterdingen, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Bonlanden, Fed. Rep. of Germany

Continuation of Ser. No. 728,460, Sep. 29, 1976, abandoned. This application May 30, 1978, Ser. No. 910,337
Int. Cl.² D04B *9/06, 15/34*
U.S. Cl. 66—27 **10 Claims**



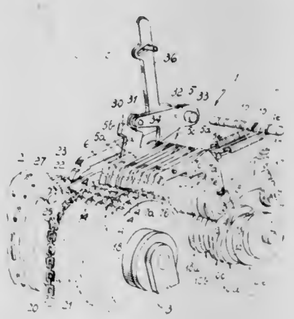
1. An assembly plate mounted on a cam base plate for the stationary and interchangeable assembling of at least one cam part of a group of cam parts of a knitting machine at at least one location on the assembly plate, said group including a plurality of cam parts of the same or different type, each cam part having an outer contour and one predetermined position at said location, and the assembly plate having a first surface and attaching means for mounting said cam parts on said assembly plate first surface and a plurality of first positioning means for association with said cam parts, said first positioning means being raised portions of the assembly plate which are integral and unitary with such plate, said first positioning means being located essentially entirely on said assembly plate first surface about the outer contour of each of said cam parts with respect to said attaching means for non-rotatably and non-slidably maintaining said cam parts in position to accurately orient said cam parts into a selected needle guidance position, at least one cam part having only one position on said assembly plate in which all of said first positioning means associated with such one cam part bear against the outer contour of such one cam part, said first positioning means having a height above said first surface of the assembly plate less than the height of the cam parts so that butts of a needle assembly will contact only the cam parts and will not come into contact with said first positioning means, said assembly plate including means for mounting said plate on the cam base plate.

4,231,235

DEVICE FOR ADVANCING THE MAIN DRUM IN A CIRCULAR KNITTING MACHINE

Francesco Lonati, Via Valsorda, 28, Brescia, Italy

Filed Apr. 9, 1979, Ser. No. 28,154
Claims priority, application Italy, Apr. 14, 1978, 22355 A/78
Int. Cl.³ D04B *15/00*
U.S. Cl. 66—236 **4 Claims**



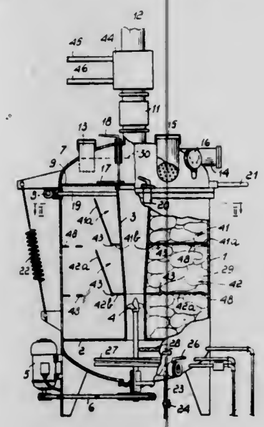
1. In a circular knitting machine having at least one needle cylinder, a main drum for controlling knitting steps and a sawtooth ratched wheel rigid with said drum, a device for controlling advancement of said drum, said device comprising a primary pawl and four secondary pawls, a number of rows of teeth on said ratched wheel corresponding to the number of said pawls, said teeth each having a tip and an axial width, means for moving back and forth said primary pawl and said secondary pawls such that said primary pawl performs one back and forth movement during two revolutions of said at least one needle cylinder and said secondary pawls each performs two back and forth movements in regular succession within the span of two revolutions of said at least one needle cylinder, means for inactivating said primary pawl according to a knitting program, programming members arranged between said rows of teeth, said programming members extending circumferentially over a distance related to said knitting program and radially at least as far as said tips of said teeth, each of said secondary pawls having a working end having a width greater than said axial width of said teeth.

4,231,236

DYEING MACHINE, PARTICULARLY FOR DYEING AND DRYING STOCKING ARTICLES AND LIKE GARMENTS

Bruno G. Tratta, and Ermanno Taglaferri, both of Calvisano, Italy, assignors to Tidue S.r.l., Giovanni In Croce, Italy

Filed Apr. 7, 1978, Ser. No. 894,311
Claims priority, application Italy, Apr. 18, 1977, 22563A/77
Int. Cl.[2] D06B 5/24
U.S. Cl. 68—15 **4 Claims**



1. A machine for dyeing and drying stocking articles and like garments contained in bags, comprising a substantially cylindrical vessel for receiving said bags, said vessel having a cover and a bottom, a plurality of perforated diaphragms arranged horizontally inside said vessel spaced from one another for supporting said bags in superimposed layers, a tubular element penetrating said perforated diaphragms centrally and extending in said vessel coaxially thereto and spaced from said cover and said bottom, a driven propeller accommodated in said tubular element, means for supplying a treating liquid to said vessel and for discharging said liquid from said vessel, means for heating said liquid, and means for supplying drying air to said vessel and for discharging said drying air from said vessel, wherein said perforated diaphragms comprise an upper and a lower perforated diaphragm located respectively next to said cover and said bottom of said vessel, and intermediate perforated diaphragms each having a central cross member and two perforated tiltable portions, said tiltable portions being oppositely located with respect to said cross member and pivotally supported thereby to be tilted in a position allowing loading and unloading of said bags.

4,231,237

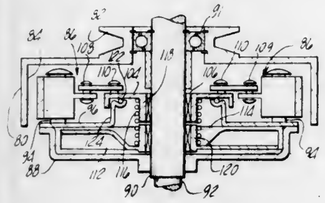
WASHING MACHINE WITH DELAYED ACTION DRIVE CLUTCH

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 21, 1978, Ser. No. 972,117
Int. Cl.[3] D06F 23/04, 37/40
U.S. Cl. 68—23.7 **22 Claims**

1. A delayed action drive mechanism comprising:
a first drive member;
a second drive member;
movable engagement means including at least one clutch member mounted to said second drive member and movable into engagement with said first drive member to establish a driving engagement therebetween;
delay means retarding movement of said at least one clutch member into said engagement with said first drive member, said delay means including:
a rotary member;
means causing rotation of said rotary member by movement of said at least one clutch member towards engagement with said first drive member;
damping means driven by said rotary member and imposing a viscous damping force thereon resisting said movement, whereby said viscous damping force delays the movement of said at least one clutch member into engagement with said first drive member, whereby engagement is delayed.

12. In a clothes washing machine of the type including a tub and a perforate basket disposed within said tub, means for introducing a washing liquid into said tub and basket, an agitator mounted within said basket, recirculation pump means for pumping washing liquid into said basket during washing and rinsing cycles of operation of said washing machine to produce an increased liquid level in said basket relative to the liquid level in said tub, drain pump means for pumping liquid out of said basket and tub during centrifugal extraction cycles of operation of said machine, and drive means including a drive motor directly connected to said recirculation and drain pump means, transmission means for oscillating said agitator for washing and rinsing operation and for rotating said basket for centrifugal extraction operation and clutch means drivingly connected between said motor and said transmission; said clutch means including:



an input drive member connected for rotation by said motor;
at least one clutch member constructed and arranged to move outwardly in response to rotation of said input drive member;
an output drive member connected to said transmission and located for engagement by said at least one clutch member after a predetermined outward movement of said at least one clutch member so as to establish a driving connection therebetween;
a damping means; and
a rotary damper plate associated with said damping means and connected to said at least one clutch member; said at least one clutch member causing rotation of rotary damper plate relative to said damping means in response to outward movement of said at least one clutch member and said damping means being effective to impose a viscous damping force on said rotary damper plate opposing such relative;
whereby engagement of said at least one clutch member with said output drive member is delayed to thereby delay the oscillation of said agitator and the rotation of said basket, respectively, for a predetermined period after said recirculation and drain pump means, respectively, are activated by said drive motor.

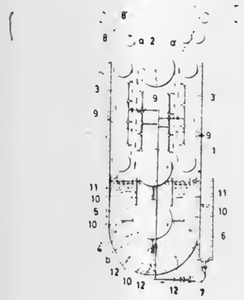
4,231,238

APPARATUS FOR THE LIQUID TREATMENT OF A CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Wakayama, Japan

Filed Mar. 23, 1979, Ser. No. 23,256
Claims priority, application Japan, Mar. 30, 1978, 53-41433[U]; Mar. 30, 1978, 53-41434[U]
Int. Cl.[2] D06B 3/16, 21/02, 23/04
U.S. Cl. 68—62 **9 Claims**

1. An apparatus for the liquid treatment of a cloth comprising an upwardly arranged, open top, U-shaped liquid tank, said tank consisting of an upper portion and a lower portion and at least the lower portion thereof arranged to contain a treating liquid, endless net conveyer means located within said upper and lower portions of said tank for conveying a cloth therethrough, said endless net conveyer means including a plurality of upwardly extending net conveyer sections, a first and a second said net conveyer sections disposed in relatively closely spaced relation within the upper portion of said tank and forming therebetween an inlet passage for feeding cloth downwardly into said tank, third and fourth said net conveyer sections disposed in relatively closely spaced relation in the upper part of said tank and forming therebetween an outlet passage for removing cloth upwardly from said tank, a plurality of liquid jet nozzles spaced apart along each of the opposite sides of said inlet and outlet passages and said jet nozzles on the opposite sides of said passages being offset in the upward direction relative to one another and positioned relative to said net conveyer sections forming said passages so that said jet



nozzles direct a treating liquid through said net conveyer sections in the generally horizontal direction for colliding alternatively with opposite sides of the cloth passing through said passages so that the cloth alternately collides with said conveyer sections forming the opposite sides of said passages, said conveyer means forming at least a side of a lower cloth passage located within said lower part of said tank and extending between the lower end of said inlet passage and the lower end of said outlet passage, said tank having a liquid level therein located at least at the upper end of said lower cloth passage, the opposed sides of said lower cloth passage being spaced a greater distance apart than said conveyer sections forming said inlet and outlet passages so that the cloth entering said lower cloth passage from said inlet passage assumes a folded over state and remains in the folded over state between the end thereof where the cloth enters said lower cloth passage from said inlet passage and the end thereof where the cloth exists from said lower cloth passage and enters said outlet passage.

4,231,239

SPRAY WASHER SYSTEM

Gary G. Lazaroff, 144 Gunston Hall Ct., Chesterfield, Mo. 63017

Filed Apr. 16, 1979, Ser. No. 30,451
Int. Cl.[3] D06F 35/00
U.S. Cl. 68—205 R **5 Claims**

1. In a spray washing system for garments including a spray station through which garments are transported in a generally vertical plane, the spray station having a set of vertically spaced pipes with parallel axis extending generally parallel to said plane, each of said pipes forming an acute angle with the horizontal, a spray nozzle mounted on each of said pipes and arranged to direct a spray against garments in said plane, and means for rotatively oscillating the pipes about their axes to cause the spray area of the nozzles mounted thereon to oscillate, wherein the improvement comprises:
(a) the means for rotatively oscillating said pipes comprising means for interconnecting the vertically spaced pipes for simultaneously rotatively oscillating the vertically spaced pipes, the interconnecting means including:
1. bars rigidly connected to and extending from the pipes, and
2. links rotatively connected to the bars of two vertically spaced pipes on rotative axes parallel to the pipe axes for providing simultaneous movement of the interconnected bars,
(b) the means for rotatively oscillating the pipes further comprising an arm rotatively connected to a bar on one of said pipes on a rotative axis parallel to the axis of said one pipe for oscillating said pipes,
(c) the means for rotatively oscillating the pipes further comprising:



1. a motor means,
2. a drive wheel rotatively driven by the motor means,
3. the arm being operatively connected to the drive wheel for oscillating the arm,
4. a base mounted on the spray station, the base carrying the motor means and drive wheel,
5. a connecting rod having one end rotatively connected to the drive wheel, and
6. a lifter pivotally mounted to the base, the other end of the connecting rod being rotatively connected to the lifter, and the arm being rotatively connected to the lifter, the lifter being pivotally oscillated by the rod to oscillate the arm,

(d) the base is adjustably mounted to the spray station, the plane of the base being parallel to the axes of the pipes, and being at an acute angle with the horizontal, and
(e) the drive wheel connecting rod and lifter are mounted on rotative axes parallel to the plane of the base.

4,231,240

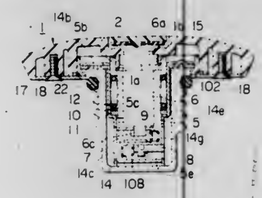
SCREW PLUG ASSEMBLY

Masao Fujita, Fukushima, and Kiyoshi Kitaori, Hiratsuka, both of Japan, assignors to Nissan Shatai Kabushiki Kaisha, Hiratsuka and Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 28, 1978, Ser. No. 929,194
Int. Cl.[3] B65D 55/14
U.S. Cl. 70—173 **6 Claims**

1. A screw cap assembly comprising a manually rotatable handle piece, a cylindrical case connected with said handle piece for rotation therewith, a key-operated cylinder lock

within said cylindrical case, said handle piece having an opening providing access for inserting a key into said lock to rotate said lock relative to said case between a locked position of the lock and an unlocked position of the lock, an externally threaded cylindrical screw plug surrounding said case, clutch means between said case and said screw plug for transmitting rotary motion from said case to said screw plug, means providing a driving connection between said clutch means and said plug and latch means carried by said case for effecting a drive connection between said case and said clutch means both in the screw advancing and screw retracting directions of rotation of said plug when said lock is in its unlocked position and for effecting a drive connection between said case and said clutch only in the screw advancing direction of rotation of said plug when said lock is in its locked position while allowing rotation of the case and handle piece relative to the plug in the screw retracting direction of the plug when said lock is in its locked position, said latch means including a first latch member, complimentary latching formations on said first latch member and



on said clutch means providing a positive drive connection between said case and said clutch means in the screw advancing direction of rotation of said screw plug and allowing relative movement between said case and said clutch means in the screw retracting direction of rotation of said screw plug, means urging said first latch member into engagement with said clutch means to interconnect said complimentary latching formations, a second latch member, further complimentary latching formations on said second latch member and on said clutch means providing a positive drive connection between said case and said clutch means in the screw retracting direction of rotation of said screw plug, further means urging said second latch member into engagement with said clutch means to interconnect said further complimentary latching formations and means providing a mechanical connection between said lock and said second latch member for withdrawing said second latch member from engagement with said clutch means and disconnecting said further complimentary latching formations when said lock is in its locked position.

4,231,241

VEHICLE SHIFTER LOCKING DEVICE

Frank F. Lipski, Los Angeles, Calif., assignor to Marshall A. Lerner, Los Angeles, Calif., trustee of Henry Bissell, a part interest

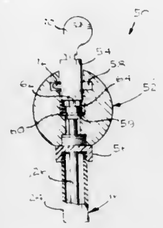
Filed Aug. 24, 1978, Ser. No. 936,631
Int. Cl.[2] B60R *25/06*; E05B *65/12*; G05G *1/04, 5/06*
U.S. Cl. 70—195 **12 Claims**

1. A shifter locking device for use with a shifter for an automatic transmission having a PARK position, which shifter includes a shift lever housing and a lockable central release post projecting therefrom which is operative to release a latching mechanism retaining the transmission in said PARK position, comprising:

a shifter grip adapted for attachment to the shift lever housing in a position encasing the projecting release post;

a lock member attachable to the release post within the shifter grip and projecting therefrom to permit a user, by moving said lock member, when in an unlocked state, to move the release post to release the transmission latching mechanism; and

means for preventing detachment of said shifter grip from said shift lever housing including shift grip retaining means located within the shifter grip between said lock member and said shift lever housing; and



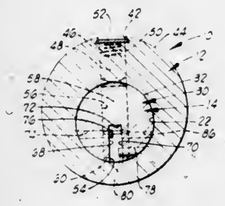
wherein said shift grip retaining means includes a nut threaded onto the release post and a washer positioned between said release post and said nut to thereby prevent detachment of said shifter grip from said shift lever housing when said lock member is in the locked state.

4,231,242

PLUG FOR A KEY OPERATED LOCK

Lewis J. Hill, Grove, and Bill J. Dillard, Mustang, both of Okla., assignors to U-Change Lock Industries, Inc., Oklahoma City, Okla.

Continuation of Ser. No. 800,699, May 26, 1977, abandoned.
This application Oct. 23, 1978, Ser. No. 953,932
Int. Cl.[3] E05B *15/06*
U.S. Cl. 70—347 **2 Claims**



1. An improved plug for a key operated lock having a lock body, comprising:

a cylindrical plug body removably supported by the lock body and having a key slot formed longitudinally therein, the plug body having a first internal surface defining one transverse limit of the key slot and a second internal surface defining another transverse limit of the key slot, the plug body having a plurality of stud bores intersecting the cylindrical periphery of the plug body and the first internal surface of the plug body, and the plug body having a plurality of stud bores intersecting the cylindrical periphery of the plug body and the second internal surface of the plug body;

a first stud member secured within one of the stud bores intersecting the first internal surface and having a portion thereof projecting into the key slot; and

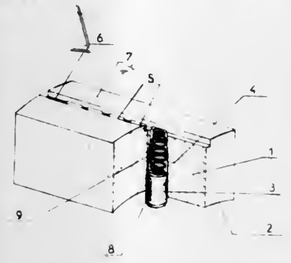
a second stud member secured within one of the stud bores intersecting the second internal surface and having a portion projecting into the key slot so that the first and second stud members coact to only permit entry into the key slot of a key having a preselected key blank design determined by the selected placement of stud members in the stud bores.

4,231,243

PIN TUMBLER LOCKS AND THEIR ASSEMBLY

Andre Thirion, Dijon, France, assignor to Antivols Simplex, France

Filed May 25, 1978, Ser. No. 909,456
Claims priority, application France, May 25, 1977, 77 15862
Int. Cl.[2] E05B *9/04, 15/14, 27/04*
U.S. Cl. 70—364 A **7 Claims**



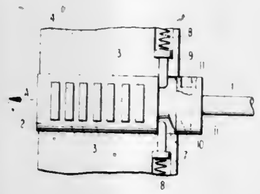
1. A tumbler lock comprising a body having an axial cylindrical hole in which a cylindrical plug is mounted for rotation, the plug comprising an axial key passage and a plurality of axially aligned radial holes opening into the said key passage and into the peripheral surface of the plug, a tumbler slidably mounted in each of the said radial holes, the body comprising a plurality of axially aligned radial holes opening into the said axial hole, a further tumbler biased towards the plug by means of a spring sliding in each of the radial holes of the body, each of said radial holes in the body having a cylindrical portion adjacent to the axial hole and a conical portion extending from said cylindrical portion and narrowing towards the periphery of the said body, said conical portion communicating with the exterior of the body and being dimensioned for having the associated further tumbler wedged therein.

4,231,244

CYLINDER LOCK, ESPECIALLY FOR MOTOR VEHICLES

Rolf Krügener, and Hermann W. Kurth, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,733
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748408
Int. Cl.[3] E05B *63/00*
U.S. Cl. 70—422 **8 Claims**



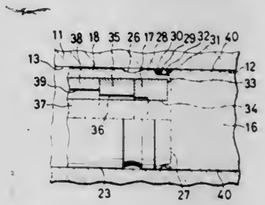
1. A cylinder lock, comprising rotor means having tumbler means which engage into at least one tumbler channel means provided in the inner wall of a stator means receiving the rotor means, when a key is pulled off in the locking position, said rotor means being operable to be connected with at least one locking element, characterized in that the rotor means is provided with an intentional rupturing place adjoining the last tumbler means, as viewed in the key insertion direction, which ruptures during a forcible pulling out of the rotor means, whereby an elastically engaging locking not accessible from the outside takes place between the rotor and stator means, characterized in that said elastically engaging locking is facilitated through the use of resiliently engaging locking means comprising at least one guided bolt means which, when the rotor is pulled out, initially contacts an inlet bevel, then yields resiliently and finally engages an associated recess.

4,231,245

INDIRECT EXTRUSION APPARATUS

Jintaro Ishiba, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 773,147, Mar. 1, 1977, Pat. No. 4,144,734.
This application Nov. 20, 1978, Ser. No. 961,989
Int. Cl.[3] B21C *35/04, 27/00*
U.S. Cl. 72—253 A **6 Claims**



1. An indirect extrusion apparatus, comprising:

(a) a support;

(b) a container having a through bore defined by an inner surface and receptive of a billet;

(c) a die holder fixed at one end to said support, receptive of an orificed die at its other end, and having a peripheral surface portion with a close sliding fit with said inner surface, there being a generally axially facing annular step surrounding that portion thereof which is receptive of the die and defining with said bore the end of an annular space extending to said other end without restriction;

(d) a retractable ram for moving said container and the billet to effect extrusion of the billet through the die orifice whereby impurities are collected as an annular portion of a butt by said step in said annular space;

(e) an actuator connected to said container for shifting the same when said ram is retracted from said container;

(f) a retractable gate extendable to a position to act between said support for the die holder and said container for enabling said actuator to dispose said container in a predetermined position with respect to said other end of said die holder which it surrounds; and

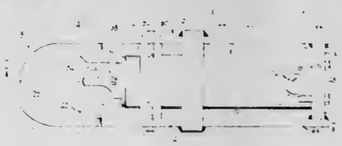
(g) a shear movable across the end of said bore for severing the butt of the billet from its annular portion and from the extrusion when in said predetermined position.

4,231,246

CRIMPING TOOL FOR TUBULAR-LIKE OBJECTS AND METHOD

Edward J. Gorenc, 19014 Chickasaw, Cleveland, Ohio 44119; Ulles E. Fox, 14406 Sylvia Ave., Cleveland, Ohio 44110, and Imre A. Lesko, 1318 Washington Blvd., Mayfield Hts., Ohio 44114

Filed Oct. 31, 1978, Ser. No. 956,368
Int. Cl.[3] B21D *15/03, 37/00*
U.S. Cl. 72—412 **18 Claims**



1. In a tool for exerting a crimping like force on a boiler tube or the like, mounted in relatively closely spaced relation to

other similar tube elements projecting generally laterally from an associated boiler drum, for physically deforming the tube from the exterior thereof along an area running generally lengthwise of the tube for removal of the latter from attachment to the drum comprising, a frame, reciprocal fluid power means mounted on said frame and adapted for extension and retraction generally lengthwise of the frame, said frame including a closed, relatively thin collar portion at one end thereof disposed generally symmetrically on opposite sides of an axis running lengthwise of said frame and generally parallel to the direction of extension and retraction of said power means, said collar portion being adapted to receive therethrough an associated tube, and a force applying non-piercing head secured to said power means for applying deforming force to the tube when the latter is disposed in extending relation through said collar portion of said frame between said collar portion and said head, and upon application of pressurized fluid to said power means for causing extension of said power means, said collar portion including an underside surface adapted for general engagement with the exterior of the boiler drum in the operative position of the tool wherein an associated tube is received through said collar portion preparatory to removal of the tube, said head commencing generally adjacent the plane of said underside surface and extending generally vertically upwardly therefrom so as to be operative to apply the deforming force lengthwise of the associated tube commencing generally adjacent the connection of the associated tube to the boiler drum.

4,231,247

DENT STRAIGHTENING TOOL

Charles R. Haydon, No. 20, Seattle Motor Ct., 19326 Pacific Hwy. S., Seattle, Wash. 89188

Filed May 7, 1979, Ser. No. 36,434
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—479 **4 Claims**



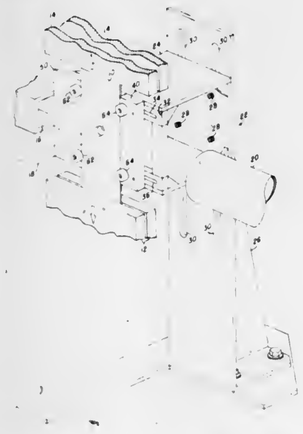
1. A tool for use in straightening a dent in a sheet metal skin, comprising:
(a) an elongate shaft;
(b) an integral handle at one end of said shaft; and
(c) work piece engaging, helical threads integrally formed in the opposite end of said shaft, said threads comprising,
(1) a substantial constant diameter root portion;
(2) a tapered thread portion disposed along the length of said root;
(3) a blunt tip at the distal end of said thread portion opposite said handle; and
(4) said thread portion beginning from a minimum radius at said tip and progressively increasing in radius along the length of said root to a depth substantially greater than the radius of said root portion to thereby provide a thread with a relatively large anvil surface area disposed substantially perpendicular to the length of said root,
so that when the tool is threadably engaged within an initial hole provided in the dented sheet metal of a diameter slightly larger than the root diameter, only a narrow slit is formed in the dented sheet metal extending radially from the initial hole for a distance corresponding to the maximum radius of said threads to thereby provide a substantial anvil contacting surface against which the dented sheet metal can bear when the tool is pulled in an outwardly direction.

4,231,248

LASER TENSILE TEST SAMPLE HOLDER

Edmund J. Rolinski, Dayton, Ohio, and Bernard Laub, Cupertino, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 15, 1979, Ser. No. 48,875
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—15.6 **4 Claims**



1. In combination with a system for the simultaneous laser, wind tunnel and tensile machine testing of flat plate test samples wherein the tensile machine is located to approximately align the test sample parallel to the flow from a wind tunnel nozzle; a test sample holder for maintaining substantial alignment of the test sample parallel to the wind tunnel flow, comprising: a frame member; a stationary sample alignment member secured to the frame member, upstream in the wind tunnel flow from the test sample; an adjustable sample alignment member secured to the frame member, downstream in the wind tunnel flow from the test sample; means for supporting said frame member on the tensile machine with the stationary alignment member and the adjustable alignment member aligned substantially parallel to the flow from the wind tunnel nozzle; means for positioning the test sample with respect to the stationary alignment member and the adjustable alignment member to provide a smooth flow from the wind tunnel across the stationary alignment member, the test sample and the adjustable alignment member.

4,231,249

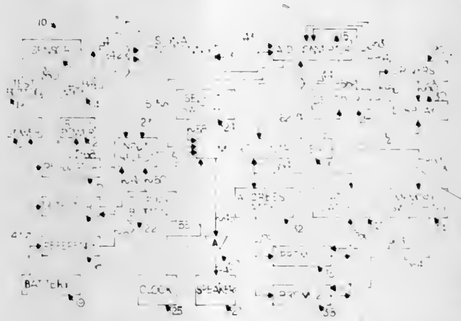
APPARATUS AND METHODS FOR MONITORING CONCENTRATIONS OF TOXIC SUBSTANCES IN A WORK ENVIRONMENT

Matthew M. Zuckerman, Palo Alto, Calif., assignor to Sierra Labs, Inc., Sunnyvale, Calif.

Filed Mar. 20, 1979, Ser. No. 22,285
Int. Cl.³ G01N *27/18*
U.S. Cl. 73—23 **9 Claims**

1. A portable, personal monitor for measuring and displaying the concentrations of toxic substances to which an individual wearing the monitor is exposed during a shift or other work period of the individual, said monitor comprising,

sensor means for sensing the concentration level of the toxic substance in the air ambient to the monitor and effective to produce an analog signal having a magnitude dependent on the concentration level,
convertor means for converting the analog signal to a digital signal corresponding to the sensed concentration level,
controller means for
(a) indicating the present concentration level sensed by the monitor,



(b) determining and storing the maximum concentration level sensed during the work period, and
(c) computing and storing a time-weighted average of the concentration levels sensed during the work period, and
case means for mounting and housing the sensor means, convertor means, and controller means and constructed for wear by an individual whose exposure to the toxic substance is to be monitored during the work period.

4,231,250

APPARATUS FOR CONTINUOUS MEASUREMENT OF THE LIQUID LEVEL IN A CONTAINER

Dieter Leber, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,813
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2835744
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 V **10 Claims**



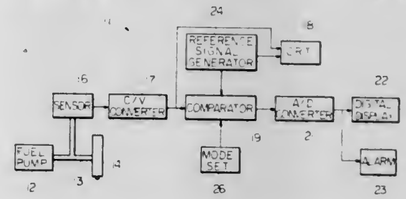
1. Apparatus for continuous measurement of the liquid level in a container having a floor, particularly a fuel tank of a motor vehicle, wherein a flexible, multiple-strand band cable is secured to the container and is an oscillation-determining element of an oscillator, the output of which communicates with a device to be operated thereby, such as a control or display stage, and wherein the length of the sensor is larger than the length required for the sensor to reach to the floor of the container, said sensor having at least a portion thereof doubled upon itself to define an arc or loop at the floor of the container, and support means engaging the sensor and holding the arc or loop means in constant, predetermined relationship relative to the container floor.

4,231,251

APPARATUS FOR SENSING SCHNARREN PHENOMENON IN FUEL INJECTION LINE

Hiroshi Hatsuno; Jinpei Fukazawa; Mitsuo Fukushima, and Shinji Ogawa, all of Higashimatsuyama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 17, 1979, Ser. No. 30,916
Claims priority, application Japan, Apr. 24, 1978, 53/48420
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—119 A **6 Claims**



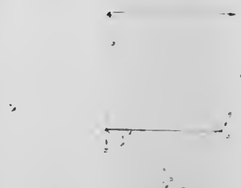
2. An apparatus for sensing a Schnarren phenomenon in a fuel injection line, characterized by comprising:
sensor means connected to the line for producing an electrical signal corresponding to fluid pressure in the line;
reference signal means for producing a reference signal having a predetermined frequency;
display means for displaying the electrical signal and the reference signal; and
comparator means for comparing a frequency of the electrical signal with a frequency of the reference signal and producing an output indicating a difference therebetween.

4,231,252

BOREHOLE DIRECTION MEASUREMENT MEANS

Leonard A. Cherkson, Mt. Isa, Australia, assignor to Mount Isa Mines Limited, Brisbane, Australia

Filed Nov. 20, 1978, Ser. No. 961,898
Claims priority, application Australia, Nov. 24, 1977, 2534
Int. Cl.³ E21B *47/024*
U.S. Cl. 73—151 **18 Claims**



1. Means for providing data for determining a change from one direction to another of a reference axis fixedly associated with a body, when at least one of said directions is non horizontal, comprising:
first gravity sensor means defining a first sensor direction which is at a constant sensor angle with respect to said reference axis, for producing a first signal or signals responsive to the component of the earth's gravity vector in said first sensor direction,
a mass fixedly associated with said body and mounted for undriven rotation about said reference axis, said first sensor means being, or being fixedly associated, with said mass; the inertia of said mass being such that said sensor direction at any instant is substantially independent of rotation of said body about said reference axis,
drive means whereby said mass may be driven to a predeter-

mined angular velocity about said reference axis and then allowed to rotate undriven, and

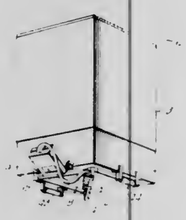
means for comparing selected parameters of said first signal or signals as occurring during one time period with said selected parameters as occurring during another time period.

4,231,253

AIR-FLOW CAPTURE AND CONTROL DEVICE FOR FLOW MEASUREMENT

Buff Ohnhaus, 120 Jackson NE., Albuquerque, N. Mex, 87108, and James D. Faith, 9804 Mary Ellen Pl. NE., Albuquerque, N. Mex. 87111

Filed Jun. 4, 1979, Ser. No. 45,051
Int. Cl.³ G01F *1/46*
U.S. Cl. 73—861.62 **11 Claims**



1. Portable apparatus for collecting and guiding an airflow to be measured, comprising:

a first frame (**1**) mounting an apertured panel (**25**) and provided with means for varying the open area of the panel aperture while maintaining it in a polygonal shape, said varying means comprising a plurality of movable members (**32–35**) of sheet material and means (**38–42**) for moving said members simultaneously and for indicating the aperture area defined by said members;

means (**4**) supported on said first frame for mounting the probe (**8**) of an air-velocity-meter adjustably with reference to the center of said aperture and for mounting the indicating portion (**9**) of said air-velocity-meter on said frame in an attitude making it easily readable by a person holding up said apparatus;

means (**27**) for sealing said members of said varying means with respect to said apertured panel (**25**);

a hood (**3**) foldable into said first frame and having folding legs (**46–50**) and a second frame (**52,12**) arranged to be held parallel to said first frame when said hood is erected; and

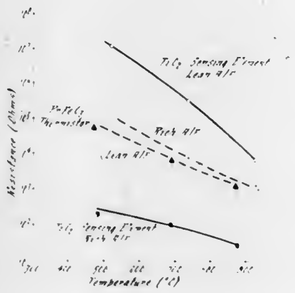
vanes (**71–74**) hingedly connected to said legs, firmly engageable together within said hood in the central region thereof, with their surfaces parallel to the axis of said hood when said hood is erected.

4,231,254

RARE EARTH OR YTTRIUM, TRANSITION METAL OXIDE THERMISTORS

Eleftherios M. Logothetis, Birmingham; Kamlakar R. Laud, and John K. Park, both of Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 857 ,498, Dec. 5, 1977, Pat. No. 4,162,631.
This application Mar. 12, 1979, Ser. No. 19,794
The portion of the term of this patent subsequent to Jul. 31, 1996, has been disclaimed.
Int. Cl.³ G01K *7/18*
U.S. Cl. 73—362 AR **1 Claim**



1. A thermistor that senses temperature in an oxygen varying environment, which comprises a compound corresponding to the formula $PrFeO_3$.

4,231,255

RATE MEASURING DEVICE FOR JOINT AND/OR MUSCULAR PERFORMANCE

Andre L. Haski, 224 Military Rd., Dover Heights, New South Wales 2030, Australia, and Cyriacus A. Bleys, Coogee, Australia, assignors to said Andre L. Haski, New South Wales, Australia, by said Cyriacus A. Bleys

Filed Jun. 25, 1979, Ser. No. 51,670
Claims priority, application Australia, Jul. 5, 1978, PD4951
Int. Cl.³ G01L *5/02*
U.S. Cl. 73—379 **9 Claims**



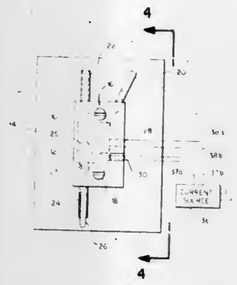
1. A rate measuring device for measuring joint and/or muscular performance, said device comprising a sealed bladder containing a fluid and adapted to be squeezed through the action of the joint and/or muscle the performance of which is to be tested; a pressure transducer in fluid communication with said bladder and providing an output indicative of the instantaneous pressure of said fluid; a plurality of comparators each connected to the output of said pressure transducer, the output of each comparator being enabled when said pressure transducer indicates that a corresponding one of a plurality of different predetermined pressure thresholds has been exceeded, the number of said thresholds corresponding to the number of said comparators; and timing and recording means operable by said comparators to record the time at which each pressure threshold is exceeded.

4,231,256

THERMOELECTRIC GAS DRYER

Robert L. Chapman, La Habra, and John N. Harman, III, Placentia, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 5, 1979, Ser. No. 9,203
Int. Cl.³ G01N *1/22*
U.S. Cl. 73—421.5 R **17 Claims**



1. An apparatus for drying a flowing sample stream of gas containing moisture, said apparatus comprising:

housing means having three paths intersecting at a predetermined point within said housing;

an inlet coupled to a first of said three paths to receive said sample gas stream;

an outlet coupled to a second of said three paths to exhaust said sample gas stream;

wick means disposed within a third of said three paths, said wick means having one end situated to absorb and transmit any condensate out of the flow of said sample gas stream;

cooling means coupled to said housing means and responsive to temperature changes for maintaining the temperature of said housing below the dew point of said sample gas stream;

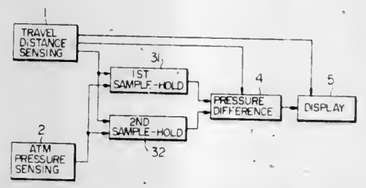
sensor means associated with said cooling means to sense the temperature of said housing and control the heat dissipation of said cooling means.

4,231,257

SLOPE SENSOR FOR A VEHICLE

Yasuhisa Yoshino, Okazaki; Akira Kuno, Oobu, and Yoshio Shimoda, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 20, 1979, Ser. No. 31,968
Claims priority, application Japan, Jun. 23, 1978, 53/76776
Int. Cl.³ G01C *23/00*
U.S. Cl. 73—432 CR **2 Claims**



1. A slope sensor for a vehicle comprising:

travel distance sensor means for generating a timing signal each time a vehicle travels a predetermined distance;

atmospheric pressure sensing means for generating an electric signal corresponding to an atmospheric pressure;

first and second sample-hold means, connected to said travel distance sensor means and said atmospheric pressure sensor means, for alternately sample-holding said electric signal corresponding to an atmospheric pressure in response to said timing signal; and

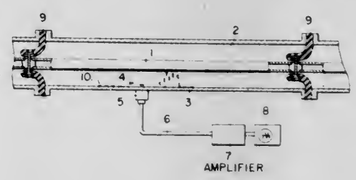
comparator means, connected to said first and second sample-hold means and said travel distance sensor means, for detecting a difference value of said electric signal held by said both sample-hold means.

4,231,258

METHOD AND APPARATUS FOR DETECTING FOREIGN MATTERS IN GAS SEALED ELECTRIC APPARATUS

Shinichi Menju, Atsugi; Kunio Takahashi, Yokohama; Eiichi Haginomori, Tokyo; Yoichi Murakami, Yokohama, and Eiichi Zaima, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha and Tokyo Denryoku Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 2, 1979, Ser. No. 571
Claims priority, application Japan, Jan. 19, 1978, 53-3711; Jan. 19, 1978, 53-3712
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—572 **2 Claims**



1. In a method for detecting for the presence of foreign matter in a gas sealed electrical apparatus including a tank at ground potential and containing an insulating gas and having a high voltage live element disposed in the tank, the improvement which comprises:

applying a voltage to the high voltage live element for causing generation of ultrasonic waves by collision of foreign matter with the tank, said waves being propagated through the tank;

sensing the ultrasonic waves produced by said collision which are propagated through the tank; and,

indicating the magnitude of the sensed ultrasonic waves to enable determination of the shape of the foreign matter.

4,231,259

METHOD AND APPARATUS FOR NON-DESTRUCTIVE EVALUATION UTILIZING THE INTERNAL FRICTION DAMPING (IFD) TECHNIQUE

Alagu P. Thiruvengadam, 10509 William Tell La., Columbia, Md. 21044, and Ambrose A. Hochrein, Jr., 18521 Kilt Ter., Olney, Md. 20832

Filed Aug. 11, 1978, Ser. No. 933,114
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—584 **23 Claims**

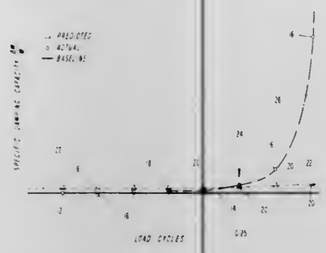
1. A method for detecting an incipient flaw in an object by measurement of the specific damping capacity of the object, comprising the steps of:

inducing an excitation having a predetermined amount of energy in the object to produce a stress in the anelastic stress range;

measuring a value indicative of changes in the specific damping capacity occurring in the object;

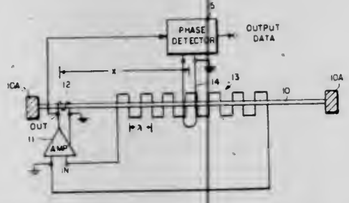
recording the measured value;

periodically repeating the steps of inducing, measuring and recording;
determining from the recorded values a baseline for the specific damping capacity of the object;



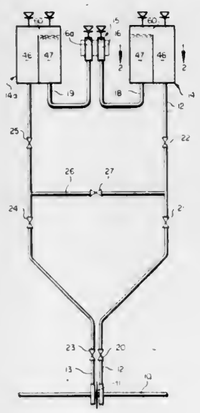
establishing a set of predetermined values which indicates the expected relationship of said measured values to said baseline; and
thereafter checking at intervals for a difference which is greater than a predetermined amount between the recorded values and the predetermined values.

4,231,260
POSITION DETERMINING SYSTEM
Jacques R. Chamuel, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Nov. 3, 1978, Ser. No. 957,462
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—597 **21 Claims**



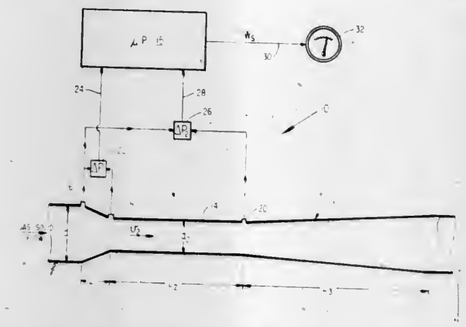
1. A position determining system comprising
at least one delay means capable of supporting a signal which travels along said delay means;
first transducer means coupled to said delay means and capable, when activated, of producing a traveling signal having at least one selected frequency, which signal travels along said delay means;
at least one second transducer means coupled to said delay means and responsive to said traveling signal to produce at least one electrical signal having said at least one selected frequency;
amplifier means responsive to said at least one electrical signal and capable of producing an output signal comprising a plurality of signal components of different frequencies, at least one of said signal components having said at least one selected frequency, said at least one electrical signal being arranged to be in phase with the at least one signal component having said at least one selected frequency;
means for supplying said output signal to said first transducer means to activate said first transducer means;
receiver transducer means relatively movable with respect to said delay means and coupled thereto for detecting said traveling signal as it travels past said receiver transducer means;
means for determining the delay of said detected signal as it travels from said first transducer means to said receiver transducer means whereby the position of said receiver transducer means relative to said first transducer means is determined; and
means for substantially reducing reflections of said traveling signal in said delay means.

4,231,261
FLUID PRESSURE MEASURING DEVICE
Charles W. Elmer, Merrillville, Ind., assignor to Inland Steel Company, Chicago, Ill.
Filed May 21, 1979, Ser. No. 41,107
Int. Cl.³ G01L *13/02*; G01F *1/38*
U.S. Cl. 73—716 **8 Claims**



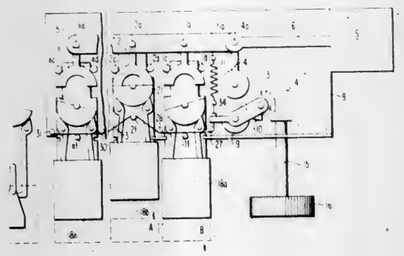
1. In a device for measuring the fluid pressure in a fluid-conducting conduit:
a first housing;
a cavity in said first housing, said cavity having a top, a bottom and side walls;
a diaphragm defining one wall of said cavity;
said first housing comprising means defining the other walls of said cavity;
said cavity comprising means for containing a liquid;
a second housing having a top, a bottom and side walls;
said second housing including a rigid, vertical interior wall terminating at a top end and dividing said second housing into two vertically disposed chambers each having an upper end and a lower end;
a first connecting line comprising means for placing a first of said two chambers in fluid communication with said fluid-conducting conduit and for transmitting to said first chamber the fluid pressure of the fluid in said conduit;
said first chamber comprising means for containing therein the fluid from said conduit;
a second of said chambers comprising means for containing a liquid with the top surface of said liquid above the top surface of the liquid contained in said cavity of the first housing and below the top of said second housing;
said second housing comprising channel means, located above said top end of said vertical interior wall, for placing the upper end of said chamber in fluid communication with the upper end of said second chamber and for transmitting the fluid pressure of the fluid in said first chamber to the liquid in said second chamber;
and a second connecting line comprising means for placing the bottom of said second chamber in liquid communication with the bottom of said cavity to transmit the fluid pressure on the liquid in said second chamber to the liquid in said cavity.

4,231,262
SYSTEM FOR MEASURING ENTRAINED SOLID FLOW
Richard H. Boll, deceased, late of Alliance, Ohio (by United National Bank & Trust Co., executor), and Walter L. Ghering, Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed Mar. 28, 1979, Ser. No. 24,769
Int. Cl.³ G01F *1/74*
U.S. Cl. 73—861.04 **5 Claims**



1. A system for measuring the flow of solids entrained in a fluid stream comprising:
a venturi assembly for passing the fluid stream therethrough having a converging section, a constant diameter section, and a diverging section;
a pair of pressure measuring devices connected to said venturi assembly to measure the pressure drop across different points of said venturi, said first measuring device measuring the pressure drop across the converging section of said venturi assembly and the second measuring device measuring the pressure drop across the converging and the constant diameter section of said venturi assembly; and
circuit means connected to said pair of pressure measuring devices to calculate the flow of solids through said venturi assembly according to a predetermined equation which is a function of the pressure drops across said venturi.

4,231,263
MANUAL AND AUTOMATIC CONTROL DEVICE FOR ELECTRONIC EQUIPMENT AND OTHERS
Luis M. Antonello, via XXI Aprile, 12, Rome, Italy
Filed Dec. 27, 1973, Ser. No. 428,952
Claims priority, application Italy, Dec. 29, 1972, 55132 A/72
Int. Cl.² F16H *35/18*; H01H *9/26*; H03J *5/06*
U.S. Cl. 74—10.33 **17 Claims**



1. A mechanical memory device comprising:
(a) a transverse bar,
(b) means supporting said bar for generally transverse movement relative to its longitudinal axis,
(c) input means for moving said bar to plural selected positions,
(d) plural means each for defining a distinct position of said bar, each comprising an element pivotally connected to said bar and rotatable relative to said bar upon movement thereof, said elements being spaced along said bar and each said element having engagement means having a distinct position for each position of said bar, and
(e) plural means for sensing selected positions of said bar, for storing said sensed positions and for actuating said bar to cause it to occupy positions thereof corresponding to said stored positions each comprising means movable transversely to said bar and having means for sensing and storing the position of said engagement means of said element, said sensing and storing means comprising means for engaging said engagement means movably carried by said transversely movable means.

4,231,264
DERAILLEUR MECHANISM
Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany
Filed Aug. 22, 1978, Ser. No. 936,569
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739543
Int. Cl.² F16H *7/22*
U.S. Cl. 474—80 **29 Claims**



1. A derailleur mechanism for the rear wheel of a bicycle and like vehicle comprising:
(a) a support element;
(b) mounting means for mounting said support element on said vehicle in a fixed position relative to the axis of rotation of said wheel;
(c) an elongated link member;
(d) an elongated guide member, each of said members including first and second longitudinal end portions;
(e) first and second pivot means respectively connecting said first longitudinal end portions to said support element for angular movement of said members relative to said support element;
(f) a carrier element;
(g) third and fourth pivot means respectively connecting said second longitudinal end portions to said carrier element for angular movement of said members relative to said carrier element;
(h) fifth pivot means connecting respective portions of said members intermediate said end portions thereof for relative angular movement of said members,
(1) said pivot means defining respective pivot axes extending in a common direction,
(2) said first, third, and fifth pivot means preventing significant longitudinal movement of said link member relative to said support element, said carrier element, and said guide member respectively,
(3) said second and fourth pivot means permitting move-

ment of said end portions of said guide member substantially in the direction of guide member elongation relative to said elements respectively;

(i) a chain wheel mounted on said carrier element for rotation in a plane substantially transverse to said axis of rotation in said fixed position of said support element; and

(j) operating means for moving said members relative to each other about the pivot axis of said fifth pivot means.

4,231,265

TOOTH GRIP BELT PULLEY

Horst Hanisch, Aidlingen; Heinrich Winkelmann, Ahlen, and Adolf Fischer, Haar, all of Fed. Rep. of Germany, assignors to Winkelmann and Pannhoff and Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,179

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655909

Int. Cl.³ F16H *55/44*

U.S. Cl. 474—152 **13 Claims**



1. A belt pulley of deformed sheet metal comprising a pulley rim, hub means axially positioned for receiving a shaft end and web means extending essentially radially between said pulley rim and said hub means, said pulley rim, hub means and web means being formed from one piece of sheet metal characterized in that the hub means is constructed pot-shaped and includes a cylindrical wall constructed as interference seat for a shaft end and a bottom wall constructed as axial abutment for the shaft end, the edge of the hub means passing over into the web means of the pulley, and characterized in that the bottom wall of the hub means is constructed double-walled of two sheet metal parts, in that one sheet metal part extends up to areal connecting places of the other sheet metal part, and in that the two sheet metal parts are non-detachably connected with each other at the bottom of the hub means as also at said connecting places.

4,231,266

LUBRICATING DEVICE FOR POWER TRANSMISSION UNIT

Kazuyoshi Nishikawa; Makoto Uno, and Hideaki Koga, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 31, 1978, Ser. No. 929,235

Claims priority, application Japan, Oct. 12, 1977, 52/122273

Int. Cl.² F16H *57/04*; F16N *7/26*

U.S. Cl. 74—467 **7 Claims**

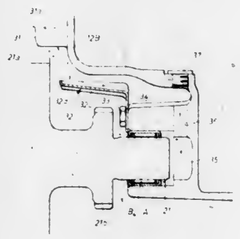
1. In a power transmission unit for a motor vehicle comprising:

a housing to be secured to a cylinder block of an engine, said housing having upper and lower chambers therein;

a power input member located within said housing for connection to a crankshaft of the engine by means of a disengageable coupling arranged within the upper chamber of said housing, the power input member being supported from said housing by a pair of axially spaced bearings;

a change-speed gearing means arranged within the lower chamber of said housing and having a mainshaft and a countershaft, each supported from said housing, parallel to said input member, by a respective pair of axially spaced bearings; and

an idler shaft arranged between said power input member and said mainshaft and supported from said housing, parallel to said power input member, by a pair of axially spaced bearings, said idler shaft being provided with an idler gear and with a reverse driving gear spaced from



said idler gear, said idler gear meshing in a common vertical plane with a driving gear on said power input member and with an input gear on said mainshaft, and said reverse driving gear being adapted to mesh in a common vertical plane with a reverse gear axially spaced from said input gear on said mainshaft by way of a reverse idler gear on a reverse idler shaft;

the improvement wherein said housing is provided on the inner wall thereof with a protrusion located above said idler gear and having a vertical guide face to be splashed with lubricating oil pumped up by rotation of said idler gear, and an oil receiver is secured to a bearing boss of said housing, said receiver having a guide portion located above said reverse driving gear and inclined toward the bearing on said idler shaft in the region of said reverse driving gear to receive the oil dropping from said protrusion.

4,231,267

ROLLER HYDRAULIC VALVE LIFTER

Louis J. Van Slooten, West Olive, Mich., assignor to General Motors Corporation, Detroit, Mich.

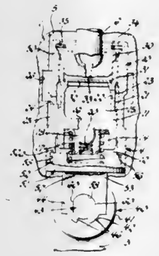
Filed Nov. 1, 1978, Ser. No. 956,644

Int. Cl.² F16H *53/06*

U.S. Cl. 74—569 **2 Claims**

1. In a valve tappet of the type including a follower with a cam follower roller rotatably journaled on a roller shaft, the improvement wherein said follower has two pairs of oppositely facing depending struts thereon with a roller space therebetween, each said strut including a depending tang at the free end thereof; each said pair of said struts having a shaft space between facing said struts aligned with the shaft space of

the other said pair of said struts and, wherein said roller shaft includes an intermediate circular journal portion on which said cam follower roller is journaled and free end portions at opposite ends thereof; each said free end portion having opposed flats thereon, each said flat being connected by a radial abutment shoulder to said circular journal portion, said free ends with said flats thereon of said roller shaft being slidably re-



ceived in said shaft spaces with said roller shaft then retained against axial movement in opposite directions by abutment of the said abutment shoulders against said struts, the free ends of said depending tangs of each said pair of said struts being positioned so as to at least partly encircle said free end portions of said roller shaft whereby to retain said roller shaft and therefor the cam follower roller to said follower in unit assembly therewith.

4,231,268

FLYWHEEL FOR SMALL SIZE TAPE RECORDER

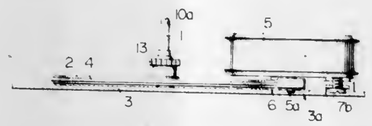
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,368

Claims priority, application Japan, Jul. 30, 1976, 51/91153

Int. Cl.³ G05G *3/00*

U.S. Cl. 74—572 **5 Claims**



1. A flywheel for a small size tape recorder, the flywheel being directly engaged at its periphery by an output wheel of a motor, the output wheel rotating about an axis which is substantially parallel to the axis of rotation of the flywheel so that upon rotation of the output wheel in one direction the flywheel rotates in an opposite direction, the flywheel being constructed to satisfy the following relationship;

$$I_F = I_M \times n$$

where I_M represents the moment of inertia of the motor about its output shaft, I_F the moment of inertia of the flywheel, and n the ratio W_M/W_F wherein W_M and W_F represent the angular velocity of the output shaft of the motor and the flywheel, respectively, whereby the angular momentum of the flywheel substantially balances the angular momentum of the output wheel.

4,231,269

Patent Not Issued For This Number

4,231,270

ELECTRICALLY DRIVEN FASTENING APPLIANCE

Katsuyuki Totsu, No. 1-17-8, Higashi-Mukojima, Sumida-ku, Tokyo, Japan

Filed Jul. 5, 1978, Ser. No. 922,127

Claims priority, application Japan, Jul. 7, 1977, 52-81381; Sep. 13, 1977, 52-109444

Int. Cl.³ B25D *23/142*

U.S. Cl. 81—474 **6 Claims**



1. A power fastening tool comprising a housing closed at one end, a tool driving spindle journalled at said closed end and extending outwardly therefrom, an electric motor mounted in said housing and having the drive shaft extending therefrom and an automatic clutch control planetary gear system interconnecting said motor drive shaft and said spindle, said gear system comprising a central gear fixed to said motor drive shaft, a plurality of planetary gears arranged around said central gear supported on a planet carrier connected to said spindle and drivable by said central gear and an annulus member having an internal gear which coacts with the planetary gears for revolution about the central gear, said annulus member having one end closed to form a face in opposition to the closed end of said housing, said annulus face and said closed end being provided with resiliently engagable clutch means operating to respectively maintain said annulus member stationary relative to said housing on application of a first torque not exceeding a predetermined level and to permit rotation of said annulus member with respect to said housing on application of a second torque greater than said predetermined level.

4,231,271

ATTACHMENT FOR BOLT TIGHTENING AND REMOVING DEVICE

Keiichi Yamada, 20-19, Hancho 4-Chome, Minou-Shi Osaka Prefecture, Japan

Continuation-in-part of Ser. No. 788,308, Apr. 18, 1977. This application Dec. 19, 1978, Ser. No. 971,053

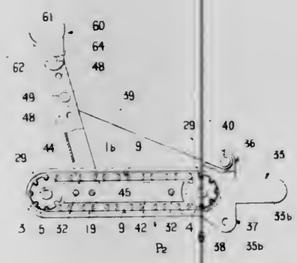
Claims priority, application Japan, Dec. 21, 1977, 52-173075[U]

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.3 **8 Claims**

1. An attachment (P1; P2) for a tightening and removing

device (**18**; **25**) for objects such as bolts, nuts and the like, comprising: an elongated casing (**2**; **26**); an input shaft (**14**; **28**) journaled at one end of said casing for attaching said tightening and removing device; a chain wheel (**4**) lodged in said casing and formed integrally with said input shaft; an output shaft (**16**; **28**) journaled at the other end of said casing for attaching a socket (**15**) that serves to grip the objects; a second chain wheel (**3**) lodged in said casing and formed integrally with said output shaft; an endless chain (**19**) lodged longitudinally in and along said casing for interconnecting said wheels; reaction force



receiving means (**21**, **22**; **33**, **39**, **44**) provided in said casing, said reaction force receiving means (**33**, **39**, **44**) including a reaction force receiving lever (**44**) whose rear end is attached (**45**) to said casing (**26**) in such a manner that the free end thereof serves to contact the objects; and means (**36**, **37**, **40**) for selectively attaching a supporter (**39**) to said casing (**26**) and for selectively projecting said reaction force receiving lever (**44**) to either side of said casing, towards the outside of said output shaft (**28**), according to the direction in which the reaction force is made to work.

4,231,272

TRIM CHUTE AND METHOD

Jere W. Crouse, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

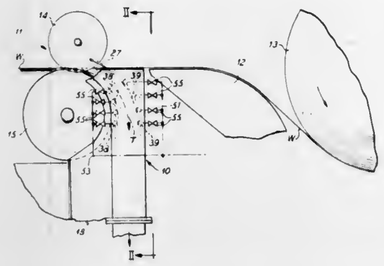
Filed Oct. 10, 1978, Ser. No. 949,788
Int. Cl.³ B65H *35/02, 29/24*
U.S. Cl. 83—98 **23 Claims**

1. A trim chute assembly for receiving trim strip severed by a slitter from the margin of a travelling web, comprising:

chute means defining a generally downwardly extending passageway for guiding the trim strip along a path downwardly away from the slitter;

said chute means having opposed spaced passageway-defining wall surfaces between which the trim strip is adapted to pass freely downwardly in the passageway;

and means for supplying low velocity air downwardly and biasing the air generally toward and then to flow downwardly along said wall surfaces with enhanced coanda effect and providing cushioning, lubricating air layers which move substantially parallel to the direction of travel of the trim strip and at a controlled velocity about the same as the speed of travel of the travelling web so that as the air layers move downwardly along said path between said chute means wall surfaces and both of said



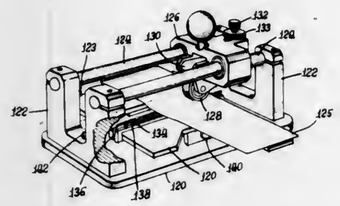
opposite faces of the trim strip flotation of the strip downwardly in the passageway free from contact with said surfaces is effected and movement of the strip away from the slitter along said path is facilitated.

4,231,273

APPARATUS FOR PERFORATING A PAPER SAMPLE

Alfred Walter, Schlieren, Switzerland, assignor to Alfred Walter AG, Schliereh, Switzerland

Division of Ser. No. 867,622, Jan. 6, 1978, Pat. No. 4,133,203.
This application Oct. 25, 1978, Ser. No. 954,331
Claims priority, application Switzerland, Jan. 10, 1977, 258/77
Int. Cl.³ B26D *3/08*
U.S. Cl. 83—510 **2 Claims**



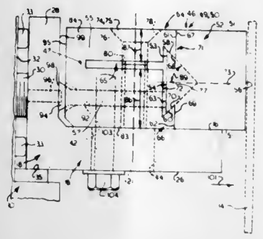
1. Apparatus for perforating a paper sample comprising a base including a pair of spaced, horizontally extending plates which serve as a bed for the paper sample, an elongated, replaceable perforating blade mounted in the space between said plates with the perforated edge extending above the surface of said plates, a pair of spaced, parallel and horizontally extending rods supported above and by said base, a carriage carried by said rods for horizontal movement, a bell crank pivotally mounted to said carriage with one arm extending below said carriage, a wheel rotatably mounted to said one arm of said bell crank so as to be moveable along said blade by movement of said carriage, and means for adjusting the spacing between said carriage and said other arm of said bell crank so as to adjust the pressure of said wheel against the blade, whereby when the carriage is moved the wheel rides over the perforating blade to perforate the paper sample disposed between the perforating blade and the wheel.

4,231,274

SAW GUIDE ASSEMBLY

Gerald J. Matchette, 3339-236 St., Langley, British Columbia, Canada (V3A 4P6)

Filed Mar. 8, 1978, Ser. No. 884,609
Int. Cl.³ B23D *55/08*; **B27B** *13/10*
U.S. Cl. 83—820 **8 Claims**



1. A clamping assembly for clamping a saw guide block of wearable material therein, the block having first and second engaging surfaces adjacent an inner face thereof, and an outer face remote from the inner face to serve as a wearing face to bear against a saw blade of a sawing apparatus, the clamping assembly and block being received in a holding means of the sawing apparatus for location relative to a datum surface of the sawing apparatus, the clamping assembly being characterized by:

(a) an assembly body having front and rear portions; the front portion having spaced apart first and second clamping elements with oppositely disposed first and second gripping and bearing surfaces respectively spaced on opposite sides of, and disposed parallel to, a clamp axis; the first and second gripping and bearing surfaces being adapted to engaged the first and second engaging surfaces respectively of the block, the clamping elements having respective root portions disposed remotely from the gripping and bearing surfaces and extending from the rear portion, the clamping elements being spaced apart by a gap extending forwardly from the rear portion, the rear portion extending essentially continuously between root portions of the clamping elements and between opposite end portions of the body to maintain the first and second clamping elements in alignment with one another, the clamping elements being adapted for movement towards each other about a bend axis disposed generally adjacent the root portions and generally parallel to the clamp axis,

(b) clamping means disposed between the root portions and the gripping and bearing surfaces of the clamping elements for applying a clamping force to the clamping elements and thence to the guide block, so that the clamping force deflects the first clamping element generally about the bend axis towards the second clamping element to narrow the gap therebetween.

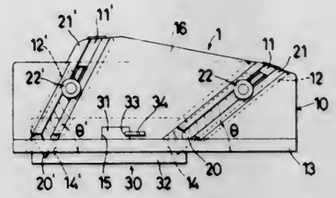
4,231,275

CUTTER FOR THIN BOARDS

Nobuo Onishi, 2-3, 3-chome, Tanaka, Minato-ku, Osaka, Japan

Filed Apr. 17, 1979, Ser. No. 30,878
Claims priority, application Japan, Oct. 19, 1978, 53-145582[U]
Int. Cl.³ B26D *9/00, 11/00*
U.S. Cl. 83—862 **3 Claims**

1. A cutter for cutting thin boards comprising a base having an even under surface and provided with a plurality of guide grooves on one side in such a manner that they are arranged so as to form progressively larger angles with said under surface, a plurality of cutting blades mounted in said guide grooves in such a manner that they fall on the same plane with each other,



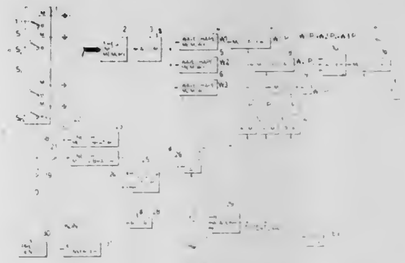
and a guide member adjustably provided in the lower part of said base.

4,231,276

ELECTRONIC MUSICAL INSTRUMENT OF WAVESHAPE MEMORY TYPE

Shigeo Ando, Iwata, and Takayasu Kondou, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 30, 1978, Ser. No. 938,255
Claims priority, application Japan, Sep. 5, 1977, 52-105792
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.19 **14 Claims**



1. A keyboard style electronic musical instrument comprising:

a plurality of waveshape storage means storing waveshapes with different tone colors, said waveshapes being same in fundamental frequency but different from each other in amount of harmonics;

addressing means responsive to the operation of a key of the keyboard for addressing said waveshape storage means to read out said waveshapes from the waveshape storage means at a repetition rate corresponding to a depressed key of the keyboard;

mixing means for mixing the waveshapes read out from said waveshape storage means, at a mixing ratio according to a mixing ratio control signal;

conversion means for converting the output of said mixing means to a corresponding musical tone;

touch-responsive means responsive to the operation of the key of said keyboard for generating a first touch-responsive signal corresponding to the initial speed at which the key of said keyboard is depressed, and a second touch-responsive signal corresponding to the strength of pressure with which the key is depressed;

generating means responsive to the operation of the key of said keyboard for generating a time-dependent signal changing with time after the key depression; and

producing means for producing said mixing ratio control signal on the basis of said first and second touch-responsive signals and said time-dependent signal.

10. In a keyboard type electronic musical instrument includ-

ing a keyboard having a plurality of keys; a plurality of waveshape storage means for obtaining a plurality of waveshape component signals having different harmonic content; means for combining said waveshape component signals in a ratio determined by a plurality of mixing parameters, each of said mixing parameters being associated with a predetermined one of said waveshape component signals; and means for obtaining sound from the output of said means for combining the waveshape component signals; the improvement comprising:

first information means for generating a depression-speed signal indicative of the speed at which a selected one of said keys is depressed;

second information means for generating a time-lapse signal indicative of a period during which said selected one of the keys is depressed;

third information means for generating an applied-pressure signal indicative of the pressure with which said selected one of the keys is depressed; and

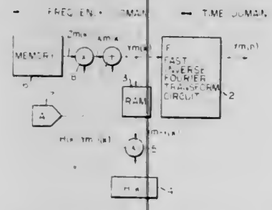
means responsive to said depression-speed signal, said time-lapse signal, and said applied-pressure signal for providing said plurality of mixing parameters.

4,231,277

PROCESS FOR FORMING MUSICAL TONES

Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 30, 1978, Ser. No. 955,882
Int. Cl.³ G10H *1/02*; G06F *7/38*
U.S. Cl. 84—1.19 **17 Claims**



1. A process for forming musical tones comprising:

a step of repeatedly generating a first spectrum signal expressing a first frequency spectrum distribution;

a step of repeatedly generating a third spectrum signal by adding a second spectrum signal to said first spectrum signal;

a step of repeatedly generating said second spectrum signal by delaying said third spectrum signal for one repeat cycle and multiplying by a first transfer function on a frequency domain;

a step of repeatedly generating a fourth waveshape signal from said third spectrum signal by the Inverse Fourier Transform operation; and

a step of generating a waveshape and tone having a designated frequency in accordance with said fourth waveshape signal.

4,231,278

ADAPTIVE COMPUTATION IN A DIGITAL TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

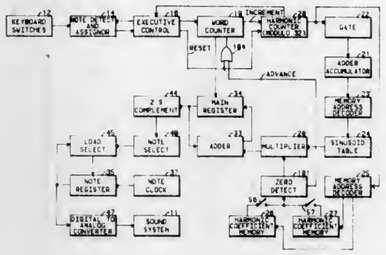
Filed Apr. 25, 1979, Ser. No. 32,980
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.19 **12 Claims**

1. In a musical instrument having one or more tone generators in which a plurality of data words corresponding to the amplitudes of a corresponding number of evenly spaced points defining the waveform of one cycle of an audio signal are computed by a Fourier transform using stored values of harmonic coefficients and in which the waveform points are transferred sequentially from a note register to a digital-to-analog converter at a rate proportional to the pitch of the tone being generated the improvement for generating said data words in a time interval whose length is determined by the values of the harmonic coefficients comprising:

a harmonic coefficient memory means for storing values of harmonic coefficients,

memory addressing means for reading out harmonic coefficients from said harmonic coefficient memory,

a computation means using said values of harmonic coefficients wherein said data words are computed during a computation cycle,



a comparator means whereby a comparison signal is generated in response to a preselected value of a harmonic coefficient read out of said harmonic coefficient memory, and

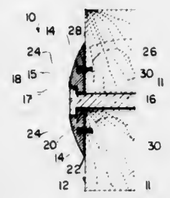
termination means responsive to said comparison signal whereby said harmonic coefficients are inhibited and not provided to said computation means and whereby said computation cycle is terminated thereby causing the duration of said computation cycle to be altered in response to said preselected value of a harmonic coefficient.

4,231,279

ADAPTIVE WASHER AND BOLT ASSEMBLY

Joseph E. Theriot, P.O. Box 766, Houma, La.

Filed Jul. 10, 1978, Ser. No. 922,838
Int. Cl.³ F16B *43/00*
U.S. Cl. 85—9 R **11 Claims**



1. An adaptive washer and bolt assembly comprising:

a. a bolt having a non-circular bolt head portion mounted on a cylindrical bolt shaft;

b. a rounded washer body providing an inner flattened face abuttable against a base structure to which said bolt and said washer body will be attached, said washer body having a rounded outer surface, said outer rounded surface and said inner flattened face intersecting at the outer edge of said rounded washer body to form a peripheral circular edge portion to said washer body;

c. A substantially cylindrical central bore providing an opening through said washer body, said bore having a diameter substantially equal to or larger than the diameter of said bolt shaft; and

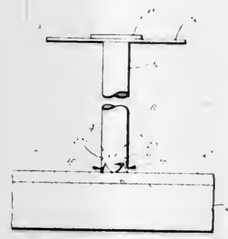
d. a non-circular bolt head recess being correspondingly sized to conform to the size of said bolt head, said bolt head registering with said recess, said recess being provided on said washer body adjacent said curved outer surface and communicating with said central bore, said bolt head recess receivably and protectively housing said bolt head, with the uppermost surface portion of said bolt head being substantially flush with said curved outer surface.

4,231,280

INTERPENETRATING NAILABLE FASTENER FOR SHEET METAL

Jerome A. Gross, 6304 S. Rosebury, St. Louis, Mo. 63105

Filed Mar. 20, 1978, Ser. No. 888,139
Int. Cl.² F16B *15/00*
U.S. Cl. 85—31 **2 Claims**



1. A nailable fastener for the spreading interpenetration of sheet metal, comprising:

a metal shank having a driving end portion and an opposite penetrating end portion whose outer surface is generally cylindrical, said opposite end portion being provided with more than two lobes,

each of said lobes having an outer surface which forms part of said generally cylindrical surface, and having a single planar inner camming surface commencing at a level along said shank at which its cylindrical surface portion is uninterrupted and sloping outward away from the driving end portion and forming a partial elliptical intersection with said generally cylindrical outer surface, whereby to provide a cutting edge having a rounded tip cutting edge portion,

said cutting edge being hardened and the lobe portions inward thereof being of greater ductility,

whereby, on backing such sheet metal with a harder metal anvil and driving the fastener therein, the hardened lobe tip portions penetrate the surface of such sheet metal and the lobe camming surfaces bend the ductile lobes outward as their hardened cutting edges slit into and form pockets in the sheet metal within which the bent lobes fit, thereby securing the fastener against withdrawal or tilting.

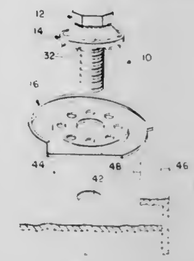
4,231,281

ADJUSTABLE SPACER-CAM ASSEMBLY

Ernest W. Reinwall, Jr., McHenry, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 10, 1979, Ser. No. 2,422
Int. Cl.³ F16B *43/02*, *39/26*
U.S. Cl. 85—50 AT **11 Claims**

1. An adjustable spacer-cam assembly comprising in combination a generally disc-shaped cam plate; said plate having an elevated central portion, the upper surface of said central portion having a plurality of drive-receiving means thereon, a flange member extending outwardly from the bottom of the central portion and having a continuously-increasing, upwardly-directed ramp extending about a portion of its outer periphery; said cam plate having an aperture extending through the central portion of the cam; a spring washer member having a central aperture, friction-enhancing means on the upper surface thereof, and a plurality of drive-inducing means on the underneath surface thereof adapted to cooperate with the drive-receiving means of the cam plate; a screw member having a threaded shank portion and a headed portion including surfaces adapted to be engaged by a torque-inducing tool, and friction-increasing means on the underneath surface thereof; said shank portion being adapted to be received in the central apertures of both the spring washer and the cam plate's central portion and further extending into an aperture in a workpiece; whereby as the screw is rotated and advanced into the aperture in the workpiece by said torque-inducing tool, rotational force



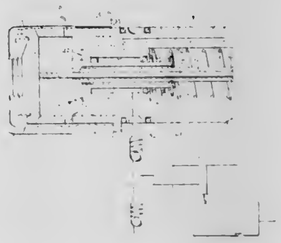
is transmitted from the screw to the washer by means of their respective engaged surfaces which have friction-increasing and friction-enhancing means thereon and, correspondingly, from the drive-incuding means of the washer to the cam plate by means of its drive-receiving means; the ramp portion increasing in height in a direction opposite to the direction of rotation such that, as the cam is rotated, the ramp portion will adjustably occupy a variable amount of space between the workpiece and another element attached thereto.

4,231,282

IGNITION SYSTEM

Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Mar. 29, 1979, Ser. No. 25,176
Int. Cl.³ F41F *1/04*
U.S. Cl. 89—7 **7 Claims**



1. An ignition system for liquid propellant comprising:

a first chamber;

a piston having a head disposed in said first chamber and dividing said first chamber into an ignition chamber and a liquid propellant supply chamber;

means for admitting gas into said ignition chamber;

unidirectional flow valve means for admitting liquid into said supply chamber and for blocking loss of liquid therefrom;

means for providing under pressure a predetermined quantity of liquid propellant through said unidirectional flow valve means into said supply chamber, whereby said liquid propellant causes translation of said head of said piston in a first direction to enlarge the volume of said supply chamber and to decrease the volume of said ignition chamber, to compress and thereby heat the gas;

first means effective upon the translation of said head to a predetermined minimal volume of said ignition chamber for passing an initial quantity of liquid propellant from said supply chamber into said ignition chamber for ignition by the therein compressed and heated gas, whereby the ignited liquid propellant provides an increase in gas pressure in said ignition chamber and causes translation of said head of said piston in a second direction opposite to said first direction to enlarge the volume of said ignition chamber and to decrease the volume of said supply chamber; and

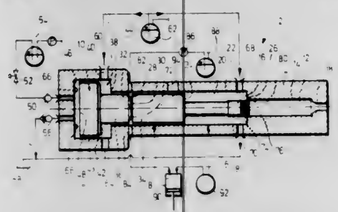
second means effective upon the translation of said head in said second direction to progressively pass the remaining quantity of liquid propellant from said supply chamber to said ignition chamber during the course of movement in said second direction of said head.

4,231,283

PULSATING LIQUID JET GUN AND METHOD OF OPERATING THE SAME

Werner Malburg, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Fed. Rep. of Germany

Filed Nov. 1, 1978, Ser. No. 956,804
Int. Cl.³ B05B *1/08, 3/14*
U.S. Cl. 89—8 **25 Claims**



1. A pulsating liquid jet gun, comprising, a cylinder having a cylinder bore with a combustion space for periodically receiving a propellant charge and a bore portion defining a liquid chamber, a free piston movable in said cylinder bore between said combustion space and said liquid chamber, means for generating hot reaction gases by ignition of said propellant charge periodically in said combustion space, means for filling liquid into said liquid chamber prior to every ignition of said propellant charge, said means for generating hot reaction gases for causing ignition of the propellant charge being by an adiabatic compression thereof thermally initiating the ignition.

4,231,284

LOAD EQUILIZATION FEEDBACK FOR PARALLEL CHANNEL SERVO ACTUATORS

Alan C. Smith, Newhall, and Manfred A. Runkel, Valencia, both of Calif., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 31, 1978, Ser. No. 938,578
Int. Cl.³ F01B *25/04*; F15B *11/22, 13/16*
U.S. Cl. 91—171 **2 Claims**

1. Mechanical feedback apparatus having load synchronization in a parallel pair force transmission system comprising:

(A) a pair of actuators each having a housing including a cylinder, a piston and a piston rod;

(B) means connecting said cylinders rigidly together in side by side relationship with said piston rods extending from said cylinders in the same direction;

(C) means connecting said piston rods rigidly together at one end thereof outside said cylinders;

(D) a separate control valve means for each of said actuators and formed as a part of the housing for its respective actuator for controlling the application of fluid under pressure from a source thereof to said actuators to cause relative movement between said pistons and their respective cylinders;

(E) means anchoring one of said cylinders and said piston rods;

(F) means connected between the other of said cylinders and piston rods and said control valve means including:

1 a rigid feedback member having a pair of diverging arms,



2 a summing link having a pair of spaced apart legs interconnected with a flexible web so that said link is flexible in torsion, said arms being connected to said legs,

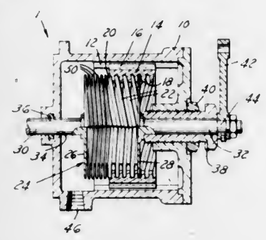
whereby differential lateral motion between said pistons and cylinders is detected by said feedback members and is applied to said control valve means through said link for counteracting said differential lateral motion.

4,231,285

VARIABLE RATE ANEROID CAPSULE

Michael M. Schechter, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1978, Ser. No. 967,531
Int. Cl.³ F01B *19/00*; F16J *3/04*
U.S. Cl. 92—34 **7 Claims**



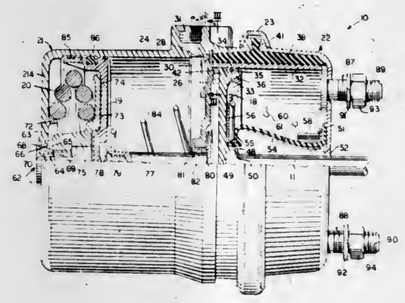
1. A variable rate aneroid capsule comprising a sealed bellows having a plurality of axially expandable and contractible convolutions defining a predetermined spring rate to the bellows providing a stroke varying as a linear function of the change in differential pressure level acting on the convolutions, the convolutions being helically formed to define an externally threaded helical surface, means to prevent expansion or contraction in either direction of certain ones of the total convolutions to vary the bellows spring rate and thereby provide a different linear stroke of the bellows for the same differential pressure level acting on the convolutions, said means to prevent expansion or contraction comprising an element having an internally threaded surface mounted for mating engagement with selected ones of the external surfaces of the convolutions, and means providing relative rotation between the bellows and external surface for progressively threading convolutions of the bellows into engagement with the external surface.

4,231,286

BRAKE ACTUATORS

Sergio Campanini, Iola, Kans., assignor to The Echlin Manufacturing Company, Branford, Conn.

Filed Jun. 13, 1979, Ser. No. 48,067
Int. Cl.³ F01B *7/00*
U.S. Cl. 92—64 **22 Claims**



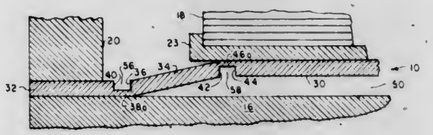
10. In an actuator for use in a vehicle having a braking system including a fluid pressure source valve means coupled to said source for developing a service pressure of variable magnitude and a brake assembly having a control element movable through a certain distance between a rearward inactive position and a forward limit position at which maximum braking force is applied to the vehicle, said actuator comprising housing means defining a rearward end wall, an intermediate partition wall and a forward end wall and rearward and forward coaxial internal cylindrical surfaces around rearward and forward spaces between said rearward and forward end walls and said partition wall, auxiliary and service pistons in said spaces on opposite sides of said partition wall, peripheral seal means on said pistons in slidable engagement with said internal cylindrical surfaces, an elongated rod for extending forwardly from said housing along the axis of said cylindrical surfaces and to a forward end connectable to said control element, first force transmitting means between said auxiliary piston and said rod, second force transmitting means between said service piston and said rod, a coiled compression spring having a forward end acting against the rearward side of said auxiliary piston means for admitting fluid under source pressure into said housing to act against the forward side of said auxiliary piston to move said auxiliary piston rearwardly and compress said spring, said spring being operative upon removal of said source pressure to act through said first force transmission means and said rod to move said control element forwardly from said rearward inactive position to said forward limit position, and means for admitting fluid under service pressure into said housing to act against the rearward side of said service piston and to act through said second force transmission means and said rod to effect movement of said control element forwardly from said rearward inactive position to said forward limit position with the force applied to said control element being uniformly proportionate to the magnitude of said service pressure throughout said movement, said service piston being in front of said partition wall and said auxiliary piston being behind said partition wall.

4,231,287

SPRING DIAPHRAGM

Parker C. Smiley, Oakland, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed May 1, 1978, Ser. No. 901,622
Int. Cl.³ F01B *19/00*; F16J *3/00*
U.S. Cl. 92—94 **12 Claims**



1. A high pressure diaphragm comprising

a generally planar central member having an outer edge, a low pressure side and a high pressure side,

a generally planar outer flange-engaging member having an inner edge, a low pressure side and a high pressure side,

a rigid, generally planar annular ring member having an outer edge, an inner edge, a low pressure side and a high pressure side,

a first means for flexibly connecting said outer edge of said annular ring member to said inner edge of said flange-engaging member, comprising

a first bridge member having a thickness less than the thickness of said annular ring member and fabricated integrally with said annular ring and said flange-engaging member,

a second means for flexibly connecting said inner edge of said annular ring member to said outer edge of said central member comprising

a second bridge member having a thickness less than the thickness of said annular ring member and fabricated integrally with said annular ring member and said central member, and,

an electroexpansive member located proximate said low pressure side of said central member and adapted to exert force thereon when said electroexpansive member is in its expanded position, and

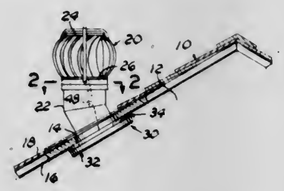
means for maintaining said electroexpansive member at all times under compression.

4,231,288

ROOF VENTILATING APERTURE SEAL

Billy L. Finley, 1016 NW. 21, Moore, Okla. 73160

Filed Apr. 13, 1979, Ser. No. 29,794
Int. Cl.³ F24F *7/02*
U.S. Cl. 98—43 R **1 Claim**



1. In combination with a wind driven turbine attic ventilator overlying a roof having an inner surface and having a ventilating aperture, the improvement comprising:

a generally flat disk underlying the roof in surrounding relation with respect to the aperture therein for closing said aperture,

said disk having a pair of concentric flanges adjacent its periphery forming a substantially U-shaped groove open toward the inner surface of said roof;

a seal formed from resilient material coextensive with the

groove and projecting beyond said flanges for sealing with the inner surface of said roof; and,

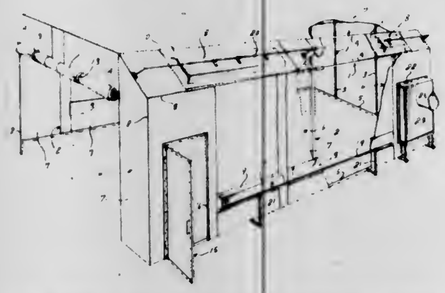
a resilient member extending between and connecting said disk with a peripheral portion of said attic ventilator in a manner to prevent the normal angular rotation of said turbine.

4,231,289

PAINTING BOOTH

Alain Domicent, 800 Lakeshore Dr., Dorval, Quebec, Canada (H9S 2C6)

Filed Jan. 26, 1979, Ser. No. 6,734
Int. Cl.³ F23J 11/12
U.S. Cl. 98—115 SB **8 Claims**



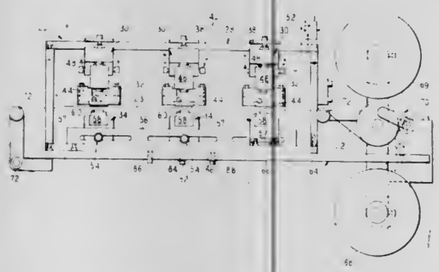
1. A painting booth comprising a framework forming a booth skeleton, a booth including a roof, walls and an access door, the major portion of said roof, walls and access door consisting of an air filtering pervious skin, fixed to, and supported by, said framework and operatively confining a closed booth space, paint spraying equipment located within said booth space for spraying paint on an article to be painted and also located within said space, and an air purifying and blower unit including a casing fixed to said framework, extending through an opening made in said skin and peripherally sealed to the latter, said casing having an inlet opening communicating with said booth space and an outlet opening communicating with the exterior of said booth enclosure, an air filter extending across said inlet opening and an air blower mounted in said casing exteriorly of said air filter, said air blower sucking air into said booth space through said air filtering pervious skin, and expelling air out of the booth space through said air filter.

4,231,290

MULTIPLE HEAD MARKING DEVICE

James L. Shenoha, Lockport, Ill., assignor to Norwood Marking & Equipment Co., Downers Grove, Ill.

Filed Oct. 30, 1978, Ser. No. 955,706
Int. Cl.³ B41J 1/08
U.S. Cl. 101—93.11 **7 Claims**



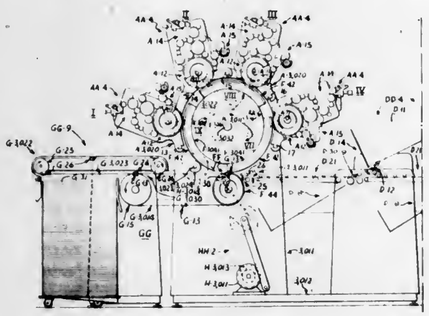
1. A multiple imprinting apparatus for simultaneously marking a plurality of discrete marking areas on a surface to be marked, said marking areas being spaced apart transversely of a line of travel of the surface to be marked, comprising an imprint marking assembly having a frame member mounted in juxtaposition to the surface to be marked, a plurality of transversely spaced marker head members adjustably carried on said frame member for positioning said marker head members in registration with said discrete marking areas, said marking areas being variable in size and spacing when changing the surface to be marked, each marker head member includes an individually powered striker member, movable towards and away from the marking areas, a transfer tape assembly including a transfer tape, carried by said frame member, means to adjust said transfer tape assembly to angularly position a span of the transfer tape relative to the transversely spaced marker head members for movement therealong, said span having a longitudinal length and a width, the marker head members having raised imprinting indicia thereon in opposition to said tape whereby the angular adjustment of said transfer tape assembly is effective to position said transfer tape span relative to said raised indicia whereby each raised indicia contacts the tape span to imprint the discrete marking areas when striker members are activated, in a discrete longitudinal area of the tape, said longitudinal areas being offset from one another across the width of the tape and non-overlapping.

4,231,291

PRINTING PRESS

William W. Davidson, Jr., Port Washington, Long Island, N.Y., assignor to North Shore Precision Research Corporation, Port Washington, Long Island, N.Y.

Division of Ser. No. 498,844, Aug. 19, 1974, Pat. No. 4,098,185, which is a division of Ser. No. 235,221, Mar. 16, 1972, Pat. No. 3,848,320, which is a continuation-in-part of Ser. No. 73,161, Sep. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 658,385, Aug. 4, 1967, abandoned. This application Jan. 3, 1978, Ser. No. 866,778
Int. Cl.³ B41F 7/08, 31/30; B65H 3/10, 7/12
U.S. Cl. 101—137 **16 Claims**



1. A sheet-fed printing press comprising a large printing cylinder and a lower printing cylinder mounted in a frame structure in rotational, tangential relationship, with said large printing cylinder above said lower printing cylinder to form a printing couple with a printing bite therebetween, said large printing cylinder having an effective diameter which is an integer multiple, greater than one, of the effective diameter of said lower printing cylinder, a single work area on the periphery of said lower printing cylinder, the periphery of said large-printing cylinder being divided into a plurality of substantially equal work areas, means for automatically feeding a sheet of paper once for every revolution of said lower printing cylinder in timed relationship with the rotation of said lower printing cylinder, from a supply of sheets on one side of the vertical plane containing the axis of said lower printing cylinder, to and through the bite of said printing couple to delivery means on the other side of said plane, including a paper support plate adjacent said lower printing cylinder over which said sheets pass, an intermittently driven lower feed roller rotatably mounted on a fixed center with the upper surface thereof projecting through an opening in said paper support plate and approximately tangent to the face thereof, an upper feed roller which is free to turn about a shaft which is mounted in a frame which intermittently rocks to bring said upper feed roller to contact with said lower feed roller and to lift it out of contact therewith, a plurality of stop fingers closer to said lower printing cylinder and projecting upwardly through other openings in said paper support plate, said stop fingers being pivotably mounted to move up into a fixed position in the path of said sheets and to rock forward and down out of the path of said sheets, cylinder register stops carried by said lower printing cylinder and cylinder gripper fingers which work in cooperation with said cylinder register stops and which open to allow the leading edge of a sheet to be brought into register with said cylinder stops and then close to hold the leading edge of the sheet in said registered position, means including a plurality of cams mounted to rotate with said lower printing cylinder which act to cause said lower feed roller to be stationary, said upper feed roller in said lifted position and said stop fingers in said up position at the time in the cycle when the leading edge of a sheet fed by said feeding means passes over said paper support plate and stops in contact with said upwardly projecting stop fingers, said rotatable cam means then acting to cause said upper feed roller to descend to hold the sheet against said lower feed roller to then rock said stop fingers forward and down out of the path to be followed by the leading edge of the sheet and at a rate to keep them ahead of said leading edge, to then start to rotate said lower feed roller in a direction to cause it to advance said leading edge at an accelerating rate to bring said leading edge to the periphery of said lower printing cylinder as said cylinder register stops and said cylinder gripper fingers pass the position of the surface of said paper support plate and then at a greater accelerating rate to bring said leading edge into register contact with said cylinder register stops and then at a rate to hold said leading edge in said registered position, and stationary cam means associated with said lower printing cylinder which cause said cylinder grippers to open as said lower printing cylinder rotates and they approach the position of said paper support plate and to hold them in said open position as they pass the position of said support plate and as said leading edge of said sheet moves beyond the edge of said paper support plate and into the grippers, to cause them to start to close as said leading edge moves into register contact with said cylinder register stops, and to close to grip said leading edge as it is held in register contact with said cylinder stops, said rotating cam means then causing said upper feed roll to lift to release the sheet, said lower feed roller to cease turning and come to rest and said stop fingers to remain below the surface of said paper support plate until just before the time in the cycle when the leading edge of a following sheet will reach the position of the stop fingers, whereby the leading edge of each sheet is carried to and through the bite of the printing couple held securely in registered position against the cylinder register stops.

4,231,292

SAFETY INTERLOCK FOR OFFSET PRINTING PRESS

James R. Stolle, Whitinsville, Mass., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Aug. 25, 1978, Ser. No. 936,823
Int. Cl.³ B41F 7/08, 13/28, 31/30, 7/40
U.S. Cl. 101—137 **3 Claims**

1. In an offset printing press having a mainframe, a printer head fixed to the mainframe, the printer head including a blanket cylinder and a plate cylinder, the plate cylinder and the blanket cylinder being rotatably supported by the printer head, the plate cylinder being movable into and out of an engagement position with the blanket cylinder wherein the plate cylinder is rotatably driven by a drive means at said engagement position, and a carriage mounted on the mainframe and linearly movable to and from the plate cylinder, the carriage including dampening and inking rollers, a safety interlock system for electrically deenergizing a motor mounted on the mainframe and driving the drive means, comprising:

a pair of power lines across which the press motor is connected for electrical energization;

a relay connected across the power lines, the relay being in electrically parallel relation with the press motor, the relay including at least one pair of relay contacts which are normally open when the relay is deenergized, the relay contacts being electrically series-interposed between the motor and one of the power lines; and

a switch means electrically connected in series relation between the relay and one of the power lines, the switch



means being responsive both to carriage movement to and from the printer head over a predetermined distance and to the plate cylinder movement into and out of its engagement position, wherein movement of the carriage away from the printer head for the predetermined distance, when the plate cylinder is in its engagement position, opens the switch means to deenergize the relay and electrically open the pair of relay contacts wherein the motor is electrically disconnected from one of the power lines, movement of the plate cylinder out of its engagement position closing the switch means and reenergizing the relay to electrically close the pair of relay contacts wherein the motor is reconnected to the power lines when the carriage is at the predetermined distance from the printer head.

4,231,293

SUBMISSILE DISPOSAL SYSTEM

C. James Dahn, Chicago; Douglas R. Morita, Morton Grove, and Allen J. Tulis, Addison, all of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 26, 1977, Ser. No. 847,468
Int. Cl.³ F42B 25/16
U.S. Cl. 102—7.2 **2 Claims**

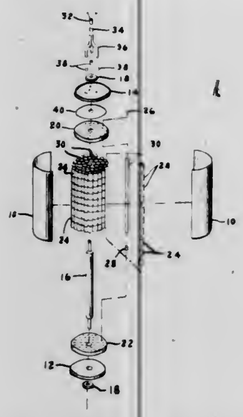
1. A system for effecting the rapid and uniform dispersal of submissiles from a compact container, said system comprising

A. a cylindrical container of frangible material having a support rod coaxially positioned therewithin;

B. a multiplicity of abutting cylindrically shaped submissiles oriented parallel to the longitudinal axis of said container and positioned around said support rod to substantially fill said container;

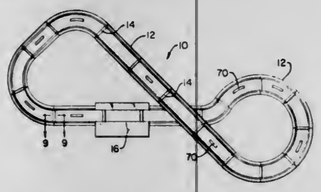
C. A multiplicity of cylindrical explosive charges interstitially located with respect to said submissiles to provide a hex-packed arrangement of said submissiles with respect

to said support rod and said explosive charges with respect to said support rod; and



D. means to initiate the detonation of said explosive charges in order to disperse said submissiles rapidly and uniformly over a predesignated target area.

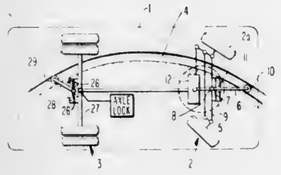
4,231,294
TOY TUBE TRAIN
Philippe Arzoumanian, 160 Eaton St., Providence, R.I. 02908
Filed May 21, 1979, Ser. No. 41,009
Int. Cl.³ B61B *13/10*
U.S. Cl. 104—138 R **10 Claims**



1. A high speed toy train comprising a plurality of detachably connectible track sections each having an elongated base, a pair of spaced parallel track rails mounted on said base, means mounted on said base between said track rails for supplying electrical current to a toy train on said rails, means to confine the train and prevent derailment at high speeds comprising a transparent cover for said base, coacting means on said base and cover for mounting said cover to said base, and a toy train for operating on said rails, said train having means for contacting said electrical supply means between said track rails.

4,231,295
TRAFFIC SYSTEM FOR TRACK-TIED VEHICLES WITH STEERABLE AXLE
Hans-Joachim Förster, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 20, 1977, Ser. No. 808,367
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628217
Int. Cl.² E01B *25/28*
U.S. Cl. 104—245 **40 Claims**

1. A traffic system for track-guided vehicles which includes at least one vehicle axle having axle means connected with steerable wheels, the traffic system comprising a road-associated guide means for defining a drive track, a guide lever means arranged on the vehicle for detecting a course of the guide means, and further means for transmitting movements of the guide lever means indirectly to the steerable wheels including an auxiliary energy assisted force and movement transmission means, characterized in that the guide lever means is pivotally connected to the axle means, means are provided for limiting a pivotal deflection of the guide lever means over a relatively small angular path corresponding only to a fraction of a maximum deflection angle of the steerable wheels, the means for transmitting movements of the guide lever means



includes means for defining a force-flow transmission path of the guide lever means between the guide means and the axle means and for enabling the vehicle to be track-guided along the guide means in a damage-free and operationally reliable manner without a deflection of the steerable wheels and in that a track directional detection means is provided for detecting at least approximately the direction of the guide means relative to a longitudinal axis of the vehicle including a detection lever means pivotally connected at a free end of the guide lever means.

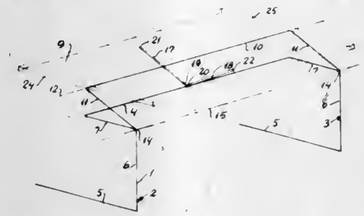
4,231,296
THREE-TRUCK HIGH ADHESION LOCOMOTIVE
Keith L. Jackson, Granite City, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.
Filed Jun. 2, 1978, Ser. No. 911,985
Int. Cl.² B61C *3/00*; B61F *3/06, 5/08, 5/16*
U.S. Cl. 105—136 **21 Claims**



1. In a railway locomotive, at least three load bearing trucks spaced apart lengthwise of the locomotive and comprising a pair of end trucks and at least one intermediate truck, each of said trucks having a pair of longitudinally spaced-apart wheeled axles, a truck frame resiliently supported on said axles, each of said end trucks having a bolster resiliently supported on its frame for vertical and transverse cushioning movements with respect thereto, said intermediate truck having bolster structure resiliently supported on its frame for vertical and transverse movements with respect thereto, each of said end trucks having a traction transmitting connection between its frame and its bolster, said intermediate truck having a traction transmitting connection between its frame and its bolster structure, all of said traction transmitting connections being effective substantially at rail level, elongated underframe structure, means supporting said underframe structure on said bolsters and said bolster structure and preventing longitudinal tiling of said bolsters and bolster structure relative to said underframe structure, said underframe structure and the bolsters of each of said end trucks having fixed cooperating vertical axis swivel bearings accommodating solely relative swiveling movements of said end truck bolsters with respect to said underframe structure, and transversely yieldable longitudinally unyielding means connecting said intermediate truck bolster structure and said underframe structure for transmitting longitudinal forces

from said intermediate truck bolster structure to said underframe structure and accommodating substantial lateral excursions of said intermediate truck bolster structure with respect to said underframe structure as may be required for operation of the locomotive on curved track, said swivel bearings and said connecting means cooperating with said underframe structure supporting means and said traction transmitting connections to maintain the effective level of traction transmission from said trucks to said underframe structure substantially at rail level whereby to minimize axle-to-axle load transference in each of said trucks while minimizing development of lateral components of traction forces in any of said traction transmitting connections.

4,231,297
TABLE HAVING AN ADJUSTABLE SUPPORT AND LOCKING SYSTEM FOR THE TOP THEREOF
Gert A. E. Holbek, Holte, Denmark, assignor to Erik Munch, Denmark
Continuation of Ser. No. 880,059, Feb. 22, 1978, abandoned. This application Feb. 13, 1979, Ser. No. 11,911
Claims priority, application Denmark, Feb. 23, 1977, 785/77
Int. Cl.³ A47F *5/12*
U.S. Cl. 108—10 **10 Claims**

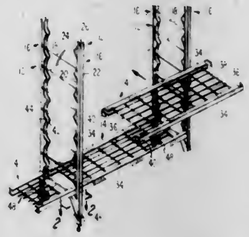


1. Table, comprising a table top which is adjustable both as regards the height and the slope of the table top, characterized by a rigid U-shaped member, the branches of which are pivotally connected to a subframe of the table about a horizontal axis, and the intermediate part of which is pivotally connected to the table top about an axis extending parallel with the pivot axis of the branches; a first telescopically extensible rod, the lengths of which is adjustable from a predetermined initial length which corresponds to the distance between the pivot axis of the branches and the pivot axis of the intermediate part of the U-shaped member, one end of the first rod being pivotally connected with the subframe of the table at a distance from the pivot axis of the branches, the other end of said first rod being pivotally connected with the table top at a distance from the pivot axis of the intermediate part, which distance corresponds to the distance between said one end of said first rod and the pivot axis of the branches; a second telescopically extensible rod, one end of which is pivotally connected with the subframe and the other end of which is pivotally connected with the table top at a distance, as seen in direction perpendicular to the pivot axis of the intermediate part, from said other end of said first rod, the pivot connections of said other rod being selected so that said other rod forms an angle different from nil together with the plane defined by the pivot axis of the branches and the pivot axis of the intermediate part.

4,231,298
SHELVING SYSTEM
Hyman Pollack, 41 Stonicker Dr., Lawrenceville, N.J. 08648
Filed Mar. 21, 1979, Ser. No. 22,582
Int. Cl.³ A47B *57/06*
U.S. Cl. 108—64 **10 Claims**

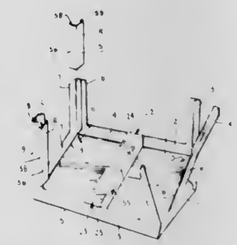
1. A shelving system comprising

(a) at least two uprights each of which includes a pair of post assemblies at opposite sides thereof and vertically spaced cross braces extending between and joined to the post assemblies, the several post assemblies being disposed at rectangularly spaced corners of said system, each corner post assembly comprising at least one outer and one inner post element spaced closely from each other and relatively formed to define between them a plurality of side locking spaces occurring at each of said corners at selected, vertically spaced intervals along the length of the elements of the post assembly provided at said corner; and



(b) at least one rectangular shelf including an angular locking tongue at each corner thereof, each locking space having a widened upper part adapted to loosely receive said locking tongue and merging into a narrower lower part adapted to lockingly engage said tongue in a position in which the tongue is confined between the inner and outer post elements of the post assembly provided at said corner, and is in embracing relation to one of said elements.

4,231,299
MERCHANDISING DISPLAY
James L. Gebhardt, Roswell, and Ferris L. Hutchins, Jr., Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Jun. 15, 1979, Ser. No. 49,189
Int. Cl.³ A47B *7/00*
U.S. Cl. 108—91 **9 Claims**

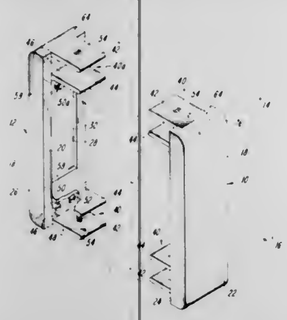


1. A merchandising display comprising a top with legs disposed respectively at each corner thereof and extending downwardly therefrom, and characterized in that each of said legs comprises a pair of elongated V-shaped support elements arranged with the apexes of said V-shaped support elements of each pair in close juxtaposition and an elongated retention clip arranged to envelope and interlock each pair of said V-shaped support elements.

4,231,300
SHELF BRACKET ASSEMBLY
John S. Shepard, 1304 S. Shields, Ft. Collins, Colo. 80521
Filed Sep. 4, 1979, Ser. No. 72,351
Int. Cl.³ A47B *3/00*
U.S. Cl. 108—111 **12 Claims**

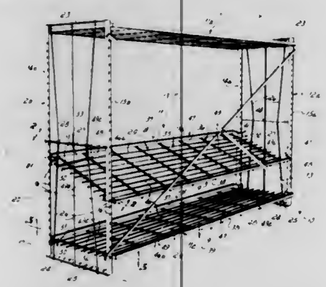
1. An assembly including a shelf bracket for constructing shelving from spaced elongated shelf boards of standard thickness, comprising:

an elongated leg of generally rectangular lateral cross section having space-opposed major surfaces joined by space-opposed minor surfaces;
means defining a longitudinal groove in one of said major surfaces, said groove being of predetermined width and predetermined depth;
a pair of U-shaped clips each having a pair of plates joined by a flat bight with said plates being parallel-spaced apart a distance substantially equal to said standard thickness for



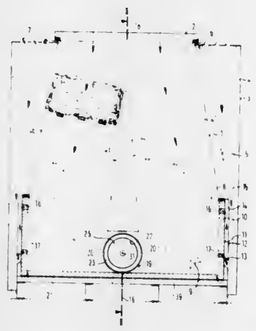
snug engagement with the marginal edge portion of a shelf board, with said bight having a width no greater than and substantially the same as said predetermined width to seat tightly in said groove, and with said bight having a thickness no greater than said predetermined depth;
and means for securing said clips individually in respective different mutually spaced portions of said groove with said bight seated therein and said plates oriented transversely with respect to said leg.

4,231,301
ADJUSTABLE SHELF ASSEMBLY
Wade H. Barrineau, III, 5159 E. Shore Dr., Conyers, Ga. 30207
Continuation-in-part of Ser. No. 628,133, Nov. 3, 1975, abandoned, and a continuation-in-part of Ser. No. 737,401, Nov. 1, 1976. This application Aug. 29, 1977, Ser. No. 783,568
Int. Cl.[2] A47B 57/04, 57/20
U.S. Cl. 108—146 **1 Claim**



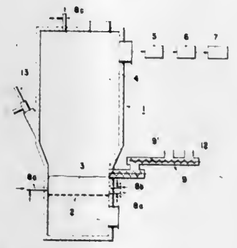
1. A shelf assembly comprising
a front corner post having a plurality of holes along the length thereof,
a shelf adapted to be positioned in a horizontal attitude, said shelf having a front edge and a rear edge,
said shelf comprising a grid formed from a plurality of transverse members and a plurality of longitudinal members connected to said transverse members,
latch structure connected with said shelf adjacent said front corner post, said latch structure comprising a flex arm connected at one end to said shelf and formed by one of said longitudinal members which has an end not connected to an outermost transverse member and hence is free to flex in the plane of said shelf, and a latch finger forming an extension of said flex arm and extending perpendicularly to the free end thereof, said flex arm being disposed generally parallel to the front edge of said shelf in a connect position at which said latch finger is received in said corner post hole, and said latch finger being retracted from that corner post hole in response to a force exerted on said flex arm in a direction generally normal to the front edge of said shelf, thereby permitting said shelf to be easily assembled with or disassembled from said front corner post by exerting manually a force on said flex arm in said generally normal force direction,
a portion of said longitudinal members establishing a hand grip which can be manually engaged by one of the fingers and thumb of an installer's hand,
one of said longitudinal support members comprising a front band of substantial vertical rigidity, said flex arm being formed integral with one of said longitudinal support members other than said front band, said latch finger passing through a dog leg at the corner of said shelf formed from said front band, thereby providing vertical force stability to said latch finger.

4,231,302
APPARATUS AND PROCESS FOR BURNING OF FUELS OF RELATIVELY YOUNG GEOLOGICAL AGE AND OF ANY RESULTING GASES
Hans Linneborn, Cologne, Fed. Rep. of Germany, assignor to Albert Neuhaus-Schwermann and Walter Otto Zerbin, both of Arnsberg, Fed. Rep. of Germany
Continuation of Ser. No. 833,333, Sep. 14, 1977, abandoned. This application May 14, 1979, Ser. No. 38,927
Int. Cl.[3] F23G 5/12
U.S. Cl. 110—229 **14 Claims**



1. A heating assembly for burning fuel of organic origin, comprising, in combination:
a substantially enclosed hollow assembly including a predetermined region within said assembly for receiving the fuel for ignition purposes;
first oxygen supply means for supplying said predetermined region with oxygen at least at a rate adequate for producing a gas flow of distilled-off gases, air gases and combustion gases from the ignited fuel;
an elongated outer shell disposed within said predetermined region and having a plurality of passages for dividing said gas flow into a plurality of streamlets;
an elongated inner shell, having an inlet and an outlet, disposed within said outer shell and defining a space between said inner and outer shells, said space communicating with said inlet, said streamlets being recombined into a gas stream in said space;
second oxygen supply means for supplying said inner shell with oxygen near its inlet for burning said stream of gas; and
an exhaust conduit communicating with said outlet for exhausting said burnt stream from said heating assembly, whereby said stream of gas remains in said heating assembly for a predetermined dwelling time, said predetermined dwelling time being substantially proportional to the sum of the lengths of said inner and outer shells.

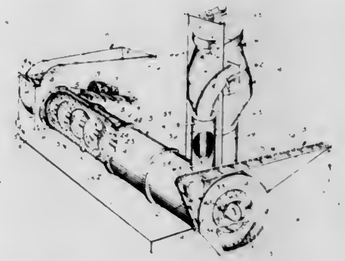
4,231,303
METHOD FOR INCINERATION OF ORGANIC CHLORINE COMPOUND AND INCINERATOR USED THEREFOR
Masayoshi Fujiu, Fujisawa, and Tetsuo Hida, Yokohama, both of Japan, assignors to Showa Denki K.K., Tokyo, Japan
Filed Oct. 31, 1978, Ser. No. 956,364
Int. Cl.[3] F23G 5/00
U.S. Cl. 110—245 **10 Claims**



1. A method for the fluidized-solids incineration of an organic chlorine compound, which method comprises:
causing particles of an inert medium to be fluidized so as to form a fluidized bed,
controlling the composition of said bed so that the particles of the inert medium for the fluidized bed contain SiO_2 and Al_2O_3 in a combined concentration of at least 95% by weight and Na_2O and K_2O in a combined concentration of not more than 1.0% by weight,
causing the organic chlorine compound to be admixed into the fluidized bed in conjunction with water or an aqueous solution and simultaneously subjecting the compound to combustion,
and consequently giving rise to an exhaust gas having an extremely low chlorine gas content.
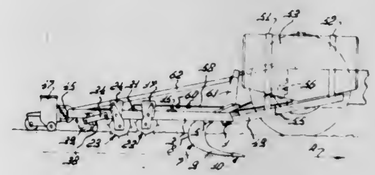
4,231,304
COMBUSTION APPARATUS UTILIZING AN AUGER HAVING AN INTEGRAL AIR SUPPLY SYSTEM
Gordon H. Hoskinson, Jacksonville, Fla., assignor to Cornell-Hoskinson Manufacturing Corp., Brooklyn, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,269
Int. Cl.[3] F23G 5/00
U.S. Cl. 110—257 **21 Claims**

19. A screw conveyor means for moving debris through an elongate combustion chamber while delivering air for combustion of the debris and comprising an elongate hollow shaft means mounted for rotation and penetrated by longitudinally spaced apart air flow openings, drive means for rotating said shaft means, thread means spiraled about said shaft means for engaging debris upon rotation of said shaft means and thereby for moving engaged debris, and fan means operatively communicating with said shaft means for impelling air flow therethrough, said thread means defining a hollow interior operatively communicating with said shaft means for receiving air flow impelled therethrough and for directing air to impinge onto debris engaged by said thread means and cooperating with said shaft means and said fan means for distributing air



flowing through said shaft means therealong and thereby facilitating combustion of debris moved by said conveyor means.

4,231,305
SOIL CULTIVATING MACHINE
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland
Filed Aug. 8, 1978, Ser. No. 931,998
Claims priority, application Netherlands, Aug. 15, 1977, 7708957
Int. Cl.[3] A01C 5/00, 5/08
U.S. Cl. 111—7 **11 Claims**



1. A soil cultivating machine comprising a frame and soil penetrating tools being supported on the frame, spraying means mounted on said frame and positioned to the rear of said tools, a plurality of soil cultivating rollers journalled on the frame and at least one of said rollers comprising soil penetrating means, said one roller being located behind said spraying means, whereby material can be sprayed in advance of the roller and mixed into the soil with vegetation cut by the soil penetrating means, said spraying means comprising spaced apart spraying booms with valve means and said booms being operatable independently of one another, one spraying boom with rearwardly directed spraying nozzles being located in advance of said roller and seed drills being mounted behind that roller, said roller having a plurality of support plates and a periphery of elongate members, each tool being a tine pivotably connected to the frame adjacent the end of a substantially rectangular upper portion of the tine, a shear pin interconnecting said upper portion to the frame to prevent pivotal movement of the tine during normal operation, and said upper portion extending upwardly and forwardly at about 45° to the vertical.

4,231,306

APPARATUS FOR INJECTING GRANULAR MATERIAL IN SOIL

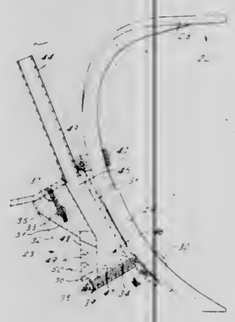
Alan G. Whitehead, Harpenden, and David J. Tite, Tring, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 16, 1978, Ser. No. 878,469

Claims priority, application United Kingdom, Feb. 23, 1977, 07620/77

Int. Cl.³ A01C *7/20, 15/04*

U.S. Cl. 111—86 **19 Claims**



1. Apparatus for injecting granular material in soil comprising:

an outlet means having an elongated form for securing to the rear of a tine adapted for opening a vertical slit in the soil when dragged through the soil, the said outlet means being for securing to the rear of such a tine with the elongated form of the outlet means aligned generally along the length of the tine;

said outlet means defining an inlet opening for connection to a conduit for delivering granular material under air pressure to said outlet means, and said outlet means defining at least one outlet opening adapted to direct granular material out from said outlet means at least one said opening being oriented in an upward direction;

said outlet means being shaped for guiding granular material in at least one flow path leading from said inlet opening, said at least one outlet opening adapted for directing the granular material out from said outlet means predominantly in an elongated distribution aligned generally in a common plane with said elongated form of said outlet means, and in a direction such as to be directed rearwardly of a tine when said outlet means is attached to the tine, said distribution including an upwardly directed component and each said outlet means including a swirl chamber operative to forcibly randomise the granular material immediately prior to its exit through said at least one outlet opening.

4,231,307

PULSE GENERATOR FOR SEWING MACHINES

Hideaki Takenoya, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

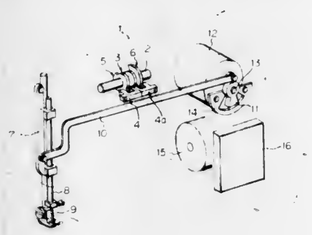
Filed Oct. 4, 1978, Ser. No. 948,321

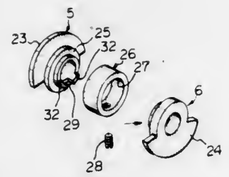
Claims priority, application Japan, Oct. 4, 1977, 52-132858[U]

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 E **6 Claims**

1. In a sewing machine which comprises a machine housing, a main shaft rotatably mounted on the machine housing, a needle bar swingably mounted and vertically reciprocated by the main shaft, a feeding device operated in timed relation with the needle bar, first electrically operated means for controlling the lateral movement of the needle bar, and second electrically operated means for controlling the movement of the feeding device, a pulse-generating system operative for generating in synchronism with rotation of the main shaft pulses controlling the operation of the first and second electrically operated means, the pulse-generating system comprising two rotational parts, two pulse-generating devices, each pulse-generating device sensing the presence and absence of a respective one of





the two rotational parts and generating pulses in correspondence thereto, each rotational part having an axial extension, and furthermore including a mounting ring encircling the main shaft and receiving the axial extensions of the two rotational parts and means securing the mounting ring and thereby the two rotational parts to the main shaft.

4,231,308

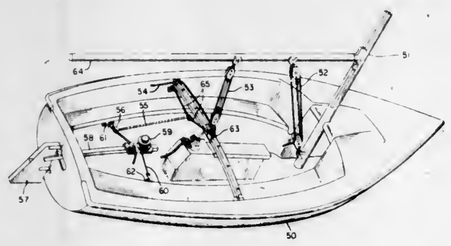
SAILING VESSEL SELF STEERER

Seymour Vall, Manhattan, N.Y., assignor to Falcon Safety Products, Inc., Mountainside, N.J.

Filed Feb. 5, 1979, Ser. No. 9,126

Int. Cl.³ B63H *25/04*

U.S. Cl. 114—144 R **6 Claims**



1. A self-steering system for maintaining a preselected course in a sailing vessel which system comprises in combination:

(A) balance reel assembly means comprising a balance reel; a balance line wound around said balance reel and having one end attached to the leeward side of said sailing vessel and one end attached to said balance reel, jamb cleat means and base means for supporting the aforesaid balance reel assembly means components, said base means being detachedly attached to the tiller of said sailing vessel;

(B) steering line means having two ends, one end being attached to said jamb cleat means of said balance reel assembly means; and

(C) traveller control line means mounted transversly from the leeward to the windward side of said vessel, said traveller control line means being operatively connected intermediate to said sides to mainsheet means, said second end of said steering line means being connected to said traveller control line means at a point between said mainsheet means and said windward side of said vessel, whereby when tension is placed on said balance line, steering line means and traveller control line means by action of said balance reel a bend is formed in said traveller control line means in the vicinity of the point where said steering line means is connected to said traveller control line means, and whereby further changes in wind velocity or direction are directly translated by corresponding changes in the extent of the bend into simultaneous sail and rudder adjustments to return the vessel to a desired preselected course.

4,231,309

RUDDERS FOR BOATS, PARTICULARLY FOR PLEASURE BOATS

Jean Pelletier, Le Pradet, France, assignor to Coast Catamaran France S.A., Hyeres, France

Filed Mar. 27, 1978, Ser. No. 890,806

Claims priority, application France, Jul. 26, 1977, 77 22936

Int. Cl.³ B63H *25/38*

U.S. Cl. 114—162 **12 Claims**



1. A boat rudder comprising:

a rudder-blade hinged, in its upper part, to a substantially horizontal pin carried by a rudder-blade support, itself hinged about a substantially vertical pin, situated at the rear of the boat and carried by gudgeons fixed on this boat;

a bar fixed to a bar support, the rear part of this bar support being hinged to a substantially horizontal pin provided at the upper part of the rudder-blade;

a locking device for jamming the bar support in relation to the rudder-blade support, in a lower position of the rudder-blade corresponding to the normal working position, this locking device comprising a stop member, carried by the bar support, spaced longitudinally from the pin hinging the bar on the rudder-blade, said stop member being adapted to cooperate with a jamming member carried by the rudder blade support, the assembly of the stop member and the jamming member being arranged so as to ensure automatic unlocking of the bar support in relation to the rudder-blade support when the stress exerted on the rudder-blade exceeds a given limit greater than the stresses likely to be exerted on the rudder-blade during normal sailing,

characterised by the fact that it is provided with a balancing adjustment device comprising:

means for adjusting the normal working position of the rudder-blade with respect to the rudder-blade support so that the ratio of the areas of the rudder blade situated respectively in front and behind the hinge pin of the rudder-blade support (or its extension) may be adjusted;

and longitudinal displacement means for varying the distance between said stop member and the pin for hingeing the bar support on the rudder-blade, so as to set the locking in accordance with the position of the rudder-blade determined by the above adjustment means.

4,231,310

REMOTE CONTROL UNIT

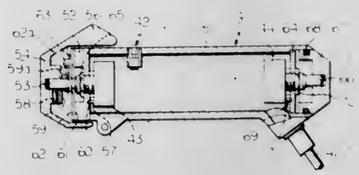
Shigeru Muramatsu, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Apr. 10, 1978, Ser. No. 895,109

Claims priority, application Japan, Apr. 20, 1977, 52-48973[U]

Int. Cl.³ B63H *25/00*

U.S. Cl. 114—144 RE **1 Claim**



1. An improved remote control unit, comprising:

(A) an elongated, generally cylindrical, main casing housing an A-M switch, a main variable resistor and a subordinate variable resistor;

(B) a main-dial rotatably coupled to one longitudinal end of said main casing and operationally coupled to said main variable resistor, said main-dial being rotatable about the longitudinal axis of said main casing over a prescribed angle on both sides of a zero-point responsive to an external force applied thereto;

(C) means for elastically and automatically restoring said main-dial to said zero-point when said external force is removed from said main-dial;

(D) a sub-dial rotatably coupled to the other longitudinal end of said main casing and operationally coupled to said subordinate variable resistor, said sub-dial being rotatable about said longitudinal axis of said main casing over a prescribed angle on both sides of a zero-point responsive to an external force applied thereto;

(E) said main-dial being operationally coupled to said main variable resistor via a shaft which is rotatably coupled to said main casing coaxially therewith and which extends through said one end of said main casing; and

(F) said elastically and automatically restoring means including:

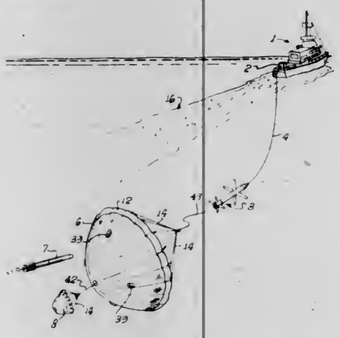
(1) a driver disc coaxially secured to said shaft outside said one end of said main casing and provided with a pair of hooks projecting towards said main casing at symmetric positions on the periphery thereof;

(2) a stopper disc coaxially secured to said one end of said main disc while allowing free turning of said shaft and provided with a pair of hooks projecting towards said driver disc at symmetric positions on the periphery thereof; and

(3) an override spring interposed between said two discs and having a center helical portion loosely winding around said shaft and a pair of branches whose ends are

in abutting engagement with said hooks of said two discs in such an arrangement that turning of said shaft causes elastic deformation of said override spring via said driver disc.

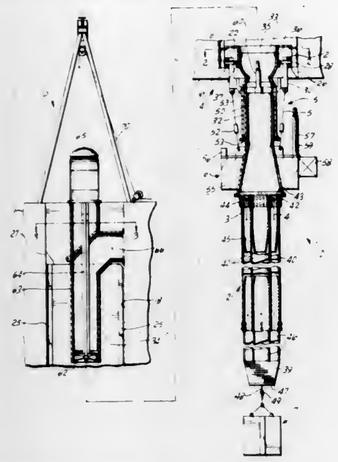
4,231,311
TOWABLE POD ASSEMBLY FOR PROTECTIVELY DISABLING INCOMING TORPEDOES
Ernest P. Longerich, Chatsworth, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 1, 1978, Ser. No. 939,012
Int. Cl.[2] B63G *8/24*
U.S. Cl. 114—244 **20 Claims**



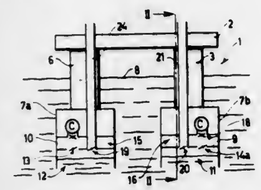
1. Apparatus for intercepting and disabling underwater torpedo-like missiles directed toward a ship comprising:
a towable pod in the form of an elongate tube-like casing,
tow cable means for towing the pod aft of the ship,
means for detecting the incoming path of said missiles,
a missile-disabling main parachute stored in said tube-like pod casing, and
means for releasably deploying the main parachute into said incoming path for providing an intercept barrier for engaging and disabling the missiles.

4,231,312
FLEXIBLE OCEAN UPWELLING PIPE
Abraham Person, Los Alamitos, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.
Filed Aug. 21, 1978, Ser. No. 935,673
Int. Cl.[3] E02B *9/00*
U.S. Cl. 114—264 **19 Claims**

1. An ocean engineering apparatus comprising a water flow pipe assembly adapted to be connected at an upper end thereof to a support structure, the support structure incorporating a pump operable for establishing and maintaining water flow through the pipe assembly to the support structure which is disposed adjacent the surface of an ocean and the like, the pipe assembly being adapted to extend essentially vertically in the ocean downwardly from the support structure to a lower end disposed a substantial distance below the support structure and above the ocean floor, the pipe assembly defining at least one essentially continuous water flow conduit extending essentially from end-to-end of the pipe assembly, motion accommodating connection means for connecting the upper end of the pipe assembly to the support structure and for isolating from the pipe assembly essentially all motions of the support structure about horizontal axes, the conduit over a major portion of its length being defined essentially of a material having positive buoyancy in sea water and which has an effective modulus of elasticity in the temperature range of from about 40 degrees F. to about 90 degrees F. not in excess of about 100,000 pounds per square inch for at least one hour, and ballast means connected to the lower end of the pipe assembly having net negative buoyancy in sea water sufficiently correlated to the positive buoyancy of the conduit material to establish in the conduit material at the upper end of the conduit a selected low tensile stress in the conduit material.

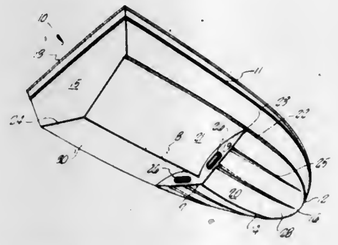


4,231,313
STABILIZING SYSTEM ON A SEMI-SUBMERSIBLE CRANE VESSEL
Pieter S. Heerema, Kapellen, Belgium; Alexandre Horowitz, Eindhoven, and Henricus P. Willemsen, Aarle-Rixtel, both of Netherlands, assignors to Varitrac AG, Zug, Switzerland
Continuation of Ser. No. 769,002, Feb. 16, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 913,608
Claims priority, application Netherlands, Feb. 19, 1976, 7601712; Nov. 11, 1976, 7613007
Int. Cl.[3] B63B *35/02*
U.S. Cl. 114—265 **7 Claims**



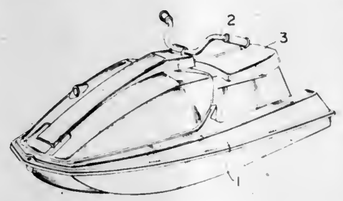
1. A semi-submersible crane vessel comprising a platform, a plurality of vertical hollow columns supporting the platform, said columns being distributed along a circumferential outer region of the vessel, submerged bouyancy hulls supporting said columns such that the platform is above water level, and a stabilizing system for stabilizing the vessel with respect to outboard handling of loads by at least one crane on the vessel, said stabilizing system comprising ballast chambers in said bouyancy hulls, valve means for selectively admitting surrounding water into said chambers, said chambers comprising (a) air chambers at the lower ends of said columns at the level of said submerged buoyancy hulls; (b) said air chambers having a top closure below the level of the water surrounding said submerged buoyancy hulls, a bottom connection in communication with the surrounding water and vertical air conduits extending upwardly from said chambers for connecting the latter to ambient atmosphere; (c) means for controlling said valves for admission of desired amounts of water into said air chambers during handling of a crane load in dependence on the weight of said loads and the position of said loads with respect to said vessel and measuring means including gauging means for measuring the water level in each said air chamber, said gauging means including an air pressure sensor for each of said air chambers and a water pressure sensor at the exit of each said chamber to the surrounding water, the difference between said sensed pressures being indicative of the water level in each said first air chamber.

4,231,314
HYDROPLANE BOAT
Michael Peters, 2700 Severance St., Los Angeles, Calif. 90007
Filed Feb. 17, 1978, Ser. No. 878,751
Int. Cl.[2] B63B *1/00*
U.S. Cl. 114—291 **19 Claims**



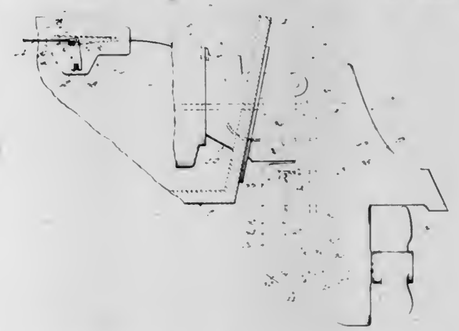
1. A hydroplane boat comprising
a hull including two generally V-shaped sections being disposed one aft of the other,
a transverse step in said hull separating said V-shaped sections, and
continuous chines from stem to stern,
wherein the aft hull section comprises two surface portions separated by a central keelson, each of said surface portions being generally concave in the area just aft of said step, and becoming progressively less concave toward the transom of said boat so that at said transom, each of said surface portions is substantially flat and intersects said transom in substantially a straight line.

4,231,315
WATER-JET PROPULSION UNIT FOR VESSELS
Hisataro Tachibana, and Hiromi Ono, both of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed May 8, 1978, Ser. No. 903,803
Claims priority, application Japan, May 12, 1977, 52/54930; May 13, 1977, 52/55825
Int. Cl.[2] B63H *11/00*
U.S. Cl. 440—43 **5 Claims**



1. A water-jet propulsion unit for a vessel which comprises water duct means having inlet means and an outlet nozzle means variable between a horizontal rearward orientation and a vertical downward orientation, and power-driven impeller means disposed in said duct means for forcing water from the inlet means to said outlet nozzle means, said outlet nozzle means comprising an upper nozzle element means having opposite side edges and a lower nozzle element means also having opposite side edges, said upper and lower nozzle element means being disposed with the side edges on one nozzle element means in slidable engagement with the side edges on the other nozzle element means, said upper nozzle element means and said lower nozzle element means being of cross-sectional configurations to define a closed area between them, one of said nozzle element means being mounted for swingable movement about a horizontal axis, resilient means for biasing the other nozzle element means into slidable engagement with said one nozzle element means at the side edges so that when said one nozzle element means is moved from a horizontal position to a vertical position the other said nozzle element means is slidable moved to a position staggered with respect to said one nozzle element means to provide a vertically directed outlet nozzle means.

4,231,316
ACTUATION MEANS FOR MARINE PROPULSION DEVICE TRANSMISSION
Gerald F. Bland, Kenosha, Wis., and Guy D. Payne, Lake Villa, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Mar. 27, 1978, Ser. No. 890,499
Int. Cl.[2] B63H *5/13, 21/28;* G05G *7/02*
U.S. Cl. 440—86 **20 Claims**



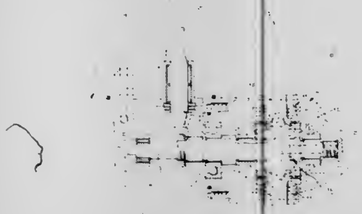
1. A marine propulsion device comprising a propulsion unit, a propeller shaft rotatably mounted in said propulsion unit and carrying a propeller, a drive shaft rotatably mounted in said propulsion unit, a reversing transmission connecting said drive shaft to said propeller shaft and shiftable between a neutral condition and a drive condition, shifting means including an actuating member mounted in said propulsion unit for reciprocal movement relative to a neutral position and connected to said reversing transmission for operating said reversing transmission in response to movement of said actuating member, a clutch shift lever mounted for reciprocal movement, and means connecting said shift lever to said actuating member for effecting movement of said actuating member in response to movement of said shift lever, said connecting means including first and second flexible shift cables each having a first end and a second end, means operably connecting said first ends of said shift cables to said shift lever and connecting said second ends of said shift cables to said actuating member such that, in response to movement of said shift lever in one direction, said first shift cable is pulled in a first direction for effecting movement of said actuating member in one direction relative to its neutral position and said second shift cable is moved in a second direction opposite to said first direction and such that, in response to movement of said shift lever in the other direction, said second shift cable is pulled in said first direction for effecting movement of said actuating member in the other direction relative to its neutral position and said first shift cable is moved in said second direction.

4,231,317

BOAT PROPELLER DEVICE

Lennart H. Brandt, Fjäras, and Staffan T. Mansson, Hjälteby, both of Sweden, assignors to AB Volvo Penta, Goteborg, Sweden

Filed Jun. 19, 1979, Ser. No. 49,649
Claims priority, application Sweden, Jul. 19, 1978, 7807965
Int. Cl.³ B63H *3/02*
U.S. Cl. 440—50 **6 Claims**



1. Boat propeller device comprising a hub and blades rotatably journalled in the hub, characterized in that the blades are turnable between two end positions, one end position determining the setting of the blades for propulsion in a first direction with a certain direction of rotation of the hub, and the second end position determining the setting of the blades for propulsion in the opposite direction with the same direction of rotation, the hub being rotatably journalled on a propeller shaft and transmission means being disposed between the shaft and the blades said means being selectively engagable so that when there is a relative rotation between the hub and the shaft, the blades turn to one of said end positions.

4,231,318

DUAL BLADE COATER

Stanley C. Zink, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Jul. 3, 1978, Ser. No. 921,502
Int. Cl.² B05C *11/04*
U.S. Cl. 118—122 **8 Claims**

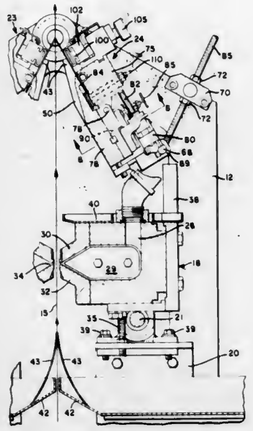
1. A twin-blade coater for applying coating materials simultaneously to the opposite sides of a vertically moving web of paper or the like,

a pair of generally opposed fountain-type applicators positioned on opposite sides of said vertically moving web in non-contacting relation to said web and each adapted to impinge a stream of coating material against said web,

means mounting said applicators for transverse pivotal movement with respect to said web whereby the region of impingement of coating material from each of said applicators may be independently varied,

a pair of metering blade assemblies, means mounting said assemblies on said frame for pivotal movement about a common transverse pivot axis vertically spaced from said applicators,

blade means on each of said blade assemblies coacting with said web at a common transverse region substantially coincidental with said pivot axis, and



independent means associated with each of said assemblies for adjusting the incidence angle of the associated said blade means independently of the other said assembly.

4,231,319

ELECTROSTATIC COPYING APPARATUS

Gottfried Waibel, Rossleithen; Günther Maurischat, and Heinz Webersik, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,358
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715904
Int. Cl.³ G03G *13/00*
U.S. Cl. 118—655 **4 Claims**



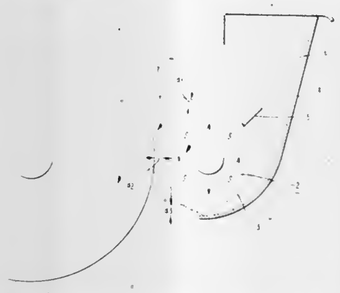
1. In an electrostatic copying apparatus wherein a travelling xerographic surface is arranged to carry latent electrostatic images in a predetermined path, a developing device for converting said latent images into powder images, comprising a receptacle for a supply of intermixed toner and carrier particles; a conveyor for withdrawing intermixed particles from said supply and to cascade the withdrawn particles over latent images in said path whereby the surplus of such particles reenters said receptacle and the particles become electrostatically charged as a result of triboelectrification during circulation in and back into said receptacle; an electrode mounted in said receptacle electrically insulated therefrom and positioned to contact the circulating particles; and electrically conductive means for limiting the electrostatic charge of said particles to a maximum desired value by connecting said electrode to ground when the electrostatic charge of said particles exceeds said maximum value, said means comprising a plurality of elements each connected between said electrode and ground and each operative to become electrically conductive and to thereby ground said electrode when the electrostatic charge of said particles exceeds one of a plurality of different values which are different for the different elements.

4,231,320

MAGNETIC BRUSH-TONER SUPPLY HOPPER

Masumi Asanae, Kamugaya, and Keitaro Yamashita, Kamisato, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 22, 1979, Ser. No. 23,002
Claims priority, application Japan, Mar. 23, 1978, 53-33531
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—657 **3 Claims**



1. A developing machine for magnetic toner having a toner supply tank with an opening, a rotatable non-magnetic cylindrical shell disposed in said opening, its cylindrical surface partially protruding into the toner supply tank and a rotatable magnet roll disposed in said cylindrical shell, said magnet roll being adapted to rotate for drawing magnetic toner out of said toner supply tank, transporting the magnetic toner around said cylindrical shell to contact a support for electrostatic latent images and then drawing unused toner again into the toner supply tank, characterized in that the width of a first gap between a wall of the toner supply tank and the cylindrical shell for drawing unused magnetic toner back into the tank is made smaller than the maximum transportation depth for magnetic toner on the cylindrical shell and greater than both the width of a second gap between a wall of the toner supply tank and the cylindrical shell for drawing magnetic toner out of the supply tank and also the width of a third gap between the latent image support and the cylindrical shell, leakage through said first gap between the wall of the toner supply tank and the shell being prevented when the magnet roll and cylindrical shell are stationary, the plane defined by said first gap being oriented vertically at the bottom of the shell and wherein said unused toner drawn back into the toner supply tank through said first gap enters said first gap in a horizontal direction.

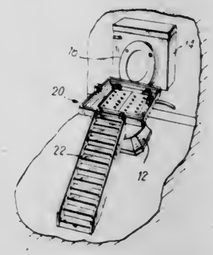
4,231,321

PET ACCESSORY FOR USE WITH A COMMODE

Floraine Cohen, 425 E. 80th St., New York, N.Y. 10021

Filed Jan. 11, 1979, Ser. No. 2,566
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—1 **1 Claim**

1. A pet accessory for attachment to a commode comprising a support having an opening adapted to be located over said commode, trap door means for selectively obturating said opening, electro-mechanical means for operating said trap door means, sensing means for sensing when a pet has been on and departed from said trap door means for actuating said electro-mechanical means, cleansing means for cleansing said trap door means under the control of said sensing means, said cleansing means including an electromagnetic valve coupled to said sensing means, said support including depending protrusions for extending into said commode and locating the support on said commode, said electromechanical means including reversible motors and said trap door means including flaps operated by said motors, timing means to control the length of time said trap door means is operated, and a ramp leading to said support, said cleansing means including a perforated tube detachably resting on said support, said sensing means includes



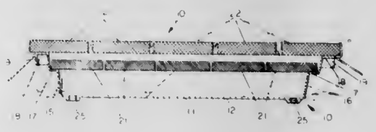
a light source and a photoelectric cell in operative combination, said timing means further sensing that the pet has arrived between the light source and photoelectric cell and departed therefrom in sequence before controlling the said length of time, said timing means including a flip-flop and inverter coupled to said photoelectric cell, an AND gate coupling said flip-flop to said electromechanical means, a delay means coupling said inverter to to said flip-flop for a resetting of the latter, and timing and reversing means coupling said AND gate to said electromechanical means whereby the trap door means is first opened and then closed.

4,231,322

APPARATUS FOR GROWING OYSTERS AND OTHER MOLLUSCS

Donald S. Gilpatric, 4304 Gifford Pinchot Dr., Annandale, Va. 22003

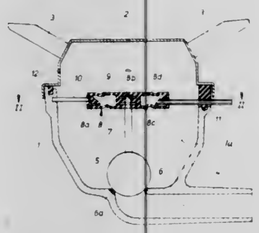
Division of Ser. No. 925,765, Jul. 18, 1978, Pat. No. 4,186,687. This application Jul. 2, 1979, Ser. No. 53,858
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 **15 Claims**



1. Apparatus for sustaining the growth of oysters and other molluscs in multiple water environments comprising in combination an elongated open-top receptacle which can be moved and placed on any form of coastal or estuarine bottom strata with tidal seawater flows containing adequate nutrients and other marine environmental requirements for the growth of oysters and other molluscs, and plural sets of multiple foraminous cribs for containing oysters and other molluscs of various sizes for off-bottom rearing and maturing to marketable qualities, said receptacle having a bottom, opposite side walls and end walls extending upwardly from said bottom, support means intermediate the open top and bottom of said receptacle supporting and protectively housing a first set of said foraminous cribs side by side within said receptacle, said second set of foraminous cribs being supported side by side, transversely

across the open top of said receptacle and superimposed over said first set of cribs, said first set of cribs having smaller size openings than the openings of said second set adapting said first set of cribs to contain oysters of a smaller size than the cribs of said second set.

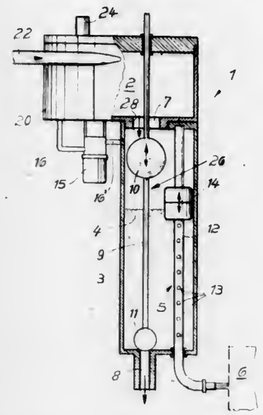
4,231,323
MILKING MACHINE CLAW
Karl E. Olander, Sodertalje, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden
Filed May 21, 1979, Ser. No. 41,102
Claims priority, application Sweden, May 26, 1978, 7806050
Int. Cl.³ A01J 5/00, 7/00
U.S. Cl. 119—14.08 **5 Claims**



1. In a milk claw for milking machines, the combination of a housing forming a milk manifold and adapted for connecting said manifold to the teat cups of a milking machine, the housing having an outlet from said manifold, a valve for controlling said outlet and including a valve seat in the housing and a valve member coacting with said seat to open and close the valve, there being a leak opening which allows a small flow through said valve in the closed position thereof, and a pneumatic operating member structurally supported in the housing and connected to the valve for operating the same, said operating member comprising two flexible diaphragms which define between the diaphragms a working chamber separated from the milk manifold, one of said diaphragms having a larger area than the other diaphragm, both of said diaphragms being exposed outside said working chamber to the pressure in the milk manifold, whereby said operating member is actuated by variations in the difference between the pressures in said manifold and said working chamber.

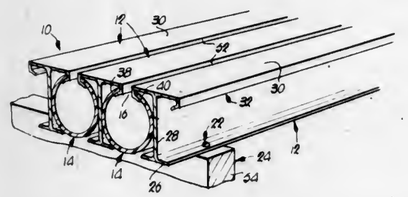
4,231,324
MILK QUANTITY METER
Peter Schletter, Kirchhellen-Bottrop, Fed. Rep. of Germany, assignor to DEC GmbH, Fed. Rep. of Germany
Filed Mar. 5, 1979, Ser. No. 17,234
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810376
Int. Cl.³ A01J 7/00; G01F 15/08
U.S. Cl. 119—14.17 **4 Claims**

1. In combination with a milk quantity meter for use in milking stations for directly measuring a quantity of milk for a quantity of milk and entrained air yielded by a cow during a milking of the type having a container for receiving milk and entrained air, means for directing milk and entrained air into said container and for separating said milk and air, air vent means associated with said container for the discharging of the air, a milk measuring receptacle adjacent to said container, connecting means providing fluid communication between said container and said receptacle such that the separated milk flows into said receptacle, the milk measuring receptacle having a closed cylinder vertically disposed below the separation chamber, said cylinder having a milk inlet opening at its upper end surface in fluid communication with said separation chamber and a milk outlet opening at its lower end surface concentrically of said milk inlet, shutoff means disposed within said receptacle alternately opening and closing both said milk inlet opening and said milk outlet opening, the improvement comprising sensing means for sensing the level of milk within the receptacle as an indication of the quantity thereof including a measuring tube extending coaxially with the receptacle axis within the receptacle, switch means arranged at predetermined



axially spaced locations in said measuring tube for indicating the level of the milk, float slidably mounted on the measuring tube for actuating said switch means and an electrically operated counter operatively connected to said switch means for indicating the quantity of milk in response to the actuation of said switch means.

4,231,325
MODULAR, WASTE COLLECTING AND DRAINING FLOOR APPARATUS
Donald M. Parks, R.R. #4, Chillicothe, Mo. 64601
Filed Jun. 6, 1979, Ser. No. 46,050
Int. Cl.³ A01K 1/01
U.S. Cl. 119—28 **2 Claims**



1. In modular, waste collecting and draining, floor apparatus adapted for installation upon underlying support means of various types, including those of type involving a directly underlying sub-floor:

a plurality of elongate assemblies each having a base, structure rising from said base, and a floor strip supported above said base by said structure;

means for mounting said assemblies upon said underlying support means with said assemblies in spaced, generally parallel relationship to each other to present an elongate chamber between said structures of each adjacent pair of assemblies and with the adjacent edges of each adjacent pair of said strips in spaced, generally parallel relationship to each other to present an elongate slot between each of said pairs of adjacent edges in communication with the corresponding of said chambers; and

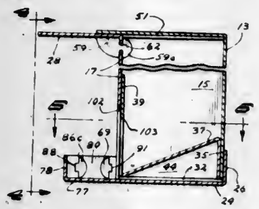
a plurality of trough means respectively disposed within said

chambers and each in communication with the corresponding of said slots for receiving and draining away waste materials passing downwardly through said slots between said strips;

each of said trough means comprising an elongate, generally cylindrical pipe-like element resting upon said underlying support means, oppositely engaging said structures of the adjacent assemblies and having an elongate opening along its upper surface in communication with the corresponding of said slots,

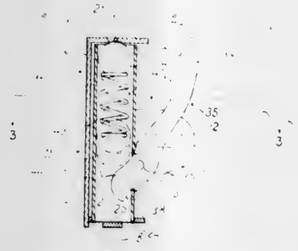
each of said strips being provided with flange means depending from the edges thereof and extending into said opening of the corresponsing of said elements whereby said flange means operate to maintain said openings in communication with said slots and said elements operate to couple said assemblies in their said relationships.

4,231,326
DOG FOOD CONTAINER AND FEEDER
David P. Hager, Deer River, Minn. 56636
Filed Nov. 24, 1978, Ser. No. 963,386
Int. Cl.³ A01K 5/00
U.S. Cl. 119—52 R **18 Claims**



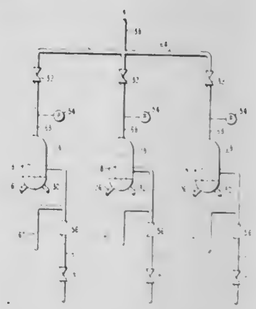
1. A shipping container feeder for containing feed, comprising a front wall, a rear wall, a bottom closure flap, and side walls joined to one another to form a generally rectangular box shaped bin having an interior and a generally rectangular tray that includes a rectangular bottom wall having one edge integrally joined to the bottom closure flap to extend away from the front wall, a front edge and opposite side edges, a tray vertical front wall joined to the front edge; and opposite tray vertical side walls joined to the side edges, tab means for joining the tray front wall to the tray side walls, a vertical reinforcing panel in the bin interior abutting against the bin front wall and tab means for joining the reinforcing panel to the tray side walls, the bin front wall and panel having openings therethrough to permit flow of feed from the bin interior to the tray.

4,231,327
RELEASABLE ANIMAL HITCHING APPARATUS
William L. Mader, Ekalaka, Mont. 59324
Filed Jan. 2, 1979, Ser. No. 337
Int. Cl.³ B68B 1/00; A01K 3/00
U.S. Cl. 119—110 **10 Claims**



1. A releasable animal hitching apparatus including a support member, hitching means movably carried by said support member, and biasing means associated with said hitching means, said support member including a main section and transverse sections extending substantially perpendicularly from said main section adjacent the ends thereof, said main section including means for fastening said support member to a supporting surface, each of said end sections having a recess therein facing the corresponding recess in said other end section, said hitching means including a hollow housing disposed between said recesses of said end sections, an opening in the sidewall of said housing, at least one bracket section extending outwardly from the external sidewall of said housing adjacent said opening thereof, a trigger member pivotally connected to said bracket section, said trigger member having a first portion extending through said sidewall opening of said housing, said first trigger portion having a rounded surface area extending toward the center of said housing and stop means adjacent the internal surface of said housing, said trigger member having a second portion extending generally along and spaced from said external sidewall of said housing, said biasing means being disposed within said housing and extending between said first portion of said trigger member and the end of said housing remote therefrom, whereby said second trigger portion end is urged toward said external sidewall of said housing.

4,231,328
AUTOMATIC STEAM GENERATOR FEEDWATER REALIGNMENT SYSTEM
Glenn E. Lang, Winfield Township, Butler County; Milburn E. Crotzer, Monroeville, and John S. Fuoto, Irwin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 18, 1978, Ser. No. 925,720
Int. Cl.² F22B 1/06, 37/42
U.S. Cl. 122—504 **7 Claims**



1. A method of automatically realigning a steam generator secondary piping system in the event of a pipe break to a given steam generator in a system having plural steam generators sharing in part a common piping system comprising the steps of:

monitoring the pressure in the respective steam generator steam exit lines and providing corresponding electrical outputs representative of the pressure monitored;

comparing the respective monitored outputs to a first predetermined setpoint and identifying through a corresponding second electrical output when any of the respective monitored values drops below the first setpoint;

closing the steam exit lines to the respective steam generators in response to the second electrical output;

comparing the respective monitored outputs to a second predetermined setpoint after the steam exit lines are closed;

identifying from the second setpoint comparison the respective monitored value that drops below the second setpoint and the corresponding steam generator, through a third electrical output; and

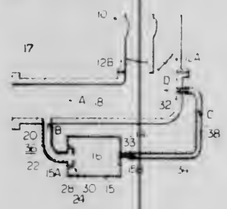
closing the feedwater line to the steam generator exhibiting the drop in pressure below the second setpoint, in response to the third electrical output.

4,231,329

APPARATUS FOR ATOMIZING FUEL IN AN INTERNAL COMBUSTION ENGINE

Yasuhiko Ishida, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 4, 1978, Ser. No. 966,122
Claims priority, application Japan, Mar. 7, 1978, 53-24989
Int. Cl.³ F02B *27/00*
U.S. Cl. 123—52 MB **11 Claims**



1. An apparatus for improving atomization of fuel in an air-fuel mixture passing through an intake line of an internal combustion engine, said apparatus comprising:

first passageway means opened to the intake line at a first position thereof;

second passageway means opened to the intake line at a second position thereof, the flow area of the second passageway means being substantially smaller than that of the first passageway means, and

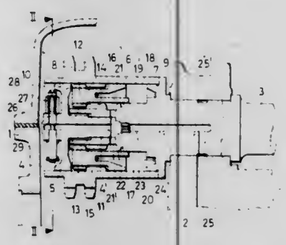
pressure accumulator means located between the first and second passageway means for producing a pressure in the pressure accumulator means, which pressure is close to a maximum pressure in the intake line, thereby generating an intermittent flow of air-fuel mixture ejected to the intake passageway via the second passageway means, said apparatus forming a closed loop between said first and second positions with no openings to or from atmosphere.

4,231,330

TIMING VARIATOR FOR THE TIMING SYSTEM OF A RECIPROCATING INTERNAL COMBUSTION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Mar. 13, 1979, Ser. No. 20,193
Claims priority, application Italy, Mar. 24, 1978, 21650 A/78
Int. Cl.³ F01L *1/34*
U.S. Cl. 123—90.15 **2 Claims**



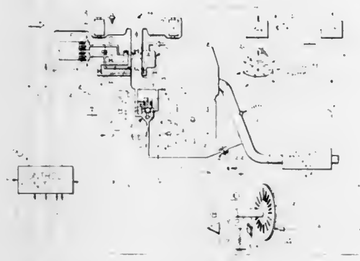
1. An internal combustion engine especially for motor vehicles in which the intake valves are controlled by one camshaft and the exhaust valves by a different camshaft, both of said camshafts being provided at one end with a gear for their drive by means of the engine crankshaft and for their appropriate timing relative to said crakshaft, the coupling of at least one of said camshafts with its gear being made by way of an intermediate member constituted by an annular piston provided with a first groove in the gear, and with a second groove which engages in a groove in the shaft, at least one of said grooves in the annular piston and the groove with which it engages being helical so that the other groove of the annular piston and the groove with which it engages can be longitudinal, said annular piston being able to make an axial sliding movement along the axis of the camshaft and of the gear, said sliding movement being limited by two limiting contact surfaces which are fixed relative to the shaft, the loading of a spring in the direction of the camshaft axis tending to keep the annular piston in a first of the two limiting positions, whereas the pressure of the engine lubricating oil can exert on one surface of the annular piston a force capable of overcoming the loading of said spring so as to move it axially and to keep it in the second of the two limiting positions, the lubricating oil flowing through a small port to the cavity in which the annular piston is located, wherein said cavity can be connected to the outside through a slide valve, the valve element of which moves in a direction normal to the camshaft axis in being displaced from the opening to the closure position, said valve element being provided with a single mass eccentric to the camshaft axis, the force of a preloaded spring acting on said valve element in its sliding direction to maintain it in its open position when the rotational speed of the engine and thus of the camshaft is less than the value for which the centrifugal force applied to the eccentric mass is equal to the preloading of the spring, whereas at higher rotational speeds the centrifugal force overcomes the preloading of the spring to move the valve element into the closure position, so that, at speeds less than said value, as the valve element is in the open position the oil pressure falls considerably because of the existence of said small port, and thus the annular piston is kept by the axial spring in its first limiting position, whereas, at speeds higher than said value, as the valve element is in the closure position, the annular piston is moved to, and kept, in its second limiting position by the oil pressure such that, because of the path of one of the grooves in said annular piston, at speeds lower than said value a first determined timing of the camshaft is obtained relative to the driveshaft, whereas at higher speeds a second determined timing is obtained.

4,231,331

PULSE GENERATOR OF THE CORONA DISCHARGE TYPE FOR SENSING ENGINE CRANKSHAFT ANGLE ON AN ENGINE CONTROL SYSTEM

Suzuo Suzuki; Hastuo Nagaishi, both of Yokosuka, and Kenji Masaki, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Aug. 1, 1978, Ser. No. 930,033
Claims priority, application Japan, Aug. 8, 1977, 52/94795; Aug. 10, 1977, 52/95802
Int. Cl.³ F02P *5/04*; F02M *25/06*; G01P *3/48*
U.S. Cl. 123—416 **24 Claims**



1. A pulse generator comprising:

a rotor having a plurality of angularly equally spaced apart segmented regions;

electrode means stationarily mounted with respect to said rotor to define an air gap with each one of said segmented regions upon rotation of said rotor and connected to a source of DC potential to form a corona discharge generating electrical circuit through said air gap to successively generate corona discharges across said air gap upon rotation of said rotor; and

an impedance element provided in said corona discharge generating electrical circuit to develop voltage pulses in response to said corona discharges.

12. A spark timing and exhaust gas recirculation control system for an internal combustion engine, comprising:

means for producing a signal representative of the amount of exhaust gases recirculated through said engine;

means for producing a signal representative of the speed of said engine;

means for generating a first pulse in response to an engine cylinder reaching a reference point of its combustion cycle and second pulses the frequency of which is proportional to the speed of said engine;

means for producing a signal representative of power which said engine delivers;

first storage means in which is stored a set of data each representative of the spark timing of said engine cylinder as a function of a set of engine speed and engine power values for generating a corresponding output in response to said signals representative of said engine speed and engine power;

second storage means in which is stored a set of data each representative of the rate of exhaust gas recirculation as a function of a set of engine speed and engine power values for generating a corresponding output in response to said signals representative of said engine speed and engine power;

counter means arranged to be preset in accordance with the output from said first storage means for counting said second pulses in response to each said first pulse and generating a spark timing pulse in response to the counted second pulses reaching said preset count value; and

means for comparing said signal representative of the amount of recirculated gases with the output from said second storage means to detect the difference therebetween for regulating said recirculated gases;

wherein said means for generating first and second pulses comprises a rotor mounted for revolution with said engine and having a plurality of angularly equally spaced apart segmented regions, electrode means stationarily mounted with respect to said rotor to define an air gap with each one of said segmented regions upon rotation of said rotor and connected to a source of DC potential to form a corona discharge through said air gap to successively generate corona discharges across said air gap upon rotation of said rotor, and an impedance element responsive to each of said corona discharges to develop a signal corresponding to said first and second pulses, one of said segmented regions having a different dimension from the dimension of the other segmented regions and being arranged in said rotor to coincide with the path of said corona discharge in response to said engine cylinder reaching said reference point.

4,231,332

SPARK AND DWELL IGNITION CONTROL SYSTEM USING DIGITAL CIRCUITRY

Robert S. Wrathall, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1979, Ser. No. 49,016
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—416 **15 Claims**

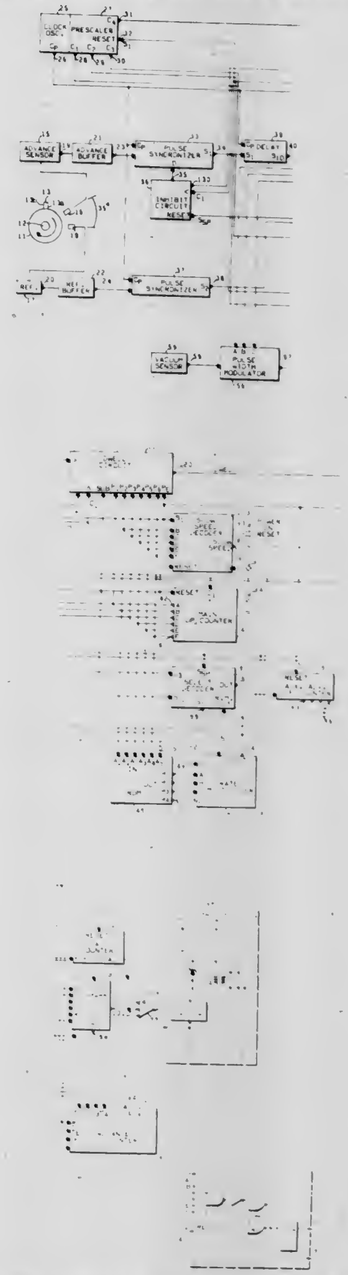
1. A digital signal processing circuit comprising:

clock means for producing an input clock signal comprising a series of digital pulses having a predetermined rate of occurrence;

rate multiplier means coupled to said clock means for receiving said input signal and producing a corresponding output signal by selectively multiplying (dividing) the rate occurrence of the input clock signal pulses in accordance with received control signals;

control means coupled to said rate multiplier means for producing and supplying said control signals for controlling the rate multiplication of said rate multiplier means, said control means comprising a read only memory means (ROM) with the output of the ROM determining said control signals;

accumulator means coupled to said rate multiplier means for



receiving said output signal and accumulating a count related to the pulse count of said output signal;

wherein the improvement comprises said control means including,

pulse width modulation means for receiving an analog signal and producing a periodic digital two state signal having a duty cycle related to the magnitude of the analog signal, and

means coupling said digital two state signal as an input to said ROM, in addition to other inputs received by said ROM, whereby the output of said ROM, which comprises said control signals, is a function of the magnitude of said analog signal, thereby causing the rate of occurrence of pulses in the output signal of the rate multiplier means to be a function of the magnitude of the analog signal while minimizing the memory storage required by said ROM and effectively causing the digital signal processing circuit to interpolate between rate multiplier means control signals stored by said ROM while minimizing the memory storage required by said ROM.

4,231,333

SINGLE POINT FUEL DISPERSION SYSTEM USING A LOW PROFILE CARBURETOR

Arthur K. Thatcher, Merritt Island, and Ed R. McCarter, Maitland, both of Fla., assignors to Arthur K. Thatcher, Merritt Island, Fla.

Continuation-in-part of Ser. No. 593,001, Jul. 3, 1975, Pat. No. 4,100,896, which is a division of Ser. No. 293,377, Sep. 29, 1972, Pat. No. 3,893,434. This application Jan. 12, 1978, Ser. No. 868,825

Int. Cl.³ F02B *3/00*; F02N *17/00*

U.S. Cl. 123—440 **27 Claims**



1. A computer controlled fuel system for an internal combustion engine having a combustion area, an intake manifold for conducting air and fuel to the combustion area, an air source for providing an airstream for entry into the intake manifold, an exhaust manifold for removing exhaust gases from the combustion area, and a fuel source, said computer controlled fuel system comprising

(A) fuel input means connected to supply fuel from the fuel source to the airstream, said fuel input means including

(1) fuel dispersion means for receiving fuel at a point adjacent the path of the airstream and for dispersing the fuel so received into the airstream at an angle relative to the direction of flow of the airstream and toward the center of the airstream at a point before the airstream reaches the combustion area of the engine, said fuel dispersion means being mounted in a predetermined orientation adjacent the path of the airstream, and

(2) fuel injection means for receiving fuel from the fuel source and for directing a flow of fuel so received to said fuel dispersion means for dispersion into the airstream; and

(B) a fuel computer means connected with said fuel input means for controlling the flow of fuel from said fuel injection means to supply a predetermined fuel-air ratio to the intake manifold in response to sensed engine conditions as long as such engine conditions remain within predetermined limits, said fuel computer means including threshold means for providing additional fuel flow to said fuel dispersion means from said fuel injection means whenever a sensed engine condition goes beyond a predetermined threshold level.

4,231,334

METHOD AND APPARATUS FOR DETERMINING THE PROPORTIONS OF THE CONSTITUENTS OF THE AIR-FUEL MIXTURE SUPPLIED TO AN INTERNAL COMBUSTION ENGINE

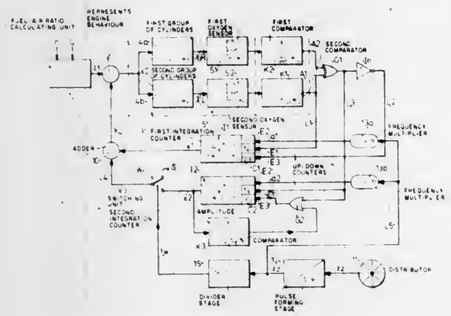
Cornelius Peter, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,163

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2713988

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—440 **14 Claims**



1. A method for determining the proportions of the air-fuel mixture constituents supplied to an internal combustion engine having an exhaust gas conduit system and a mixture preparing device associated therewith, said air-fuel mixture constituents being supplied by the mixture preparing device which has at least two oxygen sensors arranged in the exhaust gas conduit system, comprising the steps of:

detecting the rpm of and the air flow rate to the engine, calculating the air-fuel ratio which determines the fuel quantity to be delivered to the engine, and generating a signal representative of this air-fuel ratio;

integrating the output signals from each of the oxygen sensors; and

applying the integrated output signals to the generated representative signal of the air-fuel ratio and oscillating the representative signal about a predetermined air-fuel ratio value and at a predetermined amplitude, thereby regulating the average value of the overall exhaust gas composition to the predetermined air-fuel ratio value.

4,231,335

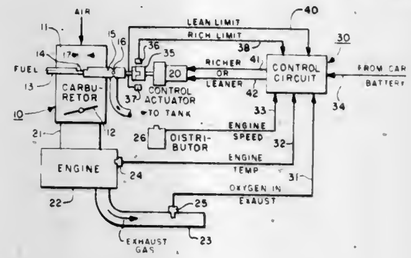
CONTROL SYSTEM FOR REGULATING AIR/FUEL RATIO

Irving H. Hallberg; Howard C. Paul, both of Des Plaines; Ronald R. Ralston, Elmhurst, and Roy E. Hunninghaus, Des Plaines, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 797,159, May 16, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,649

Int. Cl.³ F02M *7/18*

U.S. Cl. 123—440 **5 Claims**



1. A control system for regulating the air/fuel ratio of the mixture delivered to an engine in which virtually all of the gasoline is burned, and the exhaust gas is discharged through an exhaust conduit, comprising:

a sensor positioned to contact the exhaust gas and develop an electrical control signal which varies as a function of the proportion of at least one component gas in the discharged exhaust gas;

a control actuator, positioned for movement to regulate the air/fuel ratio; and

a control circuit, connected to receive said control signal and including switching means connected to displace the control actuator continually in a direction which is a function of that signal, driving the air/fuel ratio sequentially toward richer and leaner mixtures in accordance with the instantaneous value of the control signal, thus producing an optimum stoichiometric value of the air/fuel ratio, an adjustable power supply coupled to said switching means for regulating the displacement rate of the control actuator, and means connected to supply an engine-speed-indicating signal to the adjustable power supply, so that the rate of change of the air/fuel ratio is a function of engine speed.

4,231,336

EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kiyoshi Yuuki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 20, 1979, Ser. No. 31,779

Claims priority, application Japan, Sep. 12, 1978, 53/112745

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **5 Claims**

1. An exhaust gas recirculation system for an internal combustion engine, comprising:

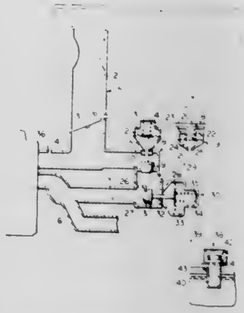
an exhaust gas recirculation passage,

an exhaust gas recirculation control valve provided at a middle portion of said exhaust gas recirculation passage which has a diaphragm chamber and is adapted to increase its opening as vacuum supplied to its diaphragm chamber increases,

a vacuum passage which conducts engine intake vacuum to said diaphragm chamber,

an orifice means provided at a middle portion of said exhaust gas recirculation passage which is upstream of said exhaust gas recirculation control valve so as to define a chamber space positioned between said orifice means and said exhaust gas recirculation control valve,

a vacuum control valve provided at a middle portion of said vacuum passage which controls level of the vacuum supplied through said vacuum passage to the diaphragm chamber of said exhaust gas recirculation control valve in



accordance with the pressure existing in said chamber space,

and an orifice control system which provides a substantial basic opening area in said orifice means and increases opening area of said orifice means so as to be larger than said basic opening area when engine temperature is above a predetermined value.

4,231,337

AIR INTAKE SYSTEM FOR DIESEL ENGINE

Akiyasu Kuwahara, and Syozo Yanagisawa, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 25, 1979, Ser. No. 33,270

Claims priority, application Japan, Apr. 28, 1978, 53-49983; Jul. 14, 1978, 53-85161

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **17 Claims**



1. An air intake system for a Diesel engine, comprising:

a main body defining therein an air passage;

a throttle valve pivotally mounted in said air passage;

at least one EGR opening formed in the peripheral wall of said air passage for the recirculation of engine exhaust gases back into said air passage;

an EGR valve means operatively associated with said throttle valve to vary the rate of the flow of the recirculated exhaust gases through said EGR opening in accordance with the operating conditions of the engine;

said EGR opening being at least partially open by said EGR valve means when said throttle valve is in its idle position;

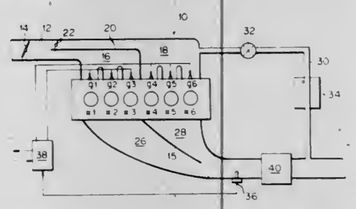
wherein the improvement comprises means for increasing the rate of the flow of intake air into said engine when the engine is at a temperature lower than a predetermined temperature.

4,231,338

INTERNAL COMBUSTION ENGINE

Fukashi Sugasawa, Yokohama, and Haruhiko Iizuka, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 30, 1979, Ser. No. 43,123
Claims priority, application Japan, Dec. 28, 1978, 53-162547
Int. Cl.³ F02M *75/06*; F01N *3/15*
U.S. Cl. 123—568 **3 Claims**



1. An internal combustion engine comprising a plurality of cylinders split into first and second groups, said first group of cylinders held in operation independently of engine load conditions, said second group of cylinders having no supply of fuel and fresh air so as to be placed out of operation when said engine is under low load conditions, an exhaust passage connected to the exhaust ports of said first and second groups of cylinders, a sensor provided within said exhaust passage for detecting the oxygen concentration of the exhaust gases passing through said exhaust passage, control means responsive to an output of said sensor for controlling the air/fuel ratio of a mixture produced in each cylinder to an optimum value, an exhaust gas purifier provided in said exhaust passage for purifying the exhaust gases passing through said exhaust passage, an exhaust gas recirculation passage having its one end connected to the intake passage of said second group of cylinders and the other end connected to said exhaust passage in arrear of said exhaust gas purifier, and valve means provided in said EGR passage which is open to allow recirculation of exhaust gases through said EGR passage when said engine is under low load conditions.

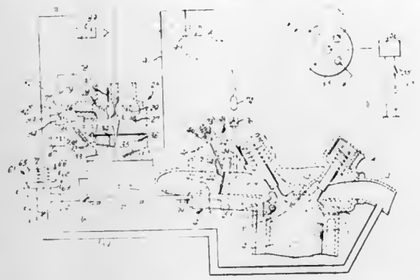
4,231,339

CONTROL DEVICE FOR EXHAUST GAS RECYCLED INTERNAL COMBUSTION ENGINE

Hiromitsu Matsumoto, Hamatsu, and Keiichi Sugiyama, Shizuoka, both of Japan, assignors to Yamaha Hatsukoko Kabushiki Kaisha, Iwata, Japan

Filed Jun. 15, 1979, Ser. No. 48,746
Claims priority, application Japan, Jun. 16, 1978, 53-72960
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **10 Claims**

1. In an internal combustion engine having a variable volume chamber in which combustion occurs, a main intake passage communicating with said chamber through a main intake port for delivering a charge thereto, an auxiliary intake passage communicating with said chamber through an auxiliary intake port, said auxiliary intake passage having an effective cross-sectional area substantially less than the effective cross-section area of said main intake passage for causing a given mass flow of charge through said auxiliary intake port to enter said chamber at a significantly greater velocity, an emission system for discharging a gas for further treatment by combustion within said chamber, valve means for controlling the ratio of communication of said auxiliary and main intake passages with said chambers during a given cycle of operation, and conduit means for delivering the gases from said emission system to said chamber, the improvement comprising means for precluding flow of said emission system gases to said chamber when a



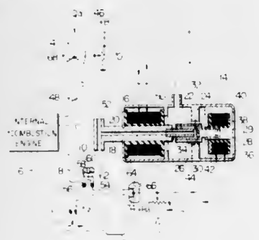
substantial portion of the chamber charge is being supplied by said main intake passage.

4,231,340

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Torazo Nishimiya, Mito; Masamitsu Okumura, Katsuta; Tomo Ito, Katsuta, and Seisaku Numakura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 20, 1979, Ser. No. 50,451
Claims priority, application Japan, Jun. 20, 1978, 53-74664
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **8 Claims**



1. An exhaust gas recirculation control system of an internal combustion engine comprising:
- a core formed therein with a hollow passage opened at its end;
- a plunger made of a magnetic material and being movable in the axial direction of said core, said plunger having a valve seat opposing the open end of said core;
- a spring biasing said plunger to bring a valve portion comprised of said open end and said valve seat into an open state;
- a first exciting coil applying a force to said plunger to move said plunger in the closing direction in opposition to the bias of said spring;
- a second exciting coil applying to said plunger a force substantially opposite to the force which said first exciting coil applies to said plunger;
- a housing defining a chamber which incorporates said valve portion;
- at least one opening formed in said housing and being in communication with a portion at a pressure substantially equal to external atmospheric pressure;
- a flow-electricity transducer generating an electric signal depending on the amount of inlet air of the internal combustion engine and applying said electric signal to said first exciting coil;
- means for communicating the hollow passage of said core to the downstream of a throttle valve;

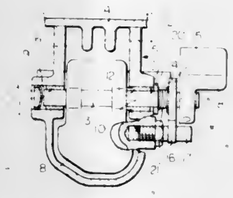
- an exhaust gas recirculation passage passing recirculation of partial exhaust gas of the internal combustion engine into a mixture introduced into said internal combustion engine;
- a control valve disposed in said exhaust gas recirculation passage, for controlling the amount of exhaust gas recirculation in response to a negative pressure in the hollow passage of said core;
- an orifice disposed in said exhaust gas recirculation passage, for generating a negative pressure at the upstream of said control valve; and
- a pressure-electricity transducer generating an electric signal in inverse proportion to the pressure downstream of said orifice and applying said electric signal to said second exciting coil.

4,231,341

EXHAUST GAS FLOW CONTROL VALVE APPARATUS FOR USE IN AN INTERNAL COMBUSTION ENGINE

Akio Kuramoto, Okazaki, and Toshinari Onishi, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 21, 1978, Ser. No. 917,654
Claims priority, application Japan, May 12, 1978, 53/55684
Int. Cl.³ F02M *31/00*; F16K *5/00*
U.S. Cl. 123—552 **13 Claims**



1. An exhaust gas flow control valve device in combination with an internal combustion engine having an exhaust housing defining an exhaust passage therein, said device including a rotary shaft extending across the exhaust passage and rotatably inserted into holes formed in opposing walls of the exhaust housing, said rotary shaft having an end portion projecting from one of said opposing walls of the exhaust housing; a valve mounted on said shaft in the exhaust passage for controlling the flow of exhaust gas; and means for rotating said shaft in accordance with change in operating condition of the engine, wherein the improvement comprises:
- sealing means sealingly surrounding sahd shaft at a position near the projecting end portion of said shaft adjacent said one wall of the exhaust housing and
- resilient means for urging said sealing means against the adjacent wall of the exhaust housing for establishing sealing contact between said sealing means and said wall of the housing.

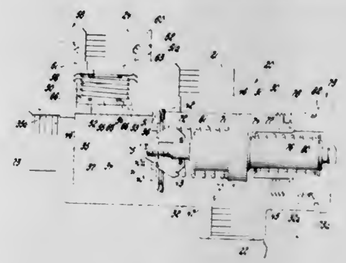
4,231,342

DIESEL FUEL HEAT RECOVERY SYSTEM AND CONTROL VALVE THEREFOR

William J. Johnston, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1979, Ser. No. 7,474
Int. Cl.³ F02M *53/00*; F16K *24/02*
U.S. Cl. 123—557 **3 Claims**

1. A temperature responsive fuel flow control valve for use in a diesel engine fuel system of the type having a fuel tank connected by a supply conduit and a fuel filter to the inlet of a fuel pump used to supply fuel to a plurality of fuel injectors mounted on the engine, the injectors being connected to a fuel return conduit whereby excess fuel supplied to the injectors and heated by the engine is returned to the fuel tank, said flow control valve including a housing defining a fuel return chamber and a mixing chamber interconnected by a port passage, said housing having an inlet passage opening at one end into said mixing chamber and connectable at its opposite end to the supply conduit intermediate the ends thereof with the fuel tank downstream thereof whereby fuel from the fuel tank can flow into said mixing chamber; a fuel supply passage in said housing opening at one end into said mixing chamber and being connectable at its opposite end to the supply conduit intermediate the ends thereof with the fuel filter upstream thereof; said housing further having a fuel return passage opening into said fuel return chamber and a discharge passage from said fuel return chamber, said fuel return passage being connectable to the return conduit whereby excess fuel being returned from the



injectors will flow into said fuel return chamber, said fuel return discharge passage being connectable to the fuel tank for the discharge of fuel thereto; a spring biased, pressure responsive valve, with a vapor vent passage therethrough, operatively positioned in said fuel return discharge passage and in continuous communication with the fuel in the fuel return chamber for controlling the pressure of fuel in said chamber, and a thermostat valve positioned in said mixing chamber in heat exchange relationship with the fuel therein for controlling flow of fuel from said fuel return chamber through said port passage into said mixing chamber as a function of the temperature of the fuel in said mixing chamber.

4,231,343

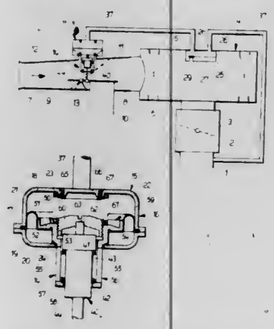
DEVICE FOR CONTROLLING THE INTAKE AIR TEMPERATURE OF A CARBURETOR-EQUIPPED INTERNAL COMBUSTION ENGINE

Herbert Alf, Ludwigsburg; Volker Ernst, Sachsenheim; Rudi Hainle, Ludwigsburg, and Rudolf Leipelt, Oberstenfeld, all of Fed. Rep. of Germany, assignors to Filterwerke Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,897
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1978, 2816727
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—556 **7 Claims**

1. A device for controlling the intake air temperature of an internal combustion engine equipped with a carburetor in its air intake system and an air filter upstream of the carburetor; the device including a raw air mixing duct leading into the air filter from an intake duct junction formed by a cold air intake duct through which is taken in raw air of ambient temperature and a warm air intake duct through which is taken in preheated raw air coming from an exhaust stove, for example; the device further including: valve means associated with said intake duct junction for adjusting the relative flows of raw air through said cold air intake duct and warm air intake duct by progressively opening one duct while at the same time closing the other duct, a pneumatic valve actuator with an actuator return spring, a drive connection between the valve means and the moving member of said valve actuator, a vacuum line leading from a point downstream of the carburetor to said valve actuator and so connected to it that the negative pressure in the vacuum line displaces said moving actuator member against the actuator return spring, in the sense of opening the warm air intake duct

closing the cold air intake duct, and, in said vacuum line, a thermostat-controlled relief valve arranged at a location where its thermostatically sensitive element is exposed to the temperature of the air flow downstream of the intake duct junction and responds to a temperature increase by progressively opening a relief port in the vacuum line to lower the negative pressure therein and to reset the valve means in the direction of closing the warm air intake duct; and the device still further including abutment means in the drive connection between said valve actuator member and the valve means, for limiting the return movement of the actuator member and drive connection, and a longitudinally expanding and contracting wax



thermostat exposed to the raw air of ambient temperature and forming a portion of said drive connection, whereby an ambient temperature level below a predetermined value causes the wax thermostat to contract to such an extent that the fully returned actuator member and drive connection, as positioned by said abutment means, maintains the valve means in a position in which the warm air intake duct remains partially opened; the improvement in said device comprising:

an adjustable threaded connection between the moving member of the pneumatic valve actuator and the wax thermostat, which connection makes it possible to permanently increase or decrease the effective length of the drive connection.

4,231,344

AIR INDUCTION SYSTEMS FOR DIESEL ENGINES

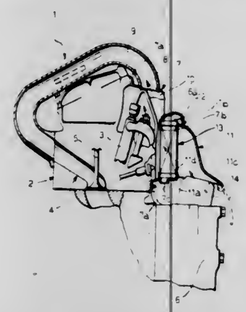
Mario Urbinati, and Luigi Conti, both of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Jan. 11, 1979, Ser. No. 2,641

Claims priority, application Italy, Jan. 20, 1978, 67105 A/78

Int. Cl.³ F02M *61/14*; F02F *7/00*; F02B *77/02*

U.S. Cl. 123—518 **5 Claims**



1. In an internal combustion engine having compression ignition and comprising:

at least one cylinder,

at least one fuel injector, said at least one cylinder having a respective said fuel injector,

at least one air induction duct defined by a respective said at least one cylinder,

a fuel pump located adjacent said engine, and

at least one fuel pipe connecting said fuel pump with a respective said fuel injector, an air induction system comprising:

baffle means fixed to said engine to cover said fuel pump, said fuel injectors and said associated fuel pipes, whereby the air inducted by said engine is caused to flow over said components, said baffle means defining an internal space,

an air filter located in said internal space upstream of said fuel injectors and said fuel pipes, whereby the air inducted by said engine passes through said filter prior to passing over said fuel injectors and said fuel pipes, and

at least one pipe for conducting filtered air from said space into the air induction duct of a respective said cylinder, said at least one pipe being located above said engine.

4,231,345

APPARATUS FOR CONTROLLING AN ELECTRICAL SWITCHING ELEMENT IN INTERNAL COMBUSTION ENGINES

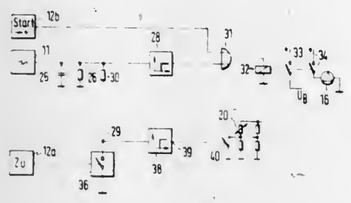
Ulrich Drews, Vaihingen-Pulverdingen; Hans Schnürle, Walheim; Michael Horbelt, Schwieberdingen; Bernhard Schmidt, Leonberg, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1979, Ser. No. 24,489

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2815780

Int. Cl.³ F02M *37/08*

U.S. Cl. 123—510 **7 Claims**



1. In an internal combustion engine having a fuel supply system, the combination of apparatus for controlling at least one electrical switching unit such as the main relay of the voltage supply and of the fuel pump control circuit in accordance with one operational characteristic and with a position of a switch such as an ignition switch indicating an operating condition, comprising a storage device for receiving a value of a signal related to a charging and discharging process, means for feeding a signal depending on one engine operational characteristic to said storage device, means for modifying at least one of the charging and discharging process determined by the switch position of the ignition switch for the engine, and means for utilizing the value of the signal stored in said storage device for controlling said electrical switching unit.

4,231,346

CONTROL ARRANGEMENT FOR A SUPERCHARGED DIESEL ENGINE

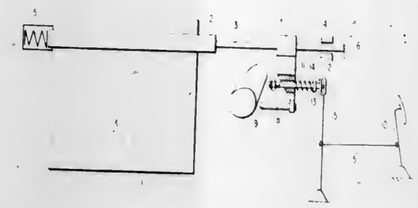
Gerhard Fränkle, Remshalden-Grunbach, and Dieter Woschee, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 865,873

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659498

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—457 **4 Claims**



1. A control arrangement for an internal combustion engine, the control arrangement comprising:

injection pump means having a slidable control rack;

full-load abutment means, said abutment means including a three-dimensional cam which is axially displaceable in response to an engine rotational signal provided by a rotational speed controller means and is rotatable in response to an air mass signal provided by an air mass measuring means;

characterized in that there is a support member fixedly attached to said control rack, a movable gas lever connected to linkage means operably associated with said control rack so as to control the quantity of fuel injected into said engine, cam-engaging means attached to said support member for engaging said three-dimensional cam in a direction corresponding to an increase in said quantity of fuel injected so as to prevent further movement of said control rack, and overload means for forming a yieldable connection between said support member and said linkage means, and in that said overload means permits relative movement between said linkage means and said support member when said cam-engaging means is in engagement with said three-dimensional cam during further movement of said gas lever, thus preventing any further sliding of said control rack.

4,231,347

FUEL PRESSURE REGULATING VALVE

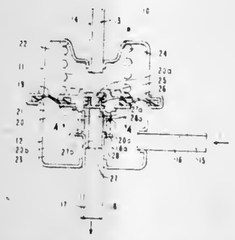
Takeharu Ohumi, Toyota, and Masaru Tsunekawa, Fujioka, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 19, 1978, Ser. No. 970,931

Claims priority, application Japan, Dec. 19, 1977, 52/170996

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—512 **2 Claims**



1. A fuel pressure-regulating valve for an electronic fuel injection system of an internal combustion engine having an induction passage, a fuel supply line and a fuel return line, the valve comprising:

a body member having a pressure port for connection to the engine induction passage, an inlet port for connection to the fuel supply line, and an outlet port for connection to the fuel return line;

a flexible diaphragm for dividing the interior of said body member into a first chamber communicating with said pressure port and a second chamber communicating with said inlet port;

a piston secured to said diaphragm and having a hollow stem extending into said second chamber;

valve means for controlling communication between said second chamber and said outlet port, said valve means including a valve member responsive to the movement of said piston and an elongated hollow seat member located in said hollow stem and having one end forming a valve with said valve member and the end remote from said valve member secured to said outlet port, said diaphragm being biased for normally closing said valve;

a bushing secured in said hollow stem and slidable upon the outer periphery surface of said seat member;

aligned apertures in said hollow stem and said bushing providing communication between said second chamber and said valve;

said bushing having flattened portions in its outer periphery surface adjacent the apertures therein, thereby forming gaps between said hollow stem and said bushing for preventing reduction in communication through said aligned apertures by a small rotational displacement of said bushing with respect to said hollow stem.

4,231,348

IGNITION SYSTEM WITH IGNITION CURRENT AND MINIMUM SPARK DURATION CONTROLS

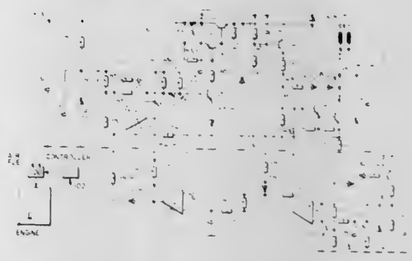
Werner Schiele, Ludwigsburg, and Richard Schleupen, Ingersheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,598

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759153

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—644 **13 Claims**



1. In an ignition system having ignition coil means (Zs), means (T5) for producing an ignition current in said ignition coil means, and means connected to said ignition coil means for producing a spark upon interruption of said ignition current in said ignition coil means:

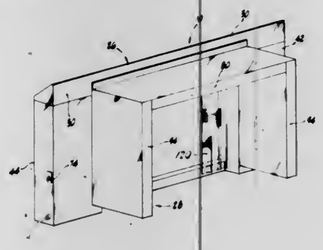
apparatus for controlling said ignition current to produce a spark having a predetermined desired spark duration comprising

current control means (40,T1) connected to said ignition coil means for controlling said ignition current in correspondence to a current control signal applied thereto;

means (C8, R28) for furnishing a desired spark duration signal corresponding to said predetermined desired spark duration;

means (T7) connected to said ignition coil means for furnishing an actual spark duration signal corresponding to the actual duration of said spark produced by said spark producing means;
means (IC3) connected to said desired spark duration signal furnishing means and said actual spark duration signal furnishing means for furnishing an error signal corresponding to the difference therebetween;
and connecting means (R20, C7, IC2) for applying said error signal to said current control means to change said current control signal in a direction for controlling said ignition current to change said actual spark duration in a direction decreasing said error signal.

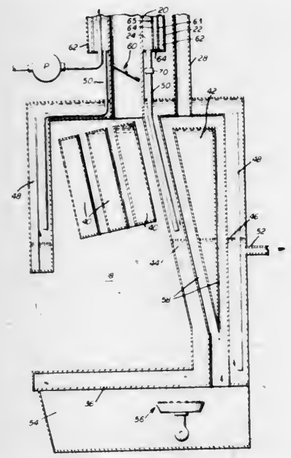
4,231,349
FIREPLACE HEAT EXCHANGER UNIT
Keith Livesay, Rte. 2, Salem, Ill. 62881
Filed Nov. 13, 1978, Ser. No. 959,786
Int. Cl.³ F24B 7/04
U.S. Cl. 126—121 **9 Claims**



1. A fireplace heat exchanger unit for a fireplace providing a heat source and having opposed sidewalls, front and rear walls, a bottom wall, and an upper flue entry, said unit comprising:
(a) a forward section including:
(1) an upper, generally elongate horizontal portion providing an air inlet chamber having at least one air inlet opening for admitting air into said air inlet chamber, and
(2) a pair of lower, generally vertical portions spaced lengthwise of and operatively attached to said upper portion and each providing an air outlet chamber having at least one air outlet opening for discharging air from said air outlet chamber,
(b) a generally U-shaped rearward section spaced forwardly of said fireplace rear wall and including:
(1) an upper portion providing an upper chamber connected to said air inlet chamber,
(2) a pair of side portions providing side chambers connected between said upper chamber and an associated air outlet chamber, and
(3) a rearward opening defined substantially by said upper and side portions, and communicating with said fireplace flue entry, and
(c) a pair of blowers each mounted within an air outlet chamber for drawing air through said air inlet opening and into said air inlet chamber, through said upper and side chambers and into the air outlet chambers for discharge through said air outlet openings.

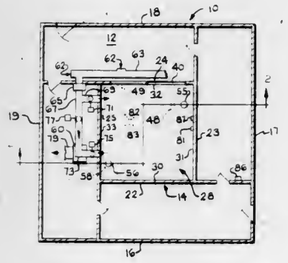
4,231,350
HOT WATER BOILER
Dean E. Marsh, 512 N. 4th St., Belen, N. Mex. 87002
Filed Jul. 20, 1978, Ser. No. 926,401
Int. Cl.³ F24B 9/04; F22B 33/02
U.S. Cl. 126—133 **3 Claims**

1. A liquid heating device comprising a combustion chamber, an exhaust stack extending upwardly from the combustion chamber and receiving combustion products from said combustion chamber, a liquid jacket associated with the combustion chamber in heat exchange relation thereto, a liquid jacket associated with the stack in heat exchange relation thereto, said liquid jacket associated with the combustion chamber including a horizontal partition defining upper and lower liquid reservoirs, a heated liquid outlet at an upper portion of the lower reservoir, a cold liquid inlet at an upper portion of the jacket associated with the stack, connecting tubes extending



between and communicating a lower end of the jacket associated with the stack and a lower portion of the upper reservoir, and vertically elongated flow tubes extending between and communicating an upper portion of the upper reservoir and a lower portion of the lower reservoir whereby the liquid is heated in three vertically oriented stages from the inlet to the outlet.

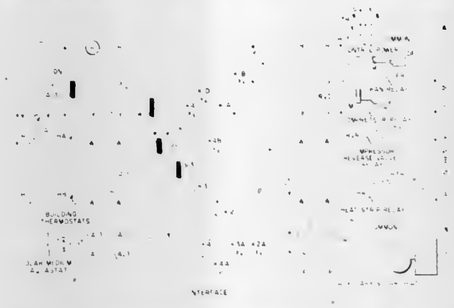
4,231,351
METHOD AND APPARATUS FOR SOLAR HEATING A BUILDING
David R. Pheils, Jr., 5814 Rye Mill Ct., Toledo, Ohio 43611
Continuation of Ser. No. 788,115, Apr. 8, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,385
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 **6 Claims**



3. A building comprising:
a solar energy collection section;
a main section having inner walls enclosing the energy collection section;
an energy storage section under the energy collection section, the storage section being defined by foundation walls, said inner walls resting upon said foundation walls;
a roof covering the energy collection section adapted to permit the passage of solar energy therethrough to heat

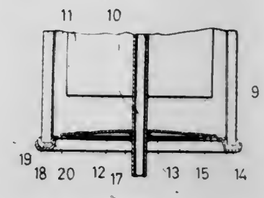
the energy collection section, said roof being attached at and resting upon said inner walls;
a floor spaced from the roof to separate the storage section from the collection section;
a subfloor spaced from and below said floor contiguous with the foundation walls to further define the energy storage section;
a first foraminous wall spaced from one of said foundation walls extending from the floor to the subfloor to define a first zone between the first foraminous wall and such foundation wall;
a second foraminous wall spaced from the foundation wall opposite the foundation wall defining the first zone to define a second zone between the second foraminous wall and the foundation wall opposite the foundation wall defining the first zone, said second foraminous wall extending from the floor to the subfloor, the floor having a first passageway communicating with the first zone and the collection section and having a second passageway communicating with the second zone and the collection section;
a heat storage mass within the storage section and between the first and second zones;
means for selectively moving air within the energy collection section through the heat storage mass and back to the energy collection section, the first and second zones and foraminous walls cooperating to distribute such moving air throughout the heat storage mass;
an alternate heat source for supplying heated air to said main section; and
means for controlling the air flow in the building such that the air from the main section can be moved through the courtyard in a mixing relationship with the air therein before being heated by said alternate heat source.

4,231,352
INTERFACE CIRCUIT FOR ADDING SOLAR HEAT TO A BUILDING HEATING AND COOLING SYSTEM
Donald R. Bowden, and Robert O. Sparks, both of Huntsville, Ala., assignors to Solar Unlimited, Inc., Huntsville, Ala.
Filed Jul. 5, 1979, Ser. No. 55,127
Int. Cl.³ F24J 3/02; G05D 23/00
U.S. Cl. 126—422 **3 Claims**



1. In building heating and cooling apparatus including building heating and cooling thermostats connected through terminals to relays controlling a building fuel-consuming heating and cooling system and controlling a building duct air circulating fan wherein said relays are energized by power from a building control voltage transformer, an interface control to be interposed at said terminals between the building thermostats and the building heating and cooling system relays for introducing and controlling an auxiliary solar heat system having a thermal storage medium circulated by a pump into heat exchange relationship with said duct, the temperature of the medium being measured by an aquastat including a heat-responsive switch, said interface comprising:
an electrical circuit having thermostat and heating and cooling and fan terminals corresponding with and interposed between the terminals of the building thermostats and of the building heating and cooling and fan system, and the circuit additionally having solar system aquastat and pump terminals;
first relay means in the electrical circuit having contacts operative upon closing of a building heating thermostat to deliver power to the building heating system and to the aquastat switch;
solar system relay means responsive to power delivered to the aquastat switch when closed and having contacts operative to interrupt power through the first relay contacts to the building heating system and operative to deliver power to the solar system circulation pump;
means to energize the air circulation fan of the building when a thermostat is closed; and
third relay means operative when a building cooling system thermostat is closed and having contacts connected to interrupt the solar system relay means and prevent it from energizing the solar system circulation pump.

4,231,353
SOLAR HEAT COLLECTING APPARATUS
Keiichi Kanatani, Kirakata; Masato Osumi, Osaka, and Hajime Hayama, Nara, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed May 10, 1978, Ser. No. 904,412
Claims priority, application Japan, May 13, 1977, 52-62380[U]; Jun. 20, 1977, 52-81370[U]
Int. Cl.³ F24J 3/02
U.S. Cl. 126—443 **8 Claims**

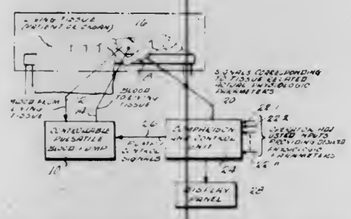


1. A solar heat collecting apparatus comprising:
a tubular outer member having at least one open end through which solar heat energy can penetrate,
an end plate at each said open end for hermetically sealing each of the open ends of said outer member to provide a vacuum within the interior of said outer member, at least a portion of each end plate disposed inwardly of its periphery being resilient,
a tubular inner member capable of absorbing solar heat energy disposed in said outer member, the ends of said inner member hermetically projecting from said end plates, the interior of said inner member acting as a passage for a heating medium, and
an annular groove formed at the periphery of each of said end plates, defined by opposed inner and outer peripheral walls, each of said open ends of said outer member hermetically joined within an annular groove of a respective end plate by means of an initially flowable sealing substance within said groove, the height of said outer peripheral wall being lower than the height of the inner peripheral wall, the sealing substance extending no higher than said outer pheripheral wall and being always below the level of said inner peripheral wall.

4,231,354
PULSATILE BLOOD PUMPING APPARATUS AND METHOD

Robert J. Kurtz, Cliffside Park, N.J., and Spencer J. Silverstein, Ithaca, N.Y., assignors to Howmedica, Incorporated, New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,567
Int. Cl.³ A61M 1/03; A61F 1/24
U.S. Cl. 128—1 D **24 Claims**



1. A pulsatile fluid pumping system for circulating blood or blood-like fluids within the vascular systems of living tissue under automatically controlled and predetermined plural physiologic parameters, said system comprising:

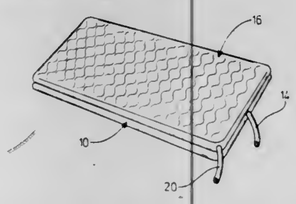
a pulsatile pump adapted for connection to said living tissue and having plural pumping parameters which may be independently controlled during cyclic operation of the pump, and

sensing and control means for simultaneously monitoring plural predetermined physiologic parameters of said living tissue and for simultaneously controlling the plural independent pumping parameters as a predetermined logical function of said plural physiologic parameters so as to substantially maintain all such physiologic parameters at respectively corresponding predetermined values.

4,231,355
DEVICE FOR AIR-MASSAGE

Katsumasa Hara, No. 121-1, 1-chome, Kamishakujii, Nerima-ku, Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,709
Claims priority, application Japan, Sep. 29, 1977, 52-117102
Int. Cl.³ A61H 7/00
U.S. Cl. 128—24.2 **8 Claims**



1. Apparatus for air massage comprising a plurality of distinct air inflatable bags arranged in parallel alignment with each other, each having its own port for feeding and exhausting air and at least one elastic element attached to one surface of at least a portion of a number of inflatable bags, said elastic element comprising an elastic sheet provided with a plurality of independent air filled projections on the surface adapted to contact with a body part, said air inflatable bags being independently inflated and deflated relative to each other in a time difference so as to move said elastic element in a wavy manner.

4,231,356
SURGICAL IMMOBILIZING BANDAGE AND THE LIKE

Koji Usukura, Kasukabe, Japan, assignor to Tokyo Eizai Lab. Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1978, Ser. No. 954,467
Claims priority, application Japan, Nov. 17, 1977, 52-138244
Int. Cl.³ A61F 13/04
U.S. Cl. 128—90 **7 Claims**

1. A surgical immobilizing bandage and the like comprising an elastic fabric impregnated with a composition the main constituent of which consists of an aliphatic polyester polymer or a mixture of aliphatic polyester polymers which are synthesized from aliphatic diols and saturated dicarboxylic acids.

4,231,357
BANDAGE FOR ABSORBING BODY FLUIDS

Hans Hessner, Djursholm, Sweden, assignor to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Dec. 4, 1978, Ser. No. 965,761
Claims priority, application Sweden, Dec. 8, 1977, 7713918
Int. Cl.³ A61L 15/00
U.S. Cl. 128—156 **12 Claims**



1. A body fluid absorbent bandage for open and weeping body wounds, comprising, in combination;

(1) at least two bandage-supporting base layer pieces for juxtaposed attachment to the body about substantially the entire periphery of the wound or injury, and surrounding it, but without covering over the wound or encroaching upon the wound, thus leaving the wound open and exposed;

(2) an intermediate foraminous sheet for attachment to the base layer as an intermediate layer extending across and bridging the wound; and

(3) an absorbent outer layer for removable attachment to the intermediate layer in a manner to extend across and cover the intermediate layer at least in the region over the wound within the surrounding base layer, the absorbent outer layer comprising at least in the region over the wound a particulate absorbent material having a water absorptivity of at least 50 mm/10 min according to Klemm, and an envelope of body fluid-pervious sheet material enclosing and retaining the absorbent material in a convex shape at least in the region over the wound, the absorbent layer being in a position to absorb body fluids escaping from the wound and passing through the intermediate layer and the enclosing body fluid-pervious sheet material and being readily removable without disturbing the intermediate and base layers and replaceable by a fresh absorbent layer and envelope.

4,231,358
SURGICAL DRESSING

Cheryle M. Atchison, 2629 N. Fruitdale Ave., Indianapolis, Ind. 46224

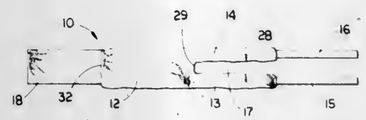
Continuation of Ser. No. 731,042, Oct. 8, 1976, abandoned. This application Nov. 9, 1978, Ser. No. 959,319
Int. Cl.³ A61F 13/00
U.S. Cl. 128—168 **4 Claims**

1. An article of manufacture for positioning in the perineal area of a person which comprises:

a pad including a layer of absorbent material integral with the pad and sized to fit within the perineal area of the person, said pad having a front end and a rear end;

a support member having a first end integrally connected to the rear end of said pad and further having a second end; and

a pair of straps, each strap having a first end and a second end, the first ends being integrally connected to the front end of said pad at spaced apart locations, the front end of

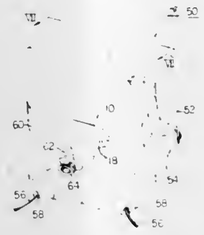


said pad and said straps defining an opening for permitting passage therethrough of male external genitalia, each of said straps including a first portion adjacent the first end, each of the first portions of said straps including a layer of absorbent material integral with the layer of absorbent material of said pad.

4,231,359
PERSONAL EMERGENCY BREATHING HOOD WITH NOSE BLOCKING DEVICE

Frank E. Martin, Chester, Md., assignor to Midori Anzen Company, Ltd., Tokyo, Japan

Division of Ser. No. 828,164, Aug. 23, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,445
Int. Cl.³ A62B 7/00
U.S. Cl. 128—201.18 **3 Claims**



1. An emergency breathing hood for use with a breathing apparatus, comprising:

a plastic hood made of a gas-impermeable, flame-resistant and transparent plastic film for covering the head of a wearer and including means for substantially sealing the hood around the neck of a wearer;

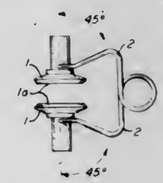
a mouthpiece secured to and extending through said plastic hood, for providing a connection between the wearer's mouth and the breathing apparatus; and

a nose blocking device for blocking the gas inflow into the nostrils and inhibiting outflow from the nostrils of the user, said nose blocking device comprising a cylindrically shaped device supported within said hood so that said cylindrically shaped device is positioned in front of and in contact with the wearer's nostrils when said hood is worn, and a thin elastic material over said cylindrically shaped device and extending over an area effective for covering the wearer's nostrils.

4,231,360
NOSE CLIP FOR RESPIRATORS

Stefan Zloczysti, and Bernd Wolke, both of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 16,898
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826620
Int. Cl.³ B63C 11/02
U.S. Cl. 128—201.18 **2 Claims**

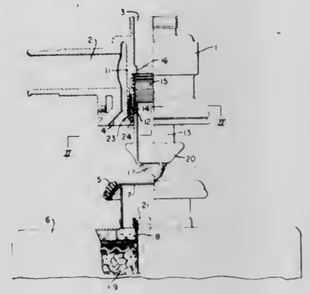


1. A nose clip for respirators, comprising two pads and a spring clip connecting them together for pressing them against the sides of a wearer's nose when the nose clip is worn, end portions of the spring clip being straight and disposed in parallel relation substantially perpendicular to the plane of the clip, and said pads being provided with transverse holes pivotally receiving said end portions, said holes being located a short distance from the nose-engaging faces of the pads, the connection between the spring and pads permitting the pads to freely tilt relative to the spring clip.

4,231,361
BREATHING APPARATUS FLOW DEVICE

Layton A. Wise, Washington, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

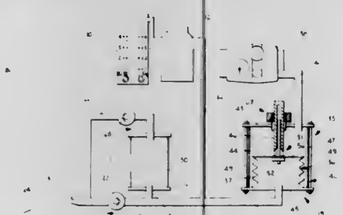
Filed Jan. 19, 1979, Ser. No. 4,659
Int. Cl.³ A62B 7/00
U.S. Cl. 128—202.26 **4 Claims**



1. A flow device for connecting a face piece and a breathing bag with a chemical canister having an upwardly extending neck closed by a sealing disk and also having a center tube extending downwardly in the canister from the neck, said flow device comprising a hollow housing provided with a top wall and a bottom opening that is encircled by a wall, means adapted to engage the upper end of said neck, the side of the housing having an opening therein for connection to a breathing bag, rigid tubular means in said housing extending through said top wall and joined thereto and having upper and lower ends, said upper end extending above said housing and having means for connection to an exhalation tube, said lower end being spaced inwardly from the side of said housing, a hollow plunger slidably mounted in said tubular means and extending down below the housing, means limiting downward movement

of the plunger, coil spring means resisting upward movement of the plunger, the plunger having an open upper end and a perforated and pointed lower end for piercing said sealing disk when the hollow housing is pressed down on said neck, and a cylindrical resilient seal encircling the lower portion of said tubular means in tight engagement therewith and extending below it, the lower end of the seal below said tubular means being in the form of a bead extending inwardly into engagement with the plunger, whereby the space between the plunger and said tubular means is sealed against flow of air therethrough.

4,231,362
ANESTHESIA VENTILATION SYSTEM
Robert M. Pearson, 11685 Spicer Dr., Plymouth, Mich. 48170, and A. Edwin Weninger, Los Alamitos, Calif., assignors to Robert M. Pearson, Plymouth, Mich.
Filed Oct. 2, 1978, Ser. No. 947,946
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.15 **11 Claims**



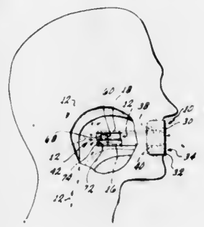
1. In an anesthesia ventilator system wherein an inflatable bellows is enclosed in a sealed canister, with the interior of the bellows being in fluid communication with a patient breathing circuit and inflation and deflation of the bellows being controlled by a respirator in fluid communication with the portion of the interior of the canister surrounding the bellows, the respirator controlling inflation and deflation of the bellows by varying the pressure in the canister, the bellows being positioned for expansion in an upward direction during inflation, the improvement comprising:
- a rod extending upwardly from the top of the bellows;
- a sleeve mounted in the top of the canister and extending downwardly therefrom to a lower end, the sleeve having an elongated opening extending upwardly from the lower end, the opening being formed and positioned such that it mates with the rod on the bellows and constrains the rod to vertical movement as the bellows expands and contracts upwardly and downwardly, the sleeve including a valve actuating portion at the lower end; and
- valve means mounted in an opening in the upper surface of the bellows for permitting gas flow between the interior of the canister and the interior of the bellows, said valve means being resiliently biased in a normally closed position so as to block gas flow out of the bellows through said opening, the valve means being positioned for engagement with the valve actuating portion of the sleeve and being openable by engagement therewith after the bellows has expanded upwardly a predetermined distance, the opening of the valve means serving to relieve the internal gas pressure in the bellows.

4,231,363
GAS DELIVERY FACE SHIELD
Jerry L. Grimes, Star Rte., Box 517, Lytle Creek, Calif. 92358
Continuation-in-part of Ser. No. 737,851, Nov. 1, 1976, abandoned. This application Jan. 8, 1979, Ser. No. 1,686
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.25 **9 Claims**



1. A device for delivering oxygen to a patient during respiratory therapy comprising:
- a unitary, shape retaining shell member adapted to overlie a patient's nose and mouth,
- a gas delivery member extending across the shell member interior and dividing said shell member into an upper portion and a lower portion, said upper portion having a peripheral surface adapted to provide a substantially gas tight seal with the patient's nose bridge and cheeks, said lower portion having a lower edge spaced outwardly thereby providing a lower opening between said mask lower edge and the patient's face, said upper and lower portions being arched outwardly from said gas delivery member and thereby in relation to the patient's face and forming an enlarged upper and lower chamber, respectively, said gas delivery member having a plurality of orifices directed into said upper chamber for directing oxygen thereto, whereby oxygen delivered to said device through said gas delivery member results in substantially greater oxygen concentration in said upper chamber than in said lower chamber.

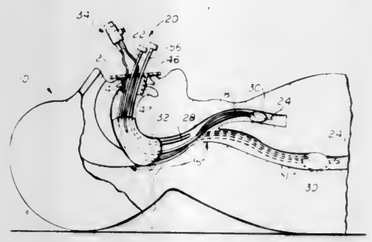
4,231,364
RESPIRATORY CONTROL
Fred R. Speshyock, 33091-R Calle Perfecto, San Juan Capistrano, Calif. 92675
Filed Apr. 30, 1979, Ser. No. 34,649
Int. Cl.³ A62B *7/10*
U.S. Cl. 128—206.15 **18 Claims**



1. A respiratory control for use in the mouth cavity for controlled breathing comprising, means defining a mouthpiece adapted to be inserted inside the mouth cavity and having a bore extending therethrough with first and second open ends, said bore being tapered from said first open end to said second open end, said first open end adapted to be located near the entrance to the mouth cavity and said second open end being

adapted to be located in the back or throat portion of the mouth cavity,
- means defining first and second air corridors between said first and second open ends, said first corridor for the flow of air during inhalation and said second corridor for the flow of air during exhalation,
- valve means in said bore permitting the flow of air in said first corridor only from said first open end to said second open end and permitting the flow of air in said second corridor only from said second end to said first end, and
- filtering means in said first corridor for providing filtered and enhanced air to the mouth cavity.

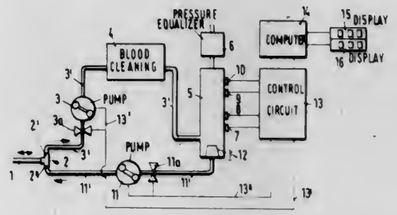
4,231,365
EMERGENCY RESUSCITATION APPARATUS
Eugene N. Scarberry, 2834 Durban, Houston, Tex. 77043
Filed Jan. 30, 1978, Ser. No. 873,517
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—207.15 **4 Claims**



1. An emergency endotracheal airway, comprising:
- a first expandable member and means for inflating said first expandible member by at least human breath to a volume effectively filling a pharyngeal region adapted to continuously seal both the oral and nasal passages extending therefrom;
- an endotracheal tube extending through said first expandable member and having an outer opening above said first expandable member and an inner opening below said first expandable member adapted to terminate in a trachea,
- a second expandable member and means for inflating said second expandible member by at least human breath surrounding said endotracheal tube adjacent said inner opening and adapted to continuously seal against a wall portion of said trachea,
- a laryngeal tube extending through said first expandable member and having an outer opening adapted to receive a supply of a selected fluid and an inner opening below said first expandable member adapted to terminate in a laryngeal region above said second expandable member; and
- a stylet removably inserted through said endotracheal tube and having a predetermined curvature and one rounded end adapted to guide said inner opening of said endotracheal tube into the trachea during insertion thereof,

whereby when said endotracheal tube is properly inserted into said trachea, a patient can be ventilated by inflating said second expandible member and, if desired, said first expandable member, and administering gas to the patient's lungs via said endotracheal tube, and if said endotracheal tube is accidentially inserted into the patient's esophagus, the patient can be ventilated by inflating said first and second inflatable members and administering gas to the patient's lungs via said laryngeal tube.

4,231,366
BLOOD FLOW MONITORING AND CONTROL APPARATUS
Wilfried Schael, Bad-Homburg-Dornholzhausen, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG Apparatebau KG, Bad Homburg von dur Hahe, Fed. Rep. of Germany
Filed Aug. 8, 1977, Ser. No. 822,928
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636290
Int. Cl.³ A61M *1/03*
U.S. Cl. 128—214 E **12 Claims**

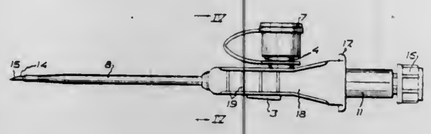


1. A blood flow monitoring and control apparatus, comprising single needle liquid withdrawal and liquid return means (**1**) connectable to a patient, blood treating means (**4**), first artery conduit means (**3'**) connecting said blood treating means to said single needle means, artery pump means (**3**) in said first artery conduit means, a single operating condition volume sensing means (**5**) having an inlet and an outlet, second artery conduit means operatively interconnecting said blood treating means (**4**) to said inlet of said single operating condition volume sensing means (**5**), vein conduit means (**11'**) and vein pump means (**11**) in said vein conduit means operatively connecting said outlet of said single operating condition volume sensing means (**5**) to said single needle means to form together with said first conduit means a closed loop flow circuit in which the blood circulates in but one direction, and control means (**13**) operatively connected to said single operating condition volume sensing means (**5**) as well as to said artery and vein pump means (**3, 11**) to control the blood flow in said closed loop flow circuit, said operating condition volume sensing means comprising filling level sensing means **7, 8, 9, 10** for the volumetric measuring of the liquid flowing in said one direction in said closed loop flow circuit, said filling level sensing means providing control signals for a liquid withdrawal phase from said volume sensing means (**5**) through said vein conduit and vein pump means (**11, 11'**) and for a liquid return phase to said volume sensing means (**5**) through said artery conduit and artery pump means (**3, 3'**), whereby the liquid withdrawal phase is stopped upon reaching a predetermined first filling level in said volume sensing means (**5**) and the liquid return phase is started whereas a liquid return phase is stopped upon reaching a predetermined second filling level and vice versa.

4,231,367
INFUSION CATHETER ASSEMBLY
Douglas L. Rash, Orchard Park, N.Y., assignor to Viggo AB, Sweden
Filed Oct. 19, 1977, Ser. No. 843,594
Claims priority, application Sweden, Oct. 26, 1976, 7611858
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214.4 **8 Claims**

1. An infusion catheter assembly comprising a catheter unit and an insertion needle unit, said catheter unit comprising an elongated housing unit having a longitudinal passage and adapted to receive a coupling device at one end, and a flexible catheter tube, having a free end mounted to the other end of said housing in communication with said passage, said insertion needle unit comprising a head engaging said coupling end of said housing unit, a needle extending from said head through

said passage and catheter tube and protruding from said free end of said tube, and a pair of digitally grippable fins projecting from said head and extending along opposite sides of said



housing in the elongated direction and in the same direction from said head as said needle, said fins being fabricated of resilient material and capable of being pressed by finger pressure against said housing unit.

4,231,368

DEVICE FOR INTRAMUSCULAR INJECTIONS, ESPECIALLY OF INSULIN

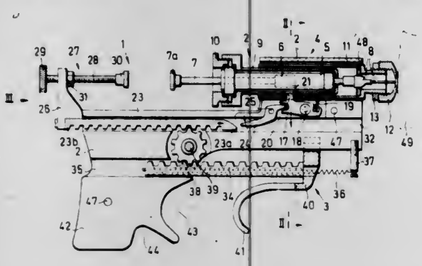
Michael Becker, Brucknerstrasse 6, 5020 Frechen-Grefrath, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,374

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812729

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—218 A **5 Claims**



1. A device for intramuscular injection capable of meeting the requirements of the administration of insulin, comprising a casing having a stationary grip member and, also, a guideway for displaceably mounting a syringe contained in a holder for a limited displacement in said guideway, a first spring for urging said syringe holder forward in said guideway, cocking means including an arresting pawl for releaseably holding said syringe holder against the force of said spring in a withdrawn position ready for use, and hand operable means (**3**) provided in said casing and operable by a single controllable continued interruptable movement of the same hand that holds the casing, to cause the syringe as a whole to be shot forward in response to displacement of said arresting pawl and, thereafter, to operate the syringe by bringing force to bear against the piston-rod (**7**, **7*a***) thereof, said hand operable means including:

a push-rod (**23**) mounted in said casing (**2**) for longitudinal movement therein and having a front end (**23*a***) arranged for acting on said arresting pawl (**17**) for displacement thereof, and equipped at its rear end (**23*b***) with hell-mounted means (**30**) for establishing contact with and bearing directly on the rear end of said piston rod (**7**, **7*a***) of said syringe (**4**) after said arresting pawl has been displaced to release said syringe, said push rod (**23**) being provided with a rack by engagement of which it may be longitudinally propelled;

a second rod (**34**) provided with a rack, mounted in said casing for movement parallel to the direction of movement of said push rod;

a rotary gear (**38**) for communicating movement between said second rod and said push rod, mounted between said rods in said casing and engaging the racks thereof;

a second spring acting on one of said rods so as to oppose forward movement of said push rod;

a pull-trigger (**41**) rigidly connected to a member of a rod system constituted by said push rod and said second rod, said pull-trigger being part of a slide mounted in said casing so as to be displaceable, with respect to the stationary grip portion (**42**) of said casing, parallel to the displacement of said rods, the displacement of said trigger being proportional to the the displacement of said piston rod of said syringe when contact is established between said push rod and said piston rod; and

a heel (**26**) on the rear end of said push-rod having an adjusting device (**27**) thereon for adjustably mounting said means (**30**) for establishing contact with the piston rod of said syringe, said adjusting device comprising a threaded spindle (**28**).

4,231,369

SEALING MATERIAL FOR OSTOMY DEVICES

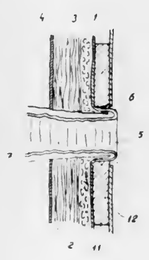
Erik L. Sorensen, Helsinge, and Hans-Ole Larsen, Farum, both of Denmark, assignors to Coloplast International A/S, Espergaerde, Denmark

Filed May 17, 1978, Ser. No. 906,549

Claims priority, application United Kingdom, May 24, 1977, 21767/77

Int. Cl.³ A61F *5/44*

U.S. Cl. 128—283 **22 Claims**



1. In an ostomy system for covering intestinal and similar stomas in a human body, comprising an ostomy device surrounding or covering said stoma and attached to the human body by sealing means, the improvement which comprises utilizing as a sealing means a shaped, gel-like composition comprising at least one physically cross-linked elastomer selected from the group consisting of styrene-olefin-styrene block copolymers and ethylene-propylene block copolymers, forming a continuous phase and at least one hydrocolloid dispersed therein, said hydrocolloid being selected from the group consisting of guar gum, pectin, sodium carboxymethyl cellulose, sodium polyacrylate, and mixtures thereof, said compositions also containing a hydrocarbon tackifier selected from the group consisting of polymers and copolymers of dicylopentadiene, alpha-pinene or beta-pinene, and wherein said gel-like composition has a low resistance to quick deformation and a rapid recovery to its original shape afte: deformation, whereby the seal between the ostomy device and epidermis of the human body as well as the seal between the stoma and the portion of epidermis exposable to discharge from the stoma are maintained intact, even under rapid body movement.

4,231,370

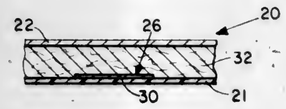
DISPOSABLE DIAPER TYPE GARMENT HAVING WETNESS INDICATOR

Judith C. Mroz, and Dennis A. Thomas, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 18, 1979, Ser. No. 50,013

Int. Cl.³ A61F *13/16*

U.S. Cl. 128—287 **7 Claims**



1. An improved disposable diaper type garment having a wetness indicator disposed intermediate a flexible translucent cover member and a flexible absorbent member, said improvement comprising a flexible pH-change/color-change type wetness indicator coating which is so disposed on an area of a said member that it is visible through said cover member and is in liquid communicable relation with said absorbent member, said coating comprising a solid-solid mixture of a pH-change/-color-change type material dispersed in a highly flexible matrix of adhesive material.

4,231,371

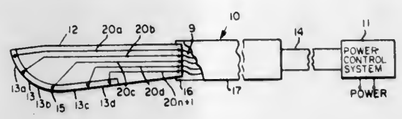
ELECTRICALLY HEATED SURGICAL CUTTING INSTRUMENT

George D. Lipp, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,191

Int. Cl.³ A61B *17/38*

U.S. Cl. 128—303.1 **6 Claims**



1. A surgical instrument for cutting tissue with electrical source powered means for providing simultaneous hemostasis, the instrument comprising: a substrate of electrically insulating material in the form of a blade having a cutting edge, having disposed thereon in the vicinity of the cutting edge an electrically heatable element of electrically conductive material exhibiting a resistance characteristic which varies as a function of the temperature, the element being divided into a plurality of independently heatable sections which form segments along said cutting edge by conducting an electrical current and directly heating the cutting edge therealong, and connection means providing electrical connection to each of said segments for independently supplying electrical power thereto, said connection means including n+1 connections for the heatable element wherein n is the number of segments forming segments of the heatable element; the connection means including a pair of conductors coupled to each adjacent segment at least one of which being a common power carrying conductor for an adjacent segment; test circuit means serially coupled to the heatable element for imposing a constant electrical input thereon to thereby produce an output response in each segment indicative of a corresponding electrical resistance, sensing means for each segment responsively connected thereto for producing a discrete output indicative of a temperature corresponding to the output response of each segment, reference means associatively coupled to each segment for establishing a reference polarity signal therefor, and switch means responsively coupled to the sensing means and reference means for coupling the source of power to each segment over the connection means in a selected polarity, such that, the selected polarity for each segment is in the same sense for an unpowered condition of the corresponding segment and in the opposite sense therefrom for a powered segment; such that, each segment may be powered and thereby heated independently.

4,231,372

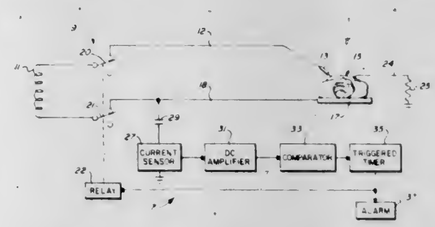
SAFETY MONITORING CIRCUIT FOR ELECTROSURGICAL UNIT

David W. Newton, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Nov. 4, 1974, Ser. No. 520,269

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.14 **8 Claims**



1. A radio-frequency electrosurgical device which comprises a radio-frequency generator, a power lead and a return lead, means for coupling the power lead and the return lead to the radio-frequency generator, an active electrosurgical electrode, means for coupling the power lead to the active electrosurgical electrode to power the active electrode, a passive electrode, means for coupling the passive electrode to the return lead, alternate path return means for coupling the return lead to ground at a point between the passive electrode and the radio-frequency generator, and means in the alternate path return means for indicating a predetermined radio-frequency return in the alternate path return means.

4,231,373

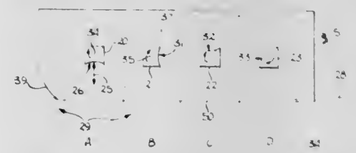
ULTRASONIC IMAGING APPARATUS

Albert S. Waxman, Los Gatos, and James F. Havlice, Los Altos, both of Calif., assignors to Diasonics, Sunnyvale, Calif.

Filed Jul. 18, 1978, Ser. No. 925,701

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **6 Claims**



1. An image acquisition apparatus for an ultrasonic imaging system comprising:

a housing defining a chamber, said housing including a body contacting membrane;

a plurality of transducers, each for transmitting and receiving ultrasonic sound, each of said transducers having an axis of rotation;

mounting means coupled to said housing for mounting each of said transducers for rotation in said chamber about its said axis of rotation, such that said axes of rotation are spaced-apart and parallel to one another;

driving means coupled to said mounting means for rotating said transducers at a constant rate of continuous uni-direc-

tional rotation about their respective said axes of rotation, and

a liquid disposed within said cavity,

whereby as said transducers rotate, a high resolution, real time image over a large field-of-view is obtained.

4,231,374

PROCEDURE AND DEVICE FOR THE DETECTION OF EXTRAORDINARY EVENTS IN A SERIES OF ESSENTIALLY PERIODICALLY RECURRING NORMAL EVENTS

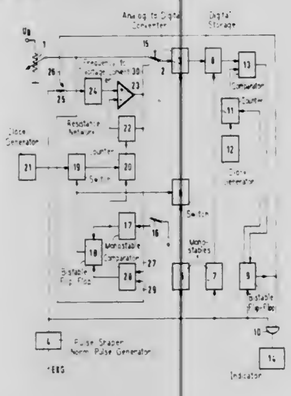
Karl Hudek, Erlangen, and Kurt Weigert, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,896

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749791

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—702 **12 Claims**



1. Procedure for the detection of extraordinary events in a series of essentially periodically recurring normal events, particularly extra systoles in the EKG, said procedure comprising:

manually setting a control (**1**) to a selected fixed value representing a time period corresponding to a fixed monitoring interval between successive occurrences of a normal event,

in a first mode of operation responding to each occurrence of the normal event to begin scanning for a further event, and continuing such scanning for a fixed time duration which corresponds to said selected fixed value, and so monitoring for a further event after each normal event directly according to said selected fixed value so long as the first mode of operation continues, shifting over from said first mode of operation to a second mode of operation, and during said second mode of operation:

(a) activating a comparator circuit (**17, 18, 28**) with the compartor having a first input (**29**) receiving a signal in accordance with said selected fixed value from the control (**1**) and having a second input (**27**) connected with a voltage regulator (**22, 23**),

(b) monitoring the actual repetition rate of currently occurring normal events by means of a frequency to voltage converter (**24**),

(c) supplying the output of the frequency to voltage converter (**24**) to said voltage regulator (**22, 23**) with the output of the voltage regulator being connected to the second input (**27**) of he comparator circuit (**17, 18, 28**),

(d) step by step adjusting the amplification factor of the voltage regulator (**22, 23**) until the output therefrom as supplied to the second input (**27**) of the comparator circuit matches the signal at the first input (**29**) thereof,

(e) responding to the matching at the first and second inputs of the comparator circuit (**17, 18, 28**) to fix the amplification factor at the currently adjusted value, and

(f) thereafter during said second mode of operation supplying the output of the voltage regulator (**22, 23**) with the amplification factor thereof adjusted according to steps (d) and (e) as a control value representing the time duration of a concomitantly variable monitoring interval, and thereafter responding to each occurrence of the normal event to begin scanning for an extraordinary event, and continuing such scanning for a time duration which is a function of said control value during said second mode of operation.

4,231,375

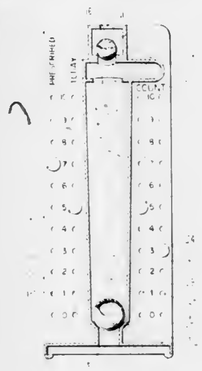
PULMONARY EXERCISER

John R. Boehringer, and John H. Lecky, both of Wynnewood, Pa.

Filed Oct. 20, 1977, Ser. No. 843,984

Int. Cl.³ A63B *23/00*

U.S. Cl. 128—725 **10 Claims**



1. Spirometer apparatus comprising:

(a) housing means including integral, operatively associated, alternately effectuated closable openings for inspiratory flow responsive and expiratory pressure means associated therewith;

(b) indicating means, associated with said inspiratory flow means, for quantifying the inspiratory pulmonary condition of the user; and

(c) said expiratory pressure means being of the positive end expiratory pressure type employing a deadweight force means operative against one of said openings in resistance to expiratory flow through the orifice.

4,231,376

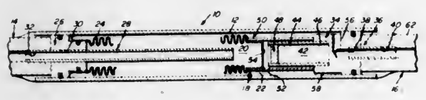
PRESSURE SENSOR

Warren C. Lyon, Baltimore, and William H. Hayes, Jr., Woodbine, both of Md., assignors to Hittman Corporation, Columbia, Md.

Continuation of Ser. No. 698,895, Jun. 23, 1976, abandoned, which is a continuation of Ser. No. 488,988, Jul. 16, 1974, Pat. No. 4,027,661. This application Aug. 7, 1978, Ser. No. 931,526

Int. Cl.² A61B *5/00*

U.S. Cl. 128—748 **8 Claims**



1. A novel subcombination for use in a pressure sensor appa-

ratus of the type that is embodied in the human body for obtaining, non-invasively, indications of internal body pressure, particularly intracranial pressure, including a two-component communication means operative upon relative movement therebetween capable of communicating internal body pressure indications non-invasively to the exterior of the body and, wherein said internal body pressure indications are detected in the body by a flexible fluid-filled tambour, said novel subcombination comprising an elongated, substantially cylindrical housing, a bellows support member connected to said housing at one end thereof and defining one of the end walls of said housing, a fluid filling the complete interior of said housing for communcating with the fluid-filled tambour through the other end of the housing to enable the transfer of fluid to the interior of the housing in proportion to the body pressure detected by the fluid-filled tambour, an elongated, substantially cylindrical elastic bellows suspended in said fluid within said housing, one end of said bellows being connected to said bellows support member for supporting said bellows coaxially within said housing and in suspension within said housing, with the substantially cylindrical side wall portion of said bellows extending from said one end of the bellows to the other end of the bellows, coaxial with said housing, said substantially cylindrical side wall portion of the bellows having a diameter less than the diameter of said housing defining an annular space therebetween, said other end of said bellows comprising a first attaching means for attaching a first component of a communication means and being spaced from the other end of the housing free of any fixed connection with said housing, said other end of the housing comprising a second attaching means for attaching a second component of a communication means free of any fixed connection with said bellows, said bellows and said housing defining a first chamber, including said annular space and said bellows and said bellows support means defining a second chamber isolated from the first chamber, each of said first and second chambers being filled completely with fluid, means for placing said first chamber in fluid communication with the fluid-filled tambour, means for permitting fluid within said second chamber to flow into and out of said second chamber upon actuation of said bellows in proportion to the amount of fluid flowing into said first chamber, the movement of said bellows taking place in a direction substantially parallel to the major axis of said housing.

4,231,377

WRAPPER FOR SMOKING ARTICLES CONTAINING MAGNESIUM OXIDE

Warren K. Cline, Brevard, and Richard H. Martin, Pisgah Forest, both of N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Filed Aug. 30, 1978, Ser. No. 937,936

Int. Cl.³ A24B *15/28;* **A24D** *1/02*

U.S. Cl. 131—9 **20 Claims**

1. A wrapper for the tobacco charge in a smoking article comprising a combustible cellulosic sheet containing at least 15% magnesium oxide and at least 0.5% of a chemical adjuvant salt selected from the group consisting of the alkali metal acetates, carbonates, citrates, nitrates and tartrates, both percentages by weight based upon the weight of the wrapper.

4,231,378

DEVICE FOR PERFORATING PACKAGED CIGARETTES

Pierre M. Stevens, 7 Stone Arch Dr., Old Westbury, N.Y. 11568

Filed May 11, 1978, Ser. No. 904,792

Int. Cl.³ A24F *13/00*

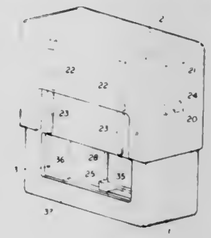
U.S. Cl. 131—170 R **30 Claims**

1. A device for perforating packaged cigarettes, or the like, comprising:

a first housing member at least partially defining a receiving area for a package of cigarettes, or the like;

piercing means coupled to said first housing member and carrying a plurality of piercing needles, said piercing means being moveable relative to said first housing member to cause said piercing needles to pierce the cigarettes in the cigarette package;

said first housing member comprising needle receiving openings through which said piercing needles pass for guiding said piercing needles during the piercing of said cigarettes; and



locking means coupled to at least one of said first housing member and piercing means for locking said first housing member and piercing means relative to each other so that they are substantially immovable relative to each other, thereby preventing said piercing needles from passing through said needle openings.

4,231,379

ASH TRAY

Yoshinori Kohori, 43-3, 3-chome, Aoyamadai, Suita, Japan

Filed Dec. 14, 1978, Ser. No. 969,332

Claims priority, application Japan, Jan. 10, 1978, 53-1729[U]; Jan. 13, 1978, 53-3263[U]

Int. Cl.³ A24F *13/18, 19/14*

U.S. Cl. 131—235 R **6 Claims**



1. An ash tray for supporting a smoke producing object, said ash tray comprising:

(a) a wall means for defining an enclosed interior space, said wall means comprising a vertically extending side wall means, an upper panel covering the upper end of said side wall means and a bottom panel covering the lower end of said side wall means;

(b) at least one aperture means formed in said side wall means for defining an opening into said interior space, said aperture means being adapted to permit insertion of said object;

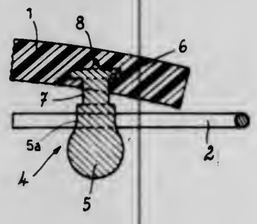
(c) a flange means formed adjacent to and below said aperture means, said flange means being adapted to support said object inserted into said aperture means;

(d) at least one small hole formed in said upper panel to allow the smoke in said enclosed interior space to go out; and

(e) a filter to remove the harmful substance in the smoke, said filter being located at an upper part of said enclosed

interior space and arranged to come into close contact with the inner surface of said upper panel, wherein the smoke from said object is trapped within said enclosed interior space such that after a predetermined time the burning of the object will be extinguished, and wherein the smoke filling said enclosed interior space gradually flows out through said filter and said small hole.

4,231,380
CLASP FASTENER
Pierre F. X. Seiller, Proulieu-Lagnieu (Ain), France
Filed Apr. 14, 1978, Ser. No. 896,392
Claims priority, application France, Apr. 15, 1977, 77 11970
Int. Cl.³ A45D *8/00*
U.S. Cl. 132—47 **1 Claim**



1. A hair clip or the like comprising:
an elongated body of synthetic-resin material having an obverse side and a reverse side;
a hinge mounted on said reverse side of said body at one end thereof;
a bent-wire arm swingably mounted at one end on said hinge and having a free end formed with a pair of legs resiliently deflectable outwardly; and
a retaining member anchored in said body on said reverse side thereof at an end of the body remote from said hinge, said retaining member comprising:
a base embedded in said body and having a square planar configuration, and a head formed on one side of said base and lying outside said body for engagement between the legs of said arm, said head and said base being solid unitarily formed of a metallic material by turning or molding, said head being generally pear-shaped and being connected by a cylindrical shank to said base, said base being formed on its side turned away from said shank with a central point adapted to position the retaining member on said body, said shank being solid and formed unitarily with said head, said base and said point.

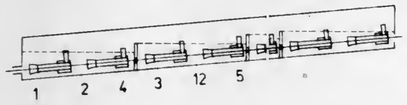
4,231,381
DENTAL FLOSS AND DENTAL AID HOLDER
Orlando A. Battista, 5280 Trail Lake Dr., Fort Worth, Tex. 76133
Filed Dec. 4, 1978, Ser. No. 965,820
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—89 **10 Claims**

1. A throw-away composite dental aid article comprising in combination:
a container body for storing therewithin a supply of mouthwash, said container having a threaded open end;
a closure cap including a compartment containing dental floss said compartment defined by a peripherally extending side wall, a bottom wall and a top wall having an aperture therein, said closure cap having a depending skirt which is threaded to engage cooperably with the threaded portion of the container body to releasably secure the closure cap thereto;
a toothpick connected to the said bottom wall of said closure cap so as to depend therefrom and extend into said container when the closure cap is secured thereto;
and a cap dimensioned and configured to seat within said aperture aperture of the top wall of said closure cap to



selectively provide access to the interior of said compartment.

4,231,382
COOLING STRAND FOR COOLING SMALL-SECTION STEEL
Hugo Beerens, Meersbusch, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Jun. 12, 1978, Ser. No. 914,619
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727362
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—64 R **4 Claims**

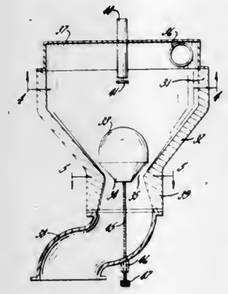


1. A cooling strand for cooling small-section steel passing through said strand in a first direction, the strand comprising:
a water container with water therein;
a plurality of cooling tubes immersed in said water and arranged coaxially within the water container, each tube having a constant internal diameter and a diameter to length ratio of from 1:5 to 1:15;
a plurality of pipes being provided at one end of each tube around the circumference thereof for feeding water under pressure into respective tubes in a direction having a component in opposition to said first direction; and means for providing a flow of water under pressure through said pipes and for inducing a flow of water through said tubes in opposition to said first direction while said steel is moving through the tubes.

4,231,383
METHOD FOR CONTROLLING MASS FLOW RATE
James F. Eversole, Mamaroneck, N.Y., and Lester P. Berriman, Irvine, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 622,521, Oct. 15, 1975, Pat. No. 4,023,125, which is a division of Ser. No. 388,761, Aug. 16, 1973, Pat. No. 3,952,776, which is a continuation-in-part of Ser. No. 151,373, Jun. 9, 1971, Pat. No. 3,778,038, which is a continuation-in-part of Ser. No. 17,086, Mar. 6, 1970, abandoned. This application Jan. 31, 1979, Ser. No. 7,946
The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.
Int. Cl.³ F02M *9/00*
U.S. Cl. 137—1 **2 Claims**

1. A method for delivering a gaseous medium at a controlled mass flow rate to a downstream location subject to a range of

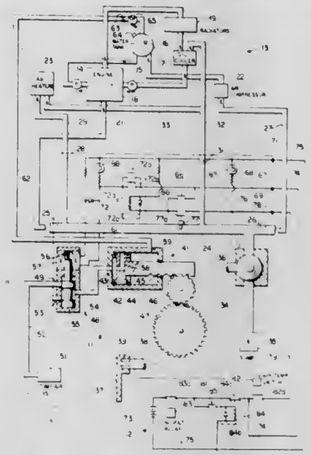
variable pressure conditions comprising the steps of flowing a gaseous medium from an upstream entry point toward the downstream location, passing the gaseous medium through a variable area constricted zone to increase the velocity thereof to sonic, passing the gaseous medium immediately downstream from the variable area constricted zone through a zone of gradually increasing cross-sectional area substantially corresponding to that of a conical section having an apex angle in the range of about 6° to 18° and having an exit comprising the downstream location in order to gradually reduce the velocity of the gaseous medium and efficiently recover kinetic energy as static pressure, and adjustably varying the cross-sectional areas of the constricted zone and the zone of gradually increas-



ing cross-sectional area in accordance with mass flow rate requirements of associated equipment in communication with the downstream location and to which the gaseous medium is to be delivered whereby the kinetic energy of the gaseous medium recovered as static pressure within the zone of gradually increasing cross-sectional area maintains the velocity of the gaseous medium through the constricted zone sonic when the pressure at the downstream location is at or below a predetermined value less than the gaseous medium pressure at the entry point but substantially more than 60% thereof so that the mass flow rate of the gaseous medium, at a given entry temperature and pressure, is directly proportional to, and is determined by the cross-sectional area of the constricted zone.

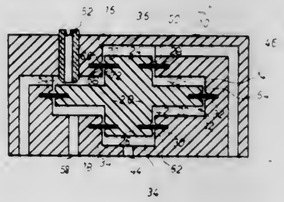
4,231,384
APPARATUS FOR DRAINING A COOLING SYSTEM
Fredrich M. Christensen, 10256 Prarie Rd., Omaha, Nebr. 68134
Division of Ser. No. 826,145, Aug. 19, 1977, Pat. No. 4,126,108, which is a continuation-in-part of Ser. No. 764,708, Feb. 1, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 932,908
Int. Cl.³ F16K *31/143*; **F01P** *11/20*
U.S. Cl. 137—62 **11 Claims**

1. A drain valve assembly comprising a housing containing
a. a manifold passage provided with a plurality of ports which lead to the exterior of the housing;
b. a depending drain passage leading from the manifold passage to the exterior of the housing;
c. a rotary, plug type drain valve arranged to open and close the drain passage;
d. motor means effective when energized to open the drain valve but being ineffective to close that valve, the motor means comprising a single-acting fluid pressure actuating motor having a working space and a movable member which responds to the pressure in that space and is connected to open the drain valve;
e. a pilot valve provided with a supply passage, an atmospheric vent passage, and a motor passage connected with the working space, and including a control member movable between vent and supply positions in which, respectively, it connects the motor passage with the vent and supply passages;
f. means biasing the control member to the vent position, and
a solenoid for shifting the control member to the supply position;
g. a manually operated valve actuator located outside the housing and coupled with the drain valve for opening and closing same, but being effective to close the drain valve



only when the working space of the fluid pressure actuating motor is vented; and
h. an electrical circuit having at least a pair of terminals leading to the exterior of the housing and which are interconnected by a loop containing the solenoid and a normally open switch means.

4,231,385
PNEUMATIC CONTROLLER
Günther Roth, Solingen, Fed. Rep. of Germany, assignor to Sunvic Regler GmbH, Solingen-Wald, Fed. Rep. of Germany
Filed Mar. 29, 1979, Ser. No. 24,958
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—86 **5 Claims**



1. A pneumatic controller wherein the commanded value and the actual value as well as a positive and a negative feedback are represented by pressures and which provides an output pressure value determining a final control quantity, comprising a housing defining an internal cavity and five ports communicating with said internal cavity, an inner body positioned in said internal cavity, and three spaced diaphragms interconnecting the housing and the body and supporting the body in said internal cavity for movement with respect to the housing, said diaphragms with said body dividing the internal cavity into four pressure chambers, a respective one of four of said ports communicating with each chamber respectively, a first of said chambers being exposed to a commanded value pressure through the respective port, a second of said chambers being exposed to an actual value pressure through the respective port and counteracting the pressure in the first chamber, a third of said chambers being exposed to a negative

feedback pressure through the respective port, the fourth of said chambers being exposed to a positive feedback pressure through the respective port, the port communicating with said third chamber being a restricted air supply port and including an outlet nozzle in said third chamber, said body defining a baffle surface in said third chamber in juxtaposition to said outlet nozzle, the fifth of said ports being an output pressure port and communicating with said third chamber, said controller being characterized by the combination of the following features:

(a) said internal cavity having two ends and between said ends comprising a cylindrical median section and two cylindrical end sections at respective sides of the median section, said end sections being of diameters that are relatively small compared to the diameter of the median section;

(b) said internal body comprising a relatively large median portion in said median section and relatively small end portions each of which is in a respective end section;

(c) said three diaphragms being annular, a first of said diaphragms being in one end section and extending between the end portion therein and the body, a second of said diaphragms being in the other end section and extending between the end portion therein and the body, and the third of the diaphragms being in the median section and extending between the median portion and the body; and

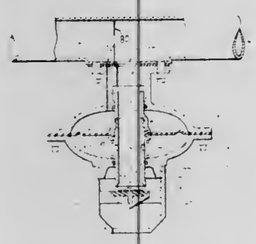
(d) said first chamber being between one of said ends and the diaphragm nearest thereto, said second chamber being between the other of said ends and the diaphragm nearest thereto, the third and fourth chambers being between the first and second chambers and being separated by the third diaphragm.

4,231,386

DIFFERENTIAL PRESSURE RELIEF VALVE

Heinz W. Braukmann, Willowdale, Canada, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Mar. 23, 1978, Ser. No. 889,247
Int. Cl.³ G05D 7/01
U.S. Cl. 137—117 **3 Claims**



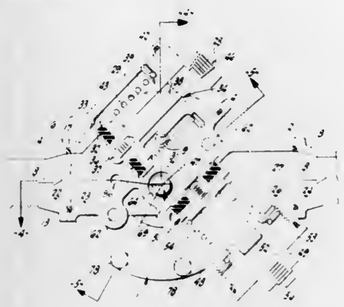
1. A differential pressure relief valve having a housing with first and second channels, said housing being adapted for facial connection to primary and secondary pressure zones in a conduit through said channels respectively, a first chamber in said housing connecting with the inner end of said first channel, a second chamber in said housing separated from said first chamber by an annular diaphragm supported by said housing, a movable sleeve in said housing secured to the inner edge of said diaphragm, said sleeve tranversing said chambers and sealed in said housing to isolate said chambers from the atmosphere, said sleeve having an aperture communicating with said lower said lower chamber, a seat in said housing exterior of said second chamber with the end of said sleeve protruding from said second chamber engageable with said seat and the other end of said sleeve, protruding from said first chamber, communicating with said secondary pressure zone through said second channel, the arrangement being such that when the primary pressure exceeds the secondary pressure by a predetermined amount, the lower end of the sleeve engages said seat due to the primary pressure on said diaphragm but when the primary pressure does not exceed the secondary pressure by the predetermined amount, the lower end of the sleeve does not engage the seat and fluid escapes from the conduit through the second channel and the sleeve past the seat.

4,231,387

BACKFLOW PREVENTING VALVE

Robert W. Dixon, Concord, Calif., assignor to Chas. M. Bailey Co., Inc., Emeryville, Calif.

Filed Jan. 11, 1979, Ser. No. 2,690
Int. Cl.³ F16K 24/02
U.S. Cl. 137—218 **1 Claim**



1. A backflow preventing valve comprising a first body portion terminating in a predetermined planar face, said first body portion having an inlet port and an outlet port both in alignment on a through first axis extending in a plane parallel to said planar face, means defining an inlet chamber in said first body portion open to said inlet port and also extending along a second axis disposed in said plane and intersecting said first axis, means defining an outlet chamber in said first body portion open to said outlet port and also extending along a third axis disposed in said plane and intersecting said second axis, means defining an intermediate chamber in said first body portion merging with said inlet chamber at an inlet valve seat centered in said plane and also merging with said outlet chamber at an outlet valve seat in said plane, an inlet valve in said intermediate chamber and having a valve stem movable in said plane toward and away from said inlet valve seat, a first spring in said intermediate chamber urging said inlet valve toward said inlet valve seat, an outlet valve in said outlet chamber and having a valve stem movable in said plane toward and away from said outlet valve seat, a second spring in said outlet chamber urging said outlet valve toward said outlet valve seat, a second body portion terminating in a predetermined planar face, means for releasably holding said first body portion and said second body portion with said planar faces substantially coincident and parallel to said plane, means defining in said first body portion an extension of said intermediate chamber disposed substantially perpendicular to said plane, means in said first body portion defining a vent valve seat surrounding said extension and substantially parallel to said plane, means defining in said second body portion a vent chamber extending perpendicular to said first plane and merging with said extension, means defining a vent to the atmosphere from said vent chamber, a vent valve having a stem movable in said extension normal to said plane and having on said stem a head movable into and out of engagement with said vent valve seat, a planar cap plate on said vent valve stem and extending parallel to said plane, a spring interposed between said second body portion and said cap plate for urging said vent valve away from said vent valve seat, a planar diaphragm extending parallel to said plane and abutting said cap plate and said second body portion, a diaphragm cap overlying said planar diaphragm on the side thereof opposite said cap plate and thereby establishing a diaphragm chamber, means for securing said diaphragm cap through said planar diaphragm to said second body portion, and means for establishing an air passage substantially normal to said first plane and extending from said inlet chamber then through said first body portion and then through said second body portion and then through said diaphragm and said cap into said diaphragm chamber.

4,231,388

GATE FOR USE IN A GATE VALVE

Charles C. Wallace, 7833 NE. Tillamook, Portland, Oreg. 97213

Filed Feb. 17, 1978, Ser. No. 878,705
Int. Cl.³ F16K 3/02
U.S. Cl. 137—242 **7 Claims**



1. For use in a gate valve, a gate having upstream and downstream faces, a port defined by a cylindrical wall having a cylindrical axis extending through the gate's thickness and a marginal groove provided on each face, each groove being in open communication with its associated face during normal valving operation for collecting foreign material therein, the improvement comprising:

channel means formed in the gate extending along a radius from the cylindrical axis for providing a passage between the cylindrical wall and at least one of the grooves.

4,231,389

REMOVABLE OPERATOR FOR GATE VALVES

Robert C. Still; Frank J. Huppenthal; Barbara J. Smith, and Gerald H. Scotney, all of Tucson, Ariz., assignors to New Concepts, Inc., Tucson, Ariz.

Filed Sep. 15, 1978, Ser. No. 942,768
Int. Cl.³ F16K 43/00, 31/54
U.S. Cl. 137—315 **24 Claims**

1. A removable operator for a gate valve, said operator being serially readily useable in the field with each of a plurality of gate valves and thereby eliminate the need for having gate repositioning apparatus attendant to and continuously remain with each of the gate valves, said operator comprising in combination:

(a) means for detachably attaching said operator to the gate valve;
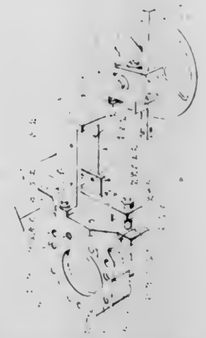
(b) positioning means for imparting translatory movement to the gate of the gate valve;

(c) means for engaging said positioning means with the gate of the gate valve;

(d) means for translating said positioning means; and

(e) means for maintaining the gate in the opened or closed position upon removal of said operator;

whereby, upon detachable attachment of said operator to the gate valve and on actuation of said positioning means, the gate



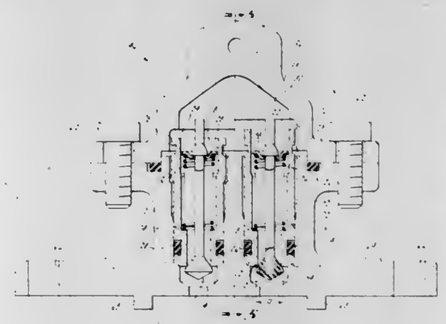
of the gate valve is raiseable or lowerable to open or close the gate valve.

4,231,390

PRESSURE REGULATOR SYSTEM

Kenneth W. Teague, Dayton, Ohio, assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 719,022, Aug. 30, 1976, Pat. No. 4,132,204.
This application Jul. 17, 1978, Ser. No. 925,078
Int. Cl.³ F16K 43/00, 17/04
U.S. Cl. 137—315 **1 Claim**



1. In an internal combustion engine, a fuel pressure regulator assembly comprising:

a housing comprising first and second housing elements which are separable at respective confronting mating surfaces, and means separably securing said two housing elements together;

a pair of generally cylindrical adjacent bores which extend into said first housing element from the respective confronting surface thereof, said bores having essentially equal main diameters, but one of said bores including a larger diameter counterbore at the respective confronting mating surface;

a shoulder in the main diameter of each bore;

a pair of generally cylindrical pressure relief valve assemblies, each disposed in a respective one of said bores and abutting the shoulder thereof, each valve assembly protruding from the respective bore at the respective confronting mating surface with one of said valve assemblies having a portion protruding farther beyond its respective bore than does a corresponding portion of the other valve assembly beyond its respective bore, said valve assemblies having essentially equal main diameters fitting within the

main diameters of the respective bores, said other valve assembly being disposed in said one bore and having a diametrically enlarged portion which fits within the counterbore but is larger in diameter than the main diameters of the bores;

a recess which extends into said second housing element from the respective confronting mating surface thereof and within which the protruding portions of said valve assemblies are disposed, said recess comprising a first portion within which the protruding portion of said one valve assembly is disposed and a second portion within which the protruding portion of said other valve assembly is disposed, said second recess portion being no deeper than the amount of the protrusion of said corresponding portion of said one valve assembly whereby incorrect assembly of the valve assemblies into the bores and/or incorrect assembly of the two housing elements together may be more readily detected; and

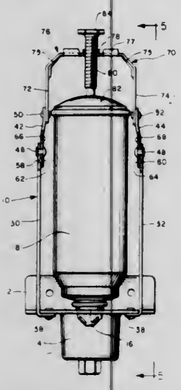
an inlet in said second housing element in communication with said recess and a pair of outlets in said first housing element, each outlet being in communication with a corresponding one of said bores and each valve assembly regulating flow between said inlet and the corresponding outlet.

4,231,391

CANNISTER MOUNTING BRACKET

James W. Burke, Long Grove, and John N. Cook, Island Lake, both of Ill., assignors to Kru-Bur, Inc., Algonquin, Ill.

Filed Feb. 21, 1978, Ser. No. 879,253
Int. Cl.³ F16K *27/08*
U.S. Cl. 137—[illegible]43 **12 Claims**



1. A bracket for mounting a cannister to a valve assembly, said bracket comprising:

means for mounting a valve assembly, said mounting means defining two spaced pivot points;

means for contacting a cannister to urge and hold the cannister against the valve assembly, said contacting means defining two spaced pivot points; and

a pair of link members interposed between the mounting means and the contacting means for alterning the separation between the mounting means and the contacting means, each link member having a first end pivotably connected to a respective one of the contacting means pivot points and a second end pivotably connected to a respective one of the contacting means pivot points;

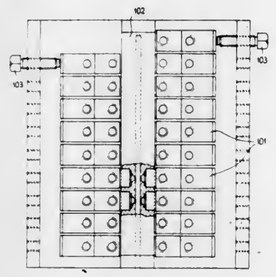
said link members pivotable about the mounting means between a first position, in which the contacting means is positioned to accept cannisters of a first size, and a second position, in which the contacting means is positioned to accept cannisters of a second size, larger than the first size.

4,231,392

COLOR-CHANGING VALVE FOR AN AUTOMATIC PAINTING MACHINE

Jean-Pierre Allibert, Chatenay Malabry, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Aug. 21, 1978, Ser. No. 935,374
Claims priority, application France, Aug. 22, 1977, 77 25556
Int. Cl.³ F16K *19/00*
U.S. Cl. 137—454.2 **2 Claims**



1. A modular color-changing valve for automatic painting machine comprising:

a longitudinally-extending common manifold having a plurality of tapered bores communicating therewith;

means for supporting said common manifold, said supporting means having support surfaces extending parallel to and spaced from said common manifold, each of said support surfaces having a plurality of threaded bores formed therein, the axes of the threaded bores being parallel with the axes of the tapered bores of said common manifold;

a plurality of unitary valves interposed between said support surfaces and said common manifold, each of said valves having a tapered nozzle received in a tapered bore of said common manifold; and

a plurality of screws threadedly engaged with threaded bores of said support surfaces, ends of said screws contacting portions of said unitary valves to urge said tapered nozzles of said unitary valves into sealing engagement with said tapered bores of said common manifold.

4,231,393

ARRANGEMENT IN OR RELATING TO A VALVE

Arne Byfuglien, Nygard, Norway, assignor to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed May 15, 1979, Ser. No. 39,141
Claims priority, application Norway, May 19, 1978, 781751
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—491 **6 Claims**

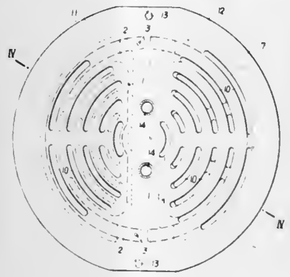
1. Arrangement in or relating to a valve comprising a housing (1) having an inlet (2) and an outlet (3) whose interconnection is closable by means of a differential piston (5) which is slidably arranged in a cylinder (4) in the housing (1), said differential piston being equipped with a bore (8) which connects its large (6) and small (7) sides, said valve further comprising a conduit or the like (15, 16, 17) leading from the chamber (10) in the housing (1) on the large side (6) of the differential piston to the outlet (3), said conduit or the like (15, 16, 17) being equipped with a pilot valve (14) for closing and opening of the conduit, characterized in that in the conduit or the like (16, 17) downstream of the pilot valve (14) is a valve means (18) which is arranged at a predetermined pressuure on its downstream side (17) to open its upstream side (16) to the pressure of the surroundings.

4,231,394

CLOSING MEMBER FOR A RING VALVE

Hans Hrabal, and Josef Wimmer, both of Vienna, Austria, assignors to Enfo Grundlagen Forschungs AG, Döttingen, Switzerland

Continuation of Ser. No. 825,781, Aug. 18, 1977, abandoned. This application May 30, 1979, Ser. No. 43,654
Claims priority, application Austria, Jul. 1, 1977, 46901/77
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—512 **8 Claims**



1. A closing reed for mounting on a valve seat having a plurality of concentrically arranged portways, comprising:

a plurality of flexible ring members extending in radial spaced concentric relationship over an angle less than 360° for controlling the flow of fluid through the valve portways and being separated by concentrically extending slits between adjoining ring members;

the outermost one of said flexible ring members including two substantially diametrically positioned mounting holes and being continuous therebetween;

at least one radially extending web member interconnecting said plurality of concentric ring members and said outermost flexible ring member; and

additional radially extending web members interconnecting at least some of said plurality of concentric ring members and said outermost ring member, said additional web members being respectively located at intermediate positions on the circumference of said outermost ring member between said mounting holes.

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NON-RETURN VALVE

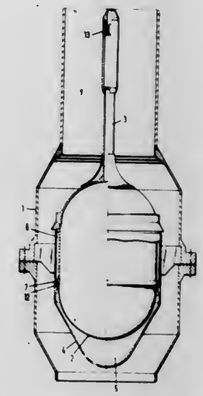
Ronald Versluis, Alphen a/d Rijn, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

Filed Aug. 30, 1978, Ser. No. 937,987
Claims priority, application Netherlands, Sep. 6, 1977, 7709799
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—514.7 **7 Claims**

1. A non-return valve including a valve body having a fluid inlet, a fluid outlet, and an annular valve seat disposed in the body between the inlet and outlet; an enclosed hollow valve member, and a valve guide bush mounted in the valve body on one side of and coaxial with the valve seat, the valve guide bush having an elongated imperforate casing with an open end directed toward the valve seat and being closed at the other end, and the valve member having a portion disposed within said guide bush for axial displacement between a valve shut position in which the valve member makes sealing contact with the valve seat and a valve open position in which the valve member is axially spaced from the valve seat, wherein the improvement comprises:

means for forming a constricted space between the inner wall of the valve guide bush casing and the outer wall of the portion of the valve member disposed within the guide bush for a limited axial range adjacent to the valve shut position for damping the movement of the valve member as it approaches the shut position and

means for limiting the entry of the valve member into the guide bush such that a chamber is disposed between the closed end of the valve guide bush casing and the valve member even when the valve member extends the greatest admissible distance into the guide bush, whereby the withdrawal of the valve member from the guide bush is not impeded by adhesion forces therebetween.

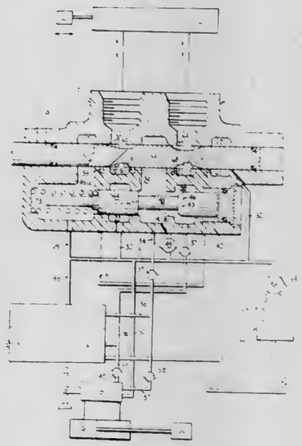


4,231,396

LOAD RESPONSIVE FLUID CONTROL VALVES

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation of Ser. No. 828,643, Aug. 29, 1977, Pat. No. 4,165,761, which is a continuation of Ser. No. 709,202, Jul. 27, 1976, Pat. No. 4,058,139. This application Jan. 26, 1979, Ser. No. 7,159
The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.
Int. Cl.³ F15B *13/08*
U.S. Cl. 137—596.13 **5 Claims**



1. A valve assembly supplied with pressure fluid by a pump comprising a housing having a fluid inlet chamber connected to said pump, a fluid supply chamber, first and second load chambers, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid exhaust means, first variable

fluid metering orifice means responsive to movement of said first valve means between said fluid supply chamber and said load chambers, second variable fluid metering orifice means responsive to movement of said first valve means between said load chambers and said exhaust means, negative load pressure sensing means between said load chambers and said exhaust means selectively communicable with said load chambers by said first valve means, second valve means having fluid isolating means between said inlet chamber and said supply chamber, said inlet chamber being solely communicable with said supply chamber by said second valve means, said fluid isolating means having means operable to isolate said inlet chamber from said supply chamber when pressure in said negative load pressure sensing means exceeds a certain predetermined level, and fluid replenishing means operable to supply fluid flow to said load chamber isolated by said fluid isolating means.

4,231,397

METHOD OF, AND APPARATUS FOR, REGULATING THE PRESSURE IN A DEFORMABLE CONDUIT CONDUCTING A FLOWING FLUID

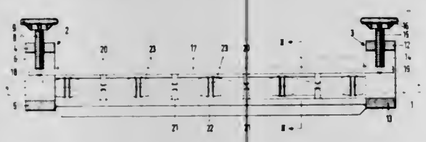
Johannes H. te Riele, Amersfoort, Netherlands, assignor to Remia B.V., Den Dolden, Netherlands

Filed Feb. 14, 1979, Ser. No. 12,154

Claims priority, application Netherlands, Feb. 17, 1978, 7801848

Int. Cl.³ F16K *7/06*

U.S. Cl. 137—614.11 **2 Claims**



1. Apparatus for regulating the pressure of a fluid flowing in a deformable conduit, comprising

(a) at least two spaced annular housing means through which the deformable conduit passes;

(b) first fluid pressure control means arranged between said spaced annular housing means in a first plane and including

(1) a first fixed support beam connected at opposite ends with said housing means and including a plurality of first longitudinally spaced ridges;

(2) first operating rod means arranged opposite said first beam and including a plurality of second longitudinally spaced ridges arranged opposite, and extending in the direction of, said first ridges to define a plurality of first opposed pairs of ridges; and

(3) first means connected with each of said housing means, respectively, for displacing said first operating rod means relative to said first support beam; and

(c) second fluid pressure control means arranged between said spaced annular housing means in a second plane normal to said first plane and including

(1) a second fixed support beam connected at opposite ends with said housing means and including a plurality of third ridges longitudinally spaced between said plurality of first ridges;

(2) second operating rod means arranged opposite said second beam and including a plurality of fourth longitudinally spaced ridges arranged opposite, and extending in the direction of, said third ridges to define a plurality of second opposed pairs of ridges, the flexible conduit being arranged between said first and second pairs of ridges, respectively; and

(3) second means connected with each of said housing means, respectively, for displacing said second operating rod means relative to said second support beam, whereby displacement of said first and second operating rods changes the cross-sectional area of the flexible conduit, thereby to control the pressure of fluid flowing therethrough.

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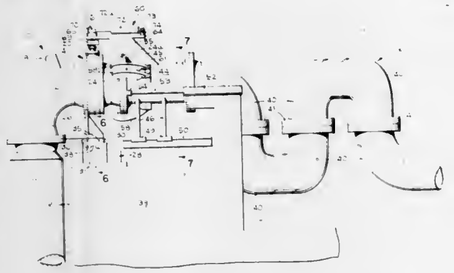
CARGO HOSE TO MARINE TANKER CONNECTION APPARATUS

Harold M. Gibbons, deceased, late of Long Beach, Calif. (by Gladys M. Gibbons, executrix), assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 12, 1978, Ser. No. 941,699

Int. Cl.³ F16L *27/00, 37/28;* **B67C** *3/34*

U.S. Cl. 137—615 **7 Claims**



1. Apparatus for connecting a manifold of a tanker in a coaxial fluid-tight relationship with a petroleum-transfer hose having a hose-assembly mounted on the end thereof, said apparatus comprising:

means for securing said hose in a position substantially vertical along side said tanker; a spool flange connected to one end of said hose assembly; a rigid pipe elbow connected to said hose and including said flange;

a pipe coupler having a coupler flange at one end thereof;

a universal pipe joint;

means for coupling said universal joint between said pipe coupler and said manifold;

a support track for supporting and guiding said pipe coupler as it moves relative to said manifold; the outlet of said pipe elbow being substantially parallel to said support track;

means for moving said pipe coupler along said support track relative to said spool flange and said manifold with said coupler flange being directed into coaxial alignment with said secured spool flange; and

means for securing said spool flange to said coupler flange in a fluid-tight connection.

4,231,399

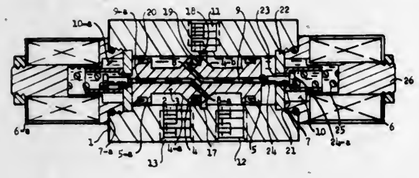
MOMENTARY CONTACT REVERSING DIVERTER

Richard S. Paullukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 872,231, Jan. 25, 1978, Pat. No. 4,178,768. This application Feb. 5, 1979, Ser. No. 9,678

Int. Cl.³ F16K *31/122, 31/06, 11/07*

U.S. Cl. 137—625.4 **4 Claims**



1. A momentary contact valve for selectively porting pressurized fluid comprising:

a multiported valve housing having a first and a second ends interconnected by an axially extending bore passing therethrough and closed by an identical electrical solenoid operator at each opposite housing end including a central solenoid plunger movable selectively between an open position when said operator is momentarily energized electrically and a closed position when said operator is de-energized, including a fluid supply and discharge port means incorporated therein,

a valving means inside said bore slidable between a first and a second positions selectively porting fluid flow through said valve including an elongated stem with a centrally located valve piston provided with pilot ports initiating therein in an overlapping relationship therebetween so as to have a first pilot port start on the right side of said valve piston and extend generally longitudinally through said stem discharging on the left stem end provided with a first integral end piston while a second pilot port starts on the left side of said valve piston and extends through said stem longitudinally for discharge on the right stem end provided with a second integral end piston, with pilot discharge ports inside said end pistons closed by said solenoid plungers, including

a valve shifting means with said position change of said valving means and means for maintaining said valving means in one of said positions driftless.

4,231,400

REMOVABLE TWO-WAY CONNECTOR FOR A FAUCET NOZZLE

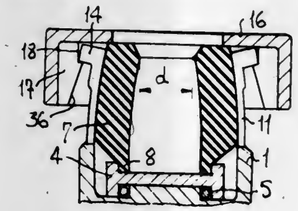
Gerard Friedling, 7, ch. des Bruchons, CH 1225 Veyrier (Geneva), and Marcel Chuard, 7d, ch. Vert, CH 1217 Meyrin (Geneva), both of Switzerland

Filed May 21, 1979, Ser. No. 40,591

Claims priority, application Switzerland, May 30, 1978, 5881/78

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—798 **7 Claims**



1. A removable two-way connector for a faucet nozzle, which comprises

(a) a body having a generally annular wall divided into a plurality of segments by gaps defined between the segments, the annular wall defining a cavity in the body and including a peripheral flange, the flange bring configurated to form a spiral camming face at each wall segment,

(b) a deformable packing sleeve disposed in the cavity adjacent the generally annular wall, and

(c) a rotary cover mounted on the body and capping the cavity, the cover having radially inwardly extending ribs having cam follower faces arranged to engage the spiral camming faces, the body wall and cover being arranged to cooperate to force the wall segments radially inwardly upon rotation of the cover in relation to the body and corresponding displacement of the cover ribs along the spiral camming faces whereby the inwardly forced wall segments are pressed against the deformable packing sleeve and the sleeve sealingly engages a nozzle surrounded by the sleeve.

4,231,401

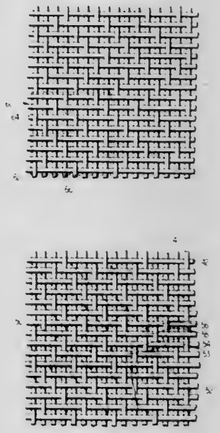
FABRIC FOR PAPERMAKING MACHINES

Tibor L. Matuska, Pensacola, Fla., assignor to Unaform, Inc., Shreveport, La.

Filed Jun. 16, 1978, Ser. No. 916,125

Int. Cl.² D03D *15/00*

U.S. Cl. 139—383 A **26 Claims**



1. A planar forming fabric comprising at least one single layer fabric having first and second surfaces, a plurality of rounds of weave arranged to each other to define the width of said single layer fabric, said adjacently arranged rounds of weave repeated a desired number of times to define the length of said single layer fabric, each of said rounds of weave being defined by warp and weft yarns interwoven according to shedding and picking instructions determined by at least two different coplanar weave patterns, said adjacent rounds of weave comprising a plurality of cross-machine direction floats in close proximity to each other on said first surface, a plurality of machine direction knuckles on said first surface, a plurality of machine direction floats in close proximity to each other on said second surface, a plurality of cross-machine direction knuckles on said second surface, said knuckles and floats coacting to prevent misalignment of said floats that are in close proximity to each other, and to provide uniform drainage apertures on said fabric.

4,231,402

DRAWING GRIPPER FOR WEAVING LOOMS

Alberto Merisio, Colzate, Italy, assignor to Somet Societa Meccanica Tessile, S.p.A., Bergamo, Italy

Continuation of Ser. No. 862,904, Dec. 21, 1977, abandoned. This application Feb. 15, 1979, Ser. No. 12,250

Claims priority, application Italy, Dec. 27, 1976, 30890 A/76

Int. Cl.³ D03D *47/20*

U.S. Cl. 139—448 **3 Claims**

1. Drawing gripper for weaving looms with continuous weft feed, comprising a gripper body, a claw attached to an end portion of said gripper body, said claw having a hook at one end, an oscillatable element positioned near one side of said body having at one end thereof an enlarged portion which is shaped to fit the interior contour of said hook, said interior contour of said hook and the enlarged portion of said oscillatable element cooperating with each other to wedge the weft thread grasped by the hook, and means on said body to allow oscillation of said element about its own longitudinal axis, the axis of said oscillatable element being arranged to pivot the enlarged portion externally of the profiled surface of the hook

of said claw, on the side of the body where the oscillatable element is arranged and positioned below the upper interior



surface of said hook where said enlarged portion contacts said hook.

4,231,403

LIQUID FEEDER FOR AUTOMATIC CULTURE APPARATUS

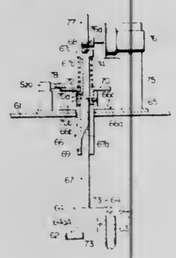
Shinroku Sogi; Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 876,894, Feb. 13, 1978, Pat. No. 4,179,339. This application Dec. 26, 1978, Ser. No. 973,116

Claims priority, application Japan, Mar. 2, 1977, 52-24766; Apr. 5, 1977, 52-41589; Apr. 5, 1977, 52-41592

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—284 **3 Claims**



1. A liquid supply switching system for automatic culture apparatus comprising a hollow shaft extending through and secured to a stationary outer plate of an incubator, a drive shaft extending through the hollow shaft for rotation and vertical motion therein, the drive shaft being peripherally formed with a keyway and a rotation controlling cam groove in which a pin secured to the hollow shaft is fitted, the drive shaft being urged to move upwardly so that its upper end face bears against a vertical movement controlling cam, a rotating plate carrying a key which engages the keyway and rotatably fitted between the hollow shaft and the drive shaft so as to be capable of only rotation integrally with the drive shaft, a vertical movement controlling cam fixedly mounted on the output shaft of a drive motor and disposed in abutment against the upper end face of the drive shaft for controlling the vertical movement thereof as the motor rotates, a tube support arm extending from the lower end of the drive shaft and adapted to have the inner end of a flexible liquid supply tube mounted thereon, and an angular position detecting mechanism including a switch operating member mounted on the rotating plate and also including a pair of motor stopping limit switches disposed adjacent to the rotating plate at the opposite ends of the angular extent of rotation of the plate, the detecting mechanism causing the switches to deenergize the motor at a given angular position at which the vertical movement of the drive shaft is stopped for bringing the discharge port of the liquid supply tube to a given three dimensional position.

4,231,404

DEVICE FOR TRIMMING THE REEDS OF WIND INSTRUMENTS

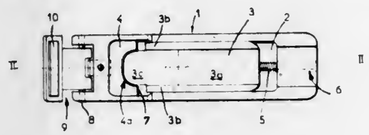
Bernard M. Van Doren, Saint Germain En Laye, and Jacques G. Frank, Conflana-Sainte Honorine, both of France, assignors to Etablissements VanDoren, Paris, France

Filed May 29, 1979, Ser. No. 43,509

Claims priority, application France, Dec. 22, 1978, 73.36140

Int. Cl.³ G10G *7/00*

U.S. Cl. 144—2 R **6 Claims**



1. A device for retrimming the reed of a wind instrument, characterized in that it comprises a body a flat part of which forms a support for said reed, a removable cutting member having a profile corresponding to that of the end of said reed and projecting perpendicularly to the surface of said flat part, and a compression member pivotably mounted about a pin on said body and disposed so that it may be applied manually against said cutting member.

4,231,405

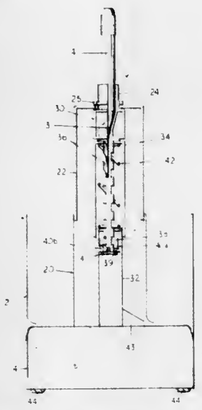
PENCIL DRIVEN MECHANICAL PENCIL SHARPENER

Jose F. Vila, 5508 31st Ave., No. 3, Woodside, N.Y. 11377

Filed Jun. 5, 1978, Ser. No. 912,225

Int. Cl.² B43L *23/02*

U.S. Cl. 144—28.4 **8 Claims**



1. A mechanical pencil sharpener actuated by insertion of a pencil thereinto which comprises:

(a) a frame;

(b) a cutter assembly having a longitudinal axis, said cutter assembly being rotatably and slidably mounted in said frame, such that a pencil to be sharpened may be inserted into the cutter assembly and forced against a portion thereof to cause sliding movement in the direction of movement of the pencil, from an initial position to a displaced position;

(c) a rod for rotating said cutter assembly to sharpen the pencil, said rod having an elongated longitudinal axis, said rod depending from said cutter assembly, being coaxially

aligned therewith and being kinematically unitary with said cutter assembly, said rod including means disposed longitudinally of its length for effecting such rotation of the cutter assembly;

(d) a sleeve fixably mounted within said frame and including means meshing with the means extending longitudinally of said rod for translating said sliding movement of said rod and said cutter assembly into simultaneous rotational movement of said rod and said cutter assembly, said sleeve being axially coincident with said rod and concentrically disposed thereto;

(e) a spring fixedly mounted between said cutter assembly and said frame, said spring being so arranged that said sliding movement of said cutter assembly pushes against said spring to compress it when a pencil is inserted and when the pencil is withdrawn, said spring returns to its initial position which, in turn, returns said cutter assembly to its initial position; and

(f) conversion means cooperating with said rod for rotating said cutter assembly upon insertion of the pencil and longitudinal movement of said rod, said conversion means including a coupling which renders the drive train ineffective upon withdrawal of the pencil and return of the cutter assembly to its initial position.

4,231,406

DEVICE FOR TREATMENT OF THE SURFACE OF ROUND TIMBER

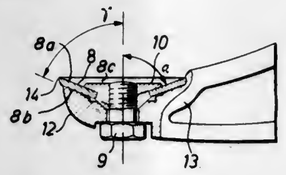
Karl-Erik A. Jonsson, Floraplan 14, S-802 28 Gävle, Sweden

Filed Nov. 9, 1978, Ser. No. 959,304

Claims priority, application Sweden, Nov. 11, 1977, 7712802

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—208 E **23 Claims**



1. A cutting tool assembly comprising:

(a) an arm having at the free end thereof a recess portion having a substantially pyramidal shape;

(b) a cutting tool having a plurality of cutting edges and containing inner and outer major surfaces which substantially are disposed in and at least partially substantially correspond to said recessed portion; and

(c) fastening means for securing said cutting tool to said recessed portion of said arm.

4,231,407

PROTECTIVE LINER FOR TIRES RESISTANT TO DISPLACEMENT DURING USE

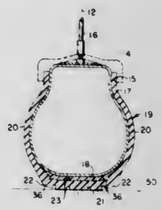
David L. James, Fresno, Calif., assignor to Mitchell D. James, Calif.

Filed Jun. 23, 1978, Ser. No. 918,475

Int. Cl.³ B60C *5/08*

U.S. Cl. 152—351 **3 Claims**

1. A protective liner for a tire having a tread portion with lateral boundaries extending circumferentially about the tire equal distances on opposite sides of a plane of reference passing through the tire substantially normal to its intended axis of rotation, a soft resilient inner surface and housing a pressurized tube, the liner comprising an elongated strip of puncture resistant material captured between the pressurized tube and the inner surface of the tire extending circumferentially about the tube; and a pair of spaced ribs integral with the liner each having side surfaces disposed in planes outwardly convergent to an apex and the ribs extending substantially lengthwise of the liner for embedded engagement with the interior surface of the tire substantially aligned with the tread portion of the tire, each rib having an outer surface substantially parallel to the plane of reference and an inner surface obliquely related to the



plane of reference whereby compression of the liner between the tube and the tire causes the inner surface of the ribs to urge the ribs from each other to tension the liner transversely therebetween to resist displacement in the tire.

4,231,408

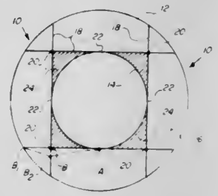
TIRE STRUCTURE

Henry Replin, 110 S. Dexter St., Denver, Colo. 80222

Filed Jun. 8, 1978, Ser. No. 913,975

Int. Cl.³ B60C *9/00*

U.S. Cl. 152—353 R **17 Claims**



5. A pneumatic tire structure comprising:

a tread;

a pair of opposing sidewalls extending from said tread and defining an inner annular opening;

an inner annular member carried by each sidewall;

from three to eight elongated wire or cord members arranged symmetrically around and tangential to each said inner annular member; and

reinforcing comprising a built-up area of additional rubber on said sidewall limited to and completely filling the area between each point of tangency, the inner annular member and the adjacent elongated wire or cord member.

9. A pneumatic tire structure comprising:

a tread;

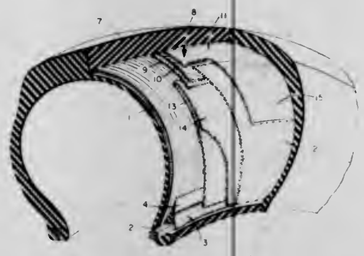
a pair of opposing sidewalls extending from said tread and defining an inner annular opening;

an inner annular member carried by each sidewall;

from three to eight elongated wire or cord members arranged symmetrically around and tangential to each said inner annular member; and

reinforcing comprising an integral sidewall rubber composition of higher durometer than the surrounding sidewall rubber, said reinforcing being limited to and completely filling the triangular area between each point of tangency, the inner annular member and the adjacent elongated connecting member.

4,231,409
RADIAL VEHICLE TIRE
Mario Mezzanotte, Milan, Italy, assignor to Societa Pneumatici Pirelli S.p.A., Milan, Italy
Filed Mar. 22, 1978, Ser. No. 888,999
Claims priority, application Italy, Apr. 7, 1977, 22150 A/77
Int. Cl.³ B60C *15/04, 15/06, 9/02*
U.S. Cl. 152—354 R **10 Claims**

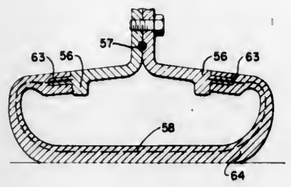


1. A pneumatic tire for vehicle wheels which comprises a carcass comprising at least one layer of cords laying in substantially radial planes, a tread, a breaker arranged between said carcass and said tread and comprising at least two layers of cords made of a material having a tensile strength of at least 260 kg/mm², said cords being parallel to one another in each layer and crossed with respect to those of the adjacent layer and forming an angle ranging between 10° and 35° with respect to the equatorial plane, and at least one strip of textile cords made of a material which shrinks in length when heated, said textile cords being parallel to the equatorial plane and being arranged in a radially outermost position with respect to said layers, said tire comprising, in each sidewall, a reinforcing element comprising at least one layer of reinforcing cords inclined with respect to the circumferential lines of the tire, said reinforcing element extending radially at least from the zone axially adjacent the bead core to a point where its radially outer portion is disposed between said layers and said breaker strip, that portion of said reinforcing element which is disposed between said layers and said strip having a width ranging between 5% and 30% of the breaker width, said reinforcing element being arranged in an axially outermost position with respect to the carcass, said tire being characterized in that it further comprises, in each sidewall at least two layers of cords parallel to each other in each layer and crossed with respect to those of the adjacent layer, said cords forming an angle ranging from 30° to 65° with respect to the circumferential lines, said two layers being arranged between said carcass and said reinforcing element and extending radially from the zone axially adjacent the bead core as far as to extend with their radially outer portion between said carcass and said breaker layers, and in that said reinforcing element has its cords inclined at an angle ranging from 25° to 90°.

4,231,410
PRE-SHAPED PLASTIC REINFORCING MEMBER AND A TIRE ENCAPSULATING SAID MEMBER
Frederick F. Vannan, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 400,083, Sep. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 250,702, May 5, 1972, Pat. No. 3,891,740. This application Jan. 28, 1976, Ser. No. 653,166
Int. Cl.³ B60C *5/12, 9/14*
U.S. Cl. 152—356 R **7 Claims**

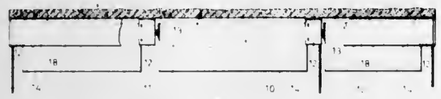
1. A wheel-tire assembly comprising two wheel members joinable around a seal to form a wheel, said wheel members having a rim portion, said rim portion having a preshaped plastic reinforcing member being encapsulated in an elastomer to form a tire.

3. A unitary preshaped plastic member molded in the shape of a tire and having a series of continuous strands extending



from bead area to bead area, each of said strands being branched to give a wishbone shape.

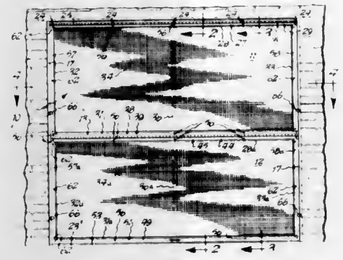
4,231,411
ROLLER-BLIND ASSEMBLY
Klaus Hehl, Remscheid-LUM/u/ ttringhausen, and Hans-Jürgen Sauer, Remscheid, both of Fed. Rep. of Germany, assignors to Riloga-Werk Joachim Schmidt, Remscheid, Fed. Rep. of Germany
Filed Jul. 21, 1976, Ser. No. 707,452
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1975, 2532622
Int. Cl.² E06B *9/08*
U.S. Cl. 160—120 **8 Claims**



1. A roller-blind assembly comprising:
two axis-defining shafts each having a pair of ends;
a blind rollable about each of said shafts between its said ends;
three identical hollow housings at and rotatably supporting said ends of said shafts, each of said housings having a pair of opposite axially spaced sides, one of said housings supporting with each of its said sides one end of each of said shafts and the other two housings each supporting with a respective one of their said sides the other end of each of said shafts, each of said housings being formed with a pair of horizontally oppositely open slots;
mechanism inside each of two of said housings each for rotating a respective one of said shafts independently of the other shaft about its axis and thereby winding and unwinding the respective blind; and
a cover plate extending axially along all of said housings and next to both of said blinds and having portions engaged in one of said pair of slots of each of said housings.

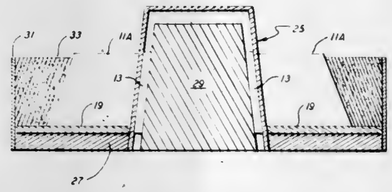
4,231,412
FOLDING GARAGE SCREEN DOOR
Eugene F. Nowak, 5826 Broadway, Lancaster, N.Y. 14086
Continuation of Ser. No. 624,790, Oct. 23, 1975, abandoned. This application Oct. 31, 1979, Ser. No. 90,024
Int. Cl.³ E05D *15/26*
U.S. Cl. 160—213 **23 Claims**

1. A screen door construction for placement in a garage door opening having a frame comprising upper screen panel means having an upper edge and a lower edge, lower screen panel means having an upper edge and a lower edge, hinge means connecting said lower edge of said upper panel means to said upper edge of said lower panel means, and adjuster means proximate said hinge means for permitting the position of said



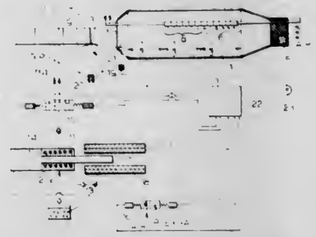
lower screen panel means to be adjusted relative to said upper screen panel means.

4,231,413
ASSEMBLY FOR AND METHOD OF MAKING MOLD AND CASTING OF ONE-PIECE IMPELLERS
Graham Bretzger, 1105 Skymont Rd., Staunton, Va. 24401
Filed Feb. 27, 1979, Ser. No. 15,589
Int. Cl.³ B22C *7/00, 9/22*
U.S. Cl. 164—15 **13 Claims**



1. A method of preparing an assembly useful in making a mold for casting one-piece impellers comprising:
(a) making a master model for one of the vanes of the impeller in a polished metal having, on the inner end thereof, a shoulder with a height and depth approximately equal twice the width of the vane at its inside edge, said vane being tapered from inside to outside;
(b) preparing from said master model a plurality of identical, flexible vanes from a material selected from the group consisting of flexible rubber and flexible plastic;
(c) forming a member having a truncated conical part containing therein a plurality of slots sized to match the inner edge of the vanes and a base plate having a plurality of slots therein equal in number to the slots in said truncated conical part with said slots in said truncated conical part and said base plate in alignment;
(d) inserting said flexible vanes from inside said truncated conical part through the slots therein with the bottom portion of said vanes in the slots in said base plate; and
(e) inserting inside said truncated conical part a core having a truncated conical shape concentric therewith, said core in abutment with said shoulders on said vanes holding said shoulders in contact with the inside of said truncated conical part.

4,231,414
HANDLING FOUNDRY MATERIALS
Charles M. G. Wallwork, Church Cottage, Birtles La., Over Alderley, Cheshire, England
Filed May 25, 1978, Ser. No. 909,470
Claims priority, application United Kingdom, May 27, 1977, 22396/77
Int. Cl.³ B22D *29/00*
U.S. Cl. 164—154 **5 Claims**



1. In a foundry moulding installation including a rotatable shake-out drum adapted to receive refractory moulds containing hot metal castings and to break them up, means for feeding moulds intermittently to the drum, and means for delivering cooling water to the interior of the drum, the improvement wherein said water delivery means comprises a reciprocating variable stroke pump, and means responsive to the operation of said intermittent feeding means for starting and stopping said pump in synchronism with the starting and stopping of said feeding means whereby said pump is capable of delivering cooling water to said drum only upon the feeding of moulds into said drum.

4,231,415
APPARATUS FOR THE PRODUCTION OF FOUNDRY SAND MOLDS
Max Wernli, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland
Division of Ser. No. 809,040, Jun. 22, 1977, Pat. No. 4,144,925. This application Dec. 21, 1978, Ser. No. 971,787
Claims priority, application Switzerland, Jun. 25, 1976, 8151/76; May 18, 1977, 6181/77
Int. Cl.³ B22C *15/22, 15/26, 17/08*
U.S. Cl. 164—160 **17 Claims**



1. Apparatus for producing foundry molds comprising vessel means for receiving therein a dosed amount of mold forming material, vacuum means for applying to said vessel means a suction effect to render mold forming material contained within said vessel means into a more cohesive mass, pressure means located adjacent said vessel means for applying a pressurized force to said mold forming material to propel said material out of said vessel means, valve means operatively interposed between said pressure means and said vessel means to control application of said pressurized force to said mold forming material, and pattern means including molding box means for receiving said mold forming material from said vessel means to form a mold therefrom, said valve means operating to block fluid flow between said pressure means and

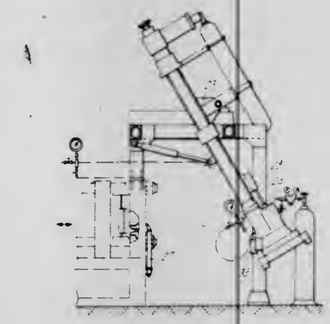
said vessel means while said vacuum means is applying suction to mold forming material contained within said vessel means, said valve means operating to open to permit fluid flow from said pressure means into said vessel means after said vacuum means have ceased applying suction within said vessel means and after said vessel means and said molding box means have been placed in operative relationship to enable transference of said mold forming material from said vessel means into said molding box means, with opening of said valve means operating to cause said pressure means to apply a pressurized force to said mold forming material to propel said mold forming material against said pattern means and to compress said mold forming material about said pattern means in order to form said foundry molds therefrom.

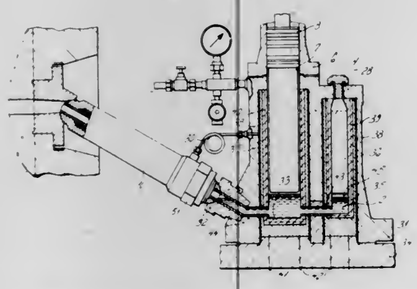
4,231,416

APPARATUS FOR CASTING METALS AND OTHER MATERIALS UNDER PRESSURE

Ivan D. Nikolov; Iliya G. Chorbov, and Ivan M. Peychev, all of Sofia, Bulgaria, assignors to NPO "Technologia Na Metalite", Sofia, Bulgaria

Filed Jan. 23, 1979, Ser. No. 5,780
Claims priority, application Bulgaria, Jan. 25, 1978, 38480
Int. Cl.³ B22D *17/04*
U.S. Cl. 164—318 **4 Claims**





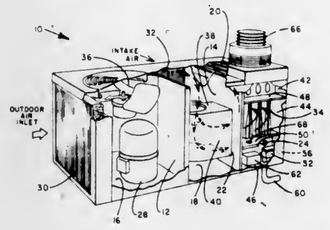
1. An apparatus for casting a molten material under pressure, comprising:
- a support structure receiving a casting mold;
- a movable frame pivotally connected to said support structure for tilting movement toward and away from said mold;
- a melt-displacing assembly mounted on said frame, said assembling comprising hot chamber means including:
  - a large chamber, formed in said hot chamber means, having generally upright side walls in a position of said assembly proximal to said mold;
  - a relatively small chamber, formed in said hot chamber means adjacent said large chamber, having upright side walls in a position of said assembly proximal to said mold; said small chamber being in fluid communication with said large chamber by means of a melt communication passage formed in said hot chamber means at a lower end of each chamber;
  - said small chamber having an opening at an upper end thereof;
  - a displaceable cover for sealing said opening of said small chamber of said hot chamber means;
  - pressurizable means associated with said frame for displacing said cover to seal the small chamber opening of said hot chamber means;
- means forming a cylinder communicating with said large chamber of said hot chamber means;
- gas supply means, associated with the large chamber of said hot chamber means, for supplying gas to said large chamber;
- a piston being reciprocatable in said cylinder to compress said gas and drive molten metal from said large chamber;
- a pressing unit mounted on said frame and associated with said piston for displacing said piston in said cylinder; and
- a metal-conducting conduit associated with said hot chamber means for connecting said large chamber with said mold in the position of said assembly proximal to said mold.

4,231,417

METHOD AND APPARATUS FOR REDUCING CORROSION IN A HEAT EXCHANGER

Chester D. Ripka, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,449
Int. Cl.³ F28F *19/00*
U.S. Cl. 165—3 **5 Claims**



1. In combination heating and air conditioning equipment wherein air is passed over a cooling coil during a cooling cycle, creating conditioned air, and during a heating cycle, air is passed over a heat exchanger of the type having walls forming an interior chamber which contain hot gasses during the heating cycle and ambient air during the cooling cycle, the method of reducing corrosion within the heat exchanger during the cooling cycle comprising: Separating a portion of the conditioned air, and forcing the separated portion of the conditioned air into the interior chamber of the heat exchanger to displace high moisture content ambient air, thereby reducing or eliminating condensation formation on the walls of the heat exchanger.

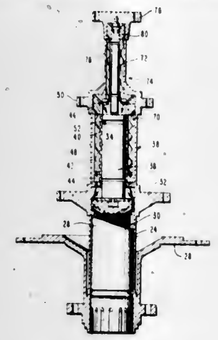
4,231,418

CRYOGENIC REGENERATOR

George P. Lagodmos, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 7, 1979, Ser. No. 36,894
Int. Cl.³ F23L *15/02*; F28D *17/00*; F25B *9/00*
U.S. Cl. 165—4 **15 Claims**

1. A thermal regenerator comprising:
- a wall enclosing a regenerator space with an inlet at one end of said wall and an outlet at the other end of said wall to define a flow direction, grooves in said wall, said grooves having a width, said grooves being oriented at an angle with respect to the flow direction;
- regenerator packing positioned within said regenerator and



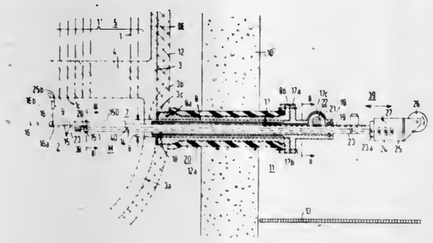
constrained by said walls, said regenerator packing being formed of discrete members which can exchange heat with gas passing through said regenerator packing, said discrete members having a major dimension at least as small as the width of said grooves.

4,231,419

MANIPULATOR FOR INSPECTION AND POSSIBLE REPAIR OF THE TUBES OF HEAT EXCHANGERS, ESPECIALLY OF STEAM GENERATORS FOR NUCLEAR REACTORS

Georg Gugel, Kalchreuth, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,800
Int. Cl.² F28F *11/00*
U.S. Cl. 165—11 A **12 Claims**



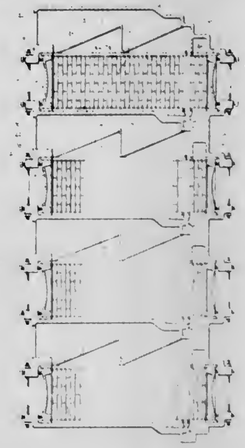
1. Manipulator for inspecting and, if required, repairing the tubes of heat exchangers of steam generators, especially for nuclear reactors, comprising a steam generator having at least one tube bundle set in a tube sheet with the tube endings in the tube sheet having individual tube openings leading into a steam generator chamber, an opening in the steam generator chamber, a lead-in nozzle extending into said steam generator chamber opening, means for bringing-in an inspection arm through the lead-in nozzle into the steam generator chamber, means for withdrawing the inspection arm through the lead-in nozzle, a blind flange for closing off the lead-in nozzle when the inspection arm is withdrawn, a mouthpiece arranged at the free end of the inspection arm, remote control means for aligning the inspection arm with the mouthpiece onto any individual tube opening for engagement with the tube opening whereby inspection instruments and tools such as eddy current probes, cleaning plugs, explosive plugs and the like can be introduced into the tubes through the mouthpiece and removed after the inspection is completed, said inspection arm comprising an elongated guide tube, movably lengthwise, in the lead-in nozzle, a swivel arm at the end of the elongated guide tube supported rotatably in a plane parallel to said tube sheet, an extendable and retractable mouthpiece carrier connected at the end of the swivel arm, and a mouthpiece which can be aligned onto the tube openings disposed on the mouthpiece carrier, with the outer contour of said swivel arm and said mouthpiece carrier in a stretched out transport position for bringing into or withdrawal from the steam generator chamber, not greater than the inner contour of said lead-in nozzle to permit transport therethrough.

4,231,420

HEAT EXCHANGER WITH CONTROLS THEREFOR

J. Hilbert Anderson, York, Pa., assignor to Sea Solar Power, York, Pa.

Filed Nov. 20, 1978, Ser. No. 962,104
Int. Cl.³ B60H *1/00*; F28F *7/00, 3/00*; F25B *41/04*
U.S. Cl. 165—40 **20 Claims**



10. A boiler module or unit comprising a plurality of heat exchangers stacked on top of each other as a unitary vertical assembly, each heat exchanger having a plurality of plates arranged in pairs in vertical planes and in spaced parallel relation to one another between a plurality of pressure plates, each pair of plates defining a passageway therebetween and each pair of plates defining a passage between adjacent pairs of plates, a cover member for the top of the uppermost heat exchanger of said stack, a cover member for the bottom of the lowermost heat exchanger of said stack, a cover member for the bottom of each remaining heat exchanger of said stack with said bottom cover constituting top covers for each subjacent heat exchanger of said stack, said top cover and said bottom cover and each intermediate bottom cover terminating in offset projections, fastening means securing said projections to one another in vertical compression and fastening means carried by said projections and engaging said pressure plates for forcing said plates towards one another in horizontal compression contemporaneous with retaining each heat exchanger in an assembled condition.

4,231,421

WOUND FIN HEAT EXCHANGER SUPPORT

Burrows P. Eaton, Camillus, and William Wright, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,622
Int. Cl.³ F28F 9/00
U.S. Cl. 165—68 **3 Claims**



1. A combination support and retainer for heat exchanger assembly utilizing wound fin tubing and having a base and top cover as components thereof which comprises:

a spacer member having a structural portion for securing components of the heat exchanger assembly and a series of spaced projections extending from the structural portion, the projections defining generally U-shaped openings for the receipt of wound fin tubes, at least one of said projections having tab means affixed to the end thereof;

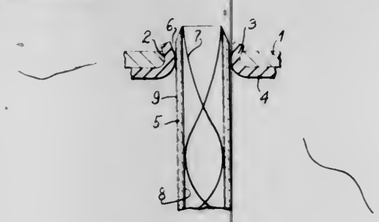
a retainer element for enclosing the U-shaped openings defined by the spaced projections such that a portion of the wound fin tubing may be secured within each opening to maintain a desired spacing therebetween, the retainer element having at least one slot which coacts with the tab means such that the tab means may be twisted relative to the retaining element to securely affix the retainer element to the spacer member to maintain the tubing within the openings.

4,231,422

METHOD FOR PROTECTING HEAT EXCHANGER TUBES MADE OF ALUMINUM AGAINST EROSION AND/OR CORROSION

Jean-Pierre Moranne, Franconville, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Continuation of Ser. No. 899,155, Apr. 24, 1978, abandoned. This application Sep. 20, 1979, Ser. No. 76,986
Claims priority, application France, May 6, 1977, 77 13968
Int. Cl.³ F28F 19/06, 9/06
U.S. Cl. 165—69 **4 Claims**



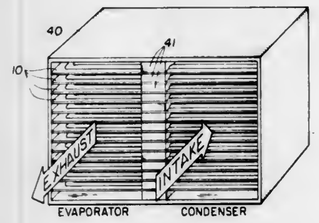
1. Heat exchanger comprising tubes made of an aluminum containing alloy, a perforated tube plate forming tube passages in which are mounted the tubes, elastomeric tightness sockets inserted between said tubes and said tube passages, said tubes having an inner surface and an outer surface with at least one of the inner surface and outer surface being coated with a layer of aluminum-silicon alloy containing from 5 to 12% silicon.

4,231,423

HEAT PIPE PANEL AND METHOD OF FABRICATION

Robert A. Haslett, Dix Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,002
Int. Cl.³ F28D 15/00
U.S. Cl. 165—105 **4 Claims**



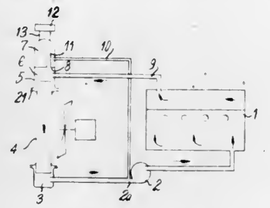
1. A heat exchanger assembly comprising a housing having a plurality of interior panel support members within a substantially open internal construction and, a plurality of flat sheet heat transfer units mounted on said support members, each of said units including a pair of flat sheets wherein at least one of said sheets includes a plurality of spaced parallel furrows, an integral manifolding channel in fluid communication with said furrows and a common fluid charging port connecting to said manifolding channel, said furrows being sealed off from said manifolding channel after charging to form a plurality of independently operative heat pipes.

4,231,424

HEADER CONSTITUTING A PRESSURIZING TANK

Jean-Pierre Moranne, Franconville, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Jun. 23, 1978, Ser. No. 917,859
Claims priority, application France, Jun. 22, 1977, 77 19102
Int. Cl.³ F28B 9/10; F28F 13/06
U.S. Cl. 165—107 D **15 Claims**



1. A header forming a pressurized tank comprising:

a peripheral shoulder;

inside partition means dividing the header into a first compartment and a second compartment, said second compartment being on upper part of the header and said inside partition means including edge cooperating with corresponding said peripherial shoulder of the header, said edge forming a stop preventing any pivoting of said partition inside the header; circuit means for bringing to the header a liquid to be cooled;

a pump for circulating the liquid;

a tubing connecting said first compartment to said circuit means; and

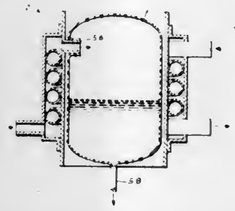
a pressurizing tubing connecting said second compartment to inlet of the pump.

4,231,425

EXTRACORPOREAL CIRCUIT BLOOD HEAT EXCHANGER

William R. Engstrom, 17 Willow St., Belmont, Mass. 02178

Filed Feb. 27, 1978, Ser. No. 881,392
Int. Cl.³ F28D 7/02; F28F 9/22
U.S. Cl. 165—156 **6 Claims**



1. A heat exchanger for use in an extracorporeal blood circuit, or the like, comprising

(a) a housing of a clear, transparent material,

(b) said housing including walls forming a portion of a helical passage for the flow of blood therethrough,

(c) a tubular conduit mounted to and passing through said housing for the flow of a heat exchange medium therethrough,

(d) the exterior of said conduit forming another portion of said helical passage whereby blood flowing through said helical passage will be in direct contact with said conduit,

(e) said housing including a cylindrical inner wall and a cylindrical outer wall spaced from the inner wall to define an annular chamber therebetween,

(f) said conduit being in the form of a helix and mounted in said chamber, each convolution of said conduit being in contact with the inner and outer walls and spaced from adjacent convolutions to define said helical passage, and,

(g) blood receiving means disposed within said inner wall and connected to the discharge end of said helical blood passage,

(h) said inner wall being tubular and said outer wall being comprised of a pair of cooperating semi-cylindrical shell sections having end flanges and joined to one another and to said inner wall.

4,231,426

METHOD OF USING TRACER FLUIDS FOR ENHANCED OIL RECOVERY

Walter H. Carter, Houston, and Jerry L. Sides, Stafford, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 9, 1979, Ser. No. 37,588
Int. Cl.² E21B 43/22, 47/00
U.S. Cl. 166—252 **16 Claims**

1. In a method for determining flow conditions between spaced-apart wells penetrating and in fluid communication with the subterranean formation comprising injecting a predetermined quantity of an aqueous liquid having dissolved therein a known concentration of a tracer material subject to bacterial attack, wherein the improvement for reducing the rate of bacterial attack of the tracer comprises:

incorporating a bactericidially effective amount of an aromatic treating compound into the aqueous liquid containing the tracer.

4,231,427

SURFACTANT WATERFLOODING OIL RECOVERY METHOD

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,919
Int. Cl.² E21B 43/22
U.S. Cl. 166—275 **14 Claims**

1. A method for recovering petroleum from a subterranean, permeable, petroleum-containing formation penetrated by at least one injection well and by at least one production well, by a surfactant waterflooding method comprising injecting an aqueous surfactant-containing fluid into the formation via the injection well, said surfactant comprising an alkylpolyalkoxyalkylene sulfonate or an alkylarylpolyalkoxyalkylene sulfonate, said fluid displacing petroleum through the formation to the producing well where it is recovered to the surface of the earth, where the improvement for increasing the viscosity and phase stability of the aqueous surfactant fluid, and decreasing the amount of surfactant retained by the formation, comprises:

incorporating in the surfactant fluid, an effective amount of a mixture of a C_1 to C_8 alkanol and a phenol having the following formula:



wherein R' is hydrogen or a linear or branched alkyl having from 1 to 8 carbon atoms.

4,231,428

WELL TREATMENT METHOD

Riley B. Needham; Charles P. Thomas, and Donald R. Wier, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1978, Ser. No. 966,458
Int. Cl.² E21B 43/26
U.S. Cl. 166—280 **8 Claims**

1. In a method of fracturing an underground zone or formation in oil and gas wells, the steps of

(a) injecting into a well a fracturing fluid to form a fracture in said formation,

(b) injecting into said formation a carrier fluid having suspended therein a proppant composed of particles coated with an organo-silicon compound prepared by dissolving the organo-silicon compound in a solvent therefor, admixing the resultant solution with particulate material, and thereafter evaporating the solvent to form a silicon-coated particulate material, and

(c) closing the well and maintaining the injection pressure on the formation until the fracture approaches the normal formation pressure.

4,231,429

LATERAL TENSIONING SYSTEM FOR RISER PIPE

Miroslav M. Kolpak, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

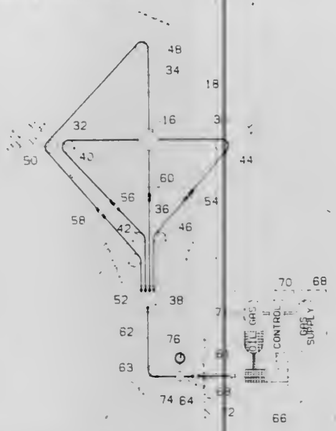
Filed Dec. 26, 1978, Ser. No. 973,257
Int. Cl.³ E21B 7/12
U.S. Cl. 166—362 **5 Claims**

5. A method for limiting the lateral stress on a member extending vertically in an opening of a floating vessel supported on a body of water which comprises:

attaching one end of each of a plurality of cables at equally spaced points on the periphery of said member;

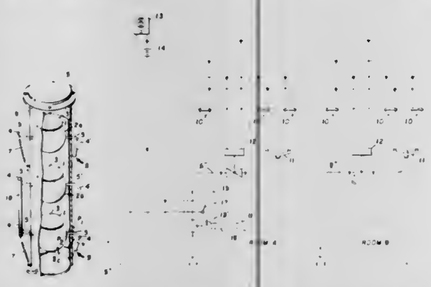
connecting the other end of each cable to a common collector;

attaching the collector to connecting means attached to said floating vessel; and



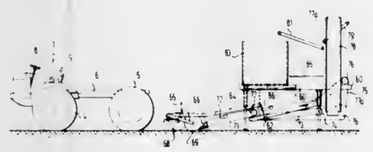
limiting the tension on said connecting means to a selected maximum.

4,231,430
AUTOMATIC SODA-ACID FIRE EXTINGUISHER SYSTEM
Dong J. Byun, 719-7, Chunghung-dong, Dong-Ku, Kwangju, Chunla Namdo, Rep. of Korea
Filed Oct. 23, 1978, Ser. No. 953,746
Int. Cl.³ A62C 35/04
U.S. Cl. 169—57 **1 Claim**



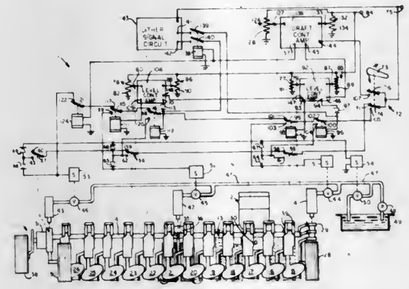
1. An automatic fire extinguishing system, comprising:
a cylindrical reaction chamber having several bottle assemblies located therein, said bottle assemblies comprising an external bottle and an internal bottle and each of the bottles containing chemicals and being supported inside the reaction chamber by at least one axle having lever arms extending from the opposite ends of the at least one axle, wherein the free end of one lever arm is connected to the outside of the chamber by a vinyl string having a selectively energizable electrical filament assembly, with the free end of the other lever arm being connected to the outside of the chamber by a coil spring, and means for energizing said electrical filament such that, when said filament is energized, the vinyl string is cut and the bottles are turned downwardly and the chemicals in the bottles are poured out on the bottom of the reaction chamber and the extinguishing gas and water produced by the reaction of the chemicals are conducted by supply means to a spray nozzle located proximate the fire.

4,231,431
DETACHABLE HARVESTING UNIT
Ernst Weichel, P. O. Box 1180, 7326 Heiningen, Fed. Rep. of Germany
Division of Ser. No. 612,741, Sep. 12, 1975, Pat. No. 4,078,626. This application Jan. 11, 1978, Ser. No. 868,543
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1974, 2443915
Int. Cl.³ A01D 13/00, 17/00
U.S. Cl. 171—46 **6 Claims**



1. An agricultural machine comprising a main frame, power means, a front axle, a rear axle, said front and rear axles located below said main frame, at least one working device, at least four attachment positions on said main frame for the reception therein of said at least one working device, means for detachably mounting said at least one working device in at least one of said four attachment positions, said at least four attachment positions comprising a first position located in front of said front axle, a second attachment position located behind said rear axle, a third attachment position located between said rear axle and said front axle and below said main frame, and a fourth attachment position located behind said front axle and above said main frame, two front wheels spaced laterally apart on said front axle and two rear wheels spaced laterally apart on said rear axle, at least one front take-off shaft connected to and driven by said power means, at least one rear take-off shaft connected to and driven by said power means, and at least one lateral take-off shaft located between said front take-off shaft and said rear take-off shaft, said at least one working device having a width at least equal to the lateral spacing between said front wheels and between said rear wheels, and means including power elevators for operating said at least one working device, said means for detachably mounting comprising an apparatus frame mounted on said main frame with the rear end of said apparatus frame located rearwardly from said main frame and the front end thereof located in said fourth attachment position rearwardly of and adjacent to said front axle, said machine comprises four said working devices said four working devices being supported from said apparatus frame as a unit so that said four working devices can be detached from said main frame, said four working devices comprises a harvesting means mounted in said first attachment position, a vertical conveyor bucket chain mounted at the rear end of said main frame in said second attachment position, a container member comprising at least one bunker mounted in said fourth attachment position, an oscillating frame dependently and vertically adjustably supported in said third attachment position from said apparatus frame and extending therefrom into said first attachment position where said oscillating frame is attached to said harvesting means and means mounted in said third attachment position and supported from said oscillating frame for connecting said harvesting means and said conveyor bucket chain whereby the harvesting, cleaning, separating, screening, conveying and collecting of a crop, such as potatoes, can be achieved.

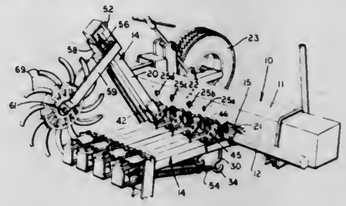
4,231,432
POSITION AND DRAFT CONTROL SYSTEM FOR PLOWS
Marvin D. Jennings, Hendersonville, N.C., assignor to International Harvester Company, Chicago, Ill.
Filed Sep. 22, 1978, Ser. No. 945,146
Int. Cl.³ A01B 63/112
U.S. Cl. 172—7 **15 Claims**



1. In a control system for a plow including frame means arranged to extend angularly from a forward end to a rearward end, a plurality of plow bottoms carried by said frame means, first wheel means for supporting a first portion of said frame means and second wheel means for supporting a second portion of said frame means spaced rearwardly from said first portion, power source means, and first and second electrically controllable level control means supplied with power from said power source means for effecting changes in the elevation of said first and second portions of said frame means with respect to said first and second wheel means, first and second level control circuits electrically coupled to said first and second level control means, each of said circuits having first and second inputs and being operative to apply signals to the corresponding level control means to raise and lower the corresponding portion of said frame means in accordance with the difference between signals applied to said first and second inputs, first and second adjustable means coupled to said first inputs to apply signals of adjustable magnitude thereto, first and second position sensing means mechanically coupled to said control means and electrically coupled to said second inputs to apply signals to said second inputs corresponding to the levels of said first and second portions of said frame means, and control circuit means for preventing operation of one of said level control means at any time when the other of said level means is operative in performing either a raising or a lowering operation to thereby prevent simultaneous operation on both of said level control means and to thereby minimize the load on said power source means.

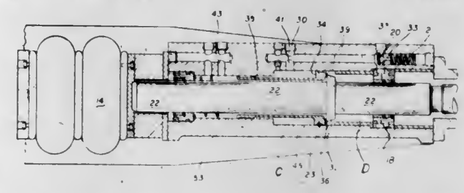
4,231,433
CULTIVATOR WITH TOOL SUPPORT ARM AND LATCH FOR HOLDING SAME IN RAISED NON-WORKING POSITION
Carroll J. Whitfield, and Anthony W. Lastinger, both of Tifton, Ga., assignors to Kelley Manufacturing Co., Tifton, Ga.
Filed Sep. 11, 1978, Ser. No. 941,067
Int. Cl.³ A01B 65/06
U.S. Cl. 172—662 **1 Claim**

1. In a cultivator including an elongated tool bar extending generally transverse to the normal direction of travel of the cultivator, at least one cultivating element mounted from a longitudinally extending tool support arm, the combination therewith of:
(a) connector means for connecting said tool support arm to said tool bar comprising a pair of jaw members disposed to clamp about the tool bar,
(b) adjustable closing means associated with said pair of jaw members for selectively providing engagement of said pair of jaw members with said tool bar,
(c) pivot means joining said tool support arm to said pair of jaw members for movement about a transverse axis,
(d) latching means comprising a locking post extending from said pair of jaw members,



(e) said locking post comprising the upper end of a shaft extending through said pair of jaw members,
(f) means for securing said pivot means to said shaft, and
(g) a spring mounted on said tool support arm constructed and arranged to engage said locking post when said tool support arm is raised thereby to hold the tool support arm in raised, non-working position.

4,231,434
HYDRAULIC IMPACT DEVICE
Edgar J. Justus, 1826 Sherwood Dr., Beloit, Wis. 53511
Filed Feb. 21, 1978, Ser. No. 879,216
Int. Cl.³ B25D 9/02; F01B 7/18
U.S. Cl. 173—119 **6 Claims**



1. A hydraulic impact device comprising a housing having a cylindrical bore comprising an upper and a lower portion, said upper portion having a diameter smaller than the diameter of the lower portion,
upper and lower bearing means mounted in the upper and lower end portions of said cylindrical bore respectively,
a ram member reciprocally disposed in said housing having upper and lower portions sealingly received in said upper and lower bearing means respectively, said ram member including a piston portion having a diameter smaller than the diameter of the lower portion of said cylindrical bore to permit fluid to bypass the piston within the cylindrical bore,a sleeve valve reciprocally disposed in the cylinder bore, said sleeve valve having a small diameter upper radial outer sealing portion for sealingly engaging the diameter of said upper portion of said cylindrical bore and having a large diameter lower radial outer sealing portion for sealingly engaging the diameter of said lower portion of said cylindrical bore, said sleeve valve further including a lower annular sealing portion for sealingly engaging the upper annular portion of said piston portion thereby dividing said cylindrical bore into upper, intermediate and lower annular chambers,
a hydraulic fluid inlet port for supplying high pressure fluid to said intermediate chamber to force said lower annular sealing portion into sealing engagement with the upper annular portion of said piston portion,
a pressure relief valve positioned between said high pressure fluid inlet port and a lower hydraulic fluid inlet port for delivering to the lower annular chamber a presure lower

than the pressure in said intermediate annular chamber so as to effect a force bias of said sleeve valve toward said piston portion and to divert oil flow to the intermediate annular chamber when the pressure in said intermediate annular chamber is reduced thereby returning said sleeve valve to sealing engagement with said piston portion,

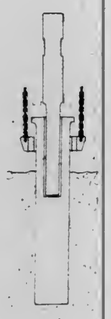
energy storage means attached to the upper portion of said housing for receiving energy from said ram member during its upward stroke, a hydraulic fluid outlet port for exhausting fluid from the upper and intermediate annular chambers, said upper and lower radial sealing portions of said sleeve valve being axially spaced such that when said lower sealing portion seals the fluid inlet port the upper sealing portion opens the fluid outlet port thereby reducing the pressure in said intermediate chamber by interrupting fluid communication between said inlet port and said intermediate annular chamber and establishing fluid communication between said outlet port and said intermediate annular chamber thereby unseating the sleeve valve and permitting said ram member to be driven downwardly by said energy storage means.

4,231,435

TOOL FOR USE PRIMARILY IN CONJUNCTION WITH A ROCKBREAKER UNIT

Lars I. Andreasson, Söderdalsgatan 48, 502 54 Boras, Sweden

Filed May 19, 1978, Ser. No. 907,462
Claims priority, application Sweden, May 27, 1977, 7706280
Int. Cl.[2] B23B *31/00, 5/22*
U.S. Cl. 173—128 **4 Claims**



1. A tool for use in connection with a rockbreaker unit comprising

(a) a first substantially elongate member,

(b) a second substantially elongate member, said second substantially elongate member having a central recess at one end and an external abutment at the same end, and

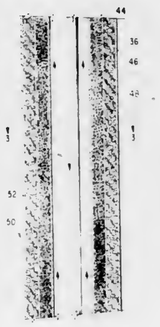
(c) a third member, said third member being a body having an aperture mating with the external circumference of said second substantially elongate member, said first substantially elongate member being carried by said rockbreaker unit in such manner as to project partially out of said unit for extending into said recess in said second substantially elongate member with its projecting portion, and said third member being suspended by chains secured to said rockbreaker unit and surrounding said second substantially elongate member, said third member being slidable along the exterior of said second substantially elongate member for engaging said external abutment thereof in consequence of said chains being drawn taut by relative displacement of said rockbreaker unit with regard to said second substantially elongate member.

4,231,436

MARINE RISER INSERT SLEEVES

Michael R. Waller, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 723,397, Sep. 15, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,669
Int. Cl.[2] E21B *15/02*
U.S. Cl. 175—7 **6 Claims**



1. A method of operation in a body of water using an offshore floating drilling structure and a subsea well in which drilling mud is used and which comprises:

connecting a riser pipe between said floating drilling structure and said well;

maintaining tension on said riser pipe;

drilling a hole by operations conducted through said riser pipes;

running a first string of casing through said riser pipe and setting it in said hole;

running a sleeve insert having an exterior diameter along substantially its entire length which is only slightly less than the internal diameter of said riser pipe and a density only slightly greater than that of said water in said riser with its lower end above said subsea well to effectively reduce the volume of space in said riser pipe and to effectively reduce the tension to be maintained on said riser pipe; and

continue drilling operations through said sleeve insert and said first string of casing.

4,231,437

COMBINED STABILIZER AND REAMER FOR DRILLING WELL BORES

Gerald S. Swersky, and Keith J. Mason, both of Edmonton, Canada, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Feb. 16, 1979, Ser. No. 12,667
Int. Cl.[3] E21B *9/24, 17/10;* **E21C** *9/00*
U.S. Cl. 175—325 **12 Claims**

1. Stabilizer and reamer apparatus for drilling a well bore, comprising a one-piece body having a fluid passage therethrough, upper coupling means and lower coupling means at the upper end portion and lower end portion, respectively, of said body for securing said body in a tubular drill string, said body including an upper stabilizer section and a lower reamer section adjoining said stabilizer section, elongate circumferentially spaced stabilizer pads secured to said stabilizer section against movement with respect thereto to center said body in the well bore, the lower ends of said pads adjoining the upper end of said reamer section, and circumferentially spaced



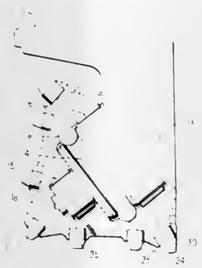
reamer cutter means carried by said lower reamer section for reaming the well bore.

4,231,438

STRAIGHT HOLE INSERT DRILL BIT

Lloyd L. Garner, San Clemente, and Charles R. Harris, Whittier, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 824,519, Aug. 15, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 949,783
Int. Cl.[2] E21B *9/10*
U.S. Cl. 175—353 **2 Claims**



1. A rotary drill bit comprising:

a main body having a plurality of legs extending downwardly therefrom, each leg having an inwardly extending journal formed thereon, and

a cone shaped cutter rotatively supported on each journal, the peripheral surface of each cutter having a plurality of annular rows of outwardly projecting cutting inserts mounted thereon with the outermost row of cutting inserts from the cone vertex forming the gage cutting row, at least one cone is configured to have the gage cutting row of inserts having a diameter larger by substantially 10% than that of the adjacent intermediate annular row of inserts, thereby enabling the extended gage row to produce a sharp corner between the borehole wall and bottom, each said cone including a heel portion adjacent said gage row, said heel portion having an outer surface parallel to the outer surface of said leg, each of said gage inserts including a cutting face parallel to the outer surface of said heel portion, each of said cones having its peripheral surface roll on the bottom of the borehole and being configured to have the gage cutting row of inserts extending downwardly further than the other annular rows of inserts thereby cutting an annular area on the borehole bottom lower than the area cut by the inner annular rows of inserts.

4,231,439

AUTOMATIC CHECK WEIGHER

James F. Hall, Jr., Ardsley, Pa.; Ralph J. Lake, Jr., Maple Shade, and William G. Scholder, Budd Lake, both of N.J., assignors to Franklin Electric Subsidiaries, Inc., Levittown, Pa.

Filed Apr. 23, 1979, Ser. No. 32,213
Int. Cl.[3] G01G *19/04, 19/52, 23/10*
U.S. Cl. 177—25 **15 Claims**



1. An automatic weighing machine capable of weighing an object as it passes through said machine, "on-the-fly," and checking that weight against a predetermined weight value entered thereon, comprises:

a transducing means for providing an electric circuit characteristic as a function of bearing weight;

means associated with said transducing means for feeding said object onto said transducing means;

discharge means associated with said transducing means for carrying said object away from said transducing means;

means connected with said transducing means for transferring said object across said transducing means; and

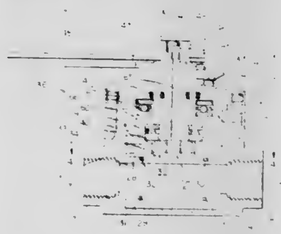
electric circuit means connected to said transducing means for providing electric power thereto, for continuously monitoring said transducing means electrical circuit characteristic whereby from said monitored characteristic said electric circuit means determines when said object is fully bearing on said transducing means, while being transferred across thereof, and determines the average weight of said object as a function of said continuous monitored characteristic.

4,231,440

ROTARY, SEGMENTED, EXPANSIBLE VALVES

Robert L. Erwin, Farmington, N. Mex., assignor to J. D. Kinsey, Farmington, N. Mex., a part interest

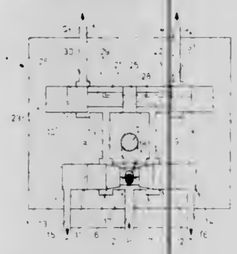
Filed May 21, 1979, Ser. No. 41,069
Int. Cl.[3] F16K *3/36*
U.S. Cl. 137—246.22 **13 Claims**



1. A valve including a body having a fluid passage and a body opening intersecting said passage, said body opening being defined by an encompassing body wall, a valve member rotatably mounted in said body opening and divided into four expansible segments, two of said segments being opposed and forming one opposed pair, the other two of said segments being opposed and forming another opposed pair, said valve

member having an opening to register with said fluid passage, said valve member opening extending through one opposed pair of said segments, the other opposed pair of said segments being solid and forming fluid stops when registered with said fluid passage, a tube lining said valve member opening, said one pair of opposed segments being slidably mounted on said tube, fluid sealing means for sealing each segment of said one opposed pair of segments with respect to said tube, means for rotating said valve member to register said valve member opening with said fluid passage in the open condition of said valve and to register said other pair of solid valve member segments with said fluid passage in the closed condition of said valve, valve seats surrounding said fluid passage on opposite sides of said valve body opening means for selectively expanding said opposed pairs of expansible valve member segments outwardly within said body opening into sealing contact with said valve seats.

4,231,441
FLOW DIVIDER VALVE ASSEMBLY
Dieter Burckhardt, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG., Friedrichshafen, Fed. Rep. of Germany
Filed Nov. 21, 1978, Ser. No. 962,631
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751082
Int. Cl.³ B62D *11/00*
U.S. Cl. 180—6.48 **5 Claims**



1. A flow divider valve assembly having an inlet (**2**), distributor outlets (**3** and **4**), a valve housing (**1**) connected to the inlet and outlets, an operating piston device (**10**) within the valve housing including pressure chambers (**21** and **22**) respectively connected by restricted passages (**30** and **31**) to the distributor outlets, compensating chamber means (**23** and **24**) connected to said pressure chambers for shifting the operating piston device to maintain a constant ratio between the flow rates of the divided flow streams delivered to said distributor outlets, the improvement residing in a control valve (**5**) floatingly mounted in the valve housing having a central portion connected to the inlet, valve adjusting means (**17-20**) connected to the central portion of the control valve for displacement thereof to an adjusted position, supply conduits (**8** and **9**) connecting the two pressure chambers of the operating piston device to said control valve, and throttling passage means (**6** and **7**) located upstream of said supply conduits for conducting the divided flow of fluid from the inlet to the supply conduits.

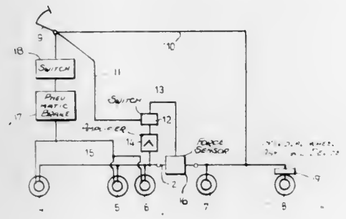
4,231,442
APPARATUS FOR BRAKING A TRAIN OF VEHICLES
Mogens Birkeholm, Kagsaavej 59, 2730 Herlev, Denmark
Continuation-in-part of Ser. No. 786,565, Apr. 11, 1977, Pat. No. 4,113,041, which is a continuation of Ser. No. 584,029, Jun. 5, 1975, abandoned. This application Aug. 18, 1978, Ser. No. 934,983
Int. Cl.³ B60T *7/20*
U.S. Cl. 180—14 R **7 Claims**

1. Apparatus for braking a train of vehicles including a tractor vehicle and at least one trailer vehicle, the apparatus comprising:

braking means for at least the rear wheels of the rearmost trailer vehicle in the train of vehicles;

control means located in the tractor vehicle and operable by an operator in said tractor vehicle for actuating only said braking means for the rearmost trailer vehicle;

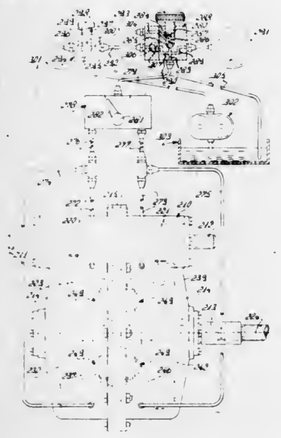
separate braking means for each vehicle in the train other than the rearmost trailer vehicle;



means for actuating the braking means for each other vehicle in response only to a positive tension force between said other vehicle and the next following trailer vehicle in the train; and

separate switch means for said each other vehicle, each of said switch means being actuated by the control means for enabling operation of the corresponding means for actuating the braking means for said each other vehicle only when said control means is operated to actuate the braking means of the rearmost trailer vehicle.

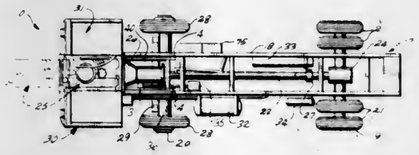
4,231,443
OVERLOAD COUPLINGS
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland
Filed Feb. 7, 1978, Ser. No. 875,946
Claims priority, application Netherlands, Feb. 11, 1977, 7701445
Int. Cl.³ B60K *17/28*
U.S. Cl. 180—53 D **22 Claims**



1. A tractor comprising driving means including a power takeoff shaft that has a coupling connectable to a driven shaft member, said coupling having two relatively moveable parts that are normally connected by locking means, said locking means comprising at least one displaceable latch in a closed hydraulic system and said latch being displaced upon overload to allow relative movement between said parts, said system

including a closed space for hydraulic fluid and said latch having a part that normally divides said space into two portions, duct means in said latch part that communicates hydraulic fluid from one portion to the other upon overload, the volume of the space remaining substantially unchanged and the latch being displaced against the pressure in said system upon overload.

4,231,444
MECHANICAL INTERFACES FOR CONTROL LINKAGES IN A REMOVABLE VEHICLE ENGINE MODULE
George O. Telesio, 7709 S. Milna Ave., Whittier, Calif. 90601
Filed Aug. 28, 1978, Ser. No. 937,108
Int. Cl.³ B60K *5/10*
U.S. Cl. 180—294 **7 Claims**



1. A vehicle comprising

(a) a chassis including a frame, drivable ground engaging traction means mounted to the frame, and drive means coupled to the traction means and connectible to an engine for driving the traction means in response to operation of the engine,

(b) an engine, a transmission, and a support for the engine and the transmission, the engine including an accelerator control linkage and the transmission including a shift linkage,

(c) means mounting the engine support to the frame for substantially linear movement of the support into and out of an operative position in which the engine is connected to the drive means,

(d) an operator's station mounted to the frame and including an accelerator linkage actuator and a transmission linkage actuator, the actuators being operable by a vehicle operator to direct and control via the linkages the operation of the engine and the transmission, and

(e) mechanical couplings in the linkages in association with the operative position of the support for automatically dissociating upon movement of the support out of its operative position and for automatically operatively associating upon movement of the support into its operative position, the coupling in the transmission shift linkage including means for positively following and transmitting in a push-pull manner to the transmission motion of the transmission linkage actuator.

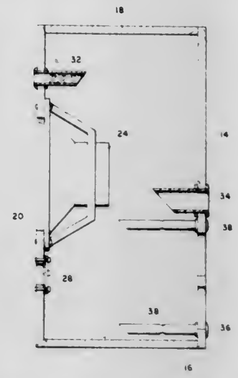
4,231,445
ACOUSTIC LENS SPEAKER CABINET
Rubein V. Johnson, 2432 Court St., Muskogee, Okla. 74401
Filed Dec. 4, 1978, Ser. No. 966,503
Int. Cl.³ G10K *13/00*; H05K *5/00*
U.S. Cl. 181—148 **6 Claims**

1. A cabinet for improving the sound output of an amplifier, comprising:

an upright housing having a front portion and a rear portion, the front portion having one or more baffle openings;

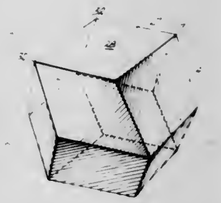
a speaker contained within the housing and mounted on the front for outward projection of sound, the speaker having a vibrational area equal to k, the speaker having means for connecting to the output of an amplifier; and

at least one wave guide sound lens, the sound lens in the form of a tubular member of selected length positioned co-axially in said baffle openings, the axis of the tubular member being horizontal and perpendicular to said front portion, the forward or exposed end of the tubular member being closed, the forward end in cross-section being concave-convex with the radii of curvature being selected



so that the forward portion at the tubular axis is thin while the outer portions beyond the tubular axis thickens to equal at least the wall thickness of the tubular member.

4,231,446
RESONATING CHAMBER
Thomas R. Weiss, and Matthew R. Kennedy, both of Crystal River, Fla., assignors to Tesserax Inc., Homosassa Springs, Fla.
Continuation-in-part of Ser. No. 876,012, Feb. 8, 1978, abandoned. This application Apr. 2, 1979, Ser. No. 26,443
Int. Cl.³ H05K *8/00*
U.S. Cl. 181—148 **14 Claims**



1. In an acoustical reproducing apparatus having a resonating chamber and a speaker means mounted in said resonating chamber, the improvement comprising:

said resonating chamber including a plurality of parallelogram-shaped panels,

each said parallelogram-shaped panel having pairs of opposed corner angles of approximately 70° and 110°,

each said parallelogram-shaped panel disposed in a plane forming an approximate 120° angle with each of the adjacent said rhombus-shaped panels,

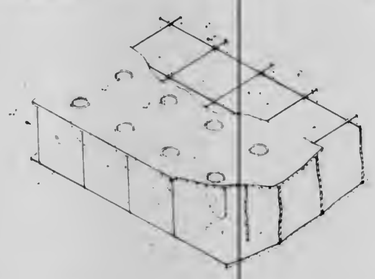
each said parallelogram-shaped panel being formed of relatively thin substantially non-sound absorbing material and having an interior surface which is planar and unpadded.

4,231,447

MULTI-LAYER ACOUSTIC LININGS

John F. Chapman, Solihull, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 20, 1979, Ser. No. 22,177
Claims priority, application United Kingdom, Apr. 29, 1978, 17148/78
Int. Cl.[3] E04B *1/82*
U.S. Cl. 181—213 5 Claims



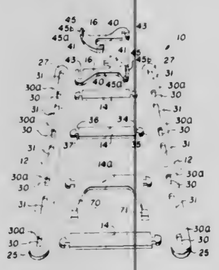
1. For a fluid-flow duct in a gas turbine engine, a multi-layer acoustic lining comprising an air-impermeable backing layer, a compartmented-airspace core structure, a core facing layer overlying said core structure and incorporating apertures having predetermined cross-sections through which sound energy can enter the core, and tube-like Helmholtz resonator necks having bodies with cross-sections substantially the same as the cross-sections of said apertures which extend from said apertures into said core structure such that an end of each resonator neck is situated within a core compartment and spaced from walls thereof to thereby render core compartments effective as Helmholtz resonators; wherein the improvement is that said end of each resonator neck within said core structure is a biased configuration such that said end lies in a plane extending at an acute angle with the body of said neck.

4,231,448

DEMOUNTABLE BOAT LADDER

Svend O. Jensen, 1554 Farrell Crescent, Delta, British Columbia, Canada V4L 1T8

Filed Aug. 6, 1979, Ser. No. 64,302
Int. Cl.[3] E06C *1/36, 1/38, 7/50*
U.S. Cl. 182—93 8 Claims



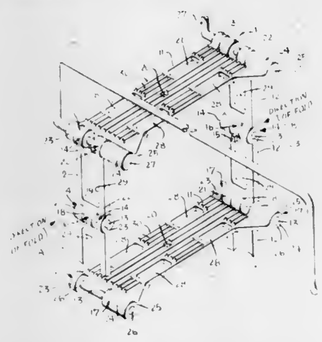
1. A boarding ladder for a boat comprising:
a pair of parallel side rails,
a plurality of treads extending between the side rails,
connecting means securing opposite ends of the treads to the side rails for ready connection and disconnection,
a pair of hangers each having a first portion adjacent one of the side rails and a second portion disposed substantially at right angles to said first position to project rearwardly of the ladder,
attachment means releasably securing the hangers to the side rails and one of the treads, and
anchoring means detachably securing rear ends of the second portions to the boat whereby to suspend the ladder alongside the boat.

4,231,449

FOLDABLE LADDER

Joseph N. Laurita, 69-03 62 Rd., Middle Village, N.Y. 11379

Filed Apr. 28, 1976, Ser. No. 681,029
Int. Cl.[2] E06C *1/36, 1/383*
U.S. Cl. 182—164 1 Claim



1. A foldable ladder of the type having a plurality of rigid steps and being operable between an operating position in which said ladder is suspended from an elevated structure and at least the majority of said steps are supported below said structure, and spaced apart from each other in a substantially parallel arrangement, and, respectively, a folded position in which said steps are disposed in close proximity to each other, the improvement comprising
support means operable to maintain said ladder rigidly in said operating position and, respectively, to permit said ladder to be folded into said folded position, and including a plurality of rigid links pivotally secured together and to said steps,
wherein each rigid step defines an aperture, said apertures being substantially aligned with each other,
a stacking rod operable to extend through said apertures to maintain said steps in substantially aligned relation to each other in said folded position, said rod including an enlarged portion near one end to restrain the passage of that end through an aperture, and a quick disconnect retaining ring removably insertable over the opposite end of the rod, said ring when inserted being operable to secure said rod within said apertures.

4,231,450

OVERLOAD WARNING SYSTEM

Robert G. Hedtke, Excelsior; Harley A. Harrom, Watertown; Wilfred H. Kelley, Jr., Maple Plain, and Sherman B. Frederick, New Hope, all of Minn., assignors to White Farm Equipment Company, Oak Brook, Ill.

Filed Oct. 23, 1978, Ser. No. 953,424
Int. Cl.[3] B66B *9/20*
U.S. Cl. 187—9 R 13 Claims

11. In a vehicle adapted for the transporting and the elevating of loads, the vehicle having a load support and a pair of wheels spaced from the load support, an overload indicator comprising:
(a) a pair of fluid vehicle supports connected to and forming a part of a wheel suspension for said vehicle;
(b) each one of the pair of supports including a movable piston means;

(c) said piston means including a member defining a wheel support for connecting thereto, said wheels;
(d) a conduit means for interconnecting said fluid supports to allow transfer of fluid to level the vehicle when the loads on said wheels are unbalanced;
(e) a pressure responsive means in fluid communication with



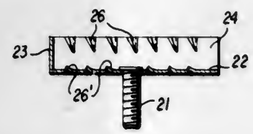
said conduit and actuatable by a preset pressure in the fluid conduit corresponding to an overload condition on the load lifting apparatus; and
(f) upon co-actuation of the pressure responsive means and a means to sense a preset elevation of the lifting apparatus, the overload condition on the lifting apparatus is signalled.

4,231,451

BRAKE HOLDER WITH PROTUBERANCES FOR HOLDING A SHOE BODY IN PLACE

Yuji Fujii, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Aug. 4, 1978, Ser. No. 931,004
Claims priority, application Japan, Aug. 11, 1977, 52-108464[U]
Int. Cl.[3] F16D *69/04*
U.S. Cl. 188—73.1 3 Claims



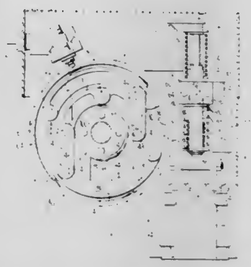
1. A brake shoe used in a brake comprising:
a shoe body of a rectangular prism-like shape made of friction material; and
a holder carrying said shoe body and having mounting means for mounting said brake shoe to the brake, said holder comprising a bottom wall, a front wall and a pair of opposite side walls for gripping said brake shoe, said front and side walls being fixed to and rising from said bottom wall, each of said side walls including a first plurality of sharp cutting protuberances directed toward said front wall, said first plurality of protuberances being formed by said side walls being cut at the upwardly outer edge thereof to form cutouts, each cutout forming a protuberance having a free edge directed toward an opposite side wall, said side walls being partially bent inwardly at said cutouts toward said shoe from the bottoms thereof respectively, whereby said free edges of said first plurality of protuberances cut into said shoe body carried by said holder.

4,231,452

SPRING APPLIED, ELECTRIC RELEASED DRUM BRAKE

Joseph K. Kraft, Parsippany, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 28, 1978, Ser. No. 973,989
Int. Cl.[3] B60T *13/04*
U.S. Cl. 188—171 8 Claims



1. A spring-applied, electrically released drum brake, comprising:
a rotatable brake drum,
first and second brake shoes pivotally operable between brake-applied and brake-released positions, relative to said brake drum, with the pivot points of said first and second brake shoes being disposed, relative to the rotational axis of said brake drum, to be self-energizing in one direction of rotation of the brake drum, and partially deenergizing in the other direction,
means for operating said first and second brake shoes including an axially displaceable rod member, and means mechanically linking said rod member and said first and second brake shoes,
first compression spring means on said rod member, said first compression spring means being pre-compressed to bias said rod member in a first axial direction which biases said first and second brake shoes towards the brake-applied position, with a first predetermined force,
electromagnetic means arranged for selective energization and deenergization,
second compression spring means on said rod member,
said electromagnetic means being arranged to compress said second compression spring means when said electromagnetic means is energized, said electromagnetic means compressing said second compression spring means without axial movement of said rod member until the stored force in said second compression spring means exceeds the stored force in said pre-compressed first compression spring means, at which time said rod member is moved in a direction opposite to said first axial direction to operate said first and second brake shoes to the brake-released position,
and control means for controlling the release of the stored force in said second compression spring means when the electromagnetic means is deenergized and said rod member moves in the first axial direction to operate said first and second brake shoes from the brake-released to the brake-applied position,
said first and second compression spring means being arranged relative to said rod member such that movement of said rod member in the first axial direction causes the braking force applied to said brake drum by said first and second brake shoes to be responsive to the difference between the stored forces in said first and second compression spring means at any instant, to cause the braking force applied to said brake drum to start at a low value and increase to substantially the first predetermined force according to the rate at which said control means allows

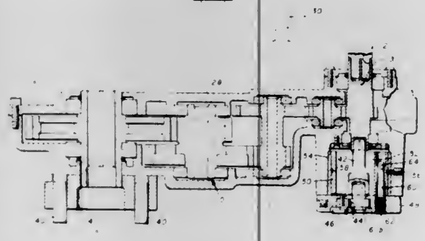
the second compression spring means to release its stored force.

4,231,453
COMBINED BOX, TABLE AND BENCH
William F. Minor, 3614 N. Kilpatrick, Chicago, Ill. 60641
Filed Nov. 20, 1978, Ser. No. 962,374
Int. Cl.³ A45F 4/06; A47B 3/10
U.S. Cl. 190—11 **7 Claims**



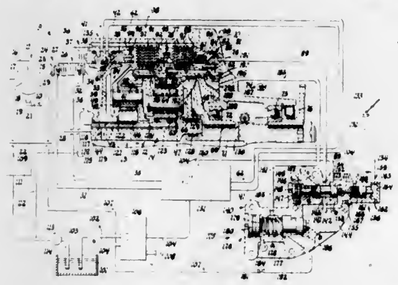
1. A multi-purpose box comprising a plurality of separate panel means having edges formed to nest together when the panel means are assembled in one configuration to form sides and ends of a box and when assembled in another configuration to form a compact luggage-type device, wherein said panel edges comprise stringers running longitudinally along the length of said panels, means for attaching said panels together to secure them in either of said configurations, means for securing together a plurality of said panels in a side-by-side, horizontally-aligned relationship to form a tabletop, and a plurality of separate part means which may be secured together to form at least a means for supporting said tabletop, said separate part means fitting inside space defined by said panels when assembled in either of said configurations.

4,231,454
TORQUE WRENCH WITH CLUTCHES IN SERIES
John H. Bickford, Middletown, and Robert F. Snyder, Hamden, both of Conn., assignors to Raymond Engineering Inc., Middletown, Conn.
Filed Jul. 12, 1978, Ser. No. 923,906
Int. Cl.³ B60K 41/24; F16D 67/02
U.S. Cl. 192—4 R **13 Claims**



1. A torque wrench including:
a casing;
torque transmission means in said casing;
input means connected to said transmission means for delivering an input force to said transmission means in response to movement of said input means in a first direction;
output means connected to said transmission means for imposing a torque load on an element to be torqued;
one way clutch means coupled to said input means to prevent reaction forces in said wrench from acting on said input means to cause undesired movement of said input means in a direction opposite to said first direction; and
slip brake means connected to said one way clutch means and in series with said one way clutch means, said slip brake means being responsive to a predetermined load on said input means in a direction opposite to said first direction to relax the reaction forces in said wrench.

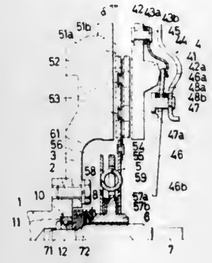
4,231,455
VEHICLE BRAKE SYSTEM WITH TRANSMISSION AND INTERNAL BRAKE
Reece R. Fuehrer, Danville, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 22, 1978, Ser. No. 944,854
Int. Cl.² F16D 67/04; B60K 41/24
U.S. Cl. 192—4 A **19 Claims**



1. In a transmission: an input; an output; a multiratio gear unit having gearing having first and second drive establishing means selectively operated for friction engagement to respectively provide first and second ratio drives between said input and said output and simultaneously operated for friction engagement to provide gear braking of said output; friction brake means operatively connected to said output selectively operable to engage and to disengage said friction brake means; drive control means to selectively establish said first and second drive establishing means to respectively provide said first and second ratio drives; and brake control means in brake off position operable to disengage said friction brake means and to permit said drive control means to selectively establish said first and second drive establishing means, and in brake on position operable in all said ratio drives to engage said friction brake means to provide friction braking, and in one ratio drive established by disengagement of one of said drive establishing means and engagement of another of said drive establishing means to engage said one of said drive establishing means to, in concert with the established another of said drive establishing means, provide gear braking.

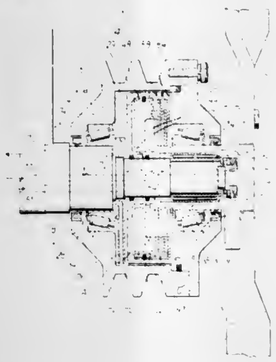
4,231,456
CLUTCH RELEASING DEVICE
Mototaka Nakane, Toyota, and Hideichi Hori, Tokai, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Apr. 20, 1979, Ser. No. 31,734
Claims priority, application Japan, Apr. 28, 1978, 53-51618
Int. Cl.³ F16D 13/75
U.S. Cl. 192—70.25 **7 Claims**

1. In a clutch assembly having a driving member, a driven member mounted on said driving member through a bearing means, a disc assembly having a hub drivingly and axially slidable mounted on said driven member,
a clutch releasing device comprising a cylindrical member interposed between said hub of disc assembly and said bearing means,
a resilient means operatively connected to said hub and said cylindrical member for positively urging said disc assembly in one direction wherein said disc assembly is released from said driving member, and



a spring means interposed between said bearing and said resilient means for normally urging said resilient means in said one direction.

4,231,457
THERMOSTATICALLY CONTROLLED FAN CLUTCH
Robert N. Cornish, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England
Filed Mar. 6, 1978, Ser. No. 883,567
Claims priority, application United Kingdom, Mar. 7, 1977, 9453/77
Int. Cl.³ F16D 43/25, 25/06, 13/74
U.S. Cl. 192—82 T **11 Claims**



1. A thermostatically controlled clutch assembly comprising a non-rotatable support shaft, an annular output member journaled for rotation about said support shaft, an annular input member journaled for rotation about said shaft and said output member, one of said members defining an annular chamber, an annular piston housing having an annular groove in one face thereof, said piston housing being positioned within said annular chamber and journaled for rotation about said support shaft and connected for rotation with said input member, an annular piston received in said groove, clutch driving plates connected for rotation with said output member means defining a first passage within the support shaft for conducting pressurized fluid from an external source to the annular piston housing and piston assembly means for defining a second passage within the support shaft for conducting a supply of cooling and lubricating fluid from said external source to the clutch driving and driven plates, and means for commonly draining both the actuating fluid and the cooling and lubricating fluid from the clutch assembly for return to the external source, a control valve and a temperature sending element arranged to open the valve to admit pressurized fluid to said first passage means at and above a predetermined temperature ambient to said sending element whereby to actuate the clutch and establish a driving connection between the input and output members and to close the valve when the temperature ambient to the sensing element is below said predetermined temperature to deactuate the clutch.

4,231,458
CARD COMPRISING AN ELECTRONIC CIRCUIT WITH OBLITERABLE CREDIT ELEMENTS FOR THE DISTRIBUTION OF GOODS OR SERVICES
Mario Limone, Corso Durante, 292, Frattamaggiore (Napoli), Italy 80027; Giovanni Russo, Via Petrarca, 20, Napoli, Italy 80100; Umberto Magliuolo, Via Oberdan, 16/bis, Pozzuoli (Napoli), Italy 80078, and Salvatore Sardella, Via R. Caravaglios, 4, Fuorigrotta (Napoli), Italy 80100
Filed Dec. 13, 1977, Ser. No. 860,229
Claims priority, application Italy, Dec. 14, 1976, 52605 A/76
Int. Cl.² G07F 3/02
U.S. Cl. 194—4 F **4 Claims**

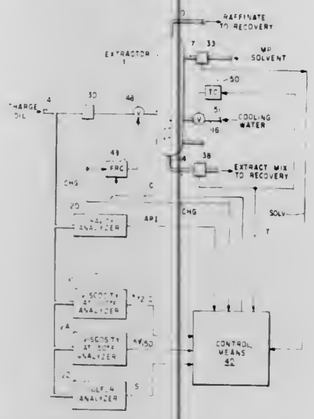


1. A card for the activation of and payment to a machine in return for services rendered or goods dispensed, said card comprising:
a support base;
card validity check means including a metal element secured to said support base;
an integrated circuit, secured to said support base, including:
fuse means including a plurality of fuse elements which are selectively destroyable in response to passage therethrough of current above a predetermined level, for retaining an electrical representation of a monetary value;
switching means responsive to test signals applied thereto for passing current selectively through individual fuse elements; and
metalized contact areas through which said integrated circuit is able to make contact with said machine.

4,231,459
CONTROL SYSTEM FOR AN N-METHYL-2-PYRROLIDONE REFINING UNIT RECEIVING LIGHT SWEET CHARGE OIL
Avilino Sequeira, Jr., and Frank L. Barger, both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.
Filed Oct. 19, 1978, Ser. No. 952,898
Int. Cl.³ C10G 21/00; C06G 7/58
U.S. Cl. 196—46 **9 Claims**

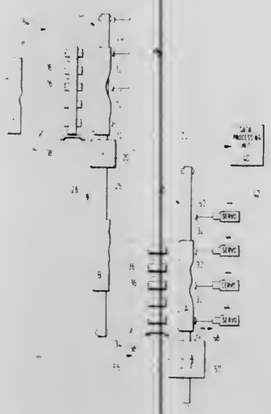
1. A control system for a refining unit having an extractor receiving light sweet charge oil and N-methyl-2-pyrrolidone solvent and providing raffinate and extract-mix which are subsequently processed to recover the N-methyl-2-pyrrolidone and to yield refined oil and extract oil, respectively, comprising gravity analyzer means for analyzing the light sweet charge oil and providing a signal API corresponding to the API gravity of the light sweet charge oil, sulfur analyzer means for analyzing the light sweet charge oil and providing a signal S corresponding to the sulfur content of the light sweet charge oil, viscosity analyzer means for analyzing the light sweet charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities of the light sweet charge oil corrected to 150° F. and 210° F., respectively, flow

rate sensing means for sensing the flow rates of the light sweet charge oil and the methyl-2-pyrrolidone and providing signals CHG and SOLV corresponding to the sensed flow rates of the light sweet charge oil and the N-methyl-2-pyrrolidone, respectively, temperature sensing means for sensing the temperature of the extract mix and providing a signal T corresponding



thereto, and control means connected to all the analyzer means, to flow rate sensing means and to the temperature sensing means for controlling one of the flow rates of the light sweet charge oil and the N-methyl-2-pyrrolidone flow rates while maintaining the other flow rate constant in accordance with signals API, S, KV_{150}, CHG, SOLV and T.

4,231,460
SYSTEM FOR TRANSFERRING WANE-EDGED BOARDS
Olli Heikinheimo, Helsinki, Finland, assignor to Plan-Sell Oy, Helsinki, Finland
Filed Oct. 18, 1978, Ser. No. 952,464
Int. Cl.³ B65G *43/08*
U.S. Cl. 198—341 **7 Claims**



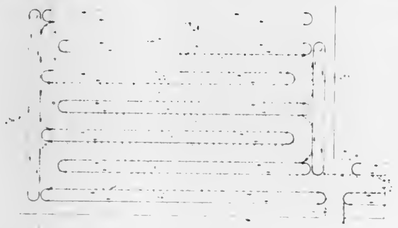
1. A system for continuously transferring wane-edged boards through a control station prior to edging to measure the wane edge for a controlled positioning of the board prior to the continuous sequential edging thereof in an edge saw mechanism, comprising:

first conveyor means to continuously align while supplying a plurality of boards sequentially both longitudinally and transversely prior to feeding of the board through the control station to provide an output indicative of the orientation of each board,

data processing means coupled with said control station and responsive to information output thereof to store information characteristic of the wane consistent of the boards and the orientation thereof, and

second conveyor means adapted separately to receive the boards from the control station to align the boards in sequence transversely and longitudinally for continously feeding thereof to said edge saw mechanism, said second conveyor means including adjustable positioning means responsive to the output of said data processing means for controlling the optimum alignment of the boards prior to the feeding thereof to said edge saw mechanism.

4,231,461
RESERVOIRS FOR CIGARETTES
Dennis Hinchcliffe; Frank Heybourn, and Eric A. Luddington, all of London, England, assignors to Molins, Ltd., England
Division of Ser. No. 622,709, Oct. 15, 1975, Pat. No. 4,078,648.
This application Mar. 8, 1978, Ser. No. 884,569
Claims priority, application United Kingdom, Oct. 18, 1974, 45316/74
Int. Cl.³ B65G *1/00*
U.S. Cl. 198—347 **11 Claims**



1. A conveyor system for cigarettes or similar rod-like articles, including a conveyor for delivering cigarettes into a junction from which there is an outlet channel, and a pair of reservoirs each comprising at least one substantially horizontal conveyor, said reservoirs lying one above the other with one end thereof in communication with the junction and means for reversibly controlling said conveyors independently of one another, so that they individually receive cigarettes from the junction or deliver cigarettes into the junction according to the state of supply and demand at the junction.

4,231,462
CAPSULE POSITIONING GUIDE AND ASSOCIATED VACUUM MANIFOLD FOR CAPSULE ORIENTING MECHANISMS
Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadephia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.
Filed May 15, 1978, Ser. No. 905,742
Int. Cl.² B65G *47/14*
U.S. Cl. 198—380 **10 Claims**

7. In a capsule orienting and turning apparatus wherein said capsules have body portions and cap portions which are of greater transverse dimensions than said body portions, and wherein said apparatus comprises, hopper means into which a multiplicity of said capsules are to be loaded, a continuously moveable capsule transporting conveyor having a plurality of pockets having generally upright pocket portions for receiving the capsules therein, said pockets being substantially equally spaced apart, each said pocket also having a capsule receiving substantially longitudinal pocket portion arranged to carry the capsule with the capsule axis extending in approximately the direction of its movement, and each said pocket having a

substantially crosswise pocket portion arranged to carry the capsule arranged substantially crosswise of the direction of its movement, means for moving said conveyor along a predetermined path with some of the capsules in a caps up attitude and others with a caps down attitude,

the combination which comprises:

tilting means for tilting the caps down capsules into an attitude arranged generally along said predetermined path, means for substantially restraining said caps up capsules from such tilting movement, vacuum rectification means directed to draw transversely of said predetermined path to rectify said capsules by shifting the cap portions of those capsules which are in a caps up position, and also the cap portions of those capsules which have been tilted by



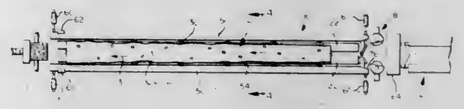
said tilting means, all in a direction generally crosswise with respect to said predetermined path, and capsule positioning guide means interposed between said transport conveyor and said vacuum means and also disposed adjacent to said means for substantially restraining said caps up capsules from said tilting movement for retaining each said capsule in its respective pocket portion immediately prior to its being subjected to said vacuum rectification means and then releasing said capsule when it is subjected to said vacuum rectification means, wherein said vacuum rectification means comprises a vacuum manifold and wherein said capsule positioning guide means is carried by said vacuum manifold, said apparatus further comprising means pivotally connecting said vacuum manifold and said transport conveyor.

4,231,463
BOTTLE STREAM COMBINER AND DIVIDER
Michael Vamvakas, Rocky River, Ohio, assignor to Niagara Bottle Washer Manufacturing Co., Cleveland, Ohio
Filed Jan. 22, 1979, Ser. No. 5,366
Int. Cl.³ B65G *47/68*
U.S. Cl. 198—446 **8 Claims**



8. The method of arranging and combining bottles standing on end while moving said bottles in a single plane, comprising feeding a miscellaneous collection of said bottles towards conveying means, receiving said bottles and conveying them in a direction along plural parallel paths spaced apart less than the diameter of said bottles, nudging said bottles toward said paths by rotating helical vanes between said paths as the bottles move in said direction said vanes being on an axis that is transverse to said paths of the bottles, then guiding said bottles toward the laterally inward of said parallel paths, and again nudging said bottles onto said laterally inward paths.

4,231,464
CONVEYOR WITH LATERALLY ADJUSTABLE FLIGHTS
Jay C. Neilson, Lakewood, Colo., assignor to Kockum Industries, Inc., Talladega, Ala.
Filed Jan. 15, 1979, Ser. No. 3,213
Int. Cl.³ B65G *17/30, 47/22*
U.S. Cl. 198—456 **17 Claims**



1. A conveyor system comprising:

endless flexible conveyor means movable along a conveyor path;

multiple flight means spaced apart along said path, each said flight means including a base portion and a load-engaging portion, said load-engaging portion being movable relative to said base portion transversely between a centered position in said path and a position laterally offset from said centered position; and

a line bar extending lengthwise along the conveyor path;

the line bar being movable transversely to said path to laterally engage said load-engaging portion to move said load-engaging portion to a selected lateral position;

whereby an object supported on said flight means can be transported on said conveyor means along said path and laterally reoriented with respect to said path.

11. A conveyor system comprising:

endless flexible conveyor means movable along a conveyor path;

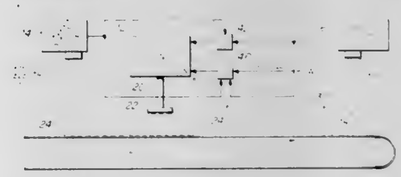
multiple flight means spaced apart along said path; and

a stationary bearing surface means along said path;

said flight means including a base portion connected to said conveyor means and a load-engaging portion movable relative to said conveyor means transversely of said path;

the load-engaging portion including bearing means for supporting the load-engaging portion on said surface means for movement both along and transversely of said conveyor path.

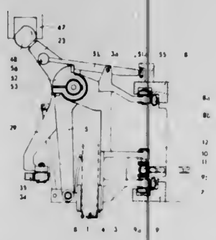
4,231,465
SELF-TIMING AUTOMATIC CONVEYOR SYSTEM
Ronald D. Bourgeois, 38 Ellison Park, Waltham, Mass. 02154
Filed Oct. 26, 1978, Ser. No. 955,140
Int. Cl.³ B65G *43/08, 47/26*
U.S. Cl. 198—460 **7 Claims**



1. A self-timing automatic conveyor system comprising:

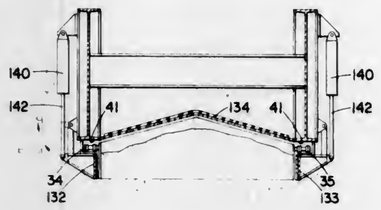
a low-friction conveyor belt;
a holding mechanism actuatable to open and close for selectively controlling flow of goods along said conveyor belt;
a control sensor circuit including a first sensor proximate said conveyor belt and adjacent said holding mechanism for monitoring flow of goods along said conveyor belt up to said holding mechanism;
a transfer sensor circuit including a second sensor spaced downstream from said first sensor and proximate said conveyor belt for monitoring flow of goods along said conveyor belt released by said holding mechanism;
first gating means, enabled by said control sensor circuit upon the presence of goods at the position of said first sensor and by said transfer sensor circuit upon the passing of goods released during the previous cycle of operation by said holding mechanism, for actuation of said holding mechanism to the open condition to pass goods upon receipt of an external signal; and
second gating means enabled by said transfer sensor circuit upon the passing of goods released by said holding mechanism, for actuating said holding mechanism to the closed condition.

4,231,466
BOOK BLOCK TRANSPORT SYSTEM
Horst Rathert, Minden, Fed. Rep. of Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Wesphalia, Fed. Rep. of Germany
Filed May 17, 1978, Ser. No. 906,843
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725416
Int. Cl.³ B65G *29/00*
U.S. Cl. 198—479 **4 Claims**



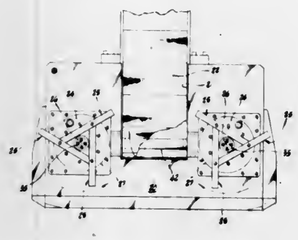
1. In a book block transport system of the type having a plurality of block pincers, the block pincers comprising a supporting frame which is driven along a continuous path, the supporting frame having at least a first stationary internal clamping jaw, and a swinging frame rotatably suspended from the supporting frame, an external clamping jaw being attached to the swinging frame and being rotatable with respect thereto to provide for positioning of a face of the external clamping jaw parallel to a face of the internal clamping jaw, the transport system further including a torsion spring for urging the internal and external clamping jaws together, the improvement comprising:
a two-dimensional cam having a groove therein, said cam being stationary with respect to the supporting frame;
a cam follower member capable of being positioned within the groove of said cam, said follower being capable of vertical movement with respect to the cam;
lever means operatively connected adjacent a first end thereof of said cam follower member;
means connecting a second end of said lever means to a first end of the torsion spring, the second end of the torsion spring being connected to the swinging frame whereby the lever means operates the external clamping jaw between the open and closed positions;
a compression arm integral with said lever means, a first end of said compression arm being connected to the said first end of the torsion spring;
a guide rail arranged on the side of the transport system opposite to the internal clamping jaw; and
means for coupling the second end of said compression arm to said guide rail to cause exertion of the clamping force of the external clamping jaw on a book block positioned between the external and internal clamping jaws.

4,231,467
DRY STACKER AND RECLAIMER
Edward E. Cheek, Brunswick, Ohio, assignor to Dravo Corporation, Pittsburgh, Pa.
Filed May 24, 1979, Ser. No. 42,126
Int. Cl.³ B65G *65/00, 65/02*
U.S. Cl. 198—508 **4 Claims**



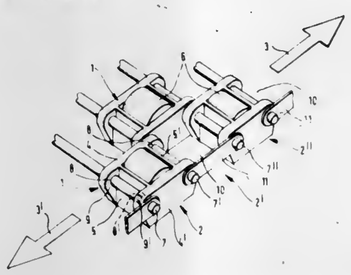
1. A backstacker-reclaimer apparatus comprising a frame, a combined stacking and reclaiming boom having proximal and distal extremities mounted on said frame, means for raising and lowering the distal extremity of the boom, a plurality of spaced stacking and reclaiming flights having end edges, endless means for supporting said flights longitudinally movable along the upper and lower reaches of said boom, including head and tail sprocket means for said endless flight supporting means located at the distal and proximal extremities of said boom, means for removing reclaimed bulk material, means for feeding bulk material to the lower reach of said boom to permit the flights of said lower reach to push said material onto a stack, fencing means extending from at least one side of the lower region of said boom in a direction substantially perpendicular to said flights and extending so as to substantially cover said end edges, said fencing means being retractable to expose the edges of the flights.

4,231,468
COAL-GATHERING ASSEMBLY FOR A CONTINUOUS MINER
Dempsey G. Tucker, 600 E. Oak St., Mascoutah, Ill. 62258
Filed Feb. 21, 1978, Ser. No. 879,353
Int. Cl.³ B65G *65/16*
U.S. Cl. 198—515 **9 Claims**



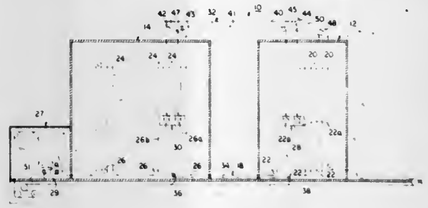
1. A coal-gathering assembly, comprising:
(a) a rotatively mounted base plate, and
(b) a plurality of bars carried by the base plate, each bar extending across the base plate so that one bar end is adjacent the next angularly adjacent bar and that the other bar end extends beyond the periphery of the base plate, each bar including a leading edge facing in the direction of base plate rotation and extending substantially between its ends, and a trailing edge facing in the opposite direction and extending outwardly from the leading edge of the next angularly adjacent bar, said leading edge and said trailing edge being continuous for providing a substantially inwardly closed pocket that holds the coal and for pushing the coal laterally outward as the base plate rotates.

4,231,469
CONVEYOR
John R. Arscott, Huntingdon, England, assignor to Ling Systems Limited, Bedfordshire, England
Filed Oct. 24, 1978, Ser. No. 954,200
Claims priority, application United Kingdom, Jan. 20, 1978, 2431/78
Int. Cl.³ B65G *17/00*
U.S. Cl. 198—779 **20 Claims**



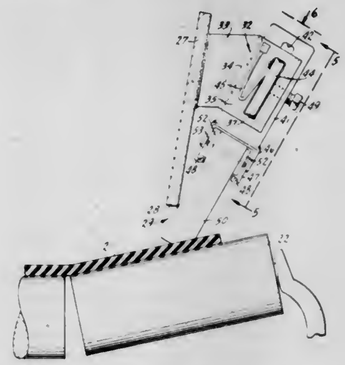
1. A conveyor comprising:
a plurality of cradles, each of said plurality of cradles further having a substantially "H" shape;
a plurality of rotatable members mounted in spaced relationship to said plurality of rotatable cradles, each of said rotatable members further being mounted on each side of the bridge of the "H" shape of each of said plurality of cradles; and
means for rotatably mounting each of said rotatable members in each of said plurality of cradles such that each of said rotatable members extends above each of said plurality of cradles for rolling contact with an object placed on the conveyor.

4,231,470
CONVEYOR SYSTEM
Ralph C. Parkes, Rydal, Pa., assignor to National Drying Machinery Company, Philadelphia, Pa.
Filed Nov. 21, 1977, Ser. No. 853,310
Int. Cl.² B65G *21/14*
U.S. Cl. 198—797 **8 Claims**



1. In a conveyor system of the type suitable to transport a plurality of containers through a first environmental area and a second environmental area wherein the conveyor follows a first path about a first plurality of upper sprockets and a first plurality of lower sprockets to define a first conveyor length within the first area and wherein the conveyor follows a second path about a second plurality of upper sprockets and a second plurality of lower sprockets to define a second conveyor length within the second area, the improvement comprising a first conveyor length adjustment means for changing the length of the conveyor in the first area, said first conveyor length adjustment means including first means to move some but not all of said first plurality of lower sprockets, and second length adjustment means including second means to move some but not all of said second plurality of lower sprockets for providing a corresponding, but opposed conveyor length change in the second area, said first conveyor length adjustment means is being associated with the movable ones of said first plurality of lower sprockets for moving them to either increase or decrease the vertical spacing between sprockets in the first area, within preselected limits, and the second conveyor length adjusting means being associated with the movable ones of said second plurality of lower sprockets for moving them to either increase or decrease the vertical spacing between the sprockets in the second area for providing a corresponding, but opposite, increase or decrease in the vertical spacing between sprockets in the second area,
whereby, for a given conveyor speed, the ratio of time of a container within the first area to the time of the container within the seccond area can be varied.

4,231,471
CONVEYOR SKIRTBOARD APRON
James R. Gordon, 301 W. Boling, Benton, Ill. 62812
Filed Apr. 13, 1979, Ser. No. 29,684
Int. Cl.³ B65G *21/20*
U.S. Cl. 198—836 **8 Claims**



1. A skirtboard apron assembly for a belt conveyor for granular material of the kind comprising a rigid skirtboard positioned a short distance above the conveyor belt and a resilient, replaceable apron mounted on and extending downwardly from the skirtboard to close the gap between the skirtboard and the belt, the apron assembly, in assembled condition, comprising:
a plurality of U-shaped brackets mounted at spaced positions along the skirtboard, each bracket having a base and two side walls defining a generally vertically oriented receptacle, the bracket side walls including aligned wedge-receiving apertures;
a corresponding plurality of tension arms, each positioned in one of the bracket receptacles and each including a wedge-receiving aperture aligned with the wedge-receiving apertures in the bracket sidewalls, each tension arm being affixed to a horizontally oriented apron-mounting channel extending parallel to the conveyor belt surface;

a corresponding plurality of wedges, each inserted through the wedge-receiving apertures in one mounting bracket and in one tension arm to mount that tension arm in the bracket;

and an apron having a longitudinally extending mounting element affixed thereto, the mounting element being slidably fitted into the channel of each tension member to suspend the apron from the tension member;

the vertical position of the apron being determined by the extent to which the wedges are inserted into the mounting brackets.

4,231,472

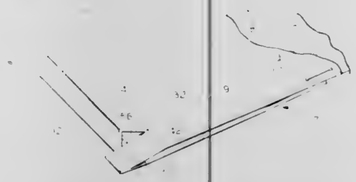
OUTER MAILING JACKET

Joseph Dlugopolski, Lombard, Ill., assignor to Fidelity Container Corporation, Elk Grove Village, Ill.

Filed Nov. 24, 1978, Ser. No. 963,337

Int. Cl.³ B65D *85/30, 85/57*

U.S. Cl. 206—309 **8 Claims**



1. An outer mailing jacket comprising a rectangular blank having a series of three major panels extending across the full width of said rectangle, each major panel being defined by two pairs of double, spaced parallel, fold lines extending transversely across substantially the entire blank, the spaces between the double fold lines defining the side panels of a box made by folding the two outside panels of said series over the center panel of said series, each of said fold lines terminating at their opposite ends in cut lines before said fold lines reach the edge of the rectangular blank, and non-folding offset panel means within said rectangle, each of said cut lines beginning at one of said parallel fold lines and extending beyond the associated parallel fold line, one side of said offset panel being defined by said cut line, and an opposite side of said offset panel being defined by an edge of said blank, one end of said offset panel being defined by a fold line positioned between said spaced parallel fold lines, the other end of said offset panel being defined by a fold line at the end of said cut line which extends beyond said associated parallel fold line, said offset panel means tipping to form an acute angle with respect to other panels when the blank is folded whereby said offset angle forms a barrier to prevent an object from sliding out of said jacket.

4,231,473

DUAL PURPOSE INSERT FOR TAPE CARTRIDGES AND CASSETTES

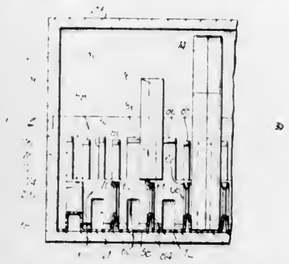
Vaughn Aprahamian, Rego Park, N.Y., assignor to Le-Bo Products Co., Inc., Maspeth, N.Y.

Filed Mar. 20, 1979, Ser. No. 22,145

Int. Cl.³ B65D *85/672*

U.S. Cl. 206—387 **13 Claims**

1. An insert adapted to be received within a carrying case and to itself selectively receive and store a plurality of first and second types of generally rectangular polyhedral objects in at least one arrayed row, said first type of polyhedral object having a relatively large thickness and a relatively small width as compared to said second type of polyhedral object, said insert comprising: at least one longitudinally extending trough, each of said troughs including first and second parallel, vertically extending side walls, each having an upper edge, the distance between confronting surfaces of said first and second side walls being substantially equal to or slightly greater than said width of said first type of polyhedral object and slightly smaller than said width of said second type of polyhedral object; a bottom wall affixed to said first and second side walls; a plurality of storage compartments each adapted to receive and store one of said first type of polyhedral object, said storage compartments including a first longitudinally arrayed plurality of parallel, upstanding partitions projecting inwardly from said first side wall, a second longitudinally arrayed plurality of parallel upstanding partitions projecting inwardly from said second side wall, each of said partitions having a topmost extension, said first plurality of partitions projecting toward and being substantially transversely coplanar with corresponding ones of said second plurality of partitions, the longitudinal spacing between confronting faces of longitudinally adjacent ones of said partitions being substantially equal to or slightly greater than said thickness of said first type of polyhedral object; and a longitudinally arrayed plurality of pairs of shelves, each of said pairs of shelves being adapted to receive and store one of said second type of polyhedral objects, said shelves including a first longitudinally arrayed plurality of shelves recessed within said first side wall with the lowermost part of said shelves being located to be above said topmost



extensions of said first plurality of partitions; a second longitudinally arrayed plurality of shelves recessed within said second side wall with the lowermost part of said shelves being located to be above said topmost extensions of said second plurality of partitions, each one of said second plurality of shelves being transversely aligned with and confronting one of said first plurality of shelves and together forming one of said pairs of shelves, each of said shelves having a bottom surface, an open top, first and second side edges and a rear wall, the distance between said side edges of each of said shelves being substantially equal to said thickness of said second type of polyhedral object, the distance between said respective rear walls of each of said pairs of shelves being substantially equal to or slightly greater than said width of said second type of polyhedral object, the longitudinal distance between corresponding side edges of at least one longitudinally adjacent pair of said shelves being smaller than the median longitudinal distance between corresponding portions of longitudinally adjacent pairs of said partitions, whereby the total number of corresponding pairs of shelves within each of said troughs exceeds the total number of first polyhedral object storage compartments and whereby said insert can receive and store a larger number of polyhedral objects of said second type than of said first type.

4,231,474

STORAGE CASE

Kenji Takahashi, Tagajo, Japan, assignor to Sony Corporation, Tokyo, Japan

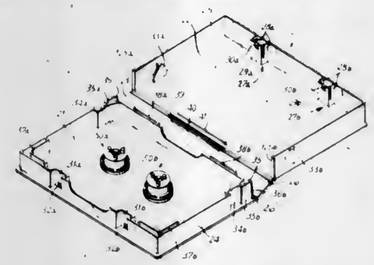
Filed Apr. 2, 1979, Ser. No. 26,311

Claims priority, application Japan, Apr. 7, 1978, 53/46334[U]; Apr. 11, 1978, 53/47355[U]

Int. Cl.³ B65D *85/67*

U.S. Cl. 206—387 **17 Claims**

1. A storage case, adapted to store a cassette of the type having at least one reel, comprising walls closable to form said storage case; and at least one hub engaging member mounted on one of said walls for engaging the hub of said at least one reel when said cassette is placed into said storage case, said hub engaging member including a post extending from said one wall, said post having a longitudinal slit therein parallel to the longitudinal axis thereof to form two post portions which are compressible toward each other in the diametrical direction across said slit, each of said post portions having a finger projecting outward therefrom adjacent a free end portion of the respective post portion and defining an inclined cam surface, a coil spring positioned over and guided by said post, a cap including a cylindrical side wall, a top wall with a central depression and an annular shoulder extending around an opening in said depression, said cap being positioned over said post and said spring such that, in passing said post through said opening in the central depression for assembling said cap to said post, the annular shoulder of said cap acts on said inclined cam surface of each of the fingers and thereby compresses the post portions to permit the fingers to pass through said opening and then to expand in said depression and lockingly engage said annular shoulder, said coil spring exerting a bias force on said cap in the direction urging said annular shoulder against said fingers, means provided on said top wall of the cap to engage said hub, a ring member projecting axially from said one wall concentrically with respect to said post and being in axially overlapping relation with said cylindrical side wall of the cap when the latter has said annular shoulder urged against said fingers, and cooperatively engageable, axially extending



key-way means and rib means on said ring member and side wall, respectively, to prevent rotation of said cap, said cylindrical side wall of the cap having an axial dimension such that its edge is spaced from said one wall when said annular shoulder engages said fingers.

5. A storage case comprising a top wall; a bottom wall; an end wall hingedly connected to each of said top and bottom walls; a peripheral wall extending from one of said top and bottom walls in the upward direction when said storage case is opened; a peripheral skirt extending from the other of said top and bottom walls in the upward direction when said storage case is opened; at least one releasable locking means on said skirt including a substantially rectangular assembly having a first wall formed by said skirt, a pair of opposite side walls, a second wall secured to said side walls, a pair of slits provided in said pair of side walls, respectively, to enable said second wall to flex in response to a force exerted thereon, and a projection extending outwardly from said second wall; at least one recess in said peripheral wall for receiving said rectangular assembly and dimensioned to exert a force sufficient to flex said second wall when said storage case is closed; and an aperture in said recess for receiving said projection extending from said second wall when said storage case is closed so as to releasably lock said storage case in its closed position.

14. A storage case comprising a top wall; a bottom wall; an end wall interconnected between said top and bottom walls; said top, bottom, and end walls being of unitary construction; the junctions formed by the interconnection of said end wall to each of said top and bottom walls being bevelled to facilitate the closing of said case; each of said bevelled junctions having a respective slit completely through a longitudinal portion thereof to form a flexible hinge; and a respective pair of longitudinal ribs running parallel to and on either side of each said respective slit to contact one another under a compressive load when said case is closed and assist said end wall and said top and bottom walls in supporting one another.

15. A storage case comprising a top wall; a bottom wall; an end wall interconnected between said top and bottom walls; said top, bottom and end walls being of unitary construction; the junctions formed by the interconnections of said end wall to each of said top and bottom walls being bevelled to facilitate the closing of said case; and a plurality of longitudinally extending recesses in each bevelled junction, each recess having a deeper portion thereof in the vicinity of its mid-section and gradually shallower portions extending in opposite longitudinal directions from said deeper portion.

17. A storage case comprising a top wall; a bottom wall; an end wall interconnected between said top and bottom walls; said top, bottom, and end walls being of unitary construction; the junctions formed by the interconnection of said end wall to each of said top and bottom walls being bevelled to facilitate the closing of said case; each of said bevelled junctions having a respective slit completely through a longitudinal portion thereof to form a flexible hinge; a respective pair of longitudinal ribs running parallel to and on either side of each said respective slit to reinforce said flexible hinge when said case is closed; a peripheral wall extending upward from said bottom wall when said case is opened; a peripheral skirt extending upward from said top wall when said case is opened; a corner reinforcing wall secured to said peripheral wall in the vicinity of each corner thereof adjacent said end wall; and a support element on each corner reinforcing wall having a cam surface to contact said skirt while said case is being closed so as to guide said skirt to fit about said peripheral wall to exert an outward force on said skirt to prevent the latter from deflecting inwardly of said case and to reinforce said end wall when said case is closed.

4,231,475

SHIPPING CARTON FOR PILE FABRIC AND A MACHINE FOR WINDING PILE FABRIC ON A REEL

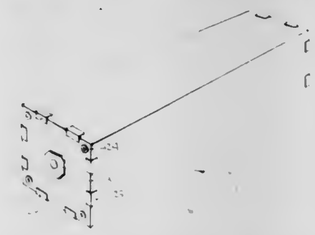
Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Division of Ser. No. 860,963, Dec. 15, 1977, Pat. No. 4,176,803.

This application Mar. 20, 1979, Ser. No. 22,293

Int. Cl.³ B65D *85/66*

U.S. Cl. 206—389 **10 Claims**



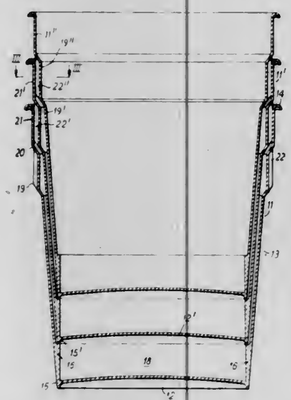
1. A shipping carton for pile fabric comprising

a reel having a pair of end frames, each said end frame including an endboard of polygonal shape and a plurality of radially disposed hook strips secured to said endboard;

a wrapper disposed peripherally about said reel between said end frames, said wrapper having a plurality of flaps folded inwardly of said wrapper in abutting parallel relation with a respective endboard, each pair of adjacent flaps having a respective one of said hook strips disposed therebetween in abutting relation; and

means securing said wrapper to each said frame of said reel.

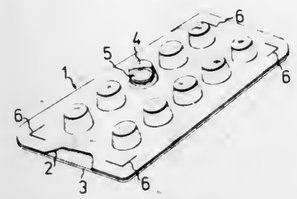
4,231,476
PLASTICS CONTAINERS
Peter A. Compton, and John G. Wood, both of Kings Lynn, England, assignors to Mars Limited, London, England
Continuation of Ser. No. 889,596, Mar. 23, 1978, abandoned, which is a continuation of Ser. No. 812,076, Jul. 1, 1977, abandoned, which is a continuation of Ser. No. 810,827, Jun. 28, 1977, abandoned. This application Jul. 2, 1979, Ser. No. 53,814
Int. Cl.³ B65D *21/02, 77/04*
U.S. Cl. 206—519 **17 Claims**



1. A nestable container at least partially of resilient plastics material comprising:
a bottom wall;
a side wall having an outside and an inside surface and diverging generally upwardly from the bottom wall;
stop and seal surfaces to limit the extent to which identical containers can be nested one inside another and form a sealed space between the bottom walls of nested containers;
holding means for releasably holding identical containers together when nested, the holding means comprising axially extending ribs disposed on one surface of the side wall and a substantially cylindrical surface on the other surface of the side wall, the axially extending ribs being so arranged to engage the substantially cylindrical part of the side wall of an identical container when the containers are nested to hold the containers together by frictional engagement,
the axially extending ribs having crests which are substantially the same distance from the axis of the container throughout a significant part of their axial length, and
the radius of the cylindrical surface being a different dimension than the distance of the crests from the axis so as to form a slight interference fit with a mating cylindrical surface of a nested container and the wall being deformable so that the cylindrical portion can engage the portion with the ribs.

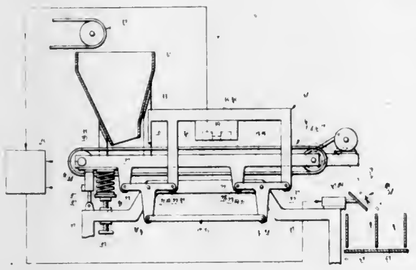
4,231,477
BLISTER PACKAGE FOR MEDICAMENTS SAFE FROM CHILDREN
Wilfried De Felice, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed May 17, 1979, Ser. No. 39,896
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822100
Int. Cl.³ B65D *83/04, 85/56, 75/70*
U.S. Cl. 206—532 **9 Claims**

1. A blister package for a medicament consisting of a deep drawn plastics film having a sealing edge and being provided with a plurality of recesses for said medicament; a covering film through which said medicament within said recesses cannot be pushed, said covering film being sealed with the plastics



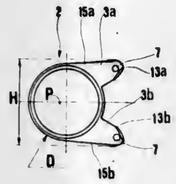
film; said sealing edge being provided with an incision forming a cutting corner in the sealing edge for cutting the covering film.

4,231,478
BULK SORTING OF PARTICULATE MATERIAL
Alan M. Stone, Briar Hill, Australia, assignor to Sphere Investments Limited, Nassau, The Bahamas
Filed Oct. 16, 1978, Ser. No. 951,957
Claims priority, application South Africa, Apr. 26, 1978, 78/2389
Int. Cl.³ B07C *5/00*
U.S. Cl. 209—576 **9 Claims**



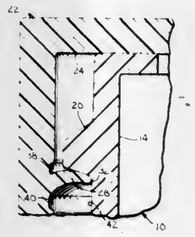
1. Apparatus for bulk sorting particulate material into fractions according to the degree to which that material possesses a certain characteristic comprising
means to move said particulate material in a continuous stream along a path, said means including a generally horizontal belt conveyor mounted on movable support means so as to be vertically movable and material feed means which comprises a hopper to receive material to be sorted and which, in operation of the apparatus, feeds material from the hopper onto the belt conveyor at a rate which varies according to the vertical position of the conveyor belt, the vertical position of the conveyor belt being dependent on the weight of feed material in said hopper;
a detector positioned such that material moving in said stream along said path will pass it and responsive to said characteristic so as to produce a time sequence of detector signals dependent on the degree to which material passing the detector possesses said characteristic;
control means to receive said detector signals and to derive therefrom control signals indicative of contiguous zones of the bulk material in the stream possessing said characteristic to differing degrees; and
stream divider means operative in response to said control signals to divide the stream of bulk material into separated material fractions such that material of differing zones is separated into different fractions.

4,231,479
CLOSURE CAPS ADAPTED FOR DISTRIBUTION IN A CHANNEL
Albert Scheidegger, 30 rue Caporal Morange, 69100 Villeurbanne, France
Continuation-in-part of Ser. No. 903,919, May 8, 1978, Pat. No. 4,171,736, which is a division of Ser. No. 862,915, Dec. 21, 1977, Pat. No. 4,114,774. This application Apr. 2, 1979, Ser. No. 26,355
Int. Cl.³ B65D *41/12*
U.S. Cl. 215—250 **4 Claims**



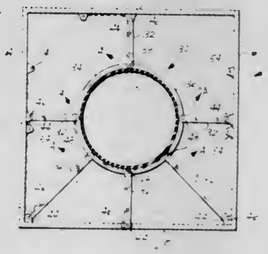
1. A closure cap comprising an annular depending skirt portion having a peripheral rim portion about the bottom thereof, two spaced tongue portions extending rearwardly from and disposed in the plane of the rim portion and forming a V-shaped space therebetween, the inside edges of the two tongue portions forming, with the edge of the rim portion in the space between the two tongue portions, a curvilinear opening wherein the inside edges of the tongue portions are substantially at a tangent to a circle having a diameter equal to the diameter of the skirt portion, while the opposite edges of the tongue portions are generally parallel and spaced apart by a distance generally equal to the diameter of the rim portion, the outer ends of the two tongue portions being curved upwardly along two symmetrical folds to insure engagement of the rim portion of an adjacent cap under the tongue portions.

4,231,480
THREADED BOTTLE LID
George B. Spransy, Oconomowoc, Wis., assignor to Anspack, Inc., Gurnee, Ill.
Filed Jan. 2, 1979, Ser. No. 538
Int. Cl.³ B65D *41/04*
U.S. Cl. 215—329 **11 Claims**



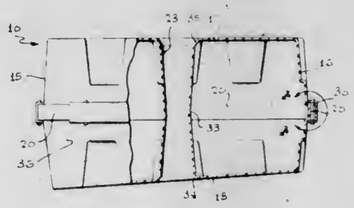
1. A lid for closing the end of a wide mouth container having an exterior helical thread of standard design on the exterior of the mouth, said cap having a sealing disc abuttable with the end of the mouth when said cap is in a closure position, said cap having a skirt depending from the periphery of said disc and lying generally parallel to the exterior of the mouth for surrounding same, said skirt having a helical thread form projecting from the inner wall thereof engagable with the thread on the container mouth for obtaining axial movement between said cap and container responsive to relative rotation therebetween, said thread form having a generally inwardly elongated trapezoidal cross-sectional configuration with a base contiguous with said inner wall, a tip extending inwardly to a predetermined clearance with the container, and a pair of side walls converging in the direction of said tip and lying obliquely with respect to said inner wall, said thread form being tilted in the direction of said disc and formed of a flexible material, said inward extension of said thread form being sufficient to cause said thread form to be deflected away from said disc by engagement with the container mouth thread into wedging contact with the root of the container mouth thread when said lid is threaded on the container.

4,231,481
CONVERTIBLE CONTAINER FOR FLUENT OR SOLID CARGO
Gilbert J. Nash, Edmonds, and Gerhard E. Seidel, Renton, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.
Filed Apr. 13, 1979, Ser. No. 29,607
Int. Cl.³ B65D *88/12, 90/04*
U.S. Cl. 220—1.5 **12 Claims**



1. A cargo container convertible between a solid storage mode and a fluent storage mode comprising
top, bottom and side walls forming a generally rectangular outer container;
an end wall at each end of said outer container substantially closing said outer container;
an inner container mounted within said outer container, said inner container comprising at least two curved circumferentially divided shell sections and means to releasably attach said sections to each other to form an open-ended cylinder, said end walls substantially closing said cylinder ends
support means pivotally mounted to said outer container and detachably mounted to said inner containner whereby said support means can be easily detached from said inner container during conversion from fluent to dry mode.

4,231,482
UNDERGROUND STORAGE VAULT
David B. Bogan, 15587 N. Bank Rd., Roseburg, Oreg. 97470
Filed Jan. 11, 1979, Ser. No. 2,574
Int. Cl.³ B65D *6/00*
U.S. Cl. 220—5 A **1 Claim**



1. An under ground storage vault comprising:
a box-like storage container having opposite sides, opposite

ends and top and bottom panels carried thereon so as to define a storage compartment between the opposing interior surfaces thereof:

a central column extending along a vertical axis through said storage compartment substantially at center thereof having its opposite ends integrally joined with said top and bottom panels respectively;

a continuous rib carried on the exterior surfaces of said sides and ends midway between said top and bottom panels for conducting lateral loads applied by surrounding earth;

said continuous rib includes an elongated metal channel secured to a central length or portion of said rib associated with each of said sides and ends;

said vertical column is a pair of frustroconical section integrally joined at their adjacent ends and terminating at their opposite ends in a flared junction with said respective top and bottom panels;

removable fastener means joining each of said side and said end channels to its respective rib portion;

said fastener means includes a plurality of metal sleeves molded in place on said rib portion and a plurality of holes carried in said channel in registry with said sleeves;

bolts insertably received through said holes and sleeves for retaining said channel onto said rib portion;

said bottom panel slopes at an angle from one end of said box-like container to its opposite end;

said top and said bottom panels include integrally formed stiffeners;

said edge marginal regions of said top and bottom panels as well as said opposite sides and ends are provided with integral indentations providing increased rigidity;

said fastener means constitute shear pins arranged to support and carry lateral loads applied to said rib;

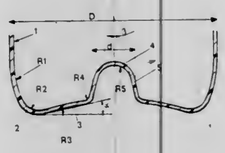
said container includes access ports and openings for the passage of solid and liquid waste products.

4,231,483

HOLLOW ARTICLE MADE OF AN ORIENTED THERMOPLASTIC

Roger Dechenne, Strombeek-Bever, and Guy Hubert, Lasne-Chapelle-Saint-Lambert, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Oct. 31, 1978, Ser. No. 956,429
Claims priority, application France, Nov. 10, 1977, 77 34381
Int. Cl.³ B65D *6/38, 23/00*
U.S. Cl. 220—66 **7 Claims**



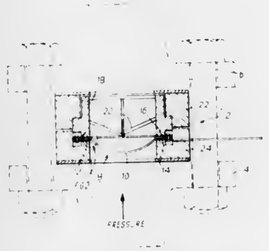
1. In a hollow article made of a molecularly oriented thermoplastic and comprising a neck zone, a side wall of generally cylindrical shape, and a reentrant base, the improvement wherein said base consists, successively, starting from the periphery of said article, of a periphery arched profile connected to said side wall, a substantially planar annular zone joining onto said peripheral arched profile, which annular zone is in the shape of a truncated cone which forms an angle of between 1° and 15° with a plane at right angles to the longitudinal axis of said hollow article, with the inner edge of said annular zone being at a higher level than its outer edge, and a central part in the form of a recessed dome which is connected to said annular zone and the diameter of which is less than 40% of the maximum external diameter of said hollow article, said central part in the form of a recessed dome consisting, successively, of an arched zone which provides the connection with said annular zone, a zone in the shape of a truncated cone, and a central cap pointing towards the interior of said hollow article, and connecting with said truncated cone zone.

4,231,484

SAFETY DEVICE FOR PRESSURE VESSELS

John D. Falconer, Newcastle upon Tyne; George T. Proudlock, Choppington, and Geoffrey Monsen, North Shields, all of England, assignors to Electrofabrication & Engineering Co. Ltd., England

Filed May 17, 1979, Ser. No. 40,039
Int. Cl.³ F16K *17/40*
U.S. Cl. 220—89 A **10 Claims**



1. A safety device for a pressure vessel, said device comprising a reverse buckling disc including a concave-convex dome portion and an annular or substantially annular flange portion surrounding said dome portion, annular inlet and outlet support means defining an internal passageway for communication with said pressure vessel, the flange portion of the disc being clamped between said inlet and outlet support means with the convex side of the dome portion of the disc freely disposed in said passageway to be subjected to pressure within the vessel, the outlet support means including a substantially flat ring member having an inner, deformable, annular portion, the internal diameter of which is less than the internal diameter of the flange portion of the disc, said deformable portion being located to have a normal rest position in which it overlies, but is out of contact with the radially outer regions of the dome portion of the disc, and upon reversal of the dome portion of the disc, initially to be engaged by the reversing radially outer regions of the dome portion of said disc and thereafter itself to be displaced by the dome portion from the normal rest position to a deformed position whereby the movement of said radially outer regions of said dome portion is retarded.

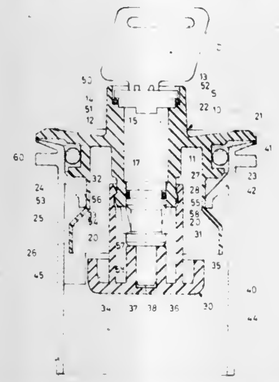
4,231,485

CAP AND FILLER ASSEMBLY FOR FUEL TANKS OF AUTOMOTIVE VEHICLES

Michele Aimar, Turin, Italy, assignor to ITW Fastex Italia S.p.A., Turin, Italy

Filed Sep. 26, 1979, Ser. No. 78,986
Claims priority, application Italy, Sep. 25, 1978, 28020 A/78
Int. Cl.³ B65D *55/14*
U.S. Cl. 220—210 **4 Claims**

1. A cap and filler assembly for fuel tanks of automotive vehicles, characterized in that the cap comprises substantially a pair of hollow cylindrical members of plastic material, one of which has at one end a control means and a circular flange for the closure of the filler opening and at the other end first snap means for engaging and retaining a cylinder lock and second snap means for receiving a complementary portion of the other of said hollow cylindrical members, said one hollow cylindrical member having also another cylindrical wall intergrally formed with said flange and terminating with a substantially square cross-section, whereas said other hollow cylindrical member has at one end snap means for engagement with the snap means of said one hollow cylindrical member and at the other end an integral cap portion having the same square cross-section as the square cross-section portion of said hollow



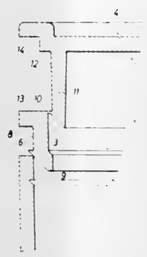
cylindrical member and a seat for receiving the end of said cylinder lock, both of said hollow cylindrical members, when connected by snap action to each other being capable of being rotated with respect to each other by said cylinder lock, and the filler comprises a diaphragm provided with an opening having the same square cross-section as the square cross-section of the portions of the pair of members forming said cap.

4,231,486

CONTAINER SEAL AND CLOSURE

Erik Bock, Kirke Hyllinge, Denmark, assignor to Superfos Emballage, Vipperod, Denmark

Filed Jun. 18, 1979, Ser. No. 49,794
Claims priority, application Denmark, Jun. 23, 1978, 2842/78
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—266 **2 Claims**



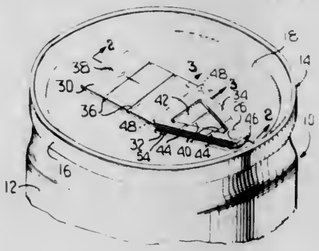
1. A seal for a container which comprises at least one upright wall and a cover, which seal comprises a rim ring engaging the mouth of the container, said cover being formed integral with said rim ring, said cover having an axial flange having a lower edge portion, a rib projecting radially between said lower edge portion and the uppermost end of the rim ring, said rib being tearable and being fractured when the cover and the rim ring are pressed into the mouth of the container, said rib engaging with the lowermost surface of the rim ring when the rim ring and the cover are pressed down into the mouth of the container, said wall of the container having an inner groove, the rim ring comprising a circumferential outer rib which engages with said groove, the rim ring having a supporting edge which turns downwards and abuts the rim of the wall and having a bearing edge which turns upwards and supports an edge portion of the cover.

4,231,487

PULL TAB HAVING MEMORY FOR EFFECTING ROLLING UP OF TAB AND REMOVABLE PANEL PORTION

Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 14, 1979, Ser. No. 66,596
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **15 Claims**



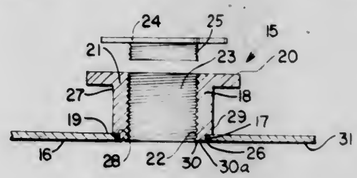
1. A pull tab for easy opening containers, said pull tab comprising an anchoring portion, an intermediate securing portion and a grip portion, and linear memory means extending transversely of said pull tab in said securing portion for effecting automatic folding of said securing portion to a folded out-of-the-way position when released.

4,231,488

CONTAINER CLOSURE SPOUT CONSTRUCTION AND METHOD OF FORMING SAME

William H. Ward, Kinnelon, N.J. 07405, and William H. Ward, Jr., 171A Overmount Ave., West Paterson, N.J. 07424

Filed Apr. 16, 1979, Ser. No. 30,406
Int. Cl.³ B65D *41/04*
U.S. Cl. 220—288 **30 Claims**



1. Container closure spout construction comprising

a container wall portion having a spout aperture defined therethrough,

a closure spout member having a substantially axially extending tubular portion defining a closure spout opening adapted to receive removably a cooperating closure element thereat,

said spout member being disposed at the spout aperture in engagement with the adjacent marginal portion of the container wall portion thereat, and

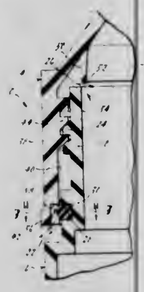
a high energy concentration laser beam produced weld seam interconnecting the spout member with the container wall portion along such adjacent marginal portion.

4,231,489

CONTAINER DEPRESSURIZATION SYSTEM

Carl E. Malone, 2281 SW. 33rd Way, Fort Lauderdale, Fla. 33312

Filed Jun. 7, 1979, Ser. No. 46,467
Int. Cl.[3] B65D *53/00*
U.S. Cl. 220—304 12 Claims



1. An improved sealing means for a refillable container assembly comprising a container having an opening at one end thereof, a closure member for closing said opening, and cooperating retaining means provided on said container and said closure member for removably retaining said closure member on said container, said improved sealing means comprising:

first sealing means provided on an outer sidewall of said container between said retaining means and the end of said container opposite said one end and operative to engage said closure member to form a fluid tight seal between said closure member and said container; and

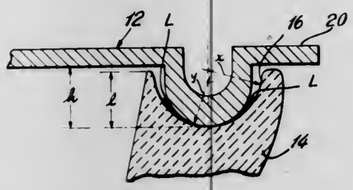
second sealing means disposed between the interior of said container and said retaining means, said second sealing means engaging and creating a sealing relationship between said closure member and said container so as to prevent nongaseous material within said container from reaching said retaining means.

4,231,490

CONTAINER

Jean-Pierre Boudreault, Mont St. Hilaire, Canada, assignor to Gaylord Regethermic Canada Ltd., Montreal, Canada

Filed Jan. 17, 1977, Ser. No. 760,131
Int. Cl.[3] B65D *43/06, 53/06, 25/28*
U.S. Cl. 220—354 5 Claims



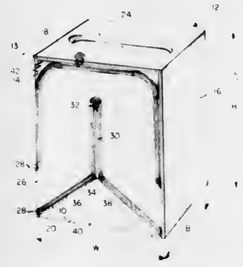
1. A container, including a bowl, the bowl having a rim, a continuous groove defined along the full extent of the rim and opening upwardly, at least the root of the groove being arcuate and having a first radius of curvature, a lid adapted to sit loosely on the bowl, the lid having a continuous rib on one surface thereof resting in the groove, the rib having a height at least greater than the depth of the groove, such that the lid is solely supported by the rib in the groove, at least the crest of the rib being convexly arcuate in cross-section and having a second radius of curvature smaller than the first radius of curvature, so that there is a linear contact between the rib and the groove; such that when the bowl contains a liquid and the lid is seated on the rim, the surface tension of the liquid present in the groove between the rib and the groove at their diverging surfaces will provide a continuous seal on both sides of the linear contact between the rib and the groove so as to enhance the retention of the rib of the lid to the groove on the bowl.

4,231,491

BUNDLE SUPPORT FOR COMPACT DISPENSING PACKAGE

Roger P. Pierson, Cincinnati, Ohio; Lawrence V. Mastalish, and Daniel J. Zollar, both of Green Bay, Wis., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 798,960, May 20, 1977, abandoned.
This application Nov. 6, 1978, Ser. No. 958,085
Int. Cl.[3] A47K *10/42;* B65H *1/00*
U.S. Cl. 221—48 3 Claims



1. An improved compact dispensing package for sheetlike materials comprising:

a folded bundle of sheets of flexible material;

a carton for containing said folded bundle of sheets of flexible material; said carton having a top wall with a dispensing aperture therein; and

a support member for maintaining said folded bundle in dispensing position within said carton; said support member being folded from a blank having first and second stem portions and having a stem projecting toward said top wall; said stem comprising an upper edge and said first and second stem portions being joined at said upper edge and having at least one outwardly projecting protuberance integral with said support member and essentially coincident with said upper edge of said stem; said stem having an outer surface which contacts and supports said folded bundle; said protuberance forming an extension of said stem whereby the length of said outer surface of said stem is greater than the sum of the lengths of said first and second stem portions.

4,231,492

APPARATUS AND METHOD FOR DISPENSING PUTTY-LIKE MATERIAL

Paul W. Rios, Strongsville, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Mar. 14, 1978, Ser. No. 886,441
Int. Cl.[3] B67D *5/46*
U.S. Cl. 222—1 24 Claims

1. An apparatus for dispensing putty-like material comprising a hollow, open ended dispenser cylinder, a bottom support plate for said cylinder substantially to close off the bottom opening therein, said support plate having an outlet passage, a dispensing valve for opening and closing said outlet passage, said dispensing valve when moved to the open position having a valve passage in vertical coaxial alignment with said outlet passage, a flexible plastic-like bag containing the putty-like material adapted to be lowered into said cylinder, said bag having a bottom of said flexible plastic-like material which rests on said support plate and covers said outlet passage after lowering of said bag into said cylinder, said dispensing valve when in such open position permitting the insertion of a rod-like device through said outlet passage and said valve passage for puncturing said bottom of said bag to provide an outlet aperture in said bag in vertical alignment with said valve passage and said outlet passage in said support plate, a push plate



in said cylinder including means for contacting the peripheral extent of said cylinder for vertically downwardly directed wiping movement therealong, a top closure plate for said cylinder, and means for urging said push plate downwardly within said cylinder to pressurize the putty-like material within said cylinder, so that when the dispensing valve is moved to the open position, the putty-like material will be dispensed from said apparatus.

4,231,493

LEVER PUMP WITH BUTTON ACTUATOR

Louis F. Kutik, Fort Lauderdale, and Howard E. Cecil, Miramar, both of Fla., assignors to Security Plastics Inc., Miami Lakes, Fla.

Filed Apr. 11, 1979, Ser. No. 28,961
Int. Cl.[3] B05B *11/00*
U.S. Cl. 222—321 14 Claims

1. In a manually actuated dispenser pumping system for dispensing product from a container, comprising:

manually actuated pressurizing pump means having a pumping cylinder and a piston which moves in a first direction during an intake stroke and in an opposite second direction during a pressurizing stroke for pressurizing product withdrawn from the container by said pump means;

storage compartment means in communication with said pump means for storing pressurized product delivered from said pump means;

accumulator piston means under bias in said storage compartment means and movable by the pressure of the product to expand the capacity of said storage compartment means;

restricted orifice means in communication with said storage compartment means and restricted sufficiently to control the rate of product discharge therethrough so as to cause a portion of the product to be stored in said storage compartment during a pressurizing stroke of said piston of said pump means when pumping continuously to be discharged through said orifice on an intake stroke of said piston, said storage compartment means including an outlet opening in communication with said outlet orifice, said outlet opening being disposed relative to said second spring-loaded piston so that it is opened and closed by movement of the second spring-loaded piston thereby completely controlling the flow to the restricted orifice;

said pump means having an intake valve and an exhaust valve, said intake valve allowing the product to enter said pump means from the container, and said exhaust valve allowing the product to enter said storage compartment means;

the improvement comprising:



lever means for operating said pumping piston of said pump means, said lever means having one pivoted end;

and button means manually movable in said first and second directions to operate the other end of said lever means;

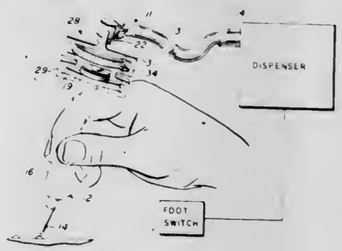
said lever means having an intermediate portion engaging said pumping piston providing a mechanical advantage so that during a given pressurizing stroke of said pumping piston said button means moves farther in said second direction than said pumping piston.

4,231,494

SYRINGE ADAPTOR ASSEMBLY

David L. Greenwood, 3118 Sandy La., Glenview, Ill. 60025

Filed Mar. 22, 1979, Ser. No. 22,698
Int. Cl.[3] B65D *83/14;* B67D *5/54*
U.S. Cl. 222—325 3 Claims



1. A connector for attachment of a syringe to a dispenser adapted to provide measured quantities of pressured gas to said syringe to displace the contents of said syringe in measured drops, said syringe having a filling end having at least two oppositely disposed external flanged projections and a dispensing end having a small aperture, said connector comprising a flexible conduit having a dispenser end and a syringe end, means at said dispenser end for attachment of said conduit to said dispenser, an externally threaded tubular member having a flexible conduit end and a syringe end and connected at said

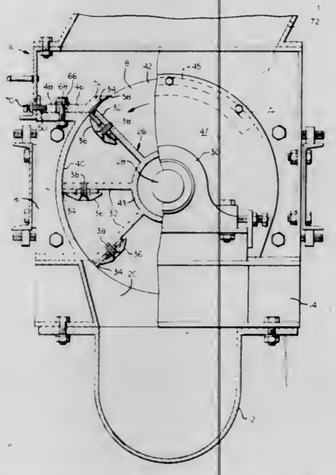
flexible conduit end to said syringe end of said flexible conduit, a syringe retainer member having (1) a collar having centrally disposed apertures loosely fitted about said externally threaded tubular member, (2) oppositely disposed channels for engaging the external flanged projections on said syringe, and (3) a stopper member affixed externally to the syringe end of said externally threaded tubular member, a knurled ring within said collar having an internally threaded aperture threadingly engaged upon said externally threaded tubular member at a portion thereof between said dispenser end and said syringe end, said stopper member having a cylindrical end portion sized to fit loosely within said filling end of said syringe and a sealing flange attached to said cylindrical end portion, said stopper member being movable relative to said retainer member upon rotation of said knurled ring whereby said sealing flange may be moved into and out of sealing engagement with the filling end of said syringe.

4,231,495

ROTARY FEEDER FOR PNEUMATIC CONVEYING LINE

Arvid Lund, North Vancouver, Canada, assignor to Rader Companies, Inc., Portland, Oreg.

Filed Feb. 23, 1978, Ser. No. 880,714
Int. Cl.³ G01F 11/10
U.S. Cl. 222—345 **4 Claims**



1. In a rotary air-lock feeder including a cylindrical housing having a top inlet and a bottom outlet and a rotor mounted in the housing having a plurality of planar, straight edged impeller blades adapted to sweep the walls of the housing of the rotor rotates in the housing, the improvement comprising:

a shear knife mounted on said housing for engagement with the edges of said impeller blades as they rotate past said inlet,

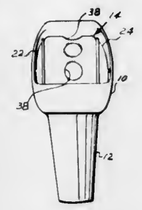
said shear knife comprising a body portion having an arcuate inner surface substantially concentric with said housing axis and a planar top surface lying in a plane defined by two perpendicular intersecting lines one of which lines is horizontal and perpendicular to a vertical plane through said housing axis, the other of said lines being inclined at an angle to the horizontal, said top surface intersecting said inner surface along a sharp edge whereby said sharp edge acts as a shear upon material projecting beyond a rotor blade edge and propelled by a blade upon such sharp edge.

4,231,496

FOOD DISPENSING UTENSIL

Channing W. Gilson, 2046 Hillhurst Ave., Los Angeles, Calif. 90027

Filed Apr. 2, 1979, Ser. No. 26,339
Int. Cl.³ B44D 3/40
U.S. Cl. 222—414 **34 Claims**



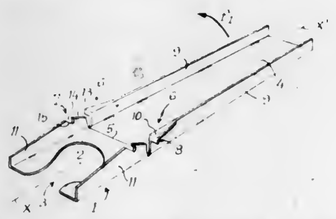
1. A food dispensing utensil comprising: a cup forming a trough; a handle on said cup; a ring rotably supported in said cup, said ring having a cavity to receive a container means containing material to be dispensed, said ring then encircling said container means, said material entering said trough when exiting from said container means, said ring having a peripheral surface at least part of which is from time to time in the trough, thereby to make contact with said material in said trough.

4,231,497

POURING SPOUT WITH PIVOTED NONUSE POSITION

Jean Bourbon, B.P. 1, Saint-Lupicin, France (39170)

Filed Jan. 24, 1979, Ser. No. 6,205
Claims priority, application France, Jan. 25, 1978, 78 02963
Int. Cl.³ B67D 5/06; B67C 9/00
U.S. Cl. 222—527 **7 Claims**



1. A pouring spout for various containers of the type having an attachment offering an oblong opening open from one of its edges so as to permit its fitting by sliding and its maintaining in place on the neck of a container, wherein said attachment is extended, on the opposite side to the inlet cross-section of the oblong opening, by a chute connected to the attachment by an articulation zone perpendicular to its longitudinal axis, said chute being provided with catch-type assembly members which co-operate with complimentary members carried by the attachment and which together ensure the maintenance and immobilization of the chute in a direction differing from that of the attachment.

4,231,498

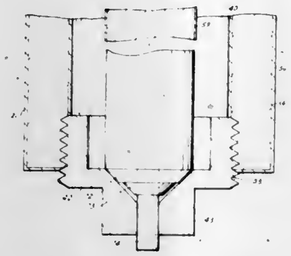
CORROSION-RESISTANT CRUCIBLE WITH GRAPHITE PARTS

James R. Quinan, Loudonville, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Nov. 1, 1978, Ser. No. 956,508
Int. Cl.³ B22D 39/00, 41/10
U.S. Cl. 222—602 **20 Claims**

11. A method of forming a device adapted for metering and transferring liquid metal comprising; the forming of a crucible structure having an open upper end and including a pouring spout having an orifice and a stopper rod shiftable between a

position seating on the pouring spout and sealing the orifice therein and a position removed from the pouring spout to permit liquid metal to flow into and out of the crucible, the space between the open upper end and the stopper rod forming a passage in the crucible structure for the escape of gases from



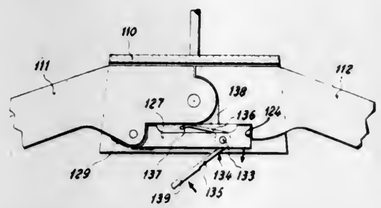
liquid metal contained within the crucible structure, forming at least the portions of the stopper rod and pouring spout which seat to seal the orifice of graphite material, and locating a tip on the stopper rod to extend into the orifice when in the seated position to facilitate isolation of the graphite portions from atmosphere.

4,231,499

HANGER WITH COLLAPSIBLE ARMS PROVIDED WITH A RELEASE AND LOCKING MECHANISM

Peter Smith, Via San Godenzo 16, 00189 Roma, Italy

Filed Mar. 22, 1978, Ser. No. 889,008
Claims priority, application Italy, Aug. 4, 1977, 50565 A/77; Dec. 1, 1977, 52031 A/77
Int. Cl.² A47J 51/10
U.S. Cl. 223—94 **1 Claim**



1. A collapsible garment hanger comprising:

a mounting block having a supporting hook;

a pair of arms pivoted to said block for pivotal movement between a first positon wherein said arms are oppositely laterally directed from said block for supporting a garment and a second position extending downwardly from said block to permit a garment to drop therefrom;

interengageable abutments on said arms for limiting relative pivotal movement thereof to said first position;

a spring operated release and locking mechanism extending between said arms for urging said arms to said first position and locking the same in said first position;

manually operable means connected to said mechanism for releasing said arms to drop to said second position;

said mechanism comprising a lever pivoted to one of said arms and having a free end portion bearing on the underside of the other arm, a torsion coil spring urging said free end against said other arm, the free end portion of said lever engaging a shoulder on said other arm when said arms are in said first position to thereby lock said arms, said manually operable means being connected to said lever for swinging the same against the action of said spring;

said free end portion of said lever comprising an upwardly extending projection and said underside of said other arm comprises a cam surface adjacent said shoulder and oblique to the longitudinal axis of said other arm; and

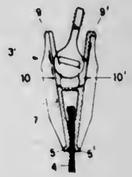
said manually operable means comprising a bell-crank pivoted at its apex within a slot in said lever and having one leg bearing on said one arm and the other leg extending downwardly from said lever.

4,231,500

CLOTHES HANGER

Mario Mainetti, Valdagno, Italy, assignor to S.A. Mainetti, Seclin, France

Filed Feb. 22, 1979, Ser. No. 14,022
Claims priority, application Norway, Apr. 17, 1978, 781330
Int. Cl.³ A47J 51/142
U.S. Cl. 223—96 **6 Claims**



1. A clothes hanger comprising a cross member having a central suspension hook, a pair of clamps carried by the opposite ends of the cross member and each having a pair of opposing substantially rigid claws in articulated relationship with arm extensions of the claws projecting above the points of articulation of the claws, and a pair of cam-shaped rotatable spreading elements one for each clamp lodged between said arm extensions of the clamps to thereby spread the arm extensions apart and draw said claws of the clamps together in gripping engagement on an article of clothing inserted between said claws, and each spreading element comprising an inside hollow portion formed of resilient material positioned perpendicular to the arm extensions of each clamp, an operating arm on said inside hollow portion, and two pegs eccentrically positioned on said inside hollow portion protruding perpendicularly from the plane of said portion and acting simultaneously on the internal surfaces of both arm extensions.

4,231,501

WINDOW MOUNT SKI RACK

David P. Goode, 2015 Long Lake Shores, Orchard Lake, Mich. 48033

Division of Ser. No. 695,314, Jun. 11, 1976, Pat. No. 4,077,554. This application Jan. 13, 1978, Ser. No. 869,110
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.
Int. Cl.³ B60R 9/12
U.S. Cl. 224—42.46 R **1 Claim**



1. A ski rack arrangement adapted to be mounted on any

substantially vertical window panel of an automotive vehicle comprising:

first and second support units, each including a frame which includes an elongated frame member;

a pair of spaced elongate ski support members carried by and mounted along the length of each said elongated frame member, said elongate ski support member ends extending from one side of the frame to form rests for vertically spaced pairs of skis;

each said frame having mounted thereon at least one suction cup for securement to the window panel; and

at least one hanger of flat stock extending from each said elongated frame member, each said hanger disposed transversely to said elongate ski support members and having a hooked free end for disposition over the top edge of the window disposing each said elongate frame member in a generally vertical direction, to vertically space said elongate ski support members;

a tie for each of said elongate ski support members;

means anchoring each of said ties at one end to one of said elongate ski support members at the point whereat each of said elongate members is anchored into each said elongated frame member, and means for releasably securing said tie to the other free end of said elongate ski support member;

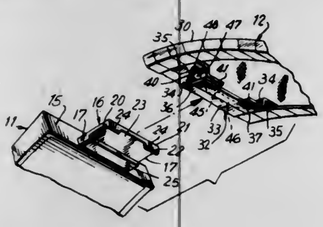
said first and second units being adapted for spaced apart mounting so as to receive and hold skis between the ski support members thereof at two spaced points and secured by said elastic ties.

4,231,502

WATCH BRACELET

Stanley Meyerson, 1111 Ocean Ave., Brooklyn, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,898
Int. Cl.³ A44C 5/14
U.S. Cl. 224—177 **6 Claims**



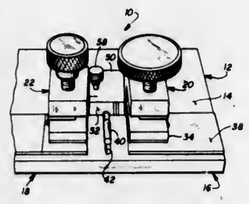
1. A watch bracelet, for connection to a watch casing lug having a retaining boss, said lug having a laterally extending groove located longitudinally inwardly of and defining said boss, and said lug having a land longitudinally inwardly of said groove, comprising a band having an end portion; a hollow housing extending across said band end portion and having one side open for receiving said lug; and a resilient element captive in said housing and normally obstructing the insertion of said lug in said housing, said resilient element being deflectable in said housing to pass said lug with said boss past said resilient element, for retaining engagement of said boss by said resilient element; wherein said resilient element comprises a leaf spring deflectable out of the path of said lug in the direction of, and beyond, said boss to pass said boss and releasable into resilient bearing engagement with said lug and positive retaining engagement with said boss; said leaf spring has a crest remote from said band and has spaced troughs proximate to said band for deflection of at least one of said troughs away from said band to pass said lug and boss, said troughs being in bearing engagement with said groove during connection of the watch casing and the bracelet; and said housing is spaced from a portion of said band adjacent to the land for conforming engagement with said band when said trough of said spring is in said groove.

4,231,503

MICROTOMY KNIFE BREAKER

James K. Butler, 1412 Woodbine Crt., Arlington, Tex. 76012

Filed Mar. 5, 1979, Ser. No. 17,455
Int. Cl.³ C03B 33/02
U.S. Cl. 225—2 **13 Claims**



1. A glass-breaking apparatus adapted for breaking microtome knives of the Ralph type, comprising:

(a) a base having a generally horizontal upper surface, and having right and left portions;

(b) right and left upright structures fixed to the right and left portions of the base, and the upright structures having portions which extend in a cantilevered fashion over the upper surface of the base, and said right and left upright structures having a central gap therebetween;

(c) a rigid fulcrum comprising a hardened and elongated member which is fixed so as to lie between the two upright structures and in a vertical plane being perpendicular to a receiving area for rectangular glass pieces, and the length of the fulcrum being appreciably less than the length of said cantilevered portions of the upright structures, whereby a piece of glass which is wider than said fulcrum may be selectively positioned over said fulcrum and under said cantilevered portions;

(d) structural means having a planar face against which a piece of scored glass can be pushed so as to be positioned over the fixed fulcrum and centered with respect to the fulcrum as measured in a front-to-rear direction, and said structural means being selectively movable in order that glass pieces of variable width may be positioned such that equal amounts of glass extend beyond both ends of the fulcrum; and

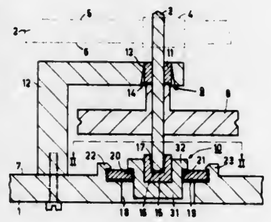
(e) means associated with the right and left upright structures for forcing a piece of glass to be fractured along a line generally parallel to the fulcrum.

4,231,504

ADJUSTING MECHANISM FOR A TAPE RECORDER CAPSTAN

Manfred Ketzer, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1979, Ser. No. 41,672
Claims priority, application Austria, Jun. 9, 1978, 422478
Int. Cl.³ B65H 17/22
U.S. Cl. 226—180 **5 Claims**



1. A recording and/or playback apparatus for a record carrier in the form of a tape, comprising a drive shaft rotatable about a longitudinal direction for transport of a tape; two bearings spaced apart from each other in the longitudinal direction of the shaft, in which the shaft is rotatably journalled; and means for mounting the bearings arranged to permit pivoting of the shaft longitudinal direction and for adjusting the angular position of the shaft relative to a reference surface, said means including an adjusting device for moving at least one of the bearings,

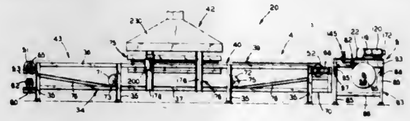
wherein the apparatus includes a guide along which said at least one bearing is movable in a direction of guiding, and said device comprises a movable control slide having at least one sliding surface arranged at an acute angle with respect to said direction of guiding, said slide moving said at least one bearing along the guide as the slide is moved.

4,231,505

METHOD AND APPARATUS FOR PRODUCING SOLAR COLLECTOR PANELS

Anthony R. Shaw, Waterville; Wallace F. Krueger, Toledo, and Lloyd E. Bastian, Perrysburg, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 11, 1978, Ser. No. 950,511
Int. Cl.³ B23K 3/00, 3/06
U.S. Cl. 228—14 **7 Claims**



1. Apparatus for producing a solar collector panel comprising: a conveyor for supporting a thin metallic, heat conductive sheet in a substantially horizontal plane, said sheet having a plurality of grooves formed therein in a predetermined pattern for receiving a tube assembly formed of conduits arranged in the same predetermined pattern, means for sequentially feeding strips of solder in one direction into said grooves of said sheet before placement of said conduits of said tube assembly therein, means for moving said feeding means transversely of said one direction, said sheet, said strips of solder and said tube assembly forming a loosely assembled unit, means advancing said conveyor for moving said loosely assembled unit in a horizontal path to a heating station, means for clamping said unit together at said heating station, and means for heating said unit to melt said solder strips and bond said tube assembly to said sheet.

4,231,506

METHOD OF WELDING METAL PIPE SECTIONS WITH EXPLOSIVES

Stephen M. Istvanffy, Beaconsfield, Canada, and Vonne D. Linse, Columbus, Ohio, assignors to Canadian Industries Limited, Montreal, Canada

Filed May 21, 1979, Ser. No. 40,515
Int. Cl.³ B23K 20/08
U.S. Cl. 228—109 **7 Claims**

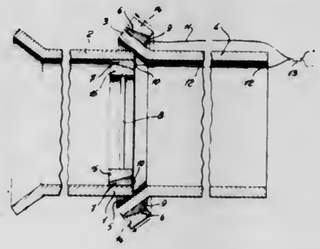
1. A method of welding together a pair of metal tube sections comprising:

(a) Positioning the ends of two metal tube sections together in male/female telescoping relationship, the female tube end being flared outward at an acute angle to the wall of the tube and the male tube end being in contact with an inside circumference of the said female flared tube end,

(b) placing a first continuous substantially band-like charge of a welding explosive against and around the exterior surface of the said female flared tube end,

(c) placing a second continuous substantially band-like charge of welding explosive against and around the interior surface of the male tube end so that the two explosive bands are in a position substantially concentric and adjacent on opposite sides of the telescoped region,

(d) providing initiating means for each of said welding explosive charges, said initiating means comprising a continuous elongated, cord-like charge of high explosives having a velocity of detonation at least 50% greater than the velocity of detonation of said welding explosive charges, the said elongated initiating charges resting in initiating contact with the edge of each charge at a point closest to the narrow diameter of said female flared pipe section, and



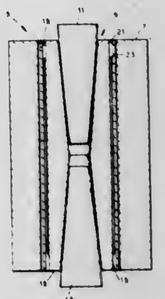
(e) detonating the said welding charges simultaneously by the initiation of each of said cord-like initiation charges at a single initiation point on each cord-like charge, the initiation points being superimposed and opposite one another, the resultant detonation shock front from each of said welding charges moving around the pipe while maintaining a large angle to the tube axis to drive together said female flared section and said male tube end to form a welded connection.

4,231,507

HIGH-TEMPERATURE, HIGH-PRESSURE BONDING OF NESTED TUBULAR METALLIC COMPONENTS

Thomas C. Quinby, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 9, 1979, Ser. No. 2,140
Int. Cl.³ B23K 20/14
U.S. Cl. 228—131 **4 Claims**



1. A graphite tool for use in diffusion-bonding a plurality of nested tubular metallic components to form a unitary tubular assembly thereof, said tool comprising:

a tubular restraining member having an axis,

a tubular core coaxially mounted within said member and defining therewith an annulus for reception of said nested components, said core being formed of a plurality of axially elongated segments each displaceable outwardly away from said axis, said segments having confronting curved inner faces cooperatively defining opposed, inwardly tapering, axially extending bores which extend

respectively from the ends of said core to the transverse midplane thereof, and

independently movable, solid, tapered rams respectively extending into said bores and movable inwardly therein to the region of said midplane to be in contact with and exert radially directed force on at least most of the interior surface of said core and compress the received nested components against said member.

3. The method of bonding a metallic foil to a metallic substrate to form a unitary tubular assembly thereof, said method comprising:

providing a bonding tool comprising a graphite tubular restraining member; a mechanically expandable graphite core coaxially mounted in said member, said core being formed of axially elongated and individually radially displaceable segments having curved outer faces which cooperatively define a cylindrical pressing surface which with said member defines an annulus, said segments having curved inner faces which cooperatively define two opposed and inwardly tapering axial bores; and independently movable, solid, tapered graphite rams respectively extending into said bores and movable inwardly therein to positions adjacent said midplane to urge said segments and pressing surface toward said member;

positioning said foil and substrate in nested relation in said annulus, each of the members so positioned being in the form of a tube having a pair of abutting edges;

maintaining the resulting loaded tool in a non-reactive atmosphere and at an elevated temperature promoting bonding of said foil and substrate; and

while the loaded tool is so maintained, maintaining a selected inwardly directed force on each of said rams to exert radially directed force on most of the interior surface of said core and compress said foil and substrate against said restraining member to effect uniform bonding of the confronting faces of said foil and substrate.

4,231,508

METHOD OF MAKING A PLATE-TYPE HEAT EXCHANGER

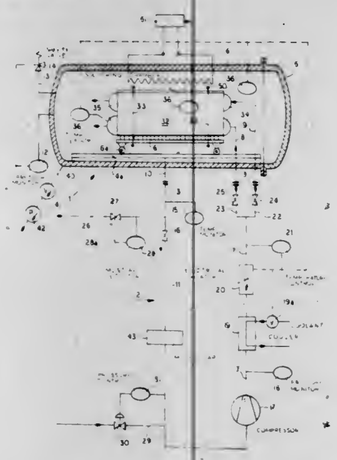
Norbert Wagner, Schlederloh, Fed. Rep. of Germany, assignor to Linde AG, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 778,460, Mar. 17, 1977, Pat. No. 4,140,266. This application Nov. 24, 1978, Ser. No. 963,289

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611832

Int. Cl.[3] B23K *1/00*

U.S. Cl. 228—219 **9 Claims**



1. A process for the soldering together of a stack of plates defining spaces between them to form a plate-type heat exchanger from the plates and wherein the spaces are formed as a plurality of passages of said heat exchanger running from one side of the stack to another side thereof generally along the plates, said method comprising the steps of:

holding said plates together in a sealed chamber with solder disposed at junctions between them;

passing a heating gas directly through said passages by distributing said gas thereto and thereby heating said plates, said heating gas being a gas inert with respect to the solder and said plates and being at a temperature below the melting point of said solder the heating gas traversing said passages before entering the chamber space around the held-together plates;

thereafter only discharging the heating gas into the chamber space around the held-together plates;

terminating the flow of gas through said passages;

heating said chamber to a temperature above the melting point of said solder thereby causing said solder to flow and bond said plates together; and

cooling said plates.

4,231,509

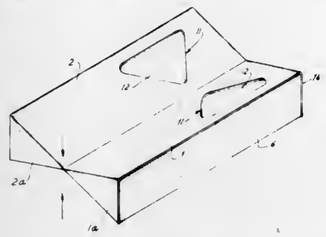
PACKAGE AND BLANK THEREFOR

John J. Austin, Hinsdale, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed May 9, 1979, Ser. No. 37,432

Int. Cl.[3] B65D *5/00, 5/42*

U.S. Cl. 229—22 **4 Claims**



1. A package for a carded blister pack including a generally planar card having two parallel rows of products secured thereto, said package comprising a single sheet folded to define two hollow sections of triangular cross-section which are connected at the apices of the respective triangles, each triangle including an upper wall portion and an identical lower wall portion, and a side wall portion extending from said upper wall portion to said lower wall portion, the upper wall portions of said triangles being inclined downwardly towards one another and towards said lower wall portions, while the latter are inclined upwardly towards one another and towards said upper wall portions, said package further including end walls closing the ends of said hollow sections whereby, with the carded blister pack disposed within the carton, each row of products is respectively disposed within a triangular hollow section.

4,231,510

LIGHT BULB CONTAINER

John M. Beard, Thamesford, Canada, assignor to A & C Boehmer Limited, Kitchener, Canada

Filed Mar. 26, 1979, Ser. No. 23,949

Claims priority, application Canada, Jul. 27, 1978, 308239

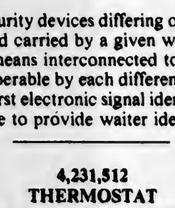
Int. Cl.[3] B65D *85/42*

U.S. Cl. 229—39 B **4 Claims**

1. A folding open ended container for a pair of light bulbs, each having a bulb portion and a stem, said container formed from a one piece blank and comprising:

(a) four interconnecting walls to define a rectangular sleeve having a top, bottom, two opposite sides, and two open ends, and

(b) a partition element having first and second separating portions and first and second bulb retaining portions, the separating and retaining portions each extending across the sleeve between the top and bottom,



the bulbs being received in the container in end to end relationship with the separating portions of the partition element extending between the bulbs to prevent contact between them and each of the retaining portions of the partition element extending between the bulb portion of one of the bulbs and a respective open end of the container to longitudinally retain said bulb in the container.

4,231,511

WAITER/TABLE CONTROL FOR ELECTRONIC CASH REGISTERS

Matthew J. Campanella, Hammonton; Anthony Maladra, Cherry Hill, and Bennett C. Goldberg, Cinnaminson, all of N.J., assignors to MKD Corporation, Cherry Hill, N.J.

Filed Apr. 17, 1979, Ser. No. 30,760

Int. Cl.[3] G06F *15/20*; G06K *15/02, 21/00*

U.S. Cl. 235—375 **15 Claims**



1. In electronic cash registers of the type used in restaurants and the like and providing for data input to the electronic cash register such as waiter identification and table number, the improvements in the mode of waiter/table identification comprising:

a plurality of security devices differing one from another and assigned to and carried by a given waiter; and

first electronic means interconnected to the electronic cash register and operable by each different security device for generating a first electronic signal identifiable with a given security device to provide waiter identification.

4,231,512

THERMOSTAT

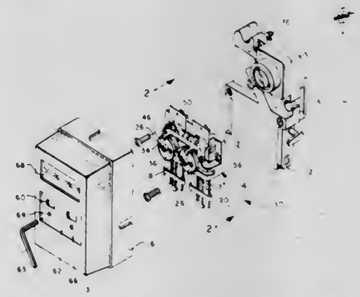
Allan B. Johnson, Mt. Prospect, Ill., assignor to Mark Controls Corporation, Evanston, Ill.

Filed Jun. 26, 1978, Ser. No. 918,969

Int. Cl.[3] G05D *23/00*

U.S. Cl. 236—47 **3 Claims**

1. In an improved pneumatic thermostat of the type having two control modes and means to switch from one control mode to the other, said thermostat including two bimetallic elements each regulating the control pressure by exerting force on a pin inside an exhaust nozzle, a control assembly having a bridge extending above and across said bimetallic elements, said bridge having two threaded openings therethrough in locations corresponding to the locations of the bimetallic elements, two dial screws, each threaded into said threaded openings and extending through the bridge to contact the bimetallic elements biased against said dial screw, two tool receivers secured to each of said dial screws, two temperature scales, each secured on one of said dial screws; two set print indicators mounted to said bridge and pointing to said temperature scale;



a cover having windows in locations corresponding to the location of the reading pointed to by each set point on each temperature scale and having two holes in locations corresponding to said tool receivers so that said dial screws can be adjusted by a tool fitting in said tool receivers without removing said cover, the improvement comprising:

a post on said bridge between said dial screws;

at least one restrictor plate secured to each dial a portion of said plate extending far enough beyond the circumferance of said dial to limit the arc through which each dial can be turned without being stopped by the post.

4,231,513

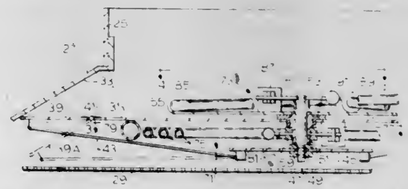
THERMALLY ACTUATED DIFFUSER

Robert L. Vance, Cupertino, and Robert W. Noll, Santa Rosa, both of Calif., assignors to Acutherm, Inc., Novato, Calif.

Filed Mar. 17, 1978, Ser. No. 887,936

Int. Cl.[3] F24F *7/00*

U.S. Cl. 236—49 **4 Claims**



3. A diffuser for circulating conditioned air into a room from a ceiling location within the room and comprising,

an outer can defining an air flow path,

said can having an air discharging outlet,

flow directing means located within the can and having a configuration to cause the air flow to be directed laterally outwardly from the air discharge outlet at a narrow angle with respect to the adjacent ceiling,

volume flow regulating means mounted in the can and movable to vary the volume flow of conditioned air through the diffuser,

a diffuser plate located in the can for receiving circulated room air along the underside of the diffuser plate and having an upperside which causes all the conditioned air to flow through the air discharge outlet,

sensor actuator means mounted on the underside of the

diffuser plate and effective both to sense changes in the room air temperature and to actuate the movable volume flow regulating means directly from power produced by a change in the sensed room air temperature,

and wherein the volume flow regulating means are operatively associated with the flow directing means to maintain sufficient velocity energy in the air flow through the air discharge outlet that the air flow hugs the ceiling and avoids dumping at all volumes of flow through the diffuser, and wherein the diffuser plate is a rectangular plate, said flow directing means include a vane extending along each edge of the diffuser plate and connected to the diffuser plate by a hinge connection so as to permit swinging movement of the vane about the hinge connection and toward and away from an inner, adjacent surface of the can to vary the volume flow with changes in angular position of the vane and wherein the volume flow regulating means include a rotatable control element mounted for rotation on the diffuser plate by the sensor actuator means and having linkages connecting the rotatable control element with each of the vanes for repositioning the vanes with rotation of the control element by the sensor actuator means.

4,231,514

AUTOMATIC VENTILATOR

Edward D. McSwain, Rte. 7, Box 328, Lincolnton, N.C. 28092

Filed Sep. 10, 1979, Ser. No. 73,892
Int. Cl.³ F24F *7/00*
U.S. Cl. 236—49 **11 Claims**



1. An improved wall ventilator for use in building constructions comprising:

(a) a housing having peripheral wall means defining an air flow passageway through the housing;

(b) a first louver section attached to said peripheral wall means and extending across a front portion of said passageway, said first section comprising a fixed panel having a plurality of spaced openings extending therethrough;

(c) a second, movable louver section positioned in and extending across said passageway behind said first louver section panel, said second louver section comprising a plurality of movable panels extending in side by side relation and being pivotally interconnected along their adjacent side edges to move about said edges;

(d) means pivotally connecting the opposite side edge portion of an end one of said second louver section panels to an adjacent side of said first louver section or housing wall means;

(e) means operatively connecting the opposite side edge of the other end one of said second louver section panels to said first louver section panel for sliding movement of said side edge along the rear face of said first louver section panel in response to pivotal movement of said plurality of second louver section panels about their interconnected adjacent side edges;

(f) said second louver section panels being pivotally movable between a first position wherein said panels thereof lie in a common plane parallel to and closely adjacent the plane of said first section panel, and a second position wherein said second louver section panels pivot about their interconnected side edges to lie in planes which are non-parallel to the plane of said first louver section panel;

(g) said second louver section panels having a plurality of openings therethrough alternately spaced therein with respect to said fixed panel openings such that imperforate portions of said first and second louver section panels overlie the openings of the other when said second section panels are in said first position to close the air flow passageway of the housing; and

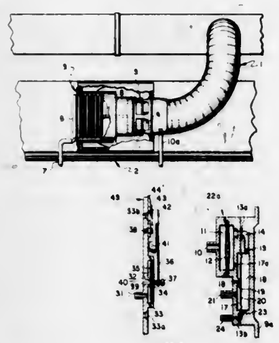
(h) means attached to said second louver section panels for moving said second louver section panels between said first and second positions to respectively close and expose said openings of said first and second louver section panels and control passage of air through said housing air flow passageway.

4,231,515

PRESSURIZED CONTROL SIGNAL APPARATUS

H. Kenneth Ring, Jr., Houston, Minn., assignor to The Trane Company, La Crosse, Wis.

Filed Jun. 4, 1979, Ser. No. 45,527
Int. Cl.³ G05D *23/08*
U.S. Cl. 236—87 **8 Claims**



1. Pressure regulating temperature responsive apparatus comprising

a. housing means for defining a chamber;

b. port means extending through said housing means in continuous, unobstructed fluid communication with said chamber, and adapted for connection to a source of air having a variable pressure in excess of atmospheric pressure, for conveying said air into said chamber, and for transmitting a control signal therefrom, said control signal changing pressure in response to temperature;

c. bleed valve means for bleeding air from said chamber;

d. diaphragm means forming a wall of said chamber and operative to control and effect the flow of air out of said bleed valve means in response to an increase in pressure exerted on the diaphragm means by air within said chamber from said source of variable air pressure, thereby causing said control signal not to exceed a maximum pressure in excess of atmospheric pressure, said maximum pressure being determined by the summation of forces acting on the diaphragm means; and

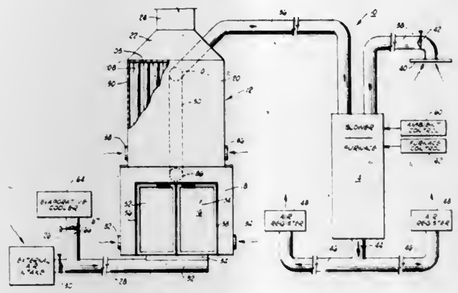
e. temperature responsive means adjacent said diaphragm means for directly exerting a force thereon, thereby biasing said diaphragm means to limit the pressure within said chamber to said maximum pressure in response to temperature.

4,231,516

HEAT CONTROL SYSTEMS

Charles E. Weingartner, Rte. 6, Box 413, Shawnee, Okla. 74801

Filed Feb. 24, 1978, Ser. No. 880,970
Int. Cl.³ F24B *7/02*
U.S. Cl. 237—81 **11 Claims**



1. An auxiliary fuel burning temperature control apparatus for use in a building enclosure in combination with a central furnace and blower system, comprising:

first chamber means having a front opening and defining a fireplace with a continuous volume of chamber around the rear and both sides, said chamber having air intake vents proximate the bottom of each side and an air exhaust vent proximate the top of the rear;

means for enclosing said first chamber means front opening to close said fireplace;

second chamber means of generally cubical form for secure affixure on top of said first chamber means, said second chamber means including a plurality of rows of flue pipes extending vertically therethrough and into communication with said fireplace, said second chamber means including lower lateral air intake vents and upper exhaust vent;

manifold and chimney means securely affixed over the top of said second chamber means;

means for introducing air into said first chamber means fireplace from external to said building enclosure; and

duct means for conveying conditioned air from said upper exhaust vents of each of the first and second chamber means to said central furnace and blower system for distribution within said building enclosure.

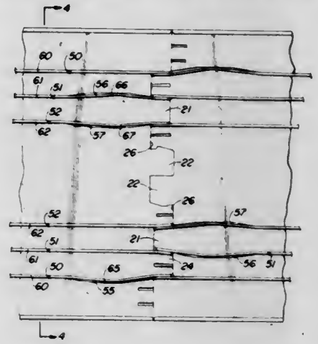
4,231,517

TRACK SECTION FOR MODEL VEHICLES

Richard C. M. Cheng, Suite 1604, Austin Center, Austin Ave., Kowloon, Hong Kong

Continuation-in-part of Ser. No. 717,581, Aug. 25, 1976, Pat. No. 4,084,746. This application Dec. 5, 1977, Ser. No. 857,503
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.² A63H *18/02, 18/12*
U.S. Cl. 238—10 F **2 Claims**

1. A track section for model vehicles, said track section comprising a generally flat bed having an upper working surface bounded within a pair of spaced side edges, a plurality of spaced projections on each end edge, said projections combining to define recesses in the spaces between said projections, said projections and recesses being configured for interdigitation upon end to end aligned engagement with a like track section, said working surface being formed with upwardly facing slots having their opposite ends opening into said recesses adjacent to said projections, conductive strips located in said slots and having end portions extending through the open slot ends into said recesses along the adjacent sides of said projections for wiping engagement of said strip end portions with the strip end portions of a like track section on said end to end aligned engagement, and an upstanding wall on each side edge of said bed and having its lower edge spaced above the underside of said bed to define a recess between the lower edge of each upstanding wall and the adjacent side edge of said bed, each of said recesses having a cross-sectional configuration substantially identical to the cross-sectional configuration of a respective upstanding wall above said working surface, for nesting superposed engagement with a like track section with



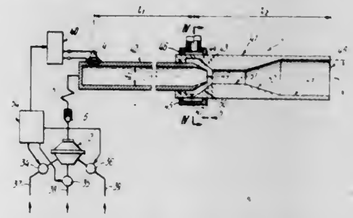
the upstanding walls of the lower section conformably entering said recesses of the upper section for maximum economy of space in storage, said conductive strips being resilient and substantially straight in undeflected condition, and said slots being of a nonstraight configuration to receive said strips in a resiliently deflected condition without permanent strip deformation, said resilient strip deflection serving to frictionally retain said strips in said slots.

4,231,518

APPARATUS FOR EXPLOSIVE APPLICATION OF COATINGS

Anatoly I. Zverev, ulitsa Bratislavskaya, 26, kv. 22, Kiev, and Alexandr S. Bondarenko, ulitsa Nizhegorodskaya, 26, kv. 40, Moscow, both of U.S.S.R.

Division of Ser. No. 788,925, Apr. 19, 1977. This application Mar. 26, 1979, Ser. No. 23,895
Int. Cl.² B05B *1/24*
U.S. Cl. 239—81 **5 Claims**



1. An apparatus for the explosive application of coatings comprising: a composite lengthwise explosion chamber having telescopically interconnected terminal and inner parts, said terminal part being arranged outside and partially enclosing said inner part, said inner part accommodating at least one spark plug and terminating in a jet nozzle, an inner space being defined between said terminal and inner parts, and the zone of interconnection of said terminal and inner parts of said explosion chamber being surrounded by an annular casing which defines, with said terminal part, a space communicating with said inner space; a batcher for metering pulverulent coating material; a preparation chamber for preparation of an explosive mixture communicating with said explosion chamber; a mixing chamber of said batcher communicating with said explosion chamber; a jet nozzle mounted in said mixing chamber for

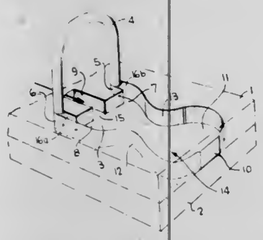
positively feeding the pulverulent coating material to said explosion chamber; a hopper communicating with said mixing chamber via a passage; a device mounted in said passage for controlling the cross-section area of said passage; a non-return valve mounted in a portion of said passage connected to said hopper to close the passage upon back impact of an explosion wave from said explosion chamber; and a partition wall of a gas-permeable material mounted within said hopper in equally spaced relation to walls of said hopper to define an annular space and communicating with a source of compressed gas, said compressed gas passing through said partition wall to prevent the pulverulent coating material in said hopper from being self-compacted.

4,231,519

FLUIDIC OSCILLATOR WITH RESONANT INERTANCE AND DYNAMIC COMPLIANCE CIRCUIT

Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20767

Filed Mar. 9, 1979, Ser. No. 19,250
Int. Cl.³ B05B 1/08
U.S. Cl. 239—102 **24 Claims**



1. A fluidic oscillator having a chamber, an inlet opening for issuing a jet of working fluid into said chamber, and an outlet opening for issuing working fluid from said chamber into the ambient environment, characterized by a fluid inertance flow conduit transferring working fluid between first and second locations on opposite sides of said jet and near said inlet opening in said chamber, and a dynamic compliance in the form of a vortex region defined between sidewalls of said chamber which generally converge towards said outlet opening and near said outlet opening such that working fluid in the jet forms in said vortex region a vortex which alternately flows in opposite directions, the vortex alternately aspirating fluid from and supplying fluid to said first and second locations in opposite phase and thereby through said inertance in alternately opposite directions.

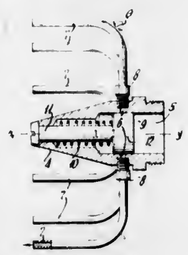
4,231,520

LIQUID SPRAYER

John E. Waldrum, 349 Fairview Ave., Ambler, Pa. 19002

Filed Mar. 2, 1979, Ser. No. 17,078
Int. Cl.³ B05B 1/14, 1/32
U.S. Cl. 239—171 **6 Claims**

1. A spray device for use on a moving vehicle comprising:
(A) a central body having a conduit defined in said body, said conduit forming a liquid inlet port at one end of the central body, and a plurality of liquid outlet ports located about the periphery of said conduit;
(B) a plurality of discharge tubes extending outwardly from said central body, each of said discharge tubes having one end connected to one of said outlet ports and the other end projecting in a direction opposite the direction of movement of the vehicle during use; and
(C) moveable, pressure-actuated outlet-blocking means positioned in said conduit, said outlet-blocking means being positioned to interrupt communication between said conduit and said outlet ports when the liquid pressure in the conduit is below a predetermined actuating pressure and being positioned to allow communication between said conduit and said outlet ports when the liquid pressure in the conduit is above a predetermined actuating pressure, wherein said outlet-blocking means comprises: a piston which is moveable in said conduit, said piston being positioned in said conduit such that it is normally in a position in which it blocks communication between said conduit and said outlet ports and is capable of being moved into a non-blocking position by the action of liquid pressure in the conduit acting against said piston in a direction opposite the direction in which the piston is moved by the action of said liquid pressure, said opposing force being of sufficient magnitude to cause said piston to move into a blocking position whenever the liquid pressure in the conduit is below the predetermined actuating pressure, and wherein said piston is cylindrical in configuration and said conduit is cylindrical in configuration for at least that portion of its length along which the piston travels in



moving from the outlet-blocking position to the non-blocking position and wherein the end section of each discharge tube nearest the outlet port extends along a line which is radial from the cylindrical axis of said conduit and the middle section of the discharge tube is curved so that the other end section projects along a line essentially parallel to said cylindrical axis in a direction opposite the direction in which the vehicle moves during use, and wherein said piston is hollowed out along a portion of its axial length to form an annular section, said piston being made of a polymeric material which is capable of undergoing cold flow under pressure, and wherein said device further comprises a diametrically expandable spring securely positioned inside the annular section of said piston, the bias of said spring exerting an outward force on the annulus walls, causing a liquid seal to be maintained between the piston and the conduit wall after the piston has undergone wear.

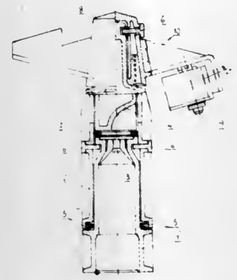
4,231,521

WATER SPRINKLER

Mair Hermine, Bolzano, Italy, assignor to Ipierre Sirotex, S.p.A, Italy

Filed Mar. 5, 1979, Ser. No. 17,454
Claims priority, application Italy, Mar. 23, 1978, 4819 A/78
Int. Cl.³ B05B 3/14
U.S. Cl. 239—230 **9 Claims**

1. A water sprinkler comprising a sleeve portion fixedly mountable on a water supply pipe, a rotatable member rotatably mounted on the sleeve, nozzle means fixedly mounted in the upper portion of the sleeve so as to be coaxial therewith, and a baffle located within the rotatable member, the baffle being coaxial with the sleeve, the rotatable member having pivotally mounted thereon at least one swing arm carrying at least one shaped member adapted, in use, to lie in the path of water issued from the nozzle and deflected by the baffle.

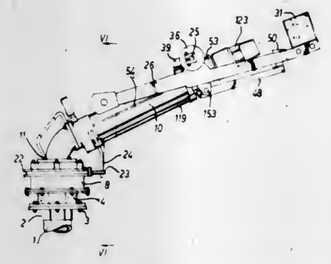


4,231,522

STEP-BY-STEP IRRIGATOR

Arno Drechsel, Via Weggenstein No. 29, Bolzano, Italy

Filed Feb. 8, 1979, Ser. No. 10,404
Claims priority, application Italy, Feb. 9, 1978, 46814 A/78; Sep. 14, 1978, 46889 A/78
Int. Cl.³ B05B 3/08
U.S. Cl. 239—233 **12 Claims**



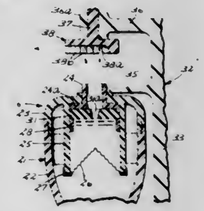
1. In a step-by-step irrigator, of the type comprising a column, a propelling tube rotatable relative to said column, a torsional brake between said column and said tube, said propelling tube including a laterally extending portion for directing a jet of water along an outward path relative to said column, an impulse arm assembly having a nose, deflector means on said nose, means mounting said impulse arm assembly on said propelling tube for periodic swinging movement between a first position in which a stop on said arm engages a stop on said tube and said deflector means at the nose is in the path of the water jet, and a second position in which the deflector means is spaced from the water jet path, said deflector means being of the type in which the rotational thrust exerted on the tube increases with increased water pressure, and return means for returning the arm toward said first position, a rapid return deflector disposed at the end of a lever lying below the laterally extending portion of the propelling tube, which rises into and lowers below the jet under the action of a mechanism for reversing the rotational direction of motion of the tube, the improvements comprising, in combination, means for automatically adjusting the braking of the rotation of the rotatable tube to increase the braking in response to increased pressure of the water at the propelling tube, and means for adjusting the period of swing of the swinging mobile nose, said deflector means comprising double acting deflector means for swinging the arm in response to impingement thereon by the water jet to move said arm toward said second position, and to arrest said swing during the return movement toward said first position when the stop on said arm is close to colliding with the stop on said propelling tube.

4,231,523

IRRIGATION SYSTEM AND VOLUME CONTROL VALVE THEREFOR

Merle A. Vikre, 32 Windward Way, New Port Richey, Fla. 33552

Continuation of Ser. No. 765,266, Feb. 3, 1977, abandoned. This application Dec. 19, 1978, Ser. No. 971,038
Int. Cl.² B05B 1/32
U.S. Cl. 239—454 **32 Claims**



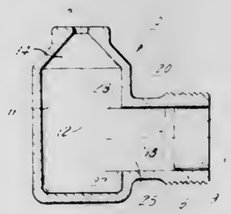
1. A device for distributing a constant volume spray of water comprising:
(a) an enclosed housing defining an internal chamber, a fluid inlet adapted for connection to a source of water for receiving water into the chamber, and an outlet constructed and arranged to issue a jet of water therefrom, the transverse dimension of the internal chamber being large in comparison with the transverse dimension of the inlet and outlet;
(b) spray deflector means disposed relative to the outlet for intercepting the jet of water and deflecting it into a spray pattern of predetermined shape;
(c) volume control means associated with the housing outlet for providing an essentially constant output volume of water from the housing outlet; and
(d) a wall member projecting internally into the chamber from the housing outlet in encircling relation thereto and in general alignment therewith, the wall chamber defining an open free end through which water is received from the inlet, said wall member at its free end having an internal transverse dimension larger than the transverse dimension of said inlet and outlet, and said wall member being spaced from the internal wall of the housing to define a dead ended annular space therewith in which air may be caught to act as a shock absorbing cushion to incoming water.

4,231,524

LARGE FLOW NOZZLE

George F. Aprea, Dedham, and Werner P. Pohle, Lynn, both of Mass., assignors to Wm. Steinen Mfg. Co., Parsippany, N.J.

Filed Jul. 12, 1979, Ser. No. 56,870
Int. Cl.³ B05B 1/34
U.S. Cl. 239—468 **13 Claims**



1. A nozzle for producing a spray directed along an outlet axis, said nozzle including a conical outlet section having a

discharge orifice at its downstream end and being centered about said outlet axis, a cylindrical whirl chamber disposed at the upstream end of said outlet section and centered about said outlet axis, an inlet section disposed upstream of said chamber and having an inlet orifice centered about an inlet axis perpendicular to said outlet axis, a transition passage disposed between said inlet orifice and said chamber, in cross-section transverse to direction of liquid flow therethrough said passage including a straight main section and a remainder including a downward tapering section extending from said main section, said main section being disposed on a flat surface of said passage, said flat surface and said main section being parallel to said outlet axis, said flat surface being essentially tangent to the inner surface of the wall defining said chamber.

4,231,525

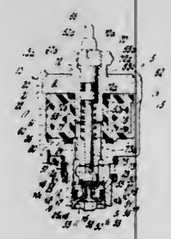
ELECTROMAGNETIC FUEL INJECTOR WITH SELECTIVELY HARDENED ARMATURE

James D. Palma, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 941,754, Sep. 13, 1978, which is a continuation-in-part of Ser. No. 838,468, Oct. 3, 1977, abandoned. This application May 10, 1979, Ser. No. 38,009

Int. Cl.³ B05B *1/32*; F16K *31/02*

U.S. Cl. 239—585 **2 Claims**



1. In an electromagnetic fuel injector of the type having a hollow tubular body with a stepped bore therethrough providing a fuel chamber therein intermediate its ends adapted to receive fuel, a fuel injector nozzle positioned in the stepped bore at one end of the body to define a spray tip at one end and an annular valve seat encircling a discharge passage upstream of the spray tip in communication with the fuel chamber, a valve positioned in the stepped bore for movement into and out of engagement with the valve seat, the valve being flat on one side thereof and being spherical opposite the flat to form a spherical seating surface for valve closing engagement with the valve seat, and a solenoid means including a stationary pole piece and a movable cylindrical armature for actuating the valve for controlling flow from the fuel chamber to the discharge passage; the improvement comprising a non-magnetic guide pin fixed to the pole piece to extend axially toward the valve seat substantially concentric therewith, the armature having a central axial guide bore therein of a diameter to slidably receive said guide pin whereby said armature is axially guided by said guide pin, and wherein at least the internal wall material of said armature defining said guide bore is wear resistant whereby frictional wear between said guide pin and said armature will be substantially reduced during extended operation of the electromagnetic fuel injector, at least the remainder of said armature in the magnetic circuit of the solenoid being of magnetically soft material.

4,231,526

PROCESS AND APPARATUS FOR TREATING WASTE PAPER

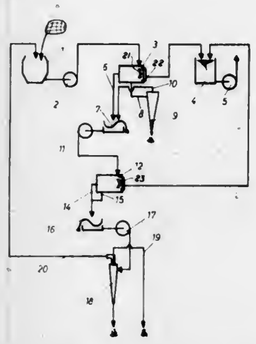
Herbert Ortner; Theodor Bahr, and Walter Musselmann, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 974,333

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759113

Int. Cl.³ B02C *23/38, 23/10, 23/14*

U.S. Cl. 241—28 **10 Claims**



1. A process for treating waste paper comprising:
rough pulping the waste paper in a beater,
treating the rough pulped waste paper from the beater in a lightweight material pulper wherein unpulped lumps of fibers and half-stuff containing foreign matter are separated from half-stuff substantially free of foreign matter,
conveying away the half-stuff nearly free of foreign matter,
treating one portion of the unpulped lumps of fibers and half-stuff containing foreign matter in a hydro-cyclone wherein foreign matter is separated from half-stuff containing some foreign matter,
treating the remaining portion of the unpulped lumps of fibers and half-stuff containing foreign matter from the lightweight material pulper together with the half-stuff containing some foreign matter from the hydro-cyclone in a vibratory sorter to separate the still further foreign matter from half-stuff containing some foreign matter,
treating the half-stuff containing some foreign matter from the vibratory sorter in a further multi-stage sorting and speck removing apparatus wherein additional foreign matter is separated from half-stuff, and
the last-mentioned half-stuff is returned to be again treated in the lightweight material pulper,
wherein the lightweight material pulper separates half-stuff containing heavy foreign matter from half-stuff containing lightweight foreign matter, the half-stuff containing heavy foreign matter being conveyed directly to the hydro-cyclone, and the half-stuff containing lightweight foreign matter being conveyed directly to the vibratory sorter.

6. A waste paper treatment plant comprising:
beater means for rough pulping waste paper,
first pulping and sorter means connected to the beater means for treating rough pulped waste paper to separate unpulped lumps of fibers and half-stuff containing foreign matter from half-stuff nearly free of foreign matter,
hydro-cyclone means connected to said first pulping and sorter means for receiving one portion of the separated out fibers and half-stuff containing heavy foreign matter, said hydro-cyclone means separating foreign matter from half-stuff containing some foreign matter,
vibratory sorter means separately connected to said first pulping and sorter means for receiving the other portion of the separated out fibers and half-stuff containing lightweight foreign matter therefrom, said vibratory sorter means being connected to said hydro-cyclone means to receive the half-stuff containing some foreign matter therefrom, said vibratory sorter means treating material received thereby to separate the foreign matter from half-stuff still containing some foreign matter, and
multi-stage sorting and speck removing means connected to said vibratory sorter means to receive therefrom the half-stuff containing some foreign matter for separating out half-stuff nearly free of foreign matter and returning at least some of said last mentioned half-stuff to a point in the plant upstream of said first pulping and sorter means.

4,231,527

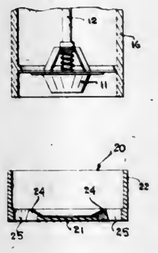
CATCHER DEVICE FOR CONDIMENT MILL

William E. Bounds, 23790 Hawthorne Blvd., Torrance, Calif. 90505

Filed Apr. 19, 1979, Ser. No. 31,615

Int. Cl.³ A47J *42/40*

U.S. Cl. 241—169.1 **2 Claims**



1. In a condiment mill having a cylindrical container member for containing the condiment and a grinder mechanism supported in said container member towards the bottom end thereof, there being an opening in said container member opposite the grinder for use in dispensing the condiment from said bottom end, and a catcher device attached to the bottom end of said container member and positioned in said opening opposite said grinder comprising
a cylindrical frame member attached to said container member, said frame member being force-fitted over the bottommost portions of the outer walls of said container member,
a plate member having a concave dish-shaped surface, and
means for suspending said plate member with the dish-shaped surface thereof directly facing the grinder mechanism, there being a large opening formed between the frame member and the plate member to permit the passage of condiment from said grinder mechanism therethrough, said suspending means comprising a plurality of web members extending between the plate and frame members,
whereby surplus condiment falling from the grinder mechanism is caught in the dish-shaped portion of the plate member.

4,231,528

GRINDING MILL SHELL LINER ELEMENTS

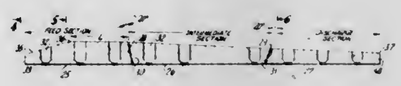
Bernard J. Schaeffer, Rifle, Colo., assignor to Amax Inc., Greenwich, Conn.

Filed Jun. 22, 1979, Ser. No. 51,083

Int. Cl.³ B02C *17/22*

U.S. Cl. 241—182 **8 Claims**

1. A longitudinal metal liner for lining the interior peripheral wall of a grinding mill,
said metal liner having a grinding surface and being formed of a plurality of segments comprising a first segment, a second segment and at least a third segment,
each segment having at least one inclined end face, at least one segment following said first segment having both end faces inclined such that the angle between said end inclined faces diverges toward the grinding surface of said liner,
said segments of the liner being cooperably longitudinally and coaxially arrangeable with the inclined end faces thereof disposed in end-to-end overlapping relationship,
whereby when said segmented liner secured to the inner peripheral wall of said grinding mill is subjected to the



working stresses of grinding media on the grinding surface of said liner, the stresses applied to the metal liner result in the generation of a vertical lifting force on at least said segment having divergent end faces due to linear strain caused by metal flow along the liner which aids in the subsequent removal of said segmented liner for maintenance purposes.

4,231,529

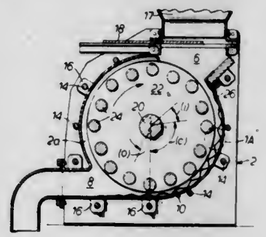
IMPACT DECORTICATOR

Norman J. Peck, Seven Hills; Thomas J. Rowland, Whalan, and John R. Ashes, Baulkham Hills, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jul. 11, 1978, Ser. No. 923,688

Int. Cl.³ B02C *13/282*

U.S. Cl. 241—189 R **19 Claims**



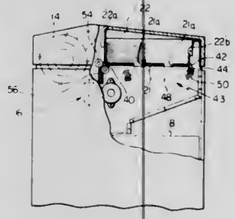
1. An impact decorticator having a rotor mounted for rotation about a substantially horizontal axis in a generally concentric and cylindrical casing having an internal surface and provided at the upper portion thereof with an inlet opening and in the lower portion thereof with an outlet opening for the material being processed, said impact decorticator being characterised in that graded, substantially horizontally extending ripples are formed on the internal surface of the casing between the inlet and outlet (in the direction of rotor rotation), said ripples having generally flat surfaces and being graded in that they become progressively sharper from the vicinity of the inlet opening, toward a central zone between the inlet and outlet openings the surfaces of the ripples which face opposite the direction of rotation having angles of presentation which decrease from about 85° in the vicinity of the inlet opening to a minimum of about 50° in the central zone, the angle of presentation being the angle between a respective flat surface which faces opposite the direction of rotation and a radial line drawn from the axis of rotation of the rotor to the bottom of that surface.

4,231,530

AUTOMATIC DOCUMENT SHREDDER

Takefumi Hatanaka, No. 276-19, Higashihiraga, Matsudo-shi, Chiba-ken, Japan

Filed Dec. 22, 1978, Ser. No. 972,471
Claims priority, application Japan, Nov. 15, 1978, 53-139772
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—223 **7 Claims**



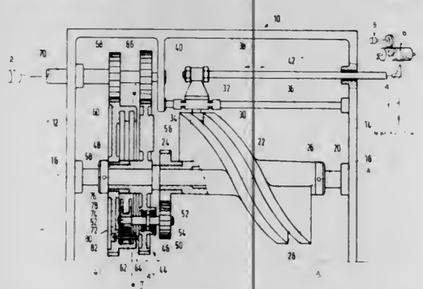
1. A document shredder for shredding waste documents into unintelligible form, comprising:
- a casing;
- means in said casing for shredding said waste document into said unintelligible form;
- stand-by chamber means provided in said casing for accommodating a plurality of said waste documents to be shredded, said plurality of waste documents being placed in said stand-by chamber in a stacked condition prior to said shredding;
- at least one partitioning member detachably disposed in said stand-by chamber means to divide said stand-by chamber means into a plurality of compartments corresponding to the sizes of said waste documents; and
- an automatic feeding mechanism for automatically and simultaneously feeding a prescribed number of sheets of said waste documents from each of said plurality of compartments to said shredding means in a batch-wise manner;
- said stand-by chamber means and said automatic feeding mechanism being provided within an upper portion of said casing.

4,231,531

DRIVE SYSTEM FOR A YARN EYE OR YARN WINDER

Aloys Greive, Münster, Fed. Rep. of Germany, assignor to Hamel GmbH, Zwirnmaschinen, Münster, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 25,182
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814759
Int. Cl.³ B65H *54/38*
U.S. Cl. 242—18.1 **10 Claims**



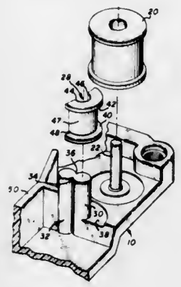
1. In an arrangement wherein a yarn is fed at a generally uniform delivery speed through a yarn eye to a yarn package rotated at a generally uniform peripheral speed, and wherein the yarn eye is reciprocated with a nonuniform speed adjacent the package to wind the yarn irregularly on the package, a drive system comprising:
- a planet carrier rotatable about a main axis;
- a planet gear rotatable on said carrier and orbitable therewith about said axis;
- an output gear in mesh with said planet gear;
- a cam rotationally coupled to said output gear and jointly rotatable therewith;
- means including a cam follower connected between said cam and said yarn eye for reciprocating said eye at a speed generally proportional to the rotation speed of said cam;
- a control wheel rotatable about said axis and having a pair of angularly offset control regions;
- means including an input adapted to be rotated at a substantially constant speed and a pair of outputs respectively connected to said carrier and control wheel for rotating same at substantially constant but different angular speeds;
- an entrainment element engageable with said regions of said control wheel and rotationally coupled to said planet gear; and
- control means including respective formations on said control regions for rotating said cam at one predetermined speed when said element engages one of said regions and for rotating said cam at another different speed when said element engages said other region.

4,231,532

TAPE CASSETTE WITH IMPROVED TAPE GUIDING

George D. Popov, Milpitas, and Howard W. Robinson, San Jose, both of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed Jul. 30, 1979, Ser. No. 61,653
Int. Cl.³ G03B *1/04*; G11B *15/32*
U.S. Cl. 242—199 **8 Claims**



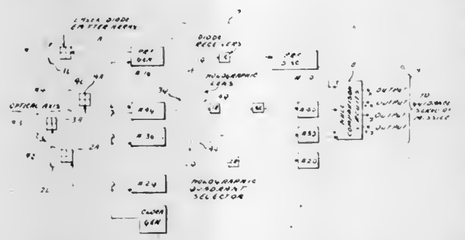
1. A precision tape cassette with improved vertical tape tracking accuracy comprising:
- a cassette shell having a base and forming a first frontal corner, a second frontal corner and a space along a frontal path intermediate said first and second frontal corners, said space being provided to receive a magnetic recording/reproducing head to interface with a magnetic tape transported along said frontal path;
- a first corner guiding element positioned adjacent said first frontal corner and protruding vertically from said base of the shell;
- a second corner guiding element positioned adjacent said second frontal corner and protruding vertically from said base of the shell;
- a first pair of integral arcuate segments forming a first 8-shaped boss protruding vertically from the shell along an axis parallel to the axis of said first corner guiding element, the first boss being integral with the shell and interposed intermediate the first corner guiding element and said space;
- a first arcuate stationary guide member having a central arcuate channel of greater than 180° and less than 360°, the first guide member being interlocked with the first boss and coaxial therewith, the first arcuate guide member having flanges at opposite ends to form a substantially U-shaped groove, the first stationary guide member being positioned to interface with the transported tape in said groove;
- a first arcuate depression within said base and coaxial with the first arcuate guide member with one flange of the first guide member being seated within said first depression;
- a second pair of integral arcuate segments forming a second 8-shaped boss protruding vertically from the shell along an axis parallel to the axis of the second corner guiding element, the second boss being integral with the shell and interposed intermediate the second corner guiding element and said space;
- a second arcuate stationary guide member having a central arcuate channel of greater than 180° and less than 360°, the second guide member being interlocked with the second boss and coaxial therewith, the second arcuate guide member having flanges at opposite ends to form a substantially U-shaped groove, the second stationary guide member being positioned to interface with the transported tape in said groove; and
- a second arcuate depression within said base and coaxial with the second arcuate guide member with one flange of the second guide member being seated within said second depression.

4,231,533

STATIC SELF-CONTAINED LASER SEEKER SYSTEM FOR ACTIVE MISSILE GUIDANCE

Richard F. Durig, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 9, 1975, Ser. No. 593,597
Int. Cl.³ F42B *15/02*; F41G *7/24, 7/26*
U.S. Cl. 244—3.16 **1 Claim**



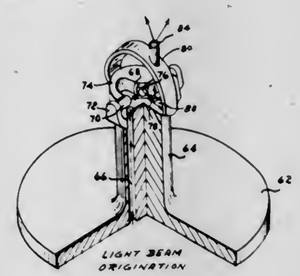
1. A static target seeker system for providing active missile guidance signals comprising:
- a. a first laser diode array emitting an optical beam modulated by a first pulse repetition frequency;
- b. a second laser diode array emitting an optical beam modulated by a second pulse repetition frequency;
- c. a third laser diode array emitting an optical beam modulated by a third pulse repetition frequency;
- d. a fourth laser diode array emitting an optical beam modulated by a fourth pulse repetition frequency;
- e. means for placing the said four optical beams in respective quadrature relationship about an optical axis;
- f. a holographic quadrant selector lens plate positioned on the said optical axis, the said lens having a quadrature focal point for each quadrant;
- g. a diode detector positioned at each said focal point;
- h. a discriminator associated with each diode, each discriminator providing an output substantially responsive only to signals from the respective corresponding emitting array; and
- i. a null comparison circuit receiving the outputs from the said discriminators and providing target guidance signals to the said missile.

4,231,534

ACTIVE OPTICAL TRACKING SYSTEM

Robert J. Lintell, Altadena, and James D. Campbell, Pasadena, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 4, 1977, Ser. No. 850,101
Int. Cl.³ F42B *15/02*
U.S. Cl. 244—3.16 **1 Claim**



1. Optical radiation transmitting means for active optical tracking systems in missiles comprising: a base, a post mounted on the base having an aperture therethrough, parallel to the longitudinal axis of the post; an inner gimbal mounted on one end of the post including a yoke, a pin extending from the yoke and a movable gimbal ring; an outer movable gimbal ring connected to the inner gimbal ring including a pin extending through the inner gimbal ring; a diverging lens mounted on said outer gimbal ring; a first mirror means mounted on the yoke pin adapted to receive radiation passing through said aperture; a second mirror mounted on the inner gimbal adapted to receive radiation from the first mirror and a third mirror mounted on the outer gimbal pin adapted to receive radiation from the second mirror and direct said radiation through the diverging lens.

4,231,535

COMPOSITE TAPE FOR ARRESTING LANDING AIRCRAFT

William R. Schlegel, and Harry E. Mayhew, both of Wilmington, Del., assignors to All American Industries, Inc., Thomaston, Conn.

Continuation of Ser. No. 803,479, Jun. 6, 1977, abandoned. This application Oct. 27, 1978, Ser. No. 955,420
Int. Cl.² B64F *1/02*
U.S. Cl. 244—110 C **11 Claims**



1. A composite elongated woven tape connected to and

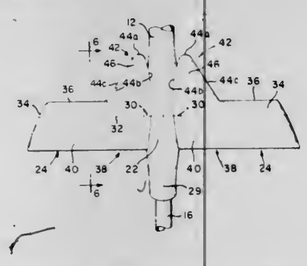
wrapped around a rotary energy absorber for arresting a landing aircraft in conjunction with cross-runway pendant means comprising a relatively short leading section having longitudinal filaments with a relatively low modulus of elasticity comprising final wrappings about the rotary energy absorber whereby the impact shock created when the aircraft is first arrested is absorbed connected to a longer trailing section having longitudinal filaments with a relatively high modulus of elasticity comprising initial wrappings about the rotary energy absorber whereby high tensile strength, high velocity of stress wave propagation and reduced mass moment of inertia are provided, the leading section being connected to the cross-runway pendant means, the trailing section being connected to the energy absorber whereby the trailing section is brought into action during the runout of the tape to gradually stop the aircraft, and a cover over the tape to protect it from exposure to sun, wear and abrasion.

4,231,536

AIRFOIL FOR CONTROLLING REFUELING BOOM

Kichio K. Ishimitsu, Mercer Island, and Edward N. Tinoco, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 11, 1977, Ser. No. 840,589
Int. Cl.[2] B64D *39/00*
U.S. Cl. 244—135 A **9 Claims**



1. In a refueling boom having a longitudinal axis and mounted to an aircraft, a ruddevator assembly to act on flow of air over the ruddevator assembly to control movement and position of the boom, said ruddevator assembly comprising:

a pair of ruddevators mounted to said boom at a dihedral angle to create both vertical and lateral lift components, each of said ruddevators having a spanwise axis and a chordwise axis, each ruddevator being mounted for rotation about an axis generally aligned with its spanwise axis, each ruddevator comprising:

a. an outboard ruddevator section having an airfoil configuration with a leading edge shaped to cause attached flow over the outboard ruddevator section to create a lifting force caused by airflow over said outboard ruddevator section,

b. an inboard ruddevator section having an airfoil configuration to create a lifting force caused by airflow over said inboard ruddevator section,

c. said inboard ruddevator section having a forwardly extending strake-like member mounted to the forward end of the inboard ruddevator section,

d. said strake-like member having a relatively sharp leading edge of a sufficiently small cross sectional radius to create detached flow of the air flow over said sharp leading edge, said sharp leading edge having three portions, namely,

1. a forward edge portion positioned generally transverse to the flow of air thereover,

2. an outboard lateral edge portion extending from the forward edge portion to the leading edge of the outboard ruddevator section at a sweep angle sufficient to create vortex flow of air passing over said outboard lateral edge portion,

3. an inboard lateral edge portion extending from the forward edge portion rearwardly along the inside edge of the ruddevator, the angular position of the inboard lateral edge portion being such that with the refueling boom extending at a downward angle from its associated aircraft so as to be positioned at an angle to the airstream, and with each ruddevator being positioned at an angle of attach such that the chordwise axis of each ruddevator is slanted with respect to a plane containing the lengthwise axis of the boom, the inboard lateral edge portion of the strake-like member extends into the airstream at a sweep angle sufficient to create vortex flow of air passing over said inboard lateral edge portion,

whereby said ruddevators are able to create relatively high lift forces at relatively high angles of attack and under conditions of yaw of the boom where the sweep angles of the ruddevators are subject to variation.

4,231,537

SATELLITE-LAUNCH VEHICLE COMBINATION AND METHOD

Michael T. Lyons, Fairfax, Va., assignor to Satellite Business Systems, McLean, V.I.

Filed Mar. 22, 1978, Ser. No. 889,087
Int. Cl.[2] B64G *1/00*
U.S. Cl. 244—160 **14 Claims**



1. A reusable satellite launch vehicle and at least one satellite supported therein comprising:

a launch vehicle having a cargo bay of given dimensions with a thrust axis,

satellite cradle means mounted within said cargo bay for support of a satellite thereby,

said satellite mounted within said cradle means and including at least one source of major thrust defining a major thrust axis for said satellite,

said cradle means supporting said satellite with said major thrust axis substantially perpendicular to said launch vehicle thrust axis.

11. A method of adapting a satellite intended for quasi-synchronous orbit for efficient launch via a reusable launch vehicle with defined cargo bay to minimize use of launch vehicle payload capability comprising the steps of:

providing said satellite with at least one major thrust motor such as an apogee kick motor whose orientation defines a major thrust axis for said satellite,

dimensioning said satellite so that when mounted for launch said satellite lies within a portion of said cargo bay wherein the improvement comprising:

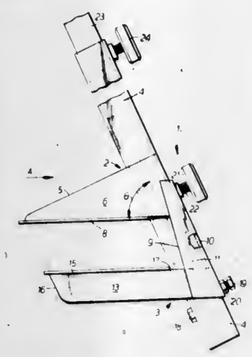
dimensioning said satellite to fit within said cargo bay with said major thrust axis at an angle of about 90° to a launch vehicle thrust axis.

4,231,538

CLAMPING DEVICES

Keith B. Lithgow, Bletchley, England, assignor to Microform Communications Limited, Bletchley, England

Filed Oct. 11, 1978, Ser. No. 950,405
Claims priority, application United Kingdom, Oct. 12, 1977, 42474/77
Int. Cl.[3] E04G *3/00*
U.S. Cl. 248—226.1 **4 Claims**



1. A clamping device, comprising

(a) a first clamp member (2) including

(1) an elongate base (4) having smooth parallel sides; and

(2) a first clamp arm (5) extending laterally outwardly from the base;

(b) a second clamp member (3) mounted for sliding movement along said base, said second clamp member including

(1) a second clamp arm (16) extending laterally outwardly from said base opposite and generally parallel with said first clamp arm; and

(2) pivot means (19) on said second clamp member for engaging the side surface of said base which is remote from said first and second clamp arms, thereby to define a pivot axis about which said second clamp arm is pivotable relative to said base;

(c) force applying means arranged on said second clamp member for engaging said first clamp member at a position spaced from said pivot axis, thereby to pivot said second clamp member about said pivot axis in a first direction causing displacement of said second clamp arm toward said first clamp arm; and

(d) stop means (17) arranged on said second clamp member for engagement with said base member to limit rotation of said second clamp member in said first direction, whereby upon displacement of said second clamp member to any desired position relative to said base member, said force applying means may be operated to pivot said second clamp member in said first direction about said pivot axis and thereby displace said stop means toward locking engagement with said base member.

4,231,539

PEDESTAL SEAT BASE

Edwin C. Sandham, Thiensville, Wis., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

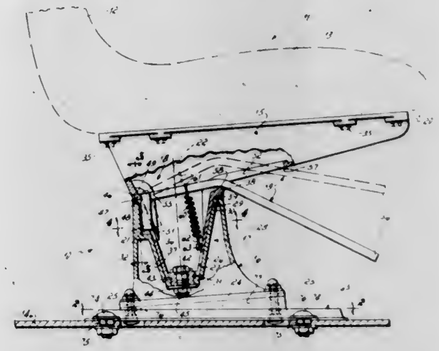
Continuation-in-part of Ser. No. 874,235, Feb. 1, 1978, abandoned. This application Apr. 5, 1979, Ser. No. 27,464
Int. Cl.[3] F16M *13/00*
U.S. Cl. 248—418 **6 Claims**

1. An improved pedestal base for a seat comprising

a seat support and a pedestal, said seat support being connectable with said seat, and said pedestal being connectable with a support surface,

a vertical thrust bearing partially carried by said seat support and partially carried by said pedestal, said vertical thrust bearing comprising an inner bearing collar and an outer bearing collar, said inner and outer bearing collars defining side walls having a generally conical cross-sectional configuration, and said inner and outer bearing collars being nested one within the other so that the side walls of said bearing collars function as bearing surfaces, and

a latch device for restraining said seat support and said pedestal in a centered position, said latch device comprising a latch dog movable through a latch port defined in



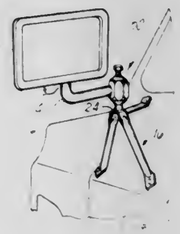
the conical side wall bearing surface of one of said bearing collars into a latch port defined in the conical side wall bearing surface of the other of said bearing collars for preventing rotation of said seat support relative to said pedestal by latching said seat support in a preferred position, and a handle connected to said latch dog for allowing rotation of said seat support relative to said pedestal by removing said latch dog from latching relation with said latch seat.

4,231,540

MIRROR CONNECTOR

Rodney A. Duncan, 1521 Pound Dr., Flint, Mich. 48504, and Wendel W. Hall, 351 Beach, Mt. Morris, Mich. 48458

Filed Dec. 14, 1978, Ser. No. 969,422
Int. Cl.[2] A47G *1/24*
U.S. Cl. 248—487 **4 Claims**



1. A mirror connector for a rectangular rear view mirror having a substantially L-shaped support stem which is normally secured through an aperture in a horizontal flange of a support frame, said connector comprising:

an elongated stem having an axial bore at its lower end adapted to threadably receive a bolt therein, and

a head portion secured to the upper end of said stem, and including a transverse throughbore adapted to slidably receive a shank of the L-shaped support stem, said head portion further including an axial throughbore extending from said transverse throughbore to the top of said head portion adapted to threadably receive a bolt therein to secure said shank within said transverse throughbore.

4,231,541

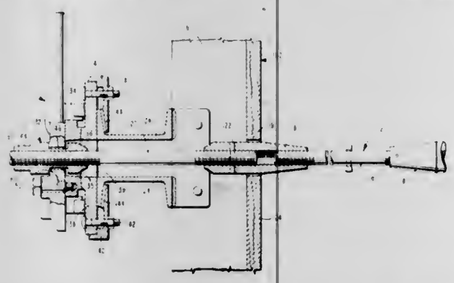
CONCRETE FORM PANEL TYING APPARATUS

James K. Strickland, Jacksonville, Fla., assignor to Strickland Systems, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 576,861, May 12, 1975, abandoned, and Ser. No. 576,862, May 12, 1975, Pat. No. 4,044,986. This application Aug. 22, 1977, Ser. No. 826,834

Int. Cl.³ E04G *17/08*

U.S. Cl. 249—216 **28 Claims**



1. Concrete form panel tying apparatus for restraining outward movement of a concrete form panel with respect to a tie passing therethrough, said apparatus comprising:

a tie extendable outwardly through an opening in said concrete form panel,

an outer end portion on said tie having a first transverse dimension,

an inner end portion on said tie located inwardly of said outer end portion and having a second transverse dimension less than said first transverse dimension,

an outwardly inclined tie surface extending between said outer end portion and said inner end portion, and curved about the longitudinal axis of said tie,

clamping means operatively associated with said tie for engaging said tie, said clamping means being positionable between said inclined surface and said concrete form panel and comprising a first clamping member having a first recess of transverse dimension greater than said second transverse dimension and less than said first transverse dimension to accommodate said tie therein, said clamping member being at an angle to the longitudinal axis of said tie, said first recess being defined at least in part by an outwardly inclined clamping surface complementary to said inclined tie surface and engageable therewith, said first clamping member being movable radially with respect to said tie between an engaged position wherein said clamping surface is in engagement with said tie surface to restrain said concrete form panel against outward movement with respect to said tie and a disengaged position wherein said inclined surfaces are not engaged with one another, and

means operatively associated with said clamping means for releasably holding said first clamping member in said engaged position.

4,231,542

AUTOMATICALLY RESETTING FLUSH VALVE

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Rutland, Mass.

Filed Aug. 9, 1978, Ser. No. 932,299

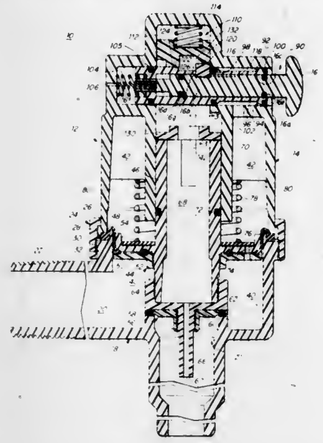
Int. Cl.³ F16K *21/04, 31/385*

U.S. Cl. 251—15 **3 Claims**

1. In a flush valve having a housing, a moveable partition sealingly engaging the housing and defining a primary chamber and a control chamber, an inlet port in the primary chamber and an outlet port in the primary chamber, and a valve element connected with the partition for closing the outlet port, the improvement comprising:

an actuator mechanism including an actuator valve connected with said control chamber; an actuator member for setting said actuator valve to the open position to vent said control chamber and enable said valve element to move away from said outlet port and open said flush valve; and

an automatic release member moveable with said actuator member for setting said actuator valve to the open position and moveable independently of said actuator member to reset said actuator valve to the closed position; and



an actuator control mechanism driven by said partition as said valve element moves away from said outlet port, enables said automatic release member to reset said actuator valve to the closed position and cease venting said control chamber.

4,231,543

CONTROLLABLE HYDRAULIC VALVE MECHANISM FOR RECIPROCATING ENGINES OR PUMPS

Hansjürgen Zürner, Ammerndorf, and Wolfgang Fuhrmann, Nuremberg, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,322

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825316

Int. Cl.³ F16K *31/122;* F16L *1/34, 9/02*

U.S. Cl. 251—57 **10 Claims**

1. A controllable hydraulic valve mechanism, especially for reciprocating engines and pumps, which includes:

a valve;

a drive cylinder;

a drive piston which projects into said drive cylinder, is operable by a cam, and is provided with control edges, said drive cylinder being adapted to have an interior space at that end of said drive piston remote from said cam;

a working cylinder;

a working piston which is guided in said working cylinder, operates said valve directly, and is provided with an oblique end face at that end thereof remote from said valve, said working cylinder being adapted to have an interior space at that end of said working piston remote from said valve;

a control conduit which interconnects said cylinders;

a first reservoir for control fluid;

a refilling conduit which interconnects said first reservoir and said drive cylinder;

a cooler arranged in said refilling conduit;

a pump operatively connected with said refilling conduit;

a return conduit interconnecting said refilling conduit and said first reservoir;

an overflow valve located in said return conduit;

a second reservoir for absorbing a substantial part of the energy produced by the lift of said cam;

means for providing a continuous communication between said drive cylinder interior space and said second reservoir, said second reservoir, at that portion thereof remote from said means, being provided with a bore having a restriction;

a discharge conduit interconnecting said second reservoir bore and said first reservoir;

two independently rotatable control sleeves arranged end-to-end in said drive cylinder in the axial direction thereof, said control sleeves surrounding said drive piston, each of said control sleeves being provided with a control ring groove which is adapted to cooperate with the pertaining control edge of said drive piston, the control ring groove pertaining to one of said control sleeves being connectable with said working cylinder interior space for infinite variable adjustment of the valve opening time of said drive cylinder interior space, the control ring groove pertaining to the other of said control sleeves being connectable to said first reservoir by means of a bore and pertaining

restriction in said drive cylinder for infinitely variable adjustment of the valve closing time of said drive cylinder interior space;

actuating means respectively operatively associated with each of said control sleeves for respectively effecting rotation thereof, said actuating means being operable from outside said drive cylinder;

a further rotatable control sleeve arranged in said working cylinder and surrounding said working piston, said further control sleeve being provided with a control ring groove for varying the lift of said valve;

a discharge conduit which leads to said first reservoir and is connectable to said working cylinder interior space by means of said further sleeve, said oblique end face of said working piston, and said control ring groove of said further control sleeve, being adjusted in such a way that a small amount of control fluid flows into said first reservoir during each valve lift adjustment; and

further actuating means operatively associated with said further control sleeve for effecting rotation thereof, said further actuating means being operable from outside said working cylinder.

4,231,544

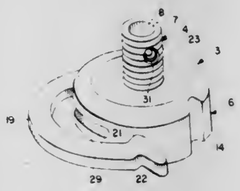
LOCKING CRANKCASE DRAIN VALVE ASSEMBLY

Duane C. Balch, 3827 Briarwood St., Napa, Calif. 94558

Filed Apr. 19, 1979, Ser. No. 31,466

Int. Cl.³ F16K *1/20*

U.S. Cl. 251—144 **5 Claims**



1. A locking crankcase drain valve assembly comprising:

a. a valve housing (3) having an outer wall for mounting in the drain opening (2) of a crankcase (1), including:

(1) a shank portion (4) for mounting in said drain opening,

(2) a valve body portion (6) integrally connected to said shank portion,

(3) a central passage (7) through said shank and valve body portions having an inlet (8) in said shank portion and an outlet (9) in said valve body portion,

(4) a valve body opening (11) formed in said valve body portion extending transversely through said central passage and forming a valve seat (12) surrounding said central passage,

(5) hinge attachment means (13) formed in said valve body portion positioned offset from said central passage,

(6) lever holding means (14) formed in said valve body portion at a selected distance from said hinge attachment means;

b. a valve member (16) formed for receipt within said valve opening and formed with pivot means (17) for pivotal attachment to said hinge means including,

(1) a seat portion (18) formed for sealing engagement with said valve seat surrounding said central passage,

(2) a spring lever (19) extending beyond said valve body portion having engaged and unengaged positions,

(3) lever attachment means (21) formed in said lever at a selected distance from said hinge attachment means (13) which in its unstressed state is less than the distance of said lever holding means (14) from said hinge attachment means (13) for engaged attachment to said lever holding means (14) so that when said lever is in said engaged position said lever is in tension,

(4) grip means (22) extending from said lever for receiving a finger or tool for moving said lever and thereby moving said valve member in and out of sealing engagement with said central passage;

c. said valve body opening in said valve body portion is formed with a tapered portion (24) in the area forming said valve seat; and

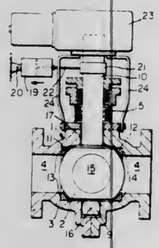
d. said valve member is formed with a tapered portion (26) in the area registering with said tapered portion of said valve opening in said valve body portion so that when said lever is in said engaged position, said tapered portion (26) is in compression with said tapered portion (24) of said valve body.

4,231,545

HIGH PRESSURE BALL VALVE WITH TIPPING ACTION

Juha A. E. Nelimarkka, Marjalahdentie 8, 00930 Helsinki 93, Finland

Filed Nov. 28, 1977, Ser. No. 855,335
Claims priority, application Finland, Dec. 3, 1976, 763488
Int. Cl.³ F16K 5/06
U.S. Cl. 251—161 **5 Claims**



1. A ball valve comprising a body provided with a flow channel; a generally ball-shaped rigid closing organ; sealing rings fitted into ring-shaped and transverse grooves in the valve body on both sides of said closing organ; a pair of spindles associated with said closing organ and provided extending from opposite sides thereof for receipt by said body and mounting said organ so that the pressure of fluid on said organ tips said organ into sealing engagement against a said sealing ring; and

means for actuating said organ to rotate it with respect to said body to effect opening and closing of said flow channel, said means including one of said spindles extending through said body to the exterior thereof through a sealing mechanism; a bellows capable of withstanding pipe pressure while remaining flexible to permit tipping of said closing organ, said bellows operatively connected to said valve body and said sealing mechanism so that low-torque turning of said organ is effected by pivoting said one spindle so that a line through said spindle is transverse to said flow channel and thus said organ is moved out of tipping engagement with a said sealing ring, and subsequent rotation of said one spindle and said organ.

4,231,546

HIGH-TEMPERATURE BIDIRECTIONAL METAL SEAL

Philip W. Eggleston, and Eugene R. Taylor, Jr., both of Marshalltown, Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Continuation of Ser. No. 619,133, Oct. 2, 1975, abandoned. This application Dec. 22, 1978, Ser. No. 972,568
Int. Cl.³ F16K 25/00
U.S. Cl. 251—173 **5 Claims**

1. A valve seal structure comprising:

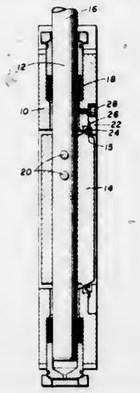
a unitary metallic annular seal member having an inner sealing portion of generally U-shaped cross section, a resilient flexible web portion extending generally outwardly from said sealing portion, and an outer periphery extending outwardly from said web portion, and including a locus of flexure points at the junction of said web and said periphery;

a valve body having a central bore and means within said bore for sealingly engaging said periphery of said seal;

valve closure means pivotable within said bore between open and closed positions, said closure means having a circumferential sealing surface converging generally toward an axis of said body bore for sealingly engaging said sealing portion of said seal in an interference fit in a region of contact when said closure means is in a closed position;

said locus of flexure points being displaced in the direction of convergence of said sealing surface of said closure means from said region of contact between said seal member and said closure means,

wherein said generally U-shaped cross section of said seal member sealing portion defines a center of curvature of said cross section, and wherein an imaginary line through said center of curvature of said U-shaped cross section and said locus of flexure points when said closure means is in



the open position intersects said sealing surface of said closure means substantially perpendicularly when said closure means is in said closed position; and

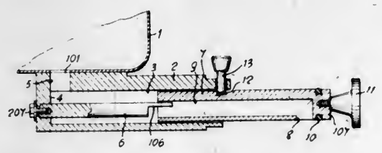
whereby upon pivoting of said closure means to said closed position, said inner sealing portion of said seal is radially stretched to accommodate said closure means, and said web portion is resiliently deflected axially and placed in generally outward compression.

4,231,547

DISPENSING VALVE FOR LIQUIDS

Ezio Manfroni, Bologna, Italy, assignor to Carpigiani Bruto Macchine Automatiche S.p.A., Bologna, Italy

Filed Feb. 22, 1979, Ser. No. 13,810
Claims priority, application Italy, Mar. 1, 1978, 12500 A/77
Int. Cl.³ F16K 31/00; A23G 9/00
U.S. Cl. 251—210 **4 Claims**



1. A dispensing valve for liquids comprising:

a first tubular member closed at one end, completely opened at its other end, and including an inlet port through the side thereof near the closed end,

a second tubular member telescopically slidably housed in the first tubular member and completely open at its end which faces the said closed end of the first tubular member and completely closed at its opposite end, the open end of the second tubular member being movable to abut the said closed end of the first tubular member, said second tubular member having an outlet port through the side thereof near the closed end of the second tubular member, said second tubular member being of a length relative to the first tubular member that in a closed position whereat the open end of the second tubular member abuts the closed end of the first tubular member, the outlet port is wholly within the first tubular member,

stop means for limiting the maximum outward stroke of the second tubular member away from its closed position toward an open position,

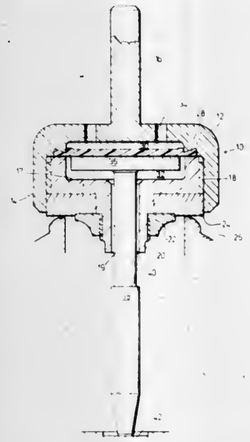
and a piston member fixed at one of its ends to the closed end of the first tubular member and extending therefrom into the interior of the second tubular member and at least a portion of said piston having an outer diameter which closely fits the interior of the second tubular member to substantially prevent fluid flow between the piston member and the interior of the second tubular member when the second tubular member engages the portion of the piston member, said portion extending from said closed end of the first tubular member outwardly farther than said inlet port but less than the said maximum outward stroke of the second tubular member.

4,231,548

BALANCE VALVE DISC AND SEAT STRUCTURE

Heinz W. Braukmann, Willowdale, Canada, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,223
Int. Cl.³ F16K 39/02
U.S. Cl. 251—282 **6 Claims**



1. A balanced valve disc and seat structure having a hollow valve disc engageable with said seat, pressure responsive means supported in said disc, said pressure responsive means dividing said hollow valve disc into separate first and second chambers, a first aperture in said disc communicating with said first chamber, a second aperture in said disc communicating with said second chamber, a plunger having one end secured to said pressure responsive means, the other end of said plunger extending through said second chamber and said valve seat and means engaging said other end of said plunger when said first chamber has a higher pressure than said second chamber.

4,231,549

VALVE STEM AND VALVE DISC CONNECTION FOR A DIAPHRAGM VALVE

Robert G. Visalli, Murrysville, Pa., assignor to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Dec. 11, 1978, Ser. No. 967,912
Int. Cl.³ F16K 31/44
U.S. Cl. 251—335 A **10 Claims**

1. A diaphragm valve comprising,

a valve body having a chamber therein with an upper portion and a lower portion,

said lower portion having inlet and outlet openings communicating with said chamber lower portion,

a valve seat in said chamber lower portion between said inlet and outlet openings,

a valve assembly positioned in said chamber lower portion in overlying relation with said valve seat and arranged to control the flow of fluid through said chamber lower portion, a flexible metal diaphragm assembly positioned in said chamber in overlying abutting relation with said valve assembly,

said metal diaphragm assembly arranged to seal said chamber lower portion from said chamber upper portion,

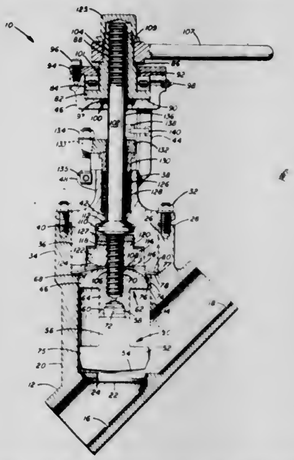
said metal diaphragm assembly having an outer annular edge portion supported by said valve body,

said metal diaphragm assembly having an axial bore extending therethrough, said axial bore forming an inner annular edge portion surrounding said axial bore,

a bonnet positioned in said chamber upper portion in overlying abutting relation with said metal diaphragm assembly outer annular edge portion to thereby secure said metal diaphragm assembly to said valve body and said bonnet,

said bonnet having a passageway therethrough, said passageway being aligned with said metal diaphragm assembly axial bore,

a threaded stem extending through said bonnet passageway and positioned within said bonnet passageway for nonrotational longitudinal movement relative thereto,



said valve stem having an upper portion extending above said bonnet and a lower portion extending through said bonney passageway and through said metal diaphragm assembly axial bore,

said metal diaphragm assembly inner annular edge portion being sealingly engaged with said valve stem lower portion,

said metal diaphragm assembly having a body portion extending outwardly from said inner annular edge portion to said outer annular edge portion,

said body portion having substantially unsupported upper and lower surfaces thereby permitting said body portion to pivot freely about the connection of said metal diaphragm assembly to said valve body and said bonnet while maintaining said metal diaphragm assembly inner annular edge portion sealingly engaged with said valve stem lower portion,

said valve stem lower portion being connected to said valve assembly,

actuator means axially mounted on and secured to said valve stem upper portion for moving said valve stem axially relative to said bonnet so that said valve assembly moves positively into and out of sealing relation with said valve seat,

a diaphragm stem clamp positioned on said valve stem lower

portion to engage one side of said metal diaphragm assembly inner annular edge portion and form a fluid tight seal between said valve stem lower portion, said valve assembly, and said metal diaphragm assembly, said valve assembly engaging an opposite side of said metal diaphragm

said diaphragm stem clamp being urged into clamping engagement with said metal diaphragm assembly inner annular edge portion with said metal diaphragm assembly body portion being substantially unsupported and freely flexible between said inner and outer annular edge portions, and

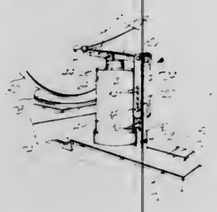
said metal diaphragm assembly being maintained in sealing engagement with said valve stem and said valve assembly valve stem and said valve assembly said diaphragm stem clamp being axially secured to said valve stem lower portion, said diaphragm stem clamp having a threaded axial bore for receiving said valve stem lower portion, said diaphragm stem clamp having a lower surface positioned in overlying abutting relation with said metal diaphragm assembly inner annular edge portion so that said metal diaphragm assembly is sealingly connected to said valve stem, and locking means threadably secured to said valve stem lower portion and abutting said diaphragm stem clamp for transmitting a downward axial force through said diaphragm stem clamp to said metal diaphragm assembly to maintain said metal diaphragm assembly inner annular edge position in sealing connected with said valve stem lower portion and said valve assembly to prevent fluid leakage through said metal diaphragm assembly axial bore and around said valve stem lower portion.

4,231,550

JACK ADAPTER FOR FRONT END ALIGNMENTS

John H. Castoe, 10234 McVine St., Sunland, Calif. 91040

Filed Nov. 23, 1979, Ser. No. 96,628
Int. Cl.³ B66F 3/00
U.S. Cl. 254—124 **11 Claims**



1. An adapter for attachment to a vertical jack for lifting against the steering control arm of a vehicle to jack up the vehicle in a safe position comprising:

an elongated rocker arm having a working end and a remote end opposite its working end;

jack attachment means pivotally secured to the rocker arm between the working end and the remote end of the rocker arm, the jack attachment means extending downwardly from the rocker arm and being configured for releasable attachment to the ram of a jack;

control arm attachment means secured to and projecting upwardly from the working end of the rocker arm for engaging a steering control arm of the vehicle to secure the rocker arm in a fixed position relative to said control arm; and

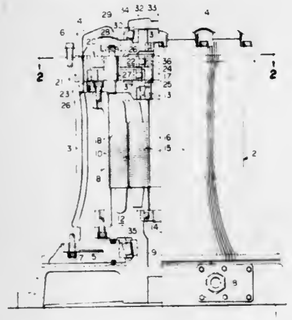
a rigid support arm pivotally secured to the remote end of the rocker arm, the support arm extending downwardly from the rocker arm and having fastening means spaced from the remote end of the rocker arm for attachment to a fixed point to maintain the remote end of the rocker arm at a fixed elevation as the rocker arm pivots through an angle about an axis through the remote end of the rocker arm in response to an upward stroke of the ram of the jack applied to the jack attachment means.

4,231,551

CAPSTAN

Mankichi Ikeda, Shimizu, Japan, assignor to Kabushiki Kaisha Ikeda Seisakusho and Sugita Sangyo Kabushiki Kaisha, both of Tokyo, Japan

Filed May 25, 1978, Ser. No. 909,644
Int. Cl.³ B66D 1/30
U.S. Cl. 254—344 **4 Claims**



1. A capstan for hauling a marine vessel by way of a rope, comprising:

a base,

a motor having a housing comprising a lower bracket fixed to said base, a cylindrical wall fixed at its lower end to said lower bracket and an upper bracket fixed to the upper end of said cylindrical wall, a stator inside said cylindrical wall and a rotor having a shaft rotatably supported by a bearing in said lower bracket and a bearing in said upper bracket,

an eccentric cam fixed on an upward extension of said shaft, a planet gear having teeth on its periphery, a central opening rotatably receiving said cam and a plurality of secondary openings arranged in a circle around and spaced from said central opening,

a plurality of pins fixed to said upper bracket and extending up through said secondary openings in said planet gear and a support bracket fixed to upper ends of said pins, said support bracket having a central bearing rotatably supporting said upward extension of said shaft, and

a drum comprising a generally cylindrical body surrounding said motor and having a negative crown, a top cover fixed to an upper end of said body and a bottom cover fixed to a lower end portion of said body, means rotatably supporting said drum comprising a lower bearing in a central opening of said bottom cover bearing on a downwardly extending central portion of said lower bracket and an upper bearing in a central recess of said top cover and bearing on an upwardly projecting central portion of said support bracket, and an internal ring gear fixed in an upper portion of said body in position to mesh with said planet gear and having at least one more teeth than said planet gear.

4,231,552

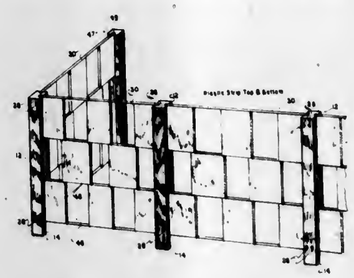
RESIDENTIAL FENCE

Clifford F. Thomas, 286 Main St., Bishop's Falls, Newfoundland AOHICO

Filed May 24, 1978, Ser. No. 909,041
Int. Cl.³ E04H 17/16
U.S. Cl. 256—24 **1 Claim**

1. A fence comprising a plurality of rigid, intermediate vertical supports; said supports being spaced apart; said supports being generally rectangular in cross-section and having longitudinal channels on opposite side walls; and corner and terminal support members each having at least one longitudinal

channel therein; vertical panels having edge portions detachably received in said channels and removable clampable fastening means in said support members for securing said edges in said channels, wherein said longitudinal channels extend in a vertical direction in the erect position of a vertical support,



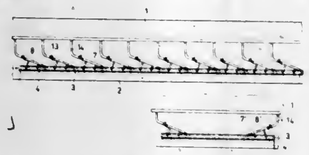
with said removable clampable fastening means serving to fix the edge portions of the vertical panels that are received in a channel in a said support member, so that a said received vertical panel is independently fixed in a channel of a single vertical support.

4,231,553

APPARATUS FOR COOLING RAPIDLY MOVING ROLLED MATERIAL

Hugo Beerens, Meerbusch; Hugo Feldmann, Alsdorf-Warden, and Claus G. Schlanzke, Ratingen-Eckamp, all of Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 891,005, Mar. 28, 1978, abandoned.
This application Mar. 13, 1979, Ser. No. 20,215
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714019
Int. Cl.³ C21D 9/52
U.S. Cl. 266—113 **5 Claims**



1. Apparatus for cooling hot, rolled material issuing from the rolling mill at high speed, the apparatus having an upstream end and a downstream end, the apparatus comprising a plurality of guide tubes arranged in line and spaced from one another, the tubes having entry ends for admitting the rolled material and exit ends, the tubes defining a path for rolled material through the apparatus, mixing means external to said guide tubes for forming a water/air mixture, and a plurality of cooling medium supply pipes directed into the ends of respective tubes at an acute angle to the path of the rolled material through the apparatus to introduce the water/air mixture into the tubes.

4,231,554

CONTROL VALVE FOR VEHICLE AIR SPRINGS AND THE LIKE

Martin A. Ekonen, Livonia, and James L. Blechschmidt, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1978, Ser. No. 952,179
Int. Cl.³ B60G 11/26; F16F 3/00, 5/00, 13/00
U.S. Cl. 267—65 D **6 Claims**

1. A pneumatic control valve for a vehicle suspension system for controlling the flow of compressible fluids to and from an air suspension spring comprising;

a cylinder with a first, second and third ports therethrough spaced intervally along the cylinder wherein said ports enter the sidewall of said cylinder;

said first port operably connected to a supply of compressible fluid;

said second port operably connected to an air suspension spring;

said third port being in fluid communication with the exteriof of said cylinder;

a piston slidably mounted in the cylinder in abutting relationship with the interior of the cylinder;

a piston rod rigidly connected to said piston and extending through the bottom end of said cylinder;

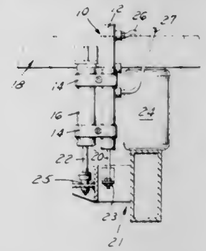
said second port is at the top portion of the cylinder with the first and third ports positioned below said second port;

said piston having a passage therethrough;

said piston moveable to a first position such that said first port is in communication with said second port such that compressible fluid passes from said first port through said second port to said air spring and said piston seals the side of said cylinder sealing the third port from the said first and second ports;

said piston moveable to a second position such that said piston seals the sides of said cylinder sealing all three ports from fluid communication with each other;

said piston moveable to a third position such that said third port is in fluid communication with said second port such



that compressible fluid passes from the air spring through the second port and through the third port and said piston seals the sides of the cylinder sealing said first port from the second and third ports;

said passage through the piston fluidically connecting the second port with one of the first and third ports when said piston is in one of said respective first and third positions;

the air spring being operably connected to the piston rod and cylinder such that the compressible fluids flowing in and out of said air spring control the position of said piston in said cylinder;

the fluid which flows into the second port when the piston is in its first position moving the piston toward said second position and said fluid which flows out of the second port through the cylinder and through the third port when the piston is in its third position moving the piston towards said second position;

the piston having sealing means mounted on the sidewalls thereof for sealing the ports when the piston is laterally aligned therewith;

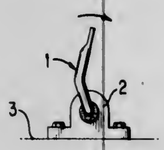
said passage through said piston having a first outlet at the top surface of said piston with said outlet in fluid communication with said second port and said second outlet aligned with one of the first and third ports when the piston is one of its first and third positions, respectively, such that said compressible fluid flows through the passage between said second port and one of the first and third ports, the other of the first and third ports being positioned above said piston and in fluid communication

with the second port when the piston is in the other of its third and first positions respectively.

4,231,555
BAR-SHAPED TORSION SPRING

Tsutomu Saito, Matsudo, Japan, assignor to Horikiri Spring Manufacturing Co., Ltd., Yachiyo, Japan

Filed Jan. 18, 1979, Ser. No. 4,579
Claims priority, application Japan, Jun. 12, 1978, 53/80213[U]; Aug. 18, 1978, 53/113364[U]
Int. Cl.³ F16F *1/14*
U.S. Cl. 267—154 7 Claims

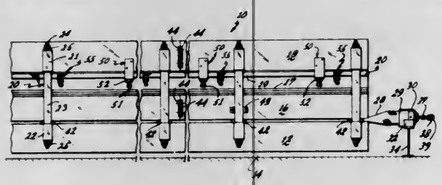


4. A bar-shaped torsion spring, such as a torsion bar, comprising an elongate main body having a hollow interior and a linking means for linking the main body to a body to be sprung, said linking means having a column-shaped leg portions and a linking head portion, said linking means being separately formed from said main body and said column-shaped leg portion being inserted into the hollow interior of each end of said main body and fixed integrally with said main body.

4,231,556
APPARATUS FOR HOLDING HOLLOW WALL PANELS WHILE THEY ARE FILLED WITH FOAMED PLASTIC

George R. Heffner, La Verne, and Max Casutt, San Diego, both of Calif., assignors to Grumman Flexible Corporation, Delaware, Ohio

Filed Nov. 6, 1978, Ser. No. 958,158
Int. Cl.³ B23Q *3/06*
U.S. Cl. 269—22 11 Claims



1. Apparatus for holding hollow wall panels while they are filled with foamed plastic comprising:

a base having a top pressure surface,

first platen means having a top pressure surface and a bottom pressure surface, said first platen means being positioned above said base,

second platen means having a bottom pressure surface, a plurality of longitudinally spaced roller support brackets extending downwardly from the bottom of said second platen means for supporting the hollow wall panels,

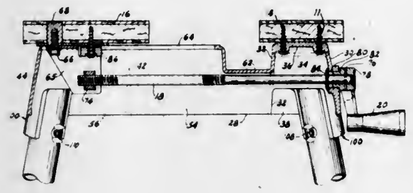
means for supporting said second platen means above said first platen means,

inflatable means positioned between the top pressure surface of said base and the bottom pressure surface of said first platen means for lifting said first platen means upwardly when a fluid under pressure is released into said inflatable means.

4,231,557
PORTABLE WORK BENCH

Donald L. Blachly, Excelsior Township, Sauk County, Wis., and Daniel A. Terpstra, Kirkwood, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 21, 1979, Ser. No. 13,208
Int. Cl.³ B25B *1/10*
U.S. Cl. 269—139 9 Claims



1. A portable work table and work holding device comprising a horizontally arranged, elongated, rectangular frame consisting of rigidly connected longitudinal and transverse frame members, one of said longitudinal frame members having horizontally spaced vertical side walls, a horizontal bottom wall and vertical end walls forming a longitudinally extending elongated compartment in said frame member open at the top for storage, a pair of boards coextending longitudinally on the upper surface of said frame, one of said boards extending along one longitudinal side of said frame and being fixed thereto, the other of said boards being slidably movable laterally toward and away from said fixed board, and screw-operated means for moving said slidably movable board toward and away from said fixed board, a socket formed at each corner of said frame receiving the upper portions of legs having such length as to space said frame at a convenient working height from a floor, means detachably connecting said legs to said frame, said elongated compartment being sized for reception of said legs when said legs are detached from said frame, said laterally slidable board being slidably movable into positions for covering and uncovering the top of said compartment, said frame having sufficient rigidity and vertical depth to render the device operable as a work surface and work holding means when said detachable legs are removed and said frame is placed directly upon a supporting surface.

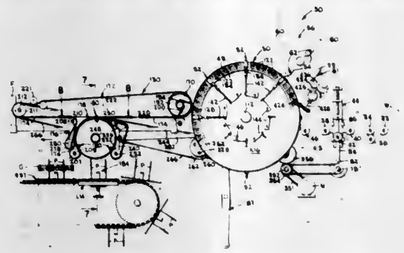
4,231,558
APPARATUS FOR ACCUMULATING ARTICLES SUCH AS BAGS

John S. Aterianus, and Donald C. Crawford, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed May 8, 1978, Ser. No. 904,133
Int. Cl.² B65H *39/08*
U.S. Cl. 270—60 26 Claims

1. An article accumulating mechanism comprising means for continuously moving a row of equally spaced articles along a first predetermined path, means defining at least one rotatable article collecting drum, means defining at least one article clamping unit on said drum, drive means for rotating said drum and also for cyclically moving said drum bodily along a second predetermined path in timed relation with the movement of the articles for moving said clamping unit into several different positions along said first path to grip said spaced articles, means for actuating said clamping unit for gripping an article each time said clamping unit moves into position to grip an article from said first path and for collecting a plurality of

gripped articles while said rotating drum moves through one cycle along said second path, and means for discharging the

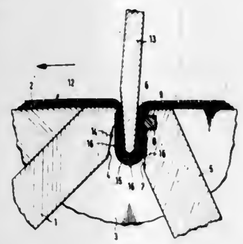


collected group of articles from said one clamping unit while moving said collecting drum along said second path.

4,231,559
FOLDING JAW CYLINDER

Otto T. Weschenfelder, Wurzburg, and Horst B. Michalik, Hochberg, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,184
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745359
Int. Cl.³ B65H *45/16*
U.S. Cl. 493—426 5 Claims

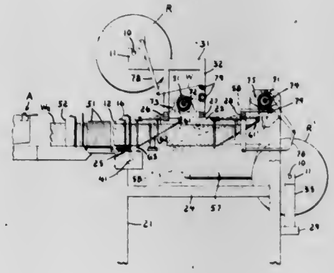


1. A folding jaw cylinder for a folding mechanism in a web-fed rotary printing machine, said folding jaw cylinder including a fixed front folding edge extending axially along a surface portion of said cylinder and having a first recess and a spaced, cooperating movable folding jaw, said folding jaw having a folding surface adjacent the surface of said cylinder and extending radially inwardly toward the center of said cylinder and having a second inner recess, said folding edge and folding jaw cooperating to form a folding gap with said first and second inner recesses cooperating to form a folding slot into which a portion of a collated stack of sheets may be forced by a folding blade to form a fold in said sheets, said fold in said sheets having a bulge portion extending into said folding slot, said folding jaw being movable toward said folding edge to contact said fold after said fold has been formed, said folding blade remaining in said fold during said movement of said folding jaw toward said folding edge, said folding jaw having a resilient friction increasing means having a coefficient of friction exceeding 0.18, said resilient friction increasing means projecting out of a notch in said folding surface and extending into said folding gap from said folding surface to press against said fold in said sheets radially outwardly from said bulge portion of said fold in said folding slot whereby said fold will be retained in said folding slot as said folding blade is moved out of contact with said sheets.

4,231,560
TENSION CONTROLLED APPARATUS FOR FEEDING WEB MATERIAL

Roger H. Stohlquist, and Leo Strombeck, both of Rockford, Ill., assignors to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Jul. 28, 1978, Ser. No. 929,168
Int. Cl.³ B65H *45/22*
U.S. Cl. 493—29 8 Claims



1. A tension controlled apparatus for feeding a web of material from a supply roll to processing equipment of the type that exerts an intermittent pulling force on the web to intermittently advance the web through the processing equipment, the apparatus including means for supporting a supply roll of web material for unwinding rotation, a first web feed roller mounted for axial rotation, a first web guide means for guiding the web after it unwinds from the supply roll to cause it to wrap part way around the first web feed roller, means for driving the first web feed roller in continuous fashion in a direction to feed the web passing thereover from the supply roll, the first web feed roller having a smooth low friction web engaging surface operative to feed the web passing thereover when the tension on the web exceeds a minimum value and to slip relative to the web when the web tension decreases below the minimum value, a drive wheel mounted for axial rotation and drive means for driving said drive wheel in continuous fashion, a driven wheel mounted for rotation about an axis parallel to said drive wheel and for shifting movement bodily along a path toward and away from said drive wheel, a second web feed roller connected coaxially to said driven wheel for rotation thereby, second web guide means for guiding the web of material to cause it to wrap part way around the second web feed roller as it passes from the first web feed roller to the processing equipment and exit from the second web feed roller in an exciting direction having a substantial component along said path and in a direction to shift the driven wheel along said path and into driving engagement with the drive wheel when tension is applied by the processing equipment on the web material exiting from the second web feed roller, the second web feed roller having a high friction web engaging surface operative when its driven wheel is in driving engagement with the drive wheel to feed the web exiting from the first web feed roller toward the processing equipment, said second web guide means including web folding means engaging the web at a location between the first web feed roller and the second web feed roller for longitudinally folding the web of material to form a folded web, said folded web being guided around said second web feed roller.

4,231,561

AUTO DOCUMENT FEEDER FOR USE WITH DUPLEX COPYING MACHINE

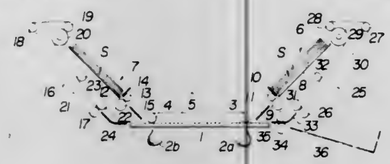
Tamaki Kaneko, Fujisawa; Seiichi Miyakawa, Nagareyama; Toyokazu Satomi, Yokohama; Yutaka Koizumi, Kawasaki; Isao Nakamura, Tokyo, and Yasuhiro Tabata, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Feb. 6, 1978, Ser. No. 875,537

Claims priority, application Japan, Feb. 10, 1977, 52-13843; Feb. 28, 1977, 52-21283; Mar. 25, 1977, 52-33772

Int. Cl.[2] B65H *1/06, 5/02, 29/00*

U.S. Cl. 271—3.1 **12 Claims**



3. An auto document feeder, for use with a duplex copying machine having an exposure station and adapted to be mounted on the exposure station, said auto document feeder comprising: sheet feeding means comprising an original table located at one side of said exposure station and operable to hold therein a plurality of sheet originals to be copied and to feed the sheet originals therefrom individually in predetermined sequence and orientation to said exposure station; platen belt means mounted on said exposure station and operable to transport a sheet original across said exposure station and to maintain each sheet original in close contact with said exposure station during exposure of the sheet original, said platen belt means being reversible to effect copying of one side of each sheet original during a forward movement of said platen belt means and a copying of the other side of the sheet original during a backward movement of said platen belt means; sheet reversing means operable to receive sheet originals from said exposure station and to invert the received sheet originals, said sheet reversing means comprising a primary sheet reversing apparatus and a secondary sheet reversing apparatus, said primary sheet reversing apparatus feeding sheet originals to said original table and said secondary sheet reversing apparatus feeding sheet originals to said exposure station of copying said other sides of said sheet originals; and sheet transport means operable to transport said sheet originals individually from said sheet reversing means to said sheet feeding means.

4,231,562

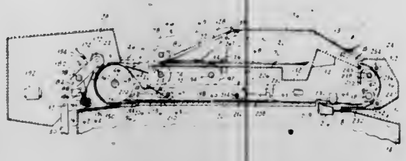
RECIRCULATING DOCUMENT FEEDER

Tatsu Hori, Los Altos, Calif., assignor to Savin Corporation, Valhalla, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,999

Int. Cl.[3] B65H *5/22*

U.S. Cl. 271—3.1 **18 Claims**



1. In a sheet feeder in which sheets are separated from one side of a stack and returned to the other side of the stack, said feeder having a place-marking element and means for automatically setting said element against the sheet on the other side of said stack, the improvement wherein said automatic setting means comprises means for mounting said element for movement along either of two paths between a first point on said one side of said stack and a second point on said other side of said stack, one of said paths extending through the space occupied by said stack and the other of said paths being a return path not extending through said space, said mounting means comprising a pin secured to said place-marking element and means for forming an endless elongated slot for receiving said pin, said element being normally subject to a biasing force in the direction of said first point along the lengths of each of said paths and at the end of said paths, and means for applying an actuating force in a direction opposing said biasing force to move said place-marking element from said first point to said second point and then removing said actuating force to permit said element to move under the influence of said biasing force back to said first point.

4,231,563

DEVICE FOR GRIPPING AND DISPLACING KNITTED OR WOVEN ARTICLES

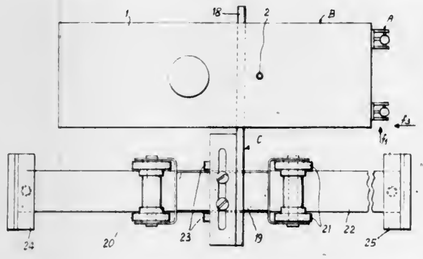
Frantz M. Boucraut, Troyes, France, assignor to Valton S.A., Troyes, France

Filed Oct. 27, 1978, Ser. No. 955,413

Claims priority, application France, Nov. 4, 1977, 77 33192; Oct. 11, 1978, 78 28994

Int. Cl.[3] B65H *3/22*

U.S. Cl. 271—18.3 **11 Claims**



1. A device for gripping one by one from a pile and for displacing knitted or woven articles, including a vacuum gripping means and a needle type gripping means acting together functionally together, wherein said two means are combined with a third, supplying means, the vacuum gripping means having an adherence surface with a first extremity and a second, opposite, extremity, said adherence surface having at least the same area as the said articles, the needle gripping means being placed in the vicinity of the first extremity of the vacuum gripping means so that the vacuum and needle gripping means may be displaced together as they grip one of said knitted or woven articles and the supplying means being placed in the vicinity of the pile of articles substantially at the height of the first article in said pile, at least one of the vacuum gripping means and the supplying means being mounted so as to cause relative movement therebetween, said movement commencing by said two means approaching one another when the needle type gripping means has seized and raised the edge close to the supplying means of the first article lying on the pile of articles.

4,231,564

PAPER SHEET HOLDING DEVICE FOR PAPER SHEET COUNTER

Tuyoshi Miyagawa, and Junichi Arikawa, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1979, Ser. No. 18,273

Claims priority, application Japan, Mar. 15, 1978, 53-33009

Int. Cl.[3] B65H *1/02, 1/26*

U.S. Cl. 271—95 **9 Claims**

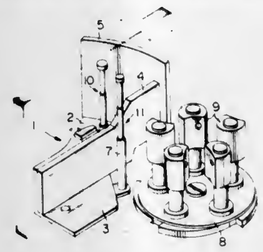
1. In a paper sheet counter including a rotary suction cylinder in communication with a vacuum source, and a plurality of suction heads carried on said rotary suction cylinder and made rotatable for sucking paper sheets one by one so as to deflect and individualize for counting the same when the same are brought close to said suction cylinder,

a paper sheet holding device for holding and bringing the paper sheets to said paper sheet counter, comprising:

a stationary base plate for bearing thereon one end portion of the lower longer side of an upright stack of the paper sheets;

a rotatable base plate for carrying thereon the other end portion of the lower longer side of the upright paper stack;

an upright holder plate carried in an upright position on the trailing side of said rotatable base plate and having its extending end positioned just above said stationary base plate for holding the back of the paper stack;



a first upright keep rod mounted on the outer wall of said holder plate;

a holder arm extending close to said paper sheet counter and made coactive with said holder plate for holding the paper sheets;

a second upright keep rod mounted on said holder arm;

a receptable formed in each of the first- and second-named keep rods; and

a telescopic pipe rod received telescopically in each of the receptacles so that it may be pulled out to and retained at a preset height, whereby the two telescopic pipe rods can be vertically extended to be capable of holding the paper sheets between the two telescopic pipe rods and thereby preventing the paper sheets from hanging downward even if the latter are too wide for the heights of said holder plate and said holder arm as they are.

4,231,565

PAPER FEED DEVICE

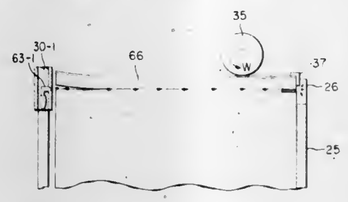
Junji Ichikawa, Kawasaki; Yuji Takahashi, Tokyo, and Jun Saito, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,628

Claims priority, application Japan, Nov. 12, 1976, 51-135982; Nov. 12, 1976, 51-135983; Nov. 12, 1976, 51-135984; Nov. 12, 1976, 51-135985; Nov. 12, 1976, 51-135986

Int. Cl.[2] B65H *3/48, 3/56*

U.S. Cl. 271—105 **1 Claim**



1. A paper feed device comprising:

means for storing a stack of paper leaves to be fed;

means, located above said storage means, for feeding the topmost paper leaf on the stack in a forward direction;

means, located at the front end of said storage means, for separating the topmost paper leaf from the stack to allow said feeding means to feed the topmost paper leaf only;

blowing means for applying pressurized air from adjacent the rear end of the stack in the forward direction at a position remote from the topmost leaf to render the leaves easily separable from adjacent leaves; and

control means for actuating said blowing means at a predetermined time after said feeding means starts to feed the topmost leaf from said stack.

4,231,566

SHEET FEED APPARATUS

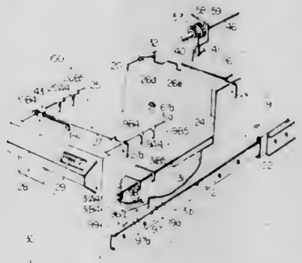
Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 30, 1978, Ser. No. 964,888

Claims priority, application Japan, Nov. 30, 1977, 52-144479

Int. Cl.[3] B65H *3/06, 1/18*

U.S. Cl. 271—117 **18 Claims**



1. A sheet feed apparatus for use with a copying apparatus comprising a sheet feed base mounted on the apparatus for movement between an inoperative sheet replenishing position and an operative sheet feeding position, support means for supporting a stack of recording sheets of different sizes on said feed base, sheet feeding means disposed above a stack of recording sheets disposed on said sheet support means, said feeding means including a drive shaft, a first feed roller means drivingly connected to said drive shaft, and a second feed roller means drivingly connected to said drive shaft, said second feed roller means being mounted for axial movement along said drive shaft, and means for shifting said second roller means axially of said drive shaft as said sheet feed base is moved between its operative and inoperative position so that said first and second roller means are optimately spaced along said drive shaft in accordance to the size of the recording sheets supported on said support means when said sheet feed base is disposed in its operative position.

4,231,567

METHOD AND APPARATUS FOR CLEARING JAMS IN COPIERS

Richard T. Ziehm, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1978, Ser. No. 965,666

Int. Cl.[3] B65H *7/06, 43/04*

U.S. Cl. 271—259 **6 Claims**

1. In a copier having means for making copies of document images including a copy input and a copy output and an in-process copy sheet normal transport path therebetween, the improved method for clearing copy sheet jams within the transport path comprising the steps of:

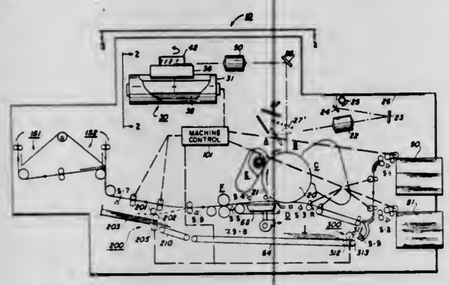
(a) providing copy sheet jam sensing and copy sheet cluster areas within said normal transport path actuable in response to copy sheet jams,

(b) sensing a jam occurrence at a jam area,

(c) clustering in-process copy sheets at a cluster area within said normal transport path upstream of a jam sensing area in response to a downstream jam by continuing the operation of at least part of said transport path to said cluster area; and

(d) removing the copy sheets at the jam area and the copy sheets clustered at said cluster area.

4. A method for clearing jams in a copier with a normal transport path for in-process copy sheets comprising the steps of:



(a) sensing a jam occurrence at a jam occurrence location within said normal transport path; and

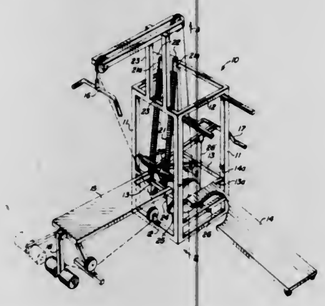
(b) clustering in-process copy sheets at said jam occurrence location, for one-point removal, by preventing the transport of any copy sheets beyond said jam occurrence location which are upstream of said jam occurrence location when said jam occurs and by transporting said copy sheets which are within said normal transport path and upstream of said jam occurrence location when said jam occurs into said jam occurrence location.

4,231,568

EXERCISE MACHINE WITH SPRING-CAM ARRANGEMENT FOR EQUALIZING THE FORCE REQUIRED THROUGH THE EXERCISE STROKE

Robert Q. Riley, 6835 E. Sheena Dr., Scottsdale, Ariz. 85254, and David L. Carey, 13627 N. 18th Dr., Phoenix, Ariz. 85029

Filed Jan. 29, 1979, Ser. No. 7,427
Int. Cl.³ A63B 21/04
U.S. Cl. 272—136 **1 Claim**



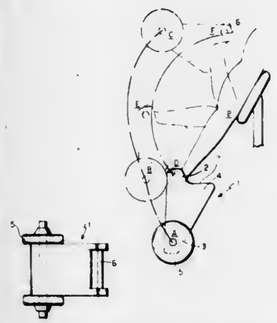
1. In an exercise machine which includes
a frame,
a force-applying member carried by and movable with respect to said frame through an exercise stroke in response to physical force exerted thereon by a user, and
spring means carried by said frame to resist the physical force applied by the user through said exercise stroke,
the improvement comprising:
force equalizing means, operatively associated with said spring means and said force-applying member, for equalizing the physical force required to move said force-applying member throughout said exercise stroke against the increased force required to elongate the spring means when said force-applying member is moved in the direction to elongate the spring means.

4,231,569

EXERCISING DEVICE

Scott M. Rae, 317 Adahi Rd., S. E., Vienna, Va. 22180

Filed Jun. 2, 1978, Ser. No. 911,903
Int. Cl.³ A63B 11/04
U.S. Cl. 272—122 **12 Claims**



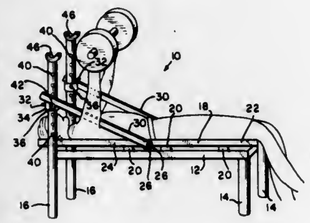
1. An exercising device which comprises an elongated frame member having a longitudinal axis and having two end portions and an intermediate portion disposed therebetween, one of said portions including means for receiving a weight member, and a handle means rotatably attached to the other of said end portions, for rotation about an axis transverse to said longitudinal frame axis, said intermediate portion of said frame member including means shaped to contain an arm-engaging surface adjacent said handle means.

4,231,570

SAFETIED EXERCISING BOARD APPARATUS, AND METHOD OF SAFETYING EXERCISING BOARD APPARATUS

Robert V. Reis, 5 Marguerite La., Towaco, N.J. 07082

Filed May 25, 1978, Ser. No. 909,203
Int. Cl.³ A63B 00/00
U.S. Cl. 272—123 **3 Claims**



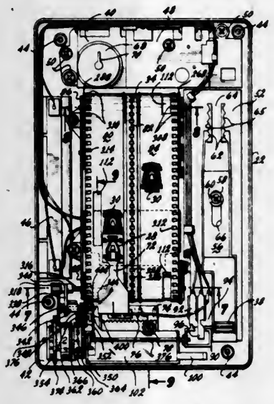
1. Safetied exercising board apparatus, comprising:
board means of a given length for supporting an exerciser thereupon in at least a generally supine position;
an upright coupled to said board means, substantially adjacent one end of said board means; and
elongate means, having one end thereof fixed to said board means, at a location intermediate the length of said board means, the opposite end of said elongate means being engageable with said upright, with a freely-displaceable, contacting engagement, in a plane elevated from said board means, for receiving thereupon a falling or otherwise uncontrolled weight-crossbar, to prevent such crossbar from freely impacting upon an exerciser supine on said board means;
wherein
said elongate means comprises means for deflecting such a falling or uncontrolled weight-crossbar away from said upright and toward said intermediate location;
said elongate and deflecting means further comprises a linear safety bar pivotably coupled at one of opposite ends thereof to said board means at said intermediate location; and further including
rest stop means coupled to said upright for receiving the other of said opposite ends of said safety bar thereupon; wherein
said upright has means for receiving a weight-crossbar thereupon and for supporting such crossbar in elevation above said board means; and
said board means comprises a pair of boards pivotably joined in traverse of said apparatus at said intermediate location;
said board means further comprises hinge means pivotably joining said boards of said pair together;
said hinge means includes a hinge pin; and
said safety bar one end is pivotably coupled to said hinge pin.

4,231,571

PORTABLE OBSTACLE TOY

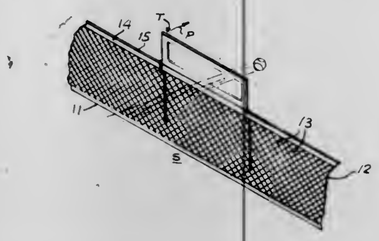
Hiroyuki Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 21, 1978, Ser. No. 971,646
Claims priority, application Japan, Dec. 28, 1977, 52-157850
Int. Cl.³ A63F 9/14
U.S. Cl. 273—1 E **18 Claims**



13. A portable electrical mechanical toy including:
a base;
an electrical power supply mounted on said base;
an electrical motor mounted on said base;
motor drive transmission means mounted on said base, said electrical motor connected to said motor drive transmission means, said motor drive transmission means including a magnetizable metal plate;
an endless belt support means connected to said base;
two endless belts independently mounted on said endless belt support means, said two endless belts including a left side belt and a right side belt;
said left side belt and said right side belt, each independently connected to said motor drive transmission means and each independently driven in an orbit around said endless belt support means;
said left side endless belt and said right side endless belt each including a top surface and a bottom surface, at least one obstacle means on the top surface of said left side belt and said right side belt;
an object member mounting means including an object member, said object member mounting means slidably mounted on said base such that said object member lies proximal to the top surfaces of said left and said right side belts, and slides transversely to the direction of the orbits of said endless belts such that said object member alternately is positioned over the top surface of said left and said right side endless belts and includes at least one coplaner position between said object member and each of said obstacle means on both said left and said right side belts;
each of said left and said right side endless belts including an opening corresponding to each of said obstacles on said belts and said openings extending between said top surface and said bottom surface of said endless belts;
a start-reset switch;
a first circuit including said electrical power supply, said start-reset switch and said electrical motor connected in series;
a second circuit connected in parallel with said first circuit between said electrical power supply and said start-reset switch;
said second circuit including a sensor switch and a solenoid;
said sensor switch including a first, a second, a third, a fourth, a fifth and a sixth contact;
said sensor switch including said second and said fifth contacts connected in series, said third and said sixth contacts connected in series, said second and said fifth contacts connected in parallel to said third and said sixth contacts, and each of said second and said fifth contacts and said third and said sixth contacts connected in series with said first and said fourth contacts, and said first and said fourth contacts connected in series with said reset switch and said solenoid switch;
said first contact positioned proximal to one of said bottom or said top surfaces of both said left and said right side endless belts, said second contact positioned proximal to the other of said top or said bottom surface of said left side endless belt, said third contact means positioned proximal to the other of said top or bottom surface of said right side endless belt, said second contact contacting said first contact through said opening in said surfaces of said left side endless belt when said object member is coplanar with said obstacle means on said left side endless belt, said third contact contacting said first contact through said opening in said surfaces of said right side endless belt when said object member is coplaner with said obstacle means on said right side endless belt;
said fourth contact connected to said object member mounting means, said fifth and said sixth contacts positioned such that said fourth contact contacts said fifth contact when said object member is positioned over said left side endless belt and said fourth contact contacts said sixth contact when said object member is positioned over said right side endless belt;
said solenoid magnetically connected to said magnetizable metal plate of said motor drive transmission means wherein when said second circuit is closed said metal plate is magnetically moved by said solenoid disconnecting said connection between said motor drive transmission means and each of said endless belts such that said endless belts cease to be driven around said endless belt support means and when said reset switch is activated said second circuit is opened and said solenoid relaxes its magnetic effect on said magnetizable metal plate reconnecting said connection between said motor drive transmission means and each of said endless belts.

4,231,572
TENNIS BALL TARGET
William S. Thornton, 204 Ella St., Lafayette, La. 70506
Filed Sep. 29, 1978, Ser. No. 947,074
Int. Cl.[3] A63B *61/00*
U.S. Cl. 273—29 A 6 Claims



1. A tennis ball target for a tennis net arranged in an installed playing position comprising, in combination, a target frame having an opening defining a target area for the passage of a tennis ball driven by a tennis player, support means for detachably mounting said frame on the tennis net in an upright, operative position with said frame extending above the upper edge of said net substantially in coplanar relationship therewith to present said opening to a player, said support means comprises a pair of downwardly depending posts arranged in laterally, spaced-apart parallel relationship, means on the upper ends of said posts for engaging the upper edge of the tennis net, means on the upper ends of said posts for mounting said frame on said posts, said posts being adapted to be interwoven with the meshes of the net in vertically extending positions with said net engaging means in supporting engagement with the upper edge of the net to detachably support said frame in said operative position, said means for mounting said frame on said posts include a spring on each of said posts for yieldingly urging said frame into said operative position whereby said frame is adapted to move yieldingly from said operative position when struck by a driven tennis ball and, said means for engaging the upper edge of the tennis net include a hook portion on the upper end of each of said posts for hooking engagement with the net upper edge.

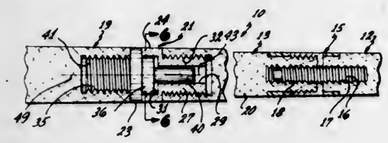
4,231,573
BOWLING LANE AND SURFACE
Peter B. Kelly, Coshocton, Ohio, assignor to General Electric Company, Worthington, Ohio
Division of Ser. No. 901,791, May 1, 1978, abandoned, which is a continuation of Ser. No. 506,069, Sep. 16, 1974, abandoned. This application Jul. 21, 1978, Ser. No. 926,604
Int. Cl.[2] A63D *1/04*
U.S. Cl. 273—51 26 Claims

1. A bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of about 0.18 and a Taber abrasion resistance of at least about 500 cycles, said bowling lane comprising a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard and hardboard, and at least one decorative plastic laminate sheet secured to the surface of said substrate, said plastic laminate sheet comprising a plurality of thermosetting resin impregnated fibrous core sheets, a resin impregnated decorative fibrous print sheet, and an overlying resin containing protective layer.

12. A decorative plastic laminate sheet of a length, thickness and a width for securing to a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard, and hardboard to form therewith all or part of a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of about 0.18 and a Taber abrasion resistance of at least about 500 cycles, said plastic laminate sheet comprising a plurality of thermosetting resin impregnated fibrous core sheets, a resin impregnated decorative fibrous print sheet, and an overlying resin containing protective layer.

18. The method of producing a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of about 0.18 and a Taber abrasion resistance of at least about 500 cycles comprising consolidating a plurality of thermosetting resin impregnated core sheets, a resin impregnated decorative fibrous print sheet, and an overlying resin-containing protective layer under heat and pressure to produce a unitary decorative plastic laminate sheet, and securing at least one such plastic laminate sheet to a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard and hardboard to produce the desired bowling lane.

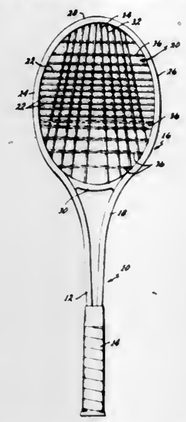
4,231,574
BILLIARD CUE HAVING A QUICK CONNECTOR FOR THE HANDLE PORTION THEREOF
William J. Williams, 11016 Mohawk, Apple Valley, Calif. 92307
Filed Nov. 6, 1978, Ser. No. 957,838
Int. Cl.[2] A63D *15/08*
U.S. Cl. 273—68 6 Claims



1. A billiard cue comprising:
a handle portion;
a shaft portion; and
fittings carried on the ends of the handle portion and shaft portion;
one of said fittings provided with a concentric central bore and an eccentric counterbore;
the other of said fittings provided with a concentric central stud and an eccentric shoulder;
said fittings adapted to be axially mated with the concentric stud received in the concentric central bore and with the eccentric shoulder received in the eccentric counterbore;
whereby when the handle portion and the shaft portion are relatively twisted for a fraction of a turn the shoulder engages the counterbore and the central stud engages the central bore to thereby securely axially clamp said handle portion to said shaft portion.

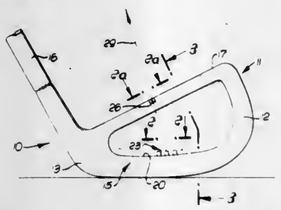
4,231,575
RACKET STRINGING
Mers Kutt, 105 Linda Isle, Newport Beach, Calif. 92660, and Bernard Osbaldeston, La Canada, Calif., assignors to Mers Kutt, Newport Beach, Calif.
Filed Dec. 23, 1977, Ser. No. 863,999
Int. Cl.[3] A63B *51/00, 51/08*
U.S. Cl. 273—73 D 11 Claims

1. A racket having an improved stringing network, said racket comprising:
a frame enclosing an annular opening and having a handle extending longitudinally from the bottom thereof;
a first plurality of generally aligned main string crossings traversing the frame from top to bottom thereof in a generally longitudinal direction and consisting of all of the main string crossings of the racket, the said main string crossings having relatively close spacing to each other at the top of the frame and continuously flaring away from each other with increasing spacing therebetween as they traverse across the frame opening to the bottom of the frame;
a second plurality of generally aligned string crossings traversing across the frame opening from one portion of the frame to an oppositely disposed portion of the frame, making large angles near 90 degrees with the first plurality



of string crossings, and being woven through the first plurality of string crossings.

4,231,576
GOLF CLUB HEAD ALIGNMENT APPARATUS
Sonnie J. Perkins, 1437 180th N.E., Bellevue, Wash. 98008
Filed Feb. 21, 1979, Ser. No. 13,028
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—183 D 5 Claims



1. In combination with a golf club having a head defining a toe, heel, upright front face and rear side, the improvement combination comprising
(a) multiple indicia on a lower portion of the head rear side, said indicia presented upwardly for viewing by the player, and
(b) an alignment marker on the club above the level of said indicia and adapted to be brought into visual alignment with a selected one of said indicia in response to adjustment shifting of the player relative to the club head,
(c) the indicia on said lower portion of the head rear side being discrete and separate from one another, and also spaced apart both in a first direction extending generally between the toe and heel, and also in a second and forward direction extending generally toward the front face, different of said indicia having at least two different configurations.

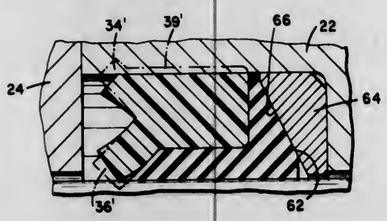
4,231,577
ELECTRICAL GAME APPARATUS USING FOLD SWITCH MATRICES
Wendi Thomas, 55 Dinsmore Ave., Framingham, Mass. 01701; Holly T. Doyle, and Robert O. Doyle, both of 77 Huron Ave., Cambridge, Mass. 02138
Filed Feb. 14, 1978, Ser. No. 877,797
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—238 1 Claim



1. Game apparatus, comprising
an enclosure including first and second boards, one for each of two players, and shield means maintaining each board visible to its player and invisible to the other player,
said boards being positioned with at least one edge adjacent to a corresponding edge on the other board,
each board being positioned in a substantially vertical plane,
each board providing a plurality of apertures extending therethrough defining an aperture matrix array, each aperture in a said aperture matrix array corresponding with a single aperture in the other said aperture matrix array,
said enclosure including sheet support structure disposed adjacent and inwardly of each said board and generally parallel therewith,
each said board providing on its inward surface an alignment boss extending inwardly toward said sheet support structure,
a flexible sheet member carried in said enclosure and carrying electrical circuit means on a single surface thereof, said sheet being folded to define a plurality of regions comprising,
first and second fixed contact carrying regions,
first and second movable contact carrying regions, and
first and second spacing regions free of circuit elements and providing contact apertures,
each said region having an alignment slot therein,
said first fixed and movable contact carrying regions being disposed adjacent one another with said first spacing regions therebetween, said movable contact elements being engageable with said fixed contact elements through said contact apertures, said first spacing region normally maintaining said movable and fixed contacts spaced apart, said alignment slots of said first fixed and movable contact carrying regions and said first spacing region being aligned with one another and cooperating with a said alignment boss positively to position said fixed and movable contact elements with respect to each other and to said contact apertures, and positively to position said three first regions with respect to said first board and its aperture matrix array,
said sheet member extending across the junction between the said adjacent edges of said boards such that, said second fixed contacts, movable contacts and spacing regions are disposed and aligned with respect to one another and to said second board in the same relationship as said first fixed and movable contact regions and spacing region are disposed and aligned with respect to said first board,

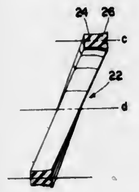
said electrical circuit and contact elements carried on said sheet surface defining electrical circuit means including a plurality of switches, said plurality of switches defining two switch matrix arrays, each corresponding to a said aperture matrix array of one of said boards, each said switch being disposed adjacent one of said apertures,
power source connecting means for connecting a power source to said electrical circuit means,
signal means connected to said electrical circuit means, responsive to a closed circuit position between said signal means and said power source connecting means for producing a signal during the continuance of said condition, said signal being simultaneously perceptible to both players,
said electrical circuit means providing a conductor connected between one side of each of every two said corresponding switches, the other side of said corresponding switches being connected respectively to said power source connecting means and said signal means,
a plurality of plug pieces each removably insertable in any of said apertures and maintainable therein by inference fit therewith, each said plug piece being formed so that when inserted it actuates the switch corresponding to said aperture and while it remains within said aperture, it maintains said underlying movable contact in engagement with said fixed contact,
the presence of a said plug piece in each of two corresponding said apertures in said aperture matrix arrays providing a continuing closed circuit condition between said power source connecting means and said signal means,
whereby a continuing perceptible signal indicates to both players the presence of a plug piece in each of two corresponding apertures.

4,231,578
SEAL ASSEMBLY
Henry A. Traub, Pacific Palisades, Calif., assignor to W. S. Shamban & Co., Santa Monica, Calif.
Filed Apr. 23, 1979, Ser. No. 32,525
Int. Cl.³ F16J 15/24, 15/32
U.S. Cl. 277—121 9 Claims



1. A seal assembly having a low pressure side and a high pressure side, said seal assembly comprising:
a first annular sealing ring having a substantially L-shaped cross-sectional configuration, the base portion of which has a first end and a second end and defines the low pressure side of said seal assembly, the arm portion of said L-shaped sealing ring extending axially from said first end of said base portion, said arm portion having a first side coplanar with said first end of said base portion and having a second side, the free end of said arm portion tapering to form an acute edge on said first side of said arm portion;
a second annular sealing ring having a substantially Y-shaped cross-sectional configuration, the body portion of which has a first side and a second side, the distance between which is greater than the distance between the second end of said base portion and the second side of said arm portion of said L-shaped annular sealing ring, said second annular sealing ring being seated concentrically upon said first annular sealing ring such that said second side of said body of said second annular sealing ring confronts said second side of said arm portion of said first annular sealing ring;
said second annular sealing ring having two arm portions each of which has an outermost corner, said corners spanning a distance greater than the distance between said first and second end of said base of said first annular sealing ring;
said two arm portions extending toward the high pressure side of said seal assembly, one of said two outermost corners extending just beyond the edge of said arm of said first annular sealing ring whereby substantially all the length of one of said two arms rests upon the tapered portion of the free end of the arm of said first annular sealing ring.

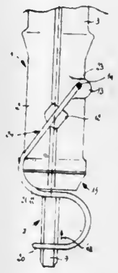
4,231,579
SEALING RING
John B. Scannell, Sandy, Utah, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Jul. 12, 1978, Ser. No. 923,838
Int. Cl.³ F16J 15/32
U.S. Cl. 277—205 11 Claims



1. A sealing ring of resilient material having a base portion at one end and a sealing portion at the other end that is bifurcated to form radially inner and outer sealing lips, said sealing ring having a free state and a deformed state; in said free state a centerline through a cross section of each of said portions lies in a cone, said base portion has an end surface and radially inner and outer surfaces, said radially inner and outer surfaces are substantially parallel to said centerline, and said end surface is substantially perpendicular to said radially inner and outer surfaces; and in said deformed state a centerline through a cross section of each of said portions is substantially parallel with said longitudinal axis, said radially inner and outer surfaces are substantially parallel with said longitudinal axis, and said end surface is substantially perpendicular to said longitudinal axis.

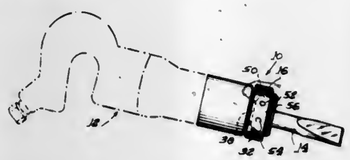
4,231,580
LOST MOTION TOOL RETAINER
Henri Emonet, 12 rue R.P. Couturier, Montbrison - Loire, France
Filed Aug. 7, 1978, Ser. No. 931,517
Int. Cl.³ B23B 31/02
U.S. Cl. 279—19.1 9 Claims

1. A reciprocating piston operated jack hammer device for breaking concrete utilizing mutually exclusively a latch type and a spring-type shifter, said device comprising:
a one piece housing having one end portion; an opposite end portion housing said piston; and a central bore therethrough;
a sleeve member mounted in the central bore of said one end portion of the housing, said sleeve member having a shoulder abutting said one end portion of the housing, said sleeve member further having an axial passage;
means for mounting said sleeve member to said housing;
a tool member having a shank portion, a working end portion and a flange therebetween, said shank portion being slidably mounted in said axial passage of the sleeve member;
means for interchangeably securing a latch type shifter with a spring type shifter to said housing, said securing means further including:
at least one pitched contact surface on the external surface of said one end portion of the one piece housing:
two spaced lugs located on the external surface of the housing, said lugs having coaxial holes for receiving a spring type shifter, said holes intersecting said central bore of the housing;
means for removably securing a latch type shifter to said sleeve member;



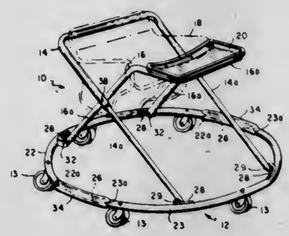
means limiting slidable movement of said tool member to a predetermined position in a direction away from said sleeve member; and
means for mounting said limiting means to said housing so that when said piston strikes said tool member to slidably move said tool member in a direction away from said piston, said limiting means engages said flange of the tool member to prevent said tool member from sliding beyond a predetermined distance from said sleeve member and such that when said tool member slidably moves in a direction towards said piston, said flange of said tool member engages said sleeve member to terminate slidable movement towards said piston.

4,231,581
PNEUMATIC HAMMER WITH TWIST RETAINER
Neil W. Benedict, Evanston, Ill., assignor to Ajax Tool Works, Inc., Franklin Park, Ill.
Filed Oct. 10, 1978, Ser. No. 949,408
Int. Cl.³ B23B 31/22
U.S. Cl. 279—19.4 4 Claims



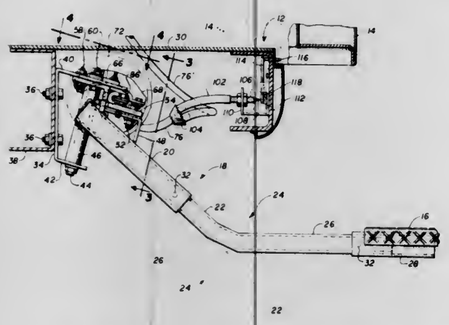
1. A pneumatic hammer for use with tools having a retainer collar or retaining grooves on a shank of the tool, said pneumatic hammer including:
a barrel, said barrel having a first large diameter portion and a smaller diameter cylindrical portion, a radially extending shoulder wall between said large diameter and smaller cylindrical portions, said barrel having a central bore opening at one end thereof to receive a shank of a tool and a plurality of circumferentially spaced retaining ball sockets in said cylindrical portion;
a plurality of retaining balls each inserted into one of said sockets to project inwardly into the barrel bore;
said sockets having inwardly tapered walls extending toward said bore and opening therein with a dimension smaller than the diameter of said balls in said socket to limit the extent of inward projection of said balls;
an outer retainer sleeve rotatably carried on said cylindrical portion of said barrel, having a plurality of recesses in said retainer sleeve for alignment with said balls at an open position to allow said balls to move radially outward in said sockets to allow insertion or removal of a tool and having a plurality of camming surfaces thereon with each surface being adjacent to a socket for twisting toward a ball to force and hold said ball inwardly at a closed position to retain the shank collar or shank grooves and limit the tool shank to a predetermined outward position;
detent means for locking said sleeve in at least said closed position comprising a resilient compressible rod having one end mounted in said shoulder wall and extending longitudinally along said cylindrical portion, a longitudinally extending groove formed in said sleeve for receiving said rod when said sleeve is in said locking position, said rod being compressible and removed from the groove by twisting said sleeve in order to change the position of said sleeve relative to the barrel; and limiting means associated with said sleeve and barrel for limiting the twisting movement of said sleeve relative to said barrel, said limiting means comprising a pin carried by one of said barrel and sleeve, and first and second abutment means carried by the other of said barrel and sleeve, said first abutment means for stopping said pin when said sleeve is in the open position and said second abutment means for stopping said pin when said sleeve is in the closed position.

4,231,582
FOLDABLE ROUND BOUNCER/WALKER
Mark D. Moss, Hollidaysburg, Pa., assignor to Hedstrom Co., Bedford, Pa.
Filed Sep. 11, 1978, Ser. No. 941,242
Int. Cl.³ B62D 7/10
U.S. Cl. 280—87.02 W 3 Claims



1. A child's play seat of the type which includes a pair of scissor frames and a seat supported by the scissor frames, the improvement comprising a pair of arcuate base frame sections the opposite ends of which are positioned opposite one another, a pair of coil springs connected to the opposing ends of the two base frame sections to form a base ring and means for pivotally connecting the lower ends of the scissors frames to the base frame sections so that a weight in the seat tends to spread apart the lower ends of the scissor frames thereby spreading apart the base frame sections and tensioning the springs so that the seat is resiliently supported above the ground and wherein said corresponding scissor frames comprise telescoping sections permitting the scissor frames and seat to fold down against the base ring, and means for releasably securing the telescoping sections in their extended positions.

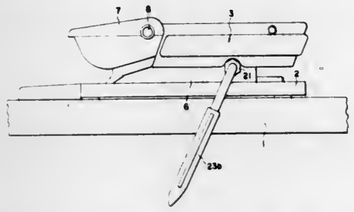
4,231,583
PROJECTABLE STEP FOR VEHICLES
William H. Learn, 402 Frederick Street, Hanover, Pa. 17331
Filed May 31, 1979, Ser. No. 44,085
Int. Cl.³ B60R *3/02*
U.S. Cl. 280—166 **10 Claims**



1. A step assembly for a vehicle having a chassis frame and a door opening outward from one wall of the body of the vehicle and means to develop a source of vacuum when the engine of the vehicle is running, said assembly comprising in combination, a supporting bracket, means to connect said bracket to said chassis frame adjacent said door, an arm pivotally connected at one end to said bracket and movable within a generally horizontal plane, a step connected to the opposite end of said arm, said arm being adapted to pivot relative to said bracket between a retracted position beneath the body of the vehicle and an operative position extending laterally from said frame in alignment with said door, a vacuum cylinder and plunger rod unit supported adjacent said bracket and connectable to said source of vacuum, a compression spring within said cylinder operable normally to project the outer end of said plunger rod outward from said cylinder, means interconnecting said outer end of said plunger rod to said arm for actuation of said arm and step, a latch carried by said arm and engageable with a keeper on said bracket when said arm is extended to releasably secure the same in said extended position, said latch being connected to said plunger rod and movable thereby to unlatched position prior to moving said arm and step to projected position, and a vacuum release valve movable to closed position by said door when the same is closed to cause vacuum to act upon said cylinder to move said plunger rod inward initially to unlatch said latch and then move said arm and step to retracted position and said door when opened moving said release valve to open position and thereby release the vacuum and permit said compression spring to reverse the movement of said plunger rod and project said arm and step to operative position and engage said latch with said keeper.

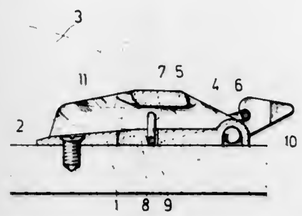
4,231,584
SKI BOOT HEEL BINDING EQUIPPED WITH SKI BRAKE
Toshikazu Kikuchi, Nagareyama, Japan, assignor to Hope Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1978, Ser. No. 971,253
Claims priority, application Japan, Dec. 21, 1977, 52/152960; Jul. 10, 1978, 53/82958
Int. Cl.³ A63C *7/10*
U.S. Cl. 280—604 **7 Claims**

1. A ski boot heel binding equipped with a ski brake comprising:
- a base plate adapted to be attached to a ski plate;
- a heel supporting body mounted on said base plate for sliding movement relative thereto in forward and rearward directions, said supporting body having a pair of side walls, an interior chamber, and a forward end supporting a heel engaging jaw;
- a transverse shaft rotatably supported by said side walls of said supporting body and movable therewith;
- a ski brake arm rigidly fixed to said transverse shaft and rotatable therewith between a braking position whereat said arm extends below the bottom of the ski plate and a non-braking position whereat said arm is above the bottom of the ski plate;
- lever means, positioned within said chamber of said supporting body and rigidly fixed to said transverse shaft and



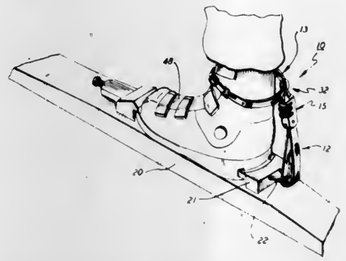
connected to a stationary portion of said base plate, for, upon rearward sliding moement of said supporting body when a ski boot is engaged with said jaw, causing said transverse shaft and thereby said arm to rotate to said non-braking position; and
- spring means, positioned within said chamber of said supporting body, for normally urging said supporting body forwardly with respect to said base plate, and for thereby urging said lever means to rotate said transverse shaft and said arm to said braking position, but allowing rearward movement of said supporting body relative to said base plate when the ski boot is engaged with said jaw.

4,231,585
SKI FASTENING
Pentti Riikonen, Kiveriönkatu 12 B 48, 15210 Lahti 21, Finland
Filed Nov. 14, 1978, Ser. No. 960,634
Claims priority, application Finland, Nov. 18, 1977, 773503
Int. Cl.³ A63C *9/10*
U.S. Cl. 280—615 **2 Claims**



1. Improvement in a ski fastening comprising a base plate with upwardly directed side plates on both sides thereof, the top margins of said side plates being directed toward each other for supporting the sole of the skiing shoe, and a clamping yoke swivellably mounted on said base plate, said yoke having upwardly bent ends for entering, from below, holes provided in the sole of the skiing shoe, and bar means on the foremost portion of the base plate for securing said yoke in clamping position, wherein the improvement comprises that said yoke being swivellably attached to said base plate at the point of angulation of said upwardly bent ends so that on fastening the skiing shoe said upwardly bent ends of said yoke will urge the shoe forwardly so that its sole is impacted between said side plates, and the top margins of said side plates being mutually connected to form a bracing bridge.

4,231,586
COMBINATION SKI LOCK AND SAFETY STRAP
David A. Krause, 5648 Stevens Dr., S., Clay, N.Y. 13041
Filed Apr. 23, 1979, Ser. No. 32,382
Int. Cl.³ A63C *11/02*
U.S. Cl. 280—637 **11 Claims**



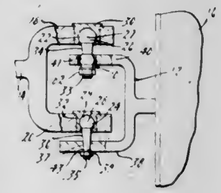
1. A combination ski lock and safelty strap that includes
- a lock having a female body section and a male shackle section receivable therein whereby the male shackle can be locked to the female body section, said lock further including a contoured aperture formed therein in which a strap may be slidably received,
- a loop strap that is slidably received within the contoured aperture of said lock in close sliding relationship therewith having coacting fastening means at each end thereof for closing said loop and a pair of spaced-apart stops positioned on either side of the lock, said stops being of a size and shape to prevent them from passing through the aperture and thus limit the extent of travel afforded the loop strap within the lock,
- a link secured in one end of the strap that is receivable in the shackle of the lock so that the link will be secured in the lock when the shackle is locked in the body section thereof,
- connecting means for securing the lock to a ski.

4,231,587
COLLAPSIBLE FRAMES FOR BABY CARRIERS
Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424
Division of Ser. No. 759,081, Jan. 13, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 964,975
Int. Cl.³ B62B *7/08*
U.S. Cl. 280—647 **11 Claims**



1. A frame mechanism for opening or closing frames for strollers, carriages and the like, comprising, in combination, at least a pair of spaced apart legs, each leg carrying at its lower end one or more wheels, a transversely disposed rod member connected to each of said legs with said legs extending above and below said transverse rod member, a longitudinally disposed elongated support member disposed between said legs, said longitudinal support member including openings through which said transverse rod member extends, said openings defining a path of movement for said transverse rod member as said transverse rod member is pulled upwardly thereby carrying said legs and wheels to a collapsed position, leg contact means disposed on said longitudinal support member and extending above and below said rod member, whereby said legs may be collapsed by pulling up on said transverse rod member causing said leg contact means to contact upper portions of said legs thereby causing the lower portions of said legs and said wheels attached thereto to pivot inwardly on said transverse rod member and when it is desired to open the legs and wheels, the transverse rod member is moved downwardly thereby causing said leg contact means to contact lower portions of said legs and thereby force said lower portions of said legs and said wheels to move outwardly to and remain in their open position.

4,231,588
ADJUSTING SLEEVE ASSEMBLY
David R. Wotton, Ann Arbor; Carroll D. Dickerson, New Hudson, and Lawrence A. Makowski, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Apr. 9, 1979, Ser. No. 28,625
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **8 Claims**

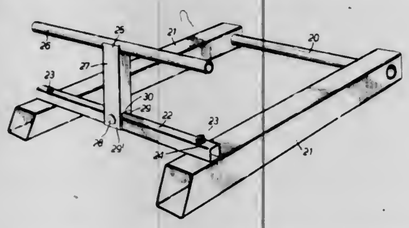


1. An adjustable mounting assembly for a steerable wheel assembly including lower and upper vertically spaced control arms connected to a supportive vehicle member, a spindle member on which a wheel is mounted, said spindle having an upper and lower arm connected to the respective upper and lower control arms, ball joints rotatably mounting each of said control arms to said spindle arms, said mounting assembly comprising;
- a first sleeve being rotatably mountable in a hole in one of said upper or lower arms, one of said ball joints mounted in the other of said respective upper and lower arms;
- said first sleeve having an aperture therethrough constructed to receive a stud integral with a ball forming one of said ball joints with said stud extending through said sleeve;
- mounting means for selectively mounting said sleeve in said hole of said arm such that said aperture through said sleeve is selectively angled through said spindle arm;
- said ball joint stud and sleeve being constructed to allow said stud to incline to extend through said angled aperture at any adjusted position of said sleeve;
- locking means for fixedly locking said stud within said sleeve and said sleeve within said hole for securing said spindle in a desired position with respect to said control arms to mount said wheel assembly with a desired camber, castor, or pneumatic trail.

4,231,589
SUPPORTING FRAME FOR A VEHICLE SEAT
Bernard E. Hodgkins, Trowbridge, and Raymond C. C. Wadey, Westbury, both of England, assignors to Zimmer Orthopaedic Limited, London, England
Filed May 29, 1979, Ser. No. 42,312
Claims priority, application United Kingdom, May 31, 1978, 24840/78
Int. Cl.³ B62D *21/00*
U.S. Cl. 280—781 **7 Claims**

1. A supporting frame for a vehicle seat, comprising longitu-

dinal, substantially rigid, first and second frame members extending at respective opposite sides of said frame, pivot means pivotably mounting said first and second frame members at respective adjacent end zones thereof for turning about a transverse axis, a transverse, substantially rigid, third frame member having its end zones connected to the respective first and second frame members at the other adjacent end zones thereof in such a manner that said other adjacent end zones can



move up and down relative to each other to a limited extent, and a substantially rigid, fourth frame member connected to said third frame member by a mounting at the middle of said third frame member allowing turning of said fourth frame member about a middle longitudinal axis relative to said third frame member, said fourth frame member serving to bear said seat and being restrained against excessive turning about said middle longitudinal axis.

4,231,590

SAFETY BELT SYSTEM FOR VEHICLES

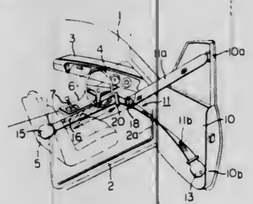
Shigeo Magane, Fujisawa, and Kazuo Yamamoto, Sagamihara, both of Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Mar. 7, 1979, Ser. No. 18,367

Claims priority, application Japan, Mar. 10, 1979, 53-29594[U]

Int. Cl.³ A62B *35/00*

U.S. Cl. 280—803 **2 Claims**



1. A passive safety belt system for a vehicle having a door with an edge hinged to a forward and side portion of the vehicle and having a seat with a first side adjacent to said door, said belt system comprising:

a first webbing providing a shoulder belt part and a waist belt part, the opposite ends of said first webbing being respectively positioned adjacent to upper and lower ends of the door edge opposite from the hinged edge;

first retractor means secured to said door, one end of said first webbing being connected to said first retractor means for protraction and retraction and the other end of said first webbing being secured to the door;

a loop member on said first webbing dividing said first webbing into said shoulder belt part and said waist belt part;

a second webbing having one end thereof attached to said loop member;

second retractor means adjacent to a second side of the seat opposite the first side, said second retractor means being connected to the other end of said second webbing for protraction and retraction, the retractive force of said second retractor means being stronger than that of said first retractor means; and

moving means engaged with said second webbing and movable along said second side of the seat in response to opening and closing of said door for moving both said webbings forward and backward relative to said seat.

4,231,591

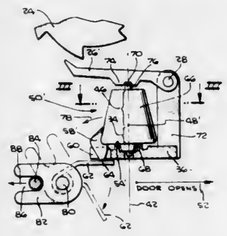
AUTOMATIC RETRACTOR INHIBITOR

Albert R. Close, Newhall, Calif., assignor to American Safety Equipment Corporation, San Fernando, Calif.

Filed Feb. 17, 1978, Ser. No. 878,730

Int. Cl.² B65H *75/48*

U.S. Cl. 280—806 **12 Claims**



1. In an inertially operated safety belt retractor adapted for mounting in a vehicular door which door has a movable locking member for engaging a mating member on the door frame for holding the door in a closed and locked position, the retractor including a spool rotatably journaled in a retractor frame and having an engaging surface for engagement by a pawl to prevent rotation thereof, a safety belt wound on the spool, a movable pawl for engaging the engaging surface of the spool to prevent protraction of the safety belt, and a high inertia mass contacting the pawl and pivoting about a first fulcrum point disposed horizontally from the center of gravity of the mass to move the pawl into engagement with the engaging surface of the spool during periods of high lateral force on the mass such as imposed in emergency conditions, the improvement for resisting the non-emergency engaging of the engaging surface of the spool by the pawl during normal opening of the vehicle door comprising:

(a) means for sensing that the vehicle door is being opened; and,

(b) means cooperating with said sensing means for disposing a superceding fulcrum point on which the mass must rotate to move the pawl into engagement with the engaging surface of the spool at a greater horizontal radial distance from the center of gravity of the mass than the first fulcrum while the door is being opened.

4,231,592

ARRANGEMENT OF A THREE-POINT AUTOMATIC BELT

Hans O. Scherenberg, Stuttgart, and Rudolf Andres, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

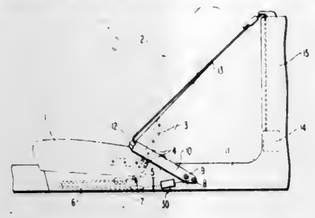
Filed Jun. 30, 1978, Ser. No. 920,681

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730081

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—808 **9 Claims**

1. An arrangement of a three-point automatic safety belt for a forward seat with a backrest in a two-door motor vehicle having rear seat means, said belt having a lower belt section and a belt band, said arrangement comprising roll-up means for the belt located within an area of a fixed vehicle side wall, and support means attached to said vehicle for receiving a fixed point of the lower belt section, the support means being operable to be transferred together with the belt band from a forward operating position into a rear position freeing the ingress to the rear seat means, wherein a pivot movement of at least



one of a coordinated door and backrest is used for transferring the support means frrom one into another end position.

4,231,593

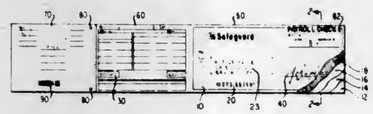
CHECK WITH ELECTRICALLY CONDUCTIVE LAYER

Vincent G. Bell, Jr., Berwyn; Thomas P. Burke, Harleysville, both of Pa.; George D. Margolin, Newport Beach, and Victor V. Vurpillat, Laguna Niguel, both of Calif., assignors to Centurion Data Corporation, King of Prussia, Pa.

Filed Feb. 21, 1978, Ser. No. 879,114

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—6 **33 Claims**



1. A negotiable instrument comprising in combination:

a first layer,

a second layer overlying said first layer, and said layers having substantially different electrical conductivities and colors wherein at least one of said layer is opaque to light and one of said layers being electrically vaporizable by exposure to an electrical discharge.

4,231,594

PIPE JOINT STRUCTURE

Theodor Merkle, Koalgsbronn; Bernhard Hausenblas, Landshausen; Hermann Schweickert, and Dieter Wengert, both of Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

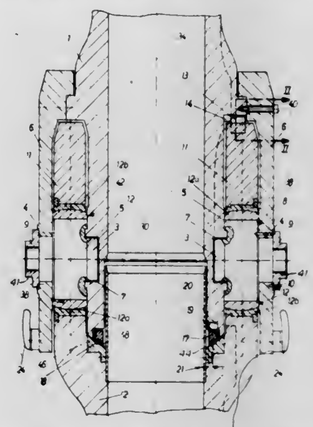
Filed May 8, 1978, Ser. No. 903,477

Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720758

Int. Cl.³ F16L *27/00*

U.S. Cl. 285—3 **13 Claims**

1. A jointed pipeline, comprising a succession of at least first second and third pipe members, first pivotal joint means operatively interconnecting one end of said first pipe member to a first end of said second pipe member, second pivotal joint means operatively interconnecting, a second end of said second pipe member to a first end of said third pipe member, said first pivotal joint means defining a first fixed pivotal axis extending transversely of said first and second pipe members for allowing said first and second pipe members to pivotally rotate thereabout relative to each other, said second pivotal joint means defining a second fixed pivotal axis extending transversely of said second and third pipe members for allowing said second and third pipe members to pivotally rotate thereabout relative to each other, said first and second pivotal axes being respectively contained in first and second planes which are substantially normal to each other, and stop means, said stop means being effective to limit the relative pivotal movement of said first pipe member relative to said second pipe member, said stop means comprising abutment type shear means, said shear means being effective to become sheared and further ineffective as abutment means when a force applied



thereagainst exceeds a predetermined magnitude which magnitude is less than that required to shear said first pivotal joint means.

4,231,595

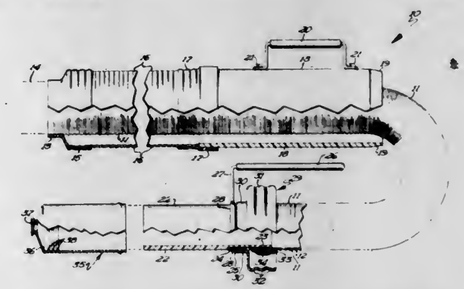
WASTE DISPENSING DEVICE FOR RECREATIONAL VEHICLES AND THE LIKE

Karl I. Knutsen, 9844 James Cir., Bloomington, Minn. 55431

Filed Nov. 29, 1978, Ser. No. 964,672

Int. Cl.² F16L *35/00*

U.S. Cl. 285—38 **4 Claims**



1. A waste dispensing device for recreational vehicles and the like comprising:

an elongate, flexible inner tubular member being longitudinally retractable and extensible between an extended position and a retracted position,

a coupling element secured to one end of said tubular member and being adapted to be attached to the waste outlet fitting of a recreational vehicle,

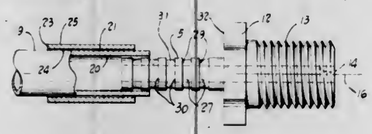
an elongate, rigid spout secured to the other end of said tubular member and projecting longitudinally therefrom,

an elongate, exterior housing structure positioned around said inner tubular member and including an elongate rigid cylindrical sleeve and an elongate flexible outer tubular member, said outer tubular member having one end thereof connected to said coupling element and having the other end thereof connected to said rigid sleeve, said exterior housing structure having a length dimension substantially less than one-half the length dimension of the inner tubular member when the latter is in the extended position,

an annular clamping cap positioned around and connected

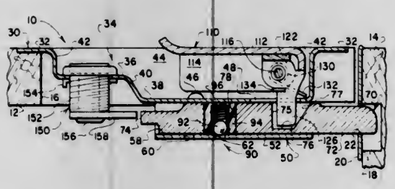
with said spout, the clamping cap releasably engaging an end portion of said rigid sleeve to retain the inner tubular member in a retracted position within said exterior housing structure.

4,231,596
TUBING JOINT ASSEMBLY
Ralph G. Ridenour, 626 Lexington-Ontario Rd., Mansfield, Ohio 44903
Filed Mar. 17, 1978, Ser. No. 887,491
Int. Cl.² F16L *13/14*
U.S. Cl. 285—382.2 **21 Claims**



1. A tubing joint, comprising, in combination,
an inner tubular part having an outer wall,
a tube surrounding and extending over said tubular part,
retention means longitudinally retaining together said tubular part and said tube and including a lateral shoulder on said tubular part larger in cross-sectional area than and acting against a lateral abutment on said tube,
seal means establishing a fluid tight seal between said tubular part and said tube and including an annular laterally directed sharp-angled peripheral rib on said tubular part engaging an annular area on the inner wall of said tube,
said retention means including an inwardly compressed portion of said tube with a longitudinal row of a plurality of oppositely directed circumferentially extending teeth on the exterior surface of said tube, and
said fluid tight seal means including a zig-zag seal path between said tubular part and tube lying beneath said row of teeth and crossing said peripheral rib.

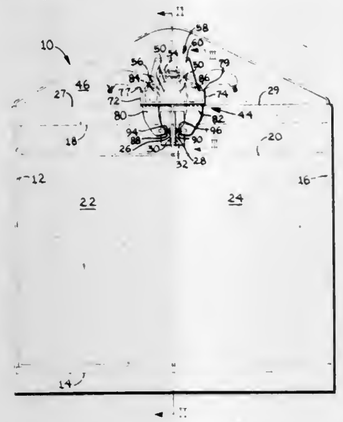
4,231,597
FLUSH-TYPE DOOR LOCK
Albert L. Pelcin, Aurora, Ohio, assignor to The Eastern Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 785,412, Apr. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 729,199, Oct. 4, 1976, abandoned. This application May 5, 1978, Ser. No. 903,164
Int. Cl.² E05B *5/00*; E05C *1/00*
U.S. Cl. 292—164 **15 Claims**



1. A flush-mountable door lock, comprising:
(a) a body structure having side and back walls which cooperate to define a forwardly facing recess, the back wall having a stepped configuration with a first part defining a relatively shallow recess portion and a second part defining a relatively deeper recess portion, and having an opening formed through the back wall;
(b) an elongate bolt slidably supported on the body structure at a location behind a portion of the back side of the second part, the bolt being movable between an extended position wherein the bolt is extended with respect to the body structure, and a retracted position wherein the bolt is retracted with respect to the body structure, the bolt having a receiving formation commuicating with the back wall opening, the receiving formation being positioned near one end of the back wall opening when the bolt is in its extended position, and being positioned near the other end of the back wall opening when the bolt is in its retracted position;
(c) a paddle-shaped handle pivotally mounted on the body member and being movable between a nested position wherein the handle is nested within the deeper recess portion, and a projected position wherein a substantial portion of the handle projects forwardly of the recess;
(d) detent means interposed between the body structure and the bolt for selectively releasably retaining the bolt in its retracted and extended positions and for assisting in moving the bolt to and positioning the bolt in its retracted and extended positions once the bolt closely approaches these positions;
(e) connecting means extending through the back wall opening and into the receiving formation for establishing a driving interconnection between the handle and the bolt which is operative to move the bolt out of its extended position and toward its retracted position as the handle is moved from its nested position to its projected position, and which is operative to move the bolt out of its retracted position and toward its extended position as the handle is moved from its projected position to its nested position;
(f) biasing means interposed between the body member and the handle:
(i) for biasing the handle toward its nested position;
(ii) for maintaining play-free engagement between the handle and the body structure when the bolt is in its extended position; and,
(iii) for maintaining a play-free driving connection between the handle and the bolt when the bolt is in its retracted position; and,
(g) the connecting means being operable to disengage the receiving formation when the bolt is extended and the handle is nested, the connection means including bolt actuator means extending through the back wall opening and being operably connected to the handle and to the receiving formation for moving the bolt from its extended position toward its retracted position when the handle is moved from its nested position to its projected position, and for moving the bolt from its retracted position toward its extended position when the handle is moved from its projected position to its nested position, the bolt actuator being operable to disengage the bolt when the bolt is in its extended position and the handle is in its nested position.

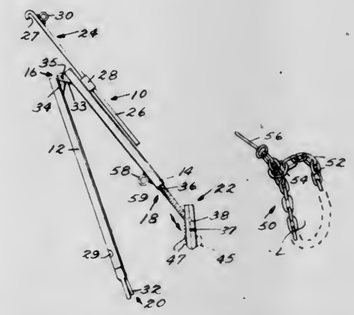
4. A flush-mountable door lock, comprising:
(a) a body structure having side and back walls which cooperate to define a forwardly facing recess, and having an opening formed through the back wall;
(b) an elongate bolt slidably supported on the body structure at a location behind a portion of the back wall, the bolt being movable between an extended position wherein the bolt is extended with respect to the body structure, and a retracted position wherein the bolt is retracted with respect to the body structure, the bolt having a receiving formation communicating with the back wall opening;
(c) detent means interposed between the body structure and the bolt for selectively releasably retaining the bolt in its retracted and extended positions, and for assisting in moving the bolt to and positioning the bolt in its retracted and extended positions once the bolt closely approaches these positions;
(d) a handle mounted on the body structure and being movable between a nested position wherein the handle is nested within the recess and a projected position wherein a substantial portion of the handle projects from the recess;
(e) connecting means extending through the opening and into the receiving formation for establishing a driving interconnection between the handle and the bolt which is operative to move the bolt out of its extended position and toward its retracted position as the handle is moved from its nested position to its projected position, and which is operative to move the bolt out of its retracted position and toward its extended position as the handle is moved from its projected position to its nested position;
(f) biasing means interposed between the body member and the handle:
(i) for biasing the handle toward its nested position;
(ii) for maintaining play-free engagement between the handle and the body structure when the bolt is in its extended position; and,
(iii) for maintaining a play-free driving connection between the handle and the bolt when the bolt is in its retracted position;
(g) the connection means being operable to disengage the receiving formation when the bolt is extended and the handle is nested;
(h) a through-hole formed in the bolt having one end opening toward the body structure;
(i) a mounting sleeve formed from plastics material being carried in the through-hole;
(j) a closed-ended hole being formed in the mounting sleeve and having an open end facing toward the body structure; and,
(k) the detent means including a detent member positioned in the closed-ended hole together with spring means biasing the detent member toward the body structure for receiving the detent member when the bolt is in its retracted and extended positions.

4,231,598
LATCH ASSEMBLY
Anthony J. Natale, Jr., Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed Aug. 25, 1978, Ser. No. 936,985
Int. Cl.² E05C *3/04*
U.S. Cl. 292—210 **7 Claims**



1. A latch assembly (**44**) comprising:
a base (**48**);
an arm (**80**);
means (**50**) for mounting said arm to said base (**48**), said arm being movable between open and closed positions;
a restraining lever (**58**) having a restraining portion (**72**);
means (**54, 62, 64**) for movably mounting said restraining lever (**58**) to said base (**48**), said restraining portion being movable between a restraining position and a release position; and
means (**73**) forming a first surface (**73**) on said restraining portion (**72**) for restraining said arm (**80, 82**) in the closed position with said restraining lever (**58**) in the restraining position and means (**77**) forming a second surface (**77**) on said restraining portion (**72**) for restraining said arm (**80**) in the open position with said restraining lever (**58**) in the restraining position; and
wherein said arm (**80**) includes a means (**91**) for wedgingly urging said arm (**80**) into the closed position as said restraining lever (**58**) moves to the restraining position.

4,231,599
CLOSURE LOCK-PROP
Charles Gayman, Smithshire, Ill. 61478
Filed Dec. 21, 1978, Ser. No. 972,062
Int. Cl.² E05C *17/32*
U.S. Cl. 292—339 **13 Claims**

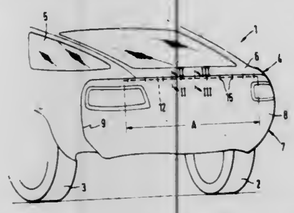


1. Apparatus for preventing the opening of a movable closure comprising first and second elongated rods; means for pivotedly mounting said first and second rods for movement from a first position wherein the rods abut in substantially end-to-end relationship to a second position wherein the rods extend substantially parallel to each other; means for effecting adjustment of the effective length of at least one of said rods; means associated with said first rod for firmly abutting the movable closure; means associated with said second rod for engaging a stationary member adjacent the closure to prevent relative movement between the closure and the stationary member; and means for selectively locking said first and second rods in the first position thereof; said means for selectively locking said first and second rods in the first position thereof comprising a third elongated rod having a latching portion formed as a hook on one end thereof; means formed on one of said first and second rods for allowing guided linear movement of said third rod parallel to said one of said first and second rods; and latching means formed on the other of said first and second rods for cooperating with said latching portion of said third rod to maintain said third rod latched in a position wherein it extends across said first and second rods in operative engagement with each; said latching means comprising means defining an aperture in said other of said first and second rods for receipt of said hook therein.

4,231,600
AUTOMOBILE BUMPER
Walter Braun, Sindelfingen; Hermann Burst, Rutesheim, and Dietmar Peter, Stuttgart-Feuerbach, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany
Filed Oct. 17, 1978, Ser. No. 952,046
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747224
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—128 **8 Claims**

1. In an automobile bumper of the type having a support of

a rigid configuration and a covering of elastic material with a flangelike portion securable to a car body by fastening members, the improvement comprising:



a strip formed in a rigid configuration and provided over at least a partial extent of said covering, said strip having sleeves which extend from an outer surface of said covering through said flange-like portion so as to bear on the car body in the region of the fastening members.

4,231,601

BUMPER FOR MOTOR VEHICLES

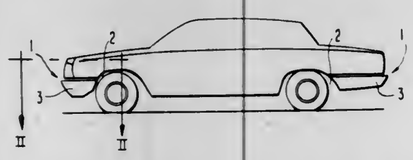
Fritz Häberle; Daniel Riechers, both of Sindelfingen, and Richard Heusel, Tübingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,001

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724016

Int. Cl.³ B60R *19/04*

U.S. Cl. 293—136 **10 Claims**



1. A bumper for motor vehicles yieldable in case of an impact and including bumper end portions laterally drawn about the vehicle, rigidly connected with the bumper center portion and extending approximately parallel to the vehicle outer surface, said end portions of the bumper being longitudinally displaceably guided at a distance from the vehicle outer surface, and a mounting bracket means rigidly connected with a respective bumper end portion and projecting with its free end into a guide means fixed at the vehicle, characterized in that the respective end portion includes a support means terminating at a distance from an associated wheel casing cutout, said support means having at its top side a cover means rigidly connected with the end portion, and the remaining area of the end portion being covered off by a downwardly projecting apron means which together with the cover means extends up to at least near the wheel casing cutout.

4,231,602

REFUSE COLLECTION DEVICE

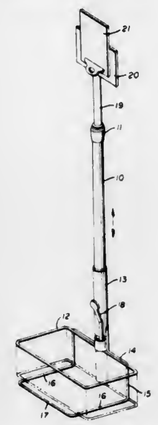
Frank N. Kinney, 300 Fountain Ave., Ellwood City, Pa. 16117

Filed Sep. 28, 1978, Ser. No. 946,540

Int. Cl.³ A01K *29/00*

U.S. Cl. 294—1 BA **1 Claim**

1. A refuse collection device comprising an elongated vertical handle, a sleeve movably mounted on said handle, vertically spaced horizontally positioned rectangular bag entering members on said handle and sleeve respectively and arranged for vertical movement toward and away from one another when said sleeve is moved relative to said handle, said bag entering member on said sleeve being vertically offset below said sleeve, first portions of said bag entering members extending from said handle and sleeve respectively in oppositely disposed horizontal right angles to said sleeve, the intermediate portions of said rectangular bag entering members being positioned at vertical right angles to said first horizontal portions whereby the remaining portions of said bag entering member on said sleeve are generally offset with respect to the plane of said bag entering member on said handle, said bag entering members adapted to enter and hold an open ended bag positioned thereover and hold and tension said bag in open end condition when moved apart vertically, a catch member on said sleeve selectively engagable with said handle whereby movement of said sleeve relative to said handle moves said bag entering members relative to one another so as to expand said open ended bag and hold the same on said members and permit said bag to be turned inside out so that a peripheral area of said bag is positioned around the opening thereof in folded relation over portions of said bag entering members.



4,231,603

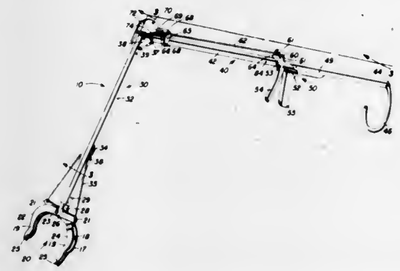
GRIPPING DEVICE FOR HANDICAPPED PERSONS

Willem D. van Zelm, 1005 Boyce Ave., Baltimore, Md. 21204

Filed Feb. 15, 1979, Ser. No. 12,336

Int. Cl.³ A47F *13/06*; B25J *13/02*

U.S. Cl. 294—19 R **9 Claims**



1. A gripping device to aid handicapped persons in reaching and picking up objects, comprising:

a gripping means;

a forward arm member connected to said gripping means;

a rearward arm member pivotally connected to said forward arm member to bring a gripped object at the distal end of said forward arm member to the position of the user of said gripping device; and

a control mechanism for controlling said gripping means and the movement of said forward arm member toward the user, said control mechanism including a remote thumb control means for operating said pivotally connected forward arm member and said rearward arm member, said pivotal connection causing said gripping means to approach the user to deposit said object.

4,231,604

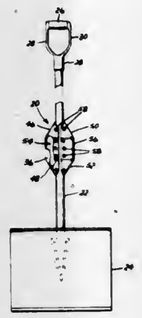
SHOVEL HAVING FULCRUM DEVICE

James J. Obergfell, 4407 Welsser Park, Fort Wayne, Ind. 46806

Filed Jun. 12, 1979, Ser. No. 47,728

Int. Cl.³ A01B *1/02*

U.S. Cl. 294—59 **3 Claims**



1. A lifting implement comprising an elongated handle having a load-carrying blade on one end,

a fulcrum device affixed to said handle intermediate the ends thereof in such position to impart a lifting movement to said blade when said device is engaged with the user's thigh and the other end of said handle is moved downwardly, said device being wider than said handle to stabilize said handle against rotation about its axis, said device including a supporting enlargement having a resilient pad on the thigh-engaging portion thereof, said thigh-engaging portion being convexly curved in directions both longitudinally and laterally of said handle, said supporting enlargement having an inner concave surface which fits snugly against said handle surface and a rounded outer surface that extends laterally beyond each side of the thigh-engaging surface of said handle, said enlargement further having predetermined lateral and longitudinal dimensions to distribute the fulcrum force over the area of the user's thigh, said pad being mounted on said rounded outer surface of said enlargement.

4,231,605

CARRIER ASSEMBLY FOR MULTI-PACK CONTAINERS

Fred C. Newman, La Grange, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

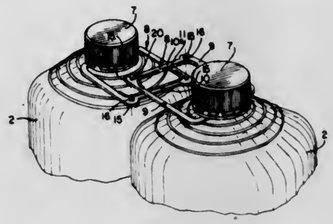
Filed Oct. 1, 1979, Ser. No. 80,373

Int. Cl.³ B65D *21/02*

U.S. Cl. 294—87.2 **10 Claims**

1. A carrier assembly for a pair of containers each of which comprises a body portion having lower and upper end portions;

a handle member connected to the upper end portion, each handle member having a pair of legs extending radially outwardly from the container and a transverse bar portion interconnecting the outer ends of said legs, said bar portions of said pair of containers being arranged in overlapped relationship with one another, and means releasably interconnecting the bar portions of the respective handles to each other to form a common carrier for both containers.



4,231,606

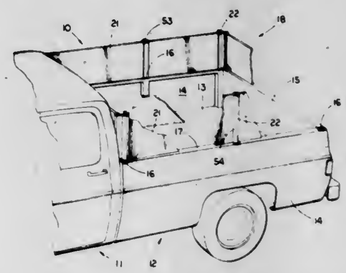
PICKUP TRUCK STAKE ARRANGEMENT

Robert P. Tuerk, 7710 Candlewood La., Indianapolis, Ind. 46250

Filed Dec. 11, 1978, Ser. No. 968,378

Int. Cl.³ B60P *7/06*

U.S. Cl. 296—43 **23 Claims**



1. A truck stake arrangement suitable for use in enclosing the bed of a pickup truck, comprising:

(a) a delta truck stake having a tapered bottom end removably seatable in the side wall pockets of a pickup truck bed;

(b) a plurality of dovetail slots in the wide wall of said delta stake, said slots being parallel and extending along a portion of the length thereof;

(c) a panel-receiving and supporting bracket defining a lateral groove therein for receipt and support of a wall enclosure panel; and

(d) a dovetail ridge extending along a portion of the length of said bracket and slidably and interchangeably received within said dovetail slots in said delta stake.

4,231,607

SIDE COLLISION PROTECTION SYSTEM FOR MOTOR VEHICLES

Nils I. Bohlin, Kungsbacka, Sweden, assignor to AB Volvo, Göteborg, Sweden

Filed Apr. 3, 1978, Ser. No. 893,053

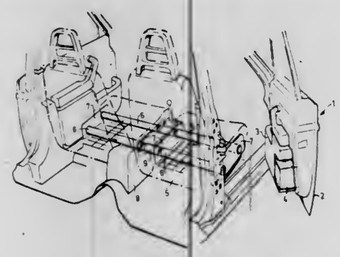
Claims priority, application Sweden, Apr. 14, 1977, 7704289

Int. Cl.² B60N *1/00*

U.S. Cl. 296—63 **13 Claims**

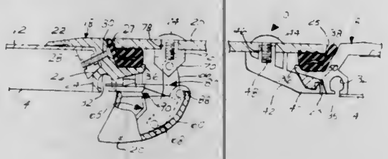
1. System for protecting motor vehicle occupants against injury in side collisions, comprising exterior and interior panels of a car body side and/or doors, a seat support, first reinforcing members arranged between the exterior and interior panels of the car body side and/or doors, and second reinforcing mem-

bers, incorporated in the seat support, and which extend transversely to the vehicle and are disposed to transmit, after a certain deformation of a press-loaded body side or door, the load to the floor of the vehicle and to the opposite body side or door, characterized in that the first reinforcing members (4) are made as essentially plastically deformable, energy absorbing members, which extend transversely over at least the greater part of the space between the exterior and interior panels (2



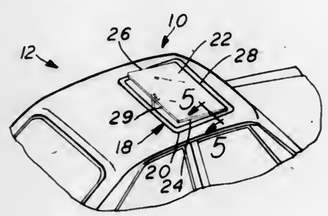
and 3 resp.) of the body sides and/or doors and which vertically cover an area level with the bumpers of the vehicle, and in that the second reinforcing members (6; 6,11) comprise transversely extending members which take up pressing loads and are incorporated in the seat support (5) level with the first reinforcing members, and outer end surfaces affixed to said transversely extending members and located adjacent to or at an insignificant distance from the interior panels of the body sides and/or doors.

4,231,608
SUNROOF STRUCTURE
Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.
Filed Jul. 29, 1977, Ser. No. 820,105
Int. Cl.[2] B60J *7/18*
U.S. Cl. 296—216 **1 Claim**



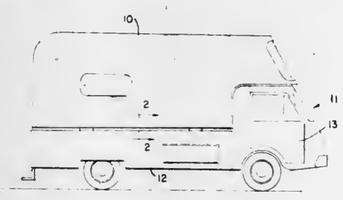
1. A sunroof for a vehicle having an opening in its roof and comprising:
- a frame extending about the edge of the opening and having a supporting surface lying in a plane substantially parallel to the vehicle roof;
- a resilient section extending about a periphery of the opening to seal said opening carried by said supporting surface; and
- a panel adapted to be supported with its perimeter in abutment with said resilient section, said frame having an upright rigid supporting section; said resilient section comprising a tubular member having a base supported section, said tubular member being compressed by said panel when said panel is forced into engagement with said resilient section; said resilient section having a flange integral with said base and extending from said base with one side of said flange being laterally spaced from an adjacent side of said tubular member to define a slot therebetween extending from said base, the other side of said flange being in abutment with and supported by said upright frame section.

4,231,609
VEHICLE SUNROOF FRAME
Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.
Filed Nov. 30, 1978, Ser. No. 965,172
Int. Cl.[3] B60J *7/18*
U.S. Cl. 296—218 **7 Claims**



1. A frame extending around an opening in a vehicle roof to support a removable sunroof panel and finish the opening perimeter comprising:
- a horizontal flange cantilevered to the frame overlaying the vehicle top around the perimeter;
- a downward extending section with an inside surface inclined inwardly and an outside surface inclined inwardly;
- a horizontal section cantilevered into the opening spaced below the roof;
- a downward projecting lip integral with the bottom surface of the cantilevered section extending around the perimeter;
- means for nestingly receiving a pair of releasable latching bayonet cams;
- means for transversely aligning the bayonet cams;
- means for attaching a releasable latch assembly;
- a trim ring member having a lower horizontal flange abutting the lip extending around the frame perimeter for securing the frame to the vehicle roof and finishing the inside of the opening; and
- means for attaching the trim ring member to the frame.

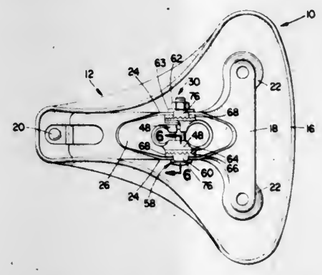
4,231,610
CAMPER ANCHORING AND LOCKING STRUCTURE
Christopher A. Stoll, 2605 Janice La., Venice, Fla. 33595
Filed Mar. 30, 1979, Ser. No. 25,347
Int. Cl.[3] B60P *3/32*
U.S. Cl. 296—167 **5 Claims**



1. A combined camper anchoring and locking structure for securing a camper body on a truck body comprising a first set of rail members secured to the undersurface of said camper body along the sides thereof, said rail members provided with grooves extending along the edges thereof, a second set of rail members having posts secured thereto and having grooves extending along the edges thereof, openings provided in the sides of said truck body for receiving said posts therein, said grooves in said first and second set of rail members engaging with one another with a means for maintaining said rail members in engaged relationship and a pivoted latch means mounted in said post for engagement with an opening formed

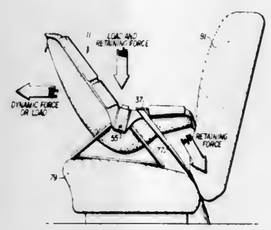
in one side wall of said truck body for releasably locking said camper body to said truck body.

4,231,611
CYCLE SEAT AND CLAMP THEREFOR
Martin J. Bird, Norwalk, Ohio, assignor to Persons-Majestic Manufacturing Company, Monroeville, Ohio
Filed Jul. 10, 1978, Ser. No. 923,059
Int. Cl.[3] B62J *1/00*
U.S. Cl. 297—195 **19 Claims**



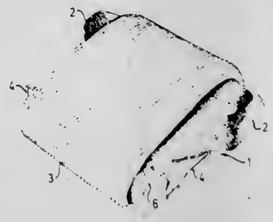
1. A cycle seat mountable on cycles having support posts of differing sizes, said cycle seat comprising:
- a saddle having an upper portion and a lower portion;
- a truss attached to the lower portion of said saddle; and,
- a clamp rotatably attached to said truss at a pivot point for mounting the seat on a cycle support post, said clamp comprising a plurality of receptacles for respectively receiving the support posts of differing sizes, wherein said receptacles are spaced generally equi-angularly about said pivot point.

4,231,612
BABY CARRIER AND CAR SEAT
Paul K. Meeker, Kent, Ohio, assignor to Questor Corporation, Toledo, Ohio
Continuation of Ser. No. 845,776, Oct. 26, 1977, abandoned.
This application Sep. 1, 1978, Ser. No. 938,874
Int. Cl.[2] A47D *1/10*
U.S. Cl. 297—250 **3 Claims**



1. In a baby carrier and car seat having a seat, back and sides; tilting, supporting and locking devices on opposite sides of said seat, each of said tilting and locking mechanisms comprising
- a compartment secured to said side;
- a plate member having a peripheral arcuate flange;
- means for pivotally mounting said plate member to said side and within said compartment;
- a support stand secured to said plate member and pivotable therewith;
- a plurality of teeth depending from the inner side of said arcuate flange;
- a depressable button member adjacent said plate member and extending upwardly through said compartment;
- a plurality of teeth on said button member of a configuration so as to nest with said teeth on said plate member; and
- spring means within said compartment for biasing said button member in a direction so as to cause said teeth to mesh.

4,231,613
CHILD'S SEAT CUSHION FOR MOTOR VEHICLES
Kjell O. Jonasson, and Sven Å. Andersson, both of Gothenburg, Sweden, assignors to AB Volvo, Gothenburg, Sweden
Filed Apr. 26, 1979, Ser. No. 33,491
Claims priority, application Sweden, May 2, 1978, 7805018
Int. Cl.[3] A47D *1/10*
U.S. Cl. 297—250 **6 Claims**



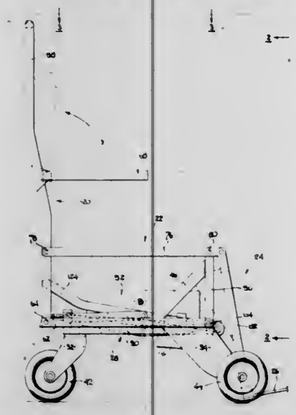
1. In a cushion for children, to be placed on the seat bottom of a vehicle seat to provide the child with an elevated sitting position, said cushion having on two opposite sides uniformly constructed guides (4) for a regular hip belt arranged in the vehicle, said belt comprising a first part (12) and a second part (16) with a locking mechanism (15) for coupling together the two belt parts, said guides being each engageable with an individual belt part in order to, when the cushion is placed in the position for use on the seat bottom and the belt parts are coupled together, hold the cushion in place on the seat bottom and prevent the belt from sliding up on the body of the passenger, each guide comprising a forwardly extending first portion (9), which defines a forwardly open slot (10), through which the first part of the belt is adapted to pass; the improvement in which each guide (4) has a second portion (13), spaced from the first portion (9) and extending laterally from the cushion to form a stop for the second belt part (16) with the locking mechanism (15), said stop being arranged to prevent upward displacement of the locking mechanism in relation to the cushion.

4,231,614
WHEELCHAIR
Gene P. Shaffer, 5139 Hazeltine, Sherman Oaks, Calif. 91423
Filed Oct. 27, 1978, Ser. No. 955,391
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—330 **17 Claims**

1. An improved wheelchair for mechanically assisting in moving a disabled person between a sitting and a standing position, said wheelchair comprising:
- a base;
- a seat located above said base and hingedly connected to said base through a first pivotal axis means, said first pivotal axis means for allowing rotation of said seat in an arc relative to said base;
- a back located behind said seat and hingedly connected to said seat through a second pivotal axis means which is separated from and movable relative to said base, said second pivotal axis means for allowing said back to move both upwardly, downwardly and laterally relative to the front end of said seat and upwardly, downwardly and laterally relative to said base;
- lever means located below said seat, pivotally mounted on said base and connected to said back, said lever means for

causing said upward, downward and lateral movements of said back relative to the front end of said seat and to said base, and for causing said rotation of said seat relative to said base;

a lower-leg rest hingedly attached to the front end of said seat through said first pivotal axis means, said first pivotal axis means for allowing pivotal upward and downward



movements of said lower-leg rest relative to said seat and said base;

cam means coupled between said lever means and said lower-leg rest for causing said lower-leg rest to move pivotally relative to said seat; and

power means on said wheelchair and in operative connection with said lever means, said power means for actuating said lever means.

4,231,615

SEAT FRAMES

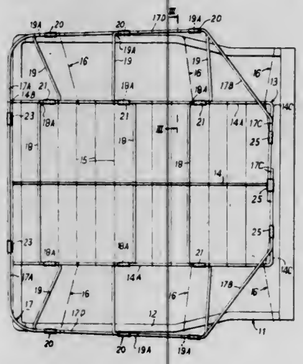
David T. Griffiths, Pontardulais, Wales, assignor to Youngflex S.A., Fribourg, Switzerland

Continuation of Ser. No. 818,505, Jul. 25, 1977, abandoned, which is a division of Ser. No. 604,177, Aug. 13, 1975, Pat. No. 4,050,738, which is a continuation-in-part of Ser. No. 440,782, Feb. 8, 1974, abandoned. This application Nov. 30, 1978, Ser. No. 964,987

Claims priority, application United Kingdom, Feb. 16, 1973, 7874/73

Int. Cl.[2] A47C 7/35

U.S. Cl. 297—452 4 Claims



1. A seat frame comprising:

(a) a base frame;

(b) a non-extendible cushion support including logitudinally extending side wire portions and a plurality of spaced transversely extending cross wires anchored between said side wire portions;

(c) a plurality of tension spring means anchored between said side wire portions and said base frame to suspend said cushion support in tension transversely with respect to said base frame;

(d) a plurality of spaced spring wires each comprising a central portion extending transversely between said side wire portions, intermediate torsional portions extending parallel with and anchored to said side wire portions, and end portions extending transversely and outwardly from said torsional portions in an upward direction from and at an obtuse angle to said cushion support;

(e) an edge frame arranged above said cushion support and including resilient edge wire portions interconnecting the free ends of said end portions of the said spring wires at respective sides of the seat; and

(f) a plurality of supplementary spring wires each comprising an intermediate torsional portion extending parallel with and anchored to a respective one of said side wire portions, a first limb extending from said torsional portion and anchored to a respective edge wire portion and a second limb transversely outwards from said torsional portion and having a free end, unconnected with said base frame, said end adapted to define a bearing portion for engagement with said base frame and located for transmission of reaction force to said base frame upon application of a load to the respective edge wire portion, whereby said free ends can move relative to said base frame upon extension of said plurality of tension spring means.

4,231,616

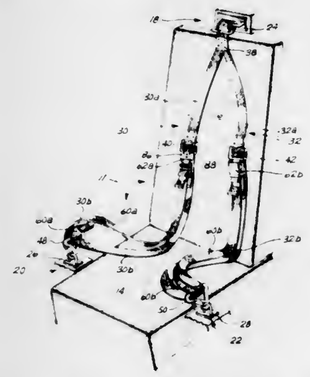
COMBINED SHOULDER HARNESS AND LAP BELT RESTRAINT APPARATUS HAVING SINGLE FASTEN/RELEASE POINT AT LAP BUCKLE

Mark C. Painter, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 17, 1979, Ser. No. 67,479

Int. Cl.[3] A62B 35/00; B64D 11/06

U.S. Cl. 297—481 9 Claims



1. In a combined shoulder harness and lap belt restraint apparatus for cooperative arrangement with a seat and associated seat back, and which includes first and second shoulder straps that extend forwardly from a shoulder harness anchor means located behind the seat back so as to pass over opposite shoulders of an occupant and downwardly therefrom along the sides of an occupant's upper torso toward first and second side anchor means respectively located adjacent opposite sides of the seat, and a lap belt that pases across an occupant's lap and includes first and second belt portions releasably connected together at their adjacent ends by lap buckle means and separately and fixedly attached at their remote ends to said first and second side anchor means, respectively, wherein the improvement comprises:

anchor guide means provided on each of said first and second side anchor means, said first and second downwardly extending shoulder straps being separately and respectively looped through said anchor guide means on said first and second anchor means, and the end portions of the thusly looped first and second shoulder straps being drawn respectively inwardly from said first and second side anchor means so as to lie along said first and second belt portions, respectively; and

first and second attachment means, said first attachment means for fixedly attaching the end portion of said first shoulder strap to said first belt portion at a point thereon intermediate said first side anchor means and said lap buckle means, and said second attachment means for fixedly attaching the end portion of said second shoulder strap to said second belt portion at a point thereon intermediate said second side anchor means and said lap buckle means.

4,231,617

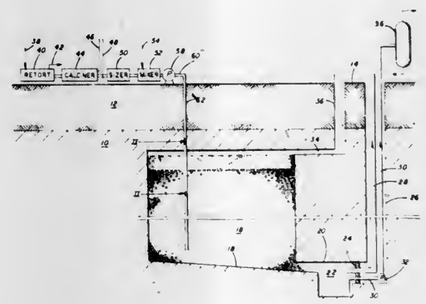
CONSOLIDATION OF IN-SITU RETORT

Olaf A. Larson, O'Hara Township, Allegheny County, Pa., and Charles W. Matthews, Lakewood, Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 816,389, Jul. 18, 1977, abandoned. This application Dec. 14, 1978, Ser. No. 969,328

Int. Cl.[3] E21C 41/10

U.S. Cl. 299—2 19 Claims



1. A method of consolidating a rubblized in-situ oil shale retort, after in-situ retorting of the shale is completed comprising:

(a) retorting oil shale at the ground surface;

(b) preparing an aqueous slurry of spent shale from the surface retorting; and

(c) pumping the slurry into the in-situ retort; wherein the pumping of step (c) is accomplished by discharging the slurry into the in-situ retort at successively higher levels in the retort and squeezing the slurry into fissures between blocks of in-situ retorted rubblized spent shale at each level to fill void space in the in-situ retorted shale, the squeezing of the slurry being accomplished at high pressures adapted to apply a pressure on walls of the retort below the fracturing pressure of the oil shale formation.

4,231,618

TUNNEL-EXCAVATING MACHINE

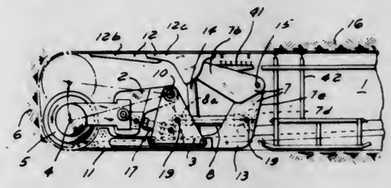
Friedrich W. Paurat, Nordstrasse 73, 4223 Voerde, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 857,191

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710960

Int. Cl.[2] E21C 25/68, 25/06

U.S. Cl. 299—31 6 Claims



1. A tunneling machine comprising:

a chassis displaceable along a stretch of tunnel to be excavated in a subterranean structure toward a face thereof to be cut away;

at least one beam mounted on said chassis and extending in the direction of said face;

cutting means on said beam engageable with said face for excavating same;

a roof support unit disposed rearwardly of said chassis and adapted to brace against the roof and floor of the tunnel behind said chassis;

a fluid-pressure cylinder arrangement interconnecting said roof support unit and said chassis as the sole means interconnecting same for relatively displacing said chassis and said roof support unit along said tunnel, said beam being displaceable relative to said chassis toward and away from said face; and

means for swingably mounting said beam on said chassis about a horizontal axis, said chassis being provided in the region of said cutting means with forwardly displaceable support skids riding on the floor of said tunnel, said cutting means including at least one cutting drum journaled on said beam for rotation about an axis substantially parallel to said face, said roof support unit comprising a roof-engaging cantilevered cap overhanging said chassis, said drum comprising a plurality of drum sections interconnected by respective universal joints and inclinable relative to one another.

4,231,619

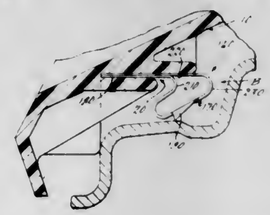
WHEEL TRIM RETENTION MEANS

Hans R. Beisch, Amherstburg, Canada, and Heinrich J. Hempelmann, Livonia, Mich., assignors to Norris Industries, Inc., Ypsilanti, Mich.

Continuation of Ser. No. 786,422, Apr. 11, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 963,735

Int. Cl.[3] B60B 7/06

U.S. Cl. 301—37 P 19 Claims



1. Retention means for retaining wheel trim formed of a plastic material on the axially outer face of a vehicle wheel

having an annular wheel flange, said retention means comprising:

means defining a generally axially inwardly opening recess on said wheel trim;

means defining a generally radially outwardly facing support surface on said wheel trim positioned radially inwardly of said recess;

a spring clip having a tab portion at one end thereof, a terminal portion at the other end thereof and a retention portion intermediate the ends thereof;

said tab portion having a cut out portion provided therein and being disposed within said recess,

said terminal portion engaging said support surface and being operative to bias said retention portion into biting engagement with said vehicle wheel when said trim member is assembled thereto; and

securing means for permanently securing said tab portion in said recess, said securing means including a mechanical interlock created by said plastic material of said wheel trim being at least partially disposed within said cut out portion of said tab portion.

4,231,620

ANTI-LOCK APPARATUS FOR A HYDRAULIC BRAKE SYSTEM

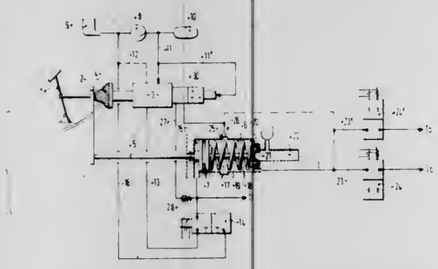
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1979, Ser. No. 41,144

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825087

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—119 **5 Claims**



1. An anti-lock apparatus for a hydraulic brake system comprising, in combination: a hydraulic main cylinder having a piston, a primary side and a secondary side for supplying a closed brake circuit, a foot-actuated brake valve, a travel-limiting spring operatively associated with said foot-actuated brake valve for permitting the pressure medium from a pressure source to be fed to said hydraulic main cylinder primary side, one 3/2-way valve and at least one 2/2-way valve operatively associated with said main cylinder for the purpose of anti-locking pressure modulation, a control line having said 3/2-way valve inserted therein leading to said primary side of said main cylinder, a return flow line disposed between said main cylinder secondary side and primary side, and a switchover valve dependent on storage container pressure for monitoring the passage of said return flow line.

4,231,621

SLIDING ROLLER BEARING WITH HEIGHT ADJUSTOR

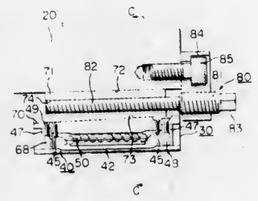
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan (158)

Filed Apr. 2, 1979, Ser. No. 26,453

Claims priority, application Japan, May 4, 1978, 53-052791

Int. Cl.² F16C *29/12, 29/06*

U.S. Cl. 308—6 C **2 Claims**



1. A sliding roller bearing comprising: a bearing member forming at one side an open ended bearing chamber and at the other side a flat surface formed with a tapered groove; an elongated track shaft having a longitudinal portion engageable with said bearing chamber; a tapered gib having a flat upper surface, a lower surface conforming to the bottom of said tapered groove, and a threaded hole extending centrally and longitudinally therethrough, said tapered gib being received in said tapered groove for sliding movement; and an adjusting bolt having at one end portion a male screw threadedly engaged with said threaded hole and at a middle portion a second male screw threadedly engaged with a flange portion of said bearing member so that the revolution of the bolt causes sliding movement of the tapered gib in said tapered groove, thereby causing a change in the distance between the said flat upper surface of said gib and the bottom surface of said track shaft.

4,231,622

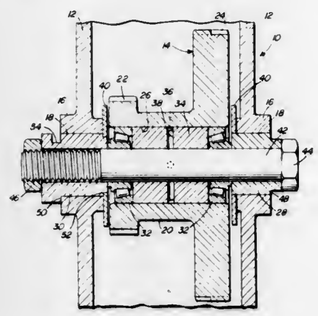
TAPERED BEARING KIT FOR INTERMEDIATE GEAR

Grover G. Paullin, 13 E. Washington Ave., Yakima, Wash. 98903

Filed Mar. 16, 1979, Ser. No. 21,434

Int. Cl.³ F16C *19/14, 25/06*

U.S. Cl. 308—22 **5 Claims**



1. A kit for converting an intermediate gear in a transfer case from a needle bearing supported gear to a tapered roller bearing supported gear comprising a pair of tapered roller bearing assemblies adapted to be received in the internal bore of an intermediate gear, a spacer adapted to be interposed between the bearing assemblies, an elongated bolt-type shaft adapted to extend through aligned bores in opposite walls of a transfer case, the bearing assemblies and spacer, and a pair of adapter bushings adapted to be received in the bores in the opposite

walls of the transfer case and adapted to receive the bolt-type shaft, said bolt-type shaft including means adapted to engage the outer ends of the bushings to enable the supporting assembly for the intermediate gear to be retained in position and the bearing assemblies preloaded by exerting predetermined axial force thereon, one of said bushings including an outwardly offset peripheral shoulder adjacent the axial outer end adapted to engage the exterior of the transfer case to limit movement of said one bushing inwardly of the transfer case, said bushing shoulder including a transversely extending groove communicating with a portion of the outer periphery thereof and adapted to receive a lock plate attached to the transfer case to lock said one bushing to the transfer case thereby securing the bolt-type shaft and other components of the support for the intermediate gear and the intermediate gear itself within the transfer case.

4,231,623

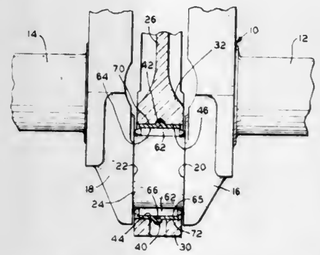
STEEL CONNECTING ROD BEARING LINER FOR INTERNAL COMBUSTION ENGINES

Vernon R. Kaufman, Cedarburg, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Oct. 2, 1978, Ser. No. 947,517

Int. Cl.³ F16C *13/14*

U.S. Cl. 308—23 **13 Claims**



1. In combination:

a connecting rod having a circular crankpin opening in one end thereof,

a circumferential groove in said connecting rod within said opening,

an annular liner circumferentially received in said opening, said liner having an outer side in tight engagement with said opening, an inner side opposite said outer side, and side edges which are generally coextensive with said inner and outer sides circumferentially around said liner, and

a groove circumferentially formed in said liner and being spaced inwardly from said side edges, said liner groove being in the form of a circumferential depression in said liner inner side and a circumferential ridge on said liner outer side, said ridge being disposed within said first-mentioned groove, said liner comprising side flange portions extending between said groove and said side edges, said side flange portions being substantially flat in the axial direction such that said groove forms a discontinuity within said liner intermediate said side edges.

4,231,624

LOCKING ROTARY FILE

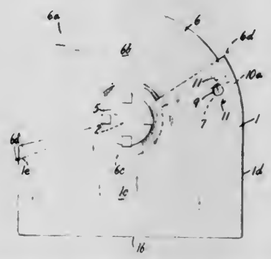
Hildaur L. Neilsen, Metuchen, N.J., assignor to The Rolodex Corporation, Secaucus, N.J.

Filed Nov. 9, 1978, Ser. No. 959,176

Int. Cl.² B42F *17/00*; A47B *49/00*

U.S. Cl. 312—186 **4 Claims**

1. In a rotary file comprising a case open at the top and having a front wall, side walls and a back wall, a rotor rotatable in said case and comprising a shaft extending through and rotatably supported by said side walls and at least one knob fixed on an end of said shaft externally of said case for turning said rotor, and a cover comprising a cylindrical wall and opposite side walls received inside the walls of said case and rotatable about said shaft for rotation of said cover between a closed position in which said cylindrical wall closes the top of said case and an open position in which said cylindrical wall is received in rear and lower portion of said case, leaving the top of said case open; means for locking said cover in closed position comprising a lock mounted in a side wall of said case and having a rotary barrel rotatable by a key and a locking member inside said case and movable by rotation of said barrel between a locked position in which it engages a side wall of said cover when in closed position to secure said cover from being opened, and an unlocked position in which said locking member is free of said side wall of said cover to permit rotation of said cover from closed to open position.



4,231,625

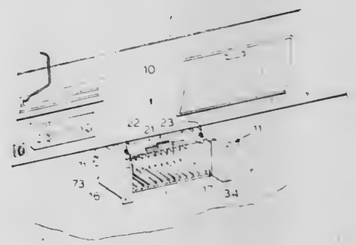
TAPE STORAGE CABINET

Jose L. Perez, C-29, 10th Ave., Lincoln Gardens, Key West, Fla. 33040, and Humberto A. Jimenez, 775 W. Dennis, Wheeling, Ill. 60090

Filed Dec. 29, 1978, Ser. No. 974,216

Int. Cl.² A47B *67/02*

U.S. Cl. 312—245 **8 Claims**



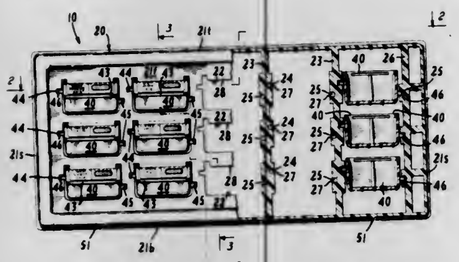
1. A cabinet for tapes comprising a container having a top wall, a bottom wall, a back wall and first and second side walls, first and second front cover members each having a front panel and top and bottom panels attached thereto including a plurality of U-shaped partition members attached to said top, bottom and back walls and spaced apart a distance sufficient to receive tape cartridges therebetween, further including a plate with a plurality of parallel extensions attached thereto and capable of being detachably inserted into said cabinet and the spacing between said parallel extensions being about equal to the spacings between said partition members and such that tape cassettes are receivable therebetween.

4,231,626

STORAGE SYSTEM

James S. Amtmann, Avon, and Louis G. Bobrowski, Berlin, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Feb. 12, 1979, Ser. No. 11,487
Int. Cl.³ A47B 77/00, 87/00
U.S. Cl. 312—350 16 Claims



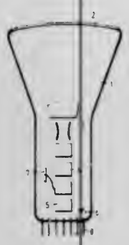
1. A combination cabinet and drawers to be combined as a storage system, the combination including a cabinet having multiple drawer receiving openings in a face thereof, and multiple drawers, said drawers being boxes, keying means cooperating between the cabinet and the drawers for permitting insertion of only correctly keyed drawers into the cabinet for use therein.

4,231,627

ELECTRON BEAM TUBE

Klaus Schaffernicht, Blaustein, and Rainer Kolbeck, Ulm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,477
Int. Cl.³ H01J 9/38
U.S. Cl. 316—25 4 Claims



1. In a method for evacuating an electron beam tube having an electrically heatable cathode whose heating power is less than 250 mW, which method includes producing a getter surface on interior walls of the tube, the improvement comprising and providing within the tube a metal member separate from the cathode and capable of being heated to above 800° C.; and supplying heating power to said member sufficient to heat it to above 800° C. after formation of the getter surface.

4,231,628

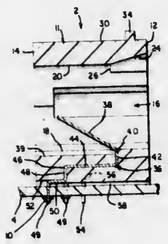
ELECTRICAL CONNECTOR RECEPTACLES

Donald W. K. Hughes, Mechanicsburg, Pa., and John H. F. Lauterbach, Clearwater, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 14, 1978, Ser. No. 969,504
Int. Cl.³ H01R 13/40, 13/54
U.S. Cl. 339—17 LC 6 Claims

1. An electrical connector receptacle of the telephone jack type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said opening having opposed internal sidewalls and opposed internal endwalls, said housing having oppositely directed external sidewalls and oppositely directed external endwalls, a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising a first end which serves as a contact spring extending from one of said internal sidewalls diagonally into said opening and towards said rearward end, an intermediate portion extending from said plug-receiving end through said housing between said one internal sidewall and the adjacent external sidewall and towards said rearward end and a second end which extends externally of said housing, said plug-receiving opening being dimensioned to receive a connector plug having spaced-apart contact members therein which engage said contact springs, said connector receptacle being characterized in that:

said housing comprises a one-piece molded part and said conductors comprise single-piece stamped and formed



members, said intermediate portions of said conductors being insert molded in said housing, said second ends of said conductors emerging from said adjacent external sidewall, said first ends of said conductors emerging from said one internal sidewall at a location proximate to said plug-receiving end, said intermediate portion of each conductors being tightly and immovably embedded in said housing, and said opening extends through said housing and opens onto said rearward end,

said connector having been manufactured by the steps of producing a continuous conductor strip comprising a carrier strip having groups of said conductors extending laterally therefrom, positioning one of said groups of said conductors in the cavity of a molding apparatus with said first ends of said conductors clamped between the ends of aligned core pins, injecting molding material into said cavity, removing the molded connector receptacle from said molding apparatus, and severing said carrier strip from said conductors.

4,231,629

APPARATUS FOR CONNECTION OF COAXIAL CABLES TO A PRINTED CIRCUIT MOTHER BOARD

Robert E. Kirby, Garner, N.C., assignor to Telex Computer Products, Inc., Raleigh, N.C.

Filed Jan. 18, 1979, Ser. No. 4,460
Int. Cl.³ H01R 17/18; H05R 1/12
U.S. Cl. 339—17 M 3 Claims

1. Apparatus for connection of a coaxial cable to a printed circuit mother board, comprising:

(a) a rigid metal chassis;

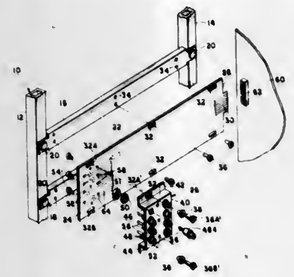
(b) a flexible adapter board rigidly removably fastened to and supported by said chassis at a first end, and adapted to be removably plugged into said mother board at its second end;

(c) a metal bracket, and means to attach said metal bracket to said adapter at said first end of said adapter; at least one opening through said bracket and including at least one conventional coaxial cable terminal, locked to said bracket by screw means; pin connector means extending from said coaxial cable terminal on said bracket, and

adapted to pass through a prepared opening in, and to be soldered to, a metal conductor on the surface of said adapter;

(d) multiple screw means passing through said bracket and said adapter into said chassis to lock said bracket and said adapter thereto;

(e) male connector means on said second end of said adapter, and conductor means on said adapter connecting said pin



of said at least one coaxial cable terminal to said male connector means;

(f) main logic mother board removably attached to said chassis and having at least one connector socket adapter to receive said male connector on said adapter;

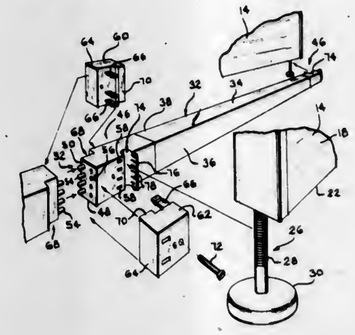
whereby a coaxial cable plugged into said coaxial cable terminal on said bracket can be connected to a circuit on said mother board without carrying vibrations to said mother board.

4,231,630

UNDER THE WALL ENERGY SUPPLY SYSTEM FOR A SPACE DIVIDER SYSTEM

Robert L. Propst, and Michael A. Wodka, both of Ann Arbor, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Apr. 23, 1979, Ser. No. 32,523
Int. Cl.³ H02G 3/26
U.S. Cl. 339—22 R 7 Claims



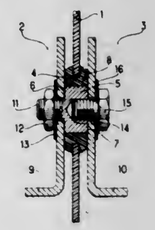
1. In a space divider system which includes a plurality of upright wall panels arranged end-to-end, each of said panels having spaced apart opposite faces extending longitudinally of said panel between the ends thereof and a lower edge extending transversely between said faces and longitudinally of said panel between said ends, leg supports supporting each of said panels on a supporting surface in a position in which said lower edge is spaced a predetermined distance above said supporting surface, an energy supply system comprising a plurality of raceway sections disposed below selected ones of said panels, each of said raceway sections corresponding to one of said selected wall panels and containing electrical conductors for transmitting electrical energy along the lower edge of an associated wall panel, each of said raceway sections having sidewalls and a bottom wall and being disposed adjacent the lower edge of an associated panel to provide an essentially unbroken appearance between said raceway section sidewalls and said faces of said associated panel, the bottom wall of each of said raceway sections being disposed a predetermined distance above said supporting surface to establish a clearance between said bottom wall of said raceway section and said supporting surface, and cooperating releasable mounting means on each of said raceway sections and an associated wall panel enabling each of said raceway sections to be mounted on and demounted from said associated wall panel by movement of said raceway section as a single unit transversely of said associated wall panel so that a plurality of wall panels can be maintained in said end to end arrangement when said raceway sections are mounted and demounted from said upright wall panels.

4,231,631

THROUGH-CONNECTOR PROVIDING AN ELECTRICAL CONNECTION THROUGH A SINGLE OR DOUBLE PLASTIC WALL AND APPLICATION THEREOF TO AN ELECTRICAL BATTERY

Jean-Marc Guerinault, Merignac, and Jacques Barber, Lormont, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Dec. 15, 1978, Ser. No. 970,067
Claims priority, application France, Jan. 18, 1978, 78 01347
Int. Cl.³ H01R 7/02
U.S. Cl. 339—94 A 11 Claims



1. A sealed electrical through-connector assembly including a barrier of predetermined thickness; a connecting member extending through a hole in the barrier; a resilient annular seal ring surrounding the connecting member, the seal ring having an uncompressed thickness greater than the thickness of the barrier and an outer perimetral surface making sealing contact with the inner surface of the hole through the barrier; a first metal part mounted on said connecting member and positioned on one side of said seal ring; a second metal part mounted on the connecting member and positioned on the other side of the seal ring; and means for applying a releasable clamping force against said metal parts for axially compressing said seal ring, wherein the improvement comprises:

rigid spacer means defining the positions of said parts relative to each other, thereby determining a fixed compression of the seal ring for any clamping force above a predetermined minimum valve.

4,231,632

CONTACT ELEMENT FOR INSULATION PIERCE TYPE

Jean-Marie Badoz, and Daniel Merceron, both of Suresnes, France, assignors to Socapex, Suresnes and Souriau et Cie, Boulogne, both of, France

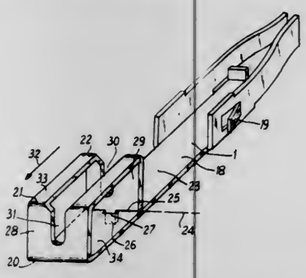
Filed Dec. 18, 1978, Ser. No. 970,854
Claims priority, application France, Dec. 22, 1977, 77 38829
Int. Cl.³ H01R 4/02
U.S. Cl. 339—97 R 7 Claims

1. A contact element having a longitudinal axis, for an insula-

tion piercing type connector for wire covered with an insulating sheath, comprising:

a front member (1) and a rear member (18) disposed in fixed longitudinal relation to said front member, said front member including means for providing contact with a complimentary contact element belonging to another circuit; and

said rear member including means for assuring connection with said wire, said rear member comprising a strip, said strip having a first extremity connected to said front member along said longitudinal axis and a second extremity, said strip having three folds, respectively along a first, a second and a third mutually parallel fold line, to form the shape of a parallelepiped, said fold lines being horizontally



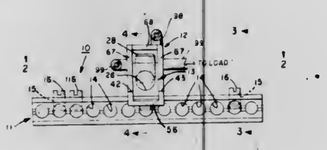
aligned perpendicular to said longitudinal axis, said strip including a horizontal first planar wall disposed at said first extremity and terminating at said first fold, a second planar wall extending between said first fold and said second fold, a third planar wall extending parallel to said first wall between said second fold and said third fold, and a fourth planar wall disposed at said second extremity and terminating at said third fold and first wall, said second and fourth walls having open slots formed therein for receiving, piercing and connecting said wire, an opening being formed in said strip in one of said first and second extremities, and means for closing said parallelepiped, said closing means comprising a tenon projecting from the extremity other than said one of said extremities and capable of penetrating said opening.

4,231,633

NEUTRAL BAR, LUG AND BARRIER ASSEMBLY

Roger D. Luke, Norcross, and John M. Rhodes, Atlanta, both of Ga., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 26, 1978, Ser. No. 945,799
Int. Cl.³ H01R 9/10
U.S. Cl. 339—242 **6 Claims**



1. Wiring means including an elongated terminal bar and a terminal connector, a plurality of parallel wire receiving bores extending transversely and sideways through said bar and spaced along the axis thereof, an individual threaded aperture extending from each of said bores to the front of said bar, said apertures normally receiving clamping screws which engage wires disposed in said bores, said connector being selectively positionable along the length of said bar at locations defined by said threaded apertures, a holding screw in threaded engagement with a selected one of said threaded apertures to secure said connector to the front of said bar at the location defined by said selected aperture, a wire receiving recess in said connector, a clamping screw threadably mounted on said connector and extending into said recess to engage a wire therein, said recess being sized to receive a wire substantially larger in diameter than the largest wire receivable by any of the bores, an insulating barrier element mounted on said bar to define a wireway which normally directs wires around the connector, said element including a main section positioned at one side of said bar and extending forward of said connector, said connector including formations operatively positioned in cooperating relationship with additional formations of said element to retain said element mounted to said bar.

4,231,634

OPTICAL IMAGE MULTIPLYING DEVICE

Jeanne A. Gantz, 1972 El Dorado, Berkeley, Calif. 94707, and David W. Kelso, 3929 Everett Dr., Oakland, Calif. 94602

Continuation-in-part of Ser. No. 838,150, Sep. 30, 1977, Pat. No. 4,162,117. This application May 14, 1979, Ser. No. 39,097
Int. Cl.³ G02B 23/00
U.S. Cl. 350—4.2 **11 Claims**



1. In an optical image multiplying device having a housing, parts of which housing define an aperture, reflecting planes contained within said housing, and an object cell mounted to said housing remote from said aperture wherein light passing between said object cell and said aperture passes between said reflecting planes to produce multiplied images, the improvement comprising:

first and second tumbler objects within said object cell, said objects being capable of rotating and tumbling relative to one another, wherein each object carries a pictorial representation on a first region thereof, wherein said pictorial representation on said first region of said first object includes a light transmitting portion through which details of said pictorial representation of said second object can been seen when viewed through said light transmitting portion, and wherein said first object includes a second light transmitting colored region distinct from said first region.

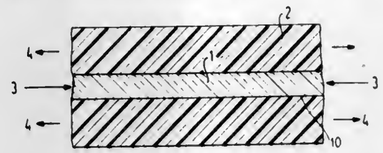
4,231,635

COMMUNICATION CABLE WITH GLASS FIBER LIGHT WAVEGUIDES

Günter Zeidler, Unterpfaffenhofen, and Ulrich Oestreich, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,230
Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724155
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 **8 Claims**

1. In a communication cable having at least one light waveguide of a glass fiber provided with a close fitting casing, the improvement comprising the casing being of a material with a modulus of elasticity greater then 1500 N/mm², said casing having a layer thickness of at least 100 μm and a maximum thickness of 1.5 mm, said casing being prestressed in tension to



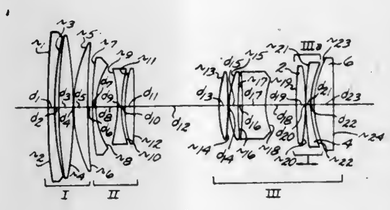
exert a uniform constant longitudinal compression upon the glass fiber.

4,231,636

VARIABLE FIELD CURVATURE LENS SYSTEM

Haruo Abe, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 723,888, Sep. 16, 1976, abandoned. This application Jul. 19, 1978, Ser. No. 926,196
Int. Cl.³ G02B 9/16, 15/18
U.S. Cl. 350—175 FS **9 Claims**



1. In a lens system for the normal transmission of flat images, the improvement of a variable field curvature capability comprising:

at least a first lens element of positive refractive power positioned within the lens system to receive incident optical ray traces of an object at infinity that are approximately parallel with an optical axis of the lens system;

a second lens element of negative refractive power located adjacent the image side of the first lens element; and

a third lens element of positive refractive power located adjacent the image side of the second lens element, the relative refractive powers of the first and second lens elements being designed so that the optical ray traces from the object on the optical axis at infinity are approximately parallel with the optical axis in a space formed between the second and third lens elements, the first and second lens elements being movable as a unit relatively to the third lens elements for changing the field curvature of the lens system without varying the back focal distance of the lens system.

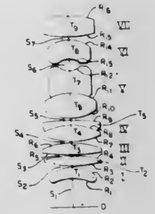
4,231,637

SEVEN-COMPONENT MICROSCOPE OBJECTIVE

Milton H. Sussman, Amherst, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 22, 1979, Ser. No. 23,052
Int. Cl.³ G02B 9/64, 21/02
U.S. Cl. 350—175 ML **1 Claim**

1. A microscope objective having seven lenses aligned in sequence on an optical axis and that exits parallel light from the last element which comprises the following lens parameters, where radii (R), thicknesses (T) and spacing (S) are in millimeters and numbered sequentially from the object plane, a minus sign (−) denotes a radius having a center of curvature on the object side of the respective lens, and indices of refraction (ND) and Abbe numbers (ν) are absolute values



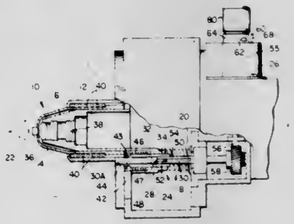
Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe Number (ν)
			$S_1=4.0$		
I	$R_1=-8.000$	$T_1=1.80$		$ND_1=1.564$	$\nu_1=60.80$
	$R_2=-4.515$		$S_2=0.2$		
II	$R_3=22.933$	$T_2=1.20$		$ND_2=1.487$	$\nu_2=84.46$
	$R_4=-14.370$		$S_3=0.2$		
III	$R_5=-34.020$	$T_3=1.60$		$ND_3=1.434$	$\nu_3=95.60$
	$R_6=-10.140$		$S_4=0.2$		
	$R_7=11.230$	$T_4=2.20$		$ND_4=1.434$	$\nu_4=95.60$
IV	$R_8=-8.671$	$T_5=0.70$		$ND_5=1.613$	$\nu_5=44.29$
	$R_9=-55.748$		$S_5=0.2$		
	$R_{10}=6.290$	$T_6=3.50$		$ND_6=1.487$	$\nu_6=84.46$
V	$R_{11}=-8.388$	$T_7=3.40$		$ND_7=1.673$	$\nu_7=32.20$
	$R_{12}=2.639$		$S_6=1.6$		
	$R_{13}=-2.593$	$T_8=2.70$		$ND_8=1.54$	$\nu_8=45.75$
VI	$R_{14}=-5.075$		$S_7=0.2$		
	$R_{15}=12.300$	$T_9=2.95$		$ND_9=1.487$	$\nu=84.46$
VII	$R_{16}=-20.060$				

4,231,638

MICROSCOPE OBJECTIVE

Theodore H. Peck, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,230
Int. Cl.³ G02B 7/10, 7/02
U.S. Cl. 350—255 **10 Claims**



1. An objective for a microscope which comprises:

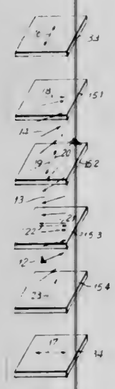
a housing member;
a first tubular objective lens holding member slidably and telescopically disposed within said housing member;
a second tubular objective lens holding member slidably and telescopically disposed within said first tubular objective holding member;
spring loading means for controlledly allowing said first and second tubular objective holding members to recede within said housing member upon impact between the first objective lens member and the object being viewed, and for causing said lens holders to return to their original position upon removal of the object from the objective; and
focusing means for incremental movement of said second tubular objective lens holding member thereby focusing the objective lenses contained therein while maintaining the position of the first objective lens holding member.

4,231,639

POLY-LAYER LIQUID CRYSTAL DISPLAY DEVICE

Syunji Banda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,874
Claims priority, application Japan, Nov. 19, 1976, 51-139861
Int. Cl.³ G02F 1/133
U.S. Cl. 350—335 **4 Claims**



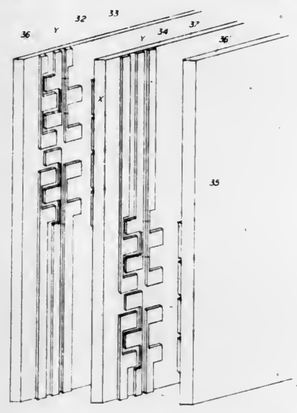
1. A liquid crystal display device, comprising an array of at least three plates, two of said plates being end plates and the remaining plates being intermediate plates, said plates taken in pairs forming cells one less in number than the number of said plates, a layer of nematic liquid crystal material of positive dielectric anisotropy in said cells, opposed surfaces of the pairs of plates having electrode means thereon for forming characters a vector from the bottom to the top of any of said characters defining a reference direction, a polarizing device at the exterior face of each end plate in said array, successive liquid crystal layers being considered alternately even and odd, the two plate faces in contact with each of said liquid crystal layers having surface orientation directions for forming the liquid crystal molecules in said layer into a helix with a twist of about 90°, said twist being in one rotational direction for the even layers and in the opposite direction for the odd layers, the two faces of each intermediate plate in said array being surface-oriented in approximately anti-parallel directions, that is, at approximately 180° to each other, one of said end plates being that through which said device is to be viewed and being termed upper end plate and each of said cells thereby being formed of an upper and lower plate, said surface orientation directions being regarded as vectors, the angle from said reference direction to said surface orientation direction on each of said upper plates being approximately 45° and to said surface orientation direction on each of said lower plates being approximately 135°, said electrodes being connectable to an exterior voltage source.

4,231,640

MATRIX TYPE LIQUID CRYSTAL DISPLAY PANEL

Fumiaki Funada, Yamatokoriyama; Keisaku Nonomura, Nara; Hisashi Uede, Yamatokoriyama, and Tomio Wada, Ikoma, all of, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1978, Ser. No. 921,062
Claims priority, application Japan, Jul. 7, 1977, 52/81794; Apr. 12, 1978, 53/43430
Int. Cl.² G02F 1/13
U.S. Cl. 350—336 **5 Claims**



1. An XY matrix liquid crystal display comprising:
a plurality of X electrodes aligned at given spaced intervals in a first direction;
a plurality of Y electrodes aligned at given spaced intervals in a second direction normal to said first direction, adjacent electrode pairs of said plurality of Y electrodes being interleaved with each other to form spaced electrode areas which alternate in said first direction; and
a layer of liquid crystal composition disposed between said plurality of X electrodes and said plurality of Y electrodes;
wherein the dimensions of each of said X electrodes in said first direction is substantially the same as the dimension of two of said interleaved electrode areas in said first direction, each of said X electrodes being superimposed over two of said electrode areas from each of said electrode pairs.

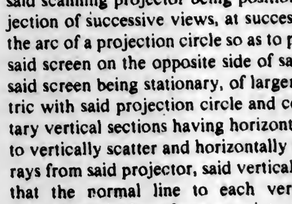
4,231,641

ELECTRO-OPTIC DEVICE

Jean-Paul Randin, Cortaillod, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Continuation-in-part of Ser. No. 744,943, Nov. 24, 1976, abandoned. This application Sep. 27, 1978, Ser. No. 946,147
Claims priority, application Switzerland, Nov. 29, 1975, 15447/75
Int. Cl.³ G02F 1/01, 1/23
U.S. Cl. 350—357 **30 Claims**

1. Electro-optic device comprising a transparent conductive layer, an electrochromic layer applied on the said transparent layer, these two first elements constituting together a first electrode, a counter-electrode maintained at distance from the said first electrode, and an electrolyte ensuring an ionic binding between the electrode and the counter-electrode, characterized by the fact that the said electrolyte is made of solid or pasty organic material constituted by at least a polymer comprising ionic groups of the type used as ion-exchange materials,



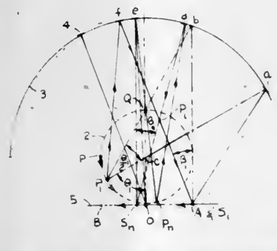
the said material of the electrolyte being chemically stable and compatible with that of the electrochromic layer.

4,231,642

STEREOSCOPIC MOTION PICTURE-CIRCULAR TO LINEAR SCAN TRANSLATOR-METHOD AND APPARATUS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed Aug. 1, 1979, Ser. No. 62,749
Int. Cl.³ G03B 35/00
U.S. Cl. 352—58 **2 Claims**



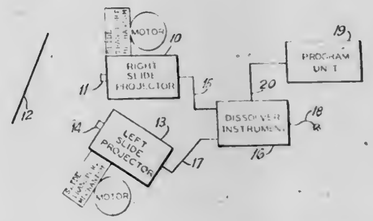
1. A method of recording and reproducing stereoscopic views for observation by plural observers without visual aids at the eyes of said observers, comprising:
photographing multiple sequential views of a scene from a motion picture camera in a manner such that between each sequential view relative motion takes place between the camera and scene and the optical axis of the camera for the various views is essentially coincident or parallel with each other; reproducing said views sequentially by projecting the views from a scanning projector onto a screen; said scanning projector being positioned, during the projection of successive views, at successive positions about the arc of a projection circle so as to project the images to said screen on the opposite side of said projection circle; said screen being stationary, of larger radius and concentric with said projection circle and comprised of elementary vertical sections having horizontal corrugated ridges to vertically scatter and horizontally reflect incident light rays from said projector, said vertical sections so oriented that the normal line to each vertical section passes through a single reference point, said reference point being located on the opposite side of said projection circle center from said screen and on a line bisecting said screen, said line passing through said projection circle center; said scanning projector constrained to project said sequential views toward a common point located on said bisecting line between said projection circle center and said screen; and the scanning of said projector being at a rate sufficient to be within the period of persistence of vision of an observer.

4,231,643

PHOTOGRAPHIC FILM PROJECTION DISSOLVE SYSTEM FOR ARC LAMP PROJECTORS

Eugene Demick, Ridgewood, N.J., and Adrian J. Van Haasteren, Jr., New York, N.Y., assignors to Bergen Expo Systems, Inc., Clifton, N.J.

Division of Ser. No. 860,286, Dec. 14, 1977, Pat. No. 4,158,491. This application Mar. 30, 1979, Ser. No. 25,358
The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.
Int. Cl.³ G05D 25/00; G03B 21/14, 23/16
U.S. Cl. 353—86 **11 Claims**



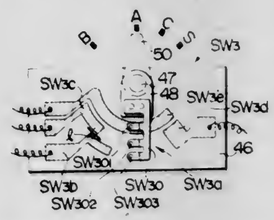
1. A system for the projection of photographic film comprising:
a plurality of photographic film projectors;
a dissolver instrument connected to said projectors and to a source of a.c. power, said dissolver instrument including power control means to regulate by phase control its average output power to said projectors;
at least one of said projectors having an arc lamp light source and a film gate and a light valve means positioned between said arc lamp and said film gate;
said light valve means attenuating the arc lamp light reaching the film from zero to full intensity and changing such intensity at a controlled rate of speed, said light valve means comprising a motor means connected to said dissolver instrument, said motor means being a rotational motor having a servo feed back loop, the extent of rotation, as distinct from the speed of rotation, of said rotational motor being a function of said average output power, and movement means connected to said motor means and moved thereby at a controlled rate of speed to relatively open, closed and intermediate positions dependent upon the angular position of said rotor means.

4,231,644

ELECTRICAL SHUTTER FOR CAMERA

Katsuhiko Tsunefuji, and Isao Kondo, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,084
Claims priority, application Japan, Sep. 30, 1977, 52-117649; Sep. 30, 1977, 52-117650
Int. Cl.³ G03B 7/083, 9/58
U.S. Cl. 354—51 **17 Claims**



1. An electrical shutter for a camera comprising a shaft, a

prime mover spring for driving said shutter, a charging member which rotates about said shaft in response to a film winding operation to charge said prime mover spring, said shutter having shutter blades movable between an open and a closed position, a shutter drive means for opening or closing the shutter blades by rotating substantially through one revolution under the resilience of said prime mover spring in response to an electromagnetic release operation, a first detent member for maintaining the shutter drive member stationary at a start position before the shutter is operated, a second detent member which is selectively movable between positions engageable with and disengageable from the shutter drive member as the shutter drive member rotates to open the shutter blades for temporarily maintaining the shutter blades in an open condition to thereby determine the length of an exposure period, said second detent member having a control portion; detent drive means for selective abutting and urging the first detent member and the second detent member to move away from the shutter drive member as the shutter drive member rotates, and an electrical shutter circuit including a first shutter release magnet which controls the operation of the second detent member to thereby control the shutter closing operation, the electrical shutter circuit including means for automatically controlling the time interval during which the shutter blades are maintained in their open position after they have been opened by the rotation of the shutter drive member, said detent drive means comprising a driving arm which is adapted to abut against the control portion formed on the second detent member during rotation of the shutter drive member, and

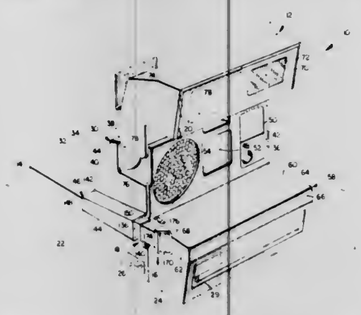
an engagement control member which is disposed adjacent to the control portion of said second detent member and is angularly movable relative to said second detent member, said engagement control member being disposed such that said driving arm initially engages said engagement control member of said second detent member and thereafter engages said control portion, said engagement control member being formed with a beveled surface engageable with said driving arm.

4,231,645

CAMERA WITH TELESCOPING DUAL ACTUATORS

Carl W. Davis, Lynnfield, and Joseph E. Murray, Jr., Malden, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 3, 1979, Ser. No. 54,652
Int. Cl.³ G03B *15/05, 17/04, 17/38*; H01H *9/26*
U.S. Cl. 354—145 **9 Claims**



1. An improved camera having an electronic flash unit and including a camera housing, means operable upon actuation for initiating an automatic cycle of camera operation including film exposure, a slider within said housing movable between an inoperative first position and an operative second position wherein said slider actuates said cycle initiating means, means for normally biasing said slider toward said first position, and a charge control circuit, responsive to operation of a charge control switch within said camera housing and normally set in a noncharging state, for connecting the flash unit to a source of electrical power to charge the flash unit's storage capacitor so that said flash unit will operate during the automatic cycle of camera operation wherein the improvement comprises:

a slider actuator coupled to said slider and being mounted on said camera for movement from a first position to a second position for actuating said slider, said slider actuator including a push button portion accessible on the exterior of said camera housing for optionally effecting manual movement of said slider actuator to actuate said slider; and

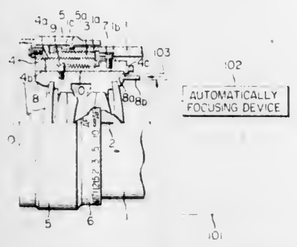
a normally operable charge switch actuator mounted on said camera for movement between an inoperative first position and sequential operative second and third positions, said charge switch actuator including a forward portion having a push button section that is accessible on the exterior of said camera housing for effecting manual movement of said charge switch actuator and a rearward portion extending into said camera housing and including a cam thereon for operating said charge control switch, said charge switch actuator and said slider actuator being cooperatively arranged so that in response to movement of said charge switch actuator from its first to its second position said cam switches said charge control switch to its charging state and in response to further movement from its second to its third position said charge switch actuator engages and moves said slider actuator from its first to its second position to effect sequential operation whereby said flash unit is charged before an automatic cycle of camera operation is initiated, said charge switch actuator and said slider actuator also being cooperatively arranged to allow independent manual operation of said slider actuator thereby providing the user with the option of bypassing the flash charge phase by not operating said charge switch actuator and manually initiating an automatic cycle of camera operation that does not include operation of said flash unit.

4,231,646

CAMERA WHICH PERMITS AUTOMATIC FOCUSING AND MANUAL FOCUSING

Yozo Iida, Komae, Japan, assignor to Nippon Kogaku K.K., Tokoyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,627
Claims priority, application Japan, Jan. 31, 1978, 53-8798
Int. Cl.² G03B *3/00*
U.S. Cl. 354—195 **9 Claims**



1. A camera which permits automatic focusing and manual focusing, comprising:

(1) an objective lens structure including:

(a) a focusing lens system;

(b) a focusing lens system supporting member for supporting said focusing lens system;

(c) biasing means for biasing said lens system supporting member in one direction of the optic axis of said focusing lens system; and

(d) an externally operable, manual focusing operating member for moving said lens system supporting member in said one direction through said biasing means and for directly moving said lens system supporting member in the opposite direction;

(2) an automatic focusing device; and

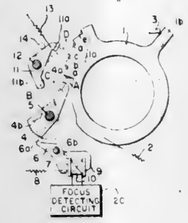
(3) actuating means for moving said lens system supporting member in the direction of the optic axis against the biasing force of said biasing means by the output of said automatic focusing device, independently of said manual focusing operating member.

4,231,647

AUTOMATIC FOCUSING CAMERA

Kiyoshi Kitai, and Yuzuru Takazawa, both of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1979, Ser. No. 8,761
Claims priority, application Japan, Feb. 7, 1978, 53-12702
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—195 **4 Claims**



1. An automatic focusing apparatus for a camera comprising: a movable focusing member for adjusting the focus of a photographic lens of a camera, the focusing member having a cam section comprising a set of cam-shaped portions which are disposed thereon to effect the positioning of the focusing member in positions corresponding to predetermined object distances; first arresting means mounted for movement between a first range of positions in which it is engageable with any one of the cam-shaped portions of the cam section and a second range of positions in which it cannot engage with any cam-shaped portion; second arresting means mounted for movement in response to the movement of the first arresting means into the second range of positions from a rest position wherein it cannot engage with any cam-shaped portions to an operative position wherein it engages a predetermined one of the cam-shaped portions corresponding to a pan-focus; a focus detecting circuit for detecting the object focus distance of an object to be photographed; and electromagnetic means responsive to the detection of the object focus distance for holding the first arresting means in the first range of positions at a position in which it engages the cam-shaped portion corresponding to the detected object focus distance and responsive to the inability of the focus detecting circuit to detect the object focus distance for effecting both the movement of the first arresting means into the second range of positions and the movement of the second arresting means into the operative position to engage the predetermined cam-shaped portion whereby a pan-focus of the lens will be obtained.

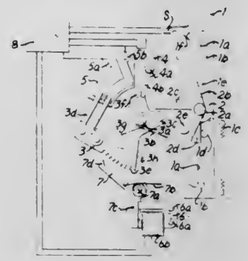
4,231,648

AUTOMATIC FOCUSING CAMERA

Kiyoshi Kitai; Tadashi Nakagawa, and Hiroaki Ishida, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1979, Ser. No. 8,762
Claims priority, application Japan, Feb. 7, 1978, 53-12701
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—195 **4 Claims**

1. An automatic focusing apparatus for use in a camera, comprising: an operating member movable from a rest position to a depressed position; an actuating member rotatably mounted on the operating member; a detecting member mounted for movement from a first position to a second position and means biasing same into the first position; means acting on the actuating member for enabling the actuating member to move the detecting member from the first to the second position in response to the movement of the operating member from the rest position to the depressed position and for disengaging the actuating member from the detecting member when the operating member is in the depressed position to enable the detecting member to move from the second position to the first position by the action of the biasing means; a device for producing an electrical signal corresponding to the position of the detecting member; a focus scanning member movable over its entire focus scanning range in response to the movement of the detecting member from its first to its second positions; electromagnetic means responsive to the actuation thereof for stopping the movement of the detecting member during the movement thereof from the second position to the first position; and a focus detecting module receptive of the signal from said device synchronously with the movement of the focus scanning member during the movement of the detecting member to the second position to determine the signal from said device corresponding to the in-focus position and for actuating the electromagnetic means to stop the return movement of the detecting member to its first position when the signal from said device is equal to that determined for the in-focus position.



4,231,649

VIEWFINDER DISPLAY IN A SINGLE LENS REFLEX CAMERA

Makoto Kimura, and Yutaka Iizuka, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

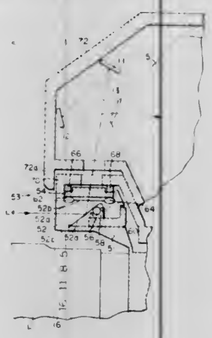
Continuation-in-part of Ser. No. 949,265, Oct. 6, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 44,975
Claims priority, application Japan, Oct. 8, 1977, 52/134765[U]
Int. Cl.³ G03B *13/02, 17/20*
U.S. Cl. 354—224 **9 Claims**

1. A single lens reflex camera body to which a viewfinder system can be removably mounted, comprising:

a projected portion provided in the front face of the camera body between a mounting portion of the camera body on which a photographic lens is mounted and a viewfinder mounted on the camera body; and

display means provided in said projected portion, said display means being capable of being viewed through a viewfinder mounted on the camera body, and wherein

said projected portion includes illumination means for illuminating said display means, and said display means is



a light transmitting display element located between said illumination means and said viewfinder.

4,231,650

BLADE TYPE FOCAL PLANE SHUTTER

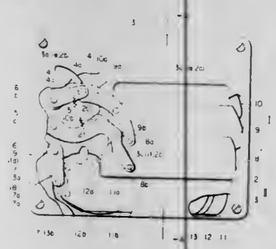
Toshihisa Saito, Tokyo, and Nobuyoshi Inoue, Kawagoe, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 14, 1978, Ser. No. 969,413

Claims priority, application Japan, Dec. 15, 1977, 52-168770[U]

Int. Cl.³ G03B 9/40

U.S. Cl. 354—246 **8 Claims**



1. A blade type focal plane shutter comprising a base plate having an exposure aperture therein, a driving arm rotatably supported at one end on said base plate and able to move between its cocked position and its uncocked position, an auxiliary arm rotatably supported at one end on said base plate at a distance from said driving arm and able to move between its cocked position and its uncocked position, at least one opague thin plate pivotably supported on said driving arm and auxiliary arm and able to open and close said exposure aperture, and a spring connected between said base plate and said auxiliary arm and able to bias said driving arm and auxiliary arm in one direction to absorb backlashes present at respective pivotably supporting points of said driving arm and auxiliary arm with said opague thin plate.

4,231,651

CAMERA BODY

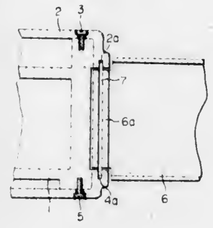
Tomio Tsuruoka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,677

Claims priority, application Japan, Mar. 29, 1978, 53-39310[U]

Int. Cl.³ G03B 17/02

U.S. Cl. 354—288 **4 Claims**



1. A camera body having a pivotally mounted back lid, comprising:

(a) an interior body;

(b) a back lid having rotatable shaft means at one end thereof;

(c) an upper cover and a lower cover removably secured to the upper portion and the lower portion, respectively, of the camera's interior body, said covers having integrally formed therewith outwardly extending axially aligned supporting members for supporting said rotatable shaft means of said back lid on the opposed surfaces of the ends of said covers; and

(d) securing means for securing said covers to the camera's interior body;

whereby said back lid may be pivotally mounted in a readily removable manner to the camera's interior body by securing said covers to the camera's interior body by said securing means when said lid shaft means are positioned between said covers.

4,231,652

DRUM FOR ELECTROPHOTOGRAPHIC COPIER

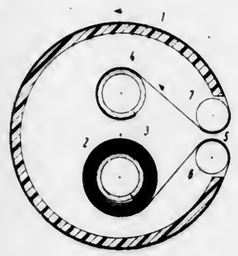
Kurt Moser, and Helmut Wegmann, both of Gerlingen, Fed. Rep. of Germany, assignors to Develop KG Dr. Elsbein & Co., Gerlingen, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,217

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756388

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 DR **34 Claims**



1. A drum for an electrophotographic copier, the drum including an interior space, a stock roll means disposed in the interior space for accommodating a supply of weblike photosensitive semiconductor material, a takeup roll means disposed in the interior space for receiving the semiconductor material from said stock roll means, the semiconductor material extends from the stock roll means around an outer peripheral surface of the drum to the takeup roll means, characterized in that at least two deflector roll means are arranged at the drum for defining a slit means for enabling the semiconductor material to be led into and out of the interior space of the drum, the drum including the stock roll means, takeup roll means, and semiconductor material are constructed as an exchangeable unit adapted to be inserted into the electrophotographic copier, and in that quick release means are provided on the drum for connecting the drum to bearing means and a rotary drive means of the electrophotographic copier, said quick release means includes means for accommodating axially adjustable bearing pins arranged at the bearing means and rotary drive means of the electrophotographic copier.

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OIL SUPPLY APPARATUS

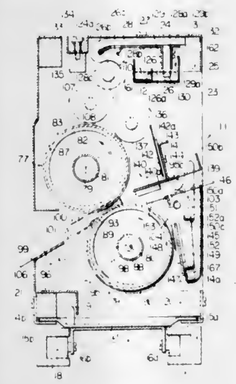
Yasumori Nagahara, Yokosuka, and Haruki Iida, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 28, 1978, Ser. No. 964,381

Claims priority, application Japan, Nov. 30, 1977, 52-144478

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 FU **20 Claims**



1. An offset preventing oil supply device for a heat type image fixing apparatus of a copying machine for operation to make copies comprising:

an image fixing roller rotatably mounted in the copying machine;

a pressure roller rotatably mounted in the copy machine engageable in pressure contact with said image fixing roller to fix an image on the copy sheet moved therebetween;

an oil container for containing a replaceable supply of offset preventing oil associated with said image fixing roller, having an oil course defined therein forming a path for the replaceable supply of oil;

oil supply means between said oil container course and said image fixing roller for supplying oil in small quantities and for evenly distributing the oil on said image fixing roller;

an oil tank for containing a supply quantity of offset preventing oil associated with said oil container;

pump means connected between said oil tank and said oil container for drawing oil from said tank and supplying it to said container at one end of said oil course;

said oil container including a drain at one opposite end of said oil course for draining the oil from said container, whereby a replaceable supply of oil is maintained in said oil container course; said pump means actuated when the copying machine is in operation for providing a flow of the oil in the container to continuously apply the oil in a non-deteriorated state to said image fixing roller through said oil supply means.

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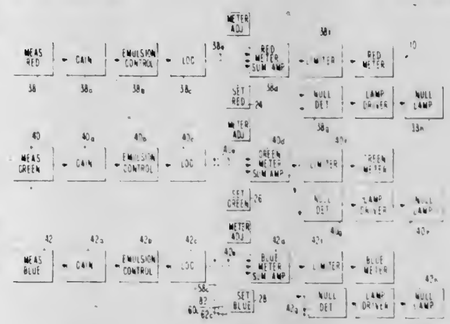
CONTROLLER FOR PHOTOGRAPHIC ENLARGER OR THE LIKE

William H. Prickett, Redwood City, Calif., assignor to Michael E. Gorski, Menlo Park, Calif.

Filed Apr. 27, 1979, Ser. No. 34,071

Int. Cl.³ G03B 27/73

U.S. Cl. 355—38 **10 Claims**



1. Apparatus for controlling a photographic enlarger in accordance with a predetermined set of reference values for color and density with the enlarger having a light source capable of radiating light of different wavelengths comprising: means for sensing a number of different wavelengths of the light from said light source, said sensing means being operable to generate a voltage corresponding to the amount of light of each of said number of wavelengths, respectively; a timer; means coupled with the timer for applying a voltage to the enlarger for energizing the same during a period in which the timer is actuated; means coupled with the timer for adjustably setting the timer to any one of a number of different time periods; a summing device for each of said number of wavelengths, respectively, each device having a number of inputs and an output, each device being operable to provide a null condition at the output thereof when the sum of the input voltages is substantially zero, said sensing means corresponding to each of said number of wavelengths being coupled to one of the inputs of the respective device, said time setting means having means coupling it to another input of each device, respectively; means coupled with a third input of each device, respectively, for applying reference density and wavelength voltages thereto in accordance with said predetermined reference set; and means coupled with the output of each device, respectively, for indicating a null condition of the output thereof.

4,231,655

METHOD OF DYNAMIC REPRESENTATION AND APPARATUS THEREFOR

Klaus M. Schwab, Troinex, Switzerland, and Detlev Kahrbek, Blumenau, Brazil, assignors to International Educational Services AG, Chur, Switzerland

Filed Feb. 27, 1979, Ser. No. 15,669

Claims priority, application Switzerland, Oct. 31, 1978, 11205/78

Int. Cl.³ G03B 27/52

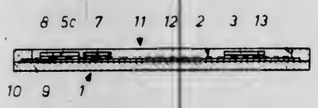
U.S. Cl. 355—40 **8 Claims**

1. A method of dynamic representation of information which comprises providing a frame having a back comprising a sheet of magnetic metal, a rim fixed to said back and having an opening defining a window, a reference sheet overlying said sheet of magnetic metal and visible through said window, said reference sheet having indicia thereon, placing on said refer-

ence sheet in selected position thereon a plurality of movable members of selected size, shape and color, said movable members having permanent magnetic properties whereby said members when placed in selected position on said reference sheet are attracted by said underlying sheet of magnetic metal and thereby held on said reference sheet in the position in which they are placed, turning said frame with said reference sheet and said movable members thereon face down on the window of a photocopying machine and operating said machine to make a photocopy of said frame with said reference sheet and said movable members thereon, said rim projecting forwardly from said back beyond said movable members on said reference sheet whereby said rim rests on the window of the photocopying machine and holds said movable members out of engagement with said window to avoid displacement of said movable members on said reference sheet.

2. Apparatus for dynamic representation of information comprising:

a frame having a back comprising a sheet of magnetic metal,



a rim fixed to said back and having an opening defining a window,

a reference sheet overlying said sheet of magnetic metal and visible through said windown, said reference sheet having indicia thereon, and

a plurality of movable members of selected size, shape and color, said movable members having permanent magnetic properties whereby said members when placed in selected position on said reference sheet are attracted by said underlying sheet of magnetic metal and thereby held on said reference sheet in the position in which they are placed when said frame is placed face down on the window of a photocopying machine,

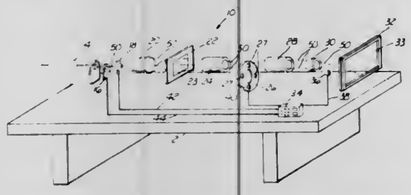
said rim projecting forwardly from said back beyond said movable members on said reference sheet, whereby said rim rests on the window of the photocopying machine and holds said movable members out of engagement with said windown to avoid displacement of said movable members on said reference sheet.

4,231,656

APPARATUS AND METHOD OF CONVERTING AN IMAGE ON A TRANSPARENCY TO LINE ART ON A RECORDING MEDIUM

Fred M. Dickey, Derby; Jerry R. White, and James Crill, both of Wichita, all of Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 28, 1979, Ser. No. 24,740
Int. Cl.³ G03B *27/72*
U.S. Cl. 355—71 **12 Claims**



1. A method of converting an image on a transparency to line art on a recording medium, the steps comprising:

directing a light beam outwardly from a high intensity light source;

illuminating an image on a transparency with the beam;

subjecting the illumination beam to a first fourier transform lens resulting in a spatial frequency distribution of the image in the illumination beam;

filtering the spatial frequency distribution of the image in the beam for removing undesirable spatial frequencies of the image and modification of the amplitude of the remaining spatial frequencies of the image;

reconstructing the filtered image of the beam from the remaining spatial frequencies by subjecting the beam to a second fourier transform lens; and

exposing the reconstructed image of the beam to a recording medium thereby producing line art from the original image on the transparency.

7. An apparatus for converting an image on a transparency to line art on a recording medium, the apparatus comprising:

an optical base;

a high intensity light source disposed on said base, said light source directing a light beam outwardly therefrom;

a transparency holder disposed on said base, said holder holding a transparency with an image thereon, said holder positioned in front of the light beam so that the light beam is directed through the transparency;

a first fourier transform lens disposed on said base and positioned in front of said holder for receiving the beam therethrough;

a filter holder having a filter mounted thereon disposed on said base and positioned in front of said first fourier transform lens, said filter filtering the spatial frequency distribution of the image in the beam for removing undesirable spatial frequencies of the image and modifying the amplitude of the remaining spatial frequencies of the image;

a second fourier transform lens disposed on said base, and positioned in front of said filter for receiving the filtered image of the beam transmitted therethrough and reconstructing the filtered image from the remaining spatial frequencies; and

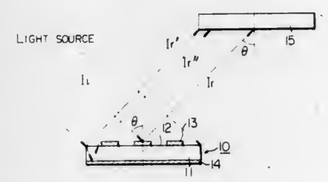
a recording medium holder disposed on said base, and positioned in front of said second lens for exposing the reconstructed image on a recording medium held thereon, thereby producing line art from the original image on the transparency.

4,231,657

LIGHT-REFLECTION TYPE PATTERN FORMING SYSTEM

Seiichi Iwamatsu, Tokyo, Japan, assignor to VLSI Technology Research Association, Japan

Filed Mar. 22, 1979, Ser. No. 22,848
Claims priority, application Japan, Mar. 27, 1978, 53/34157
Int. Cl.³ G03B *27/72*
U.S. Cl. 355—71 **15 Claims**



1. A light-reflection type pattern forming system comprising:

a light source producing light along a predetermined path;

a light-reflection substrate having a main surface facing said light source, said substrate including a highly-reflective pattern region made of a material of high light reflection formed in a selected portion of the main surface thereof, and a poorly-reflective pattern region made of a material of poor light reflection formed in the remainder of the main surface of said substrate to form a predetermined pattern on said substrate, said highly-reflective and poorly-reflective pattern regions being exposed on said main surface and having their surfaces on the same plane, said substrate being disposed on the path of said light source whereby the highly-reflective and poorly-reflective pattern regions are exposed to the light from said light source with a predetermined angle of incidence; and

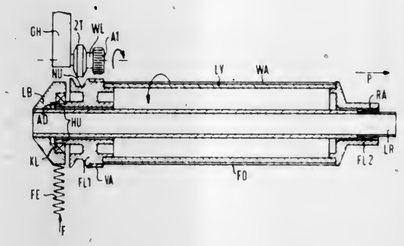
an object to be exposed, disposed at a distance from the path of said light source and positioned to receive light reflected from said highly-reflective pattern region on the main surface of said substrate.

4,231,658

DEVICE FOR POSITIONING A MASTER COPY-RECEIVING ROLLER OF A FORM PRINTING DEVICE

Siegfried Zoeke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 1, 1979, Ser. No. 35,062
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2826530
Int. Cl.² G03B *27/10*
U.S. Cl. 355—110 **11 Claims**



1. In a copying machine apparatus of the type in which a transparent roller is rotatably mounted on a lamp tube, the improvement for accurate axial positioning of the roller comprising:

a drive mechanism including a rotatable drive wheel, and first camming means;

mounting means mounting the lamp tube and said drive mechanism for relative movement toward and away from one another;

a driven wheel carried by the roller for engagement with said drive gear; and

second camming means carried by one of said roller and said tube for interaction with said first camming means to axially align said drive and driven wheels upon relative movement of said drive mechanism and the lamp tube toward each other.

4,231,659

METHOD OF MAKING AN OVERLAY MASK AND A PRINTING PLATE THEREFROM

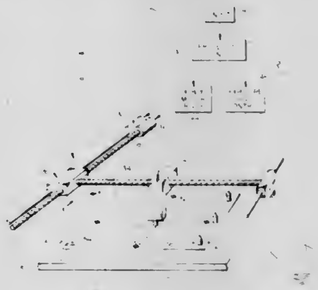
David J. Logan, Glastonbury, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Apr. 11, 1979, Ser. No. 29,358
Int. Cl.³ G03B *41/00*
U.S. Cl. 355—132 **16 Claims**

1. A method of producing a printing plate with an overlay mask comprising:

placing a film having a photosensitive surface in an automatic precisely controlled photoplotter having an optical exposure head with the photosensitive surface of the film disposed for exposure by the head;

controllably moving the exposure head relative to the photosensitive surface of the film with accurate, predetermined motions, and simultaneously exposing the film surface with the exposure head to precisely expose the film in accordance with the pattern of a desired printing plate overlay mask with sharply separated transparent and opaque areas in linear, rectangular or other shapes that divide a plate into prescribed areas for receiving and not receiving printed matter through the mask;



developing the exposed film and producing the precisely exposed overlay mask with a mask pattern in contrasting transparent and opaque areas corresponding to the film exposure; and

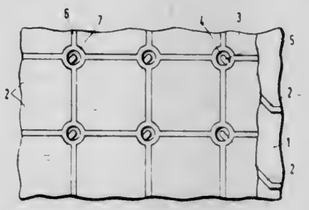
photoengraving a printing plate directly by means of the precisely exposed overlay mask for accurate disposition of printing information on the printing plate.

4,231,660

MICROSCOPE SLIDE WITH ELECTRODE ARRANGEMENT FOR CELL STUDY, AND METHOD FOR ITS CONSTRUCTION

Ernst Remy, Georgenstr. 22, 8000 Munich 40; Andreas Meyer, Herzog-Albrecht-Str. 21, 8011 Zorneding; Ellen Rieske, Thomaweg 12, 8131 Berg II, and Günther Gross, Auerbergstr. 9, 8011 Zorneding, all of Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,305
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741638
Int. Cl.³ G01N *21/01*; G02B *21/34*; B32B *3/10, 3/00*
U.S. Cl. 356—244 **16 Claims**



1. A slide for supporting an electrically contacting cell matter to be observed under a microscope comprising:

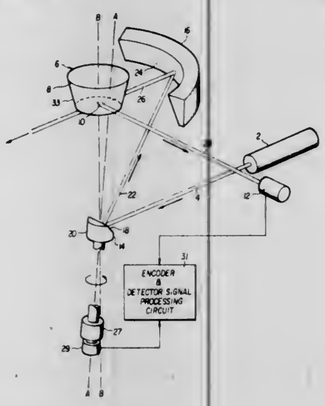
a base;

a plurality of electrical conductors disposed on said base; and

an insulating coating applied over said base and said electrical conductors to insulate said cell matter from said electrical conductors; and

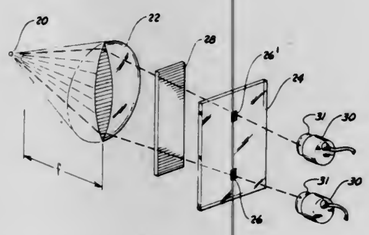
a plurality of microscopic perforations through said insulating coating, each of said perforations communicating with a respective one of said electrical conductors thereby permitting electrical contact to at least one precise area of said cell matter by stimulation of the respective electrical conductor.

4,231,661
RADIAL SCANNER
J. William Walsh, Baltimore, Md., and Raymond E. Bletry, Jr., Lake Shawnee, N.J., assignors to Becton, Dickinson & Company, East Rutherford, N.J.
Filed Sep. 20, 1978, Ser. No. 944,179
Int. Cl.³ G01N *21/01*
U.S. Cl. 356—340 **12 Claims**



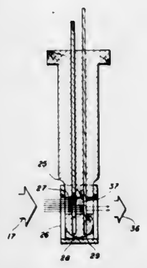
1. A radial scanner comprising:
a source of a beam of radiant energy;
a means for deflecting the beam of radiant energy, said deflecting means being located on a reference axis;
means for rotating the deflecting means to thereby sweep the deflected beam; and
means, having a planar surface curved about the reference axis for reflecting the swept, deflected beam; whereby a beam reflected by the reflecting means radially scans a test sample container located on the reference axis and displaced from said deflecting means, said scanning being affected through a range of angles lying in substantially the same plane.

4,231,662
PHASE SHIFT CORRECTION FOR DISPLACEMENT MEASURING SYSTEMS USING QUADRATURE
Seymour Feinland, Stamford, and David Kleinschmitt, South Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Sep. 7, 1978, Ser. No. 940,265
Int. Cl.³ G01B *11/14*; H01J *3/14*
U.S. Cl. 356—373 **5 Claims**



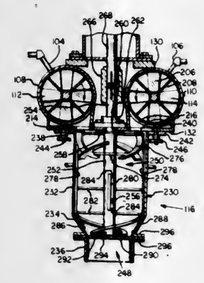
1. In a displacement measuring system, apparatus for producing variable gray level patterns, and adjusting the angle phase difference of transmitted light producing said patterns, the combination comprising:
(a) a small area light source for providing a source of light beams;
(b) an index diffraction grating with at least two windows in substantial quadrature with respect to each other and disposed adjacent said light source for receiving light beams from said light source;
(c) an extended diffraction grating adjacent to, and substantially parallel with, said index diffraction grating, and intermediate said light source and said index diffraction grating, said extended diffraction grating being capable of relative motion with respect to said index diffraction grating to coact with said index diffraction grating to produce a gray level pattern for each of said two windows when said light beams impinge on said index diffraction grating;
(d) photodetector means for receiving said gray level pattern produced by said diffraction gratings and in response thereto, producing electrical output signals which vary in phase with said gray level pattern in accordance with any relative movement between said extended diffraction grating and said index diffraction grating; and
(e) refraction means disposed intermediate said light source and said diffraction gratings for refracting said light beams before they impinge on said diffraction gratings, said refraction means being movably disposed between said light source and said diffraction gratings for refracting said light beams before said beams impinge on said diffraction gratings.

4,231,663
DEVICE FOR CALIBRATING THE PHOTOMETRIC LINEARITY OF OPTICAL INSTRUMENTS
Conrad M. Phillippi, 7420 Brantford Rd., Dayton, Ohio 45414
Filed Mar. 16, 1979, Ser. No. 21,142
Int. Cl.³ G01N *21/01*
U.S. Cl. 356—432 **4 Claims**



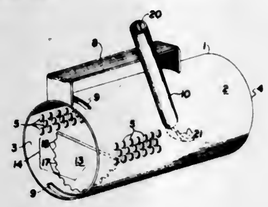
1. A device for calibrating the photometric linearity of optical instruments which transmit a light beam through the sample being analyzed, which comprises a variable attenuator which can be inserted into the path of said light beam, and when so inserted completely obstructs an area segment of said beam without altering the remainder of the beam area, and an accurate step attenuator of fixed value, capable of being inserted into and removed from the path of the beam segment not obstructed by said variable attenuator.

4,231,664
METHOD AND APPARATUS FOR COMBINING HIGH SPEED HORIZONTAL AND HIGH SPEED VERTICAL CONTINUOUS MIXING OF CHEMICALLY BONDED FOUNDRY SAND
Steven D. Flock, Beaverton, and Roger A. Hayes, Tigard, both of Oreg., assignors to Dependable-Fordath, Inc., Sherwood, Oreg.
Filed Mar. 21, 1979, Ser. No. 22,609
Int. Cl.³ B01F *7/04, 7/08, 7/24*
U.S. Cl. 366—35 **8 Claims**



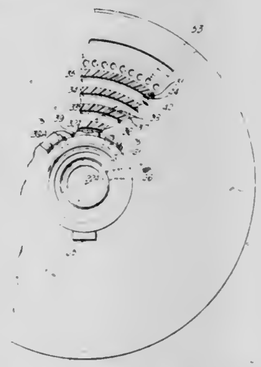
2. Mixer apparatus, comprising:
at least one horizontally extending cylindrical mixing chamber having an inlet opening adjacent its rearward end and a discharge opening adjacent its forward end;
feeder means for introducing materials to be mixed into said mixing chamber through said inlet opening;
a rotatable shaft extending centrally through said mixing chamber;
means for rotating said shaft; and
blade means mounted on said shaft for mixing said materials in said mixing chamber, conveying said materials forwardly toward the forward end of said mixing chamber and discharging said materials from said mixing chamber through said discharge opening therein,
said blade means comprising
helical blades mounted on said shaft adjacent said inlet opening for conveying said materials forwardly,
a plurality of fixed similarly pitched paddle blades mounted on said shaft forwardly of said helical blades for mixing said materials and conveying the same forwardly, and
a plurality of radially extending flinger blades mounted on said shaft forwardly of said paddle blades and adjacent said discharge opening for discharging said materials through said discharge opening.

4,231,665
FILTER AID DISPENSING ARRANGEMENT
Winston L. Shelton, P.O. Box 9922, Chenoweth Run Rd., Jeffersontown, Ky. 40299
Filed Oct. 17, 1979, Ser. No. 85,482
Int. Cl.³ B01F *5/04*; B67D *5/54*
U.S. Cl. 366—165 **5 Claims**



1. A filter aid dispensing device including: container means having sidewall means defining an open end to receive powdered filter aid and a closed end; aperture means located at selected locations in said sidewall means in spaced relation from said closed end to allow excess powdered filter aid to flow out of said container means when a predetermined quantity of powdered filter aid is accumulated in said container means when said container means is in first position; handle means to position said container means in first and second positions; slot means in transversly aligned relation in said sidewall means adjacent said open end of said container means to receive brackets disposed in vertically aligned relation to secure said container means in said second position; baffle means located within said container means adjacent said open end and disposed across said container means adjacent said sidewall means; liquid inlet tube means provided in said sidewall means to admit and direct a liquid tangentially to said container when said container means is in said second position to throughly mix said filter aid contained within said container means and liquid admitted through said liquid inlet tube means to form a precoat slurry where said slurry is dispensed from said container means through at least one of said aperture means, slot means and said open end of said container means.

4,231,666
MIXING APPARATUS
John Baron, Accrington, England, assignor to E. T. Oakes Limited, Macclesfield, England
Filed Mar. 7, 1979, Ser. No. 18,102
Claims priority, application United Kingdom, Mar. 10, 1978, 9674/78
Int. Cl.³ B01F *5/06, 7/00*
U.S. Cl. 366—304 **15 Claims**



1. A mixing device comprising, in combination:
(a) a housing of generally cylindrical construction;
(b) two end walls to said housing;
(c) a shaft mounted for rotation coaxially of said cylindrical housing;
(d) means for rotating said shaft in a given direction of rotaton;
(e) a fluid inlet and a fluid outlet to said housing;
(f) means for feeding fluid to be mixed under pressure to said fluid inlet;
(g) concentric arrays of axially extending mixing elements on at least one end wall;
(h) a rotor mounted on said shaft for rotation therewith, said rotor having an end face facing said at least one end wall;
(i) further axially extending mixing elements in a plurality of annular concentric arrays on said rotor, the mixing elements of the rotor and the at least one end wall interfitting with one another, and the mixing elements of each array on said at least one end wall and said rotor each being defined by inner and outer part-cylindrical surfaces and by further straight surfaces forming the sides of grooves, the axes of which are disposed along different tangents to an

inner pitch circle which is concentric with said part-cylindrical surfaces such that, upon rotation of said shaft in said given direction, a reverse pumping action is produced tending to resist the feeding of the fluid through the housing by the feeding means.

4,231,667

TYPEWRITER RIBBON FEED MECHANISM

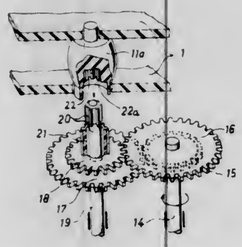
Wolfgang Behrendt; Detlef Bohnhage, both of Wilhelmshaven; Peter Friedemann, Zetel; Bernhard Frölich, Spangenberg, and Reinhold Orzessek, Schortens, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,541

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810768

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—208 **8 Claims**



1. In a feed mechanism for advancing an ink ribbon, supported in a cartridge, in feeding steps whose length is determined dependent upon the type of the ribbon; the cartridge being insertable in, and removable from a typing machine; the feed machanism including a feed roller mounted in the cartridge and operatively connected with the ribbon for advancing the ribbon; the feed mechanism further including a driving device mounted in the machine and operatively connectable to the feed roller upon insertion of the cartridge in the machine; the improvement wherein said driving device has at least two output components arranged to rotate with unlike speeds; said feed mechanism further having coupling means mounted in said cartridge and continuously operatively connected with said feed roller; said coupling means connecting a selected one of said output components to said feed roller when said cartridge is in place in said typing machine; said coupling means being arranged as a function of the type of the associated ribbon for connecting said feed roller to said selected one of said output components.

4,231,668

LIQUID POWER DRIVEN COATING APPARATUS

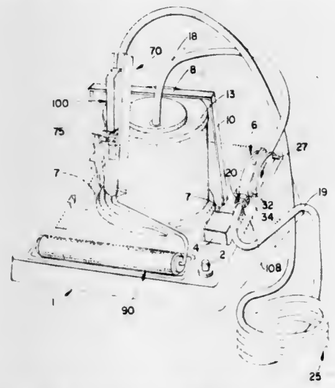
Hugh F. Groth; John D. Vogel, and Gullbert M. Hunt, all of Brecksville, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Oct. 5, 1978, Ser. No. 948,912

Int. Cl.³ B43K *5/02*

U.S. Cl. 401—146 **6 Claims**

1. Apparatus for applying a liquid coating to coatable surfaces comprising: a base; means on said base for providing cooperative support between said base and a reservoir of liquid coating material; a peristaltic pump mounted on said base, said pump having entrance and exit ports; an elongated flexible conduit having a portion thereof extending through said pump between said entrance and exit ports; said conduit outside of said entrance port being connectable in liquid transfer relationship with a liquid coating reservoir cooperatively positioned with said support; said conduit beyond said exit port being connected with applicator means for applying liquid coating material to a surface, said applicator means having a handle through which said conduit extends, a selectively operable trigger in said handle for selectively and variably constricting said conduit; said pump including a rotatable rotor assembly having a plurality of rotatable impeller rotors and an arcuate pump stator extending between said entrance and exit ports outwardly of said rotor assembly; said conduit between said entrance and exit ports being positioned beneath said stator and rotor assembly for being progressively squeezed by said rotors during rotation of said rotor assembly to pump liquid coating material to said applicator means; a motor for rotatably driving said rotor assembly and having a motor drive shaft; an epicyclic planetary gear train having an output shaft and being drivingly engaged with said motor drive shaft for providing a first substantial speed reduction from said motor drive shaft to



said output shaft; said output shaft having a diameter substantially smaller than the diameter of said rotors and being drivingly engaged with said rotors for rotating same about their own axes while engaged with said conduit for rotating said rotor assembly; said output shaft, rotors and rotor assembly being sized for providing one rotation of said rotor assembly from a substantial number of rotations of said output shaft to define a second substantial speed reduction from said output shaft to said rotor assembly; said first and second speed reductions providing a combined substantial speed reduction from said motor drive shaft to said rotor assembly; and, said pump including an automatic flow rate modification control responsive to variable back pressure in said conduit downstream of said exit port caused by selective operation of said trigger.

4,231,669

DEVICE FOR RECEIVING A WRITING IMPLEMENT

Rudolf Rosbiegalle, Geroldsgruen; Karl Färber, Steinbach; Herbert Grimm; Helmut Schmeisser, both of Geroldsgruen; Hermann Schönhut, Stein; Svatopluk Krumnikl, Nuremberg, and Günter Edel, Fürth, all of Fed. Rep. of Germany, assignors to A.W. Faber-Castell, Stein bei Nuremberg, Fed. Rep. of Germany

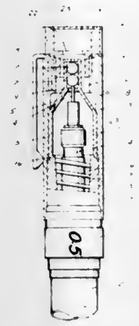
Filed Dec. 4, 1978, Ser. No. 965,918

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2756505

Int. Cl.³ B43K *5/12*

U.S. Cl. 401—258 **16 Claims**

1. A device for receiving a writing implement having a body portion, and writing insert which together with said body portion bounds a pressure-equalizing passage and has a tubular writing member, the device comprising housing means bounding an inner chamber and having an opening arranged for receiving the body portion of the writing implement and communicating with said inner chamber; a resiliently yieldable sealing member is said inner chamber of said housing means and located so that the tubular writing member sealingly abuts against said sealing member; and a wetting member in said housing means and having at least one surface which discharges a wetting medium, said surface of said wetting member being spaced from and in communication with the pressure-equalizing passage of the writing implement when the latter is inserted in the device, so that a zone of wet air is generated in



the region of said pressure-equalizing passage whereby drying of a writing liquid in the latter is prevented, but at the same time the tubular writing member is sealed by said resiliently yieldable sealing member from wet air thereby dilution of the writing liquid in the writing tubular member is prevented.

4,231,670

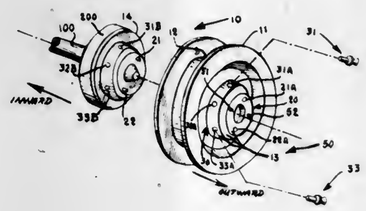
EASY CHANGE WHEEL ASSEMBLY

Jerry L. Knoski, 1695 Emerald Ct., Newark, Ohio 43055

Filed Mar. 14, 1979, Ser. No. 20,302

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—11 **4 Claims**



1. A wheel assembly, for use in combination with an axle, comprising:

a. a wheel member having an inner hollow hub portion and an outer protruding hub portion;

b. a hub member configurated and dimensioned to fit into and complement with said inner hollow hub portion of said wheel member, with said hub member connected, for rotatable motion, to an axle;

c. means for guiding said hub portions of said wheel member over and onto said hub member, with said hub member guided into, removably positioned in, and abutting said inner hollow hub portion of said wheel member, wherein said guiding means includes:

(1) a plurality of guide pins projecting outwardly from said hub member;

(2) and, a plurality of corresponding complementary guide pin holes, with one said hole for each said guide pin, and with said guide pin holes disposed in and through said outer protruding hub portion of said wheel member, and into which said guide pin holes are inserted said guide pins;

d. means for releasably connecting said wheel member and said hub member, wherein this releasable connecting means includes:

(1) a plurality of snap/lock pins, wherein each one of said plurality of snap/lock pins comprises:

(a) a hollow, essentially cylinder-shaped member having a cylindrical surface with a plurality of holes therein, a closed base end, and an open base end;

(b) a spring disposed within said hollow, cylinder-shaped member, with said spring abutting said closed base end of said hollow, cylinder-shaped member;

(c) a center shaft disposed within said hollow, cylinder-shaped member and having a first end, a second end, and a body portion therebetween with a plurality of hemispherically-configurated cavities therein, with one each of said cavities for a corresponding each one of said holes in said cylindrical surface of said cylinder-shaped member, and with each one of said plurality of hemispherically-configurated cavities disposed rearward of its corresponding hole in said cylindrical surface of said cylinder-shaped member, and also with said center shaft so disposed that it abuts said spring with its first end and also simultaneously abuts said cylinder-shaped member with its body portion;

(d) a plurality of ball bearings, with one ball bearing for each hole in said cylindrical surface of said cylinder-shaped member, selectively capturable within, and between, said holes in said cylindrical surface of said cylinder-shaped member and said corresponding cavities in said body portion of said center shaft;

(e) a push button means for selectively urging and moving said center shaft slidably forward and rearward within said cylinder-shaped member, with this push button means disposed at the second end of said center shaft, and in contact therewith, wherein this push button means includes a push button actuating member, whereby when said center shaft is selectively urged and moved slidably forward of said push button actuating member, said plurality of ball bearings are releasably captured within and between said holes in said cylindrical surface of said cylinder-shaped member and said corresponding cavities in said body portion of said center shaft, and whereby when said push button means is released said ball bearings are caused to protrude from said holes in said cylindrical surface of said cylinder-shaped member, and thereby also causing said snap/lock pin to lock said wheel member to said hub member;

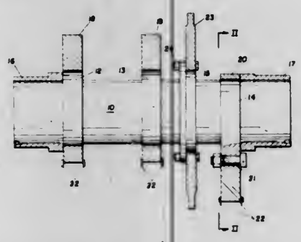
(f) and, means for grasping and holding said snap/lock pin, with this grasping and holding means integrated with said cylinder-shaped member, whereby said snap/lock pin may be grasped, held, and removably inserted into its respective and corresponding hole both in said first plurality of snap/lock pin holes in a outer protruding hub portion of said wheel member, and also in a second plurality of snap/lock pin holes in said hub member;

(2) said first plurality of corresponding complementing snap/lock pin holes being such that each hole receives one of said snap/lock pins in said outer protruding hub portion of said wheel member;

(3) and, said second plurality of corresponding complementary snap/lock pin holes being such that each hole receives one of said snap/lock pins in said hub member, wherein said first and second plurality of holes are in registration;

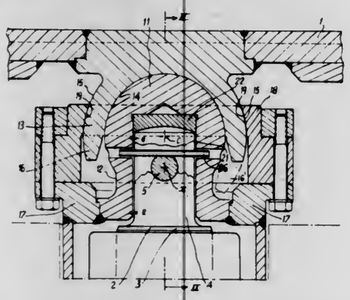
e. and, means for breaking a seal that may develop, between said inner hollow hub portion of said wheel member and said abutting hub member, as a result of releasably connecting said wheel member and said hub member with said releasable connecting means.

4,231,671
ECCENTRIC SHAFT AND METHOD OF MAKING A SHAFT
James E. Makins, Jr., Dallas, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Nov. 6, 1978, Ser. No. 958,458
Int. Cl.³ F16B 3/00
U.S. Cl. 403—13 3 Claims



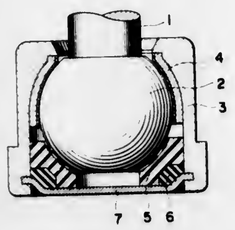
1. An eccentric shaft comprising an elongated cylindrical body, at least one small eccentric disc extending radially from said body, at least one concentric gear flange extending radially from said body, said body, disc and flange being formed as a single integral forging, and a relatively large eccentric disc shrink-fitted and keyed to said small disc, the diameters of said discs being related that the center of said large disc describes a crank circle entirely within said small disc on rotation of said shaft.

4,231,672
HEAVY DUTY ADJUSTABLE PROP WITH A BALL-AND-SOCKET JOINT
Guy Blanpain, Verneuil.En.Halatte, and Pierre Grandfils, Precy-sur-Oise, both of France, assignors to Charbonnages de France, Paris, France
Filed Jun. 25, 1979, Ser. No. 52,013
Claims priority, application France, Jun. 29, 1978, 78 19460
Int. Cl.³ F16C 11/00
U.S. Cl. 403—62 9 Claims



1. A ball joint for transmitting supporting and tractive forces between a prop and a head-piece of a support unit, the ball joint comprising a support element arranged to be carried by a prop and having a spherical head, and a cooperating element arranged to be fastened to a head-piece, the cooperating element being in the form of a skirt-shaped dome and having an internal spherical concave surface extending over a hemisphere at maximum and an external spherical convex surface concentric to said internal surface, the internal surface of the dome having a shape which corresponds to that of the head and cooperating with said head, the support element having a support surface spaced from the head and having a spherical shape corresponding to that of the head, said dome being received in the space between the support surface and the head and the support surface surrounding and bearing against the external surface of the dome, wherein the support element has a cylindrical cavity located within the spherical head and a pivot is mounted with radial clearance within the cylindrical cavity, the pivot being arranged to be carried by the prop.

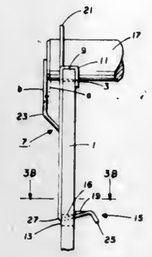
4,231,673
BALL JOINT AND A METHOD FOR MANUFACTURING THE BALL JOINT
Eiji Satoh, Fujisawa; Masayuki Kohama, Shiga; Kunihiko Yokoya; Kenji Yamada, both of Yokohama, and Akira Nemoto, Toyohashi, all of Japan, assignors to Oiles Industries Co., Ltd., Tokyo and Musashi Seimitsu Kogyo Kabushiki Kaisha, Aichi, both of, Japan
Filed Dec. 18, 1978, Ser. No. 970,170
Claims priority, application Japan, Dec. 28, 1977, 52/158456; Dec. 28, 1977, 52/158457
Int. Cl.² F16C 11/06
U.S. Cl. 403—125 8 Claims



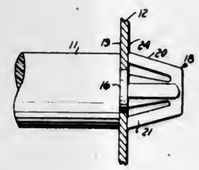
6. A ball joint comprising:
a casing having a small opening and a large opening opposite to the small opening;
a ball head housed in said casing;
a ball stud protruding from said ball head and extending through the small opening of said casing;
an upper seat consisting of a multi-layer material which is formed by providing with a synthetic resin layer having self-lubricating ability and wear resistance impregnated in a sintered layer formed on the surface of a back metal such as steel, the upper seat being formed so as to be fitted in and seated on said casing at the small opening side of said casing, and so as to fit and surround said ball head at its periphery adjacent to the ball stud;
a lower seat consisting of a synthetic resin having self-lubricating ability and abrasion resistance and being formed so as to fit and surround said ball head at its opposite periphery adjacent to the ball stud; and
a closure plate for closing said large opening of the casing;
wherein the upper seat has a spherical surface portion and a cylindrical surface portion extending toward the large opening and with its terminal cylindrical surface spaced from the surface of the ball continuing to this spherical surface portion, and the ball joint is constituted so as to enable the upper seat and lower seat to support a load securely against the casing and ball head when a tensile load is applied to the ball stud.

4,231,674
CLIP FOR ATTACHING GUIDE RAILS TO A FRAME
Henry E. Smith, Pleasanton, Canada, assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 28, 1979, Ser. No. 24,806
Int. Cl.³ B25G 3/00; F16B 7/08
U.S. Cl. 403—233 2 Claims

1. A clip for attaching a guide rail to a guide rail support member characterized in that said clip includes hanger means and first spring means for holding said clip on a guide rail support member by spring tension between said hanger means and said first spring means, said clip further including a second spring member for preventing axial movement of a guide rail and retention means for retaining a guide rail in said clip and in contact with said second spring means.



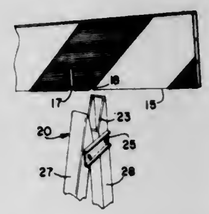
4,231,675
MOUNTING DEVICE
Milton V. Scozzafava, 17835 Contador Dr., Rowland Heights, Calif. 91748
Filed Apr. 12, 1979, Ser. No. 29,489
Int. Cl.³ B25G 3/00; F16B 9/00
U.S. Cl. 403—252 5 Claims



1. A device for mounting a member on a plate, said plate having a round hole therein with diametrically opposed notches opening into said hole,
comprising: a bearing integral with said member and adapted to fit within said hole for rotation about the axis of said hole,
a head projecting forwardly from the end of said bearing opposite said member,
two spring arms integral with said head at their forward ends,
said member, bearing, head, and arms being unyielding in an axial direction,
said arms diverging outwardly and rearwardly,
said arms being adapted to pass through said notches, the distance between the rear ends of said arms and said member being less than the thickness of said plate, and
said arms being adapted to flex in a circumferential direction when said bearing is fitted in said hole and said member is subsequently rotated relative to said plate whereby to enable said arms to move out of said notches and to press said member against said plate.

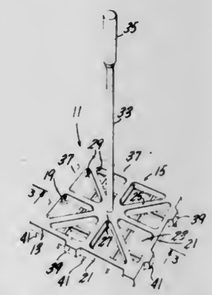
4,231,676
COLLAPSIBLE TRAFFIC BARRICADE
Dennis W. Smith, and Paul J. Mazzacano, both of Joliet, Ill., assignors to F F Fabricators, Inc., Joliet, Ill.
Filed May 21, 1979, Ser. No. 40,494
Int. Cl.³ E01F 13/00
U.S. Cl. 404—6 6 Claims

1. A collapsible traffic barricade assembly for the control of traffic, the identification of traffic lanes and the like, having a center panel with opposing end portions and two supporting leg assemblies, at least one slot formed of a certain width in each end portion of said center panel, each of said slots extending inward from a lower edge of said center panel, each of said supporting leg assemblies comprising two leg members, said leg members being joined by a bracket at an upper end, said bracket having a certain maximum thickness, said maximum thickness being equal to or slightly less than said certain slot width, said bracket being attached to each leg member for pivotal movement of each of said leg members, said bracket spacing said leg members from one another to allow insertion



of said bracket into said slot whereby said center panel is supported by said leg assemblies in a substantially horizontal manner, the lower ends of said leg members being spread to bias said upper end against said center panel, whereby the substantial equivalency in size of said slot and said bracket thickness in combination with the bias of said upper end against the center panel contributes to great lateral stability while said barricade assembly is easily collapsible and said leg members are capable of pivoting to a substantially flat position on collision or disassembly.

4,231,677
PROCESS AND APPARATUS FOR FORMING CONCRETE
Derek Roming, Carmel, N.Y., assignor to International Design Systems, Ltd., Fairfield, Conn.
Filed Aug. 28, 1978, Ser. No. 937,125
Int. Cl.² E01C 23/02
U.S. Cl. 404—89 6 Claims



1. A lightweight embossing tool for patterning an impressionable surface material comprising a rectangular weight-supporting platform formed with weight-distributing means and having an essentially flat top, bottom and side portions, a centrally located opening formed on the top surface thereof and adapted to receive a shaft, said platform having dimensions of not less than twelve inches by twelve inches or greater than eighteen inches by eighteen inches; the bottom surface of said platform having rigidly connected thereto a plurality of blades arranged within the perimeter of the bottom of said platform in a predetermined pattern, whereby the bottom of the platform portion limits the depth to which the blades penetrate the

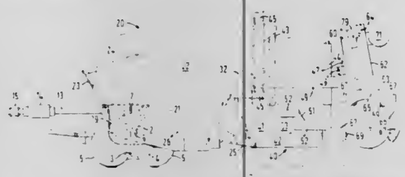
impressionable surface, the total number of lineal inches of blade being between thirty and one hundred and fifty.

4,231,678

PAVING MACHINES

Frederick A. Carternock, Dover, England, assignor to Integrated Technology Limited, St. Peter Port, Guernsey, Channel Islands

Filed May 16, 1978, Ser. No. 907,091
Claims priority, application United Kingdom, May 17, 1977, 20666/77; Aug. 4, 1977, 32740/77
Int. Cl.² E01C *19/28*
U.S. Cl. 404—103 **10 Claims**



1. A road surfacing machine arranged for movement along a road to be surfaced, the machine comprising a body including a hopper for storing material to be laid and outlet means for allowing the discharging of the material from the hopper, a front support and a rear support arranged to support the machine, the front support being situated to travel on the uneven ground to be surfaced, the rear support being situated to travel on the surface laid by the machine, metering means, positioned between the front and rear supports for forming a layer of selected thickness and shape of the material discharged from the outlet means, first bearing means on the front support for free relative angular displacement between the front support and the rest of the machine about a longitudinal axis contained in or parallel to a vertical plane of symmetry of the machine, and second bearing means on the front support for free relative angular displacement between the front support and the rest of the machine about a transverse axis perpendicular to the vertical plane of symmetry of the machine.

4,231,679

DRY DOCK FOR BUILDING VESSELS

Jury P. Ivanov, Grazhdansky proezd, 92/2, kv. 1, Leningrad, U.S.S.R.

Filed Dec. 12, 1978, Ser. No. 968,856
Int. Cl.² B63C *1/08*
U.S. Cl. 405—4 **3 Claims**



1. A dry dock for building vessels including an aft end, a middlebody and a fore end, comprising:

a main chamber having two ends at, least one of the ends being openable to a water area;

a separating gate positionable in said main chamber for dividing it into an assembly area and a completion and launching area, a middlebody of a vessel being assembled with a fore end in said assembly area, and the same vessel being completed in and launched from said completion and launching area;

at least one side chamber extending perpendicular to said main chamber for assembling an aft end of the vessel, the aft end being joined with the middlebody in said completion and launching area;

an intermediate gate installed between said side and main chambers for separating them from one another so that said side chamber is not flooded during launching of a vessel;

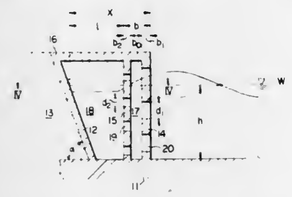
said separating gate being arranged in said main chamber in such a manner as to form an extension of a wall of said side chamber, which is the nearest wall to said assembly area of said main chamber, so that a first vessel can be launched from said completion and launching area without flooding said assembly area whereby a middlebody and a fore end of a second vessel can be assembled in said assembly area while said completion and launching area is flooded.

4,231,680

BREAKWATERS

Takeshi Ijima, Fukuoka, Japan, assignor to Iida Kensetsu Kabushiki Kaisha, Fukuoka, Japan

Filed Oct. 28, 1977, Ser. No. 846,388
The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.
Int. Cl.² E02B *3/06*
U.S. Cl. 405—31 **16 Claims**



1. A double breakwater of the semisubmerged type comprising a base on the water bottom; a back wall of generally planar configuration inclined substantially uniformly over its entire length and inclining away from the incident wave direction, so that its upper part is farther from the incident wave direction than its lower part, and the upper part of said inclined back wall rises above the calm water level; its lower part being below the calm water level; a perforated barrier wall structure having a plurality of apertures or holes standing on the base, which has the same height as the inclined back wall; and a top wall support slab which projects horizontally from the top end of the inclined back wall and which is connected to the top of said perforated barrier wall structure, so as to form and completely cover a chamber between said base and said top, and said perforated barrier wall structure and said inclined back wall, and said chamber is adapted to partly retain at all times some of the water entering said chamber so as to aid in damping wave action; whereby said double breakwater exhibits substantially uniform blocking ability against a variety of waves having a broad range of wave length with the wave energy partly dissipated into vortices generated at said apertures or holes in said wall structure and also further partly converted into vortices generated when the water rushes against said inclined back wall.

4,231,681

STRUCTURE FOR SEA-BED EXPLOITATION ALLOWING THE VARIOUS FUNCTIONS INHERENT IN SUCH EXPLOITATION TO BE PERFORMED

Samuel Tuson, Mesnil-le-Roi, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., France

Filed Sep. 11, 1978, Ser. No. 940,998
Claims priority, application France, Sep. 23, 1977, 77 28800
Int. Cl.² E21B *43/01, 7/12*
U.S. Cl. 405—195 **19 Claims**



1. A structure for sea-bed exploitation allowing various functions of such exploitation to be performed in connection with well-heads clustered into at least one group in the sea-bed, such, for example, as production, reconditioning and maintenance of said underwater well-heads, and water or gas injection into the productive layers of the sea-bed, said structure comprising: at least one articulated emergent column having a body with a submerged and an emerging portion, said column being adapted to perform at least one of said functions and having associated therewith intervention or servicing means, such as a movable tool, adapted to be vertically alignable over to provide access to each of said well-heads, said intervention or servicing means being secured to and jointly movable with a support, said support being pivotally connected to a carriage, said carriage being movably mounted along guide-rails mounted adjacent to the horizontal apparent contour of the body of the said column.
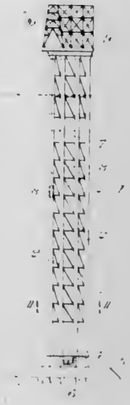
4,231,682

DEVICE FOR HANDLING APPLIANCES ON A SEA BED

Samuel Tuson, Mesnil-le-Roi, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., France

Filed Jan. 10, 1978, Ser. No. 868,300
Claims priority, application France, Jan. 17, 1977, 77 01241
Int. Cl.² E02B *17/00*
U.S. Cl. 405—202 **3 Claims**

1. An articulated column structure having a longitudinally extending axis adapted to be pivotally connected to an underwater base member anchored to the sea bed and adapted for the handling and maintenance of well heads in off-shore oil fields or the like, said column structure comprising: a head portion defining a top deck of said column structure; a bottom portion adapted to be pivotally connected to said base member anchored to the sea bed; a plurality of pillar members interconnecting said head portion and said bottom portion extending substantially parallel to the axis of said column structure; at least one tubular member mounted for rotation around said longitudinally extending axis adapted for being brought into substantial axial alignment with successive ones of a plurality of wells provided in the base member; means for rotating said tubular member; and means for guiding well head maintenance and servicing appliances through said tubular member between



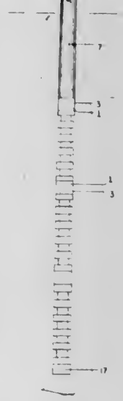
said head portion and said successive ones of the plurality of wells.

4,231,683

PROCESS AND A DEVICE FOR MAKING ANCHORAGES IN SOILS AND ROCKS

Walpy Vanderline, Rua Miralta, 201, San Paulo, Brazil

Filed Aug. 11, 1978, Ser. No. 932,880
Claims priority, application Brazil, Aug. 11, 1977, 7707080
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **7 Claims**



1. An apparatus for providing an anchorage for fastening a rod to soils, rocks or the like, said apparatus comprising an elongate anchorage sector and a free sector attached to one end of said anchorage sector, said anchorage sector comprising an upper ringed support member adjacent said free sector, a lower ringed support member and at least one intermediate ringed support member disposed therebetween, adjacent ringed support members being connected by a hollow tubular internal jacket and a hollow tubular external jacket disposed around said internal jacket, said jackets defining a tubular compartment therebetween, said intermediate ringed support member comprising:

(a) a top portion, a bottom portion and a substantially cylindrical inner passage extending therebetween, said inner passage having a cross sectional area which is substan-

tially co-extensive with and in communication with the hollow portion of said internal jacket whereby a longitudinal internal passage is formed which extends along substantially the length of said anchorage sector;

(b) at least one radial injection passage extending between said inner passage and an external surface for providing fluid communication between said longitudinal internal passage and the exterior of said anchorage sector, said external surface having an elastic means disposed thereon at least in the vicinity of and covering said radial injection passage;

(c) at least one longitudinal opening, extending between said top and bottom portions, adapted to receive a wire therethrough; and

(d) at least one longitudinal injection passage extending between said top and bottom portions for providing fluid communicaton between adjacent compartments, said longitudinal opening, said radial injection passage and said longitudinal injection passage being non-communicating.

4,231,684

SHIELD TYPE SUPPORT FOR USE IN UNDERGROUND MINING WITH LEMNISCATE GUIDE RODS

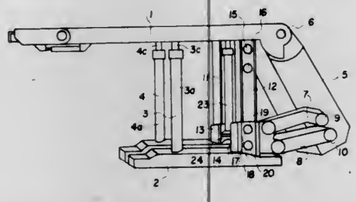
Harry Oppenländer, Wetter, and Ulrich Wilde, Essen, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,559

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841190

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—291 **12 Claims**



1. A shield-type stope support for use in underground mining, comprising a floor construction, at least one fluid pressure operated extensible and retractable ram having a top end, and having a bottom end mounted on said floor construction, a roof member connected to said top end of said ram, at least one column mounted on said floor construction extending upwardly therefrom toward said roof member, a breaking shield having one shield end pivotally connected to said roof structure at a spaced location from the connection of said roof structure to said ram and an opposite shield second end, a lemniscate support mounted on said column for upward and downward movement thereon, and a pair of lemniscate guide rods having first and pivotally connected to said support and opposite second ends pivotally connected to said shield second end.

4,231,685

ROOF SUPPORT UNIT

Harry Rosenberg, Lüdinghausen, and Lubomir Plevak, Lünen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 630

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800004

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—296 **8 Claims**

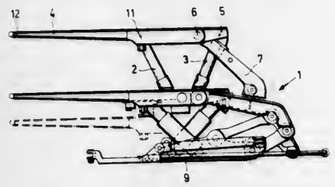
1. A roof support unit for use in a mineral mining working, comprising:

(a) a roof shield supported on a floor sill by means of at least two hydraulic props,

(b) a goaf shield pivotally linked to both the roof shield and the floor sill,

(c) at least one of the hydraulic props being inclined towards a face-side of the unit and pivotally engaging the roof shield,

(d) at least another one of the hydraulic props being:



(1) oppositely inclined towards a goaf-side of the unit,

(2) pivotably attached to the roof shield at a point nearer the goaf-side thereof than the axis of the pivotal linkage between the goaf shield and the roof shield, and

(3) passing through an aperture in the goaf shield, and

(e) said at least one prop and said at least another one prop crossing between their ends.

4,231,686

CONTROL SYSTEM OF APPARATUS FOR TRANSPORTING SLURRY

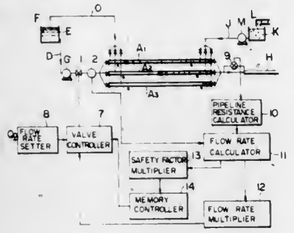
Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa, and Yukishige Kamino, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 5, 1979, Ser. No. 72,672

Claims priority, application Japan, Sep. 6, 1978, 53-108633

Int. Cl.³ B65G *53/30, 53/66*

U.S. Cl. 406—14 **3 Claims**



1. A control system of an apparatus for hydraulically transporting slurry prone to sedimentation through a pipeline system including at least one feed pipe into which a slurry and a driving liquid are alternately fed, and a transport pipe, connected to the feed pipe, through which the slurry is transported, the control system comprising:

a flow rate regulating valve means provided at a predetermined portion of the pipeline system;

a flow meter means provided in series with said flow rate regulating valve for metering a flow through the pipeline system and providing an output signal of the metered flow;

a differential pressure gauge means provided at another predetermined portion on the pipeline system for detecting a pressure drop and for providing an output signal of a detected pressure drop;

pipeline resistance calculating means for calculating a pipeline resistance in response to an output signal from said differential pressure gauge means;

a flow rate calculating means for storing a flow rate pipeline resistance characteristic at a given degree of opening of said flow rate regulating valve means, and for calculating the flow rate at a critical flow velocity for slurry sedimentation on the basis of the flow rate-pipeline resistance characteristic in response to output signals received from the flow meter means and the pipeline resistance calculating means and for providing an output signal of the calculated flow rate;

safety factor multiplying means for multiplying the flow rate at the critical flow velocity in response to an output signal from said flow rate calculating means by a safety factor and for providing an output signal;

memory controlling means for storing flow rate values at the critical flow velocity in response to an output signal from said safety factor multiplying means and for providing an output signal of a maximum flow rate of those flow rate values at the critical flow velocity; and

a valve controlling means for controlling a degree of opening of said flow regulating valve in response to an output signal from said memory controlling means;

whereby the slurry is transported through the pipeline system at a flow velocity above the critical flow velocity for slurry sedimentation.

4,231,687

APPARATUS FOR SEPARATING INDIVIDUAL ASSEMBLY PARTS FROM A COHERENT MASS AND FOR ORIENTING THE INDIVIDUAL PARTS

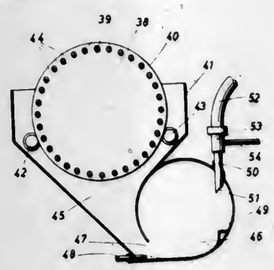
Walter Sticht, Wankhamerstrasse 8, A-4800 Attnang-Puchheim, Austria

Division of Ser. No. 826,307, Aug. 22, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 44,633

Claims priority, application Austria, Oct. 6, 1976, 7402

Int. Cl.³ B65G *53/08*

U.S. Cl. 406—52 **4 Claims**



1. An apparatus for separating individual assembly parts from a coherent mass of said parts and for orienting the individual assembly parts, which comprises

(a) a rotary drum for storing the mass of said parts, the rotary drum including

(1) a plurality of axially extending elongated support members for the stored mass of said parts, the support members constituting the peripheral wall of the drum and the support members being peripherally spaced from each other to define slot-shaped discharge opening therebetween, the openings having a width permitting single ones of the parts to pass therethrough by gravity and a length permitting a plurality of the parts to pass whereby clusters of said assembly parts resolved by rotation of the drum from the coherent mass and the individual parts pass through the openings by gravity, and means for rotating the drum

(b) a housing of circular cross section defining whirlpool chamber arranged downstream of the rotary drum and having an inlet of a dimension permitting the clusters of assembly parts to be received and passed therethrough, the whirlpool chamber having an axis extending perpendicularly to the circular cross sectional plane of the housing,

(c) a transfer passageway leading from the rotary drum to the inlet of the whirlpool chamber whereby the inlet is in communication with the peripheral drum openings,

(d) nozzle means arranged at the inlet of the housing for directing a jet of gas into the whirlpool chamber in a direction substantially tangential to the circle defined by the housing, the tangential jet of gas creating a gaseous whirlpool in the chamber for moving and separating the clusters into individual assembly parts, and

(e) conveyor means remote from the inlet and arranged to receive individual ones of said assembly parts moved by the gas jet, the conveyor means being arranged to orient the individual assembly parts.

4,231,688

APPARATUS FOR CLEARING SILAGE OR SIMILAR MATERIAL

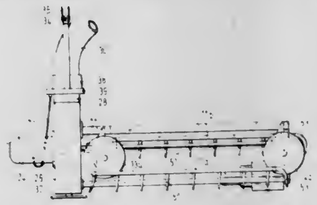
Johann Wolf, A-4644 Scharnstein, Austria

Filed Feb. 9, 1978, Ser. No. 876,242

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1977, 2709850

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—76 **38 Claims**



1. Apparatus for clearing relatively dense and matted stored material, particularly silage, from a stack of said material, comprising:

means locatable over a central portion of said stack of material for conveying particles of said material from said central portion upwardly and outwardly of said stack; and

means for loosening and directing particles of said material from a periphery of said stack surrounding said central portion toward said central portion, comprising:

at least on frame member cantilevered substantially horizontally at an inner end from said conveying means, said frame member extending radially outwardly from said conveying means; at least two push rods each having tool means extending downwardly for engaging said material;

driven means for carrying and reciprocating said push rods such that said push rod tool means travel along a closed circular path, lying in a vertical plane parallel to said frame member, having a lower material-engaging path portion in a first direction wherein particles of said material are loosened and drawn toward said conveying means by said tool means, and an elevated path portion in the opposite direction wherein said tool means are returned to a position suitable for re-travelling said lower path portion, said at least two push rods mounted on said push rod carrying means such that said push rods are offset in phase relative to one another by equal angular spacings when reciprocated; and

means for driving said push rod carrying means;

said push rod carrying means comprising:

first and second eccentric cranks at respective ends of said frame member, each said crank comprising a crankshaft having a horizontal axis of rotation fixedly disposed perpendicular to said frame member, each end of each said push rod being rotatably mounted at a predetermined distance from the axis of rotation on a respective one of said crankshafts whereby rotation

of said crankshafts causes said tool means to travel along said circular path; and

means for operatively connecting at least one of said cranks to said driving means; and

said conveyor means comprising:

a suction box having a fan within said suction box mounted on a driven shaft and having a suction opening facing said push rods,

a vertical pipe section communicating with said suction box and being disposed along a vertical axis through said suction box, and

a curved pipe section rotatably mounted on an upper end of said vertical pipe section, said suction opening disposed in a region near the end of said lower, material-engaging path portion of said tool means, the apparatus further comprising a support member adapted to rest upon said stack of stored material, said suction box being rotatably mounted on said support member such that said conveyor means and said cantilevered frame member are rotatable with respect to said stack and said curved pipe section.

4,231,689

AIR-ACTUATED PIPELINE TRANSPORTATION SYSTEM WITH WHEELED VEHICLES

Marion R. Carstens, Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Continuation-in-part of Ser. No. 656,022, Feb. 6, 1976, abandoned. This application Jan. 12, 1977, Ser. No. 757,508

Int. Cl.³ B65G *51/04*

U.S. Cl. 406—155 **26 Claims**



25. An air actuated pipeline tranportation system having pump means with at least one pump connection connected to the pipeline for creating an air flow in the pipeline and including

a vehicle comprising,

a vehicle body having a generally round cross-sectional area,

at least two load carrying wheels connected to the vehicle adjacent the bottom of the vehicle body adjacent each end of the body for supporting the vehicle for movement through the pipeline,

at least one of the wheels on each side of the body toed outwardly in the direction of movement of the vehicle for coacting with the interior of the conduit for automatically maintaining the vehicle upright in said conduit, said pipeline including at least one opening in the bottom of the pipeline spaced from all of the pump connections to the pipeline, said opening being wider than the width of a wheel but less than the width of the distance between the wheels at each end of the body whereby an upright vehicle will pass over the opening without the wheels being caught in the opening and debris will fall out of the opening.

4,231,690

TUBE LOCK DRILL TOOL

David C. Burns, Trafford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 21, 1978, Ser. No. 898,347

Int. Cl.² B23B *41/00, 41/10*

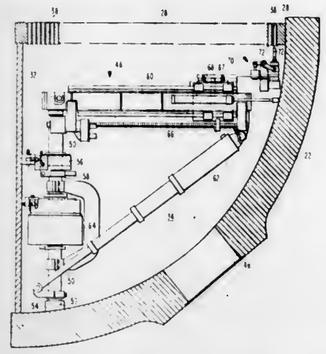
U.S. Cl. 408—80 **7 Claims**

1. A tube lock drill tool for remotely performing operations on equipment including positioning means disposed in said equipment for selectively positioning a tool with respect to said equipment for performing operations on said equipment, said tool comprising:

locking means associated with said positioning means for securing said tool in proper relationship to said equipment;

cutting means disposed on said locking means for performing cutting operations on said equipment;

a support member attached to said positioning means;



a rotatable pin disposed within said support member;

a first arm attached at one end to said pin and at the other end to said cutting means; and

rotating means disposed on said positioning means and connected to said pin for selectively rotating said pin thereby causing said cutting means to be selectively advanced toward said equipment.

4,231,691

DUAL CUTTER BORING HEAD

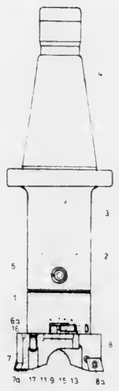
Dieter Pape, and Hans Woerz, both of Rümlang, Switzerland, assignors to Heinz Kaiser AG, Rümlang, Switzerland

Filed Oct. 16, 1978, Ser. No. 951,325

Claims priority, application Switzerland, May 11, 1978, 5156/78

Int. Cl.³ B23B *27/00*

U.S. Cl. 408—185 **4 Claims**



1. A dual cutter rotating boring head, having two cutting blade holders attached in a transverse slot provided in the exposed leading face of the head, comprising:

a pair of adjusting screws disposed within said slot, said adjusting screws being positioned to push said blade holders in a radial direction,

each blade holder comprising an additional adjusting screw and the axis of said additional adjusting screw being parallel to the longitudinal axis of said boring head,

said additional adjusting screws bearing upon the bottom surface of the slot and pushing said blade holders in an axial direction,

and the two cutting blade holders being adapted to be firmly clamped in any position by means of a set screw positioned co-axially with respect to the head.

4,231,692

DRILL COMPRISED OF HARD METAL FOR DRILLING CONTACT HOLES IN CIRCUIT BOARDS AND THE LIKE

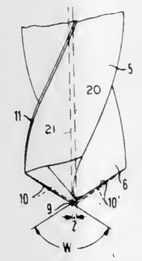
Bernhard Brabetz, and Helmut Hackl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,279

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742104

Int. Cl.³ B23B *51/02*

U.S. Cl. 408—230 **3 Claims**



1. A hard metal drill for drilling contact holes in multi-layer circuit boards of synthetic resin, comprising:

(a) a twisted portion having a grinding portion at a leading end thereof, a diameter of the twisted portion and grinding portion being a maximum of 1.5 mm;

(b) said twisted portion having subsidiary cutting edges;

(c) said grinding portion having main cutting edges and a transverse cutting edge therebetween, each of said main cutting edges being opposite and running into a spiral-shaped flute at the transverse cutting edge;

(d) one of the main cutting edges being longer than the other cutting edge and the transverse cutting edge being laterally displaced from a central longitudinal axis of the drill such that when the drill is drilling a hole, a gap of at least 20 μm but less then 50 μm is formed between the outermost twisted portion of the drill and a side of the hole being drilled as a result of eccentric rotation of the drill;

(e) said flutes having different depth dimensions with respect to one another; and

(f) the flutes having depth dimensions chosen such that the flutes are asymmetrical to a central lateral cross-sectional axis of the dril and symmetrical to an eccentric lateral cross-sectional axis of the drill which is parallel to and displaced from the central lateral cross-sectional axis by a distance corresponding to the displacement of the transverse cutting edge from the central longitudinal axis.

4,231,693

REAMER WITH RADIAL RELIEF

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

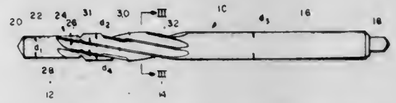
Filed Feb. 28, 1979, Ser. No. 16,014

Int. Cl.³ B23B *51/00*; B23P *6/00*; B23B *35/00*

U.S. Cl. 408—230 **28 Claims**

1. A finish reamer adapted to finish ream a hard material, said reamer comprising:

a member having a back tapered body section, said body section having a plurality of flutes, said flutes defining a plurality of cutting blades, each cutting blade having an axially extending radial relief formed therein for dissipating heat during reamer operation, said relief extending



along a portion only of said cutting blade and each of said cutting blades including a pilot and surface finish portion rearwardly of each of said radial reliefs.

4,231,694

APPARATUS FOR REMOVING A WELDING BULGE FROM PIPES

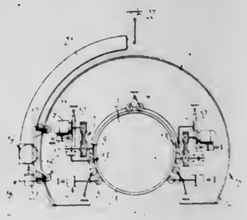
Mikhail R. Unigovsky, ulitsa Pushkinskaya, 21, kv. 33; Evgeny V. Rulevsky, ulitsa Vyshgorodskaya, 30, kv. 64; Fedor I. Sapa, ulitsa Kondratjuka, 2a, kv. 66; Alexei T. Parkhomchuk, ulitsa Kopylovskaya, 21, kv. 87; Arnold S. Yampolsky, ulitsa Kopylovskaya, 21, kv. 80; Veniamin S. Rotenfeld, ulitsa Sholom-Aleikhema, 1, kv. 17, all of Kiev; Vasily T. Ivanov, Borispol, ulitsa Shevchenko, 5, kv. 4, Kievskaya oblast; Isaak Y. Nemirovsky, ulitsa Kopylovskaya, 21, kv. 67, Kiev; Viktor M. Kovalenko, Boyarka, ulitsa Zhdanova, 65, kv. 52, Kievskaya oblast, and Nikolai S. Vnuchenko, Borispol, ulitsa Tsentralnaya, 6, kv. 35, Kievskaya oblast, all of U.S.S.R.

Filed Apr. 12, 1979, Ser. No. 29,323

Claims priority, application U.S.S.R., May 22, 1978, 2618997

Int. Cl.³ B23C *1/20*

U.S. Cl. 409—179 **2 Claims**



1. An apparatus for removing a welding bulge from resistance welded pipes, which comprises:

a U-shaped carrier adapted to be placed at the bulge zone in spaced circumferential relationship to the welded pipes and having end portions spaced apart for the welded pipes to pass therebetween, an arcuate guideway having inner and outer surfaces, and an arcuate toothed segment both adjacent the outer periphery of said carrier and extending the length thereof;

centering rollers mounted on said carrier adjacent the inner periphery thereof, means providing that at least two of said centering rollers are radially movable with respect to the center of the welded pipes circumference and disposed on opposite end portions of said carrier;

cutting tool holders disposed on said carrier for movement to and from the weld bulge;

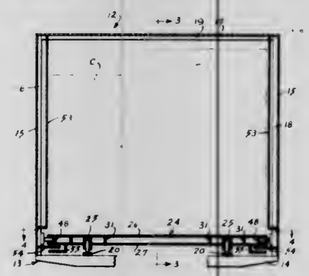
a motor-operated carriage with means to be rigidly connected to a lifting mechanism of a vehicle used for raising and carrying the apparatus, which carriage including spaced support rollers and a driving gear wheel, said spaced rollers being disposed in engagement with the inner and outer surfaces of said arcuate guideway and said driving gear being in driving engagement with the toothed segment of said carrier to rotate said carrier while said carriage remains immobilized.

4,231,695

CARGO LOADING AND UNLOADING APPARATUS FOR TRUCKS

Robert M. Weston, Sr., P.O. Box 812, Bayou La Batre, Ala. 36509

Filed Jul. 10, 1978, Ser. No. 923,515
Int. Cl.³ B60P 7/00; B61D 45/00; B20P 1/64; B63B 25/00
U.S. Cl. 410—69 8 Claims



1. An apparatus for handling cargo comprising the combination of a vehicle and a plurality of mobile pallets which are selectively moved into or removed from the vehicle, said vehicle including a body having at least side wall means mounted on a chassis and being devoid of a continuous floor, at least one longitudinally extending pallet support means mounted on said chassis, baffle means carried by said side wall means and extending substantially the full length of said body, said baffle means extending inwardly from said side wall means toward said support means to a position underlying said pallets when said pallets are moved onto said support means, each of said pallets including an imperforate wall extending across said body and overlying said baffle means carried by each side wall means, and friction reducing means for supporting said pallets, whereby said pallets support the cargo within body of the vehicle and said baffle means protects the cargo within the vehicle.

4,231,696

MULTI-FUNCTION END EFFECTOR

Stuart L. Rieben, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1978, Ser. No. 915,411
Int. Cl.² B25J 9/00
U.S. Cl. 414—5 14 Claims

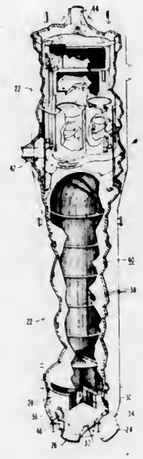
1. A multi-function end effector for performing operations on equipment comprising:

a vertical member capable of being disposed in said equipment;

centering means attached to said vertical member and having plates capable of relative horizontal motion;

tool holding means with a crescent-shaped gear for holding tools and mounted on said centering means for supporting said tools in relation to said equipment for performing operations on said equipment; and

vertical drive means attached to said vertical member and to said centering means for vertically moving said tool holding means relative to said vertical member thereby vertically positioning said tools relative to said equipment, said



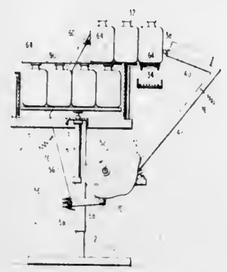
centering means horizontally positioning said tools by movement of said plates.

4,231,697

BOTTLE PACKAGING AND UNPACKAGING MACHINE

Henry H. Franz, 3201 Falls Cliff Rd., Baltimore, Md. 21211

Filed Jul. 21, 1978, Ser. No. 926,958
Int. Cl.³ B65G 57/10, 59/02
U.S. Cl. 414—37 7 Claims



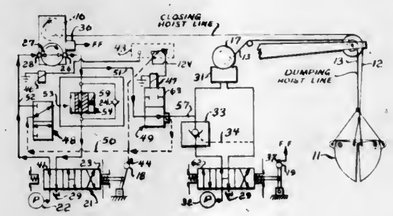
1. A bottle packaging and unpackaging apparatus for use with a conveyor delivering bottles from a bottle-making machine to a bottle-filling machine, a plurality of spaced base members having vertically disposed leg members mounted thereon, a compartment having side and end members and supported on said leg members, an elevating platform positioned within said compartment, a pusher bar positioned on one side of said compartment for intermittently pushing in row form a plurality of bottles from said conveyor across a side of said compartment and onto said platform, a second pusher bar located on the other side of said compartment for intermittently pushing in row form a plurality of bottles from said compartment onto said conveyor, each of said pusher bars having a rocker shaft connected thereto for moving said pusher bars across said compartment towards the other pusher bar, a rotatable drive shaft carried by one of said leg members with means for rotating said drive shaft, and means connecting said drive shaft with each of said rocker shafts for intermittently moving said pusher bars towards and away from one another over said platform.

4,231,698

SYSTEM FOR ONE-HAND CONTROL OF TWO WINCHES DURING HOISTING OF CLOSED CLAMSHELL, WITH DIFFERENTIATION

William J. Lado, Rome, N.Y., assignor to Pettibone Corporation, Chicago, Ill.

Filed Jan. 9, 1978, Ser. No. 867,704
Int. Cl.³ B66D 1/26
U.S. Cl. 414—624 6 Claims



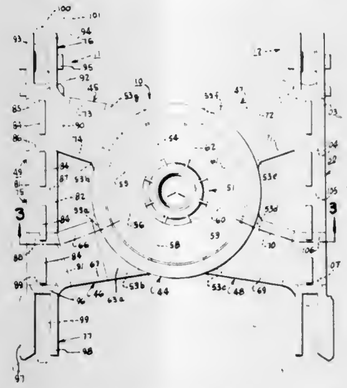
1. A hydraulic system for controlling a clamshell bucket by two hoist lines of which a first can close and raise the clamshell and the second can dump the clamshell if raised relatively to the first, said system including a first hydraulic motor and winch for the first hoist line and a second hydraulic motor and winch for the second hoist line, and means operable at will, when the first winch motor is operated to draw in the first hoist line, for supplying to the second winch motor a sufficient supply of hydraulic fluid to operate said second winch motor enough to avoid the development of excessive slack in the second hoist line, and means effective throughout raising the clamshell for controlling the pressure of said supply to provide a pressure sufficient to draw in the second hoist line, when slack; said system including means responsive to the back pressure of the fluid supplied to the second motor for limiting that pressure to a value too low to start dumping the clamshell.

4,231,699

LOWER AND CRAWLER FRAME CONSTRUCTION FOR CRAWLER PROPELLED MACHINES

George J. Thompson, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 24, 1979, Ser. No. 6,552
Int. Cl.³ B66C 23/84; E02F 3/32
U.S. Cl. 414—687 19 Claims



10. A lower works construction for a machine having a rotatable upper frame comprising a lower frame section, a plurality of leg sections mounted on said lower frame section and projecting laterally therefrom and propel unit support frames mounted on the outer ends of said leg sections, said lower frame section having diagonally disposed bulkheads, said leg sections having laterally projecting bulkheads, the inner ends of which are disposed in registry with said diagonally disposed bulkheads of said lower frame section and said support frame sections having laterally projecting bulkheads, the inner ends of which are disposed in registry with said laterally disposed bulkheads of said leg sections whereby axial and radial loads imposed on said lower frame section will be transferred along continuous paths provided by said bulkheads to said support frame sections.

4,231,700

METHOD AND APPARATUS FOR LASER BEAM CONTROL OF BACKHOE DIGGING DEPTH

Robert H. Studebaker, Dayton, Ohio, assignor to Spectra-Physics, Inc., Mountain View, Calif.

Filed Apr. 9, 1979, Ser. No. 28,178
Int. Cl.³ E02F 9/20
U.S. Cl. 414—700 4 Claims



1. In a backhoe having a platform movable about a vertical axis, an outreach boom pivotally mounted on the platform for movement about a horizontal axis, a downreach boom having one end horizontally pivotally mounted to the free end of the outreach boom, a digging bucket pivotally mounted to the other end of the downreach boom, and separate power means for controlling the vertical pivotal movements respectively of the outreach boom relative to the platform, of the downreach relative to the outreach boom, and of the bucket relative to the downreach boom, the improvements comprising:

1. means for establishing an above ground reference plane of laser energy;
2. photocell means mounted on said downreach boom and constructed and arranged to intercept said plane of laser energy throughout the digging stroke of the backhoe;
3. means responsive to the signals generated by said photocell means for varying the vertical pivotal angle of said outreach boom relative to said platform to maintain said photocell means on said downreach boom at a predetermined position relative to said reference plane throughout the digging stroke of the backhoe, and
4. means for maintaining the bucket in a fixed position throughout the digging stroke of said backhoe, whereby the digging edge of said bucket moves in a plane parallel to said overhead reference plane of laser energy.

4,231,701

MANIPULATOR

Anthony E. Middleton, Rotherham, and Brian McQuillin, Sheffield, both of England, assignors to Davy-Loewy Ltd., Sheffield, England

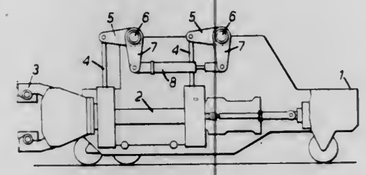
Filed Apr. 21, 1978, Ser. No. 899,101
Claims priority, application United Kingdom, Mar. 31, 1977, 13574/77
Int. Cl.³ B66F 9/00
U.S. Cl. 414—730 10 Claims

1. A manipulator comprising

(a) a carriage movable along a prescribed path;

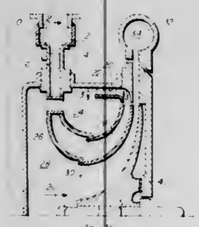
(b) a peel mounted on said carriage for gripping and supporting a workpiece;

(c) means for moving said peel relative to said carriage in the direction of movement of said carriage;
(d) means for adjusting the vertical position of said peel relative to said carriage;
(e) means for adjusting an angular attitude of said peel relative to the direction of movement of said carriage; and
(f) a positional indicating and control system for said peel, including:
(g) a plurality of generator means, each generating signals representing one parameter of the disposition of said peel relative to said carriage;
(h) computing means for determining from said parameter



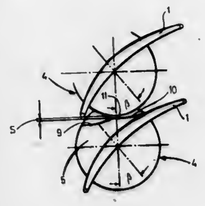
signals a positional signal representing the actual position of a point on said peel or on said workpiece relative to the carriage, taking into account an angular disposition of said peel;
(i) means for producing a locational signal representing the location of said carriage along said prescribed path;
(j) means for adding said locational signal to said positional signal to produce an output signal representing the position of said point relative to a stationary reference such as the ground; and
(k) means for controlling the movement of said peel relative to said carriage and to the position of said carriage along the prescribed path in response to said output signal.

4,231,702
TWO-STAGE TURBO COMPRESSOR
Sankaraiyer Gopalakrishnan, Brea, Calif., and William L. Kuivinen, Mount Prospect, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 24, 1979, Ser. No. 69,424
Int. Cl.³ F01D 1/12
U.S. Cl. 415—56 **6 Claims**



1. In a two stage rotary compressor having first and second stage centrifugal impellers connected to a rotatable shaft, inlets to and outlets from each stage and with the inlet to the second stage being connected to the discharge from the first stage and with the outlets from each stage being located at the same radial distance from the shaft, the improvement which comprises: the inlet to said second stage impeller being located radially inwardly of the inlet to the first stage impeller.

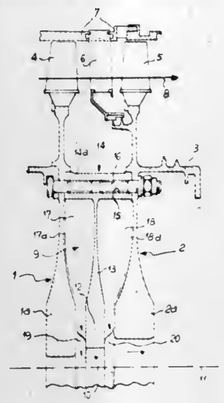
4,231,703
VARIABLE GUIDE VANE ARRANGEMENT AND CONFIGURATION FOR COMPRESSOR OF GAS TURBINE DEVICES
Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany
Filed Aug. 9, 1979, Ser. No. 65,099
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835349
Int. Cl.³ F01B 25/02
U.S. Cl. 415—159 **9 Claims**



1. A variable guide vane arrangement for use in a high-load compressor having at least one axial-flow stage in turbomachines including gas turbine engines, comprising:
a plurality of guide vanes positioned radially adjacent one another about a circumference in the axial flow stage of the compressor, each vane having a low-pressure and a high-pressure side during operation;
a plurality of generally disk shaped turntable members, each of said vanes being secured at its outer end to one of said turntable members and each of said turntable members being rotatably mounted about said circumference, the diameter of each of said turntable members being greater than the spacing between adjacent guide vanes; and
each of said turntable members being generally round and having a cut-out portion on the side adjacent to the low-pressure side of said guide vane secured thereto, said cut-out portion being formed by first, second and third arcs which merge together to form an edge surface adapted to closely abut the arcuate circumference of the next adjacent turntable member at all rotational settings of said guide vanes.

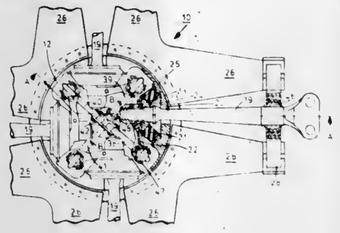
4,231,704
COOLING FLUID BLEED FOR AXIS OF TURBINE ROTOR
Michel R. Ayache, Epinay sous Senart; Jean-Claude L. Delonge, Moissy Cramayel, and Daniel J. Marey, Paris, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France
Filed Aug. 1, 1978, Ser. No. 929,910
Claims priority, application France, Aug. 26, 1977, 77 26637
Int. Cl.³ F01D 5/18
U.S. Cl. 416—95 **3 Claims**

1. In a device for moving air from the jet flow of an axial compressor for a gas turbine, said compressor having adjacent rotor disks, to be conducted along the axis of the turbine for cooling the same and including centripetal vanes in the form of spaced paddles extending radially between adjacent rotor disks, the improvement comprising:
said paddles being part of a wheel between said disks and secured at its outer periphery to said disks to form a brace and torque transmitting member therebetween, said wheel



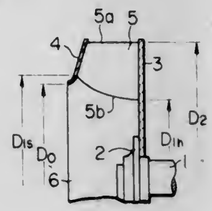
including a central disk with said paddles extending axially from opposite sides thereof.

4,231,705
HELICOPTER ROTOR
Kenneth Watson, Yeovil, England, assignor to Westland Aircraft Limited, Yeovil, United Kingdom
Filed Sep. 7, 1978, Ser. No. 940,481
Claims priority, application United Kingdom, Sep. 7, 1977, 37426/77
Int. Cl.³ B64C 27/72
U.S. Cl. 416—108 R **6 Claims**



1. A helicopter rotor including a hollow rotor hub arranged for rotation about an axis and a plurality of rotor blades extending radially of said axis, means attaching each blade to the outer end of an individual spindle, each said individual spindle having its inner end protruding into the interior of the hollow rotor hub and supported by bearing means within the hub arranged to permit rotational movement of the spindle about its axis to change the pitch of its associated blade, a respective pitch control lever coupled to the inner end of each said spindle, a plurality of connecting rods each articulated at its upper end, through a universal joint, to a respective one of said pitch control levers, the lower end of the connecting rods being attached to a common housing having independently rotatable means for connection to helicopter flying controls, one of said connecting rods being fixedly attached to said common housing, and the remaining connecting rods being attached to said common housing through universal joints.

4,231,706
IMPELLER OF A CENTRIFUGAL BLOWER
Shinjiro Ueda, Kashiwa; Yoshihiro Takada, Ibaraki; Haruo Mishina, Ibaraki, and Atsuhiko Kuroda, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Apr. 21, 1978, Ser. No. 898,995
Claims priority, application Japan, Apr. 27, 1977, 52-47918; Apr. 27, 1977, 52-47919
Int. Cl.³ F04D 29/30
U.S. Cl. 416—186 R **3 Claims**



1. An impeller of a centrifugal blower comprising:
a hub plate in the form of a disk;
a cone-shaped shroud plate;
a rotary shaft supporting said hub plate; and
a plurality of two dimensional backward shaped blades made of sheet material and arranged between said hub plate and said shroud plate, each of said blades having relatively large blade inlet and outlet widths and a given blade area;
wherein the improvement comprises arrangements whereby the center line of each of said blades projected on a plane perpendicular to said rotary shaft is shaped in a concave curve with respect to the direction of rotation of said rotary shaft so as to provide an increased outlet blade angle, and the inlet diameter of each of said blades on the side of said shroud plate is greater than the inlet diameter thereof on the side of said hub plate, and the leading edge of each of said blades is shaped, in a meridional plane, in a convex smooth curve directed radially inwardly of the impeller whereby said blade area is not substantially reduced regardless of said increased outlet blade angle.

4,231,707
FLUID SUPPLYING DEVICE
Sadao Tokorozawa, Nakai; Toyoji Shimizu, Oi, and Naomi Yoshizawa, Hatano, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 25, 1979, Ser. No. 6,960
Claims priority, application Japan, Jan. 31, 1978, 53-9632
Int. Cl.³ F04B 49/00
U.S. Cl. 417—12 **22 Claims**



1. A fluid supplying device comprising: a peristaltic pump including depression and delivery means and an electric motor, said depression and delivery means including an elastic tube (17) for receiving fluid and an assembly of depressing members (15) for alternately constricting and relaxing said elastic tube, and a drive shaft (10) connecting said depression and delivery means to said electric motor (24); a rotary member (21) disposed on said drive shaft to rotate with said drive shaft; a

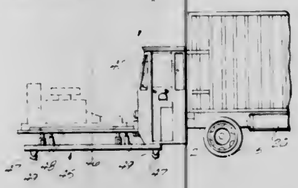
plurality of discharge-amount transmitting means (22) provided on said rotary member such that the distances between respective discharge-amount transmitting means can be varied; a detector (23) disposed relative to said discharge-amount transmitting means for detecting the passage of said discharge-amount transmitting devices; and a switch (40) connected between said detector and said electric motor to selectively deenergize said electric motor.

4,231,708

TRANSFER OF QUICK-DISCONNECT ENGINE MODULES FROM VEHICLES

George O. Telesio, 7709 S. Milma Ave., Whittier, Calif. 90601

Filed Aug. 28, 1978, Ser. No. 937,109
Int. Cl.[3] B65G 67/02; B60S 5/02
U.S. Cl. 414—343 8 Claims



1. A service cart for transferring thereto and therefrom a vehicle engine assembly which includes a support frame having parallel side members, the frame being releasably matable with a vehicle chassis for movement into and out of an operative position in the vehicle through an end of the chassis, the vehicle including cart positioning means at the end thereof through which the engine assembly is movable, selectively operable latch means cooperable between the chassis and the frame in a selected position of the frame in the vehicle for securing the frame from movement relative to the chassis in a direction corresponding to removal of the frame from the chassis, and release means operable for disabling the latch means, the cart comprising

(1) a base,

(2) a pair of frame side member engaging rails,

(3) means movably mounting the rails on the base in parallel relation and spaced a distance corresponding to the spacing between the frame side members, the mounting means including

(a) guide means for guiding the rails vertically relative to the base, and

(b) means for adjusting the vertical distance between the base and each end of each rail, and

(4) locating means carried by the cart matable with the positioning means and operable when mated with the positioning means for operating the release means, whereby the frame can be moved relative to the chassis from said selected position onto the cart rails and removed from the chassis.

4,231,709

DEMOUNTABLE TRANSPORTER FOR CONTAINERS

Richard M. Corsetti, Lynn, Mass., assignor to Craig Systems Corporation, Lawrence, Mass.

Filed Dec. 15, 1978, Ser. No. 969,980
Int. Cl.[3] B60P 3/40
U.S. Cl. 414—458 7 Claims

1. A demountable transporter assembly for use with a container having ISO corners, each said corner comprising a plate mounted on said container to define an interior cavity, said plate further forming an opening to said interior cavity, said assembly comprising:

an axle and two wheels supporting said axle,

a frame supported by said axle,

lower attachment means, supported by said frame and including a plate having a surface facing toward said container,

upper extendable attachment means pivotally supported by said frame, including a plate having a surface facing toward said container,

each said attachment means including fastener means,

said fastener means including a shear block mounted on said attachment means surface having a depth substantially equal to the width of said corner plate and a configuration substantially similar to said corner plate opening,



a lock plate of the same general configuration as said shear block,

and a rod on which said lock plate is mounted, passing through said shear block and attachment means plate, said rod being rotatable and slidable so that in a first position said lock plate and shear plate are aligned for entering said corner plate opening, and in a second position said lock plate is turned to overlap said opening,

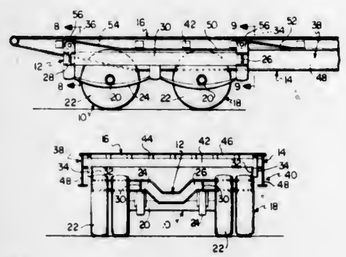
and means for securing said lock plate in said second position.

4,231,710

TILTABLE TRAILER HAVING MOVABLE UNDERCARRIAGE

Donald R. Landoll, Marysville, Kans., assignor to Landoll Corporation, Marysville, Kans.

Filed Mar. 22, 1979, Ser. No. 22,922
Int. Cl.[3] B60P 1/04
U.S. Cl. 414—475 4 Claims



1. In a trailer,

an undercarriage provided with wheel axle assemblies and with a support below the tops of the assemblies,

said support including an elongated front cross member carried by the assemblies thereahead and an elongated rear cross member carried by the assemblies therebehind,

said front member being connected with and shorter than the rear member and being of substantially the same length as the width of said assemblies,

each member having a roller at each outer end thereof, presenting a first set of front and rear rollers, and a second set of front and rear rollers horizontally spaced from the first set.

the rollers being in a common, normally horizontal plane and being rotatable about axes above said tops of the assemblies with said axes traversing the path of travel of the undercarriage; and

a frame provided with a pair of elongated, parallel, interconnected, horizontally spaced beams extending fore and aft of the undercarriage,

the distance between the beams being greater than the length of said rear member,

one beam having an inwardly and longitudinally extending track resting on said first set of rollers,

the other beam having an inwardly and longitudinally extending tract resting on said second set of rollers,

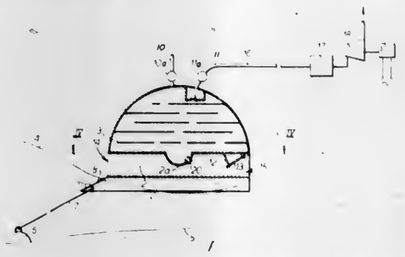
each track having a pair of longitudinally spaced upwardly and rearwardly inclined ramps, one for the corresponding front roller and one for the corresponding rear roller whereby the height of the frame is lowered to an essentially horizontal position when the undercarriage is shifted rearwardly relative to the beams.

4,231,711

EXTRACT OF ENERGY FROM THE SEA

Daniel MacGregor, MacGregor Industries Limited, Canal Estate,, Langley, Buckinghamshire, SL3 6EQ, England

Filed Sep. 8, 1978, Ser. No. 940,668
Int. Cl.[3] F04F 11/00
U.S. Cl. 417—100 10 Claims



1. Apparatus for extracting energy from waves in the surface of a body of water, comprising a structure moored in and floating in the body of water and having an inlet channel disposed to face into oncoming waves; and means for converting the energy contained in water entering the inlet channel as a result of the wave motion, to a transmittable form, said means comprising an air chamber in the form of an elongate spiral passage having a passage at one end, in communication with a downstream part of the inlet channel and having an air inlet and outlet at the other end, a rear outlet from the downstream part of the inlet channel, and valve means operable, in response to water flowing into the channel, to close suddenly the rear outlet and cause that water flowing into the channel to enter the chamber and pressurize air in the chamber whereby to enable the pressurized air to be taken from the air outlet from the chamber to do useful work.

4,231,712

SEA WATER LIFTING DEVICE

Wu Shing-Hsiung, 1, Lane 2, Chung Chen Rd., Tan Sui, Taipei Hsiuen, Taiwan

Filed Feb. 16, 1979, Ser. No. 12,817
Int. Cl.[3] F04F 1/02
U.S. Cl. 417—100 4 Claims

1. A sea water reservoir device having a base in the sea comprising a plurality of vertically stacked sealed chambers, each having an upper portion and a lower portion,

an air inlet in the upper portion of each chamber,

a water inlet in the upper portion of each chamber,

a water outlet in the lower portion of each chamber,

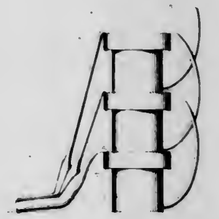
water transmission means connecting each water outlet with the water inlet of the chamber above for transmitting water up the device,

first check valve means in each water inlet for only letting water in,

second check valve means in each water outlet for only letting water out, and

intake pipe means connected to each air inlet from the base of the device for transmitting pressure from sea waves compressing and exhausting air in said pipe means





whereby the successive surges from the sea waves alternatingly compress and exhaust the air in said intake pipe means and each sealed chamber thereby forcing water through said water outlets and said water transmission means to the next chamber stacked above, the water outlet of the uppermost chamber being connected to a reservoir.

4,231,713

COMPRESSOR MODULATION DELAY VALVE FOR VARIABLE CAPACITY COMPRESSOR

Richard E. Widdowson, Dayton, Ohio, and Ward J. Atkinson, Paradise Valley, Ariz., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 9, 1979, Ser. No. 28,252
Int. Cl.[3] F04B 1/28
U.S. Cl. 417—222 2 Claims



1. In a control arrangement for an automotive air conditioning system including a variable capacity compressor, a condenser, evaporator and fluid conduit means connecting said compressor, condenser and evaporator in a refrigerant circuit, housing means for said compressor including refrigerant gas suction and discharge chambers formed therein, hydraulically operated modulating means for varying the pumping capacity of said compressor between minimum and maximum, means for continuously supplying hydraulic control fluid at a predetermined high pressure to said modulating means, a pressure

operated hydraulic control valve assembly controlling said compressor modulating means including a pressure control cell and movable operator means, passage means adapted to communicate system pressure in said suction chamber to said control cell, a pressure responsive element in said control cell operative at a cell predetermined control pressure for moving said operator means from a closed to an open position when the system pressure in said suction chamber is less than said cell predetermined control pressure, thereby permitting the flow of hydraulic control fluid to said modulating means to reduce the pumping capacity of said compressor, the improvement comprising; a modulation delay valve associated with said control arrangement for delaying the movement of said movable operator from its closed position to its open position to prevent premature reduction of pumping capacity of said compressor, said modulation delay valve including a bore with three spaced-apart ports formed therein, the first one of said ports being an inlet port connected to said discharge chamber, the second one of said ports being an inlet port connected to said suction chamber, and the third one of said ports being an outlet port connected to said pressure control cell, a valve element movably mounted in said bore for opening and closing communication between said second and third ports, means in said bore on one side of said valve element forming a discharge pressure cavity connected to said first inlet port and on the other side of said valve element forming a suction pressure cavity connected to said second inlet port and adapted by movement of said valve element for communication with said third outlet port, and resilient means exerting a force on said valve element in one direction opposing the force exerted by refrigerant gas in said discharge pressure cavity when said pump is operating, the compressed gas in said discharge pressure cavity when said compressor is operating at maximum pump capacity being above a predetermined reference pressure whereby to exert a force on said valve element in the opposite direction causing said valve element to overcome said resilient means closing communication between said second and third ports and trapping refrigerant gas within said pressure control cell at a pressure greater than said predetermined cell control pressure, thereby keeping said movable operator means closed so as to cause said compressor to continue to operate at its maximum pumping capacity, and whereby upon the compressor discharge chamber pressure falling below said reference pressure the delay valve discharge cavity pressure correspondingly falls, allowing said delay valve resilient means to move said valve element in said one direction opening communication between said second and third ports, thereby connecting said pressure control cell to said compressor suction chamber to modulate the capacity of said compressor while obviating premature reduction of maximum pumping capacity of said compressor by said control valve assembly.

4,231,714

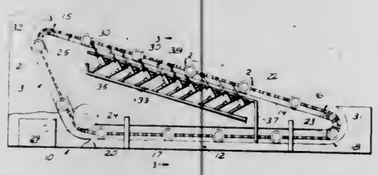
HYDRAULIC PUMP SYSTEM

William W. Colwell, 110 Windsor, George, Wash. 99824

Filed Jan. 15, 1979, Ser. No. 3,252

Int. Cl.³ F04B *9/00*

U.S. Cl. 417—229 **7 Claims**



1. A hydraulic pump system, comprising:
an inclined ramp having first and second longitudinally spaced ends, the first end of said inclined ramp being elevationally higher than its second end;
endless conveyor means including an upper flight guided along said inclined ramp and a return flight positioned beneath said inclined ramp;
power means operatively connected to said endless conveyor means for imparting motion thereto in a direction such that the upper flight of the endless conveyor means is moved along the inclined ramp from its first end to its second end;
a plurality of equally spaced weight assemblies mounted along the length of the endless conveyor means for integral movement therewith;
and a plurality of pump mechanisms located along the inclined ramp;
each pump mechanism being operatively connected to a common liquid supply and a common discharge manifold;
each pump mechanism further comprising a single acting actuator intersecting the path of movement of the weight assemblies along the upper flight of said endless conveyor means, whereby said pump mechanisms are sequentially actuated in response to movement of the weight assemblies along the upper flight of said endless conveyor means.

4,231,715

CLINICALLY USABLE PUMP APPARATUS FOR A DILATATION DEVICE

Hans Gleichner, Zurich, Switzerland, assignor to Schneider Medintag AG, Zurich, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,189

Claims priority, application Switzerland, Oct. 21, 1977, 12834/77

Int. Cl.³ F05B *49/08*; **F04B** *49/00, 21/00*

U.S. Cl. 417—307 **2 Claims**

1. A clinically usable pump apparatus for a dilatation device having a dilatation catheter, preferably for opening stenoses and occlusions or for closing vessels, ducts and openings, while utilizing a pumpable medium, comprising:
a pump adapted to be connected with the dilatation catheter for applying controlled positive pressure and negative pressure conditions to the dilatation catheter;
means for structuring the pump for accomplishing the double function of generating a positive pressure as well as a negative pressure in a closed hydraulic system between the pump and the dilatation catheter;
mechanical drive means for driving said pump;
said mechanical drive means comprises:
a work cylinder;
a work piston slidably arranged in said cylinder for carrying out forward and return strokes;
said work piston having opposite faces;
means for supplying and impinging opposite faces of said work piston with a pressurized medium; and
an excess-pressure valve for preventing that a preselected maximum pressure will be exceeded in the dilatation catheter.

4,231,716

MECHANICAL LUBRICATING PUMP

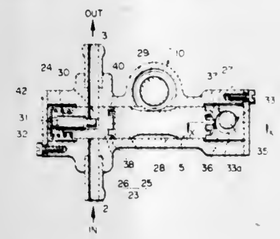
Kenichi Kubota; Osamu Mukai, and Kenji Kariyama, all of Morioka, Japan, assignors to Tohoku Mikuni Kogyo Co., ltd., Takizawa and Mikuni Kogyo Co., Ltd., Tokyo, both of, Japan

Filed Jul. 21, 1978, Ser. No. 926,619

Claims priority, application Japan, Feb. 27, 1978, 53-24341[U]; Mar. 8, 1978, 53-28523[U]

Int. Cl.³ F04B *19/02*; **F16N** *13/22*

U.S. Cl. 417—315 **2 Claims**



1. A mechanical lubricating pump comprising:
a body having an inlet and an outlet therein, said body having a cylindrical chamber defined therein;
a driving worm in said body;
cover plates on each end of said body;
a rotatable distributor assembly in said cylindrical chamber, said assembly comprising:
a first rotatable portion;
a second rotatable portion separate from and aligned with said first portion;
a worm wheel formed on said first portion and engagable with said driving worm;
a pump chamber defined in said second portion;
a stroke adjusting mechanism at one end of said first portion;
a plunger in said pump chamber;
a spring biasing said distributor into contact with said stroke adjusting mechanism and holding said plunger in contact with one of the cover plates;
means mechanically transmitting the rotation of said first portion into reciprocation of said second portion relative to said plunger therein and into rotation of said second portion, said means being operable to effect feeding of a lubricating fluid into the pump chamber through the inlet and out of the pump chamber through the outlet when the distributor assembly is rotated in a first direction and when the distributor assembly is rotated in a second direction opposite to said first direction, and when the direction of rotation of the first portion is changed from one of the first and second directions to the other of the first and second directions, to resume feeding of the lubricating fluid after a delay time corresponding to an initial rotation of the first portion only of the distributor assembly through approximately 180° from the time of the change of direction of rotation, said means further comprises a projection on the other end of said first portion, and an arcuate groove in one end of said second portion, said arcuate groove having such an angle of extent that said projection can turn 180° in said groove; and
said stroke adjusting mechanism comprises:
a control pin in said body and extending in a direction perpendicular to said distributor assembly, said control pin having an equi-diameter portion;
a regulating lever external of said body and fixedly secured to one end of said control pin;
a cam face, in the form of an eccentric circle, on said control pin;
and end cam, on one end of said first portion, abuttable with the equi-diameter portion of said control pin; and a central projection, at a center of said end cam, abuttable with the cam face of the control pin.

4,231,717

ENGINE DRIVE TYPE GENERATOR BLOWER

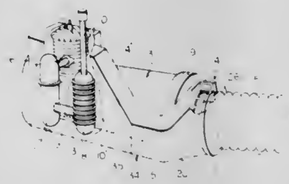
Sigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan, a part interest

Filed Oct. 10, 1978, Ser. No. 950,082

Claims priority, application Japan, Oct. 11, 1977, 52-120896

Int. Cl.³ F26B *19/00*; **F04B** *35/00*

U.S. Cl. 417—364 **7 Claims**



1. A generator blower comprising:
a base frame;
an internal combustion engine mounted on said base frame and having an output shaft;
a generator mounted on said base frame and having an input shaft connected to the output shaft of said engine;
a blower mounted on said base frame and driven by said engine;
duct means enclosing said engine and defining therein a hot air passage which has a cold air inlet and a hot air outlet;
exhaust passage means arranged across said hot air passage and connected to the exterior of said duct means;
a movable duct arranged to enclose said blower, said movable duct having an air outlet and an air inlet which can be aligned with the hot air outlet of said hot air passage and moved from a position wherein the air inlet of said movable duct is aligned with the hot air outlet of said hot air passage to a position wherein the air inlet of said movable duct directly opens into the atmosphere; and
said blower comprises a cylindrical casing enclosing a suction fan and forming thereon a plurality of openings, said movable duct being swingingly mounted on the cylindrical casing of said blower, said blower further comprising means for securing said movable duct to said blower in one position.

4,231,718

FLUID PUMP, PARTICULARLY A FUEL SUPPLY PUMP

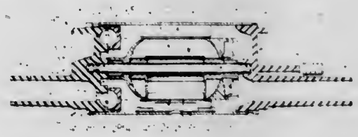
Karl Ruhl, Gerlingen, and Ulrich Kemmner, Sachsenheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,389

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741535

Int. Cl.³ F04B *39/06, 17/00*

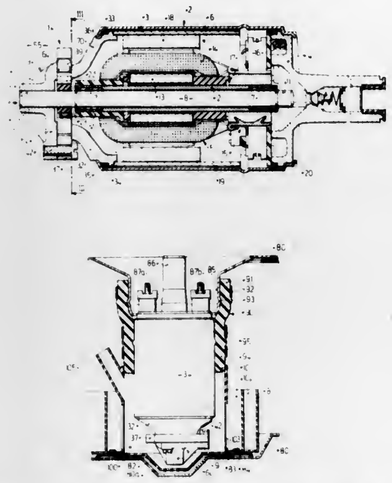
U.S. Cl. 417—366 **12 Claims**



1. A fluid pump, especially adaptable for supplying fuel to an automotive vehicle, including a pump system and an electric motor connected thereto in driving relationship and arranged in a common housing, said pump system, electric motor and common housing consisting of partially preassembled structural units, comprising:

a first structural unit comprising an outer terminal housing part having an axle made integral therewith;
a second structural rotor unit comprising a pump impeller and a motor armature mounted for rotation on said axle;
a third structural unit comprising a central partial housing surrounding said impeller and motor armature and adjoining the first terminal housing and including permanent magnets for said electric motor; and
a fourth unit comprising a second terminal housing part forming a closure for said partial housing,
a first terminal housing forming a second closure for said partial housing,
said first terminal housing part and said second terminal housing part being made of synthetic material by extrusion molding with outwardly projecting nozzles thereon, one being a suction nozzle and the other being a pressure nozzle,
both said terminal housing parts having radially extending flanges forming stop means for the central partial housing and, said central partial housing further including inwardly extending flanging means for engaging said terminal housings,
said first terminal housing part and second terminal housing part having radial inwardly extending recesses and said central partial housing being provided with inwardly extending flanges for engaging said recesses,
said first terminal housing part being provided with a lateral channel in the form of a partial ring, an interior pressure channel, a suction opening connected with said suction nozzle for the flow of fluid from said suction nozzle into said lateral channel and into said pressure channel and ventilation means for venting gases in said fluid out of said lateral channel,
said ventilation means comprising radially extending groove means opening into said lateral channel and a peripherally located axial slit communicating with said groove for venting gases from said lateral channel.

front cover element for said casing being a frustum having an asymmetrical front wall and the fuel pumping elements having



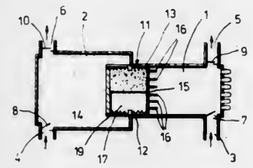
oppositely disposed surfaces that are exposed to a fuel supply in a sump means.

4,231,720

PUMP FOR FLUID MEDIA HAVING DIFFERENT TEMPERATURES

Axel König, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,768
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712679
Int. Cl.³ F04B *17/00*; F03G *7/02, 7/06*
U.S. Cl. 417—379 **17 Claims**



1. A pump for fluid media having different temperatures, comprising:
(a) means forming a first chamber for the warmer of the two media and having an inlet and an outlet as well as two respective check valves therefor;
(b) means forming a second chamber for the colder of the two media and having an inlet and an outlet as well as two respective check valves therefor;
(c) an at least partially heat conducting displacement body separating said chambers from one another and being arranged for exposure to the media in said chambers for effecting a first heat exchange between said displacement body and the fluid in one of said chambers and for effecting a second heat exchange between said displacement body and the fluid in the other of said chambers; said displacement body including means responsive to temperature changes derived from said first heat exchange for effecting deformation of said displacement body whereby the sizes of said first and second chambers are varied; said displacement body having a first state prior to response to said temperature changes and a second, deformed state subsequent to response to said temperature changes;
(d) means for effecting in said first state of said displacement body a greater said first heat exchange than said second heat exchange and
(e) means for effecting in said second state of said displacement body a greater said second heat exchange than said first heat exchange.

4,231,719

PROCEDURE AND APPARATUS FOR DEGASSING FUEL SUPPLY PUMP

Peter Ringwald, Renningen; Klaus Rose, Mundelsheim, and Karl Ruhl, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,415
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1977, 2735917
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—366 **15 Claims**

1. A fuel pump assembly comprising a cylindrical casing, an electromotor in said casing, perforated front and rear cover elements for said casing, a shaft means arranged to support said electromotor with the shaft means having a terminal portion that extends through said front cover element, said terminal portion arranged to receive a further centrally apertured cover element, said last-named cover element including fuel inlet means and fuel pumping elements having at least one planar wall disposed between said respective cover elements, said

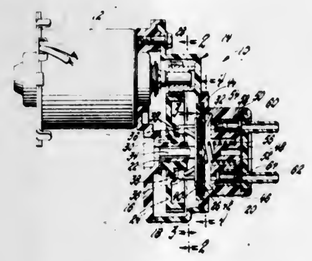
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4,231,721

DIAPHRAGM PUMP

Rufus L. Hawk, Xenia, and Ralph D. Unterborn, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1978, Ser. No. 950,722
Int. Cl.³ F04B *43/04*
U.S. Cl. 417—413 **1 Claim**



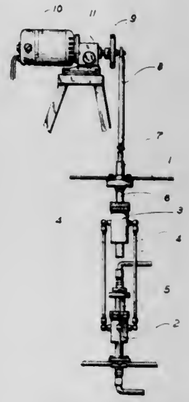
1. In a diaphragm pump having a housing, a diaphragm peripherally mounted in said housing to define a pump chamber, and inlet and outlet means communicating with said pump chamber, the improvement comprising:
a support plate forming part of the housing having a hollow stud which projects into a second chamber of the housing defined in part by the diaphragm,
a cam follower disposed in the second chamber and secured to a central portion of the diaphragm, said cam follower having a stem reciprocably and non-rotatably mounted in the hollow stud and a pair of round ended studs radially spaced from the stem and diametrically opposite each other,
a cam-gear disposed in the second chamber and rotatably mounted on the hollow stud on an axis concentric with the cam follower and diaphragm,
said cam-gear having an annular sinusoidal cam face engaging said pair of round ended studs to reciprocate the diaphragm as the cam-gear is rotated,
compression spring means disposed in the pump chamber engaging the diaphragm to expand the pump chamber and maintain the pair of round ended studs in engagement with the cam face, and
means on the support plate for mounting a motor and receiving the motor output shaft and an attached drive pinion in the second chamber for driving the cam-gear at a reduced speed.

4,231,722

MAGNETIC RECIPROCATING PUMP FOR PUMPING FLUIDS

Joachim Teichmann, No. 21 - 5, Auf dem Backenberg, 4630 Bochum 1, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,100
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712552
Int. Cl.³ F04B *35/04*
U.S. Cl. 417—418 **24 Claims**



1. A magnetic reciprocating pump for pumping fluids at high pressures and temperatures comprising:
(a) a tube of nonmagnetic material connected at opposite ends respectively to fluid conduit means;
(b) a piston freely reciprocable in said tube and comprising core magnetic means;
(c) one-way valve means for controlling flow of fluid through said conduit means during reciprocation of said piston;
(d) external magnetic means arranged about said tube; and
(e) means for reciprocating said external magnetic means along a path substantially parallel to said tube;
(f) said external magnetic means comprising a plurality of peripheral permanent ring magnets, said core magnetic means comprising a plurality of axially magnetized core permanent ring magnets, the number of external and internal permanent ring magnets being equal and said external permanent ring magnets surrounding said tube of nonmagnetic material;
(g) whereby reciprocation of said external magnetic means by said drive means causes said piston to reciprocate within said tube, pumping fluid through said one-way valve means and conduit means.

4,231,723

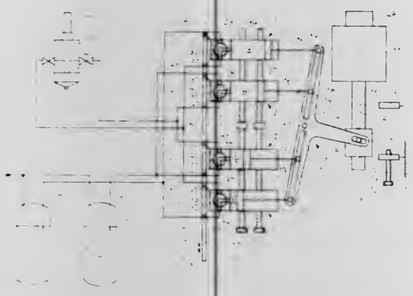
METERING AND CONVEYOR ARRANGEMENT

Walter Spühl, St. Gallen, Switzerland, assignor to Spuhl AG, Gallen, Switzerland

Filed Jul. 24, 1978, Ser. No. 927,162
Claims priority, application Switzerland, Jul. 26, 1977, 9238/77
Int. Cl.³ F04B *23/06, 49/00*
U.S. Cl. 417—429 **7 Claims**

1. A metering and conveyor arrangement for liquid to be mixed, comprising: a plurality of parallel-connected delivery pumps actuated by drive means, one pair of delivery pumps being assigned to each of said liquids; each pair of pumps comprising two piston pumps with piston rods alternately performing an intake and a discharge cycle, said piston pumps being movable relative to each other and perpendicular to said piston rods; swivel means connected to said drive means;

rocker arms located on both sides of said swivel means; each of said rocker arms being connected with one of said piston pumps and having grooves; ends of said piston rods being located and guided in said grooves; an adjustment spindle



common to one pair of piston pumps for regulating said pair of piston pumps; each adjustment spindle having two parts with opposite threads; a lockable coupling connecting said parts, one spindle part being associated with one piston pump of a pair of said pumps.

4,231,724
ADJUSTABLE METERING PUMP

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Huntingdon Valley, Pa. 19090

Division of Ser. No. 689,739, May 5, 1976, Pat. No. 4,090,818. This application Mar. 9, 1978, Ser. No. 884,880
Int. Cl.³ F04B *43/00, 39/00, 39/10*
U.S. Cl. 417—472 **3 Claims**

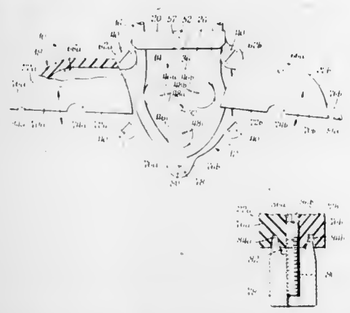


1. A valve apparatus of the type adapted for use with a reciprocating pump comprising:
an upper housing,
a lower housing connected to said upper housing and forming a plenum therebetween,
an intake connector in said upper housing adapted to receive an intake line,
an exhaust connector in said upper housing adapted to receive an exhaust line,
an inlet-outlet connector in said lower housing adapted to be connected to a pump,
a pair of flat annular valve faces on said upper housing,
a central aperture in each said valve face,
flexible mushroom shaped valve seats mounted in each said central aperture, said valve seats each having an annular disk cooperating with said flat annular valve faces forming an intake valve and an exhaust valve,
said exhaust valve having a seat outside said plenum and having a discontinuous annular ring inside said plenum surrounding the aperture under said exhaust valve face for flushing gas bubbles out of said plenum, and
apertures through said upper housing under said annular disks of said mushroom shaped valves seats.

4,231,725
PERISTALTIC PUMP

Lawrence R. Hogan, Lake Villa, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Oct. 16, 1978, Ser. No. 951,618
Int. Cl.³ F04B *43/08, 43/12*
U.S. Cl. 417—477 **16 Claims**



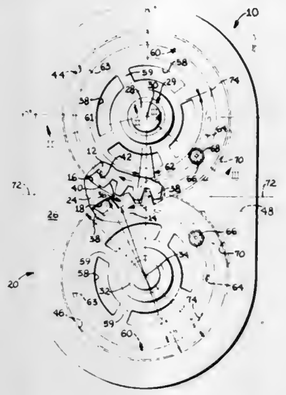
1. In a peristaltic pump which includes a base plate, a rotor rotatably supported on the base plate and having at least two compression surfaces rotatable therewith through a predetermined path, and a pair of reaction members pivotably mounted on said base plate for movement relative to said base plate between open positions spaced from said rotor to facilitate loading and removal of a compressible fluid flow tube relative to said rotor, and closed positions operative to maintain the flow tube in position so that said compression surfaces effect a peristaltic pumping action on said tube during rotation of said rotor; the improvement wherein each of said reaction members includes a shield plate cooperable with the shield plate on the other of said reaction members so as to substantially cover said rotor when said reaction members are in their said closed positions, and means operatively associated with said base plate and selectively cooperable with said reaction members to maintain said reaction members in their said closed positions.

4,231,726
GEAR PUMP HAVING FLUID DEAERATION CAPABILITY

Delwin E. Cobb, Peoria, and Maurice E. Young, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 22, 1978, Ser. No. 918,123
Int. Cl.³ F04C *2/18, 15/00*
U.S. Cl. 418—75 **15 Claims**

1. In a gear pump (**10**) having a housing (**20**) defining first and second intersecting cavities (**16,18**), and first and second intermeshing gears (**12,14**) having a plurality of teeth (**38**) and a plurality of tooth roots (**42**) between the teeth (**38**), each gear (**12,14**) positioned respectively in one of the first and second cavities (**16,18**), the improvement comprising:
air bleed passage means (**60**) in the housing (**20**) for passing entrained air collected in the fluid at said gear tooth roots (**42**) as a result of centrifugal force away from a preselected angular region of each of said cavities (**16,18**), said air bleed passage means (**60**) including a leading portion (**61**) and an adjacent trailing portion (**62**) in each of the angular regions, said leading portions (**61**) being in continuous open communication with said tooth roots (**42**) and having a construction starting in the region from 0° to 90°, continuing through the region from 90° to 180°, and terminating in the region from 180° to 270° relative to a zero degree position of intermeshing contact of said gears (**12,14**), and said trailing portions (**62**) being in communication with said tooth roots (**42**) solely through the side clearance between said gears (**12,14**) and said housing (**20**)

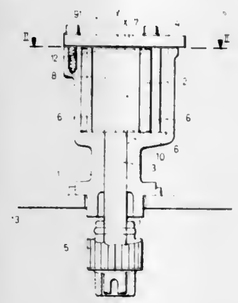


and having a construction juxtaposed to said leading portions (**61**).

4,231,727
VACUUM PRODUCING ROTARY VANE PUMP WITH SHAFT LUBRICATION

Peter Buchholz; Rolf Warnecke, both of Gifhorn, and Alfred Beier, Brunswick, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,172
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631152
Int. Cl.³ F04C *29/00, 25/00*
U.S. Cl. 418—76 **16 Claims**

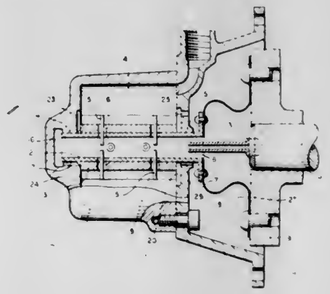


1. A rotary pump for producing vacuum pressure comprising an integral housing including a cast member having a cylindrical chamber, a rotor in said chamber having a case-hardened cylindrical shaft pivoted without bearing members in a bore in said cast member parallel and eccentric to said chamber, said rotor having a plurality of vanes mounted slideably in outwardly extending slots of the rotor and resting against the cylindrical walls of said chambers and forming variable volume pump chambers, said vanes being urged against said walls by the pressure of hydraulic oil supplied to said slots behind each of said vanes, a part of said hydraulic oil escaping into said cylindrical chamber and promoting sealing between said vanes and the walls of each cylindrical chamber, and an axially extending groove in said housing along said bore and opening into said cylindrical chamber for the flow off of said escaped oil and for providing said oil to said shaft, wherein said rotor and said vanes have approximately the same axial length as said cylindrical chamber, wherein said housing is provided with a cover axially bounding and sealing said pump chambers from each other, said cover being provided with a suction opening, communicating with one of said pump chambers, and wherein said rotor is provided with a blind hole at its end adjacent said cover, said blind hole permanently communicating with all of said slots and with an oil delivery opening.

4,231,728
ROTARY VANE PUMP

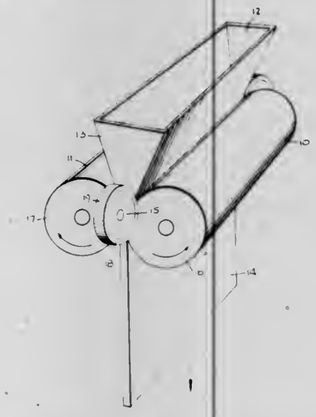
Siegfried Hertell, Radevormwald, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,545
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 7707853; Mar. 22, 1977, 7708908; Apr. 2, 1977, 7710603
Int. Cl.³ F04C *29/02*
U.S. Cl. 418—79 **9 Claims**



1. In a rotary vane pump of the type having a drive shaft rotating within front and rear bearings of which at least one is a sliding bearing, said drive shaft being connected to a rotor in which vanes are arranged to slide within radially formed slits, the vanes sliding with their ends projecting from the rotor along a stroke curve formed by the surrounding stator housing, said stroke curve encompassing at least one suction and pressure chamber which are arranged symmetrically to each other, and means to supply a lubricant to the elements of the pump through a hollow portion formed axially within the drive shaft, a support means for said stator housing enclosing a lubricant outlet side of the pump, and radially extending passages extending through the drive shaft and attached rotor, said passages connecting the hollow portion of said drive shaft with the chambers created between the base of the rotary vane and the slits formed in said rotor in which said vanes radially slide, the improvement comprising:
an annular compartment with a lubricant duct extension connecting the rear bearing surface in which said drive shaft rotates to said vane base chambers;
a ventilation passage connecting said annular compartment to the lubricant outlet side of said pump;
a lubricant passage formed on the suction side of said vanes by an axially extending groove which connects the front bearing surface on which said drive shaft rotates to the hollow portion of said drive shaft;
a radial groove connecting said front bearing to said vane base chambers, said radial groove being offset with respect to the bottom dead center of said vanes and opposite said axially extending groove in the direction of rotation of said pump; and
a bezel formed in either said front bearing or rotor which connects with radial groove and axially extending groove.

4,231,729
POWDER ROLLING APPARATUS
John H. Tundermann, Monroe, and Charles B. Goodrich, New York, both of N.Y., assignors to Huntington Alloys Inc., Huntington, W. Va.
Filed Oct. 9, 1979, Ser. No. 83,178
Int. Cl.[2] B22F *3/18*; B30B *11/00, 3/00*
U.S. Cl. 425—79 **5 Claims**

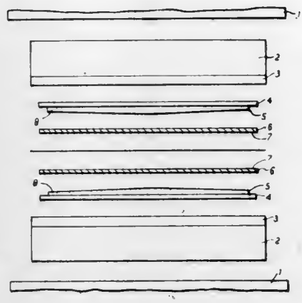


1. In apparatus for compacting metal powders comprising a pair of generally cylindrical rolls of equal length mounted for rotation about respective parallel spaced roll axes to define a roll gap therebetween, means for feeding metal powder to an intake side of the roll gap along the entire length of the roll faces to be compacted to a strip-like product of width substantially equal to the roll face length and edge-restraint means at opposite axial extremities of the rolls effective to prevent powder egress from the roll gap in a direction parallel to the roll axes,

the improvement wherein each edge restraint means comprises a wheel mounted to lie parallel to a plane containing the rolling direction and to be freely rotatable about an axis perpendicular to the roll axes, a pneumatic tire of width exceeding the roll gap mounted on the rim of the wheel, and means for urging the wheel towards the respective end-face of each roll so as to cause a portion of the surface of the pneumatic tire into frictional contact with a portion of the end-face of each roll, whereby in operation the wheel is frictionally driven by the rotating rolls and a deformed portion of the tire surface provides a mating powder seal with the roll end-faces at, and in the vicinity of, the roll gap.

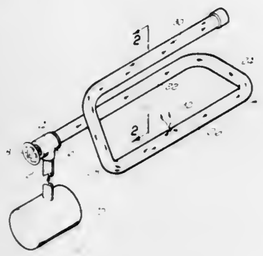
4,231,730
MOULDING VIDEO DISCS
David E. Birt, London, England, assignor to E M I Limited, Middlesex, United Kingdom
Filed Nov. 6, 1979, Ser. No. 92,062
Claims priority, application United Kingdom, Nov. 25, 1978, 46071/78
Int. Cl.[2] B29C *3/00, 17/00*; B29D *17/00*
U.S. Cl. 425—385 **10 Claims**

1. An arrangement for impressing a surface of a thermoplastics foil with a relief structure, the arrangement comprising a pair of substantially parallel mould blocks, means for applying pressure to said mould blocks, a pair of substantially parallel stamper plates mounted between the mould blocks, at least one stamper plate bearing a negative impression of said relief structure, and interposed between an adjacent mould block and stamper plate a resilient material compensator, as hereinbefore defined, wherein at least one compensator has a convex surface, the ratio of the diameter of said surface to the depth thereof being no less that 340 and no greater than 3400, which



arrangement is capable of impressing a thermoplastics foil positioned between the stamper plates.

4,231,731
MULTIFUEL SELF-REGULATING BURNER
Joseph Sharp, 337 S. Stearns Rd., Oakdale, Calif. 95361
Filed Apr. 28, 1978, Ser. No. 901,155
Int. Cl.[3] F23H *1/00*
U.S. Cl. 431—38 **7 Claims**



1. A multifuel self-regulating burner apparatus for burning a fuel from a supply comprising:

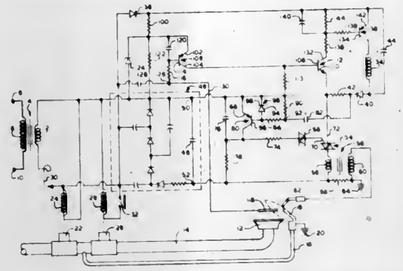
a preheater pipe portion connected for initially receiving the fuel;

a backpressure pipe portion; and

an orifice pipe portion connected between the preheater pipe portion and the backpressure pipe portion, the backpressure pipe portion being sealed except at the connection to the orifice pipe portion, the orifice pipe portion having at least one orifice therethrough, said backpressure pipe portion being located forwardly of said orifice and said orifice being positioned for applying heat to at least the backpressure pipe portion when the fuel passing through the orifice is burned.

4,231,732
GAS BURNER CONTROL SYSTEM
Harry E. Newport, Jr., Crestwood, and Robert L. Baysinger, St. Louis County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Sep. 5, 1978, Ser. No. 939,414
Int. Cl.[3] F23Q *9/08*
U.S. Cl. 431—46 **7 Claims**

1. In a gas burner control system wherein a main burner is ignited by a pilot burner, wherein spark generating circuit means is operative to ignite the pilot burner upon a call for heat and gas flow to the main burner is prevented until a pilot burner flame exists, and wherein a storage capacitor, when sufficiently charged, is opertive upon discharge thereof to effect gas flow to the main burner, the improvement comprising circuit means connected in circuit with the storage capaci-



tor and the spark generating circuit means responsive to charging current of said storage capacitor for delaying energization of said spark generating circuit means until said storage capacitor is sufficiently charged.

4,231,733
COMBINED O_2/COMBUSTIBLES SOLID ELECTROLYTE GAS MONITORING DEVICE
William M. Hickam, Churchill Borough; Ching-Yu Lin, Penn Hills, and John M. Zomp, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 31, 1978, Ser. No. 911,252
Int. Cl.[3] F23N *5/00*
U.S. Cl. 431—76 **6 Claims**

1. An oxygen/combustibles monitoring apparatus for generating a voltage signal indicative of the oxygen content of an excess oxygen condition in a monitored gas environment and a current signal indicative of the combustibles content of an excess combustibles content in a monitored gas environment, comprising:

an oxygen ion conductive solid electrolyte cell having first and second electrodes, said first electrode being exposed to the monitored gas environment, said second electrode being isolated from said monitored gas environment and exposed to an oxygen reference environment;

an electronic circuit means connected to said first and second electrodes, said electronic circuit means including a voltage measuring circuit and a current measuring circuit, said current measuring circuit including a constant voltage source and a current measuring means, and switching means for alternatively connecting said voltage measuring circuit and said current measuring circuit to said first and second electrode in response to a predetermined difference in oxygen partial pressure at said first and second electrodes;

said predetermined difference being set such that said voltage measuring means is operatively connected to said first and second electrodes during an excess oxygen condition of the monitored gas environment, an EMF signal generated by said solid electrolyte electrochemical cell as measured by said voltage measuring means being indicative of the oxygen content of said monitored gas environment;

said predetermined difference being such that said current measuring circuit is connected to said first and second electrodes during an excess combustibles condition of the monitored gas environment, said constant voltage source of said current measuring circuit maintaining a preset voltage level across said solid electrolyte electrochemical cell, said predetermined difference corresponding to a change in said monitored gas environment from an excess oxygen condition to an excess combustibles condition, said solid electrolyte electrochemical cell drawing current from said constant voltage source to transfer oxygen from said oxygen reference environment at said second electrode to said first electrode to combustibly react with said excess combustibles at said first electrode, the level of current required to transfer oxygen being measured by said current measuring means, said current being indicative of the combustibles content of said monitored gas environment.

4,231,734
TORCH IGNITER
Richard W. Burns, 28 Metacomet Rd., Plainville, Conn. 06062
Filed May 4, 1977, Ser. No. 793,517
Int. Cl.[3] F23Q *1/02*
U.S. Cl. 431—274 **14 Claims**



1. A torch igniter for attachment to a torch having a torch nozzle including a nozzle tip through which a fuel is passed for ignition comprising:

(a) an igniter attachment including a mounting base providing locking means to engage said attachment upon a torch nozzle adjacent the nozzle tip thereof, a motor mount, and a support housing having a wheel support carried thereon;

(b) spark generating means including a flint and wheel carried by said igniter attachment, said wheel having a hub and an abrading rim and being mounted on said wheel support for rotation of said wheel about its hub, said flint being carried by said attachment and having one end in contact with said abrading rim;

(c) motor means supported on said motor mount and including a shaft connected to said wheel for rotation thereof upon energization of said motor means; and

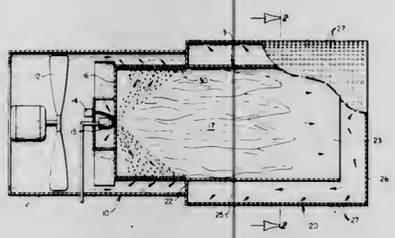
(d) an energy source connected to said motor by connector means including a switch which is manually operable to selectively energize said motor to rotate said wheel against said flint whereby sparks are generated by such rotation to ignite fuel passing through said nozzle tip.

4,231,735

RADIANT HEATER

Edgar S. Downs, 6530 Huntley Rd., Worthington, Ohio 43085

Filed Mar. 13, 1978, Ser. No. 885,535
Int. Cl.[3] F23D 7/00
U.S. Cl. 431—328 1 Claim



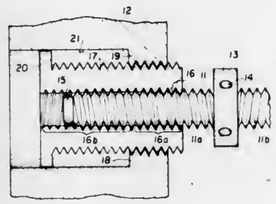
1. A radiant heater comprising an outer tubular casing closed at its forward end by a transverse imperforate wall and having a rear substantially imperforate peripheral wall section and a forward perforated peripheral wall section, an inner shell disposed with its peripheral wall concentrically within the casing but spaced radially inwardly therefrom and being substantially closed by a transverse wall at its rear end but open at its forward end, a fan within the outer casing behind said transverse rear wall, said inner shell extending from a point where its rear wall is just ahead of the fan through the imperforate section of the outer casing and on through the perforated section thereof to a point spaced from the imperforate front transverse wall of the casing, a pressure-type liquid fuel atomizing burner nozzle disposed for injecting fuel through a central opening in said transverse rear inner shell wall, said central opening also permitting the entrance of primary air, said inner shell having a rear perforated peripheral wall section which is adjacent its transverse rear wall for permitting the radial inlet of secondary air but is imperforate throughout most of its length forwardly thereof, said perforated peripheral rear wall section of the inner shell having mounted on its inner surface in covering relationship to it an annular wall section which is of high porosity and high capillarity so as to produce a combustion chamber, the space between the rear peripheral imperforate wall section of said casing and the perforated peripheral rear wall section of said inner shell forming an annular chamber for receiving secondary air from said fan which is closed at its forward end so the secondary air will flow therefrom radially inwardly through said perforated section and the covering annular high porosity and high capillarity wall section into the combustion chamber therewithin, non-atomized droplets from the nozzle that may reach it being absorbed by said wall section and burning thereof being aided by said secondary air, other fuel atomized by the nozzle producing a desired flame pattern in the forward portion of the inner shell, the products of combustion travelling axially along the interior of the tubular inner shell to heat it and then radially outwardly at its forward end and rearwardly through the annular space between the imperforate peripheral wall section of the inner shell to further heat it and the perforated peripheral wall section of the outer casing to heat it, said last-named annular space being closed at its rear end to separate it from said annular chamber so that the products of combustion will finally flow radially outwardly through the perforated peripheral wall section of the outer casing.

4,231,736

ORTHODONTIC SCREW-TYPE DEVICE AND METHOD OF MAKING SAME

Frank Reilly, Freeport, N.Y., assignor to Quanta Chemical Ltd., Brooklyn, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,304
Int. Cl.[3] A61C 7/00
U.S. Cl. 433—6 12 Claims



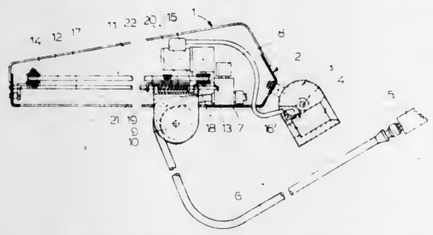
1. An orthodontic screw-type biassing device comprising:
a first member having an internally threaded bore, said threaded bore comprising first and second threaded portions adjacent each other in the axial direction of said bore, said first and second threaded portions having thread roots which lie substantially on a common line, said first threaded portion having threads of given height and said second threaded portion having threads of a lesser height; and
an externally threaded screw-type member threadably engaged in said internally threaded bore of said first member, an end portion of said screw-type member being deformed so as to freely pass through said second threaded portion of said threaded bore, said deformed end portion abutting at least one thread of said first threaded portion and binding and being non-rotatable relative said first threaded portion of said threaded bore.

4,231,737

APPARATUS FOR REMOVABLY SUPPORTING AT LEAST ONE MEDICAL, PARTICULARLY DENTAL INSTRUMENT, SUCH AS A DENTAL DRILL OR THE LIKE

Johannes Groen, Loenen, Netherlands, assignor to Holland Dental B.V., Baarn, Netherlands

Filed Sep. 14, 1978, Ser. No. 945,698
Claims priority, application Netherlands, Sep. 19, 1977, 7710232
Int. Cl.[3] A61G 1/14
U.S. Cl. 433—78 7 Claims



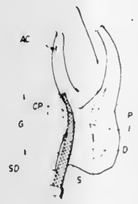
1. An apparatus for removably supporting at least one medical, particularly dental instrument, such as a dental drill or the like, of the type having one end of an elongate flexible supply tube connected thereto, said apparatus including a box having an instrument panel, a holder for the instrument on said panel, connection means in said box for connecting the other end of said flexible supply tube, and tube retracting and releasing means comprising a tube-engaging member movably mounted in said box between a first end position retracting said tube at least partially into said box and a second end position substantially completely releasing said tube from said box, respectively, reversible drive means for said tube-engaging member to move said member between said two end positions, and control means for said drive means, said control means actuating said drive means to retract said tube when said instrument is placed in said holder and actuating said drive means to release said tube from said box when said instrument is removed from said holder, respectively.

4,231,738

CANAL INSTRUMENT FOR ELIMINATING INTERFERENCE, WIDENING THE OPENING AND THE CONTEMPORANEOUS FLARED REAMING OF THE FIRST TWO-THIRDS OF THE DENTAL RADICULAR CANALS

Francesco Riitano, Corso Umberto 1°(Palazzo Tiani), Soverato (Catanzaro), and Vincenzo Spina, Via Fogliano 35, Rome, both of Italy

Filed Dec. 9, 1977, Ser. No. 859,077
Claims priority, application Italy, Dec. 9, 1976, 3607 A/76
Int. Cl.[2] A61C 5/02
U.S. Cl. 433—102 2 Claims



1. A flexible canal instrument for the elimination of interference, the widening of the opening, and the contemporaneous flared reaming of the first two-thirds of the dental radicular canals, the instrument having a tip end and a terminal end distal from said tip end, and having a continuous reduction in diameter over the full working length thereof from said terminal end to said tip end, whereby the instrument becomes continuously more flexible from said terminal end toward said tip end, the instrument further having a cutting part extending from said terminal end toward said tip end for only a part of said working length, thereby leaving a smooth tip portion at the tip end thereof for easy guidance in the canal.

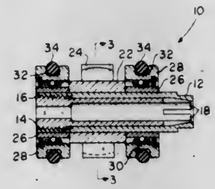
4,231,739

UNITARY CARTRIDGE TYPE TURBINE ASSEMBLY

Robert T. Iudica, N. Babylon, N.Y., assignor to Professional Mfg. Corp., Deer Park, N.Y.

Filed Apr. 11, 1979, Ser. No. 29,710
Int. Cl.[3] A61C 1/08
U.S. Cl. 433—126 15 Claims

1. A self-contained cartridge assembly free of any outer enclosure for insertion and use as a unit in and for removal from a plurality of dental handpieces in which the housing interiors are different in size and in which each housing has a fluid inlet to direct fluid into the housing and an outlet to exhaust fluid from the housing and in which the housing becomes the enclosure for said cartridge assembly when said cartridge assembly is positioned therein, said cartridge assembly comprising
sleeve shaped means of substantially the length of the housing and for engagement with a dental tool,
a turbine having impeller faces extending into the housing and for impingement thereagainst by fluid directed into the housing through the fluid inlet thereof to rotate said turbine,
said impeller being connected with said sleeve for conjoint rotation therewith,



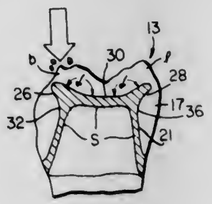
rollable bearings fixed on said sleeve on opposite sides of said impeller,
and engaging means captured on said rollable bearings extending outward therefrom for fluid tight engagement with the wall of the handpiece housing on opposite ends of said impeller to confine and direct the inlet fluid against said impeller and the faces thereof to contain the fluid from flowing outward from between said cartridge and the engagement of said engaging means with the housing.

4,231,740

DENTAL RESTORATIVE STRUCTURES

Itzhak Shoher, 50 Shlomo Hamelech St., Tel Aviv, and Aharon E. Whiteman, 13 J1 Perez St., Petach Tikvah, both of Israel

Filed Feb. 2, 1979, Ser. No. 8,944
Int. Cl.[3] A61C 13/08
U.S. Cl. 433—208 13 Claims



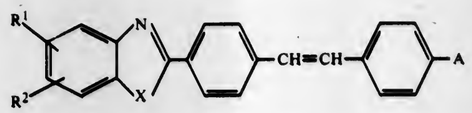
1. A dental restoration comprising a molar pontic having a porcelain superstructure surrounding a metal framework composed of an integral assembly of metal members in an open structural arrangement having a basket-like configuration for forming a substantial occlusal concavity with porcelain disposed about, between and below said metal members.

4,231,741
MIXTURES OF OPTICAL BRIGHTENERS

Dieter Günther, Kelkheim; Rüdiger Erckel, Eppstein; Günter Rösch, Bad Soden am Taunus, and Heinz Probst, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

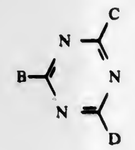
Filed Dec. 21, 1978, Ser. No. 971,735
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759217
Int. Cl.³ D06P *1/642*
U.S. Cl. 8—571 5 Claims

1. Mixtures of optical brighteners consisting of from 0.05 to 0.95 part by weight of a compound of the formula I



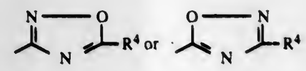
I

and of from 0.95 to 0.05 part by weight of a compound of the formula IV

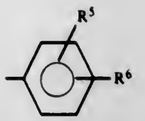


IV

in which the symbols X, R^1, R^2, A and B are defined as follows: X is oxygen or sulfur, R^1 and R^2, which may be identical or different, are hydrogen, fluorine, chlorine, phenyl, C_{1-9}alkyl, C_{1-4}alkoxy, C_{1-4}dialkylamino, acylamino, carboxy, cyano, carbonamido, mono- or di-alkylcarbonamido, carboalkoxy, sulfo, sulfonamido, mono- or di-alkyl-sulfonamido, alkyloxysulfonyl, two vicinal radicals R^1 and R^2, when taken together, are a fused benzo ring, lower alkylene or 1, 3-dioxapropylene; A is cyano, a group of the formula $-COOR^3$, $CONR_2^3$ with R^3 being hydrogen, C_{1-18}alkyl, cycloalkyl, aryl, alkylaryl, halogenaryl, aralkyl, alkoxyalkyl, halogenalkyl, hydroxyalkyl, alkylaminoalkyl, carboxyalkyl, carboalkoxyalkyl, two alkyl or alkylene, when taken together with the nitrogen atom, being a morpholino, piperidino or piperazino ring; or A is a group of the formula



in which R^4 is straight chain or branched alkyl having from 1 to 18 carbon atoms, preferably 1 to 6 carbon atoms, which may be substituted by hydroxy, halogen, lower alkoxy, dialkylamino, lower alkylmercapto, chloroaryloxy, aryloxy, arylmercapto or aryl radicals both alkyl groups contained in the dialkylaminoalkyl groups, when taken together, may form a morpholino, piperidino or piperazino ring; or R^4 is a group of the formula $-(CH_2CH_2O)_n-R$ with n being 1, 2 or 3 and R being hydrogen; lower alkyl, dialkylaminoalkoxyalkyl or alkylthioalkoxyalkyl, the alkyl groups in dialkylaminoalkoxyalkyl, when taken together, may form a piperidino, pyrrolidino, hexamethylenimino, morpholino or piperazino ring; or R^4 is a group of the formula $-(CH_2)_m-CH=CH-R$ with m being an integer of from 0 to 5, or R^4 is a radical of the formula



wherein R^5 and R^6, which may be the same or different, are hydrogen, fluorine, chlorine, phenyl, lower alkyl, lower alkoxy, C_{1-4}acylamino, carboxy, cyano, carbonamido, mono- or di-alkylcarbonamido, carboalkoxy, sulfo, sulfonamido, mono- or di-alkyl-sulfonamido, alkyloxysulfonyl, two vicinal radicals R^5 and R^6, when taken together, may form lower alkylene, a fused benzo ring or 1,3-dioxapropylene; B is a polycyclic aromatic radical having at least three condensed rings; C is amino, substituted by one or two alkyl, hydroxyalkyl, acyl or phenyl groups, and two alkyl groups, when taken together with the nitrogen atom of the amino group may form a pyrrolidino or piperidino ring or, when taken together with a further nitrogen or oxygen atom, a piperazino or morpholino ring; or C is alkoxy, hydroxyalkyl, acyloxy, alkylthio or carbalkylmercapto; D independent from C is defined as C and may further stand for a chlorine atom.

4,231,742
MANUFACTURE AND USE OF HEAT TRANSFER PRINTINGS

Dieter Clausen, Baldham, and Albert Uhlemayr, Forstinning, both of Fed. Rep. of Germany, assignors to Michael Huber Munchen, GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 855,530, Nov. 28, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,215
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654651
Int. Cl.³ D06P *1/08*
U.S. Cl. 8—470 11 Claims

1. The new use of a printing ink for thermo-transfers, said ink consisting essentially of at least one sublimable dye, at least one rapidly UV hardenable binder having polymerizable ethylenic unsaturation and a UV polymerization initiator, comprising printing said ink by the offset or letter printing method onto a heat-transfer backing, hardening the binder with UV radiation, and subsequently heat-transferring the print to a textile fabric.

4,231,743
PROCESS FOR SHADING DURING THE VAPOR PHASE DYEING OF CARPET

Mervin R. Buckwalter; Walter T. Bulson, and Leonard N. Ray, Jr., all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 694,763, Jun. 10, 1976, Pat. No. 4,181,497. This application Apr. 16, 1979, Ser. No. 30,450
Int. Cl.³ D06P *5/12*
U.S. Cl. 8—471 3 Claims

1. A process for making a decorative carpet through the use of sublimable dyes comprising the steps of:

(a) printing sublimable dyes on a porous transfer sheet,

(b) preparing a carpet product which has on one side thereof carpet yarn forming the face fiber yarns,

(c) placing the transfer sheet adjacent the face fiber yarns so that the transfer sheet with the sublimable dyes printed thereon will be adjacent the face fiber yarns of the carpet product,

(d) positioning a shade controlling means which is a porous sheet adjacent a portion of the transfer sheet to reduce the air flow permeability through the transfer sheet and carpet product so as to yield dye, but at a reduced intensity in those areas where the shade controlling means exists, and

(e) transferring the sublimable dyes from the transfer sheet to the carpet face yarns by the application of a directional flow, heated gaseous medium, passing through the trans-

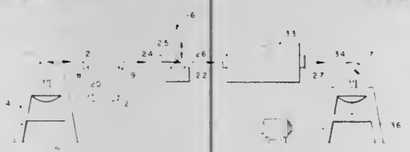
fer sheet and the carpet product in the direction from the transfer sheet towards the face fiber yarns with the areas not containing the shade controlling means resulting in full color transfer of dye from the transfer sheet to the face fiber yarns of the carpet product and with those areas containing the shade controlling means there being a diminishing of dye intensity, but still dyeing, on the face fiber yarns of the carpet product, resulting in partial color transfer of dye to the face fiber yarns to give a shade difference between the areas with and those without the shade controlling means.

4,231,744

PROCESS FOR DYEING CLOSELY CONSTRUCTED NON-TUFTED TEXTILE MATERIALS AND PRODUCTS PRODUCED THEREBY

Lorence M. Moot, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 15, 1978, Ser. No. 915,822
Int. Cl.[2] D06P 5/00
U.S. Cl. 8—495 **12 Claims**



1. In a process for improving the sharpness of a pattern of dye applied to closely constructed non-tufted textile materials characterized as having a weight of at least about 4 ounces per square yard with a jet dyeing apparatus including conveying means for transporting the textile, jet orifices for delivering dye in a pattern to said textile material and control means for supplying data to control the operation of the application of dye from the jet orifices to the textile material, said process including the sequential steps of modifying the textile material prior to dyeing of same with the jet dyeing apparatus by applying an aqueous admixture containing an effective minor amount of a substantially oil and water repellent fluoropolymer to the textile material to provide from about 0.20 to about 2.5 weight percent of the fluoropolymer on the textile material, heating the fluoropolymer treated textile material to a temperature effective to dry the textile material and cure the fluoropolymer thereby providing a fluoropolymer modified textile material, dyeing the fluoropolymer textile material, and recovering a resulting dyed fluoropolymer modified textile material, the improvement comprising incorporating into the aqueous admixture containing the fluoropolymer from about 0.001 to about 0.01 weight percent of a fluorosurfactant, said fluorosurfactant containing a F_3CCF_2CH— moiety.

4,231,745

PROCESS FOR PAD-DYEING AND PRINTING FABRICS MADE OF CELLULOSE AND/OR REGENERATED MODIFIED CELLULOSE AND OPTIONALLY POLYESTER FIBERS

Erich Feess, Hofheim, and Friedrich Reinhardt, Neuenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 741,400, Nov. 12, 1976, abandoned. This application Mar. 16, 1978, Ser. No. 887,363
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2551432
Int. Cl.[3] D06P 3/82, 3/54
U.S. Cl. 8—552 **14 Claims**

1. In a process for printing or pad-dyeing fabrics consisting of fibers of cellulose or regenerated cellulose or mixtures of these fibers with an aqueous composition containing a disperse dyestuff, the improvement which comprises printing or pad-dyeing said fabric with a printing paste or pad-dyeing liquor containing as a thickening agent a synthetic polymer which is an addition polymer containing recurring units of at least one low molecular weight ethylenically unsaturated mono- or dicarboxylic acid, said polymer having free carboxy groups.

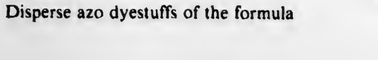
4,231,746

DYEING OF CELLULOSE-CONTAINING TEXTILE MATERIAL AND NOVEL DYES FOR USE THEREIN

Johannes Dehnert, and Werner Juenemann, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,566
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837500
Int. Cl.[3] C09B 27/00, 31/02
U.S. Cl. 8—680 **9 Claims**

1. A process for dyeing cellulose-containing textile material which comprises contacting a cellulose-containing textile material with water and an oxyethylene or oxypropylene compound, thereby to swell the cellulose fibers of said textile material and dyeing said swollen fibers with a dye of formula I



I

where R is an aliphatic, cycloaliphatic, araliphatic or aromatic radical and n is 0 or 1, and where the rings A, B and C may be substituted and/or may carry a fused ring.

4,231,747

SHRINKPROOFING WOOL WITH COPPER SALTS OF CARBOXYLIC ACIDS

Nathan H. Koenig, Albany, and Mendel Friedman, Moraga, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 16, 1979, Ser. No. 57,858
Int. Cl.[3] D06M 13/00, 3/02, 13/20, 13/12
U.S. Cl. 8—127.6 **13 Claims**

1. A process for shrinkproofing proteinaceous fibers, which comprises

(a) contacting the fibers with an aqueous solution of a cupric salt of a carboxylic acid containing from 2 to 18 carbon atoms at a temperature and concentration and for a period of time sufficient to enhance the shrinkage properties of the fibers, and

(b) contacting the fibers of step a with a semipolar, water miscible organic solvent at a temperature and in an amount and for a period of time sufficient to shrinkprpof the fibers.

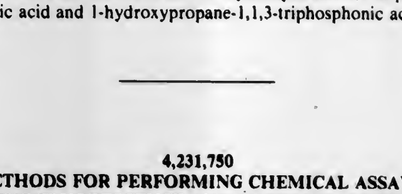
4,231,748

AZO DYESTUFFS

Herbert Hugl, and Gerhard Wolfrum, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 962,960
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752424
Int. Cl.[3] D06P 1/18; C09B 29/01
U.S. Cl. 8—668 **2 Claims**

1. Disperse azo dyestuffs of the formula



wherein

R_1'' represents phenyl, tolyl, or chlorophenyl,
R_2'' and R_3'' represent chlorine,
R_4'' represents phenyl and
R_5'' represents methyl.

4,231,749

DYEING PROCESS USING A SEQUESTRATING AGENT

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex Societe Anonyme, Paris, France

Continuation of Ser. No. 817,797, Jul. 21, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 33,010
Claims priority, application France, Jul. 23, 1976, 76 23120
Int. Cl.[3] D06P 1/10, 1/667
U.S. Cl. 8—584 **3 Claims**

1. In a process for the dyeing of textile fibers in an aqueous dyeing bath containing a metal-containing dyestuff sensitive to demetallization by a sequestrating agent at a temperature and for a period sufficient to transfer said dyestuff to said textile fibers, wherein said bath contains at least one sequestrable metal in the form of a metal of said dyestuff, an alkaline-earth metal or a heavy-metal impurity, the improvement which comprises introducing into said bath a sequestrating agent in the form of a hydroxy-(C_1 to C_4)-alkane phosphonic acid salt capable of sequestrating said impurity without affecting the physical-chemical characteristics of said dyestuff, said salt being selected from the group which consists of the sodium, potassium and lithium salts of hydroxyethane-1,1-di-phosphonic acid and 1-hydroxypropane-1,1,3-triphosphonic acid.

4,231,750

METHODS FOR PERFORMING CHEMICAL ASSAYS USING FLUORESCENCE AND PHOTON COUNTING

Robert M. Dowben, Dallas, Tex., and James R. Bunting, Boston, Mass., assignors to Diagnostic Reagents, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 634,797, Nov. 24, 1975, abandoned. This application Dec. 13, 1977, Ser. No. 860,168
Int. Cl.[2] G01N 33/16, 31/14, 21/22
U.S. Cl. 23—230 B **22 Claims**

1. In a competitive binding assay method for determining the concentration of a substance in a fluid sample which comprises providing a light emitting tracer compound and detecting the amount of tracer to determine the concentration of the substance the improvement comprising detecting said tracer by a photon counting method which (1) discriminates the photons emitted by said tracer from noise and non-specific light by subtracting the counts emitted by a tracer free sample and, (2) discriminates the photons emitted by such tracer from the quenching effects of the sample by counting only those photons of a predetermined pulse height.

4,231,751

NOVEL METHOD OF TESTING A CHARGE CALCINED ALUMINA TO DETERMINE ITS SUITABILITY FOR USE IN HYDROCARBON CONVERSION

Leon F. Koniz, Poughkeepsie, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 887,392, Mar. 16, 1978, Pat. No. 4,171,329, which is a continuation-in-part of Ser. No. 704,003, Jul. 9, 1976, abandoned. This application Jan. 5, 1979, Ser. No. 1,235
Int. Cl.[2] G01N 21/04, 31/02
U.S. Cl. 23—230 R **2 Claims**

1. The method of testing a charge calcined alumina to determine its suitability for use in a hydrocarbon conversion process including steam dealkylation, and in particular its ability to effect hydrocarbon conversion to desired products without substantial formation of less desired products, which comprises:

(i) mixing said charge calcined alumina with an excess of water, thereby forming an aqueous mixture;

(ii) heating said aqueous mixture;

(iii) digesting said heated aqueous mixture during which opertion the aqueous mixture becomes opaque in accordance with the formation, by rehydration, of beta alumina trihydrate, which latter is observed as suspended material while the nonsuspended material is observed as a layer in the lower portion of the aqueous mixture; and

(iv) determining the opacity of the upper portion of the aqueous mixture including the suspended material—a high opacity signifying unsuitability of the charge calcined alumina for use in steam dealkylation in which hydrocarbon conversion is effected to form desired products without substantial formation of less desired products, and a low opacity signifying a higher degree of suitability.

4,231,752

METHOD OF DETERMINING SALT WATER IN OILS

Edward J. Moore, and Michael Sedlak, both of Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,247
Int. Cl.[3] G01N 33/26, 33/18, 31/02, 33/52
U.S. Cl. 23—230 HC **10 Claims**

1. An improved method for determining the presence of salt water in a lubricating oil which comprises the steps of extracting the oil with an aqueous medium and contacting said aqueous medium containing chloride ion with a composite comprising silver chromate deposited on an adsorbent, the improvement whereby the aqueous medium used to extract the chloride ion is a combination of aqueous alkali metal or ammonium salt, an aliphatic monohydric alcohol and a halohydrocarbon or mixed halohydrocarbons.

4,231,753

CONTROL OF A CRACKING FURNACE

William S. Stewart, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1979, Ser. No. 22,909
Int. Cl.[2] G06G 7/58; G06F 15/18
U.S. Cl. 23—230 A **47 Claims**

19. A method for operating a cracking furnace comprising the steps of:

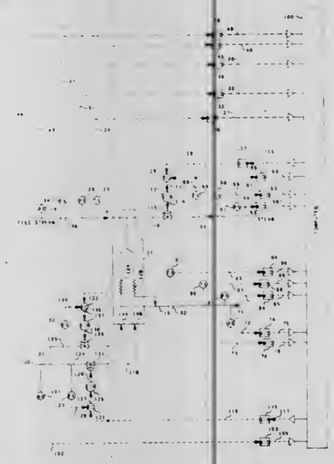
combining a feed stream provided to said cracking furnace with a diluent fluid;

supplying fuel to said cracking furnace, the combustion of said fuel supplying heat to said cracking furnace;

removing a gaseous mixture, containing the cracked components of said feed stream and containing said diluent fluid, from said cracking furnace;

establishing a first signal representative of a prediction of the heat required by said cracking furnace to maintain a desired percent conversion;

establishing a second signal representative of said desired percent conversion;
establishing a third signal representative of the actual percent conversion;
comparing said second signal and said third signal and establishing a fourth signal responsive to the difference between said second signal and said third signal;
combining said first signal and said fourth signal to establish a fifth signal representative of a corrected prediction of the heat required by said cracking furnace to maintain said desired percent conversion;
establishing a sixth signal representative of the heating value of said fuel;



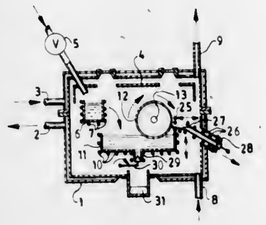
establishing a seventh signal in response to said fifth signal and said sixth signal, said seventh signal being representative of the flow rate of said fuel required to supply the heat required by said cracking furnace to maintain said desired percent conversion;
establishing an eighth signal representative of the actual flow rate of said fuel;
comparing said seventh signal and said eighth signal and establishing a ninth signal responsive to the difference between said seventh signal and said eighth signal; and
manipulating the flow rate of said fuel in response to said ninth signal.

4,231,754
CHEMILUMINESCENT ANALYTICAL DEVICE
Paul O. Vogelhut, Mishawaka, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed May 23, 1979, Ser. No. 41,682
Int. Cl.³ G01N *21/76, 33/50*
U.S. Cl. 23—230 R **12 Claims**

1. A test device for determining an analyte in a sample comprising at least one layer incorporated with a first reagent system responsive to the presence of said analyte to produce a reaction product and at least one luminescent layer having a second reagent system responsive to the presence of said reaction product to produce luminescence, and in which there is a pH gradient between the first reagent system layer and the luminescent layer.

11. A method for determination of a constituent in a sample which comprises contacting the sample with the device of claim 1 and observing any detectable chemiluminescent response.

4,231,755
PROCESS FOR PURIFYING SOLID SUBSTANCES
Heinz Herzer; Heinz-Jorg Rath, and Dietrich Schmidt, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany
Filed May 19, 1978, Ser. No. 907,442
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722784
Int. Cl.³ B01D *9/04*
U.S. Cl. 23—293 R **5 Claims**



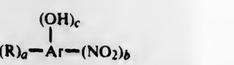
1. In a process for purifying semiconductor silicon by melting and subsequent resolidification, the improvement comprising the steps of:
forming a melted bath of the silicon to be purified at a temperature between 1430° and 1500° C.;
disposing a roller in the bath to a depth of between 0.01 to 0.3 times the diameter of the roller;
cooling the roller internally to a temperature between 800° and 1200° C.;
rotating the cooled roller in the melted silicon to form a solidified silicon film, wherein the residence time of the roller surface in the melted silicon, measured in minutes, is 0.0025 to 0.5 times the numerical value for the roller diameter;
remelting the silicon film formed on said roller at a distance of 0.1 to 0.5 d. π from the surface of the melt, measured on the circumference of the roller, wherein d. is the diameter of the roller; and
collecting the remelted silicon in an appliance.

4,231,756
GASOLINE AND PETROLEUM FUEL SUPPLEMENT
Samuel B. King, 2985 McGavach Pike, Nashville, Tenn. 37214
Filed May 11, 1979, Ser. No. 38,288
Int. Cl.² C10L *1/18, 1/16*
U.S. Cl. 44—53 **4 Claims**

1. A fuel supplement comprising 250 to 1500 ml of methyl alcohol, 100 to 800 ml of xylene, 250 to 1500 ml of ethyl alcohol, 200 to 800 mg of potassium hydroxide and 200 to 800 mg of sodium hydroxide.

4,231,757
NITRO PHENOL-AMINE CONDENSATES, METHODS OF MAKING SAME, FUELS AND ADDITIVE CONCENTRATES CONTAINING THEM
Kirk E. Davis, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
Filed Jun. 2, 1978, Ser. No. 911,728
Int. Cl.² C10L *1/22*
U.S. Cl. 44—63 **45 Claims**

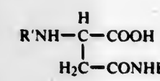
1. A nitrogen-containing composition substantially free of nitro groups made by condensing:
(A) at least one nitro phenol represented by the formula



wherein R is a substantially saturated, substantially hydrocarbyl, nonaromatic substituent bonded to an aromatic ring carbon of Ar through a direct carbon bond; a is zero or an integer of 1 up to three times A where A is the number of aromatic nuclei present in Ar; b and c are each independently integers of 1 up to three times A with the proviso that the sum a+b+c does not exceed the unsatisifed valences of Ar; and Ar is an aromatic moiety having 0 to 3 optional substituents, Opt, selected from the group consisting of halogen, —L, —OL, —CN, —NH_2, —NHL, —NL_2, —C(O)OL where L is a lower alkyl group of 1 to 7 carbon atoms and combinations of two or more of said optional substituents with
(B) at least one amine having at least one hydrogen atom directly bonded to a nitrogen atom or an oxygen atom.

4,231,758
MOTOR FUEL COMPOSITION
Mahmoud S. Kablaoui, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.
Filed Jun. 21, 1976, Ser. No. 698,436
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—71 **9 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in a gasoline boiling range containing from about 0.001 to 5.0 weight percent of a substituted asparagine having the formula:



in which R and R' each represent a secondary or a tertiary alkyl or alkylene radical having from about 7 to 20 carbon atoms and from about 0.01 to 0.05 volume percent of a carbonic acid ester having the formula:

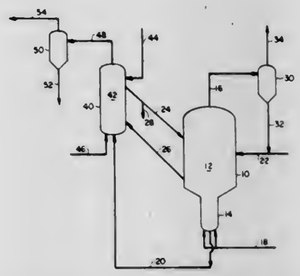


in which R is a divalent aliphatic hydrocarbon radical containing 2 to 3 carbon atoms, R' is hydrogen or an aliphatic hydrocarbon radical containing 2 to 18 carbon atoms, x has a value from 1 to 4 and n has a value from 0 to 4.

4,231,759
LIQUID HYDROCARBON FUELS CONTAINING HIGH MOLECULAR WEIGHT MANNICH BASES
John H. Udelhofen, Wheaton, and Roger W. Watson, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.
Filed Mar. 12, 1973, Ser. No. 340,016
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—75 **9 Claims**

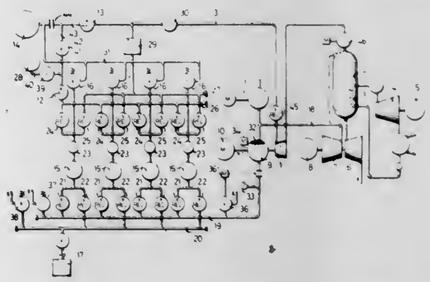
1. A liquid hydrocarbon combustion fuel containing an amount sufficient to impart improved detergency properties thereto of an additive composition comprising the condensation product of (1) a high molecular weight sulfur-free alkyl-substituted hydroxyaromatic compound wherein the alkyl group has a number average molecular weight of from about 600 to about 3,000, (2) an amine which contains an amino group having at least one active hydrogen atom, and (3) an aldehyde, wherein the respective molar ratio of reactants is 1:0.1-10:0.1-10.

4,231,760
PROCESS FOR GASIFICATION USING A SYNTHETIC CO_2 ACCEPTOR
Michael S. Lancet, and George P. Curran, both of Pittsburgh, Pa., assignors to Continental Oil Company, Stamford, Conn.
Filed Mar. 12, 1979, Ser. No. 20,005
Int. Cl.³ C10J *3/12, 3/54*
U.S. Cl. 48—197 R **1 Claim**



1. In a process for producing a synthesis gas by reacting a carbonaceous fuel with water in the presence of a CO_2 acceptor comprising calcium oxide to produce a synthesis gas rich in hydrogen with at least a portion of the carbon dioxide so produced being reacted with said calcium oxide to produce calcium carbonate and to provide sufficient heat to maintain a desired reaction temperature, the improvement comprising; using as the CO_2 acceptor, a CO_2 acceptor consisting essentially of calcium oxide supported in a refractory carrier matrix, said carrier having the general formula $Ca_5(SiO_4)_2CO_3$ wherein said calcium oxide is present in an effective amount up to about 50 weight percent, calculated as CaO based on the weight of the acceptor.

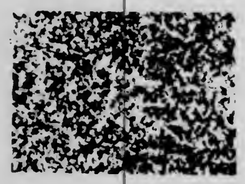
4,231,761
FLARE GAS LIMITING APPARAUS FOR COAL GASIFICATION UNIT
Helmut Meyer-Kahrweg, Wuppertal, Fed. Rep. of Germany, assignor to Steag A.G., Essen, Fed. Rep. of Germany
Filed Jun. 23, 1978, Ser. No. 918,437
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728826
Int. Cl.² F17D *3/00*
U.S. Cl. 48—192 **5 Claims**



1. A gas flare pollution reducing device comprising:
a coal pressure gasification unit having inlet means and exhaust means, said inlet means for introducing gasification agents into said gasification unit, said exhaust means for emitting product gas formed by combining gasification agents and coal in said gasification unit;
pressure reducing means, connected to said inlet means of the pressure gasification unit, for reducing the pressure of

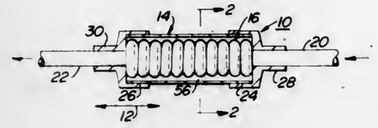
gasification agents into said gasification unit after an interruption in the operation of said gasification unit;
a start-up flare regulating valve having an upstream port and a downstream port, said upstream port connected to said exhaust means of said gasification unit;
a main flare regulating valve having an upstream port and a downstream port, said upstream port connected to said exhaust means of said gasification unit;
a start-up flare connected to said downstream port of said start-up flare regulating valve for burning product gas from said gasification unit;
orifice means, connected to said downstream port of said start-up flare regulating valve and to said downstream port of said main flare regulating valve, for limiting the flow of product gas therethrough;
a main gas flare connected to said orifice means for burning product gas from said gasification unit;
a first predetermined minimum response pressure, connected to said start-up flare regulating valve at said upstream port, for actuating said start-up flare regulating valve after an interruption in the operation of said gasification unit and when an excess quantity of product gas is formed in said gasification unit, said first predetermined minimum response pressure further being determined by the critical pressure ratio for the product gas across said start-up flare regulating valve; and
a second predetermined minimum response pressure connected to said main flare regulating valve at said upstream port for actuating said main flare regulating valve after an interruption in the operation of said gasification unit and when an excess quantity of product gas is formed in said gasification unit, said second predetermined minimum response pressure further being determined by at least 90 percent of the critical pressure ratio for the product gas across said main flare regulating valve, whereby when said start-up flare regulating valve and said main flare regulating valve are opened and said pressure reducing means are opened after an interruption in the operation of said gasification unit the product gas is permitted to flow from the gasification unit to said start-up gas flare and to said main gas flare to be burned therein thereby reducing environmental pollution.

4,231,762
METHOD OF PRODUCING A SINTERED DIAMOND COMPACT
Akio Hara, and Shuji Yazu, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Division of Ser. No. 902,812, May 4, 1978, Pat. No. 4,171,973. This application Dec. 13, 1978, Ser. No. 968,970
Claims priority, application Japan, May 4, 1977, 52-51381; Feb. 28, 1979, 54-22333
Int. Cl.³ B24D *3/06*
U.S. Cl. 51—309 **5 Claims**



1. A method of producing a sintered compact for use in a cutting tool comprising:
pulverizing a diamond powder into a particle size finer than one micron by using cemented carbide balls and a pot having a cemented carbide lining, the cemented carbide being selected from the group of WC base cemented carbide and (MoW)C base cemented carbide;
mixing the diamond powder with a powder abraded from the balls and pot, which is also pulverized into a particle size finer than one micron to produce a powder mix containing 95 to 20 volume % of the diamond powder;
degassing the powder mix in a vacuum at temperatures over 300° C; and
hot-pressing the powder mix under high pressure at high temperature within the stable range of the diamond powder.

4,231,763
EXHAUST GAS POLLUTION CONTROL SYSTEM
C. Robert Balsden, 11127 Willow Bottom Dr., Columbia, Md. 21044
Filed Aug. 29, 1978, Ser. No. 937,787
Int. Cl.³ B01D *1/00*
U.S. Cl. 55—1 **14 Claims**

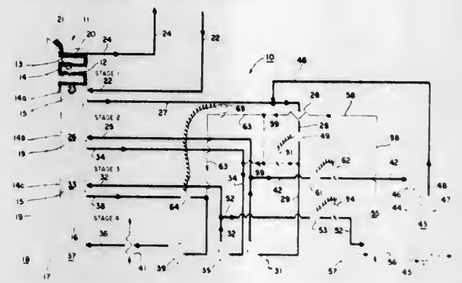


10. A method for reducing exhaust gas audio levels, particulate and chemical waste materials emitted to the atmosphere subsequent to exhaust gases passing from a combustion chamber, including the steps of:
(a) introducing said exhaust gases into a central passageway of an exhaust gas purification element having an open contour donut shape;
(b) directing a portion of said exhaust gases internal said exhaust gas purification element from said central passageway;
(c) circumferentially transporting said exhaust gases within said gas purification element;
(d) increasing the velocity of said portion of said exhaust gases directed into said exhaust gas purification element when taken with respect to a velocity of said exhaust gas within said central passageway;
(e) ejecting particulate matter through particulate ejection openings formed through a wall of gas purification element, said particulate ejection openings being located at a substantially maximum radial distance when taken with respect to said central passageway; and,
(f) reintroducing a portion of said exhaust gases within said exhaust gas purification element to said central passageway through gaseous ejection openings formed through said wall of said gas purification element, said gaseous ejection openings being located substantially adjacent said central passageway.

4,231,764
SYSTEM FOR REMOVING ORGANIC CONTAMINANTS FROM AIR
Manlio M. Mattia, 1208 Waterford Rd., West Chester, Pa. 19380
Filed Sep. 25, 1978, Ser. No. 945,327
Int. Cl.³ B01D *53/08*
U.S. Cl. 55—28 **13 Claims**

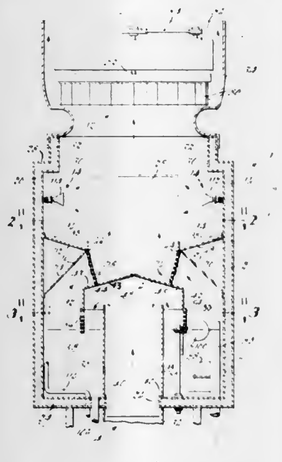
1. A continuous process for removing low concentration organic vapor contaminants from contaminated air and for recovering a portion of said organic vapor contaminants, comprising the steps of:
passing said contaminated air through a bed of moving adsorbent material to provide contaminant bearing adsorbent material,
passing a first hot partially inert regenerating gas through said contaminant bearing adsorbent material to provide a first contaminant rich partially inert gas and to provide

partially contaminated contaminant bearing adsorbent material,
passing a second hot partially inert regenerating gas through said partially contaminated contaminant bearing adsorbent material to provide substantially regenerated adsorbent material and a second contaminant rich partially inert gas,
cooling said substantially regenerated adsorbent material to provide said adsorbent material,



diverting a portion of said first contaminant rich partially inert gas through a condenser to provide a less contaminated contaminant rich partially inert gas and to recover a portion of said contaminants,
returning said less contaminated contaminant rich partially inert gas to said first contaminant rich partially inert gas from which it was diverted, and
mixing said partially inert gases.

4,231,765
AIR CLEANING APPARATUS AND METHOD
Morton J. Scott, 6472 Riverdale, Hamburg, Mich. 48139
Filed Apr. 17, 1979, Ser. No. 30,719
Int. Cl.³ B01D *47/12*; F24C *15/20*; F23J *15/00*
U.S. Cl. 55—90 **10 Claims**



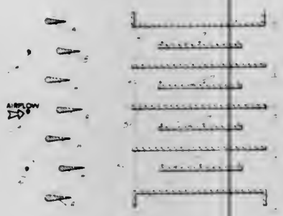
1. An apparatus for ventilating and cleaning air having smoke, grease and the like as contaminants therein, comprising:
a housing having side walls, an air inlet opening and an air exhaust opening;
an air inlet duct communicating with said air inlet opening and having an end portion extending a substantial distance into said housing;
means for moving air through said housing;
first and second lower grids positioned in the interior of said housing;
a lower baffle for directing air through said lower grids having a generally inverted V-shaped cross-section with downwardly extending side flanges, said lower baffle being located in opposition to said end portion of said inlet duct and each of said side flanges being spaced from said inlet duct and supporting one of said first and second lower grids;
first and second upper grids supported in the interior of said housing at a location generally higher than said first and second lower grids;
first and second upper baffles for respectively directing air through said first and second upper grids, each of said first and second upper baffles having a V-shaped cross-section and being attached to opposite side walls of said housing, the apex of each said first and second upper baffles being inwardly directed and supporting one of said first and second upper grids respectively;
means for providing a homogeneous sheet of water on each of said first and second upper grids and said first and second lower grids; and
each of said first and second upper grids and said first and second lower grids comprising a foraminous sheet member located generally transverse to the flow of air directed therethrough and having means associated with each perimeter edge portion thereof for preventing flow of air around said sheet member.

5. A method of removing contaminates and other foreign matter from air by passing said air through a housing and cleaning said housing, said method comprising the steps of cyclically:
(A) providing a sheet of water interior of said housing, said sheet of water being drawn from a reservoir located in the bottom portion of said housing, and said sheet of water flowing downwardly to sequentially form a first water curtain and a second water curtain spaced therefrom, said second water curtain flowing into said reservoir; and passing air sequentially through said second water curtain and said first water curtain;
(B) discontinuing step (A), draining water from said reservoir and cleaning the interior surfaces within said housing by spraying hot water thereagainst, said hot water flowing downwardly into said reservoir and being continuously drained therefrom; and
(C) discontinuing step (B) and filling said reservoir with water.

4,231,766
TWO STAGE ELECTROSTATIC PRECIPITATOR WITH ELECTRIC FIELD INDUCED AIRFLOW
Wendell P. Spurgin, Cincinnati, Ohio, assignor to United Air Specialists, Inc., Cincinnati, Ohio
Filed Dec. 11, 1978, Ser. No. 968,100
Int. Cl.³ B03C *3/08, 3/12*
U.S. Cl. 55—138 **17 Claims**

1. In an electrostatic precipitator air cleaner of the type having a plurality of spaced collecting plates for collecting charged particles, the spaces between said plates forming passageways having an inlet end and an outlet end, one or more ionizers positioned adjacent said inlet end, and means for charging said ionizers to a relatively high first electrical potential, the improvement comprising accelerator means positioned

between said ionizers and said inlet end for producing a relatively strong electric field in the region between said ionizers



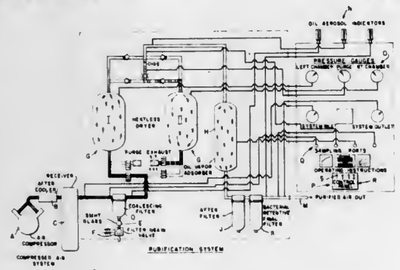
and said inlet end tending to move air through said passageways and to charge particles aspirated by said moving air.

4,231,767
LIQUID-GAS SEPARATOR APPARATUS
Roy M. Acker, Los Angeles, Calif., assignor to TRW Inc., Cleveland, Ohio
Filed Oct. 23, 1978, Ser. No. 953,598
Int. Cl.[3] B01D *19/00*
U.S. Cl. 55—186 **9 Claims**



9. Liquid-gas separator apparatus comprising a housing having an upwardly extending wall, a convoluted screen in said housing having an interior surface and an exterior surface, the exterior surface facing said wall, said screen having a lower end spaced from said wall, said screen extending upwardly and outwardly from said lower end foward said wall and having an upper end sealed to said wall, the housing having a liquid flow path which extends upwardly from the interior surface of said screen, the screen convolutions having successive peaks and troughs defining grooves extending upwardly along the screen from the lower end of the screen to the upper end of the screen, inlet means near the lower end of the screen for directing a liquid-gas mixture into the space between said screen and said wall and for constraining said mixture to flow upwardly along the exterior surface of the screen, and vent means near the upper end of the screen for venting gas from the space between the screen and said wall, the mesh size of the screen being predetermined so that liquid passes through the screen and gas passes along the exterior surface of the screen, especially in the grooves, and is vented through the vent means.

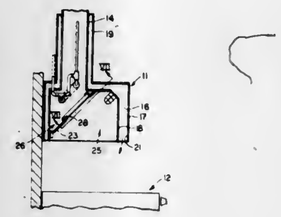
4,231,768
AIR PURIFICATION SYSTEM AND PROCESS
Chesterfield F. Seibert, Cortland, and John D. Miller, Homer, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.
Filed Sep. 29, 1978, Ser. No. 947,310
Int. Cl.[3] B01D *53/04, 53/26*
U.S. Cl. 55—179 **38 Claims**



1. An air purification system capable of removing substantially quantitatively commonly occurring gaseous liquid and solid contaminants, including water and hydrocarbons, from compressed air, thereby ensuring hydrocarbon-free moisture-free and particulate-and microbial-solid-contaminant-free compressed air, ready for application in pharmaceutical uses, comprising, in combination, and in the sequence indicated:
(1) a coalescer filter separating and removing hydrocarbon droplets and water droplets;
(2) an adsorbent dryer sorbing water vapor and hydrocarbon aerosols at least in part on particulate desiccant;
(3) an oil vapor adsorber sorbing hydrocarbon vapor and hydrocarbon aerosols at least in part on particulate activated sorbent;
(4) an after-filter separating and removing particulate solids larger than bacterial dimensions; and
(5) a bacterial-retentive final filter separating and removing particulate solids of bacterial dimensions and any remaining hydrocarbon aerosols.

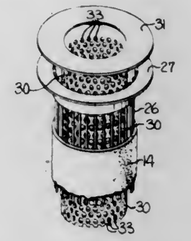
38. A air compressor and purification system capable of delivering hydrocarbon-free moisture-free and particulate- and microbial-solid-contaminant-free compressed air, ready for application in pharmaceutical uses, comprising, in combination, and in the sequence indicated:
(1) an air compressor;
(2) an after-cooler;
(3) a compressed air receiver;
(4) a coalescer filter separating and removing hydrocarbon droplets and water droplets;
(5) an adsorbent dryer sorbing water vapor and hydrocarbon aerosols at least in part on particulate desiccant;
(6) an oil vapor adsorber sorbing hydrocarbon vapor and hydrocarbon aerosols at least in part on particulate activated sorbent;
(7) an after-filter separating and removing particulate solids larger than bacterial dimensions; and
(8) a bacterial-retentive final filter separating and removing particulate solids of bacterial dimensions and any remaining hydrocarbon aerosols.

4,231,769
FILTERED VENTILATING SYSTEM
Willard K. Ahlrich, 2227 Pine Lake Dr. N.W., Stuart, Fla. 33494
Filed Feb. 21, 1978, Ser. No. 879,066
Int. Cl.[2] B01D *45/18*
U.S. Cl. 55—242 **16 Claims**



15. In a filtered ventilating system for a cooking unit, including:
a hood emplaceable above a cooking unit and opening downward theretoward for capturing fumes released during cooking;
an exhaust stack for removing cooking fumes entrapped by said hood, a barrier wall extending widthwise of said hood and dividing the interior of said hood into inlet and outlet zones respectively open to said cooking unit and said exhaust stack, said wall having a fume opening therethrough;
a filter panel disposable across said fume opening to filter out grease and the like from said cooking fumes prior to entry into said exhaust stack;
latch means for holding said filter panel in place in said fume opening;
the improvement comprising:
a pair of links, first pivots at one end of said links pivotally mounting said links on said barrier wall at opposite sides of said fume opening, the other ends of said links being pivotable from a retracted position extending along said barrier wall;
second pivots at said other end of said links pivotally mounting the central portions of sides of said filter panel on said other ends of said links for rotation of said filter panel through at least 180° with respect to said links, the maximum spacing from said first to said second pivots on each link exceeding one-half the height of the filter panel, said links being pivotable on said first pivots to an extended position angling at about a right angle from said barrier wall into said inlet zone for permitting said 180° rotation of said filter panel without interference between said filter panel and barrier wall;
said barrier wall including a bottom lip along the front bottom edge of the fume opening and extending upward to block the bottommost portion of the filter panel from moving forward into said intake zone;
said links each incorporating lost motion means acting along the length thereof (1) for increasing the separation between the first and second pivots on each link to achieve said maximum spacing, and (2) for decreasing the separation between the first and second pivots on each link to permit the lower edge of the filter panel to clear said bottom lip as said filter panel enters or leaves said fume opening.

4,231,770
BAG-TYPE FILTER APPARATUS WITH INTERNAL AIR DIFFUSER
Allen S. Johnson, Jr., P.O. Drawer 1037, Salisbury, N.C. 28144
Filed Sep. 18, 1979, Ser. No. 76,605
Int. Cl.[3] B01D *46/04*
U.S. Cl. 55—302 **10 Claims**

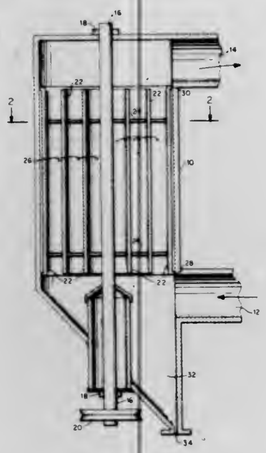


4. In a filter apparatus of the type wherein a particulate-laden gas is directed through a tubular filter bag for filtering and retaining the particulate material on the exterior of the bag, and wherein the filter bag is cleaned by a periodic reverse purge of air into the bag, said filter bag having an outlet end for discharge of the filtered gas and being supported by a tubular supporting cage positioned within said filter bag, the combination therewith of hollow perforated means having a length less than said tubular supporting cage positioned within said tubular supporting cage and cooperating with said outlet end of the filter bag for diffusing and distributing throughout the filter bag air received within said hollow perforated means when a periodic reverse purge of air is directed into the outlet end of the filter bag so as to more effectively clean the filter bag while also reducing excessive flexing of the filter bag and abrasive wear thereof to thereby provide a substantial increase in the efficiency of the filter apparatus and a significant increase in the life of the filter bag.

4,231,771
DISPERSOID SEPARATION METHOD AND APPARATUS
Warren E. Winsche, Bellport, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Apr. 28, 1978, Ser. No. 901,047
Int. Cl.[3] B01D *45/12*
U.S. Cl. 55—408 **1 Claim**

1. Apparatus for removing entrained particulate matter in the range of from five to ten microns from combustion gases produced in the burning of powdered coal, comprising:
means defining a cylindrical housing having an elongated vertical axis;
partition means, comprising a plurality of impervious wall members, for dividing the interior of said housing into a plurality of axially-extending coextensive, substantially unobstructed, annular and concentric through passages around in parallel forming annular collecting surfaces;
inlet means for directing tangentially into the lower end of said housing and said passages a flow of said combustion gases at a selected angular velocity sufficient to produce a centrifugal force on said entrained matter capable of driving said matter radially;
means for rotating said partition means around said axis at substantially said angular velocity so as to minimize the velocity difference between said gases and said surfaces and forming boundary layers of sufficient thickness to shield collecting material from the influence of the flowing gases to permit collection of substantially all of said entrained particulate matter;
hopper means located within said housing below said inlet means for removing particulate matter collect on said

surfaces when flow through said apparatus is terminated; and



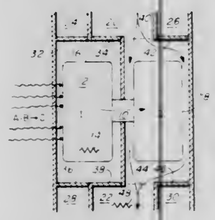
outlet means at the upper end of said housing for carrying away said gases after removal of said particulate matter.

4,231,772

SOLAR POWERED HEAT PUMP CONSTRUCTION

Charles A. Berg, Buckfield, Me., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 10, 1978, Ser. No. 950,180
Int. Cl.³ F25B *27/00, 29/00*
U.S. Cl. 62—2 **13 Claims**



1. Apparatus powered primarily by solar radiation for heating space in a building, said apparatus being operable to effect an intermittent heat pump cycle employing an adsorbent material and a working refrigerant comprising a condensible adsorbate, said apparatus comprising

first and second sealed chambers separated by a valve which, when open, provides a refrigerant vapor transfer path between the chambers,

said first chamber containing an adsorbent material, having a closed loop heat exchange system for exchanging heat with said adsorbent material, and being in thermal communication with a solar collector,

said second chamber being serviced by a second heat exchanger,

wherein said first chamber includes a heat and mass transfer promoting structure comprising a plurality of discreet wafers of adsorbent material for facilitating heat and mass transfer during adsorption/desorption, each said wafer having a surface exposed to a vapor flow path and a surface in contact with a sheet of material having high thermal conductance, said sheets being in thermal communication with said closed loop.

4,231,773

FIBROUS GLASS MANUFACTURE USING REFRACTORY BUSHING

Thomas D. Erickson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 25, 1978, Ser. No. 945,734
Int. Cl.³ C03D *37/02*
U.S. Cl. 65—1 **6 Claims**

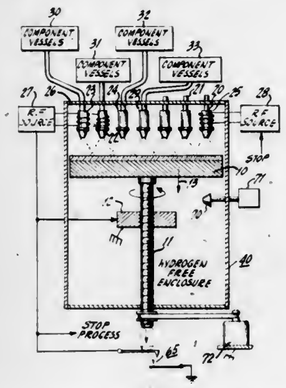
1. In a process for producing glass fibers comprising: electrically heating a bushing so as to maintain a pool of molten glass therein, and attenuating a glass stream issuing from said bushing into a glass fiber, the improvement wherein said bushing is fabricated of chromic oxide which has been doped with a sufficient amount of a dopant to increase its electrical conductivity said dopant is a compound having a cationic moiety with a valence of 1 or 2 and an ionic radius which is within about 15% of the ionic radius of chromium and an anionic moiety selected from the group consisting of oxides, halides, sulphates, carbonates and nitrates.

4,231,774

METHOD OF FABRICATING LARGE OPTICAL PREFORMS

Mokhtar S. Maklad, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,792
Int. Cl.³ C03B *37/025, 37/075*
U.S. Cl. 65—3 A **8 Claims**



1. A process for manufacturing an annular optical preform of a large diameter and of a predetermined height of the type capable of being drawn into an optical fiber, comprising the steps of:

rotating a high temperature resistant flat base member about its center,

positioning a first nozzle a predetermined distance above the center of said base member, generating an RF field at the location of said first nozzle for depositing a pyrolysed central core of glass by a vapor oxidation process on said rotating base member via said nozzle,

positioning a second nozzle adjacent said first and to the right and a third nozzle adjacent said first and to the left, both at said predetermined distance, generating an RF field at the location of said second and third nozzles for depositing by a vapor oxidation process a pyrolysed first annular glass ring about said core on said rotating base member,

positioning a fourth and a fifth nozzle with said fourth nozzle adjacent and to the right of said second nozzle and said fifth nozzle adjacent and to the left of said third nozzle each at said predetermined distance, generating an RF field at the location of said fourth and fifth nozzles for depositing by a vapor oxidation process a pyrolysed second annular glass ring about said first ring and on said rotating base member,

advancing said rotating base member away from said nozzle position at a rate determined by the growth of said central core and annular rings to form a preform whose height increases as said base member advances, with the surface of said preform being parallel to the flat surface of said base member and,

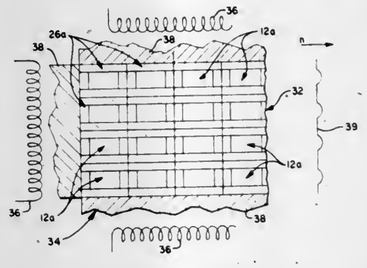
ceasing the steps of rotating, advancing and generating said RF fields, when said preform attains said predetermined height.

4,231,775

METHOD OF MAKING OMMATEAL LENSES AND PLATES

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 23, 1979, Ser. No. 32,323
Int. Cl.³ C03C *15/00, 25/06*
U.S. Cl. 65—30 E **10 Claims**



1. The method of making a unidirectionally graded refractive index columnar lens element comprising:

preparing an elongated lens preform of optical glass having a composition which includes a modifying oxide, said preform being of rectangular cross-sectional shape and having a pair of optically finished sides, one opposite the other;

positioning against each of said optically finished sides a piece of a first cladding glass which is preferentially soluble relative to the glass of said preform and substantially non-reactive with said modifying oxide;

positioning against each of remaining sides of said preform a piece of a second cladding glass which is also preferentially soluble relative to the glass of said preform but has an affinity to ions of said modifying oxide;

zonally heating and drawing the assembly of said preform and all cladding pieces sufficiently to bring at least a portion of said preform to the cross-sectional size desired of said lens element substantially without alteration of said rectangular shape of said preform;

substantially uniformly heating said portion of said preform and corresponding portions of said cladding pieces to a temperature and for a time sufficient to effect extraction of ions of the modifying oxide substantially only into said second cladding glasses;

cooling and annealing said portion of said preform; and

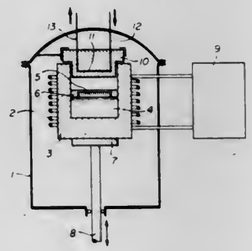
leaching all cladding glasses away from said portion of said preform whereby said portion constitutes said unidirectionally grades refractive index lens element.

4,231,776

METHOD FOR MANUFACTURING A PANEL OF ANISOTROPIC CERAMIC GLASS

Felix Trojer, Lancy, and John Briggs, Onex, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 707,756, Jul. 22, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,196
Claims priority, application Switzerland, Jul. 22, 1975, 9557/75
Int. Cl.³ C03B *27/02*
U.S. Cl. 65—33 **2 Claims**



1. A method for manufacturing a panel of anisotropic ceramic glass comprising acicular crystals enclosed in a vitreous matrix, the acicular crystals being orientated perpendicularly to the panel faces and traversing the panel from one face to the other, comprising the steps of:

(a) preparing a homogeneous plate of a homogeneous mineral composition capable of forming a ceramic glass comprising a crystalline phase and a vitreous phase from a mixture of mineral oxides and mineral compounds capable of generating such oxides or a mixture of mineral compounds capable of generating such oxides, said plate being in vitreous state and having the shape and dimensions of the panel to be obtained,

(b) placing said plate of vitreous composition on the surface of and in contact with a molten metal bath consisting of a metal or alloy of a melting point lower than the melting point of said mineral composition, said molten metal bath being provided with heating means for heating said bath to a desired temperature whereby said placing brings the lower face of said plate in contact with said bath to the same temperature,

(c) providing cooling means for cooling said plate from above said plate and employing said cooling means to bring an upper face of said plate which is free from contact with said molten metal to a temperature below said desired temperature for said bath,

(d) and monitoring and controlling said respective heating and cooling means, so as firstly to bring the whole plate to a temperature at least equal to its working temperature and above the crystallization temperature range of the crystalline phase, while bringing the upper face of said plate to a temperature lower than that of a lower face in contact with the bath surface to establish a temperature gradient perpendicular to said faces, the whole of said temperature gradient remaining above said crystallization temperature range, and then to simultaneously decrease the temperature of the two faces of said plate to effectively maintain said temperature gradient essentially constant throughout the entire growth of the crystalline phase, said temperature decrease being continued until the whole of the temperature gradient is brought below said crystallization temperature range, to effect nucleation of the crystalline phase first in the upper face and acicular crystals to then grow downwards according to a planar growth front in the direction of the lower face until said lower face is reached, and the direction of maximum

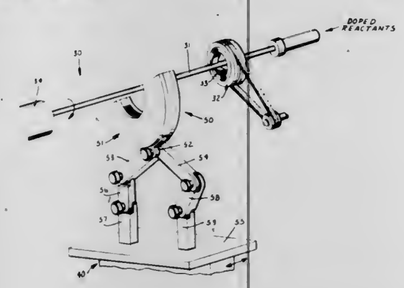
growth of the crystals thus formed being perpendicular to the faces of the panel throughout its whole thickness, whereby said panel of ceramic glass is formed.

4,231,777

METHODS OF AND APPARATUS FOR HEATING A GLASS TUBE

Brian Lynch, Norcross, and Fred P. Partus, Atlanta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 27, 1979, Ser. No. 24,289
Int. Cl.³ C03B *23/04, 37/025*
U.S. Cl. 65—109 **21 Claims**



1. A method of heating a glass tube, said method comprising the steps of:

heating an outer surface of the tube by directing a flow of combustible gases through a plurality of passageways in a housing toward a portion of the length of said tube;

cooling at least those portions of the housing and the walls that define end portions of the passageways which are adjacent the tube and from which the combustible gases exit without cooling said tube, said cooling being sufficient to inhibit degradation of the material forming said housing and said walls, and to thereby prevent contamination of the tube;

controlling the temperature profile along said portion of the length of said tube which includes providing a variable confinement of the heat to said portion of the length of the tube; and

causing relative motion between the tube and the housing along the tube to cause successive portions of the length of the tube to be heated while rotating said tube about an axis which extends along the length of the tube.

10. An apparatus for heating a glass tube, which includes:

means for supporting a tube for rotation about its longitudinal axis;

means for including a plurality of passageways for directing a flow of combustible gases toward said tube;

means for cooling at least those portions of the passageways which are adjacent the tube to inhibit contamination of the passageways and thereby prevent contamination of the tube;

means for providing a variable confinement of the heat to said portion of the length of the tube to control the temperature profile along said portion of the length of said tube, said means for providing a variable confinement including an arcuate surface spaced equidistantly from the tube for confining at least partially the tube, said means for controlling the temperature profile including means for mounting the arcuate surface for movement toward or away from the tube;

means for causing relative motion between the tube and the confining means along the tube to cause successive portions of the length of the tube to be heated; and

means for rotating the tube about an axis which extends along the length of the tube.

4,231,778

METHOD OF STRENGTHENING GLASS ARTICLES

Paul W. L. Graham, Toledo, and Thomas W. Moore, Jr., Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 18, 1979, Ser. No. 40,606
Int. Cl.³ C03B *29/00, 32/00*
U.S. Cl. 65—117 **12 Claims**

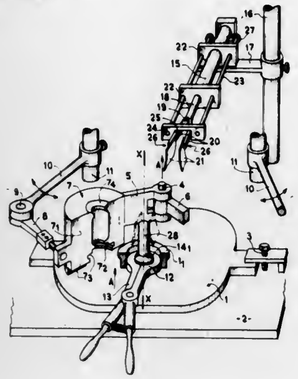
1. The method of strengthening newly-formed glass articles having surface defects in their exterior surfaces comprising the steps of allowing the said newly-formed glass articles to partially cool immediately following their formation, immediately rapidly heating the defect-containing newly-formed exterior surfaces of said articles to an elevated temperature ranging from about 1000° to 1250° F. for a period of time ranging from about 1 second to about 6 minutes, depending upon selection of the heat source, said time period being less than that which would cause visible softening or fusing of the said exterior surfaces, and then annealing said glass articles to remove stresses therefrom.

4,231,779

APPARATUS FOR MOLDING GLASS OBJECTS WITH TONGS AND SPADES

Rene E. L. Barre, 39 boulevard Bourdon, Paris, France

Filed Feb. 21, 1979, Ser. No. 13,361
Claims priority, application France, Nov. 10, 1978, 78 31899
Int. Cl.³ C03B *11/00*
U.S. Cl. 65—323 **3 Claims**



1. In apparatus for manufacturing glass objects comprising a pair of chill-mould halves each including a mould recess, means for moving said mould halves toward and away from each other whereby the mould halves are movable together with their mould recesses in registration with each other to form a mould cavity with an upright axis at a predetermined mould position, tongs including jaws sized and shaped to fit into the mould cavity and to form the lower portion of the mould cavity, whereby a gob of molten glass is placed in the mould cavity and the mould halves are moved away from each other to leave a parison supported by the jaws of said tongs at the mould position, the improvement therein of two spades movable toward and away from said mould position on opposite sides of the upright axis, and means for moving said spades first in position on opposite sides of the parison supported by said jaws and then into contact with the parision, then out of contact with the parison and finally away from positions on opposite sides of the parison.

4,231,780

TREATMENT OF PHOSPHATE ROCK ON SOIL IN SITU WITH SULFURIC ACID

Dwight D. Collins, Bakersfield, Calif., assignor to Chemsoil Corporation, Bakersfield, Calif.

Filed Sep. 3, 1976, Ser. No. 720,499
Int. Cl.² C05B *1/00*
U.S. Cl. 71—40 **14 Claims**

1. The method of providing available phosphate and gypsum to soil comprising:

(a) applying bare granules of pulverized phosphate rock which has not been previously treated by sulfuric acid to the top of the soil exposed to the air without mixing the granules into the soil or otherwise covering the granules, whereby to form a layer of granules the top of which is exposed to the air and whose area covers the top of the soil to an appreciable extent; and

(b) applying to the top of said layer, sulfuric acid of such concentration as to be containable by equipment made of cold-rolled carbon steel without substantial corrosion, more viscous than water, and deliquescent, said concentration being above about 75% H_2SO_4, whereby that portion of the sulfuric acid which contacts the granules tends to remain adherently in contact with the granules and attract water for reaction with said granules, without substantial penetration of the acid into the soil beneath the granules.

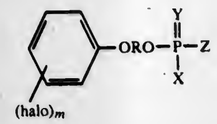
4,231,781

HALOPHENOXY-ALKOXY PHOSPHONATES AND THIOPHOSPHONATES

Fred S. Elseman, Basking Ridge, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,376
Int. Cl.³ A01N *57/10*; C07F *9/12, 9/18*
U.S. Cl. 71—87 **11 Claims**

1. A halophenoxy-alkoxy phosphonate having the formula:

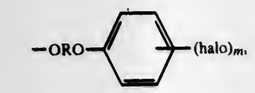


wherein

R is alkylene having from 1 to 4 carbon atoms;

Y is oxygen or sulfur

X is OH, halo,



—ORSROH or OH—NH(R‴) (ROH);

Z is—OH, halo,



or, when X is OH—NH(R‴) (ROH), then Z can also be OH—NH(R‴) (ROH);

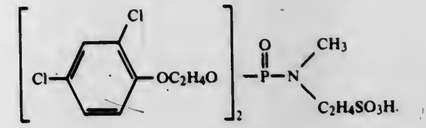
R′ is hydrogen or alkyl having from 1 to 4 carbon atoms;

R″ is an alkyl sulfonic acid or a halide or alkali metal salt thereof, where R″ contains not more than 4 carbon atoms;

R‴ is hydrogen or —ROH; and

m is an integer having a value of from 1 to 5 and wherein at least one of X and Z is other than —OH.

2. The compound of claim 1 having the formula:



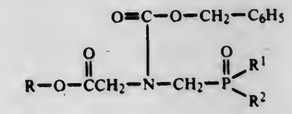
4,231,782

N-CARBOBENZOXY-N-PHOSPHONOMETHYLGLYCINE THIOESTERS

John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 3, 1978, Ser. No. 957,766
Int. Cl.³ A01N *57/12*; C07F *9/40*
U.S. Cl. 71—87 **30 Claims**

1. A compound having the formula



wherein R is a member of the class consisting of alkyl of from 1 to 10 carbon atoms, chloroalkyl of from 1 to 4 carbon atoms and containing from 1 to 3 chlorine atoms, alkoxyalkoxy of from 3 to 7 carbon atoms and alkoxyalkoxyalkoxy of from 5 to 9 carbon atoms and R^1 and R^2 are each selected from the class consisting of lower alkoxy, cyanoalkoxy containing from 2 to 4 carbon atoms, lower alkenylthio, alkylthic containing from 1 to 6 carbon atoms, phenylalkylthio wherein the alkyl group contains up to 4 carbon atoms, phenylthio and substituted phenylthio.

4,231,783

SUBSTITUTED 2-IMINO-1,3-DITHIO AND 1,3-OXATHIO HETEROCYCLIC COMPOUNDS AS HERBICIDAL ANTIDOTES

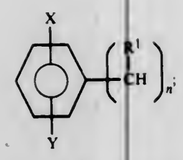
Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 15, 1978, Ser. No. 960,987
Int. Cl.³ A01N *43/02*
U.S. Cl. 71—90 **26 Claims**

1. A method of reducing injury to crop plants selected from the group consisting of rice, sorghum and wheat due to the application thereto of thiocarbamate herbicides which comprises applying to the plant locus a safening effective amount of a compound having the formula



or an agriculturally acceptable acid addition salt thereof, wherein R is



R_1 is hydrogen or lower alkyl; X and Y independently equal hydrogen, lower alkyl, lower alkoxy or halogen; n is 0, 1, 2 or 3; provided that when n is 1 R_1 cannot equal ethyl.

4,231,784

HERBICIDAL SULFONAMIDES

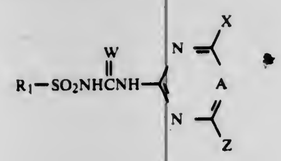
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 820,882, Aug. 1, 1977. This application May 10, 1979, Ser. No. 37,948

Int. Cl.[3] A01N *43/02*, *43/48*; C07D *239/28*, *239/34*, *403/12*

U.S. Cl. 71—92 12 Claims

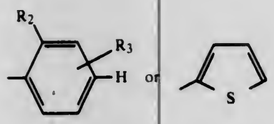
1. A compound selected from



(I)

where

R_1 is



R_2 and R_3 are independently hydrogen, fluorine, chlorine, bromine, methyl, methoxy, nitro or trifluoromethyl;

W is oxygen or sulfur;

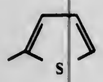
X is $-NHCH_3$ or $-N(CH_3)_2$;

Z is methyl or methoxy; and

A is

or N

and their agriculturally suitable salts provided that when R_2 is nitro or trifluoromethyl, R_3 can not be nitro or trifluoromethyl and when A is N, then R_1 is



11. A method for the control of undesirable vegetation comprising applying to the locus of such undesirable vegetation a herbicidally effective amount of a compound of claim 1.

4,231,785

HERBICIDE ANTIDOTES

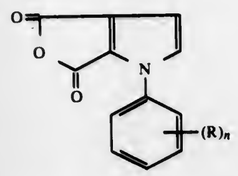
Larry W. Peterson, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 937,621, Aug. 28, 1978, abandoned. This application May 21, 1979, Ser. No. 41,266

Int. Cl.[3] A01N *25/32*, *43/70*, *43/36*

U.S. Cl. 71—93 5 Claims

1. A method for increasing the safety of the herbicide, cyanazine, with respect to a grain sorghum plant, which comprises making available to the growing sorghum plant, just before the plant is contacted with the herbicide, an effective amount of one of six antidote compounds of the formula:



wherein in each of said compounds, n and R are as follows:

n	R
0	—
1	3-(—Cl)
1	2-(—F)
1	3-($—CF_3$)
1	2-(—Cl)
2	2-(—Cl),5-(—Cl)

wherein the number indicates the position of the substituent, R, on the indicated phenyl ring.

4,231,786

COMPOSITIONS AND METHODS FOR REDUCING HERBICIDAL INJURY

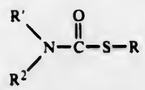
Albert J. Czajkowski, Maryland Heights, and David E. Schafer, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1974, Ser. No. 536,527

Int. Cl.[3] A01N *37/20*

U.S. Cl. 71—100 5 Claims

1. A method for reducing injury to wheat, sorghum and corn by thiolcarbamate herbicides selected from the group consisting of S-2-dichloroallyl N,N-diisopropylthiocarbamate and S-2,3,3-trichloroallyl N,N-diisopropylthiolcarbamate which comprises applying to the soil, crop or crop seed an effective safening amount of a compound of the formula



wherein R is lower alkyl, R' is hydrogen and R^2 is phenyl.

4,231,787

HERBICIDAL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME, AND METHOD OF USE THEREOF

Ryuzo Nishiyama, Takatsuki; Ryohei Takahashi, Tokyo; Kanichi Fujikawa, Kyoto; Rikuo Nasu, and Nobuyuki Sakashita, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

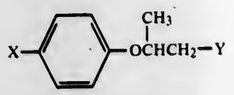
Division of Ser. No. 734,913, Oct. 22, 1976, Pat. No. 4,105,435. This application Jun. 21, 1978, Ser. No. 917,758

Claims priority, application Japan, Oct. 29, 1975, 50-129313; Apr. 23, 1976, 51-46800; Jul. 30, 1976, 51-90315

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—107 1 Claim

1. A method for controlling noxious gramineous weeds in the presence of cultivated broad leaf crops which comprises applying a herbicidally effective amount of a herbicidal composition which consists essentially of a herbicidally effective amount of at least one compound having the formula (I):



(I)

wherein X is 4-trifluoromethylphenoxy group; and Y is a hydroxy group or a phenylcarbonyloxy group as an active ingredient and an agriculturally acceptable adjuvant.

4,231,788

RIPENING OF GRAPES

Sidney R. Siemer, Fresno, Calif.; Richard S. Gordon, St. Louis, Mo., and Louis G. Nickell, Chicago, Ill., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,884

Int. Cl.[3] A01N *37/02*, *35/02*

U.S. Cl. 71—113 9 Claims

1. A method for increasing the % Brix in grapes prior to harvest by applying to the leaves of the grape vines a compound selected from the group consisting of vanillin and carboxylic acid salts containing from 3 to 5 carbon atoms.

4,231,789

METHOD FOR PROTECTING CROPS FROM SUFFERING DAMAGES

Mitsuyoshi Okii, 2611-6, Oyama-machi, Machida-shi, Tokyo; Tatsuya Onitake, 1-3, Kiso-machi, Machida-shi, Tokyo; Masanobu Kawai, 1-12-2, Asahi-machi, Machida-shi, Tokyo; Tetsuo Takematsu, 612, Mine-machi, Utsunomiya-shi, Tochigi-ken Tokyo, and Makato Konnai, 3645, Tsuruta-machi, Utsunomiya-shi, Tochigi-ken, all of Japan

Division of Ser. No. 807,743, Jun. 17, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,781

Claims priority, application Japan, Jun. 17, 1976, 51/70405; Jun. 17, 1976, 51/70406; Aug. 5, 1976, 51/92752; Jan. 24, 1977, 52/5785

Int. Cl.[2] A01N *33/04*

U.S. Cl. 71—121 7 Claims

1. A method for protecting a crop selected from the group consisting of a gramineous crop, radish, mulberry and tobacco from suffering damage selected from the group consisting of cold-weather damage, frost damage, fading of green color, damage from photochemical oxidants and wilting of leaves which comprises applying to a locus to be protected, in an amount sufficient to protect said crop, an alkylene diamine represented by the general formula:

$$H_2N-(CH_2)_n-NH_2$$

wherein n is an integer of 4–12.

4,231,790

PROCESS FOR THE PREPARATION OF TANTALUM AND NIOBIUM POWDERS OF IMPROVED EFFICIENCY

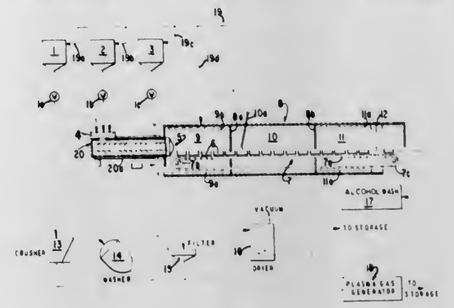
Reinhard Hähn, Langelsheim, and Dieter Behrens, Goslar, both of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 677,038, Apr. 14, 1976, abandoned. This application Nov. 2, 1978, Ser. No. 956,898

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1975, 2517180

Int. Cl.[3] B22F *9/00*; C22B *34/24*

U.S. Cl. 75—0.5 BB 21 Claims



1. A process for the preparation of a powder of high electrical capacitance of a transition metal of atomic number above 23 of column d3 of the Periodic Chart of Elements, which comprises the steps of:

heating a shallow bed of a powdered alkali metal transition metal halide selected from the group consisting of alkali metal tantalum halide and alkali metal niobium halide in a vacuum and/or under an inert atmosphere thereby removing any water and hydrogen halide present at a temperature of about 325° C. up to the sintering point of said powder to such an extent that said heating decrepitates said alkali metal transition metal halide;

mixing said powder maintained under a dry inert gas with powdered anhydrous alkali metal halide maintained under a dry inert gas and alkali metal maintained under a dry inert gas in 1:0.75–2.0:4.75–5.5 molar ratio at a temperature above the liquefaction point of said metal and below the ignition point of said mixture thereby forming a paste;

forming said paste into shaped masses;

cooling said shaped masses to a temperature below 50° C. and then igniting said shaped masses by contacting said shaped masses at a single point with a glowing external ignitor thereby initiating a reduction reaction and forming elementary tantalum or niobium;

allowing said reaction to go to substantial completion in the absence of external application of heat;

the dimensions of said shaped masses and their temperature at ignition of below 50° C. being predetermined so that the maximum temperature reached by said shaped masses during said reaction is less than about 800° C. and is between about three and five times the ignition temperature of the paste;

cooling said reacted shaped masses;

and pulverizing the reaction product and removing any alkali metal halide and alkali metal present; said steps being performed in an inert atmosphere or under vacuum while any alkali metal is present.

17. A continuous process for the manufacture of tantalum metal powder which comprises heating a shallow bed of a powdered alkali metal tantalum halide in a vacuum and/or under an inert atmosphere thereby removing any water and hydrogen halide present at a temperature of about 325° C. up to the sintering point of said powder to such an extent that said heating decrepitates said alkali metal tantalum halide, mixing

said powder maintained under a dry inert gas with dry powdered anhydrous alkali metal halide maintained under a dry inert gas and an alkali metal maintained under a dry inert gas in 1:0.75–2.0:4.75–5.5 molar ratio at a temperature above the melting point of said metal and below the ignition point of said mixture thereby forming an extrudable paste, extruding said paste into shaped masses in open containers, the dimension of said shaped masses of paste in said open containers and their temperature at ignition of below 50° C. being predetermined so that the maximum temperature reached by said shaped masses during said reaction is less than about 800° C. and is between about three and five times the ignition temperature of the paste, conveying said shaped masses in open containers therefor through a continuous reaction chamber having an inert atmosphere and a cooling section, an ignition section, a combustion section and another cooling section, cooling said shaped masses in said containers in said cooling section to a temperature below 50° C., igniting said shaped masses in said container in said ignition section by contacting said shaped masses at a single point with a glowing external ignitor, allowing the combustion which occurs to proceed to completion in said combustion section in the absence of external application of heat, cooling said reacted shaped masses in said cooling section to below 50° C., discharging said containers from said reaction chamber, removing the reaction product from said containers, recycling said containers, and removing any alkali metal halide and alkali metal present in said reaction product, said reaction mixture being maintained under an inert atmosphere at least until said reaction is substantially complete.

4,231,791

ROASTING OF SULPHIDE MATERIALS

James A. Charles, Stapleford, England, assignor to Metallurgical Processes Ltd. and I.S.C. Smelting Ltd., both of, The Bahamas

Filed Jul. 5, 1979, Ser. No. 54,872

Claims priority, application United Kingdom, Jul. 4, 1978, 28729/78

Int. Cl.³ C22B *1/10, 13/00, 19/00*

U.S. Cl. 75—9 **6 Claims**

1. A process for roasting zinc/lead sulphide materials, comprising forming substantially spherical pellets composed predominantly of lead sulphide, coating said pellets with predominantly zinc sulphide material, and then roasting the coated pellets in a roasting apparatus to effect oxidation of sulphide, predominantly to oxide.

4,231,792

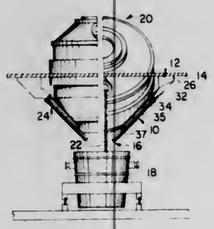
CHUTE WITH HAZARDOUS FLAME AND FUME CONTROL

Frederic J. Adelsperger, Highland, Ind., assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 23, 1979, Ser. No. 23,336

Int. Cl.³ C21C *7/00*; C21B *7/16*

U.S. Cl. 75—53 **8 Claims**



1. In apparatus for making additions to molten metal, said apparatus including a tubular chute having an upper entry opening for receiving additions and a lower discharge opening adapted to be located adjacent an open vessel into which the molten metal is poured, said chute having a tendency to act as a chimney for hot gases, the improvement comprising means to inject gas into the chute between the upper entry opening and the lower discharge opening in directions toward the discharge opening and across the chute, at a flow rate and pressure sufficient to prevent an upward flow of hot gases through the chute when molten metal is poured into a vessel adjacent the lower discharge opening, and to create a lower than ambient pressure at the upper entry opening.

4,231,793

NICKEL-BASE ALLOY

Gerhard Kruske, Oberursel; Otto Knotek, Aachen, both of Fed. Rep. of Germany, and Erich Lugscheider, Vaals, Netherlands, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,519

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829702

Int. Cl.² C22C *19/05*

U.S. Cl. 75—122 **4 Claims**

1. A nickel-base alloy which is resistant to corrosion, abrasion, erosion, cavitation and temperature cycles and possesses a high high-temperature strength, consisting essentially of the following composition in percent by weight:

Carbon: 0.5 to 5
Tungsten: 2 to 15
Chromium: 25 to 55
Boron: 0.5 to 3.5
Phosphorus: 0.5 to 4.5
Silicon: 1 to 5
Iron: 1 to 5
Nickel: balance

and meets the following boundary conditions:

(a) percent by weight C = percent by weight C_1 = percent by weight C_2 + 0.2;
(b) percent by weight W = 36 × percent by weight C_1;
(c) percent by weight Cr ≧ 17 + 9 × percent by weight C_2 − 4 × percent by weight C.

4,231,794

LEAD BASED ALLOY FOR THE BONDING OF ALUMINUM PARTS TO PARTS COMPRISING AN ALLOY OF A HEAVY METAL

Jean-Pierre Moranne, Franconville, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Apr. 13, 1979, Ser. No. 29,862

Claims priority, application France, Apr. 20, 1978, 78 11759

Int. Cl.³ B23K *35/26*

U.S. Cl. 75—166 C **3 Claims**

1. Soldering alloy having a lead base for the soldering or soft brazing of parts of which at least one part is made of aluminum or aluminum alloy and another part is made of an alloy of heavy metal selected from copper, brass, stainless steel and the like, comprising:

70 to 90% lead by weight
10 to 30% cadmium by weight
0.5 to 2% tin by weight and
between 0.2 and 1% antimony by weight.

4,231,795

HIGH WELDABILITY NICKEL-BASE SUPERALLOY

Robert C. Gibson, Ringwood, N.J., and Michael K. Korenko, Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 22, 1978, Ser. No. 917,833

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 **5 Claims**

1. A nickel base alloy consisting essentially of, by weight percent, 57–63 Ni, 7–18 Cr, 10–20 Fe, 4–6 Mo, 1–2 Nb, 0.2–0.8 Sl, 0.01–0.05 Zr, 1.0–2.5 Ti, 1.0–2.5 Al, 0.02–0.06 C and 0.002–0.015 B, said alloy being characterized by a combination of long-term structural stability, strength and excellent weldability.

4,231,796

INTERNAL ZONE GROWTH METHOD FOR PRODUCING METAL OXIDE METAL EUTECTIC COMPOSITES

Grady W. Clark, Oak Ridge; John D. Holder, Knoxville, and Arvid E. Pasto, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 28, 1978, Ser. No. 964,406

Int. Cl.³ B22F *3/00*

U.S. Cl. 75—206 **8 Claims**

1. A method for preparing a cermet composite comprising the steps of

(a) preparing a compact having about 85 to 95 percent theoretical density from a mixture of metal and metal oxide powders, said metal and metal oxide comprising a system containing a eutectic composition; and
(b) inductively heating said compact in a radiofrequency field to cause the formation of an internal molten zone contained within an external solid skin of compact material, said metal oxide particles in said powder mixture being effectively sized relative to said metal particles to permit direct inductive heating of said compact by said radiofrequency from room temperature to form said internal molten zone.

4,231,797

FIRED IRON-ORE PELLETS HAVING MACRO PORES

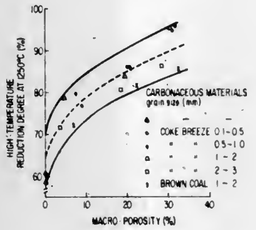
Isao Fujita, Kobe; Mamoru Onoda, Miki; Fumikazu Kawaguchi, Kobe; Yoshimichi Takenake, Kobe, and Tadao Tsutaya, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 774,067, Mar. 3, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,837

Claims priority, application Japan, Mar. 3, 1976, 51-23647

Int. Cl.³ B22F *3/10*

U.S. Cl. 75—256 **1 Claim**



1. Fired iron ore pellets containing macro pores ranging from 0.1 to 3 mm in diameter dispersed throughout each of said pellets at a ratio of from 5 to 25% relative to all of the pores contained in each pellet and which have been prepared by firing a green pellet comprising up to 4% of a carbonaceous material having a grain size of from 0.1 to 3 mm, from 3 to 9% dolomite, iron ore particles wherein 60–95% of the said iron particles are up to 44μ in size and 15 to 25% of said iron ore particles are up to 10μ in size, and limestone in an amount so as to adjust the CaO/SiO_2 ratio to about 1.2.

4,231,798

ALLOY CARRIER FOR CHARGING CUPOLA FURNACES

Hans Schramm, and Klaus Schramm, both of Essen, Fed. Rep. of Germany, assignors to Frank & Schulte GmbH, Essen, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,938

Int. Cl.³ C22C *37/00*

U.S. Cl. 75—256 **1 Claim**

1. An alloy carrier for charging cupola furnaces, the carrier having the form of bodies molded with cement, the alloys being manganese in the form of ferromanganese and silicon, in the following composition:

8–40% by weight, Mn
9–22% by weight, C
2–9% by weight, Fe
18–45% by weight, Si
15–30% by weight, Portland Cement
4–8% H_2O, chemically bound
2–7% impurities

characterized by the employment of ferromanganese carbure having a carbon content of 6% to 8% as the manganese carrier and silicon carbide as the silicon carrier.

4,231,799

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Jürgen Rochlitz, Breckenheim, and Günter Schön, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

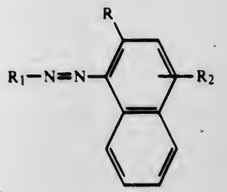
Continuation of Ser. No. 354,199, Apr. 25, 1973, abandoned. This application May 15, 1975, Ser. No. 577,953

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1972, 2242627

Int. Cl.² G03G *5/04*

U.S. Cl. 430—59 **11 Claims**

1. An electrophotographic recording material comprising an electroconductive support material with a photoconductive double layer of organic materials composed of a tightly packed, homogeneous, uniform, opaque, charge carrier producing dyestuff layer prepared by vacuum evaporation of the dyestuff and a transparent top layer of insulating materials with at least one charge transporting compound, in which the organic dyestuff layer is composed of the general formula



in which

R is a hydroxyl or amino group,
R_1 is phenyl, naphthyl or quinolyl which are optionally substituted by hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro groups, halogen or by carbamoyl or sulfonamido groups which are optionally substituted at the nitrogen by C_1–C_4 alkyl, C_1–C_4 alkenyl, phenyl or cyclohexyl groups,
R_2 is hydrogen, amino or carbamoyl, which may be N-substituted by phenyl, naphthyl or benzimidazolonyl

and in which the transparent top layer is composed of a mixture of a charge transporting monomeric heterocyclic compound with at least one substituted amino group and having an extended π-electron system, which is selected from the group of oxazoles, oxdiazoles, triazoles, imidazoles and pyrazoles, and a binder in a ratio by weight of about 1:1,
which recording material is useful in an electrophotographic copying process with negative charging of the top layer.

4,231,800

DRY HEAT SETTING REFRACTORY AND METHODS OF USING SAME

John P. Holt, Ladue, and Theodore P. Cash, Bonne Terre, both of Mo., assignors to Valley Mineral Products Corporation, St. Louis, Mo.

Filed May 14, 1979, Ser. No. 38,918
Int. Cl.³ C04B 35/04
U.S. Cl. 106—58 8 Claims

1. A dry heat setting refractory composition which forms an adhesive bond in situ upon application of sufficient heat to melt said alkali silicate, comprising about 94% to about 98% refractory material and about 6% to about 2% of hydrated alkali silicate, said refractory material being sized so that it contains about 28% to about 38% coarse fraction, about 38% to about 48% intermediate fraction and about 15% to about 25% fine fraction, said fine fraction containing sufficient magnesite to react with the alkali silicate present to form fosterite and a solid solution of alkali oxide in excess MgO to provide a bond preventing the refractory from breaking up at temperatures above the melting point of said alkali silicate, said composition being substantially free of water and materials which generate substantial amounts of liquid at or below steelmaking temperatures.

4,231,801

CEMENT AND CONCRETE MIXTURE

Harvey R. Dunton, Anaheim, Calif., assignor to Associated Concrete Products, Inc., Santa Ana, Calif.

Filed Sep. 14, 1978, Ser. No. 942,310
Int. Cl.³ C04B 31/02
U.S. Cl. 106—97 5 Claims

1. A composition for concrete comprising:
(a) water,
(b) fine and coarse aggregate; and
(c) a cement mixture which in turn comprises from about 20% up to about 25% fines of alumino-silicate petroleum cracking catalysts with the balance being a cementing agent.

4,231,802

METHOD OF MIXING DIFFICULTY DISPERSIBLE MATERIAL, E.G., FAT OR WAX, IN A GUM-MICROCRYSTALLINE CELLULOSE MATRIX, AND POWDER PRODUCT

Emanuel J. McGinley, Morrisville, Pa., and Joseph M. Zuban, Holiday, Fla., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 691,267, Jun. 1, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 923,501
Int. Cl.³ A21D 2/18; C08L 1/02
U.S. Cl. 106—197 C 5 Claims

1. A method of preparing powders and granules capable of forming in cold water with only mild agitation, a stabilized micro-dispersion of a difficult to disperse material; said method comprising mixing the difficult to disperse material in liquid form with a matrix comprising by weight from about 70 to about 99 parts of disintegrated beta-1,4 glucan and from about 1 to about 30 parts of a water soluble polymer selected from sodium carboxymethyl cellulose, xanthan gum, sodium alginate, carrageenan, tragacanth gum, karaya gum and pregelatinized waxy maize starch intimately associated with the beta-1,4 glucan, the ratio by weight between the difficult to disperse material and the matrix being not greater than about 1:4, adding sufficient water to swell the matrix and form a paste, said water amounting to from about 10% to about 85% of the weight of the paste, mixing the paste to distribute said difficult to disperse material therethroughout, and continuing to mix while heating the paste to drive off the added water.

4,231,803

STARCH ADHESIVE COMPOSITION CONTAINING AN OXIDIZED WAXY STARCH ESTER

Edward M. Bovler, St. Louis County, and James A. Carter, St. Louis, both of Mo., assignors to Anheuser-Busch Incorporated, St. Louis, Mo.

Filed May 22, 1978, Ser. No. 908,222
Int. Cl.³ C08L 3/06
U.S. Cl. 106—213 15 Claims

1. A composition suitable for use as a remoistening adhesive for gummed tape comprising an esterified oxidized waxy starch ester, a plasticizer, and water, said waxy starch ester having an acyl substitution of about 1.5% to about 2% and about 0.3% to about 0.5% carboxyl groups, said composition when applied to tape, dried, and remoistened having tack properties similar to those of an adhesive made from animal glue.

4,231,804

VAPOR STRIPPING METHOD

Robert C. Petterson, 7800 Cohn St., New Orleans, La. 70118, and Roger C. Loubier, 1000 Milton St., Gretna, La. 70053

Filed Jan. 17, 1978, Ser. No. 870,103
Int. Cl.² B08B 5/00
U.S. Cl. 134—11 22 Claims

1. A method for stripping a protective coating from the surface of a coated object, comprising circulating a stream of a stripping composition in a gaseous state at about ambient temperature and pressure into contact with said surface for a time sufficient to destroy the adhesion between said protective coating and said surface and substantially in the absence on said surface of liquid condensate of said stripping composition, said stripping composition normally being a liquid and having a partial pressure of at least about 5 mm. of Hg. at ambient temperature and pressure.

4,231,805

VAPOR STRIPPING PROCESS

Robert C. Petterson, 7800 Cohn St., New Orleans, La. 70018, and Roger C. Loubier, 1000 Milton St., Gretna, La. 70053

Continuation-in-part of Ser. No. 870,103, Jan. 17, 1978. This application Jan. 4, 1979, Ser. No. 1,053
Int. Cl.² B08B 5/00
U.S. Cl. 134—11 33 Claims

20. A method for stripping an organic coating from the surface of a coated object comprising circulating a stream of a stripping composition in a gaseous state into contact with said surface for a period of time sufficient to destroy the adhesion between said organic coating and said surface, said stripping composition being normally liquid and having a partial pressure of at least about 5 mm. Hg. at ambient temperature and pressure, said contacting being carried out with neither said stripping composition nor said surface above about ambient temperature and with at least one of said surface or said stripping composition being cooled below ambient temperature.

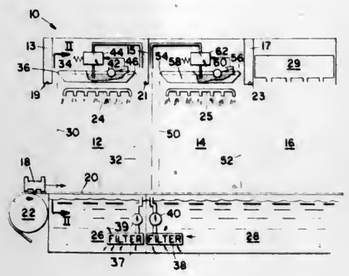
4,231,806

FLUID BARRIER MEANS FOR PARTS WASHER APPARATUS

William P. Henry, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1978, Ser. No. 936,960
Int. Cl.³ B08B 7/04
U.S. Cl. 134—18 3 Claims

3. A method of isolating a wash zone (12) in a parts washer (10) having openings defining entrance and exit passages (19, 21) of said wash zone (12), comprising:
passing a generally continuous laminar liquid curtain (30 or 32) across at least one of said openings, including supplying a source of liquid to a reservoir (34) positioned at the top of said wash zone (12) and maintaining a level of liquid in said reservoir (34) sufficient to provide a continuous



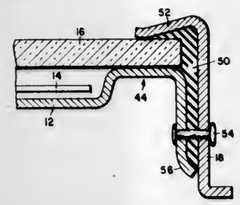
flow of the liquid over at least one edge (36 or 46) of said reservoir (34).

4,231,807

ENCLOSURE FOR A SOLAR CELL ARRAY

Michael C. Keeling, Tempe, and Dwight E. Doss, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 865,038, Dec. 27, 1977, Pat. No. 4,170,507. This application May 11, 1979, Ser. No. 38,152
Int. Cl.³ H01L 31/04
U.S. Cl. 136—251 3 Claims



1. An enclosed solar cell module which comprises:
a cover glass;
a flexible metallic back plate, configured so that a solar cell array can be positioned between said cover glass and said back plate, said back plate having an edge lip against which said cover glass can sit;
an array of solar cells positioned between said cover glass and said back plate;
a potting material filling the volume between said cover glass and said back plate and surrounding said solar cell array, said potting material flexing said back plate and being compressively loaded by positioning said cover glass against said edge lip; and
an edge seal around said enclosure comprising a pliable gasket material and a metal bezel, said edge seal confining said potting material within said enclosure and holding said cover glass against said edge lip.

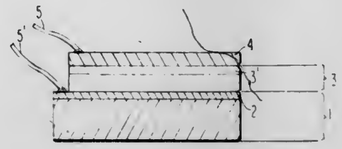
4,231,808

THIN FILM PHOTOVOLTAIC CELL AND A METHOD OF MANUFACTURING THE SAME

Masatoshi Tabei; Kazuhiro Kawaziri, and Yosuke Nakajima, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 5, 1979, Ser. No. 72,817
Claims priority, application Japan, Sep. 5, 1978, 53-108958
Int. Cl.³ H01L 31/04
U.S. Cl. 136—260 17 Claims

1. A method of manufacturing a photovoltaic cell which comprises providing a thin coating of n-type CdTe of up to about 2 microns thick on a conductive surface of a substrate, heat-treating said CdTe thin coating at a temperature of from about 80° to 210° C. for a period of from 20 to 180 minutes to form a modified surface region of said CdTe coating, and providing a transparent output electrode on the surface of said heat-treated thin coating opposite the substrate.



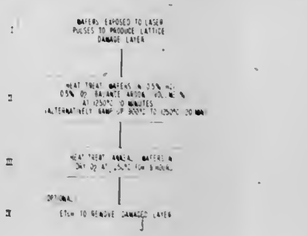
6. A thin film photovoltaic cell comprising a conductive support, an overlying n-type CdTe layer having a thickness of up to about 2 microns which has been heat-treated at about 80° to 210° C. for about 20 to 180 minutes and a transparent electrode on the surface of said heat treated CdTe layer opposite said support.

4,231,809

METHOD OF REMOVING IMPURITY METALS FROM SEMICONDUCTOR DEVICES

Paul F. Schmidt, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 25, 1979, Ser. No. 42,401
Int. Cl.³ H01L 21/322, 21/324
U.S. Cl. 148—1.5 8 Claims



6. In a process for gettering transition metal impurities from a body of silicon semiconductor material which comprises heating the body in an ambient which includes hydrogen chloride and dry oxygen
the improvement comprising the ambient comprises by volume, hydrogen chloride about 0.5 percent, oxygen from about 0.5 to 1.0 percent, and the balance argon.

4,231,810

PROCESS FOR PRODUCING BI-POLAR CHARGE COUPLED DEVICES BY ION-IMPLANTATION

Ottomar Jäntsch, Ottobrunn, and Jenö Tihanyi, Munich, both of, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,960
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837485
Int. Cl.³ H01L 29/78, 21/265
U.S. Cl. 148—1.5 8 Claims

1. A process for producing a charge coupled device for sensors and memories comprising:
(a) providing a semiconductor substrate of a first conductivity type;
(b) producing regions of a second conductivity type in said semiconductor substrate via ion implantation so as to form a shift channel;

(c) producing zones of said first conductivity type in said regions via ion implantation;
said regions and zones being arranged in series, with each region being separated from other regions and each zone being separated from other zones;

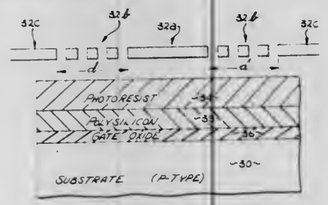


(d) producing a control electrode between an interspace between said zones and above portions of said zones which are adjoin said interspace; and
(e) producing a relatively highly doped region of said second conductivity type at each end of said shift channel via ion implantation.

4,231,811
VARIABLE THICKNESS SELF-ALIGNED PHOTORESIST PROCESS

Sasson Somekh, Redwood City, and C. Norman Ahlquist, Menlo Park, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 13, 1979, Ser. No. 75,095
Int. Cl.³ H01L 21/26
U.S. Cl. 148—1.5 **11 Claims**



1. In the fabrication of integrated circuits, a process for forming a layer of photo-sensitive material having two different thicknesses comprising the steps of:
providing a masking member having at least one area which substantially blocks light and a second area which includes a plurality of spaced-apart features of predetermined dimensions and spacing;
projecting light with a projection means through said masking member onto a layer of said photo-sensitive material, said projection means for resolving images only with dimensions greater than those of said features, such that said photo-sensitive material receiving light passing through said second area of said masking member is uniformly illuminated at an intermediate intensity; and
developing said photo-sensitive material;
whereby two different thicknesses of said layer are formed with a single masking step.

4,231,812
SURFACE TREATMENT OF METAL STRIP

Philippe Paulus, Liege, and Jules Hancart, Jupille, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Mar. 13, 1979, Ser. No. 20,196
Claims priority, application Belgium, Mar. 14, 1978, 864899
Int. Cl.² C23F 7/10; C21D 1/60
U.S. Cl. 148—6.15 R **17 Claims**

1. A method of treating the surface of a steel strip and coating it with a phosphate layer, during thermal treatment which comprises quenching after recrystallization, the method comprising the following steps:
(a) heating the strip to a temperature higher than the recrystallization temperature and holding at this temperature; and
(b) quenching the strip in a phosphating bath having a temperature of at least 80° C. and containing at least one phosphate of the type $Me(H_2PO_4)_n$, where Me is selected from Zn, Ni, Mn, and alkali metals, at a concentration in the range 1 to 20 g/l.

4,231,813
METHOD OF PREPARING A CATHODE ELECTROCATALYST

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

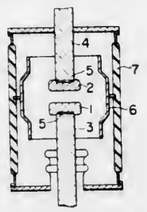
Division of Ser. No. 916,637, Jun. 19, 1978. This application May 24, 1979, Ser. No. 42,166
The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.
Int. Cl.² C25B 1/46, 11/04
U.S. Cl. 148—6.3 **4 Claims**

1. A method of preparing an electrode comprising the steps of:
(a) depositing tungsten, cobalt, and phosphorous onto a metal substrate; and
(b) heating the substrate in the presence of an oxygen containing oxidizing atmosphere sufficiently to form a porous surface rich in oxycompounds of cobalt of the plus three oxidation state.

4,231,814
METHOD OF PRODUCING A VACUUM CIRCUIT BREAKER

Ryuji Watanabe, Tokaimura; Hideo Arakawa, and Keiichi Kuniya, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 22, 1979, Ser. No. 13,807
Claims priority, application Japan, Feb. 22, 1978, 53/18502; Feb. 24, 1978, 53/19659
Int. Cl.² C21D 1/44
U.S. Cl. 148—11.5 C **10 Claims**



1. A method of producing a vacuum circuit breaker having breaker contacts made of a cast alloy, said cast alloy containing copper or a copper alloy as its main component and, as the sub-component, a metal having a lower melting point and a higher vapour pressure than said main component and having a solubility limit to said main component at room temperature, said sub-component being contained in excess of said solubility limit at room temperature,
characterized by comprising the steps of heating said cast alloy in a vacuum atmosphere at a temperature of 800° C. or higher but not so high as to cause a melting of said cast alloy to spheroidize said sub-component in said main component and to remove sub-component exuded to the surface of said cast alloy from said surface and then mounting said cast alloy as said breaker contacts into said vacuum circuit breaker.

4,231,815
COPPER ALLOY BRAZING PASTE

John L. Snyder, Cleveland, Ohio, assignor to SMC Corporation, New York, N.Y.

Filed Aug. 9, 1979, Ser. No. 65,374
Int. Cl.³ B23K 35/34
U.S. Cl. 148—24 **2 Claims**

1. A copper-manganese brazing paste composition for brazing at temperatures between about 1650° C. and 1850° C., comprising:
the alloy powder having an average particle size between 5 and 177 microns and dispersed in fugitive binder to provide a brazing paste containing by weight between 2% and 50% said fugitive binder, said alloy powder being an alloy consisting essentially of on a weight basis 60% to 75% copper, 24% to 37% manganese, and 0.5% to 3% silicon.

4,231,816
AMORPHOUS METALLIC AND NITROGEN CONTAINING ALLOY FILMS

Jerome J. Cuomo, Lincolndale; Amitava Gangulee, Croton-on-Hudson, and John Kobliska, Mount Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,115
Int. Cl.³ C04B 35/00
U.S. Cl. 148—31.55 **12 Claims**

1. An amorphous metallic alloy film composed of nitrogen with at least one transition metal selected from the group consisting of Cr, Fe, Co, and Ni and with at least one element selected from the group consisting of B, Si, Al, C, and P, wherein the nitrogen content of said alloy is greater than about 1 atomic percent.

4,231,817
EXTRUDED CORROSION RESISTANT STRUCTURAL ALUMINUM ALLOY

Yo Takeuchi, Urawa; Koichi Ohbori, Ohmiya; Masabumi Hatsushika, Kitamoto, and Shinichi Komori, Urawa, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Ohtemachi, Japan

Filed Nov. 9, 1978, Ser. No. 959,094
Int. Cl.³ C22C 21/10
U.S. Cl. 148—32.5 **4 Claims**

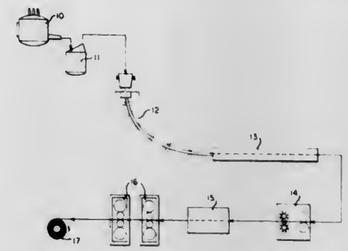
1. An extruded corrosion-resistant aluminum alloy structural element having a strength of from 25 to 40 kg/mm² prepared by extrusion and heating treatment of an aluminum alloy which consists essentially of, in weight percentage
magnesium from 0.45 to 0.98%,
silicon from 0.3 to 0.8%,
zinc from 0.5 to 2.5%,
and
the balance aluminum and incidental impurities.

4,231,818
METHODS OF PRODUCING SILICON STEEL STRIP

Robert H. Henke, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 680,527, Apr. 26, 1976, abandoned, which is a division of Ser. No. 493,531, Aug. 1, 1974, Pat. No. 3,969,162, which is a division of Ser. No. 239,538, Mar. 30, 1972, Pat. No. 3,843,422. This application May 22, 1979, Ser. No. 41,341
The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl.³ H01F 1/04
U.S. Cl. 148—111 **5 Claims**

1. The method of producing silicon steel strip for magnetic purposes from slabs comprising the steps of:
(a) heating the slabs to a temperature above 2200° F., to stabilize MnS, and immediately rolling said slabs into strip in a planetary mill of the Zendzimer type to a thickness range of about 0.060 to 0.150 inch while maintaining the



temperature in the temperature range 2100° F. to 2200° F., during said rolling, and
(b) quenching the strip to precipitate MnS.

4,231,819
DIELECTRIC ISOLATION METHOD USING SHALLOW OXIDE AND POLYCRYSTALLINE SILICON UTILIZING A PRELIMINARY ETCHING STEP

Jack I. Raffel, Lexington, and Stephen E. Bernacki, Worcester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 773,637, Feb. 28, 1977, Pat. No. 4,184,172, which is a continuation-in-part of Ser. No. 747,743, Dec. 6, 1976, abandoned. This application Jul. 27, 1979, Ser. No. 61,374
Int. Cl.² H01L 21/20, 21/302, 21/76
U.S. Cl. 148—175 **3 Claims**

1. A method for achieving isolation of the silicon islands of integrated circuits comprising:
isotropically etching to a predetermined depth those portions of a silicon substrate surface which correspond to the area surrounding the bottom of silicon islands to be subsequently grown,
oxidizing the preceding etched silicon surface,
simultaneously growing a polycrystalline layer of silicon on said oxidized surface and an epitaxial layer on the remaining portions of said silicon substrate to form said silicon islands,
masking the surface of said silicon islands leaving the portions of said islands contiguous to said polysilicon surface unmasked and also any regions of said island surface for oxide isolation between impurity junctions,
oxidizing the exposed silicons, the depth of such silicon etching and the thickness of said oxide being such that the top of said oxide is substantially co-planar with the top surface of the masked silicon islands and the bottom of the oxide extends below the junction depth of junctions to be subsequently formed in said epitaxial silicon islands,
removing said mask on the surface of the silicon islands to provide a surface into which impurities may be provided to form junction devices in said islands.

4,231,820
METHOD OF MAKING A SILICON DIODE ARRAY TARGET

William N. Henry, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

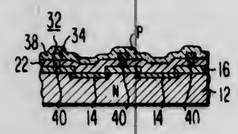
Filed Feb. 21, 1979, Ser. No. 13,120
Int. Cl.³ H01L 21/225
U.S. Cl. 148—187 **13 Claims**

1. In a method of making a silicon diode array target of the type wherein an insulating layer is deposited on a semiconductor substrate of a first conductivity type and an array of apertures is formed through said layer exposing said substrate, wherein the improvement comprises the steps of:
(a) depositing a film of substantially intrinsic polycrystalline

silicon over said insulating layer and the exposed substrate in said openings;

(b) forming photolithographically on said film a masking layer having a plurality of interconnecting members defining an array of openings in substantial register with said apertures and exposing said intrinsic film, each of said elements being formed to have a predetermined width;

(c) diffusing through said openings a second conductivity type doping element laterally into a portion of said intrinsic film underlying an edge portion of each of said masking members, so that the width of the undoped intrinsic film underlying each of said masking members is less than the predetermined width;



(d) simultaneously driving said doping element through the intrinsic film deposited in said opening into said substrate to form an array of PN junctions therein;

(e) removing said masking layer; and

(f) selectively etching away the undoped intrinsic film to form an array of doped polycrystalline silicon pads separated by the width of the removed undoped intrinsic film.

4,231,821

EMULSION BLASTING AGENT SENSITIZED WITH PERLITE

Walter B. Sudweeks, Orem, and Larry D. Lawrence, Salt Lake City, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

Filed May 21, 1979, Ser. No. 41,154
Int. Cl.³ C06B 45/02
U.S. Cl. 149—21 **11 Claims**

1. A cap-sensitive water-in-oil emulsion blasting composition comprising a water-immiscible liquid organic fuel as a continuous phase, an emulsified aqueous inorganic oxidizer salt solution as a discontinuous phase, an emulsifier, and perlite in an amount of from about 1.0% to about 8% by weight based on the total composition having an average particle size ranging from about 100 microns to about 150 microns as a sensitizing agent and a density reducing agent in amount sufficient to reduce the density of the composition to within the range of from about 0.9 to about 1.4 g/cc and to render the composition cap-sensitive.

4,231,822

NON-POLLUTING PROCESS FOR DESENSITIZING EXPLOSIVES

Milton Roth, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 18, 1978, Ser. No. 970,404
Int. Cl.³ C06B 21/00
U.S. Cl. 149—109.6 **5 Claims**

1. A method for desensitizing an explosive material containing at most the elements of carbon, hydrogen, oxygen and nitrogen, said method consisting essentially of:

preparing a slurry of said explosive material in an aqueous solution of a reductant containing no elements besides those contained in said explosive material, said reductant being selected from the group consisting of acetaldehyde, citric acid, formaldehyde, formic acid, lactic acid, maleic acid, malic acid, malonic acid, oxalic acid, tartaric acid and glucose, wherein said explosive material is present essentially in solid, particulate form, and

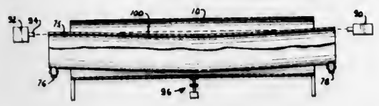
reacting said explosive material and said reductant in said slurry for a period of time sufficient to achieve desensitization of said explosive material.

4,231,823

METHOD AND APPARATUS FOR CENTERING TWO CONCENTRIC CYLINDERS

Milburn L. Hart, La Marque, Tex., and John F. Bridge, Worthington, Ohio, assignors to H. C. Price Co., Bartlesville, Okla.

Division of Ser. No. 857,088, Dec. 5, 1977, Pat. No. 4,141,130.
This application Dec. 13, 1978, Ser. No. 969,289
Int. Cl.² G01B 1/00
U.S. Cl. 156—64 **10 Claims**



1. A method for monitoring the position of a section of pipe within a filling cavity formed by the pipe and an outer jacket during filling, said method comprising the steps of:

establishing a linear reference line along the inner surface of said section of pipe; and

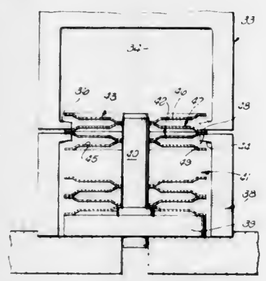
detecting the deviation of said section of pipe from said reference line caused by movement of said section of pipe during filling.

4,231,824

METHOD OF MAKING A BELLOWS

William J. Cooper, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,295
Int. Cl.³ B32B 31/20
U.S. Cl. 156—73.1 **1 Claim**



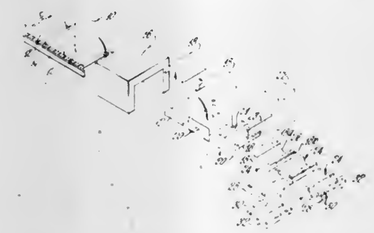
1. The method of making a bellows, said method comprising the steps of: forming a plurality of centrally apertured plastic discs, each being symmetrical about an axis and having an approximately planar central annular portion and inner and outer annular flanges connected to said central annular portion around a corresponding aperture and around an outer edge thereof, respectively, said flanges lying generally in parallel planes normal to said axis and on opposite sides of the plane of said central annular portion; placing the inner flanges of two reversed discs in contact with each other with one inner flange on a first fixture; placing a first ultrasonic welding horn with a hollow cylindrical end portion on the other inner flange; exciting said first horn in a manner to cause said two inner flanges to weld together; repeating said placing and exciting steps to weld a plurality of pairs of said discs together at corresponding contacting inner flanges thereof and to form a plurality of respective subassemblies; having respective axes of symmetry; sliding a first subassembly onto a second fixture with the outer flanges of the two discs of the first subassembly straddling a semicircular projection of said second fixture; sliding a second subassembly onto a second ultrasonic welding horn with the outer flanges of the two discs of the second subassembly straddling a semicircular projection of said second horn; and aligning said second fixture and said second horn until one outer flange of said first subassembly contacts and is coaxial with that of said second subassembly; and exciting said second horn to weld the contacting outer flanges of said first and second subassemblies together; and repeating said sliding and exciting steps while replacing said first subassembly on said second fixture with said second subassembly and ultrasonically welding a third subassembly to said second, a fourth to said third, a fifth to said fourth, and so on.

4,231,825

METHOD OF MAKING JACKETED FOAM PIPE INSULATION

Neil A. Carter, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 23, 1979, Ser. No. 32,182
Int. Cl.² B32B 5/20
U.S. Cl. 156—78 **2 Claims**



1. A method of making jacketed foam pipe insulation (24) comprising applying hardenable liquid resin impregnated fibrous glass mat (10) to a semicylindrical mold (12), curing the resin in the mat (10) while it is on the mold (12) to form a semicylindrical glass fiber reinforced resin jacket (18), removing the jacket (18) from the mold (12), assembling the jacket (18) in cooperative concentric relationship with a second semicylindrical mold (20) of a smaller radius than that of the first mold (12) to provide a semicylindrical space (21) therebetween, inserting a foamable hardenable liquid resin in the semicylindrical space (21), allowing the liquid resin in the space (21) to expand into foam (26) and harden while adhering to the jacket (18) to form a semicylindrical piece of jacketed foam pipe insulation (24), removing the second semicylindrical mold (20) from the jacketed foam pipe insulation (24), adhering a compressible semicircular pad (28) of fibrous glass wool with a suitable adhesive to one end face of the jacketed foam pipe insulation (24), and adhering a compressible strip (30) of fibrous glass wool with a suitable adhesive to a flat longitudinal face of the jacketed foam pipe insulation (24).

4,231,826

PROCESS FOR FORMING V-BELTS AND BELT SLEEVES

Richard E. Wrast, Nixa, Mo.; William J. Gardiner, Lakewood, and Francis A. Shedd, Denver, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

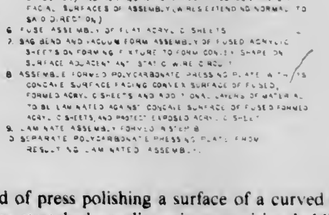
Filed Dec. 22, 1978, Ser. No. 972,291
Int. Cl.³ B29H 7/22; F16G 5/06
U.S. Cl. 156—138 **9 Claims**

1. A process for making V-belts comprising the steps of:

fabricating an inverted belt sleeve from generally uncured elastomeric material with a tensile member interpositioned between an inner first layer and an outer second layer;

skiving circumferential strips of uncured elastomeric material from the second layer at axial spacings of the sleeve and forming a plurality of circumferential grooves in the sleeve;

molding and curing the skived belt sleeve while partially forming inverted V-belts with molded, overspaced V-side portions, the belts circumferentially attached to one another by portions of the first layer juxtaposed the grooves;



removing portions of the molded V-sides at the circumferential grooves to define raw V-sidewall portions having predetermined spacing; and

circumferentially severing the cured belt sleeve juxtaposed at least some of the circumferential grooves thereby forming a plurality of finished V-belts having raw edge V-sidewall portions.

4,231,827

PRESS POLISHING AND LAMINATING PLASTIC TRANSPARENCIES USING POLYCARBONATE PRESSING PLATES

James F. Wilson, Worthington, and James C. Craig, Butler, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1979, Ser. No. 25,151
Int. Cl.³ B32B 27/00; B29C 1/00
U.S. Cl. 156—214 **13 Claims**

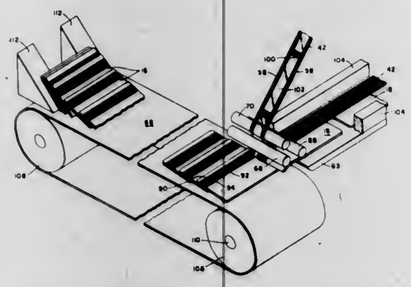
1. A method of press polishing a surface of a curved solid sheet of cast or stretched acrylic resin comprising holding a rigid, smoothly surfaced sheet of polycarbonate of complemental curvature against said surface with no parting material therebetween to form an assembly, and subjecting said assembly to sufficient elevated pressure and temperature for sufficient time for said surface of said rigid acrylic resin sheet to develop the smoothness of said polycarbonate sheet, said temperature being a maximum of 250° F. (121° C.) for cast acrylic resin and 217° F. (103° C.) for stretched acrylic resin so that it is below the deformation temperature of said polycarbonate sheet and sufficiently high to press polish the surface of said acrylic resin sheet without unduly softening said acrylic resin sheet.

4,231,828

METHOD FOR APPLYING MAGNETIC STRIPS

Leonard A. Mintz, 27 Kettering Rd., Norwood, Mass. 02062

Division of Ser. No. 822,822, Aug. 8, 1977, Pat. No. 4,149,925.
This application Jan. 10, 1979, Ser. No. 2,544
Int. Cl.[2] B44C *3/02*
U.S. Cl. 156—230 **4 Claims**



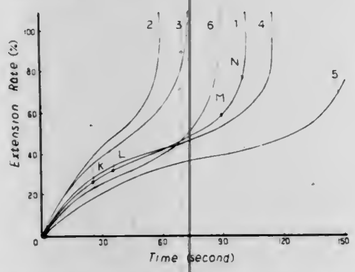
1. The method of sealing a strip of magnetic material to the surface of a card-like member comprising:
(a) superimposing an elongated tape coated with a magnetic material on the surface of said card-like member;
(b) feeding said card and superimposed tape between a heated roller having a pressing edge and a reaction roller;
(c) driving said heated roller at which the surface speed of said pressing edge is slightly slower than the velocity at which said card-like member is fed to said roller whereby said card-like member accelerates the speed of said heated roller to bring the surface speed of its periphery into substantial synchronism with the surface speed of said reaction roller;
(d) heating said heated roller to a predetermined temperature;
(e) forcing said heated roller against said card-like member with a constant predetermined pressure at which said magnetic material seals to said surface; and
(f) shearing the portion of said magnetic material sealed to said surface from the rest of the magnetic material on said tape by pulling tape away from said card-like member.

4,231,829

PROCESS OF TRANSFER PRINTING

Toshio Marui, and Masuo Masuda, both of Ibaraki, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 4, 1979, Ser. No. 35,986
Claims priority, application Japan, May 16, 1978, 53-58567; May 25, 1978, 53-91076
Int. Cl.[2] B41M *3/12*; B44C *1/16*
U.S. Cl. 156—230 **7 Claims**



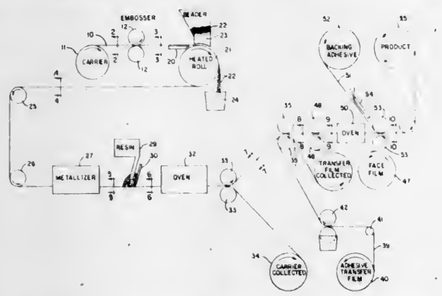
1. In a process of transferring a pattern printed on a thin film of a polyvinyl alcohol resin to a surface of an object by pressing the object to the thin film floated on the surface of water with the printed surface faced up and submerging the object into the water, the improvement which comprises incorporating boric acid or its salts selected from the group consisting of borax, anhydrous borax and borates other than sodium borate into said thin film of polyvinyl alcohol resin or into said water; said resin having an average degree of polymerization of 300 to 3,000 and an average degree of hydrolysis of 65% to 97% by mole; said boric acid or its salt being incorporated in said film in an amount of 0.02% to 10% by weight based on the polyvinyl alcohol resin or in the water in a concentration of 0.002% to 0.5% by weight.

4,231,830

PROCESS FOR PREPARING REFLECTING SHEETING HAVING WIDE ANGLE RESPONSE

John R. Ryan, Jackson, Miss., and Paul Shalita, Roslyn Heights, N.Y., assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 811,945, Jun. 30, 1977, Pat. No. 4,123,140.
This application Oct. 17, 1978, Ser. No. 952,145
Int. Cl.[2] B32B *31/20, 15/20*; G02B *5/128*
U.S. Cl. 156—232 **12 Claims**



1. A process for preparing a reflective sheeting having a wide angle response comprising:
(a) embossing a deformable carrier sheet free of light-reflecting beads to form a network of relatively depressed cavities having straight wall and bottom portions spaced apart by ridges, said carrier sheet comprising a supporting sheet having a coherent film of thermoplastic material that is sufficiently adhesive to retain and position such beads thereon,
(b) then adhering to said wall and bottom portions of the cavities and said ridges of said adhesive thermoplastic film of the carrier sheet light-reflecting beads while leaving portions of said beads exposed,
(c) filling said cavities and covering said ridges and exposed portions of said beads with a solidified layer of a resinous organic matrix having a greater adherence to said beads than said carrier sheet has to form ridges and cavities in the matrix corresponding, respectively, to said cavities and ridges of the carrier sheet,
(d) separating the carrier sheet from said matrix and transferring the beads from said sheet to said matrix to coat similarly the cavities and ridges thereof,
(e) applying an adhesive to said ridges of the matrix and securing a light-transmitting film to said ridges to form an encapsulated reflective sheeting having open areas between said cavities and film,
(f) said light-reflecting beads in coating the corresponding wall and bottom portions of the cavities formed in the matrix serving to impart a wide angle response to the sheeting.

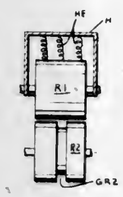
5. A process for preparing an encapsulated reflective sheeting having wide angle response comprising:
(a) embossing a deformable carrier sheet free of light-reflecting beads but having a film of a thermoplastic material to form a network of relatively depressed cavities having straight wall afid bottom portions and spaced apart by straight ridges, said wall and bottom portions and ridges being lined with said thermoplastic film,
(b) heating said deformed carrier sheet to render said thermoplastic material adhesive,
(c) partially embedding light-reflecting beads in said heated, adhesive thermoplastic film lining the side and bottom portions of said cavities and said ridges,
(d) coating the exposed portions of said beads with a reflective metal,
(e) filling said cavities and covering said ridges and beads with a solidified layer of a resinous organic matrix having a greater adherence to said beads than the thermoplastic film of said carrier sheet has, and forming cavities having straight wall and bottom portions and ridges in said matrix corresponding to said ridges and cavities, respectively, of said carrier sheet,
(f) separating said carrier sheet and its thermoplastic film from said beads and matrix,
(g) applying an uncured, thermosetting adhesive to said ridges of the matrix,
(h) securing a light-transmitting face film to said matrix at said ridges by said adhesive to form an encapsulated reflecting sheeting having open areas between said cavities and face film,
(i) said light-reflecting beads in coating the corresponding side and bottom portions of the cavities of the matrix serving to impart a wide angle response to the sheeting.

4,231,831

APPARATUS AND METHOD FOR FORMING AN ELONGATED STRUCTURAL ELEMENT FROM PLASTIC MATERIAL AND FOR APPLYING A DECORATIVE FILM THERETO

James L. Gebhardt, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 861,547, Dec. 19, 1977, abandoned.
This application Apr. 30, 1979, Ser. No. 34,365
Int. Cl.[3] B44C *1/14, 1/24, 3/02*
U.S. Cl. 156—233 **4 Claims**



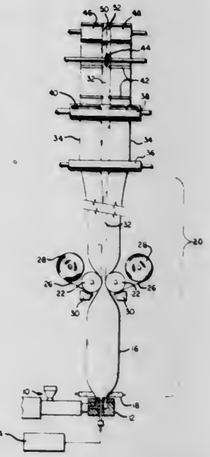
1. A method of transferring a decorative film forming a part of a coating on one surface of each of two tapes to two angularly related surfaces respectively of an elongated element, said method comprising the steps of passing said element and one of said tapes between a first pair of heated pressure rolls one of said rolls having a groove on the periphery thereof and with the coating on said one tape pressed into face contacting relation with one of said surfaces of said element by an ungrooved peripheral portion of said one roll and with the other of said surfaces disposed in said groove, adjusting the temperature of said first pair of rolls at a level between 550° F. and 650° F. and the velocity of movement of said element at a level between fourteen and nineteen feet per minute, the higher the temperature, the faster the velocity may be, twisting said element about its linear axis downstream from said first pair of pressure rolls, passing said element and the other of said tapes between a second pair of heated pressure rolls one of said rolls having a groove on the periphery thereof and with the coating on said other tape pressed into face contacting relation with the other of said surfaces of said element by an ungrooved peripheral portion of said one of said second pair of pressure rolls and with said one tape and said one surface disposed in said groove of said one of said second pair of pressure rolls, and adjusting the temperature of said second pair of pressure rolls to a level correlated with the velocity of movement of said element, said pairs of pressure rolls being similarly oriented.

4,231,832

PROCESS OF MANUFACTURING LAMINATED WEB

Roy J. Weikert, 2000 Schlater Dr., Sidney, Ohio 45365

Filed Feb. 3, 1978, Ser. No. 874,794
Int. Cl.[2] B29D *23/04*
U.S. Cl. 156—244.14 **13 Claims**



1. A process of manufacturing a laminated web of bags comprising the steps of:
extruding in molten form a cylindrical tube of thermoplastic material,
inflating said tube as it is extruded to provide an inflated length of said tube extending from said extruder,
applying to said inflated length of said tube in sheet form a laminate of material which covers a major portion of the surface of said tube but has a total width less than the full circumference of said tube,
flattening the combined tube and laminate without fusing opposed walls of said tube to each other and with a resulting uncovered portion of said tube extending longitudinally thereof, and
sealing said laminate to said flattened tube and said opposed walls of said tube to each other along lines extending transversely of said flattened tube a distance less than the width of said flattened tube to provide a web of interconnected, laminated bags.

4,231,833

LAMINATED FRAME ASSEMBLY AND PROCESS

Aaron L. Lieberman, 426 Ashbourne Rd., Elkins Park, Pa. 19117

Filed Oct. 20, 1978, Ser. No. 953,024
Int. Cl.[3] B32B *31/00*; A47G *1/08, 1/12*
U.S. Cl. 156—249 **38 Claims**

1. A process for framing and mounting an indicia-bearing sheet comprising the steps of
(a) removing a portion of a release sheet from a framing assembly, said framing assembly comprising
a flexible sheet which is at least partially transparent to light,
a framing means attached to said flexible sheet,

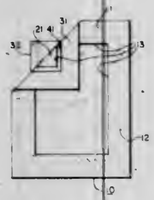
an adhesive layer adhered to one face of said flexible sheet, and

said release sheet having a first face, in contact with said adhesive layer, which is removable from the adhesive layer and an opposite face,

wherein the framing means has a framed space substantially of the same dimensions as the release sheet portion removed from the assembly;

(b) laminating to the assembly, in the space created by the removal of the release sheet portion in step (a), an indicia-bearing sheet which indicia is visible through said flexible sheet through the face opposite said adhesive layer;

(c) removing the remaining release sheet from the assembly; and



(d) adhering a substrate to the adhesive exposed by step (c).

25. A framing and mounting assembly comprising

a flexible sheet which is at least partially transparent to light,

a framing means having a framed space, which framing means is attached to said flexible sheet, an adhesive layer adhered to one face of said flexible sheet, and

a release sheet having a release face, in contact with said adhesive layer, which is removable from the adhesive layer, and having an opposite face, wherein said release sheet has an inner portion and an outer portion, said inner portion being detachable from the outer portion and defining a space having substantially the same dimensions as the frame space.

4,231,834

PROCESS TO MANUFACTURE TUBULAR ARTICLES RESEMBLING WOOD, CANE, BAMBOO, REED, WICKER, RATTAN, RUSH, AND THE LIKE

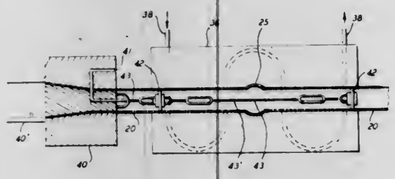
Humberto Trejo Gonzalez, Av. Presidentes No. 52, Mexico City 13, Mexico

Continuation-in-part of Ser. No. 893,850, Apr. 6, 1978, abandoned. This application Feb. 9, 1979, Ser. No. 11,006

Claims priority, application Mexico, May 30, 1977, 169238; May 30, 1977, 169239; May 30, 1977, 169244

Int. Cl.³ B29C *17/07, 27/14*

U.S. Cl. 156—294 **22 Claims**



1. A method for producing artificial, tied tubular structures, the tying and the tubular portions of which have the appearance of natural materials, comprising the steps of:

extruding a thermoplastic tubular material having base coloring,

separately extruding tying strips of basically colored thermoplastic material with striations formation on the surfaces thereof, longitudinally orienting the molecules of the material as it is being extruded whereby a molecular memory is imposed thereon,

applying coloring to said strips of thermoplastic material by treating it with a solvent that at least partially disssolves said material, said solvent material having powdered polyvinyl chloride and a pigmenting material dispersed in it, whereby said thermoplastic material is made to resemble natural materials,

heating preselected portions of the extruded tube after it leaves the extruding die and applying pressure to the heated portion to deform it so that the tube has deformed portions alternating with non-deformed portions,

forming annular incisions in the hot deformed portions and peripheral striations as well as longitudinal incisions perpendicular to the said annular incisions, and then cooling the tube,

applying to the surface of the tube a solvent for the material of the tube,

pigmenting the extruded tube with pigment dispersed in the said solvent that has thermoplastic material dissolved in it so that the pigment will simulate veins on the surface of the tubular material,

allowing the pigmented alternatively deformed tubular material to air-dry,

cutting the tubular material processed by the foregoing steps into desired lengths,

heating it at selected points to bend tubular lengths as may be required, and letting it cool; attaching connecting means to the ends of said cooled tubular portions, and

tying together the cut tubular material by means of said strips of colored thermoplastic material after connecting them in such manner as to produce structural portions of furniture, ornaments, and structures in general made of natural looking materials such as wood, rattan, cane, reed, rush, bamboo, wicker and the like, the said strips becoming tightened when their oriented molecules recover their original position.

20. A two piece travelling mold wherein the two pieces are essentially symmetrical and hinged by the lower edge of their inner surfaces, having each of them a lengthwise cavity along their mid-portion, and at their center of the cavity length there is an irregular deeper recessed cavity, said lengthwise cavity forming a molding duct when the mold hinged pieces rotate about their hinge so that their inner surfaces come together to close the mold.

4,231,835

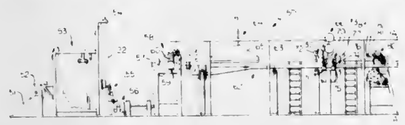
APPARATUS FOR AND METHOD OF MAKING CARPETING STRIP HAVING INTEGRAL SEAM-FORMING PORTION

Rufus N. Ensley, Waynesville; Doyle V. Haren, Clyde; Arthur D. Logan, and Michael E. McLean, both of Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 10, 1979, Ser. No. 28,787

Int. Cl.³ B65H *25/00;* **B32B** *31/00*

U.S. Cl. 156—361 **16 Claims**



2. In an apparatus for continuously making a carpeting strip having integral joining means; said apparatus comprising means for feeding a wear layer having a bottom surface and opposed side edges; means for continuously moving and guiding said wear layer in a rectilinear path; photoelectric means for sensing opposite side edges of said wear layer to enable adjustment of a part of said moving means and thereby provide adjustment of the position of said wear layer; a pair of devices for fixing a pair of release tapes against said bottom surface with each of said devices fixing its release tape adjacent an associated side edge portion of said wear layer; each release tape defining a free part of said wear layer disposed thereagainst; and means forming a compressible backing material against said bottom surface and against said tapes so that each of said tapes isolates a portion of said backing material from said wear layer and is sandwiched therebetween; the improvement comprising; a tenter assembly defined as a part of said moving means with said tenter assembly having means for stretching and holding said wear layer at a precise width to enable fixing each of said release tapes at a precise location thereagainst; adjustment means for each of said devices to enable adjustment thereof relative to said wear layer and fixing of an associated tape at said precise location adjacent an associated side edge portion; a trimming apparatus having a pair of cutting means for cutting through said wear layer, tapes, and backing material; and means for positioning each cutting means to define the width of said carpeting strip and assure a predetermined required width of release tape remains on each side edge portion of said carpeting strip after cutting by said cutting means while providing each of said side edge portions with a precision planar cut side edge defined by an edge of said wear layer, release tape, and backing material disposed in coplanar relation; said positioning means being adapted to be operated independently of said tenter assembly; a pair of photoelectric devices each disposed along a side edge portion of said carpeting strip; each of said devices detecting associated release tape in its sandwiched position to assure presence of a required width thereof during continuous making of said carpeting strip and after cutting by said cutting means; and a carpeting strip marking mechanism operatively connected to each of said photoelectric devices; said marking mechanism being actuated by either of said photoelectric devices and providing a continuous marking of said carpeting strip in response to detection of the required width of release tape by each photoelectric device; said marking mechanism ceasing its marking once a photoelectric device detects that said required width is no longer present; said carpeting strip being particularly adapted to have a cut side edge thereof disposed in abutting relation against a substantially identical carpeting strip having a substantially identical cut side edge by removing said tape from said carpeting strip and a similar tape from said identical carpeting strip and bonding said free parts of said wear layers together against support means briding an isolated portion of backing material of said carpeting strip and a similar isolated portion of backing material of said identical carpeting strip.

4,231,836

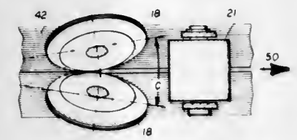
SYSTEM FOR AUTOMATIC JOINING AND ROLLING UP OF CORD STRIPS

Stig-Ove E. Ljungqvist; Bernth S. Hammarström, and Sture F. E. Fritjofsson, all of Gislaved, Sweden, assignors to Gislaved AB, Gislaved, Sweden

Filed Feb. 2, 1979, Ser. No. 8,954

Int. Cl.³ B29H *9/04*

U.S. Cl. 156—405 P **13 Claims**



1. Apparatus for automatically joining cord strips (**42,43**) for tires, such as vehicular tires, comprising:

a stationary table (**12**);

conveying means (**2**) for conveying a cord strip (**42**) to said stationary table (**12**);

guide means (**16**) mounted above said conveying means; and

a joining device (**4**) movably mounted above said conveying means (**2**) and being movable into and out of registration with said stationary table (**12**), said joining device comprising a movable carriage (**17**) movably mounted on said guide means so as to move in a line above the joining line of said cord strips to be joined;

said joining device further comprising a spring loaded roller (**21**) on said movable carriage which is spring loaded in a downward direction toward said stationary table; and a pair of pulleys (**18**) located behind said spring loaded roller (**21**) in the direction of movement of said joining device during a joining operation, said pulleys being obliquely mounted at an angle toward each other and each having a circumferential bearing surface for engaging respective ends of cord strips to be joined to draw said respective ends together substantially when said roller and pulleys are rolled over the ends of said cord strips to be joined during movement of said carriage (**17**) on said guide means, said obliquely mounted pulleys having substantially conical shaped circumferential portions on the inner facing adjacent surfaces thereof such that the inner parts of said pulleys have an extended common contact surface (**18***a*), said spring loaded roller (**21**) pressing down said ends of said cord strips to be joined on said stationary table (**12**) and said trailing pair of pulleys (**18**) drawing together said pressed down edges of said respective cord strips to join said respective edges by the adhesiveness of said strip edges combined with the pressure imparted thereto by said obliquely mounted pulleys (**18**).

4,231,837

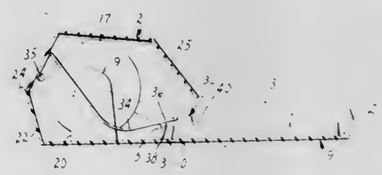
NOTEPAPER DISPENSER AND TAPE TABBER

Joseph F. Ramey, West St. Paul; George A. Seiler, St. Paul, and Dorman N. Thompson, Jr., St. Croix Beach, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 20, 1978, Ser. No. 962,059

Int. Cl.² B32B *31/18*

U.S. Cl. 156—522 **5 Claims**



1. A notepaper dispenser comprising a frame having a support surface for a stack of sheets with one end in register,

means for rotatably supporting a roll of pressure-sensitive adhesive tape,

an applicating member having a planar surface positioned on said frame above said sheets and adjacent said one end of said sheets,

means supporting said applicating member for movement toward and away from the upper sheet of a said stack of sheets on said support surface for applying the free end of a said roll of tape successively to a said upper sheet, said support surface having a length and width substantially greater than the size of said applicating member and the width of said tape, and

cutting means for cutting a length of tape, said cutting means being positioned on said applicating member adjacent an edge of said planar surface, which edge is spaced along the path of said tape from said means for supporting said roll of tape beyond said planar surface.

4,231,838

METHOD FOR FLUX GROWTH OF KTiOPO$_4$ AND ITS ANALOGUES

Thurman E. Gier, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1978, Ser. No. 898,444
Int. Cl.[2] B01J *17/04, 17/20*
U.S. Cl. 156—600 **9 Claims**

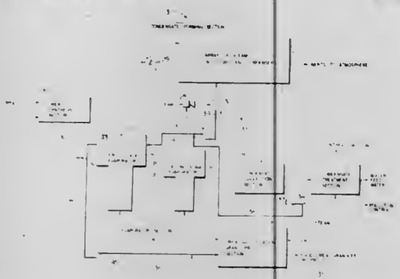
1. In an improved process for producing a single crystal of $MTiOXO_4$ by combining and heating starting materials comprising $MTiOXO_4$ and a nonaqueous flux M/X/O, or their precursors, where M is selected from the group consisting of K, Rb and Tl and X is selected from the group consisting of P and As, said process being carried out either by (a) heating the combined starting materials, in such amounts that the ratio of $MTiOXO_4$ to flux at the highest heating temperature is greater than the saturation value, in a temperature gradient wherein the hot zone is within the range about 800° C. to about 1000° C. and the cold zone is within the range about 10° C. to about 135° C. cooler than the hot zone so as to produce a nonaqueous melt; maintaining the temperature gradient for about 3 days to about 3 weeks to allow crystal growth; and cooling and recovering crystalline $MTiOXO_4$, or (b) uniformly heating the combined starting materials, in such amounts that the ratio of $MTiOXO_4$ to flux at the highest heating temperature is less than the saturation value, to a temperature within the range about 700° C. to about 1100° C. until a clear nonaqueous solution is produced; slowly cooling the solution at a rate no greater than 5° C. per hour to effect crystallization of $MTiOXO_4$; and recovering crystalline $MTiOXO_4$, the improvement characterized in that the composition of the combined starting materials is within the trigonal regions ABC, DEF, GHI, JKL, MNO, PQR or STU of FIGS. 1 to 7, respectively, wherein the $Pna2_1$-type $MTiOXO_4$ is the only stable solid phase in equilibrium with the molten flux.

4,231,839

AFTER-TREATMENT PROCESSES AND APPARATUS, ESPECIALLY FOR UREA AND AMMONIUM NITRATE PLANTS

John W. Barron, Rockaway, N.J., and William H. Van Moorsel, Medicine Hat, Canada, assignors to CF Industries, Inc., Chicago, Ill.

Filed Jan. 30, 1979, Ser. No. 7,748
Int. Cl.[2] C07C *126/00*
U.S. Cl. 159—47 UA **16 Claims**



1. In a urea process of the kind in which product from a synthesis section is passed through at least one evaporator section for concentration prior to delivery to a solidification section, and in which said evaporator section has a vaporous overhead stream containing entrained urea, CO_2, NH_3, and H_2O, and further in which at least part of said evaporator section overhead stream is condensed to produce a derivative condensate stream containing dissolved entrained urea, CO_2, and NH_3; the improvement comprising:

(a) bringing said vaporous overhead stream from said evaporator section into mass and heat transfer relationship with a stream consisting at least in part of said derivative condensate stream without materially transferring H_2O from said overhead stream to said condensate stream, to thereby:

(i) reduced the entrained urea in said overhead stream and enrich the condensate in urea;

(ii) reduce the temperature of said overhead stream and add heat to said condensate stream; and

(iii) desorb CO_2 and NH_3 from said condensate stream into said overhead stream; and

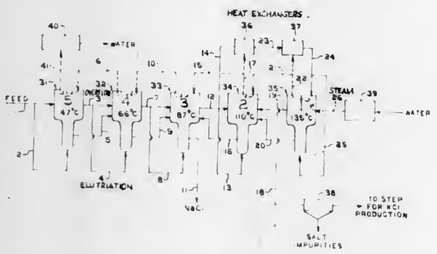
(b) delivering the urea-rich and CO_2, NH_3-lean condensate stream resulting from said mass and heat transfer step as a stream separate from concentrated product from said evaporator to said solidification section for processing there along with concentrated product from said evaporator.

4,231,840

METHOD OF CONCENTRATING AN AQUEOUS SOLUTION BY MULTIPLE EFFECT EVAPORATING

Donald H. Geesen, Wilcox, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Feb. 1, 1979, Ser. No. 8,358
Int. Cl.[2] B01D *1/26*
U.S. Cl. 159—47 R **3 Claims**



1. In a method of concentrating an aqueous solution containing a first salt and a second salt, the solubility of the first salt increasing more with increasing temperature than the solubility of the second salt, by multiple effect evaporation wherein the multiple effect evaporators comprise at least three evaporator effects, wherein the multiple effect evaporators are backward fed, wherein the first evaporator effect is the hottest, wherein second salt is precipitated during evaporation, wherein the concentrated mother liquor from the multiple effect evaporators is forwarded to a zone operated at atmospheric pressure, and wherein mother liquor effluent from the evaporators is forwarded to a zone wherein the first salt is recovered, the improvement comprising:

A. Operating the first evaporator effect at superatmospheric pressure;

B. Operating at atmospheric pressure an evaporator effect which is preceeded in the direction of mother liquor effluent flow by at least one cooler evaporator effect;

C. Feeding to the first evaporator effect a portion of the overflow from the evaporator effect cooler than the evaporator effect operated at atmospheric pressure, wherein the portion bypasses the evaporator effect operated at atmospheric pressure; and

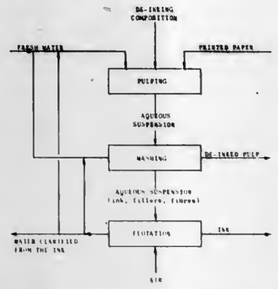
D. Feeding the mother liquor effluent from the first evaporator effect to the evaporator effect operated at atmospheric pressure.

4,231,841

PROCESS FOR THE DE-INKING OF PRINTED WASTE PAPER

Giulio Calmanti; Salvatore Gafa, both of Milan; Giovanni M. Dadea, Tradate; Alfonso Gatti, Novi Ligure, and Fulvio Burzio, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 17, 1978, Ser. No. 952,200
Claims priority, application Italy, Oct. 20, 1977, 28816 A/77; Sep. 1, 1978, 27242 A/78
Int. Cl.[3] D21C *5/02*
U.S. Cl. 162—5 **5 Claims**

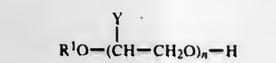


1. In a washing process for de-inking printed waste paper comprising pulping a printed waste paper as an aqueous alkaline suspension in the presence of a de-inking composition and washing the pulped paper with water, thereby obtaining a thickened suspension of paper in water separate from the washing waters which consist of another more dilute suspension containing ink, fillers, and a small amount of residual paper fibers, the improvement comprising

(1) using as said de-inking composition, a de-inking composition consisting essentially of:

(A) a salt of a fatty acid of the formula: R—COO—M wherein R represents one or more hydrocarbon chains selected from the class consisting of saturated and/or unsaturated hydrocarbons; and M represents a metal selected from the class consisting of Na and K; said fatty acid salt being present in an amount between 5% and 32% with respect to the weight of the entire composition;

(B) a nonionic ethoxylated and/or propoxylated surfactant of the formula:

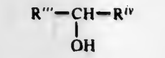


$$R^1O-(CH-CH_2O)_n-H$$

wherein: Y is either H or CH_3; R^1O represents the hydrophobic moiety of the molecule and is derived from a compound selected from the class consisting of alkylphenols of formula



saturated primary fatty alcohols of formula $R''—CH_2OH$; saturated secondary fatty alcohols of formula



fatty acids of the formula $R^V—COOH$; and mixtures thereof, wherein R', R'', R''', R^{IV} and R^V are alkyl chains; and

n is a number between 2 and 40; said nonionic surfactant being present in an amount between 5% and 25% by weight of the entire composition;

(c) an anionic surfactant selected from the class consisting of sulphonates of the formula $R^2—SO_3—M'$; sulphates of formula $R^3—O—SO_3—M'$; and mixtures thereof, wherein:

R^2 is selected from the class consisting of linear paraffin chains, olefin chains, and alkylaryl chains;

R^3 is a paraffin chain; and

M' is selected from the class consisting of Na, K, NH_4 and mono-, di- and tri-substituted alkylamines;

said anionic surfactant being present in an amount between 2% and 8% with respect to the weight of the entire composition;

(D) a sodium-carboxylmethyl-cellulose in an amount between 1% and 5% with respect to the weight of the entire composition; and

(E) an alkaline inorganic salt selected from the class consisting of metasilicate, disilicate, carbonate, borate and polyphosphates, said alkaline inorganic salt being present in an amount between 30% and 80% of the entire composition; the percentages of the components (A), (B), (C), (D), and (E) totaling essentially 100%, said composition being present in an amount of about 1 to about 6% by weight with respect to said paper and the pH during the pulping being from about 9 to about 12;

(2) injecting air or another inert gas in a flotation unit, into the other more dilute suspension coming from the washing operations, to cause a flotation in an alkaline medium at a pH of about 9, without the addition of flocculants resulting in the formation of two phases, the upper-most phase containing ink;

(3) skimming said upper-most phase; and

(4) at least partially recycling the lower-most phase comprising de-inked clarified water, residual paper fibers, and fillers in diluted form to the pulping and washing operations.

4,231,842

RECOVERY OF THERMAL ENERGY FROM A THERMOMECHANICAL PULP PLANT

Pertti Ojala, Turku, Finland, assignor to Valmet Oy, Finland

Filed Jun. 7, 1978, Ser. No. 913,327
Claims priority, application Finland, Dec. 22, 1977, 773916
Int. Cl.[3] D21B *1/12;* **D21F** *5/20*
U.S. Cl. 162—47 **11 Claims**



1. A method of recovering the thermal energy contained in the pressurized process steam generated by a plant in the production of thermomechanical pulp, by utilizing it in the drying section of a paper manufacturing machine, said method comprising the steps of:

(a) applying the process steam to the primary side of a heat exchanger;

(b) applying water to the secondary side of the heat exchanger to produce hot water;

(c) vaporizing the water to produce clean steam; and

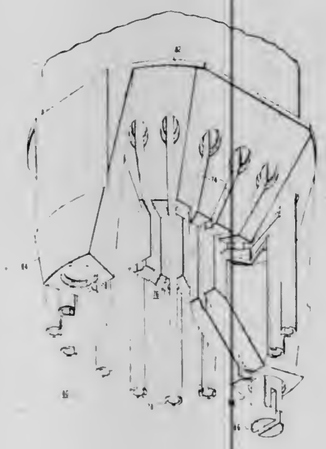
(d) utilizing the clean steam to at least a first steam group of the drying section of the paper manufacturing machine, without increasing pressure.

4,231,843

GUIDE TUBE FLOW DIFFUSER

Donald L. Myron, Pensacola, and Robert T. Berringer, Gulf Breeze, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 2, 1977, Ser. No. 821,101
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—50 1 Claim



1. A nuclear reactor having a guide tube flow diffuser including a reactor vessel with a closure head disposed thereon, an array of fuel assemblies and control assemblies mounted within said reactor vessel between a lower core plate and an upper core plate, an inlet and an outlet disposed on said reactor vessel for circulating a coolant in heat transfer relationship with said fuel assemblies and said control assemblies, an upper support plate attached to said reactor vessel above said upper core plate defining an outlet plenum therebetween, a plurality of support columns supported by said upper support plate and extending downward to said upper core plate for supporting said upper core plate, comprising:

guide tubes extending from said upper support plate to said upper core plate for guiding control rods disposed therein;

spacers disposed within said guide tubes at intervals along the length of said guide tubes;

split tube guides attached to said spacers for providing guidance for said control rods;

side openings disposed in said guide tubes for allowing said coolant to exit from said guide tubes; and

a conical shaped body having a center opening and radial slots therein for accommodating said control rods, said conical shaped body having a plurality of sloped sides terminating above said core plate and surrounding said center opening with said sloped sides having a flat lower surface substantially parallel to said core plate for diverting the upward flow of said coolant around the outside of said guide tubes, thereby reducing the flow of said coolant through said side openings and thus improving the guidance of said control rods;

legs having at least one sloped side extending from said body to near said upper core plate for providing attachment to said upper core plate; and

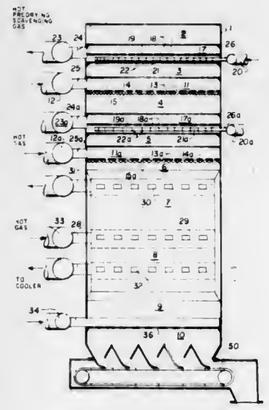
pins disposed in said legs for engaging said upper core plate thereby maintaining proper alignment between said guide tubes and said upper core plate.

4,231,844

METHOD AND APPARATUS FOR PRODUCING ABRASION RESISTANT COKE FROM BROWN COAL BRIQUETS

Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen; Horst Dungs, Herne; Roman Kurtz, and Hans-Joachim Kersting, both of Frechen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG and Rheinische Braunkohlwerke AG, both of, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 18,870
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2812005
Int. Cl.[3] C10B *49/06, 3/00, 53/08*
U.S. Cl. 201—34 6 Claims



1. In a combination with a method of producing abrasion resistant coke from brown coke briquets in a shaft furnace of the type having a top inlet for receiving a charge of the coal briquets and a bottom outlet for removing the coke in which the brown coke briquets are serially preheated, and, carbonized and cooled in stages by directing inert hot combustion gases into the furnace in contact with the briquets, and with the gas removed and recirculated in circuits for each of the respective preheating, drying and carbonizing stages in which there is recirculated gas substantially composed of inert hot combustion gases obtained from the carbonizing of the brown coke briquets, the improvement comprising introducing additional inert hot combustion gases into the furnace in said preheating and drying stages at a temperature and in an amount sufficient to raise the temperature of the circulating gases removed from the respective preheating and drying stages to at least 20C.° above steam saturation temperature of the combined gases.

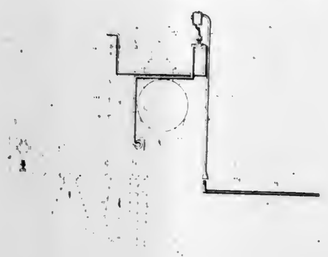
4,231,845

EQUIPMENT FOR EMISSION-FREE OPERATION OF A COKING PLANT

Timen Vander, Ursem; Nicolaas J. Thijssen, Santpoort; Jan F. de Blok, Beverwijk, and Jan Middel, Nieuwe Sluis, all of Netherlands, assignors to Hoogovens Ijmuiden, B.V., IJmuiden, Netherlands

Division of Ser. No. 870,138, Jan. 17, 1978, abandoned. This application Jun. 18, 1979, Ser. No. 49,115
Claims priority, application Netherlands, Jan. 24, 1977, 7700675
Int. Cl.[2] C10B *27/00, 27/04, 41/06, 41/08*
U.S. Cl. 202—113 2 Claims

1. Coking plant comprising a plurality of coking chambers for the coking of coal by dry distillation, a mobile coke pusher machine for removing coke, a coal leveller bar carried thereby, an ascension pipe for each chamber for the discharge from the chamber of the gases evolved during coking, means for injecting steam into the ascension pipe so as to create a sub-atmospheric pressure in the chamber and adjustable pneumatically actuated timing means after the chamber has been charged with coal stopping the injection of steam to the ascension pipe of that chamber when a period of time has elapsed following the commencement of the coking process in the chamber, determined by the step of levelling of the coal charged into the



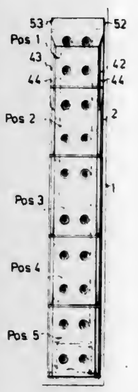
chamber, said timing means being provided with an air conduit which is connected to the timing means and which ends in a downwardly open funnel, said coke pusher machine bearing an upwardly extending air conduit nozzle, adapted to register with said funnel, to deliver an air pulse, transmitted by the air conduit to actuate the timing means.

4,231,846

PLUG FOR PROTECTING COKE-OVEN CHAMBER DOORS FROM THE ACTION OF THE INTERNAL TEMPERATURE IN THE OVEN

Hans Mathiak, Bönen, and Hans Oldengott, Bockum-Hövel, both of Fed. Rep. of Germany, assignors to Ruhrkohle, AG., Essen, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,237
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724982
Int. Cl.[2] C10B *25/06, 25/18*
U.S. Cl. 202—248 12 Claims



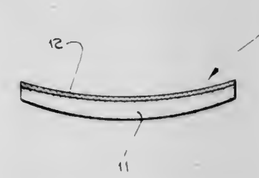
1. A plug for protecting a coke-oven chamber door from heat within the oven, said plug comprising a plurality of vertically stacked refractory bricks mountable on the inside of said door: said bricks having first and second spaced, parallel vertical faces, said second face being abutable with said door and said first face facing away from said door; said faces being joined by side walls, said side walls including short transition portions joined to said first face and converging in a direction away from said door, said side walls having adjacent portions joined to said transition portions, said adjacent portions being longer than said transition portions and converging in a direction away from said door but at a smaller angle than said transition portions, said side walls further including diverging portions joined to said adjacent portions and to said second face, said diverging portions diverging in a direction away from said door, the uppermost brick in said stack having a surface intersecting said first face and side walls which forms a part of the upper end face of the plug and which extends obliquely upward from said first face in a direction toward the door; said diverging portions of said side walls ending below the intersection of said oblique surface and said first face, said plug having a downwardly extending tar discharge chute formed in each side wall of said plug; the lowermost brick in said stack being supportable on said door; the height of an intermediate one of said bricks being selected in accordance with the desired height of said plug; and said bricks having recesses therein receiving a plurality of countersunk bolts extending through said bricks and engageable with said door for fastening said bricks to the door.

4,231,847

ELECTRODEPOSITION OF NICKEL-IRON ALLOYS HAVING A LOW TEMPERATURE COEFFICIENT AND ARTICLES MADE THEREFROM

Kenneth Lui, Fountain Valley, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 775,310, Mar. 7, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,779
Int. Cl.[2] C25D *1/02, 1/06, 3/56*
U.S. Cl. 204—7 5 Claims



1. A method of electrodepositing on an electrically conductive substrate an electrodeposited substantially homogeneous admixture of nickel and iron, said homogeneous admixture containing substantially no iron oxide, said mixture having a temperature expansion coefficient of less than about 5×10^{-6}, said method comprising forming an electrolytic aqueous solution having a pH of less than about 3 and consisting essentially of nickel chloride ions and ferrous sulfate ions containing substantially no iron oxide, the amount of ferrous ions present in said aqueous electrolyte solution being between about 60 weight percent and 80 weight % based on the total weight of ferrous ions and nickel ions present in said aqueous electrolyte solution and the amount of nickel ions present in said aqueous electrolyte solution being between about 40 weight percent and 20 weight percent based on the total weight of ferrous ions and nickel ions present in said aqueous electrolyte solution, said electrolytic solution being in contact with an anode, said anode consisting essentially of iron and nickel, the amount of iron and nickel in said anode being substantially the same weight percent as the amount of nickel and iron in the electrodeposited homogeneous admixture of nickel and iron, said anode being electrically connected to a source of electric potential; contacting said electrically conductive substrate with said electrolytic solution, said substrate functioning as a cathode when electric current is passed through said anode, said aqueous electrolytic solution and said substrate; conducting an electric current through said anode, electrolytic solution and substrate; excluding free oxygen from said electrolytic solution while said current is being conducted therethrough; discontinuing the conduction of said electric current through said anode, electrolytic solution and substrate when a predeter-

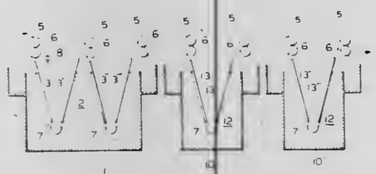
mined amount of said nickel ions and ferrous ions are electrodeposited on said substrate; and removing said substrate from contact with said electrolytic solution.

4,231,848

METHOD FOR MAKING A RAW BOARD FOR USE IN PRINTED CIRCUITS

Yoshio Kawasumi, and Haruki Sato, both of Saitama, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed May 3, 1979, Ser. No. 35,695
Claims priority, application Japan, May 8, 1978, 53-53705
Int. Cl.³ C25D *5/10, 5/56*
U.S. Cl. 204—20 **9 Claims**



1. A method for preparing a raw board for use in printed circuits comprising the steps of:

(A) depositing copper layer onto a film or sheet of synthesized resins;

(B) subjecting said copper-deposited film or sheet to an electrochemical treatment at a temperature between 40° C. and 90° C. with a first electroplating bath containing copper sulfate, sulfuric acid, chlorine ion and a surface glazing agent including thiourea; and

(C) subjecting thereafter the film or sheet to an electrochemical treatment with a second electroplating bath containing copper sulfate and sulfuric acid.

4,231,849

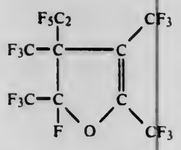
PROCESS FOR THE PREPARATION OF A PERFLUORINATED CYCLIC ETHER

John Hutchinson, and Graham Whittaker, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 909,180, May 24, 1978, abandoned. This application Jun. 18, 1979, Ser. No. 49,787
Claims priority, application United Kingdom, Jun. 9, 1977, 24084/77
Int. Cl.³ C07D *307/38*
U.S. Cl. 204—59 F **6 Claims**

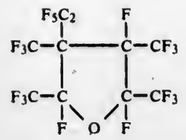
1. A process for the preparation of a perfluorinated cyclic ether which comprises:

(a) subjecting the pentamer of tetrafluoroethylene to a single step process of hydrolysis and cyclisation by adding a tertiary nitrogen base to a dispersion of the pentamer and a polar aprotic organic solvent in water at a temperature of from 0° C. to 50° C. to obtain the $C_{10}F_{18}O$ ether of formula



; and

(b) perfluorinating the ether obtained in step (a) to obtain a perfluorinated cyclic $C_{10}F_{20}O$ ether having the formula:

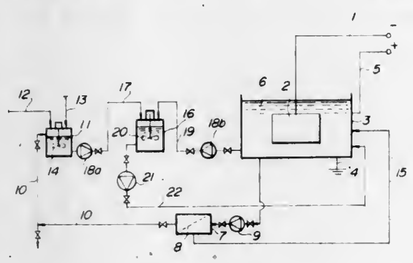


4,231,850

PROCESS FOR A CATIONIC CATHODIC ELECTROCOAT

Hironobu Kato, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 11, 1979, Ser. No. 28,939
Claims priority, application Japan, Apr. 12, 1978, 53-42086
Int. Cl.³ C25D *13/04, 13/12*
U.S. Cl. 204—181 C **9 Claims**



1. A process for cationic cathodic electrocoating, comprising the steps of:

cathodically electrocoating a first cationic electrodepositable paint composition having a pH value between about 6.0 and 8.0 and a first neutralization equivalent;

filtering said cationic electrodepositable paint composition to produce a filtrate;

mixing said filtrate with a second electrodepositable paint composition having a second neutralization equivalent lower than said first neutralization equivalent to obtain a dispersion;

homogeneously diluting said dispersion with a portion of said first electrodepositable paint composition to obtain a supplemental feed electrodepositable paint composition; and

periodically supplementing said first electrodepositable paint composition with said supplemental feed paint composition, whereby the properties of said first electrodepositable paint composition are maintained.

4,231,851

METHOD FOR ELECTROCHEMICALLY COATING A METALLIC SUBSTRATE WITH A PROTECTIVE FILM OF A PHENOLIC RESIN

Giuliano Mengoli, Padua; Sergio Daolio, Luzzara; Ugo Giulio, Testona, and Carlo Folonari, Turin, all of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano and Consiglio Nazionale Delle Ricerche, Rome, both of, Italy

Filed Apr. 6, 1979, Ser. No. 27,700
Claims priority, application Italy, Apr. 10, 1978, 67788 A/78
Int. Cl.³ C25D *9/02, 13/08*
U.S. Cl. 204—181 R **9 Claims**

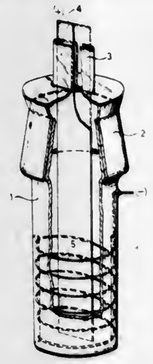
1. A method for electrochemically coating a metallic substrate utilized as anode in an electrochemical cell in which a direct current flow of electrical energy is passed from a cathode to said anode through a liquid alkaline-reacting electrolyte comprising at least one phenolic monomer and a basic substance dissolved in a normally liquid solvent, thereby to progressively form on said substrate an impervious adherent polymeric film of a phenolic resin, wherein the improvement comprises:

(a) the solvent is water, an alcohol having from 1 to 4 carbon atoms, or a mixture of the two;

(b) the phenolic monomer comprises phenol in an amount of from 50 to 250 g per liter electrolyte, and at least one halo-, alkoxy- or alkyl-substituted phenol in an overall amount of from 5 to 35 g per liter electrolyte, the substituent being in an ortho- or meta- position;

(c) the basic substance comprises an alkylene diamine in an amount of from 1 to 10 vol.% referred to the electrolyte;

(d) the direct current flow density does not exceed 10 mA/sq.cm. of the metallic substrate.

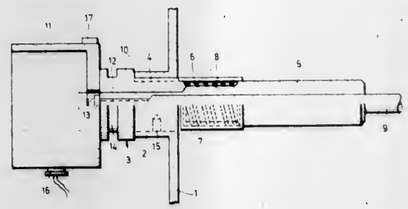


4,231,852

DEVICE FOR CATHODIC CORROSION PROTECTION EMPLOYING AN EXTERNAL CURRENT ANODE

Hans Ruckert, Dortmund, Fed. Rep. of Germany, assignor to Vereinigte Elektrizitätswerke Westfalen AG, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 764,740, Feb. 1, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,298
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605088
Int. Cl.² C23F *13/00*
U.S. Cl. 204—196 **5 Claims**



1. In combination, a hot water tank having a passive anticorrosive layer on an inner wall of the tank and a device for cathodic corrosion protection of said hot water tank device, the protection device including the use of an external current anode and comprising:

a holder adapted for insertion into a wall of said tank;

an external current anode disposed on said holder;

a reference electrode also disposed on said holder;

potentiostat means connected to the reference electrode and to the anode and connected to the tank wall for measuring a potential between the reference electrode and the tank wall and for continuously varying electrical current flow through said current anode sufficiently to keep said potential substantially constant; and

an insulating piece being provided between the reference electrode and the external current anode and which extends into the tank;

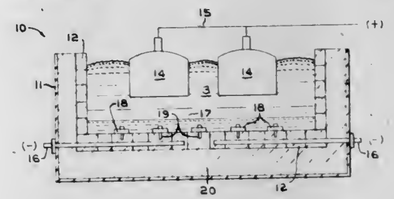
wherein the insulating piece has an extension substantially perpendicular to the tank wall when inserted therein, said extension being at least a multiple of the length of the free end of the reference electrode from the tank wall; wherein the external current anode extends centrally through the insulating piece; and wherein said insulating piece has an annular recess, and the reference electrode is arranged in helical or ring form in an annular recess of the insulating piece, said recess being covered by the flow-reducing sheathing.

4,231,853

CATHODIC CURRENT CONDUCTING ELEMENTS FOR USE IN ALUMINUM REDUCTION CELLS

Henry W. Rahn, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 27, 1979, Ser. No. 33,782
Int. Cl.² C25C *3/16*
U.S. Cl. 204—243 R **7 Claims**



1. In an electrolytic metal reduction cell wherein molten metal is produced by electrolyzing between active anodic and cathodic surfaces a compound of the metal dissolved in a molten solvent said molten metal collecting in a pad on the floor of the cell said cell comprising carbon-lined side walls and a floor defining a chamber containing the molten constituents, anode means suspended in said chamber, cathode current supply means imbedded in the carbon lining by which electric current is conducted from the cathode current supply means through the carbon lining to the pool of molten metal, the improvement residing in the provision of means for reducing the voltage loss from the cathode current supply means to the active cathodic surface said means provided by at least one plate or tile-shaped element held in loosely restrained physical engagement with the surface of the carbon lining of the floor of the cell by means of at least one pin, said pin extending through an aperture formed in said plate or tile, the lower end of said pin being inserted in the carbon lining thereby restraining lateral movement of said plate or tile with respect to the vertical axis of the pin said plate or tile and associated pin being formed of an electrically conductive refractory hard metal.

4,231,854

ANODE FOR CATHODIC ELECTROCOATING

Klaus Boehlke, Hessheim, and Fritz E. Kempter, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 16, 1978, Ser. No. 951,565
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747334
Int. Cl.³ C04B *35/26, 35/54*; C25B *11/12, 11/16*
U.S. Cl. 204—294 **14 Claims**

1. An anode for cathodic electrocoating, which comprises a mixture of

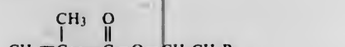
(A) from 60 to 90% by weight of magnetite or a magnetite/-natural graphite mixture and
(B) from 40 to 10% by weight of a plastic.

4,231,855
ELECTRODIALYSIS MEMBRANES OF HIGH INTERSTITIAL MOLALITY BASED UPON METHACRYLATE ESTER DERIVATIVES

Russell B. Hodgdon, Sudbury, and Samuel S. Alexander, Boxboro, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 935,438, Aug. 21, 1978, abandoned. This application Mar. 2, 1979, Ser. No. 16,994
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—301 **2 Claims**

1. An ion exchange resin membrane consisting of a copolymer of about 35 to about 50 mol percent of at least one compound selected from the group consisting of ethylene glycol dimethacrylate, neopentyl glycol dimethacrylate, polyethylene glycol dimethacrylate, trimethylol propane trimethacrylate, bis-phenol A dimethacrylate, pentaerythritol trimethacrylate and pentaerythritol tetramethacrylate with about 65 to about 50 mol percent respectively of a methacrylate ester salt having the chemical formula:



where R is an ion exchange moeity selected from the group consisting of quaternary ammonium salts and sulfonic acid salts, said copolymer having an interstitial ion exchange molality of at least about 2.2 gram equivalents of ion exchange capacity per kilogram of water content, said membrane having a resistivity as measured at 1000 Hertz in equilibrium with 0.01 N sodium chloride solution at room temperature of less than about 30 ohm cm.².

4,231,856
PURIFYING FILTER-CLOGGING COAL TAR FORMED FROM LOW-TEMPERATURE COAL CARBONIZATION

Ingo Romey, Hünxe, and Hellmüt Kokot, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 845,454, Oct. 25, 1977, abandoned, which is a continuation of Ser. No. 682,171, Apr. 30, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,134
Claims priority, application Fed. Rep. of Germany, May 13, 1975, 2521117
Int. Cl.² C10C *1/00*
U.S. Cl. 208—39 **8 Claims**

1. A process for purifying filter-clogging coal tar residues of the type obtained by low-temperature carbonization of coal, and including viscous organic coal tar constituents, particulate solid impurities and liquid water, the process comprising the steps of heating coal at 450°–700° C. and at least substantially in the absence of air to thereby decompose the coal and obtain products including coal tar which contains liquid water, particulate solid impurities, and viscous organic coal tar constituents including light oils which tend to combine with the liquid water to produce a filter-clogging emulsion; heating the thus-formed coal tar to a temperature above the boiling point of water and sufficiently high to thereby distill off substantially all of the water and the light oils so as to obtain an intermediate product of increased viscosity and which is substantially free from the presence of liquid water and of the light oil constituents which in combination form the filter-clogging emulsion; and subsequently filtering the intermediate product without the use of a diluent to thereby separate the particulate solid impurities from the undistilled viscous constituents of the coal tar, the filtration without the use of a diluent being possible due to the elimination of light oils and water and the consequent absence of filter clogging which would otherwise result from the combination of the light oils with water onto a filter-clogging emulsion.

4,231,857
PROCESS FOR PREPARING PETROLEUM-DERIVED BINDER PITCH

Osamu Kato, Yokohama; Seiichi Uemura; Syunichi Yamamoto, both of Kawasaki; Takao Hirose, Kamakura, and Hiroaki Takashima, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

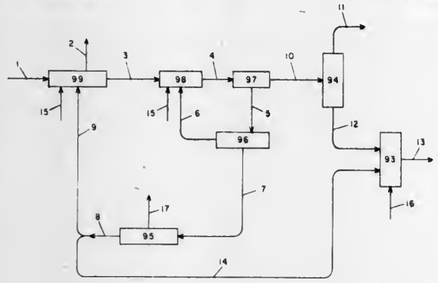
Filed Jul. 5, 1979, Ser. No. 55,052
Claims priority, application Japan, Jul. 14, 1978, 53-85044
Int. Cl.³ C10C *1/00*
U.S. Cl. 208—40 **8 Claims**

1. A process for the preparation of petroleum-derived binder pitch, comprising heat treating at 380°–500° C. for 15 minutes-20 hours a mixture of both (1) a heavy fraction boiling at not lower than 200° C. and being obtained by the steam cracking of petroleum and (2) a heavy fraction boiling at not lower than 200° C. and being obtained by the catalytic cracking of petroleum.

4,231,858
PROCESSING SHALE OIL TO JET FUEL

Walter H. Seitzer, West Chester, and Abraham Schneider, Overbrook Hills, both of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 766,113, Feb. 7, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 916,027
Int. Cl.² C10G *23/02, 29/12*
U.S. Cl. 208—89 **11 Claims**



1. Process for preparing whole crude shale oil to facilitate maximum conversion to jet fuel comprising:
(a) contacting whole crude shale oil with both hydrogen and a catalyst selected from the group consisting of cobalt molybdate on alumina, nickel molybdate on alumina and nickel-cobalf molybdate on alumina, at a temperature in the range of between from about 600° F. to about 850° F. and a pressure in the range of between from about 200 psig to about 5000 psig, the combination of conditions being such that the hydrogen consumption is in the range from about 700 to about 3000 standard cubic feet per barrel, until a substantial amount of neutral and acidic nitrogen compounds contained in the oil are converted to basic nitrogen compounds, hydrocarbons and ammonia;
(b) separating the contacted shale oil from the catalyst;
(c) contacting the separated oil with an amount of anhydrous hydrogen chloride at least sufficient to react with the basic nitrogen compounds remaining in said separated oil to form a reaction product, said contacting being carried out at a temperature range wherein the lower temperature is that at which only nominal amounts of wax will precipitate and the upper temperature is that at which only nominal amounts of reaction product resulting from the reaction of the hydrogen chloride and the basic nitrogen compounds will redissolve in the oil; and
(d) separating the oil from the reaction product of step (c).

4,231,859
MOLYBDENITE FLOTATION

Jerry L. Huiatt, Murray; Melvin D. Shurtz, Orem, both of Utah, and George M. Potter, Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

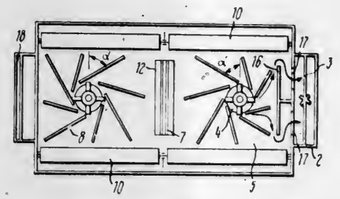
Continuation-in-part of Ser. No. 900,838, Apr. 28, 1978, abandoned. This application Nov. 27, 1979, Ser. No. 97,751
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—11 **1 Claim**

1. A process for recovering molybdenite from copper sulfide flotation concentrates containing minor amounts of iron sulfide comprising (1) preparing an aqueous pulp comprising the concentrate and about 0.2 to 1 pound of activated carbon per ton of concentrate, (2) injecting steam into the pulp in an amount and for a time sufficient to raise the temperature to about 70° to 100° C. and to maintain the pulp at this temperature for a period of about 10 to 60 minutes, (3) continuing steam injection while adding to the hot pulp an amount of soluble sulfide reagent sufficient to depress copper and iron sulfides, and conditioning the mixture for a period of about 0.5 to 3 minutes with continued steam injection, and (4) injecting a mixture of steam and air into the hot pulp in an amount sufficient for continued maintenance of the temperature of about 70° to 100° C. and to float a rougher molybdenite concentrate.

4,231,860
FLOTATION MACHINE

Vyacheslav D. Kuznetsov, ulitsa Akademika Pavlova, 140a, kv. 97; Boris P. Preobrazhensky, viezd Trinklera, 5, kv. 79; Valentin E. Rozhnov, ulitsa Tobolskaya, 52, kv. 10; Jury V. Stepanov, ploschad Rozy Ljuxemburg, 5, kv. 10, all of Kharkov; Anatoly N. Belitsky, ulitsa Deputatskaya, 166, kv. 55, Makeevka Donetskoi oblasti; Viktor N. Belzer, 763 kvartal dom 14, kv. 26, Makeevka Dontskoi oblasti; Grigory A. Tokar, bulvar 8 Sentyabrya, 6, kv. 28, Makeevka Donetskoi oblasti; Ivan K. Plastovets, bulvar 8 Sentyabrya, 14, kv. 1, Makeevka Donetskoi oblasti; Ivan I. Barylo, ulitsa Ostrovskogo, 10/32, kv. 5, Makeevka Donetskoi oblasti; Boris A. Koval, ulitsa Artema, 80a, kv. 86, Donetsk; Sergei F. Chepurnykh, ulitsa Matrosova, 14a, kv. 58, Kharkov; Petr N. Chumachenko, prospekt Traktorostroitelei 107, kv. 204, Kharkov; Nikolai F. Simonov, ulitsa Ivanova, 12/16, kv. 46, Kharkov; Petr P. Kharkhardin, prospekt Kirova, 109, kv. 48, Dnepropetrovsk, and Ilya M. Litmanovich, ulitsa Suvorova, 8, kv. 4, Makeevka Donetskoi oblasti, all of U.S.S.R.

Filed Sep. 20, 1978, Ser. No. 944,129
Claims priority, application U.S.S.R., Sep. 21, 1977, 2524485
Int. Cl.² B03D *1/18*
U.S. Cl. 209—169 **11 Claims**

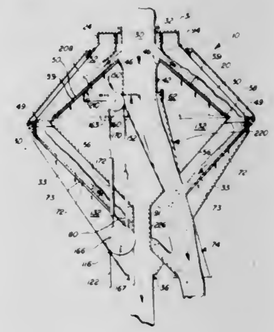


1. A flotation machine comprising a plurality of cells arranged in series and provided with pulp receiving and discharging devices, wherein each cell comprises: at least two aerators positioned within said cell along a longitudinal axis of said cell and offset toward a respective end wall from a transverse axis of said cell; at least two stator plates fitted with a central opening, each aerator being mounted in spaced relationship with a respective stator plate and above said central opening of said respective stator plate; vertical blades mounted on each stator plate at an angle to a vertical plane passing through a center point of a respective aerator; first regulating means positioned intermediate a gap defined between said stator plates along the flow direction of said pulp for regulating longitudinal recirculating flows of said pulp; second regulating means positioned between side walls of said cell and said stator plates for regulating transverse flows of said pulp; and froth-removing means positioned above said stator plates in an upper part of said cell.

4,231,861
GRAIN CLEANING APPARATUS

Steven G. Hannie, Bloomington, and Terry D. Tucker, East Peoria, both of Ill., assignors to Parsons Manufacturing, Incorporated, Roanoke, Ill.

Filed Mar. 26, 1979, Ser. No. 24,057
Int. Cl.³ B07B *1/46*
U.S. Cl. 209—240 **7 Claims**



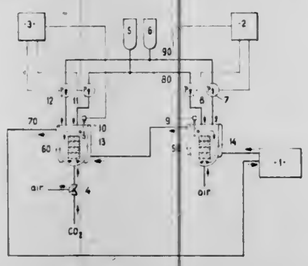
1. In a grain cleaning apparatus for removing fine foreign material from grain, said apparatus being of the type having an upright housing, at least one layer of inclined screens within said housing, said screens supporting grain for gravity flow while foreign material passes therethrough, at least one wall disposed below said screen layer, said wall cooperating with said screen layer to define a foreign material receiving chamber, a grain inlet disposed above and communicating with said screen layer to deliver grain for gravity flow over said screens in a relatively thin layer, a grain outlet disposed below and communicating with said screen layer, and a foreign material outlet communicating with said foreign material receiving chamber, said grain outlet being distinct and separate from said foreign material outlet, and means for selectively directing all of said grain over said screens or permitting all of said grain to bypass said screens, the improvement which comprises:
means for directing only a selected proportion of grain flowing through said grain inlet to said screen layer and simultaneously directing the remainder of said grain flowing through said grain inlet to said grain outlet without said grain passing over said screens; and
a grain segregating conduit for carrying said remainder of said grain through said foreign material receiving chamber directly into said grain outlet.

4,231,862

METHOD FOR THE PRESERVATION OF AN ACTIVATED SLUDGE

Roberto Mona, Bellinzona, and Jürgen Gnieser, Weinfelden, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 22, 1979, Ser. No. 22,691
Claims priority, application Switzerland, Apr. 3, 1978, 3530/78
Int. Cl.³ C02F *3/12*
U.S. Cl. 210—601 **11 Claims**



1. A method for the preservation of an activated sludge for the reuse in biological waste water purification stages, comprising the steps of:

storing activated sludge which is to be preserved and subsequently introduced and used in a biological waste water purification stage;

flushing the activated sludge with a gas to preserve the stored activated sludge prior to its use; and

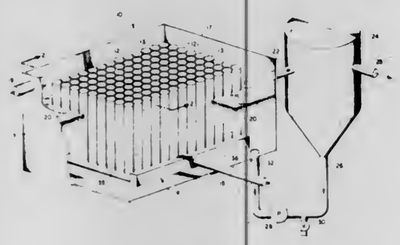
using as the flushing gas a gas containing at least carbon dioxide and to the extent that the flushing gas contains oxygen the flushing gas contains at least a reduced amount of oxygen in relation to air.

4,231,863

METHOD AND APPARATUS FOR TREATING WATER

Eldon M. Sutphin, 306 Field Club Ridge Rd., Pittsburgh, Pa. 15238

Filed Apr. 26, 1979, Ser. No. 33,350
Int. Cl.² C02C *1/08*
U.S. Cl. 210—615 **25 Claims**



1. Apparatus for treating water containing contaminants comprising:

an enclosure closed on the bottom portion thereof and adapted to hold water therein;

a plurality of substantially vertical open ended conduit members adapted to support biota growth thereon and positioned in mutually adjacent, close packed relationship in adjacent rows of several conduit members each with openings defined between the adjacent conduit members;

gas distribution means having a plurality of gas outlets positioned with at least one gas outlet adjacent the open bottom portion of each conduit member; and

means for maintaining a water level which at least partially immerses the conduit members;

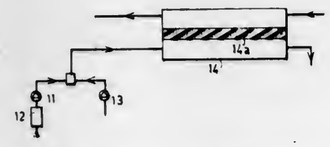
whereby gas may be expelled through the gas distribution orifices into each conduit member to aerate and lift the water to the top portion of the conduit thereby producing flow upward through the conduit members and downward there between thereby exposing the contaminated water to the inner and outer surfaces of the conduit members.

4,231,864

PROCESS FOR PREPARATION OF A WATER FOR HEMODIALYSIS, AND ITS APPLICATION IN RENAL HEMODIALYSIS

Didier Marty, 6, rue Clémence Isaure, 31000 Toulouse; Albert Abadie, 18, rue de Nimes, 31400 Toulouse, and Michel Mustin, 8, rue du Libre Echange, 31000 Toulouse, all of France

Filed Sep. 25, 1978, Ser. No. 945,296
Claims priority, application France, Oct. 21, 1977, 77 32009
Int. Cl.³ B01D *15/04*
U.S. Cl. 210—669 **12 Claims**



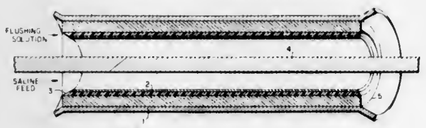
1. A process for preparation of water for hemodialysis comprising fixing acetate anions CH_3COO^- on at least one water insoluble anion-exchange resin and passing potable water containing undesirable anions through a bed of the thus prepared resin and substituting the undesirable anions contained in the initial potable water for the acetate ions fixed on said resin, and using the acetate containing water in a hemodialysis process.

4,231,865

BACKWASHING REVERSE-OSMOSIS AND ULTRAFILTRATION MEMBRANES BY ELECTRO-OSMOSIS

Kurt S. Spiegler, El Ceritto, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation of Ser. No. 950,761, Oct. 12, 1978, abandoned.
This application Aug. 7, 1979, Ser. No. 64,466
Int. Cl.³ B01D *13/00, 13/02*; C02B *1/82*
U.S. Cl. 210—636 **3 Claims**



1. A process for improving the efficiency of a reverse osmosis process for purification of saline water, said reverse osmosis process consisting essentially of applying to said saline water a pressure in excess of the osmotic pressure of the saline water, said saline water being separated from purified product water by a reverse osmosis membrane whereby pure water is caused to permeate through said membrane while salt molecules are retained by the membrane, comprising backwashing the membrane by application of an electric potential across the membrane to cause an electroosmotic backflow of water through the membrane.

4,231,866

RECOVERY OF ORGANIC AND AQUEOUS PHASES FROM SOLVENT EXTRACTION EMULSIONS

Kenneth W. Moser; Richard E. Siemens, both of Albany, and Stanley C. Rhoads, Corvallis, all of Oreg., assignors to The Unites States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 24, 1978, Ser. No. 936,465
Int. Cl.² B01D *15/00*
U.S. Cl. 210—660 **4 Claims**

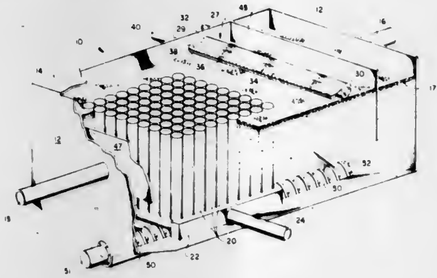
1. A process for recovery of organic solvent and aqueous phases from solvent extraction emulsions consisting essentially of the steps of (1) admixing the emulsion with diatomaceous earth and heating the mixture to a temperature of about 45° to 60° C. for a time sufficient for the diatomaceous earth to sorb foreign matter from the emulsion, (2) separating the diatomaceous earth, with sorbed foreign matter, from the organic solvent and aqueous phases and (3) separately recovering the organic solvent and aqueous phases.

4,231,867

METHOD AND APPARATUS FOR TREATING HETEROGENEOUS FLUID SYSTEMS

Eldon M. Sutphin, 306 Field Club Ridge Rd., Pittsburgh, Pa. 15238

Filed Aug. 31, 1979, Ser. No. 71,527
Int. Cl.² B01D *17/04*
U.S. Cl. 210—703 **35 Claims**



19. A method for separating constituents of differing densities dispersed in a fluid phase, the method comprising:

flowing gas bubbles into a liquid through a plurality of gas outlets positioned beneath the surface of a liquid to aerate the liquid;

moving the aerated liquid through a plurality of substantially vertical, open-ended conduit members positioned in mutally adjacent, close packed relationship in adjacent rows of several conduit members each with openings defined between the adjacent conduit members and immersed in the mixture;

separating at least a portion of constituents dispersed in at least one of the gas and liquid during flow through the conduit members;

forming a layer of separated, initially dispersed constituents; and

removing the layer of separated initial dispersed components from the liquid.

32. A method for separating constituents as set forth in claim 19 in which particles are dispersed within the liquid to provide greater surface area of solids within the liquid.

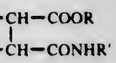
4,231,868

PROCESS FOR DEWATERING MINERAL AND COAL CONCENTRATES

Samuel S. Wang, Chesire, and Morris E. Lewellyn, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1979, Ser. No. 1,137
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—728 **8 Claims**

1. A process for dewatering mineral and coal concentrates which comprises mixing with an aqueous slurry of the mineral or coal concentrate a dewatering aid in an amount ranging from about 0.15 pound per ton to about 5.0 pounds per ton, said dewatering aid consisting essentially of an N-monosubstituted sulfosuccinamate of the general structure:



wherein R is a linear or branched aliphatic radical having four to fifteen carbon atoms, inclusive, R' is a linear or branched aliphatic radical having four to fifteen carbon atoms, inclusive, and X is hydrogen or a sulfonate salt, there being one X as hydrogen and one X as a sulfonate salt, and thereafter dewatering the treated slurry by filtration.

4,231,869

PERMANENT COBALT CATALYST FOR SULFITE OXYGEN SCAVENGING

Bob L. Carlberg, and Robert A. Hart, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Continuation of Ser. No. 899,629, Apr. 24, 1978, abandoned.
This application Mar. 19, 1979, Ser. No. 21,418
Int. Cl.³ C02F *1/72*
U.S. Cl. 210—763 **6 Claims**

1. In the recovery of hydrocarbons from petroliferous formations wherein water is injected into the formation through a wellbore, the method comprising reducing oxygen levels by mixing said water with a source of sulfite ion, said mixture then being passed over a catalyst bed containing water insoluble cation exchange resin having cobalt ions adsorbed thereon such that treated low oxygen content water contains substantially no cobalt ion.

4,231,870

PROCESS FOR REGENERATION OF A FILTER MEDIUM

Tron-Halvard Fladby, Asker, Norway, assignor to A/S Akers Mek. Verksted, Oslo, Norway

Filed Feb. 16, 1979, Ser. No. 12,738
Claims priority, application Norway, Feb. 20, 1978, 780583; Mar. 6, 1978, 780770
Int. Cl.³ B01D *23/24*
U.S. Cl. 210—797 **2 Claims**

1. A method of cleaning and regenerating a filter which is used for filtering water but which becomes clogged with a layer of deposited microorganisms such as algae over a period of time, said method including the steps of

(a) draining away the water to be filtered from both the upstream side and the downstream side of the filter, the upstream and downstream sides relating to the direction of the flow of water to be filtered therethrough,

(b) directly contacting the filter with a previously formed sulfuric acid solution as the only active treatment chemical, said solution having a concentration of at least 65% sulfuric acid which is sufficient to break down and dehydrate the deposited layer, the acid solution being directed so as to first contact the upstream side of the filter, and

(c) washing the filter with purified water so as to flush away the residue of the microorganisms, the washing water



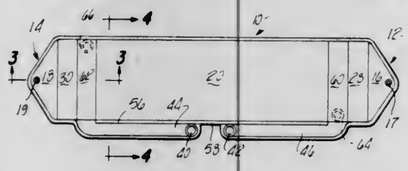
being directed so as to first contact the upstream side of the filter.

4,231,871

ARTIFICIAL KIDNEY AND METHOD FOR MAKING SAME

Bennie J. Lipps, Walnut Creek, Calif.; William P. Murphy, Jr., Miami, Fla., and Frank W. Mather, III, Lafayette, Calif., assignors to Cordis Dow Corp., Miami, Fla.

Division of Ser. No. 805,601, Jun. 10, 1977. This application Aug. 7, 1978, Ser. No. 931,229
Int. Cl.³ B01D *31/00;* **A61M** *1/03*
U.S. Cl. 210—87 **15 Claims**



1. An improved hollow fiber artificial kidney comprising in a one-piece integral construction a jacket member having

(1) spaced apart end portions interconnected by curvilinear portions, said curvilinear portions having portions integral with an exterior surface thereof and at least one of said exterior surface portions extending outwardly from said curvilinear portions for at least a part of the length thereof, said curvilinear portions and said end portions encompassing an inlet blood chamber, a dialysate chamber and an outlet blood chamber, each said chamber being fluid-tight and separated from each other,

(2) a first tubesheet adjacent one end of said curvilinear portions separating said inlet blood chamber from said dialysate chamber,

(3) a second tubesheet adjacent the other end of said curvilinear portions separating said dialysate chamber from said outlet blood chamber,

(4) a multiplicity of hollow fibers embedded in each said first and second tubesheet and extending therebetween, said hollow fibers being semipermeable and the ends of said fibers being open and terminating substantially in the plane of the outer end surface of each said tubesheet thereby providing communications between the interiors of said blood chambers through the passageways in said fibers, said hollow fibers between said tubesheets being within said dialysate chamber,

(5) blood supply means including an integral blood port in communication with said inlet blood chamber for supplying blood thereto,

(6) blood return means including an integral blood port in communication with said outlet blood chamber for removing blood therefrom, and

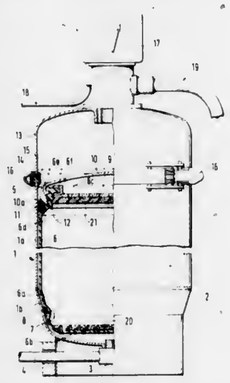
(7) dialysate means including integral inlet and outlet ports in communication with said dialysate chamber for supplying fresh dialysate to and removing spent dialysate from said dialysate chamber.

4,231,872

DEVICE FOR COMPLETE DESALINATION OF WATER

Wolfgang Kell, Kopernikusstr. 9, D-4044 Kaarst 1, Fed. Rep. of Germany

Filed Nov. 27, 1978, Ser. No. 964,073
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 27525811
Int. Cl.³ B01D *27/00, 35/02;* **B01J** *47/04*
U.S. Cl. 210—93 **11 Claims**



1. An apparatus for the desalination of water comprising:

a cylindrical pressure-resistant vessel having means at the ends thereof for connection to a pressurized water line;

a disposable cylindrical cartridge having peripheral walls formed of water impermeable, non-pressure resistant material positioned within said vessel so that the peripheral walls of said cartridge are in close proximity to or abutting the inside of said vessel,

a mixed bed of cationic and anionic exchange resins in said cartridge,

removable cover means at one end of said vessel,

water inlet and outlet means at the axial ends of said cartridge so that said cartridge is positioned in said vessel in such a way that water passing through said vessel will pass through said cartridge,

first sealing means near the end of said cartridge adjacent said water inlet means for establishing a water-pressure-tight seal between the wall of said cartridge and said vessel,

said cartridge including a clamping ring threadedly attached to the upper portion of said cartridge and an inwardly directed chamfer adjacent said clamp ring,

said first sealing means including a circumferential gasket abutting said chamfer and urged into contact with said vessel by means of said clamp ring

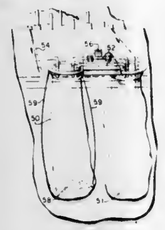
whereby the pressure of water passing through said cartridge is transferred through the non-pressure resistant walls of said cartridge to the pressure resistant walls of said vessel without damage to the walls of said cartridge.

4,231,873

UNDERWATER LIQUID CONTAINMENT SYSTEM

Michael P. Swigger, 580 Erbes Rd., Thousand Oaks, Calif. 91360

Filed Sep. 6, 1977, Ser. No. 830,581
Int. Cl.² B63B *35/00;* **E02B** *1/00*
U.S. Cl. 210—170 **2 Claims**



1. A liquid containment system comprising:

at least two elongated closed containers constructed of flexible fluid impermeable material for storing liquids;

said containers oriented in a generally upright manner proximate each other with each having a top portion and a bottom portion and being substantially entirely immersed within a surrounding body of water;

said top portions including an opening providing access to the interior thereof and being supported in an uppermost position by buoyant means connected thereto for communication to the atmosphere;

said buoyant means comprising a floating structure which supports a header assembly and conduit means in communication with each of said openings for transporting liquids into and out of said containers, said header assembly providing a plurality of passageways for transporting liquid in a predetermined manner through said conduit means;

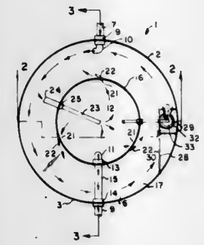
said containers being adapted to dispense solid materials accumulated in the bottom portion thereof wherein one of said containers includes connecting lines secured to the bottom portion thereof for drawing said portion near said top opening to facilitate the dispensation of said solid materials.

4,231,874

GYRATORY AEROBIC AERATION TREATMENT TANK

Raymond W. Heiligtag, Rte. 4, Box 180, Imperial, Mo. 63052

Filed Dec. 14, 1976, Ser. No. 750,395
Int. Cl.³ B01F *3/04;* **C02F** *3/22*
U.S. Cl. 210—195.4 **7 Claims**



1. A self-contained waste treatment tank, which comprises:

a cylindrical outer shell, said shell having a bottom wall a cylindrical side wall, and a top wall, said outer shell delimiting a chamber;

a cylindrical baffle mounted in said chamber, said cylindrical baffle dividing said chamber into a first chamber part and a second chamber part, said cylindrical baffle having a lower end attached along the bottom wall of said outer shell and an upper end extending above a liquid level in said chamber, said cylindrical baffle having at least one opening permitting communication between said first and said second chamber parts along the lower end of said baffle;

sewage inlet means communicating with said first chamber part;

inlet means in said cylindrical baffle communicating with said first chamber part and said second chamber part, said inlet means being positioned below the liquid level in said chamber;

outlet means communicating with said second chamber part and a point external of said outer shell; and

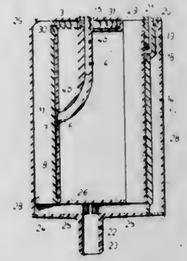
means for generating a horizontal circulatory flow pattern in said first chamber, said flow pattern generating means comprising a pump submerged in sad first chamber part, said pump having an inlet positioned toward the bottom of said first chamber part and an outlet, and linkage means connected to the outlet of said pump, said linkage means including a first pipe operatively connected to said pump, connection means connected to a second end of said first pipe, and a second pipe operatively connected to said connection means, said first pipe having a first internal diameter, said second pipe having a second internal diameter, said second internal diameter being larger than the internal diameter of said first pipe, said connection means including an expanding part for expanding the diameter of said linkage means from said first diameter to said second diameter, said second pipe having an outlet in and below the fluid level in said first chamber part, said horizontal circulatory flow pattern generating means creating a flow pattern in said first chamber part which directs fluid from said first chamber part to said second chamber part through said inlet means and which simultaneously draws fluid from said second chamber part to said first chamber part along the opening in the lower end of said cylindrical baffle.

4,231,875

DIFFUSION APPARATUS UTILIZING TUBULAR SEMI-PERMEABLE MEMBRANE

Per-Olov A. V. Carlsson, Sösdala, and Kaj O. Stenberg, Staffanstorp, both of Sweden, assignors to Gambro AB, Sweden

Filed May 3, 1978, Ser. No. 902,353
Claims priority, application Sweden, May 13, 1977, 7705656
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—232 **26 Claims**



1. Diffusion apparatus comprising an outer casing, a one-piece inner core disposed within said outer casing defining a diffusion space between said one-piece inner core and said outer casing, so that a tubular semi-permeable membrane having a first end and a second end and a spacing material can be wound about said one-piece inner core within said diffusion space, said one-piece inner core including a first end, a second end, and an aperture on the surface of said one-piece inner core facing said outer casing, said one-piece inner core further

including integral inner core first fluid channel means communicating between said aperture on said surface of said one-piece inner core and said first end of said one-piece inner core whereby said one-piece inner core provides for fluid communication between said first end of said inner core and said aperture on said surface of said inner core for communication with a first fluid within the interior of said tubular semi-permeable membrane at the first end thereof, second fluid directing means communicating with a second fluid within said diffusion space for contacting the outer surface of said tubular semi-permeable membrane, and third fluid directing means communicating with said first fluid within the interior of said tubular semi-permeable membrane at the second end thereof.

4,231,876

REUSABLE COFFEE FILTER

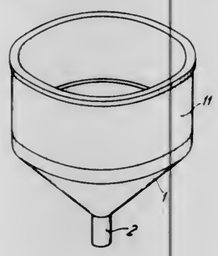
Anton Zimmermann, Ennetbürgen, and Albert Greutert, Sachseln, both of Switzerland, assignors to MAXS Aktiengesellschaft, Sachseln, Switzerland

Filed Feb. 15, 1979, Ser. No. 12,502

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808295

Int. Cl.[2] B01D *23/28;* **B65B** *39/00;* **B67C** *11/00*

U.S. Cl. 210—232 **3 Claims**



1. A reusable coffee filter assembly for use in providing a filtrate of liquid such as coffee, said assembly comprising:

a cone-shaped funnel and a reusable filtering element positionable within said funnel;

coacting spacing means to critically space an inner surface of said funnel and an outer surface of said filtering element at a distance of between from 0.2 mm and 1.5 mm from each other when said filtering element is positioned within said funnel, said spacing means including an inwardly extending peripheral rib at an upper inner portion of said funnel, a plurality of spaced inwardly extending protrusions on a lower portion of said inner surface of said funnel adjacent a lower outlet port of said funnel, and a peripheral groove at an upper portion of said filtering element, said groove engaging said rib, and a minimal outer surface portion of said filtering element contacting said spaced protrusions to maintain said critical spacing between said inner surface of said funnel and said outer surface of said filtering element to provide a substantial filtering area in which a continuous layer of the filtrate is formed on said inner surface of said funnel and passes through said outlet port as a continuous column of liquid; and

a throttling means in said outlet port, said throttling means being so dimensioned and spaced in said outlet port to control the flow of the filtrate to maintain said continuous layer of filtrate whereby a rapid filtering speed is attained.

4,231,877

BLOOD DIALYZER

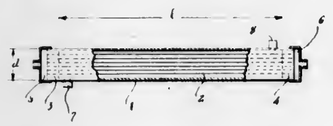
Kazuhisa Yamauchi; Taku Tanaka; Syuji Kawai, and Hirokuni Tanii, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 30, 1978, Ser. No. 910,462

Claims priority, application Japan, Jun. 1, 1977, 52-71838[U]

Int. Cl.[3] B01D *31/00*

U.S. Cl. 210—321 B **4 Claims**



1. An improved blood dialyzing apparatus comprising the combination of a cylindrical housing and at least one bundle of semi-permeable hollow filaments positioned in said housing, a blood inlet and outlet in respective ends of said housing, and a dialysate inlet and outlet in the side wall of said housing, the improvement wherein:

said housing has an inside diameter in the range of 20 to 50 mm, and an effective length in the range of 200 to 350 mm, the ratio of the effective length of said housing to the inside diameter thereof being within the range of 7 to 10.

4,231,878

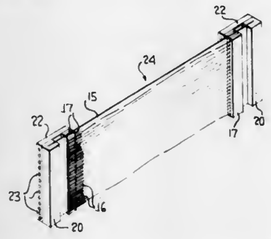
CAPILLARY MASS TRANSFER DEVICE

William G. Esmond, 8000 Country Club Rd., Havre de Grace, Md. 21078

Filed Jul. 16, 1975, Ser. No. 596,501

Int. Cl.[3] B01D *31/00*

U.S. Cl. 210—321 B **12 Claims**



1. A capillary mass transfer device comprising a group of capillary tubes, said group of tubes including a plurality of tubes arrranged in side by side and generally stacked relation with said tubes defining a general plane, means for defining a fluid passage surrounding said tubes, first flow means for directing a first fluid into and through said tubes, and second flow means for directing a second fluid through said first flow means into and through said fluid passage, said means defining a fluid passage including a pair of wall defining members extending generally coextensive with said tubes in the direction of tube length and lying in planes disposed generally parallel to said general plane of the tubes, said wall defining members being spaced with respect to one another transversely of said tubes and disposed on opposite sides of the general plane of said tubes with said tubes being disposed therebetween, said wall defining members further having end portions in the direction of tube length disposed beyond each end of said tubes, means fixedly securing end portions of said tubes relative to said wall defining members and in sealed relation to said wall defining members, and said second flow means including flow passage defining members positioned between said end portions of said wall defining members and extending generally parallel to the general plane of said tubes, each flow passage defining member having inner and outer end portions with each inner end portion being sealed relative to exteriors of said tube end portions and forming part of said means defining a fluid passage, said flow passage defining members having flow passages therethrough opening into said fluid passage.

4,231,879

APPARATUS FOR SELECTIVE SEPARATION OF MATTER THROUGH SEMI-PERMEABLE MEMBRANES

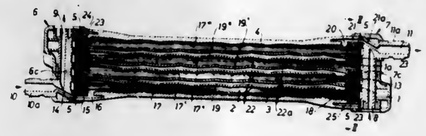
Kurt Spranger, Ammerbuch-Entringen, Fed. Rep. of Germany, assignor to Gambro Dialysatoren GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,314

Claims priority, application Sweden, Oct. 17, 1977, 7711630

Int. Cl.[3] B01D *31/00*

U.S. Cl. 210—321 B **20 Claims**



1. Apparatus for selectively separating matter between a first fluid and a second fluid through semi-permeable membranes, said apparatus comprising:

a plurality of elongated frame assemblies each of which has a first end and a second end and each of which defines an elongated contact chamber for said second fluid;

a plurality of tubular semi-permeable membranes for said first fluid for each of said frame assemblies, said pluralities of tubular membranes being disposed in said contact chambers of said frame assemblies;

said frame assemblies being stacked with said elongated contact chambers being in side by side relationship and with said first ends of said frame assemblies arranged at a first end of said stacked frame assemblies and said second ends of said frame assemblies arranged at a second end of said stacked frame assemblies;

fluid communication means for said stacked frame assemblies for providing fluid communication between said contact chambers of said frame assemblies through which said second fluid is adapted to be conducted;

a pair of cover plates for said stacked frame assemblies, said cover plates being disposed on opposite sides of said stacked frame assemblies and each having a first end arranged adjacent said first end of said stacked frame assemblies and a second end arranged adjacent said second end of said stacked frame assemblies;

sealing means for sealing said tubular semi-permeable membranes from said contact chambers so that there is no contact between said first fluid and said second fluid;

a first end fitting encompassing the outer periphery of said stacked frame assemblies at said first end of said stacked frame assemblies and a second end fitting encompassing the outer periphery of said stacked frame assemblies at said second end of said stacked frame assemblies, at least said first end fitting including means for clamping said stacked frame assemblies between said pair of cover plates to hold said stacked frame assemblies together;

inlet means for said first fluid for introducing said first fluid into said tubular semi-permeable membranes and outlet means for said first fluid for withdrawing said first fluid from said tubular semi-permeable membranes;

inlet means for said second fluid for introducing said second fluid into at least one of said contact chambers; and

outlet means for said second fluid for withdrawing said second fluid from said contact chambers whereby said second fluid is conducted substantially throughout said contact chambers of said stacked frame assemblies around said tubular semi-permeable membranes supported therein to selectively separate matter between said first and second fluids.

4,231,880

ASSEMBLY FOR THE CLOSURE OF THE END OF A FLATTENED TUBE

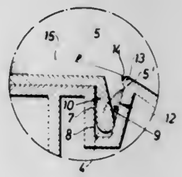
Per-Olov A. V. Carlsson, Sösdala, and Kaj O. Stenberg, Staffanstorp, both of Sweden, assignors to Gambro AB, Sweden

Filed Nov. 17, 1978, Ser. No. 961,517

Claims priority, application Sweden, Nov. 18, 1977, 7713020

Int. Cl.[3] B01D *13/00*

U.S. Cl. 210—321 B **10 Claims**



1. A clamping assembly for clamping and sealing the end of a flattened tube, comprising a groove for receiving an end of a flattened tube, and a clamping member including a beaded portion for clamping and sealing the end of a flattened tube when said clamping member is in a clamping position within said groove and the end of the flattened tube is properly disposed in said groove, said groove comprising a first groove surface and a second groove surface disposed at an oblique angle relative to said first groove surface, said second groove surface including a clamping portion, and said clamping member including a locking portion adapted to mate with said clamping portion of said second groove surface when said clamping member is in its said clamping position within said groove whereby said beaded portion is held in its sealing position relative to the end of a flattened tube properly disposed within said groove.

4,231,881

PULP SCREEN DEVICE

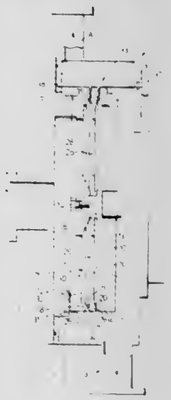
Gosta Ingemarsson, Säffle, Sweden, assignor to Eur-Control Källe AB, Sweden

Filed Dec. 29, 1978, Ser. No. 383

Claims priority, application Sweden, Dec. 30, 1977, 7714960

Int. Cl.[3] B01D *33/02*

U.S. Cl. 210—396 **10 Claims**



1. A screen device for separating undesirable impurities from

a pulp suspension, said device is provided with at least one continuous circular screen slot provided between a first chamber into which suspension to be screened is conducted through an inject-inlet and from which undesirable material is passed away through a reject-outlet, and a second chamber from which screened suspension is forwarded through an accept-outlet, characterized in that the screen slot is formed by two walls stationary in relation to each other and that a cleaning device bears against the screen slot, said cleaning device and slot being movable in relation to each other for continuous cleaning of the screen slot.

4,231,882

TREATING SUBTERRANEAN WELL FORMATIONS

Eugene A. Elphingstone, and Lewis R. Norman, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 871,735, Jan. 23, 1978, abandoned. This application Oct. 20, 1978, Ser. No. 953,284

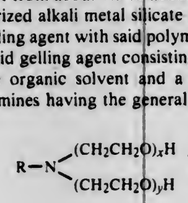
Int. Cl.³ E21B *43/27*

U.S. Cl. 252—8.55 C **35 Claims**

1. A method of forming a low pH highly viscous thixotropic fluid for use in treating a subterranean well formation comprising the steps of:

combining an aqueous solution of acid other than hydrofluoric acid with an aqueous alkali metal silicate solution having a pH of greater than about 11 in an amount sufficient to lower the pH of the resulting mixture to the level in the range of from about 7.5 to about 8.5 thereby forming a polymerized alkali metal silicate gel;

combining a gelling agent with said polymerized alkali metal silicate gel, said gelling agent consisting of a solution of a water soluble organic solvent and a mixture of ethoxylated fatty amines having the general formula:



wherein:

R is selected from saturated and unsaturated aliphatic groups having in the range or from about 8 to about 22 carbon atoms, and

x and y each have a value in the range of from 0 to about 10 but both x and y are not 0; and

said ethoxylated fatty amine is present in said gelling agent in an amount in the range of from about 10% to about 80% by weight of said gelling agent;

combining additional aqueous solution of acid other than hydrofluoric acid with said polymerized alkali metal silicate gel-gelling agent mixture in an amount sufficient to obtain a mixture containing excess acid in the range of from about 1% to about 28% by weight of said mixture; and

shearing said mixture to thereby obtain a highly viscous thixotropic treating fluid.

4,231,883

LUBRICANT COMPOSITION

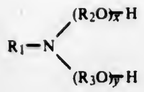
Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed May 4, 1979, Ser. No. 36,073

Int. Cl.³ C10M *1/32, 1/40*

U.S. Cl. 252—33.4 **7 Claims**

1. In a lubricating oil composition formulated for use in the crankcase of an internal combustion engine, said lubricating oil comprising a major amount of an oil of lubricating viscosity suitable for use in an engine crankcase, the improvement wherein said composition contains a minor friction-reducing amount of an oil soluble additive having the formula



wherein R_1 is an aliphatic hydrocarbon group containing about 12–36 carbon atoms, R_2 and R_3 are divalent hydrocarbon radicals containing 2–4 carbon atoms and x and y is 2 to about 6, said improvement resulting in an increase in fuel economy.

4,231,884

WATER RETARDANT INSULATION COMPOSITION COMPRISING TREATED LOW DENSITY GRANULAR MINERAL MATERIAL AND FINELY DIVIDED LIMESTONE OR SIMILAR CARBONATE OR SILICATE MINERAL PARTICLES AND METHOD FOR USING SAME

Carl B. Dorius, Salt Lake City, Utah, assignor to American Gilsonite Company, Salt Lake City, Utah

Continuation-in-part of Ser. No. 815,581, Jul. 14, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,791

Int. Cl.³ C04B *43/08, 43/00*; F16L *59/02, 59/04*

U.S. Cl. 252—62 **62 Claims**

1. A composition for thermally insulating and protecting structures against corrosion comprising a mixture of about 80% to about 20% by volume limestone particles having a particle size smaller than about 150 mesh Tyler standard sieve size, said particles being coated with a water repellant material; and about 20% to about 80% by volume of a low density granular mineral material having a particle size larger than the limestone particles, each granule threof having vesicular pores such that said granular mineral material has a bulk density from about 3 to about 65 pounds per cubic foot, said granular mineral material being coated with a water repellant material selected from the group consisting of silicones, asphalts, waxes and gilsonite.

28. A composition for thermally insulating and protecting structures against corrosion comprising a mixture of about 80% to about 20% by volume mineral particles not having vesicular pores, said mineral particles being selected from the group consisting of silicate minerals and carbonate minerals, said particles having a particle size smaller than about 150 mesh Tyler standard sieve size, said particles being coated with a water repellant material; and about 20% to about 80% by volume of a low density granular mineral material having a particle size larger than the mineral particles, each granule thereof having vesicular pores such that said granular mineral material has a bulk density from about 3 to about 65 pounds per cubic foot, said granular mineral material being coated with a water repellant material selected from the group consisting of silicones, asphalts, waxes and gilsonite.

4,231,885

THERMAL ENERGY STORAGE COMPOSITION COMPRISING PEAT MOSS

Philip G. Rueffel, Prince Albert, Canada, assignor to Saskatchewan Minerals, Chaplin, Canada

Filed Jul. 12, 1979, Ser. No. 56,837

Int. Cl.² C09K *5/06*

U.S. Cl. 252—70 **16 Claims**

1. A thermal energy storage composition which utilizes latent heat of phase change to store thermal energy comprising:

an incongruently melting salt hydrate, capable of storing thermal energy as latent heat of phase change, and a nucleating agent, both being trapped in a network of peat moss.

4,231,886

ESTER SOLUTIONS OF COMPLEX SALTS

Robert C. Carlson, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 29, 1979, Ser. No. 7,667

Int. Cl.³ B01J *31/02*

U.S. Cl. 252—117 **7 Claims**

1. A composition consisting essentially of a complex salt dissolved in a liquid organic ester which is free of substituents which are reactive with cationically polymerizable groups, wherein said complex salt is present in an amount of at least 10% by weight of said composition, and wherein said complex salt is selected from diorganoiodonium complex salts and triorganosulfonium complex salts of a type capable of initiating photopolymerization of cationically polymerizable materials.

4,231,887

ZEOLITE AGGLOMERATES FOR DETERGENT FORMULATIONS

Arthur F. Denny, Katonah, and John D. Sherman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 26, 1979, Ser. No. 52,190

Int. Cl.² B01J *1/04*; C11D *3/12, 3/20, 17/06*

U.S. Cl. 252—174.19 **5 Claims**



1. Zeolite-containing agglomerate particles suitable for incorporation into detergent formulations which comprise (a) crystals of a three-dimensional zeolite of the molecular sieve type containing ion-exchangeable alkali metal cations, said zeolite being contained in a combined matrix of an intimate mixture of (b) at least one or a mixture of two or more ethoxylated alcohols having the formula $R—O—(CH_2—CH_2—O)_nH$ wherein "R" is a primary or secondary alkyl group containing from 9 to 18 carbon atoms and "n" is a whole number of from 3 to 12 inclusive, said ethoxylated alcohol being present in an amount of 15 to 50 parts by weight per 100 parts by weight of zeolite crystals (hydrated), and (c) sodium citrate, as the dihydrate, in an amount of 8 to 25 parts by weight per 100 parts by weight of zeolite.

4,231,888

COMPOSITION USED FOR EXTRACTING COPPER FROM AQUEOUS COPPER SALTS

Raymond F. Dalton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 756,067, Jan. 3, 1977, Pat. No. 4,142,952. This application Dec. 1, 1978, Ser. No. 965,498

Claims priority, application United Kingdom, Jan. 30, 1976, 3788/76; Jun. 15, 1976, 24722/76; Oct. 21, 1976, 43711/76

Int. Cl.² C22B *15/08, 3/00*

U.S. Cl. 252—182 **6 Claims**

1. A composition for use in extracting copper values from aqueous solutions of copper salts, said composition comprising (1) o-hydroxyaryloximes selected from the group consisting of a mixture of 5-nonylsalicylaldoximes and a mixture of 5-heptylsalicylaldoximes and (2) a mixture of p-nonylphenols, the amount of (2) being in the range of 0.1 to 20 times the weight of (1), said composition being capable of permitting greater overall copper recovery in a process involving contacting the aqueous solution of copper salts with a solution of said composition in a water-immiscible organic solvent, separating from the aqueous phase the solvent phase containing copper in the form of a complex with the indicated oxime mixture, contacting the solvent phase with an aqueous mineral acid, and separating the solvent phase from the aqueous phase containing copper in the form of a salt with the mineral acid.

4,231,889

DIVALENT SILVER OXIDE FOR USE IN PRIMARY CELL AND MANUFACTURING METHOD THEREOF

Kaoru Murakami, Hirakata; Mitsugu Okahisa, Kyoto; Tomohiko Arita, Hirakata, and Hiroshi Kumano, Daito, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 935,314, Aug. 21, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,937

Claims priority, application Japan, Aug. 19, 1977, 52-99666; Feb. 24, 1978, 53-21393; Feb. 24, 1978, 53-21394

Int. Cl.³ C01G *5/00*; H01M *4/54*

U.S. Cl. 252—182.1 **15 Claims**

1. A method for manufacturing a stable silver oxide for use in a primary cell which consists essentially of the steps of:

(a) reacting in aqueous solution at a temperature of 0° to 60° C. at least one member selected from the group consisting of silver salts and silver oxide (Ag_2O), persulfate and alkaline metal hydroxide to produce silver-II oxide, said persulfate being used in amount 1.0 to 1.85 times the theoretical amount thereof, with its concentration in aqueous solution being in the range from 0.04 to 0.72 mol/l, and said alkaline metal hydroxide being used in amount 1.05 to 6.0 times the theoretical amount thereof, with its concentration in aqueous solution being in the range from 0.3 to 4.8 mol/l and

(b) water washing and drying said divalent silver oxide thus produced.

10. The method of manufacturing a stable silver-II oxide as claimed in claim 4, wherein there is added to the thus produced silver-II oxide, at least one cadmium compound selected from the group consisting of cadmium salts and cadmium oxide in an amount of 0.05 to 20 parts by weight based on the amount of cadmium, per 100 parts by weight of silver.

4,231,890

BLEACHING COMPOSITION CAUSING NO COLOR CHANGE OR FADING OF COLORED AND FIGURED CLOTHS

Kouichi Yagi, Tokyo, and Yunosuke Nakagawa, Soka, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 957,082

Claims priority, application Japan, Nov. 25, 1977, 52-141351

Int. Cl.³ C11D *7/54, 3/395*; D06L *3/02*

U.S. Cl. 252—186 **9 Claims**

1. A bleaching composition which does not cause color change or fading of fabrics, consisting essentially of 50 to 98 weight % of peroxide which releases oxygen in an aqueous solution, 1 to 49 weight % of nitrilotriacetic acid, or water-soluble salt thereof, or mixture thereof, and 1 to 49 weight % of water softener capable of removing or masking calcium ions and magnesium ions contained in hard water to convert the hard water to soft water.

4,231,891

SOLID COMPOSITIONS FOR GENERATION OF GASES CONTAINING A HIGH PERCENTAGE OF HYDROGEN OR ITS ISOTOPES

Werner F. Beckert, Las Vegas, Nev.; William H. Barber, Brandywine, Md., and Ottmar H. Dengel, Front Royal, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 16, 1978, Ser. No. 916,423
Int. Cl.³ C01B 1/07
U.S. Cl. 252—188 12 Claims

1. Solid compositions for generating gases containing a high percentage of hydrogen or hydrogen isotopes comprising an intimate mixture of at least one metal powder selected from the group consisting of magnesium, aluminum, vanadium, zirconium, and titanium and at least one salt selected from the group consisting of an ammonium salt of the formula $(NH_4)_nX$ and a hydrazinium salt of the formula $(N_2H_6)_nX$ wherein H stands for hydrogen and its isotopes, X is an inorganic acid group and n is the valency of said inorganic acid group and wherein said compounds are present in about stoichiometric amounts or are present in amounts such that there is a stoichiometric excess of one of the components.

4,231,892

MANGANESE DOPED ZINC SILICATE LUMINESCENT PHOSPHORS WITH III-V OXIDE SUBSTITUTIONS

Ifay F. Chang, Chappaqua, and Merrill W. Shafer, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,521
Int. Cl.³ C09K 11/44
U.S. Cl. 252—301.6 F 5 Claims

1. Luminescent composition of a solid solution comprising $Zn_{2-y}Mn_ySi_{1-2x}Al_xP_xO_4$ having a willemite crystal structure wherein

$0<y\leqq 0.25$ and $0<x<0.5$,

wherein x is an amount sufficient to effect a luminescence efficiency that is greater than said composition absent Al and P, and

wherein y is an amount sufficient to effect an emission peaked near 5230 Å.

4,231,893

PROCESS FOR PREPARING AQUEOUS DISPERSION OF CERIA AND RESULTING PRODUCT

James L. Woodhead, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 25, 1978, Ser. No. 954,658
Claims priority, application United Kingdom, Nov. 1, 1977, 45471/77; May 25, 1978, 22835/78
Int. Cl.³ B01J 13/00
U.S. Cl. 252—313 R 12 Claims

1. A process for the preparation of an aqueous dispersion of ceria comprising forming a slurry of cerium IV hydroxide with water and an acid, the acid being capable of causing deaggregation of aggregated crystallites in the cerium IV hydroxide, heating the slurry for such a time and at such a temperature that the pH reaches a steady value, the quantity of acid in the slurry being such that the said steady value of pH is below 5.4, thereby to produce a conditioned slurry, separating liquid containing unreacted acid from said conditioned slurry to provide a slurry residue and admixing sufficient water with the resulting slurry residue to produce a sol of ceria.

12. An aqueous dispersion of ceria whenever prepared by a process as claimed in claim 1.

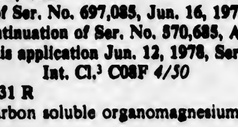
4,231,894

STABILIZED ALKALI METAL BISULFITE OR SULFITE-CATALYZED SOLUTIONS

Walter M. Lavin, Horsham; James I. McFarlane, Warminster, and Dennis L. Rose, Fairless Hills, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 929,187, Jul. 31, 1978, abandoned, which is a division of Ser. No. 807,949, Jun. 20, 1977, which is a continuation of Ser. No. 724,442, Sep. 20, 1976, abandoned. This application Jan. 17, 1980, Ser. No. 112,981
Int. Cl.³ C23F 11/18
U.S. Cl. 252—389 A 15 Claims

1. A method for stabilizing during storage an aqueous solution of an alkali metal sulfite or bisulfite containing a water-soluble cobalt catalyst without affecting the catalytic effect of the cobalt catalyst, which solution with an increase of pH will experience the precipitation of said cobalt as its sulfite salt, said method consisting essentially of incorporating in said solution a stabilizing amount of a compound having the structural formula:



$M_2O_3P-\underset{\displaystyle OH}{\overset{\displaystyle R}{\underset{|}{\overset{|}{C}}}}-PO_3M_2$, wherein

R is a lower alkyl of from 1 to 3 carbon atoms and wherein M is selected from the group of hydrogen, sodium, potassium and ammonium.

4,231,895

SYNERGISTIC HEAT STABILIZER COMPOSITIONS CONTAINING AN ANTIMONY OR A BISMUTH COMPOUND

Robert D. Dworkin, Old Bridge, N.J., assignor to M & T Chemicals Inc., Woodbridge, N.J.

Filed Jan. 2, 1979, Ser. No. 72
Int. Cl.³ C09K 15/32, 15/14, 15/08
U.S. Cl. 252—400 A 18 Claims

1. In an improved composition for imparting heat stability to halogen-containing polymers of ethylenically unsaturated hydrocarbons wherein the heat stabilizer exhibits the general formula MX_3, MX_nY_{3-n}, RM=S and R_nMX_{3-n} wherein M is antimony or bismuth, R is hydrocarbyl, n is 1 or 2 and X and Y individually represent the residue obtained by removing (1) the hydrogen atom from a carboxy (—COOH) group of a mono- or polyfunctional carboxylic acid or mercaptocarboxylic acid or (2) the hydrogen atom from the sulfur atom of a mercaptan, mercaptoalkanol, mercaptocarboxylic acid or an ester of a mercaptocarboxylic acid or mercaptoalkanol, the improvement which resides in the presence in said composition of a synergist containing at least one residue obtained by removing one or both hydrogens from the hydroxyl groups of a o-dihydric phenol, said residue being bonded through one or both oxygen atoms to an element selected from the group consisting of boron, phosphorus, silicon, antimony, tin and zinc.

4,231,896

ORGANOMAGNESIUM COMPLEXES

Dennis B. Malpass, LaPorte, Tex., assignor to Texas Alkyls, Inc., Deer Park, Tex.

Continuation of Ser. No. 697,085, Jun. 16, 1976, abandoned, which is a continuation of Ser. No. 570,685, Apr. 23, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 915,083
Int. Cl.³ C08F 4/50
U.S. Cl. 252—431 R 4 Claims

1. A hydrocarbon soluble organomagnesium complex having the formula

$(R'_2Mg)_m\cdot(RM)_n$

wherein RM is triethyl boron, R' is n-butyl and m and n are numbers such that the ratio of m/n is from 1 to 20.

2. A hydrocarbon soluble organomagnesium complex having the formula

$(R'_2Mg)_m\cdot(RM)_n$

wherein RM is tri-isobutyl boron, R' is n-butyl and m and n are numbers such that the ratio of m/n is from 1 to 20.

4,231,897

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 947,906, Oct. 2, 1978, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application May 4, 1979, Ser. No. 36,120
The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.
Int. Cl.³ B01J 27/08, 27/10, 23/36
U.S. Cl. 252—441 18 Claims

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of a cadmium component.

6. A catalytic composite as defined in claim 1 wherein the porous carrier material contains a catalytically effective amount of a halogen component.

4,231,898

REFORMING WITH MULTIMETALLIC CATALYSTS

Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1979, Ser. No. 53,374
Int. Cl.³ C11D 7/02; C10G 35/06
U.S. Cl. 252—441 6 Claims

1. A process for the preparation of copper-containing catalysts which comprises

forming an inorganic oxide support,

impregnating said support by contact thereof with a copper-containing halogen acid solution,

neutralizing said halogen acid treated, copper-containing support, and then

impregnating said copper-containing support by contact thereof with a solution containing one or more hydrogenation-dehydrogenation components.

4,231,899

METHOD OF PRODUCING A STEAM STABLE ALUMINOSILICATE ZEOLITE CATALYST

Nai Y. Chen, Titusville; Joseph N. Miale, Lawrenceville, both of N.J., and William J. Reagan, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 801,881, May 31, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,279
Int. Cl.³ B01J 29/04, 29/28
U.S. Cl. 252—455 Z 16 Claims

1. A method for stabilizing a crystalline alumino-silicate zeolite catalyst against steam deactivation wherein said zeolite is characterized by a silica/alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 and when said zeolite is an organozeolite further characterized by having at least about 50% of its active cationic sites occupied by organic cations comprising intimately admixing said zeolite and a sufficient amount of a suitable charring agent and thereafter subjecting said zeolite catalyst to calcination at an elevated temperature below about 1100° F. in a closed system having a limited amount of oxygen thereby converting a portion of said organic cations and/or charring agent to carbonaceous material of which at least about 1.5-15 wt. % is deposited and retained within the pores of said zeolite catalyst after said calcination.

6. The process of claim 1 wherein the catalyst is selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-35 and ZSM-38.

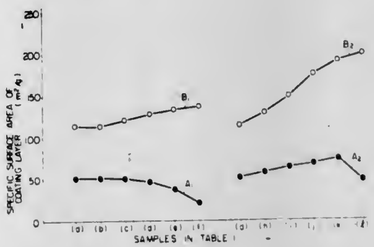
11. The process of claim 1 wherein the charring agents are selected from the group consisting of unsaturated hydrocarbons, dicyclic aromatics, picoline N-oxide and tripropyl N-oxide.

4,231,900

METHOD FOR FORMING ACTIVATED ALUMINA COATING ON REFRACTORY ARTICLE AND ARTICLE THEREBY PRODUCED

Tadanari Kato; Tadashi Ikemi, and Takatoshi Sagawa, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 684,243, May 7, 1976, abandoned, which is a continuation of Ser. No. 466,074, May 1, 1974, abandoned. This application Mar. 31, 1978, Ser. No. 892,035
Claims priority, application Japan, May 24, 1973, 48-58127
Int. Cl.² B01J 23/62, 23/82
U.S. Cl. 252—466 PT 16 Claims



1. A method for forming a high surface area coating on the surface of a monolithic catalyst carrier, said method comprising the steps of:

preparing a mixture containing not more than 20 parts by weight of alumina sol and one part by weight of activated alumina, said alumina sol containing 3 to 15 Wt % of alumina, said activated alumina containing not less than 60 Wt % of delta-alumina;

coating said mixture onto the surface of the catalyst carrier;

drying the coated catalyst carrier; and

firing the coated catalyst carrier at a temperature in the range of 150° to 850° C. for a time in the range of from 0.5 to 20 hours to form the high surface area coating on the surface of the catalyst carrier.

15. A catalyst for purifying exhaust gases from automobile engines, comprising a monolithic carrier, a high surface area coating formed on the surface of said monolithic carrier, said high surface area coating being formed by firstly preparing a mixture containing not more than 20 parts by weight of alumina sol and one part by weight of activated alumina, said alumina sol containing 3 to 15 Wt % of alumina, said activated alumina containing not less than 60 Wt % of delta-alumina, secondary coating said mixture onto the surface of said monolithic carrier, thirdly drying the coated monolithic carrier, fourthly firing the coated catalyst carrier at a temperature in the range of 150° to 850° C. for a time in the range of from 0.5 to 20 hours, and lastly immersing the fired coated monolithic carrier in a solution containing a noble metal.

4,231,901

ELECTRICALLY CONDUCTIVE FOAM AND METHOD OF PREPARATION AND USE

George R. Berbeco, West Newton, Mass., assignor to Charleswater Products, Inc., Needham, Mass.

Continuation-in-part of Ser. No. 824,051, Aug. 12, 1977, Pat. No. 4,150,418. This application Jun. 23, 1978, Ser. No. 918,411

Int. Cl.³ H01B *1/06*; H01C *1/06*

U.S. Cl. 252—511 **27 Claims**

1. An electrically conductive foam adapted for use with electronic components sensitive to static charges, which foam consists essentially of:

an open-cell polymeric foam uniformly impregnated with electrically conductive particulate material in an amount of from about 2% to 40% by weight of the impregnated foam and sufficient to provide for a surface resistance of the foam of less than about 30,000 ohms per square inch, the particulate material having a particle size of less than 40 millimicrons, and from about 1% to 60% by weight of the impregnated foam of a film-forming polymeric-binding material securing the conductive particulate material to the foam.

4,231,902

THERMISTOR WITH MORE STABLE BETA

Ruey J. Yu, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1978, Ser. No. 935,874

Int. Cl.² H01B *1/06*

U.S. Cl. 252—519 **3 Claims**

1. A thermistor comprising a resistance body composed of cobalt oxide, manganese oxide and zinc oxide in substantially the ratios by weight defined by the area ABCD of FIG. 1, together with about 3-6% by weight titanium oxide providing a predetermined temperature coefficient of electrical resistance, beta, substantially constant from about 50° F. to 350° F., the same being pressed and sintered to form a unitary homogeneous body.

4,231,903

DETERGENT COMPOSITIONS

Martin K. O. Lindemann, Bridgewater, and Robert J. Verdicchio, Succasunna, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

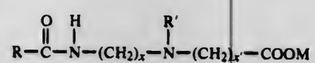
Filed Nov. 30, 1978, Ser. No. 965,460

Int. Cl.² C11D *3/36*, *7/36*

U.S. Cl. 252—545 **10 Claims**

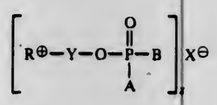
1. A low irritating detergent and cleansing composition wherein the active ingredients consist essentially of

(a) from about 1 to 20% by weight of the total composition of an amphoteric surfactant of the formula



wherein R is an alkyl group containing from about 8 to 18 carbon atoms and mixtures thereof; R′ is hydroxy alkyl containing from 2 to 4 carbon atoms or $CH_2—O—CH_2—$·COOM; x and x′ are integers from 1 to 5; and M is hydrogen or an alkali metal; and

(b) from about 1 to 20% by weight of the total composition of a compound selected from the group consisting of a phosphobetaine of the formula



wherein

A is selected from O^-, OM and $—O—Y—R^{\oplus}$

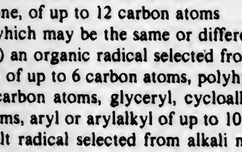
B is selected from O^- and OM′

$X^{\ominus}$ is an anion

z is an integer from 0 to 2

with the proviso that only one of A and B can be O^- and z is of a value necessary for charge balance;

R is an amidoamine reactant moiety of the formula



wherein

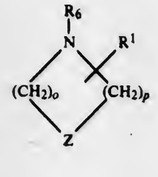
R^1 is alkyl, alkenyl, alkoxy, or hydroxyalkyl of from 5 to 22 carbon atoms each, or aryl or alkaryl of up to 20 carbon atoms;

R^2 is hydrogen or alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each or cycloalkyl of up to 6 carbon atoms, or polyoxyalkalene of up to 10 carbon atoms;

R^3 and R^4, are the same or different and are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl moiety, and polyoxyalkylene of up to 10 carbon atoms; in addition, R^3 and R^4 taken together with the nitrogen to which they are attached, may represent an N-heterocycle, structure in which the Y radical is bonded to a ring atom of said N-heterocycle other than the nitrogen of the R moiety;

n is an integer from 2 to 12; or

R is an N-heterocyclic radical of the formula



wherein

Z is N, S or O;

o is an integer from 0 to 3;

p is an integer from 1 to 3;

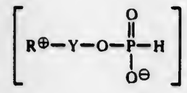
provided that the sum of o+p is from 3 to 4;

R^1 is defined as before and is linked to a ring carbon atom; and

R_6 is alkyl of from 2 to 6 carbon atoms

Y is alkylene, of up to 12 carbon atoms

M and M′, which may be the same or different, are (a) hydrogen, (b) an organic radical selected from alkyl or hydroxyalkyl of up to 6 carbon atoms, polyhydroxyalkyl of up to 10 carbon atoms, glyceryl, cycloalkyl of up to 6 carbon atoms, aryl or arylalkyl of up to 10 carbon atoms, or (c) a salt radical selected from alkali metals, alkaline earth metals, and mono-, di-, or tri-ethanolamine, provided that when either M or M′ is an organic radical (b), the other M and M′ must be hydrogen or a salt radical (c); or a phosphitaine of the formula:



R and Y are as defined above;

wherein the total of (a) and (b) does not exceed about 35% by weight of the total composition.

4,231,904

DETERGENT BARS WITH IMPROVED PROPERTIES

David Machin, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,496

Claims priority, application United Kingdom, Mar. 1, 1978, 8079/78

Int. Cl.² C11D *1/28*, *17/00*

U.S. Cl. 252—557 **9 Claims**

1. A detergent bar containing from about 20% to about 70% by weight of water soluble salts of acyl (C_8 to C_{22}) isethionates and an amount of ethoxylated (about 1 to about 30 units) sorbitan ester, having from about 12 to about 22 carbon atoms in the acid derived portion effective to increase the slip properties of the bar.

4,231,905

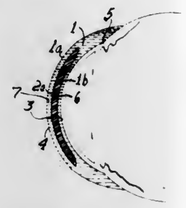
POLYMETHYLMETHACRYLATE CELLULOSIC COPOLYMER LENS MATERIAL

Charles W. Neefe, Big Spring, Tex., assignor to Neefe Optical Laboratory, Big Spring, Tex.

Continuation-in-part of Ser. No. 919,240, Jun. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,764, Nov. 9, 1977, Pat. No. 4,110,264, which is a continuation-in-part of Ser. No. 737,045, Oct. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 663,095, Mar. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,796, May 22, 1976, Pat. No. 3,957,049. This application Jun. 25, 1979, Ser. No. 51,345

Int. Cl.³ C08L *1/10*, *1/26*

U.S. Cl. 260—17 A **6 Claims**



1. A gas permeable, dimensionally stable, optically clear contact lens material made by the steps of dissolving in monomeric methylmethacrylate 2% to 80% by weight of the methylmethacrylate of a soluble solid cellulose ether or ester polymer material which does not prevent the polymerization of the monomeric methylmethacrylate, polymerizing the methylmethacrylate cellulosic solution to form a ridged transparent contact lens material which has a faster recovery from being flexed than a polymethylmethacrylate or a cellulosic contact lens material.

4,231,906

INK COMPOSITION FOR NON WOVEN FABRICS OF SYNTHETIC FIBERS

Maurizio Giorgetti, Busto Arsizio, Italy, assignor to ATEX-/U.S.A., Inc., Asheville, N.C.

Filed Dec. 11, 1978, Ser. No. 968,297

Int. Cl.³ C09D *11/06*, *11/10*, *11/12*

U.S. Cl. 260—19 N **6 Claims**

1. An ink composition for the imprinting of polyolefinic non woven fabrics, comprising a pigment, a desiccant, a binder based on isophthalic and/or urethane varnish, a polyethylene protective wax and characterized in that it comprises between 54 and 64 percent by weight of an oleoresinous varnish consisting of a phenolic resin, crude linseed oil, tung oil and high boiling mineral oil, the composition being further characterized in that it imparts significant resistance to washing of the polyolefinic non woven fabrics such that when said fabric is washed as a delicate textile with a bland detergent, no discernible color change occurs after as many as six or seven cycles of washing, the composition being further characterized in that it imparts a feel or "hand" to said imprinted polyolefinic non woven fabric which remains unchanged after repeated washings and prolonged period of storage, the composition being further characterized in that said imprinted polyolefinic non woven fabric demonstrates substantial resistance to abrasion, the composition being further characterized in that said imprinting of polyolefinic non woven fabrics can be carried out lithographically with a desiccation time substantially less than two days, and characterized by a durable chemical linkage between the ink and the non woven fabric such that breakage does not occur under flexing of the fabric.

4,231,907

CATHODIC ELECTRODEPOSITION COMPOSITIONS EMPLOYING FATTY ACID DERIVATIVES

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Grow Group Inc., New York, N.Y.

Division of Ser. No. 859,295, Dec. 12, 1977, Pat. No. 4,155,824. This application Dec. 22, 1978, Ser. No. 972,208

Int. Cl.² C09D *3/58*, *3/80*, *5/40*

U.S. Cl. 260—23 AR **16 Claims**

1. An organic coating composition containing a dispersion, solution or suspension of a coating composition containing an acrylic polymer; the coating composition characterized as containing (a) an ester resulting from reacting an acrylic polymer with a fatty acid, and (b) Formula A within said polymer molecule, and said Formula A group being derived from an oxirane ring, wherein the coating composition has substantially no oxirane rings therein:

Formula A: $—CH_2—C(Z)—CH_2—N=$

wherein Z is independently selected from the group hydrogen, hydroxyl, alkyl ether having from 1 to 6 carbon atoms; acyloxy having from 1 to 6 carbon atoms;

(=O), $+OR^3\frac{}{n}H$, $+OR^3\frac{}{n}OH$ and $+O—R'(CH_2OH)\frac{}{n}OH$;

wherein R′ is a saturated alkylene group of from 2 to 4 carbon atoms and n is a number 1 to 6.

4,231,908

COMPOSITION FOR USE BETWEEN POLYMERIC TIE PLATES AND CROSS TIES

Charles J. Pennino, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 846,685, Oct. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 766,447, Feb. 7, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,336

Int. Cl.³ C08L *91/00*; E01B *9/40*

U.S. Cl. 260—28.5 AS **5 Claims**

1. A gap-filling, adhesive composition for use between a polymeric tie plate made of a polymer of the group consisting of polyolefins and polyurethanes and the dapped area of a wood, concrete or polyethylene railroad cross tie which comprises:

(a) 65 to 75 wt. % of an asphalt having a softening point in the range of 75° to 100° C. and a penetration in the range of 10 to 50;

(b) 10 to 20 wt. % of a styrene butadiene copolymer having a molecular weight in the range of 60,000 to 91,000; and

(c) 7 to 25 wt. % of a processing oil having a viscosity in the range of 427 poises at 37.78° C. to around 2,500 poises at 37.78° C. and a flash point in the range of 210° C. to 250° C. and the composition has a viscosity in the range of about 100 to 300 poises at 150° C.

4,231,909
POLYCHLOROPROPYLSILOXANE PLASTICIZED POLYVINYL CHLORIDE COMPOSITIONS
Frederick W. G. Fearon, Valparaiso, Ind., and Gary A. Vincent, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Apr. 30, 1979, Ser. No. 34,820
Int. Cl.³ C08L 27/06, 83/08
U.S. Cl. 260—29.1 SB 3 Claims

1. A plasticized polyvinyl chloride composition consisting essentially of a blend of (A) 88 to 99.9 percent by weight of polyvinyl chloride resin and (B) 0.1 to 12 percent by weight of a siloxane plasticizer which is a polysiloxane fluid containing at least 10 mole percent of chloropropylsiloxane units such that siloxane (B) is not exuded from the blend of (A) and (B), the chloropropylsiloxane units consisting essentially of units of the general formula

$$ClCH_2CH_2CH_2SiO_{\frac{3-n}{2}}(CH_3)_n$$

wherein n equals zero, one or two and any remaining siloxane units consisting essentially of units of the general formula

$$R_mSiO_{\frac{4-m}{2}}$$

wherein each R is independently selected from the group consisting of methyl radicals and phenyl radicals and m equals one, two, or three.

4,231,910
PRIMER COMPOSITION
Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Feb. 8, 1979, Ser. No. 10,295
Int. Cl.³ C08L 61/28; C09J 3/16
U.S. Cl. 260—29.4 R 5 Claims

1. A primer composition for application to a solid substrate to provide improved adhesion with thermoplastics, the composition consisting essentially of (A) 1 to 25 weight percent of an organosilicon compound selected from a group consisting of (1) 3-glycidoxypropyltrimethoxysilane, (2) 3-mercaptopropyltrimethoxysilane, (3) 2-mercaptoethyltrimethoxysilane, (4) 2-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane and (5) partial hydrolyzates of (1), (2), (3) or (4) and (B) 75 to 99 weight percent of an alkoxymethyltriazine which is a product of etherification of a methyloltriazine with a monohydric alcohol having 4 carbons or less.

4,231,911
ABRASION RESISTANT COATING FOR FOAMED PLASTIC SUBSTRATES
Edgardo Santiago, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Continuation of Ser. No. 926,189, Jul. 20, 1978, abandoned. This application Apr. 25, 1979, Ser. No. 33,279
Int. Cl.³ C08L 75/04
U.S. Cl. 260—29.6 NR 6 Claims

1. A synthetic varnish composition adapted to be applied by conventional printing techniques and equipment to films of foamed plastic substrates to provide an adherent, lubricious, abrasion resistant, protective coating thereon, said composition comprising an emulsified aqueous mixture of polyurethane resin and polyethylene resin having a solids ratio ranging from 1:9 to 1:1, said polyethylene resin being emulsified with a non-ionic or anionic emulsifying agent, and up to 30% by weight of a low molecular weight alcohol, the amount of said alcohol being sufficient to depress the surface tension and coefficient of friction of said composition to improve printability and lubricity thereof and provide long-term shelf stability to said composition, the viscosity of said composition ranging from about 18 to 35 seconds as measured by Zahn Cup No. 2 at 65° to 85° F.

4,231,912
RUBBER LATEX COMPOUNDS
Henry Cowx, 67, Redlonning Rd., Hensingham, Whitehaven, Cumbria, England, and Jean-Luc Urbain, Salmagne, 55000 Bar le Duc (Meuse), France
Filed Mar. 1, 1979, Ser. No. 16,406
Int. Cl.³ C08J 9/30
U.S. Cl. 260—29.7 SQ 10 Claims

1. A latex compound which comprises an aqueous dispersion of a rubber latex and a sulphosuccinamate of the formula:

$$ROR_1{-}[OR_1]_n{-}NHCO{-}\underset{X}{\overset{H}{C}}{-}\underset{Y}{\overset{H}{C}}{-}COO^-$$

wherein R represents an alkyl or alkaryl group having from 7 to 18 carbon atoms, R_1 represents an alkylene group having 2 to 3 carbon atoms, n is an integer having a value of from 0 to 5 and one of the groups X and Y represents a hydrogen atom whilst the other represents a SO_3 group.

4,231,913
FLUID SHAPABLE SULFURIC COMPOSITIONS BASED ON ARYLALIPHATIC COPOLYMERS
Joseph Kyritsos, Craponne, and Jean Sacco, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France
Continuation of Ser. No. 580,244, May 23, 1975, abandoned. This application Mar. 28, 1978, Ser. No. 890,992
Claims priority, application France, May 24, 1974, 74 18524
Int. Cl.³ C08L 77/10
U.S. Cl. 260—30.8 R 4 Claims

1. A fluid, shapable, sulphuric composition which is optically anisotropic at temperatures below 100° C., consisting essentially of

a sulphuric solvent and

a solute which consists essentially of a copolyamide with a fiber forming inherent viscosity of at least 1 when measured on a solution in substantially pure sulphuric acid at 25° C. and at a concentration of 0.5 g of polymer in 100 ml of solution, consisting of units selected from the group consisting of: —CO—R_n—CO, —NH—R'—NH, and —CO—R"—NH units wherein 5–35 mol% of the total quantity of radicals R, R' and R" are flexible radicals selected from the group consisting of tetramethylene radicals, butenylene radicals, and tetramethylene or butenylene radicals substituted by one or more lower alkyl or halogen radicals; the remainder of the radicals, R, R' and R" consisting of rigid segments which can be identical or different and the majority of which are selected from the group consisting of p-phenylene, trans-1,4-cyclohexylene, trans-trans-1,4-butadienylene, and 2,5-pyridylene segments or their derivatives substituted by one or more lower alkyl or halogen radicals; and wherein n is 0 or 1 provided that when R' is flexible it can only be present as tetramethylene or substituted tetramethylene, in an amount of 5–20 mol% of the total quantity of radicals R, R' and R" and in the sequence:

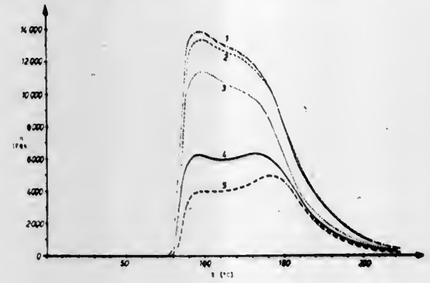
—NH—R"—CO—NH—R'—NH—CO—R'—NH—

and that no unit —CO—R"—NH— is linked directly to another —CO—R"—NH—, said copolyamide consisting essentially of at least 10% by weight of the composition.

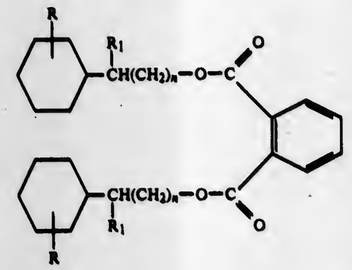
4,231,914
POLYURETHANE-BASED BINDER SYSTEM FOR THE PRODUCTION OF CASTING MOLDS OR CORES
Thorwald Born, Leipziger Str. 89, 3000 Hannover 1, and Karl-Heinz Brüning, August-Bebel-Str. 10, 3012 Langenhagen 1, both of Fed. Rep. of Germany
Filed May 30, 1978, Ser. No. 910,283
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759262
Int. Cl.³ C08K 5/10
U.S. Cl. 260—31.8 N 3 Claims

1. A composition useful for producing casting molds comprising about 100 parts of a flowable, granular solid, about two parts of a mixture including polyisocyanate and a polyol in proportions to form polyurethane upon reaction and an ester solvent, said solvent constituting from 40–60% of the resultant mixture, said ester having an acid component selected from the group consisting of an aliphatic dicarboxylic acid having from six to twelve carbon atoms and a benzene polycarboxylic acid having at least three COOH groups and an alcohol component having from six to thirteen carbon atoms and selected from aliphatic alcohol, cycloaliphatic alcohol, arylaliphatic alcohol, and aromatic alcohol.

4,231,915
USE OF DI-(CYCLOHEXYLETHYLMETHYLOL) PHTHALATES OR DI-(ETHYLCYCLOHEXYLMETHYLOL) PHTHALATES AS PLASTICIZERS FOR POLYVINYL CHLORIDE
Manfred Kaufhold; Dieter Hepp, and Gerhard Meanel, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany
Filed Apr. 4, 1979, Ser. No. 26,983
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814400
Int. Cl.³ C08K 5/11; C08L 27/06
U.S. Cl. 260—31.8 R 12 Claims



1. In a method of plasticizing polyvinyl chloride by adding a plasticizer to polyvinyl chloride, the improvement wherein the plasticizer is a di-(cyclohexylethylmethylol) phthalate or a di-(ethylcyclohexylmethylol) phthalate of the formula



wherein R is ethyl or hydrogen; R_1 is methyl or hydrogen; and n is an integer of 0–2; and when n is 2, R is H and R_1 is H; when n is 0, R is ethyl and R_1 is H, and when n is 1, R_1 is methyl and R is H; the two ester radicals being the same or different.

4,231,916
POTTING AND ENCAPSULATING MATERIAL FOR ELECTRONIC CIRCUITS
Thomas A. Knappenberger, Phoenix, and James F. Landers, Jr., Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 890,434, Mar. 27, 1978, abandoned. This application Oct. 16, 1979, Ser. No. 85,456
Int. Cl.³ C08L 63/02
U.S. Cl. 260—37 EP 9 Claims

1. Potting and encapsulating material for electronic circuits utilized in high acceleration and high thermal cycling environments consisting essentially of an intermixed compound of uncured thermosetting resin and curing agent in a flowable powder form with a particle size in the range of approximately 60 mesh to 200 mesh and curable in a range of approximately 125° F. to 212° F. at approximately ambient pressure, and hollow microspheres having a diameter in the range of approximately 5 microns to 300 microns said resin-curing agent and microspheres being intermixed in a ratio in the range of approximately 35 percent to 45 percent resin-curing agent to microspheres by weight.

4,231,917
HIGH TEMPERATURE CONCRETE COMPOSITES CONTAINING ORGANOSILOXANE CROSSLINKED COPOLYMERS
Arkady Zaldin, Rego Park; Neal Carciello, Patchogue; Lawrence Kukacka, Port Jefferson, and Jack Fontana, Shoreham, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Feb. 6, 1979, Ser. No. 9,624
Int. Cl.³ C08L 83/04
U.S. Cl. 260—37 SB 9 Claims

1. A thermally stable polymer concrete composition comprising about 10–30% by weight of a liquid monomer mixture consisting essentially of an organosiloxane polymer containing pendant groups selected from the group consisting of CH_3, $CH{=}CH_2$, C_2H_3, C_6H_5, and mixtures thereof, and capable of being crosslinked, and at least one olefinically unsaturated crosslinking monomer in an amount of about 15% to 50% by weight of said monomer mixture, and about 70–90% by weight of an inorganic filler system containing silica sand and portland cement in ratios ranging from about 9 parts sand to 1 part cement, to, 7 parts sand to 3 parts cement.

4,231,918
PROCESS FOR THE MASS COLORATION OF LINEAR POLYESTERS
Fridolin Bühler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Sep. 15, 1978, Ser. No. 942,517
Claims priority, application Switzerland, Sep. 23, 1977, 11652/77
Int. Cl.³ C08K 5/23, 5/34, 5/35, 5/45
U.S. Cl. 260—40 P 9 Claims

1. A process for the mass coloration of a linear polyester by homogeneously mixing said polyester and a colorant which is a mixture consisting of (a) 0.05 to 0.35% by weight, based on the amount of polyester, of one thioindigo pigment, one dioxazine pigment or mixture of the two and (b) a polymer-soluble dye selected from the group consisting of anthraquinone, azo, azomethine, phthalocyanine, perinone, isondolinone, methine and triazine dyes.

4,231,919

SUSPENSION POLYMERIZATION OF STYRENE MONOMERS IN THE PRESENCE OF CARBON BLACK

Henry V. Isaacson, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 831,572, Sep. 8, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,266

Int. Cl.³ C08J 3/20

U.S. Cl. 260—42.53 **4 Claims**

1. A suspension polymerization process for polymerizing in the presence of untreated carbon black containing absorbed oxygen a polymer comprising more than 40 weight percent styrene moiety which comprises suspending in a continuous liquid phase for polymerization a dispersion comprising monomer, initiator and said carbon black, said monomer comprising styrene moiety having a substituent with a Hammett sigma value more positive than about 0.06.

4,231,920

TRANSPARENT TO TRANSLUCENT FLAME-RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 25, 1979, Ser. No. 6,473

Int. Cl.² C08K 5/42

U.S. Cl. 260—45.7 S **13 Claims**

1. A transparent to translucent and flame retardant polycarbonate composition comprising a mixture of a high molecular weight aromatic polycarbonate; a minor amount of a flame retardant salt selected from the group consisting of organic alkali or organic alkaline earth metal salts of sulfonic acids or mixtures thereof; and, a minor amount of a coadditive solvent selected from the group consisting of water, organic protic compounds or organic aprotic compounds, or mixtures thereof.

4,231,921

NOVEL LIGHT STABILIZERS

Paul Moser, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,875

Claims priority, application Switzerland, Jul. 15, 1977, 8793/77

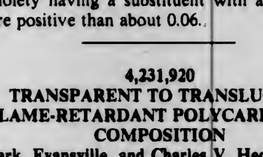
Int. Cl.² C08K 5/35; C07D 211/94, 211/98, 211/10

U.S. Cl. 260—45.75 R **10 Claims**

1. A compound of formula I

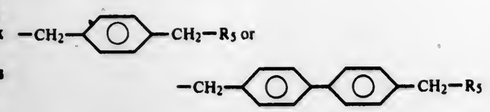
$$M^{q\oplus}\,[L'^{\ominus}]_{q/r}\cdot mA \qquad (I)$$

wherein $M^{q\oplus}$ is a metal ion carrying a double or triple positive charge and q is 2 or 3 and r is 1 or 2, the quotient q/r being 1, 1.5, 2 or 3, and L is a piperdine, which is substituted by at least one enolate group in the 1-position or 4-position and wherein the ring nitrogen is sterically hindered by alkyl substituents in the adjacent positions, having the formula II

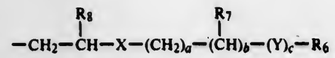


(II)

in which R_1 is hydrogen or C_1-C_4 alkyl and Z_1 is hydrogen, C_1-C_{12} alkyl, C_3-C_8 alkenyl, C_3-C_4 alkynyl, C_2-C_{21} alkoxyalkyl, C_7-C_8 aralkyl, an aliphatic acyl group having 1-4 C atoms, or one of the groups $-CH_2COOR_2$ or $-CH_2-CH(R_3)-OR_4$, or a $-(CH_2)_4-R_5$, $-CH_2-CH=CH-CH_2-R_5$,

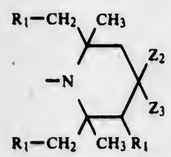


radical or a group of the formula III



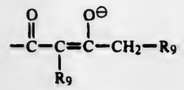
(III)

in which R_2 is C_1-C_8 alkyl, C_3-C_6 alkenyl, phenyl, C_7-C_8 aralkyl or cyclohexyl and R_3 is hydrogen, methyl or phenyl and R_4 is an aliphatic C_1-C_{18} acyl group, an aromatic C_7 acyl group, an araliphatic C_8-C_9 acyl group or an alicyclic C_6-C_9 acyl group, in which the aromatic part can be unsubstituted or substituted by chlorine, C_1-C_4 alkyl, C_1-C_8 alkoxy and/or hydroxy, and R_5 is a group of the formula IV



(IV)

in which Z_2 and Z_3 are as defined below, and R_6 is a group of the formula V

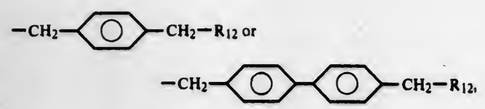


(V)

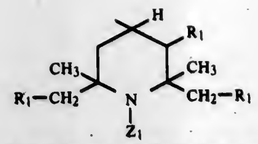
in which R_9 is hydrogen or C_1-C_4 alkyl, and R_7 and R_8 independently of each other are hydrogen, methyl, phenyl, C_2-C_9 alkoxymethyl or a $-CH_2-O-R_6$ radical, in which R_6 is as defined above, and a is 0, 1 or 2 and b is 0 or 1 and c is 0 or, if a and/or b differ from 0, is also 1, and X and Y independently of each other are —O— or



in which R_{10} is hydrogen, C_1-C_{12} alkyl, C_3-C_8 alkenyl, cyclohexyl, C_3-C_{21} alkoxyalkyl, C_7-C_{13} aralkyl, phenyl which is unsubstituted or substituted by C_1-C_8 alkyl and/or C_1-C_8 alkoxy, or a group $-CH_2-CH_2-O-R_6$, in which R_6 is as defined above, and Z_2 is hydrogen, C_2-C_{18} aliphatic acyloxy, benzoyloxy which is unsubstituted or substituted by C_1-C_8 alkyl or C_1-C_8 alkoxy, or C_2-C_{18} acylamido group which is unsubstituted or C_1-C_8 N-alkylsubstituted, or one of the groups $-R_{12}$, $-(CH_2)_d-R_{12}$,

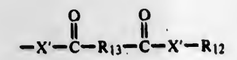


in which d is 2 to 10 and R_{12} is a group of the formula VII



(VII)

in which R_1 and Z_1 are as defined above, or Z_2 is also a group of the formula VIII



(VIII)

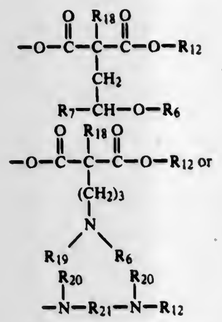
in which R_{12} is as defined above and X' is —O— or



in which R_{14} is hydrogen or C_1-C_4 alkyl, and R_{13} is $-(CH_2)_e-$ or a group



in which e is 0 to 8 and R_{15} and R_{16} independently of one another are hydrogen, C_1-C_{12} alkyl, C_3-C_8 alkenyl, C_7-C_{11} aralkyl, cyanomethyl, cyanoethyl or a group $-CH_2COOR_{17}$, in which R_{17} is methyl or ethyl, or Z_2 is one of the groups

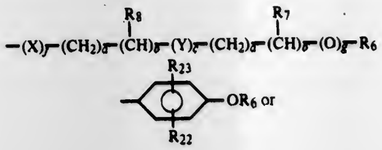


(IX)

(X)

(XI)

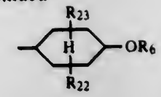
in which R_6, R_7 and R_{12} are as defined above and R_{18} is hydrogen, C_1-C_8 alkyl, allyl, phenyl or benzyl and R_{19} is hydrogen, C_1-C_8 alkyl, allyl or benzyl and R_{20} is C_1-C_4 alkyl or a group of the formula V which is as defined above, and R_{21} is C_2-C_6 alkylene, cyclohexylidene, phenylene, diphenylene, 4,4'-diphenylene oxide or 4,4'-diphenylenemethane, or Z_2 is also a group of the formulae XII, XIII or XIV



(XII)

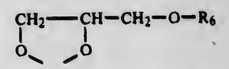
(XIII)

-continued

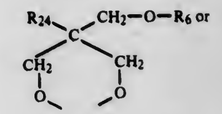


(XIV)

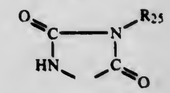
in which a, b, c, X, Y, R_6, R_7 and R_8 are as defined above and f, a' and b' are 0 or 1 and g is 0 or, if a' and/or b' differ from 0, is also 1, and R_{22} and R_{23} independently of one another are hydrogen, C_1-C_4 alkyl, cyclohexyl, phenyl, benzyl, α-methylbenzyl or α,α-dimethylbenzyl, and Z_3 is hydrogen or cyano, or Z_2 and Z_3 together are one of the groups XV, XVI or XVII



(XV)

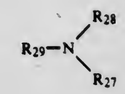


(XVI)



(XVII)

in which R_6 is as defined above and R_{24} is hydrogen, methyl or ethyl and R_{25} is hydrogen, C_1-C_{18} alkyl, C_3-C_8 alkenyl, cyclohexyl, C_7-C_8 aralkyl or a group $-CH_2-COOR_{26}$ or $-CH_2-CH(R_8)-O-R_6$, in which R_{26} is C_1-C_{18} alkyl and R_6 and R_8 are as defined above, and m is 0, 1 or 2 and A is H_2O or an amine of the formula (XVIII)



(XVIII)

in which R_{27} is substituted or unsubstituted alkyl, cycloalkyl, aryl or aralkyl, a substituted or unsubstituted aminoalkyl or piperidinyl group, and R_{28} is hydrogen or substituted or unsubstituted alkyl or cycloalkyl, a substituted or unsubstituted aminoalkyl group or a piperidinyl group, or R_{27} and R_{28} together with the N atom form a pyrrolidine, piperidine or morpholine ring which is substituted by alkyl groups or is unsubstituted, and R_{29} is hydrogen or substituted or unsubstituted alkyl.

10. A polymeric material containing a compound of the formula I according to claim 1.

4,231,922

IMPACT MODIFIED POLYARYLATE BLENDS

Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,131

Int. Cl.² C08L 51/04, 67/02

U.S. Cl. 260—45.95 G **24 Claims**

1. A thermoplastic molding composition having improved notched izod impact values after molding, said composition comprising in admixture:

(a) a polyarylate derived from a dihydric phenol and an aromatic dicarboxylic acid;

(b) a polyester derived from an aliphatic or cycloaliphatic diol, or mixtures thereof, and an aromatic dicarboxylic acid; and

(c) an impact modifier which is a graft copolymer of a vinyl aromatic, an acrylate, an unsaturated nitrile, or mixtures thereof, grafted onto an unsaturated elastomeric backbone

and having a tensile modulus of less than about 100,000 psi.

4,231,923

ASSAY METHOD AND COMPOUNDS

Richard J. Miller, Raleigh; Kwen-Jen Chang, and Pedro Cuatrecasas, both of Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Oct. 13, 1977, Ser. No. 841,678

Claims priority, application United Kingdom, Mar. 28, 1977, 12867/77

Int. Cl.[2] C07C *103/52*; A61K *43/00*

U.S. Cl. 260—112.5 R **10 Claims**

1. A compound of formula (I):

$$H-X^1-X^2-X^3-X^4-(X^5)_m-(X^6)_n-OH \quad (I)$$

wherein

X^1 is selected from L-tyrosyl and N-alkyl-L-tyrosyl (wherein the alkyl has 1 to 4 carbon atoms) substituted in the phenol moiety at the 2-position or at both the 2- and 6-positions (with respect to the hydroxy group) with an iodine radioisotope;

X^2 is selected from glycyl and D-alanyl;

X^3 is selected from glycyl and L-alanyl;

X^4 is selected from L-phenylalanyl and L-4-chlorophenylalanyl;

X^5 is selected from L-leucyl, D-leucyl,, L-methionyl, D-methionyl, L-valyl, D-valyl, L-norleucyl, D-norleucyl, L-threonyl and D-threonyl;

X^6 is L-threonyl;

and m and n are each selected from O and I, provided that when they are both O then X^2 is D-alanyl;

together with their salts, esters, amides and N-alkylamides wherein the alkyl has 1 to 4 carbon atoms.

4,231,924

4-N-ACYLFORTIMICIN B DERIVATIVES AND THE CHEMICAL CONVERSION OF FORTIMICIN B TO FORTIMICIN A

John S. Tadanier; Jerry R. Martin, and Paul Kurath, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 888,085, Mar. 20, 1978, Pat. No. 4,155,902. This application Jan. 10, 1979, Ser. No. 2,436

Int. Cl.[2] C07C *103/52*; C07H *15/22*

U.S. Cl. 260—112.5 R **3 Claims**

1. A method of preparing 1,2',6'-tri-N-benzyloxycarbonyl fortimicin B, which method comprises:

reacting fortimicin A with N-[benzyloxycarbonyloxy] succinimide to form tetra-N-benzyloxycarbonyl-fortimicin A, and

hydrolyzing the tetra-N-benzyloxycarbonyl fortimicin A to form said 1,2',6'-tri-N-benzyloxycarbonyl fortimicin B.

4,231,925

PENTAPEPTIDES WITH ANALGESIC ACTIVITY ON PERIPHERAL ADMINISTRATION

Victor M. Garsky, Radnor, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,911

Int. Cl.[3] C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 R **6 Claims**

1. A pentapeptide of the formula:

$R^1-N-H-Tyr-N-R^2-D-Met-Gly-N-R^3-Phe-N-R^4-D-Ser-X$

wherein

R^1 is hydrogen, methyl, ethyl, propyl, 2-methyl-2-pentenyl, 2-methyl-1-pentenyl, methylcyclopropyl, or methylcyclobutyl;

R^2, R^3, and R^4 are, independently, hydrogen or methyl; and

X is an amino group, $-OR^5$, or $-CH_2OR^5$ where R^5 is hydrogen or an alkyl group containing 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,231,926

METHOD AND APPARATUS FOR HYDROLYZING KERATINACEOUS MATERIAL

Rowland Retrum, 1226 Wilton La., Kirkwood, Mo. 63122

Filed Dec. 11, 1978, Ser. No. 968,479

Int. Cl.[2] C07G *7/00*; A23J *1/10*

U.S. Cl. 260—123.7 **10 Claims**

1. The method of continuously hydrolyzing keratinaceous material comprising continuously delivering generally untreated such material to a vessel, heating the material within the laden vessel without a build-up of pressure to a temperature of not exceeding 212° F., violently agitating by beating the keratinaceous material in the said vessel through the rotation of agitating means to between about 150 to 350 rpm, continuing the violent agitation and heating of said material for a length of time required to beat the material to render it sufficiently wilted and to a flowable and pumpable consistency, continuously pumping the now flowable fluidized material from the said vessel and into a second vessel that is pressurized for hydrolyzation, heating the fluidized material while in the second vessel to a temperature of between about 265° F. to 365° F. and for a length of time to generate vaporization and incident pressure therein up to between about 25 to 150 psig, agitating the material in the second vessel for a period of time until hydrolyzation occurs, and then continuously pumping the hydrolyzed material from the said second vessel for eventual drying.

4,231,927

HYDRAZONO PENICILLIN DERIVATIVES

Riccardo Monguzzi; Giorgio Pifferi; Mario Pinza, and Giampietro Broccali, all of Milan, Italy, assignors to CRAF Sud, Aprilia Latina, Italy

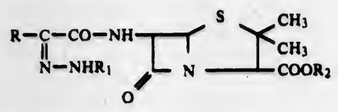
Filed Jun. 7, 1978, Ser. No. 913,325

Claims priority, application Italy, Jun. 7, 1977, 24337 A/77

Int. Cl.[3] C07D *499/68*, *499/70*

U.S. Cl. 260—239.1 **7 Claims**

1. Hydrazono penicillin of the formula



wherein R represents phenyl, 2- or 3- thienyl or 2- or 3- furyl, R_1 represents hydrogen or alkyl containing from 1 to 4 carbon atoms, R_2 represents hydrogen, sodium, potassium, pivaloyloxymethyl or 1-(ethoxycarbonyloxy)-ethyl, in separated form E or Z or mixture of the same.

2. 6-(α-Methylhydrazonophenylacetamido)penicillanic acid sodium salt.

4,231,928

ANTIBACTERIAL AGENTS

Takayuki Naito, Kawasaki; Jun Okumura, Yokohama, and Hajime Kamachi, Ichikawa, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 839,687, Oct. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 784,904, Apr. 5, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 32,837

Int. Cl.[3] C07D *499/66*, *499/68*, *499/70*

U.S. Cl. 260—239.1 **16 Claims**

3. 6-[D-(−)-α-Phenyl-α-(7-hydroxy-4-oxo-4H-

pyrimido[1,2-b]pyridazin-3-ylcarboxamido)acetamido]penicillanic acid.

4,231,929

SULFAM(NA)PHTHALEINS

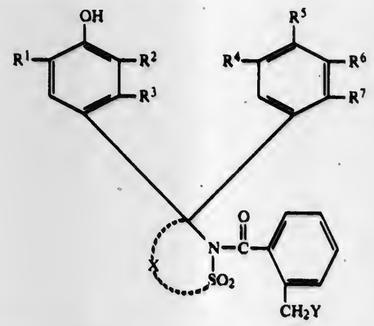
Stanley M. Bloom, Waban; Alan L. Borror, Lexington, and James W. Foley, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,005

Int. Cl.[2] C07D *275/06*, *417/10*, *279/02*; C09B *17/04*

U.S. Cl. 260—243.3 **28 Claims**

1. A compound of the formula



wherein R^1 and R^2 each are selected from hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro and fluoro; R^3 is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or hydroxy; R^2 and R^3 taken together represent the carbon atoms necessary to complete a fused benzene ring; R^4 and R^6 each are selected from hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro and fluoro; R^7 is hydrogen, hydroxy, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms; R^6 and R^7 taken together represent the carbon atoms necessary to complete a fused benzene ring provided R^2 and R^3 are taken separately when R^6 and R^7 are taken together; R^5 is selected from hydrogen, hydroxy, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, —N,N-(dialkyl)amino wherein each alkyl contains 1 to 4 carbon atoms, —N,N-(w-R^8alkyl)$_2$amino wherein R^8 is hydroxy or halo and said alkyl has 1 to 4 carbon atoms, $-NHCOCH_3$, piperidino, pyrrolidino, N-methylpiperazino, morpholino, thiomorpholino or tetrahydro-2H,4H-1,3,6-dioxazocino; R^4, R^5 and R^6 taken together represent the atoms necessary to complete a fused quinolizidine ring; X represents the atoms necessary to complete 2,3-dihydrobenz[d]-isothiazole-1,1-dioxide or 2,3-dihydronaphtho[1,8-d]-1,2-thiazine-1,1-dioxide; and Y is selected from chloro and bromo.

4,231,930

1-SUBSTITUTED THIOMETHYLTRIAZOLOBENZODIAZEPINES

Kentaro Hirai, Kyoto; Toshio Fujishita, Toyonaka, and Teruyuki Ishiba, Takatsuki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

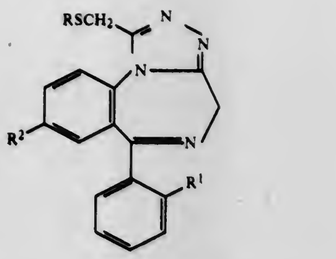
Filed Mar. 1, 1979, Ser. No. 16,615

Claims priority, application Japan, Mar. 9, 1978, 53-27524

Int. Cl.[3] C07D *487/04*

U.S. Cl. 260—245.5 **4 Claims**

1. A compound of the formula:



wherein

R is 1-4C alkylthio, 7-10C phenylakylthio, phenylthio and halo-phenylthio;

R^1 is hydrogen or halogen;

R^2 is halogen or nitro;

and its pharmaceutically acceptable acid addition salt.

4,231,931

TETRAPHENYLKETAZINES AND ISOINDOLINONE PIGMENTS OBTAINED THEREFROM

Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

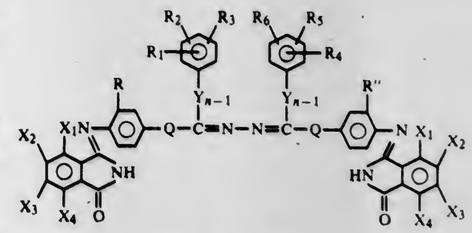
Filed Jan. 30, 1979, Ser. No. 7,549

Claims priority, application Switzerland, Feb. 3, 1978, 1215/78

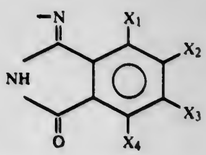
Int. Cl.[3] C07D *209/34*

U.S. Cl. 260—325 PH **6 Claims**

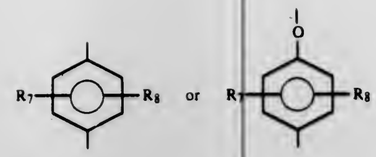
1. An isoindolinone pigment of the formula



wherein X_1, X_2, X_3 and X_4 represent hydrogen or halogen atoms, or one or two of X_1–X_4 represent alkoxy groups of 1 to 4 carbon atoms or phenoxy groups and the others represent hydrogen or halogen atoms, R and R" represent hydrogen or halogen atoms or methyl or methoxy groups, R_1, R_2, R_4 and R_5 represent hydrogen, chlorine or bromine atoms or alkyl groups of 1 to 2 carbon atoms, R_3 and R_6 represent hydrogen or halogen atoms, alkyl or alkoxy groups of 1 to 2 carbon atoms or when R_3 and R_6 are independently in the meta or para position in respect to X, R_3 and R_6 may also be a group of the formula



Q represents a direct bond or a p-phenylene groups, n is 1 or 2 and X represents a group of the formula



wherein R_7 and R_8 represent hydrogen or chlorine atoms or methyl groups.

4,231,932

PHTHALIMIDOMETHYL CYCLOPROPANE CARBOXYLIC ACID ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

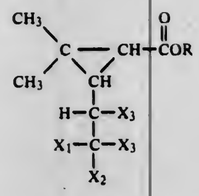
Continuation-in-part of Ser. No. 5,375, Jan. 22, 1979, and a continuation-in-part of Ser. No. 834,659, Sep. 19, 1977, abandoned. This application May 14, 1979, Ser. No. 38,563

Claims priority, application France, Sep. 21, 1976, 76 28279; Jul. 19, 1977, 77 22078; Mar. 17, 1978, 78 07780

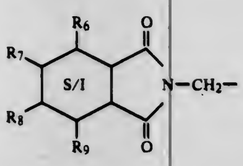
Int. Cl.³ C07D *209/48*; A01N *43/38*

U.S. Cl. 260—326 A **9 Claims**

1. A compound of the formula



wherein X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine and R has the formula



R_6, R_7, R_8 and R_9 are individually selected from the group consisting of hydrogen, chlorine and methyl and S/I indicates that the ring may be aromatic, dihydro or tetrahydro.

4,231,933

NOVEL 3-HYDROXY-PYRROLIN-2-ONE DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred F. Herrmann, St. Peter, and Gustav Hechtfischer, Freiburg, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

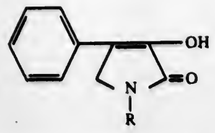
Division of Ser. No. 821,260, Aug. 3, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,339

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636722

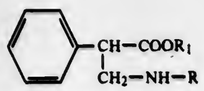
Int. Cl.³ C07D *207/12, 401/04, 407/04*

U.S. Cl. 260—326.5 FL **3 Claims**

1. A process for the preparation of compounds of the formula:



in which R is a saturated or unsaturated alkyl group of up to 6 carbon atoms or the group alk-ar, wherein alk is a methylene-, ethylene- or propylene- group and ar is a substituted or unsubstituted phenyl-, furyl-, or pyridyl- ring wherein the substituent is methoxy or chloro; wherein a compound of the formula:



in which R has the above meaning and R_1 is an alkyl group of up to 8 carbon atoms, is condensed with a dialkyl oxalate of the formula:



in which R_2 is an alkyl group of up to 3 carbon atoms, in an anhydrous lower alcohol of up to 3 carbon atoms in the presence of a corresponding alkali metal alcoholate at a temperature in the range of 70° to 90° C.

4,231,934

PROCESS FOR THE PRODUCTION OF N-(HYDROXYPHENYL) MALEIMIDES

Masayuki Oba; Motoo Kawamata; Hikotada Tsuboi, and Nobuhito Koga, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

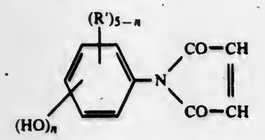
Filed Nov. 2, 1978, Ser. No. 956,971

Claims priority, application Japan, Nov. 2, 1977, 52-130905; Nov. 4, 1977, 52-131504

Int. Cl.³ C07D *207/44*

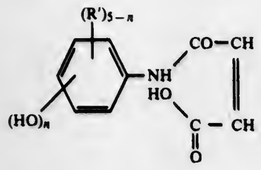
U.S. Cl. 260—326.5 FM **12 Claims**

1. A process for the production of a N-(hydroxylphenyl)-maleimide of the general formula:



(I)

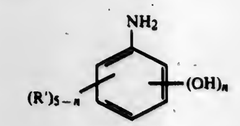
where R' stands for H, CH_3, C_2H_5, F, Cl, Br or I and n is an integer of 1-5, comprising treating a N-(hydroxyphenyl)-maleamic acid expressed by the general formula:



II

where R' and n each have the same meaning as indicated above, at a temperature of 0°-150° C. with a dehydrating agent selected from the group consisting of oxides and oxyacids of

sulfur or phosphorus, alkali metal and alkaline earth metal salts of said oxyacids and mixtures thereof to effect dehydrative cyclization of the maleamic acid, said maleamic acid being obtained by the reaction of an aminophenol expressed by the general formula:



III

where R' and n each have the same meaning as indicated above, with maleic anhydride.

4,231,935

1-PHENYL-3-AZABICYCLO[3.1.0]HEXANES

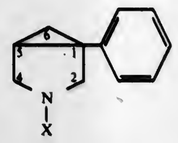
William J. Fanshawe, Pearl River; Joseph W. Epstein, Monroe; Lantz S. Crawley, Spring Valley, all of N.Y.; Corris M. Hofmann, Ho-Ho-Kus, and Sidney R. Safir, River Edge, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 809,339, Jun. 23, 1978, Pat. No. 4,131,611, which is a continuation-in-part of Ser. No. 723,402, Sep. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 601,128, Jul. 31, 1975, abandoned. This application Oct. 13, 1978, Ser. No. 951,411

Int. Cl.² C07D *209/52*

U.S. Cl. 260—326.5 B **29 Claims**

1. An optically active compound of the formula:



wherein the phenyl moiety is mono-substituted from the group consisting of C_1-C_6 alkoxy, amino, acetamido and hydroxy; X is selected from the group consisting of hydrogen, straight chain C_1-C_8 alkyl, and a moiety of the formula $C_nH_{2n}R_1$, wherein n is an integer from 1 to 3 and R_1 is selected from the group consisting of phenyl and p-fluorobenzoyl; the racemic mixture thereof; the mirror image thereof; and the non-toxic pharmaceutically acceptable salts thereof.

4,231,936

MITOMYCIN C DERIVATIVES

Kinichi Nakano; Chikahiro Urakawa, both of Machida, and Ryoji Imai, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

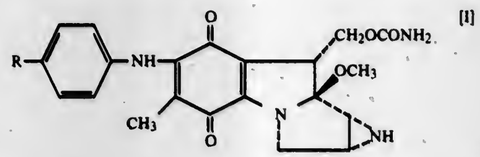
Filed Aug. 28, 1978, Ser. No. 937,376

Claims priority, application Japan, Aug. 31, 1977, 52-103542

Int. Cl.³ A61K *31/40*; C07D *487/04*

U.S. Cl. 260—326.24 **3 Claims**

1. A compound of the formula:



[I]

wherein R is selected from the class consisting of a hydroxy group and an amino group.

4,231,937

PREPARATION OF ALKYLENE CARBONATES FROM ALKYLENE IODOHYDRINS

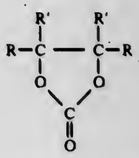
Jar-lin Kao, and Ming N. Sheng, both of Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 28, 1978, Ser. No. 937,294

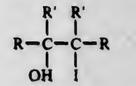
Int. Cl.³ C07D *317/36, 317/38*

U.S. Cl. 260—340.2 **14 Claims**

1. A process for the preparation of alkylene carbonates having from 3 to 31 carbon atoms per molecule of the formula



wherein R and R' are individually selected from the group consisting of alkyl groups having from 1 to 8 carbon atoms, aryl groups or lower alkyl or alkoxy, nitro or halogen substituted aryl groups, which comprises reacting in a liquid phase the corresponding alkylene iodohydrin having from 2 to 30 carbon atoms per molecule of the formula

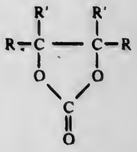


wherein R and R' are as defined above, with carbon dioxide at a temperature in the range of about 30° C. to 120° C. and at a total pressure between about atmospheric and 1400 psig, at a pH value of between 3 and 10, in the presence of oxygen or an oxygen-containing gas and an effective amount of a catalytic mixture of

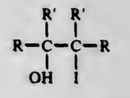
(1) an iodide selected from the group consisting of potassium, sodium and lithium iodides and

(2) cupric carbonate dihydroxide, and recovering the desired alkylene carbonate.

10. A process for the preparation of alkylene carbonates having from 3 to 31 carbon atoms per molecule of the formula



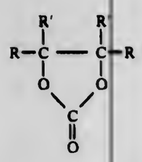
wherein R and R' are individually selected from the group consisting of alkyl groups having from 1 to 8 carbon atoms, aryl groups or lower alkyl or alkoxy, nitro or halogen substituted aryl groups, which comprises reacting in a liquid phase the corresponding alkylene iodohydrin having from 2 to 30 carbon atoms per molecule of the formula



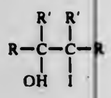
wherein R and R' are as defined above, with carbon dioxide at a temperature in the range of about 30° C. to 120° C. and at a total pressure between about atmospheric and 1400 psig, at a pH value of between 3 and 10, in the presence of oxygen or an

oxygen-containing gas and an effective amount of a catalytic mixture of potassium iodide and calcium carbonate.

11. A process for the preparation of alkylene carbonates having from 3 to 31 carbon atoms per molecule of the formula

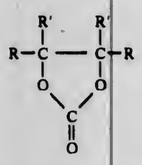


wherein R and R' are individually selected from the group consisting of alkyl groups having from 1 to 8 carbon atoms, aryl groups or lower alkyl or alkoxy, nitro or halogen substituted aryl groups, which comprises reacting in a liquid phase the corresponding alkylene iodohydrin having from 2 to 30 carbon atoms per molecule of the formula

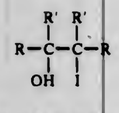


wherein R and R' are as defined above, with carbon dioxide at a temperature in the range of about 30° C. to 120° C. and at a total pressure between about atmospheric and 1400 psig, at a pH value of between 3 and 10, in the presence of oxygen or an oxygen-containing gas and an effective amount of a catalytic mixture of calcium iodide and zinc carbonate.

12. A process for the preparation of alkylene carbonates having from 3 to 31 carbon atoms per molecule of the formula

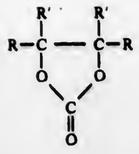


wherein R and R' are individually selected from the group consisting of alkyl groups having from 1 to 8 carbon atoms, aryl groups or lower alkyl or alkoxy, nitro or halogen substituted aryl groups, which comprises reacting in a liquid phase the corresponding alkylene iodohydrin having from 2 to 30 carbon atoms per molecule of the formula

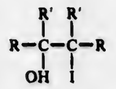


wherein R and R' are as defined above, with carbon dioxide at a temperature in the range of about 30° C. to 120° C. and at a total pressure between about atmospheric and 1400 psig, at a pH value of between 3 to 10, in the presence of oxygen or an oxygen-containing gas and an effective amount of a catalytic mixture of iron iodide and calcium carbonate.

13. A process for the preparation of alkylene carbonates having from 3 to 31 carbon atoms per molecule of the formula



wherein R and R' are individually selected from the group consisting of alkyl groups having from 1 to 8 carbon atoms, aryl groups or lower alkyl or alkoxy, nitro or halogen substituted aryl groups, which comprises reacting in a liquid phase the corresponding alkylene iodohydrin having from 2 to 30 carbon atoms per molecule of the formula



wherein R and R' are as defined above, with carbon dioxide at a temperature in the range of about 30° C. to 120° C. and at a total pressure between about atmospheric and 1400 psig, at a pH value of between 3 and 10, in the presence of oxygen or an oxygen-containing gas and an effective amount of a catalytic mixture of palladium iodide and calcium carbonate.

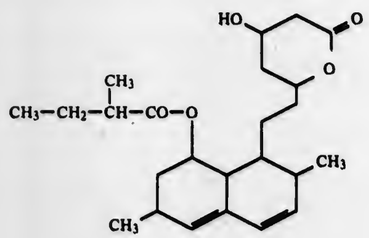
4,231,938

HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PROCESS OF PREPARATION

Richard L. Monaghan, Somerset; Alfred W. Alberts, Short Hills; Carl H. Hoffman, Scotch Plains, and George Albers-Schonberg, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 15, 1979, Ser. No. 48,946
Int. Cl.³ C07D *309/30*
U.S. Cl. 260—343.5 **1 Claim**

1. The compound of the formula



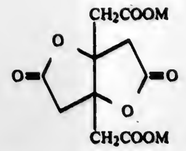
4,231,939

2,5-DIOXO-3H,6H-FURO[(3,2-b]FURAN-3A,6A-DIACETIC ACID AND SALTS THEREOF

Harold E. Hartzler, Goshen, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 26, 1979, Ser. No. 97,307
Int. Cl.³ C07D *307/93*
U.S. Cl. 260—343.6 **5 Claims**

1. 2,5-dioxo-3H,6H,furo[3,2-b]furan-3a,6a-diacetic acid and salts thereof characterized by the structural formula



wherein M is hydrogen, an alkali metal or ammonium.

5. A method for the preparation of 2,5-dioxo-3H,6H-furo[3,2-b]furan-3a,6a-diacetic acid which comprises oxidizing 9,10-dihydroxy-1,4,5,8-tetrahydronaphthalene with ozone and hydrogen peroxide for a time sufficient to form the desired product.

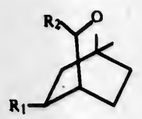
4,231,940

2-OXABICYCLOOCTANE DERIVATIVES

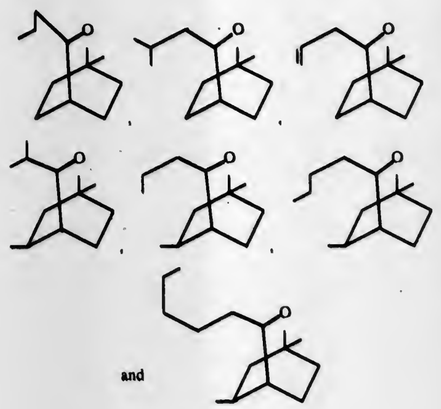
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Jun. 7, 1979, Ser. No. 46,936
The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.
Int. Cl.³ C07D *309/04*
U.S. Cl. 260—345.1 **8 Claims**

1. A cyclic chemical compound having the structure:



wherein R_1 is selected from the group consisting of hydrogen and methyl and R_2 is C_3-C_5 alkyl or alkenyl, said compound being selected from the group consisting of



and

4,231,941

SYNTHESIS OF 2,5-DIHYDROFURAN

Robert F. Drury, Hightstown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 25, 1979, Ser. No. 51,972
Int. Cl.³ C07D *307/28*
U.S. Cl. 260—346.11 **9 Claims**

1. Improved process for preparing 2,5-dihydrofuran by the dehydration of 1-butene-3,4-diol in the presence of a soluble mercury salt as catalyst in a dissociating solvent at a neutral or acidic pH at an elevated temperature, the improvement characterized in that the dehydration is carried out at a pH of 4 to 7 at 80°–120° C. in the presence of solid mercuric oxide.

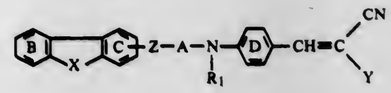
4,231,942

STYRYL COMPOUNDS

Stefan Koller, Ramlinsburg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 12, 1979, Ser. No. 20,109
Claims priority, application Switzerland, Mar. 21, 1978, 3082/78
Int. Cl.³ C07D *307/91*
U.S. Cl. 260—346.71 **11 Claims**

1. A styryl compound of the formula (I)



(I)

in which

X is $=CH_2$, —O—, —S— or the grouping $=NR_3$ wherein R_3 is hydrogen or an alkyl group having 1 to 4 carbon atoms,

Z is the —O— or —S— atom,

A is a straight-chain or branched-chain alkylene group having 2 to 4 carbon atoms,

R_1 is lower alkyl unsubstituted or substituted by hydroxy, cyano, phenyl or phenoxy,

R_2 is hydrogen, C_1-C_4-alkyl unsubstituted or substituted by OH, CN, halogen or C_1-C_4-alkoxy, C_1-C_4-alkoxy unsubstituted or substituted by OH, CN, halogen, lower alkyl or lower alkoxy, halogen or phenoxy unsubstituted or substituted by OH, CN, halogen, lower alkyl or lower alkoxy, and

Y is —CN, $—COOR_4$, $—SO_2R_4$ or $CONR_3R_5$, wherein R_3 has the meaning given above, R_4 is C_1-C_4-alkyl group or the phenyl group, R_5 is hydrogen or is the same as R_4,

and the benzene rings B, C and D can be further substituted by alkyl of 1 to 4 carbon atoms, alkoxy or 1 to 4 carbon atoms, halogen, —CN, $—NO_2$, $—SO_2$-alkyl, $—SO_2NH_2$, $—SO_2NH$-alkyl (C_1-C_4), $—SO_2N$ (alkyl-C_1-C_4)$_2$ or —COO-alkyl-(C_1-C_4).

4,231,943

MALEIC ANHYDRIDE PRODUCTION

Stephen G. Paradis, Fairfax; David M. Marquis, Lafayette, both of Calif., and Kiran R. Bakshi, Murrysville, Pa., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 645,585, Dec. 31, 1975, abandoned. This application May 31, 1979, Ser. No. 44,781
Int. Cl.³ C07D *307/60*
U.S. Cl. 260—346.75 **5 Claims**

1. A process for producing maleic anhydride from n-butane which comprises:

(a) feeding n-butane and air to a reactor;

(b) contacting the butane and air in the reactor with a crystalline vanadium and phosphorus mixed oxide catalyst at reaction conditions including a temperature between 550° F. and 1000° F. so as to convert 15 to 28% of the butane per pass and obtain a reactor effluent containing maleic anhydride, unreacted butane, nitrogen, and oxygen, said catalyst consisting essentially of pentavalent phosphorus, vanadium and oxygen, said vanadium having an average valence in the range from about +3.9 to +4.6, said catalyst moreover having a phosphorus-to-vanadium atomic ratio in the range from about 0.9–1.8 to 1;

(c) removing maleic anhydride from the reactor effluent to obtain maleic anhydride-lean effluent;

(d) recycling a portion of the maleic anhydride-lean effluent to the reactor so as to maintain in the reactor an oxygen content of about 6–12 volume %;
(e) removing butane from the other portion of maleic anhydride-lean effluent; and
(f) recycling the removed butane to the reactor.

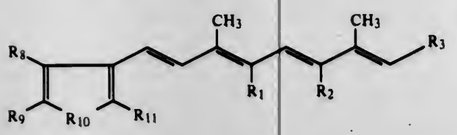
4,231,944

FLUORINATED POLYENES

Ka-Kong Chan, Hopatcong, and Beverly A. Pawson, Verona, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 936,466, Aug. 24, 1978, Pat. No. 4,171,318, which is a continuation of Ser. No. 809,738, Jun. 24, 1977, Pat. No. 4,137,246, which is a continuation-in-part of Ser. No. 722,939, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,028, Nov. 14, 1975, abandoned. This application May 10, 1979, Ser. No. 37,803
Int. Cl.³ C07D *307/16, 307/12, 333/24*
U.S. Cl. 260—347.4 **5 Claims**

1. A compound having the formula:



II

wherein one of R_1 and R_2 is fluorine and the other is hydrogen; R_3 is formyl, hydroxymethyl, alkoxymethyl, carboxyl, alkoxycarbonyl, carbamoyl, mono(lower alkyl)-carbamoyl or di(-lower alkyl)-carbamoyl; R_8 and R_{11} each are lower alkyl; R_9 is hydrogen or lower alkyl; and R_{10} is oxygen; or pharmaceutically acceptable salts thereof.

4,231,945

S-5-(AZIDOMETHYL OR AMINOMETHYL)-2-LOWER-ALKOXYTETRAHYDROFURANS

Stuart McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 959,032, Nov. 8, 1978, which is a continuation-in-part of Ser. No. 922,605, Jul. 7, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,722
Int. Cl.³ C07D *307/20*
U.S. Cl. 260—347.7 **2 Claims**

1. A lactol derivative selected from the group consisting of S-5-(azidomethyl)-2-lower alkoxytetrahydrofuran, S-5-(aminomethyl)-2-lower alkoxytetrahydrofurane, and an S-5-(N-protected aminomethyl)-2-lower alkoxytetrahydrofuran wherein said lower alkoxy has up to four carbon atoms and said N-protecting group is stable to acid and is removable with base.

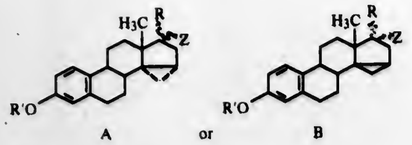
4,231,946

14,15-METHYLENE DERIVATIVES OF THE ESTRANE SERIES AND METHODS FOR PREPARING SAME

Kurt Ponsold, Jena; Richard Prousa, Jena-Neulobeda; Michael Oettel, Jena; Joachim Strecke, Jena-Neulobeda, and Herbert Hoffmann, Jena, all of German Democratic Rep., assignors to VEB Jenapharm, Jena, German Democratic Rep.

Filed Jun. 22, 1979, Ser. No. 50,998
Claims priority, application German Democratic Rep., Jun. 28, 1978, 206323
Int. Cl.³ C07J *1/00*; A61K *31/56*
U.S. Cl. 260—397.4 **12 Claims**

1. A compound of the formula



A or B

where R' is H or methyl;
R is a hydroxy, acetoxy, arylaminocarbonyloxy or alkylaminocarbonyloxy radical and
Z is H or a lower alkyl, or
R and Z together are oxygen.
7. A compound as defined in claim 1, which is 3-methoxy-14β,15β-methylene-estra-1,3,5(10)-triene-17-one.

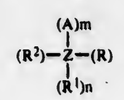
4,231,947

TANTALUM AND NIOBIUM CATALYSTS OR CATALYST PRECURSORS

Richard R. Schrock, Brighton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 883,628, Mar. 6, 1978, abandoned. This application Jan. 2, 1979, Ser. No. 32
Int. Cl.³ C07F *9/00*
U.S. Cl. 260—429 R **12 Claims**

1. A compound of the formula:



wherein R is cyclopentadienyl, $C_5H_xMe_{5-x}$, wherein x is an integer from 0 to 5, or neopentylidene, R^1 is neopentyl or benzyl, n is 0 or 1, R^2 is neopentylidene, benzylidene, tetramethylene or 2,3-dimethyltetramethylene, A is halo or a moiety of the formula $YR^3R^4R^5$ wherein Y is a group 5 element and R^3, R^4 and R^5 can be the same or different and are C_1–C_4 alkyl, aralkyl, aryl or bipyridyl and Z is tantalum or niobium: m=1 or 2.

4,231,948

LITHIUM DICYCLOPENTADIENYL TITANIUM HYDRIDE COMPOSITIONS

Guido P. Pez, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 3, 1978, Ser. No. 957,392
Int. Cl.³ C07F *7/28*
U.S. Cl. 260—429.5 **7 Claims**

1. A composition of matter of the formula: $LiRR'TiH$, wherein R and R' are cyclopentadienyl rings of the empirical formula, C_5H_5, wherein the ring hydrogens may be independently substituted with one or more groups inert toward lithium metal, said rings being bonded to titanium by sigma-bonds, pi-bonds or mixtures thereof, and said composition exhibiting a ^{13}C nuclear magnetic resonance spectrum in deuterated benzene, in which observed values for the chemical shifts of the ring carbons in R are different from the observed values for ring carbons in R', and said composition exhibiting an infrared spectrum in deuterated n-hexadecane in which a titanium metal-hydride absorption band is observed in the region of about 1250–1450 cm^{-1}.

4,231,949

PROCESS FOR PREPARING ORGANOTIN ESTERS

Mario Q. Ceprini, Cedarhurst, N.Y.; John D. Collins, Albrighton, England; Samuel Hoch, Brooklyn, N.Y., and Donald A. Wood, Warley, England, assignors to Albright & Wilson Limited, Warley, England

Filed Jul. 28, 1978, Ser. No. 928,795
Int. Cl.² C07F *7/22*
U.S. Cl. 260—429.7 **15 Claims**

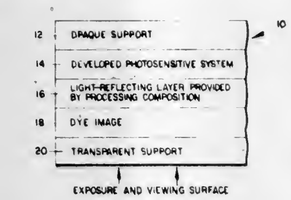
1. A process for preparing organotin esters of a carboxylic acid which comprises adding a base to an agitated mixture of (i) an organotin chloride of formula R'_2SnCl_2 wherein each of R' is an organic group, and (ii) a carboxyl compound, which is a maleate half ester of formula $R^2OOC—CH=CH—COOH$ wherein R^2 is an alkyl group of 3–20 carbon atoms or a cyclohexyl group, the addition being carried out in the presence of added water, and producing a second mixture which is reacted to form an organotin product comprising an organotin ester with at least one maleate group attached to a tin atom, said product containing tin and chlorine with a weight ratio of chlorine to tin of less than 1:8, the amount of organotin chloride, carboxyl compound and base being such that for each mole of organotin chloride, there are 1.95–2.4 moles carboxyl compound and 1.9–2.5 equivalents of base, the proportion of the number of equivalents of base to equivalents of carboxyl compound being 0.9–1.3:1 and the proportion of equivalents of base to moles of added water being 0.001–0.5:1.

4,231,950

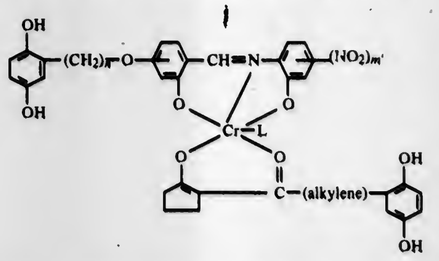
YELLOW AZOMETHINE DYE DEVELOPERS

Elbert M. Idelson, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 836,078, Sep. 23, 1977, Pat. No. 4,166,741. This application Mar. 23, 1979, Ser. No. 23,264
Int. Cl.³ C07F *11/00*
U.S. Cl. 260—438.5 R **4 Claims**



1. A compound which is represented by the formula



where L represents molecules that can satisfy the coordination sphere of chromium, —(alkylene)— has from 0–6 carbon atoms, n' is an integer of from 1–8 and m' is 1 or 2.

4,231,951

COMPLEX SALT PHOTOINITIATOR

George H. Smith, Maplewood, and Peter M. Olofson, North Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 876,114, Feb. 8, 1978, Pat. No. 4,173,476. This application Jun. 25, 1979, Ser. No. 51,901
Int. Cl.³ C07F *9/90*
U.S. Cl. 260—446 **4 Claims**

1. The process for the preparation of a triarylsulfonium hexafluoroantimonate salt comprising the steps of
(a) providing an aqueous solution of a watersoluble triarylsulfonium salt;
(b) adding solid $NaSbF_6$ or $KSbF_6$ to said aqueous solution to form a mixture; and
(c) recovering triarylsulfonium hexafluoroantimonate from said mixture.

4,231,952

PROCESS FOR THE PRODUCTION OF MONOISOCYANATE

Hartmut Knöfel, Odenthal-Erberich, and Klaus König, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 827,913
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639931
Int. Cl.³ C07C *118/00*
U.S. Cl. 260—453 P **11 Claims**

1. A process for the preparation of relatively low boiling monoisocyanates of the formula:

R—NCO

from the corresponding carbamic acid chlorides corresponding to the following general formula:

R—NH—COCl

in which R represents an aliphatic hydrocarbon radical having from 1 to 5 carbon atoms; comprising adding an at least equivalent quantity, based on the hydrogen chloride bound in the carbamic acid chloride, of relatively high boiling organic monoisocyanate or polyisocyanate whose boiling point is higher than the boiling point of the relatively low boiling monoisocyanate to be produced, to the carbamic acid chlorides, optionally dissolved in inert organic solvents, and distilling off the relatively low boiling monoisocyanate from the thus-obtained mixture, optionally together with the solvent.

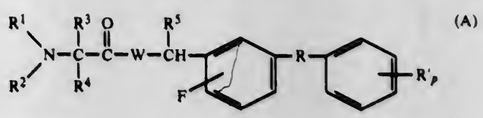
4,231,953

FLUORO SUBSTITUTED ARYL ESTERS AND THIOLESTERS OF AMINO ACIDS

Clive A. Henrick, Palo Alto, and Barbara A. Garcia, Boulder Creek, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 878,091, Feb. 16, 1978, which is a continuation-in-part of Ser. No. 824,947, Aug. 15, 1977, abandoned, and Ser. No. 779,886, Mar. 21, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,565
Int. Cl.³ C07C *101/14, 101/16, 121/78*
U.S. Cl. 260—465 D **29 Claims**

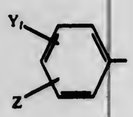
1. A compound of the formula (A)



(A)

wherein,
R is oxygen, sulfur, methylene or carbonyl;

R' is hydrogen, fluoro, bromo, chloro, trifluoromethyl, methyl, methoxy or methylthio;
p is zero, one or two; W is oxygen or sulfur;
R^1 is cycloalkyl, cycloalkenyl, cycloalkenyl substituted with halo or lower alkyl, or the group



in which t is zero, one, two, three or four; Y is independently selected from hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylcarbonyl, lower alkoxycarbonyl, lower acyloxy, halogen, cyano, nitro, and lower haloalkylthio; and Z is independently selected from the values of Y, cycloalkyl, and lower haloalkoxy; or Y and Z form a methylenedioxy group;
R^2 is hydrogen, lower alkyl, lower haloalkylcarbonyl, or formyl;
R^3 is lower alkyl of 2 to 5 carbon atoms, lower alkenyl of 2 to 5 carbon atoms, lower haloalkyl of 1 to 4 carbon atoms, lower haloalkenyl or 2 to 4 carbon atoms, or lower cycloalkyl of 3 or 4 carbon atoms;
R^4 is hydrogen or fluoro;
R^5 is hydrogen, cyano, ethynyl, methyl, trifluoromethyl or thioamide; and the salt thereof of a strong inorganic acid or organic acid.

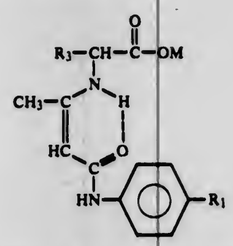
4,231,954

DANE SALT AND PROCESS FOR PREPARING AMINOPENICILLINS THEREFROM

Reinhold H. W. Bender, Kennett Square, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 20, 1979, Ser. No. 31,890
Int. Cl.[3] C07C *121/60*; C07D *499/00*
U.S. Cl. 260—465 D 5 Claims

1. A compound having the formula:



wherein R_1 is cyano or nitro; R_3 is phenyl, methylthiophenyl, nitrophenyl, aminophenyl, hydroxyphenyl, alkoxyphenyl in which alkoxy is of 1–4 carbon atoms or halogenophenyl; and M is hydrogen, an alkali metal or a triloweralkylamine.

4,231,955

SYNTHESIS OF ALKYL AND ALKYLAMINONITRILES

Clarence D. Chang, Princeton; William H. Lang, Pennington, both of N.J., and Rene B. LaPierre, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 13, 1979, Ser. No. 57,547
Int. Cl.[3] C07C *120/00, 121/43, 121/16, 121/18*
U.S. Cl. 260—465.1 13 Claims

1. A method for synthesizing alkylnitriles and alkylaminonitriles which comprises effecting reaction between formaldehyde, C_1-C_5 monohydric alcohol and a compound having the formula R_1R_2NH where R_1 and R_2 are selected from the group consisting of hydrogen and alkyl groups containing 1 to 5 carbon atoms at a temperature between about 500° F. and about 1200° F., a pressure between about 1 and about 100 atmospheres and a liquid hourly space velocity between about 0.2 and about 20 in the presence of a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 and recovering from the resulting reaction mixture, a product containing at least one of the above nitrile compounds.

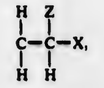
4,231,956

PROCESS FOR PREPARATION OF THIOETHERS

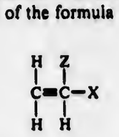
Daniel S. Sullivan, III, and Wilbur L. Bridges, both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 776,261, Mar. 10, 1977, abandoned, which is a continuation of Ser. No. 599,998, Jul. 29, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,316
Int. Cl.[3] C07C *120/00, 121/16, 121/20, 149/20*
U.S. Cl. 260—465.8 R 9 Claims

1. A process for the preparation of thioethers having the formula R'—S—R or R—S—R wherein R' is a C_1 to C_{18} hydrocarbon ligand and R has the formula



wherein Z is H or CH_3 and X is an electron withdrawing group selected from the group consisting of carboalkoxy, nitrile and carboxamide groups, said process comprising
(i) the exothermic reaction of an activated alpha, beta unsaturated compound of the formula



wherein Z is H or CH_3 and X is an electron withdrawing group selected from the group consisting of carboalkoxy, nitrile and carboxamide groups, said compound being capable of undergoing the Michael addition reaction, with at least stoichiometric quantities of H_2S or R'SH in the presence of a catalyst and at a temperature in the range of 30° C. to 90° C., wherein, said catalyst is selected from the group consisting of
(a) 1,5-diazabicyclo (5,4,0) undec-5-ene,
(b) 1,4-diazabicyclo (2,2,2) octane,
(c) 1,5-diazabicyclo (4,3,0) non-5-ene, and
(d) quinuclidine, and
(ii) recovering said thioethers.

4,231,957

PHOSPHONIUM COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND A PROCESS FOR THE PREPARATION OF ASYMMETRICALLY SUBSTITUTED STILBENE FLUORESCENT BRIGHTENING AGENTS

Michael Märky, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,902
Claims priority, application Luxembourg, Nov. 4, 1977, 78449
Int. Cl.[3] C07C *143/24*; D06P *1/38*
U.S. Cl. 260—505 C 6 Claims

1. A phosphonium compound of the formula
$(R')_3P—\oplus CH_2—X'—CH=CH—R_1''—Y_1\oplus$

in which R_1'' is a phenyl radical which, in addition to the group $Y_1\ominus$, can carry one or two further substituents from the group comprising alkyl having 1 to 4 C atoms, alkoxy having 1 to 4 C atoms, cyclohexyl, alkenyl having 3 or 4 C atoms,

phenyl, sulpho, fluorine, chlorine, bromine or carbalkoxy having 2 to 5 C atoms, R' is alkyl having 1 to 4 C atoms, cycloalkyl having 5–7 C atoms or phenyl, $Y_1\ominus$ is $SO_3\ominus$ and X' is 1,4-phenylene, 4,4'-biphenylene or 1,4- or 2,6-naphthylene.

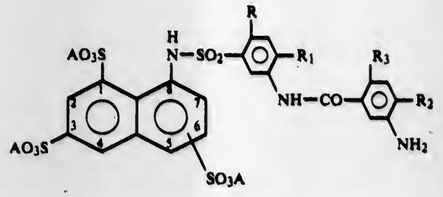
4,231,958

UREYLENE PHENYLENE ANIONIC NAPHTHALENESULFONIC ACIDS

Gerald J. Siuta, Yonkers; Ransom B. Conrow, Pearl River; John F. Poletto, Nanuet, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 923,742, Jul. 11, 1978. This application Mar. 5, 1979, Ser. No. 17,204
Int. Cl.[3] C07C *143/30*
U.S. Cl. 260—507 R 18 Claims

1. A compound of the formula:



wherein R, R_1, R_2 and R_3 are selected from the group consisting of hydrogen and methyl; and A is a pharmaceutically acceptable salt cation.

4,231,959

PHOSGENE MANUFACTURE

Robert P. Obrecht, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 15, 1978, Ser. No. 878,032
Int. Cl.[3] C07C *51/58*
U.S. Cl. 260—544 K 8 Claims

1. An improved process for preparing phosgene by reacting chlorine with substantially pure carbon monoxide in a reaction zone to produce a product gas mixture comprising phosgene and unreacted carbon monoxide, separating substantially all of said phosgene from said unreacted carbon monoxide by passing the gas mixture through a partial condensation zone and recycling a major portion of said unreacted carbon monoxide directly to said reaction zone whereby the raw material yield of the process is increased and the amount of carbon monoxide discarded as a waste stream is reduced.

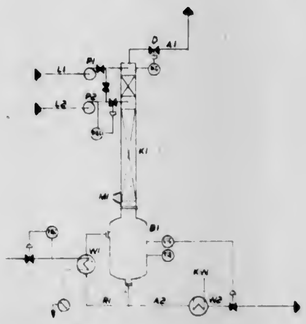
4,231,960

PROCESS FOR THE PURIFICATION OF UREA SOLUTIONS CONTAINING BIURET AND THE LIKE

Alfred Schmidt, Vienna, Austria, assignor to OMV Aktiengesellschaft, Vienna, Austria

Filed Jun. 5, 1978, Ser. No. 912,328
Claims priority, application Austria, Jun. 8, 1977, 4077/77
Int. Cl.[3] C07C *126/00*
U.S. Cl. 564—73 3 Claims

1. A process for the purification and regeneration of urea solution contaminated by urea conversion products such as biuret, triuret and the like, comprising the steps of contacting the contaminated urea solution with ammonia whereby about 1% to about 10% by weight of ammonia based on the total amount of urea is absorbed, maintaining said contaminated urea solution in contact with ammonia for a period of about 30–240 minutes at a temperature of about 110° to about 170° C. to react the conversion products with the ammonia, separating CO_2 and excess ammonia from said urea solution and separating said CO_2 and excess ammonia from each other, said steps of contacting, maintaining, separating CO_2 and excess ammonia



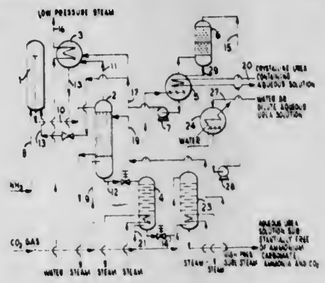
from the urea solution and separating the CO_2 from the excess ammonia being carried out simultaneously.

4,231,961

PROCESS FOR PREPARATION OF UREA

Keizo Konoki, Tokyo; Michio Nobue, Funabashi; Akito Fukui, Yokkaido, and Shigeru Inoue, Kamakura, all of Japan, assignors to Toyo Engineering Corporation and Mitsui Toatsu Chemicals, Incorporated, both of Tokyo, Japan

Filed Nov. 5, 1979, Ser. No. 91,444
Claims priority, application Japan, Nov. 30, 1978, 53-148131
Int. Cl.[3] C07C *126/00*
U.S. Cl. 564—65 1 Claim



1. In a process for the preparation of urea, which comprises reacting NH_3 and CO_2 in a urea-synthesis reaction vessel under high temperature and high pressure conditions, in the presence of an excess of NH_3, then decomposing the ammonium carbamate contained in the effluent from the reaction vessel, separating the decomposition products from the effluent together with the excess NH_3 returning them to the reaction vessel, and concentrating the aqueous solution of urea obtained after separating the ammoniun carbamate and excess NH_3 from the reactor effluent, and then recovering the urea, the improvement which comprises: feeding NH_3 and a recovery solution containing NH_3, CO_2 and water into said reaction vessel and carrying out a urea synthesis reaction at a temperature of 180° to 200° C., under a pressure of 150 to 250 Kg/cm^2 gauge, while controlling the compositon of the reactant materials fed into said reaction vessel so that the NH_3/CO_2 molar ratio is 3.0 to 4.0 and the H_2O/CO_2 molar ratio is 0.3 to 0.6; feeding the liquid effluent from said reaction vessel and a part of the CO_2 gas to be used as a reactant material into a first, high pressure, decomposing and stripping device, the pressure of which is maintained at the same level as the internal pressure of said reaction vessel, and in said first device flowing the liquid effluent from the first reaction vessel in gas-liquid contact with said

part of said CO_2 gas, while heating said effluent at a temperature of from 170° C. up to the temperature in said reaction vessel to partially decompose the ammonium carbamate present in said effluent and to strip the gaseous decomposition products thereof and excess NH_3 from the liquid by means of said CO_2 gas, and separately discharging from said first device a first stream of gas comprised of NH_3, CO_2 and water vapor, and a high pressure liquid effluent having a total content of 15 to 25% by weight of NH_3 and CO_2 based on the total weight of the high pressure liquid effluent and excluding NH_3 and CO_2 present in combined form as urea; reducing the pressure of the high pressure liquid effluent and introducing the high pressure liquid effluent into a second, medium pressure, decomposing and stripping device in which the temperature is maintained at 150° to 170° C. and the pressure is maintained at 15 to 25 Kg/cm^2 gauge, and feeding another part of CO_2 to be used as a reactant material into said second device as a stripping gas, and in said second device flowing the liquid effluent from said first device in gas-liquid contact with said another part of said CO_2 gas to decompose more of the ammonium carbamate and to strip the gaseous decomposition products thereof by means of said another part of said CO_2 gas, and separately discharging from said second device a second stream of gas comprised of NH_3, CO_2 and water vapor, and a medium pressure liquid effluent having a total content of 5 to 15% by weight of NH_3 and CO_2 based on the total weight of the medium pressure liquid effluent and excluding NH_3 and CO_2 present in combined form as urea; reducing the pressure of the medium pressure effluent and then introducing same into a third, low pressure, decomposing and stripping device in which the temperature is maintained at 100° to 140° C. and the pressure is maintained at 1.5 to 3 Kg/cm^2 gauge and feeding the remainder of the CO^2 gas to be used as a reactant material into said third device as a stripping gas, and in said third device flowing the liquid effluent from said second device in gas-liquid contact with said remainder of said CO_2 gas to complete the decomposition of the ammonium carbamate and to strip the gaseous decomposition products thereof by means of said remainder of said CO_2 gas, and separately discharging from said third device a third stream of gas comprised of NH_3, CO_2 and water vapor, and a low pressure liquid effluent which is an aqueous solution of urea substantially free of ammonium carbamate, free NH_3 and free CO_2; then concentrating the effluent from said third device; cooling the third stream of gas discharged from said third device and dissolving same in an aqueous solvent to form a recovery solution; then increasing the pressure of said recovery solution; then dissolving the second stream of gas discharged from said second device in said recovery solution and flowing said recovery solution in indirect heat exchange contact with an aqueous urea solution to concentrate same; then increasing the pressure of said recovery solution and dissolving the first stream of gas discharged from said first device in said recovery solution and flowing said recovery solution in indirect heat exchange contact with water to generate low pressure steam; and then introducing the recovery solution containing dissolved therein the first, second and third streams of gas into said reaction vessel together with the starting NH_3 to effect the urea synthesis reaction.

4,231,962

3-PHENOXYBENZYLIDENEAMINES AND 3-BENZYLBENZYLIDENEAMINES

Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Laurenz Gsell, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

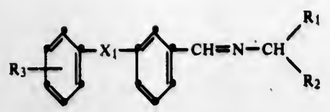
Filed May 29, 1979, Ser. No. 42,756

Claims priority, application Switzerland, Jun. 8, 1978, 6289/78; Apr. 10, 1979, 3406/79

Int. Cl.³ C07C *119/10*

U.S. Cl. 564—272 **3 Claims**

1. A compound of the formula



(I)

in which

R_1 is hydrogen or alkyl,

R_2 is alkyl, with alkyl groups denoted by R_1 and R_2 together not containing more than 12 C atoms, or R_1 and R_2 together being alkylene having 4–11 C atoms,

R_3 is hydrogen, halogen, methyl or methoxy, and

X_1 is oxygen or $—CH_2—$.

4,231,963

PROCESS FOR PRODUCING AMINOPHENOL ETHER

Akira Shinohara, Shimizu; Nobuhide Wada; Yukio Tokunaga, both of Shizuoka, and Chihiro Yazawa, Yokohama, all of Japan, assignors to Ihara Chemical Industry Company, Limited, Tokyo, Japan

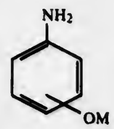
Filed Oct. 3, 1979, Ser. No. 81,460

Claims priority, application Japan, Nov. 2, 1978, 53-134482

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—443 **2 Claims**

1. A process for producing an aminophenol ether which comprises reacting an alkali aminophenolate having the formula



wherein M represents an alkali metal atom; with an organic halide having the formula

R-X

wherein R represents a lower alkyl group, a lower alkenyl group or benzyl group; and X represents a halogen atom in substantially anhydrous condition in the presence of an alkali metal hydroxide and a quaternary salt selected from the group consisting of quaternary ammonium salts and quaternary phosphonium salts.

4,231,964

NITROAMINES, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE AS DIAZO COMPONENTS

Rudolf Kühne, Frankfurt am Main, and Heinrich Hamal, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

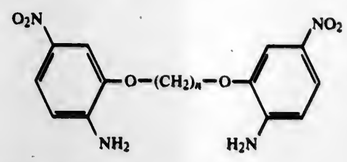
Continuation of Ser. No. 862,666, Dec. 21, 1977, abandoned. This application Jan. 18, 1979, Ser. No. 4,608

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658329

Int. Cl.³ C07C *93/06*

U.S. Cl. 564—305 **5 Claims**

1. A compound having the formula



wherein n is 1 to 4.

4,231,965

PHENOXY PHENYL ETHANONES

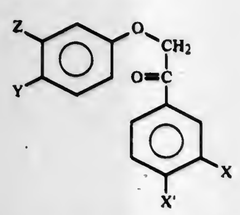
Robert A. Scherrer, White Bear Lake, and Richard M. Stern, Cottage Grove, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 943,690, Sep. 19, 1978, Pat. No. 4,154,848, which is a division of Ser. No. 861,893, Dec. 19, 1977, Pat. No. 4,128,659. This application Mar. 5, 1979, Ser. No. 17,816

Int. Cl.² C07C *49/84, 65/16*

U.S. Cl. 568—327 **2 Claims**

1. A compound of the formula



wherein X and X' are individually hydrogen, fluorine, chlorine, bromine or carboxyl or together can complete a benzo ring, Y is hydrogen, fluorine, chlorine, bromine, carboxyl, carboxymethyl or together with Z can form a propylene chain, provided that the compound contains one and only one of the rings including X and X' and Y and Z, and provided further that the compound contains not more than a single carboxyl function.

4,231,966

METHOD OF CONDUCTING REACTIONS IN A TRICKEL-TYPE REACTOR

Günter Brandes, Hamburg; Johannes Wöllner, Kapellen Krs. Moers; Wilhelm Neier, and Werner Webers, both of Orsoy, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 545,641, Jan. 30, 1975. This application Oct. 23, 1978, Ser. No. 953,508

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404329

Int. Cl.³ C07C *45/45*

U.S. Cl. 568—396 **10 Claims**

1. In a process for carrying out a condensation-hydrogenation reaction between hydrogen and a ketone where in an on-stream period the reactants pass downwardly in contact with a fixed bed of particulate condensation-hydrogenation catalyst having an average particle size no greater than about 2 mm in a trickle-type reaction zone, the improvement which comprises prior to instituting the on-stream period removing air from said reaction zone by passing a gas devoid of free oxygen downwardly through said reaction zone and said catalyst bed, interrupting the flow of said gas and flooding the reaction zone by introducing a liquid to flow upwardly through said catalyst bed and cover same and then removing said liquid from said reaction zone and substantially simultaneously introducing hydrogen and said ketone into said reaction zone to flow downwardly through said catalyst bed under condensation-hydrogenation conditions, thereby instituting the on-stream period.

4,231,967

PROCESS FOR PRODUCING SALICYLALDEHYDE

Teruo Matsuda, and Tetsuo Murata, both of Nihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

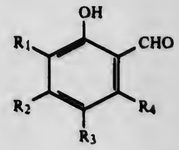
Filed Jun. 8, 1979, Ser. No. 46,933

Claims priority, application Japan, Jun. 13, 1978, 53-71811

Int. Cl.³ C07C *45/00*

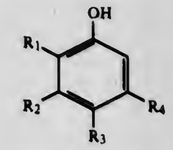
U.S. Cl. 568—433 **5 Claims**

1. A process for producing a salicylaldehyde of the formula (I),



(I)

wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom, an alkyl, cycloalkyl, alkoxyl or hydroxyl group or a halogen atom, which comprises reacting formaldehyde or a formaldehyde liberating compound with a phenol of the formula (II),



(II)

wherein R_1, R_2, R_3 and R_4 are as defined above, in a solvent using as a catalyst at least one member selected from the group consisting of chromium (III) acetylacetonate, chromium formate, chromium acetate, chromium oxalate, chromium adipate, chromium benzoate, chromium bromide, chromium carbonate, chromium nitrate, iron acetylacetonate, iron benzoate and iron salicylate, at a temperature of 150° to 210° C.

4,231,968

STABILIZATION OF 1,1,1-TRICHLOROETHANE

Leonhardt Magiera; Raban Grundmann, both of Marl, and Dieter Krockenberger, Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,624

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803529

Int. Cl.³ C07C *17/42*

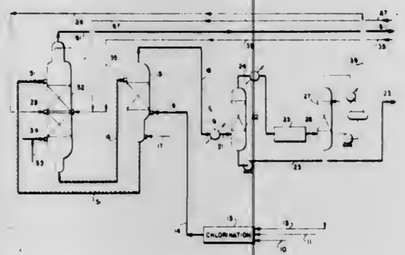
U.S. Cl. 570—109 **9 Claims**

1. Stabilized 1,1,1-trichloroethane containing a stabilizer, the stabilizer consisting essentially of (a) 0.2–2% by weight of the total mixture of 2-methyl-2,3-epoxypropanol-(1); (b) 0.2–2% by weight of the total mixture of 2-methyl-2,3-epoxypropanol-(1) and 0.2–2% by weight of the total mixture of methyl tert-butyl ether; or (c) a mixture of either (a) or (b) and 0.5–1.5% by weight of the total mixture of nitromethane, 0.5–1.5% by weight of the total mixture of 1,2-epoxybutane or 0.001 to 0.01% by weight of the total mixture of diisopropylamine or N-methyl morpholine.

4,231,969
PRODUCTION OF HEXACHLOROCYCLOPENTADIENE

Herbert Riegel, Maplewood, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Feb. 21, 1978, Ser. No. 879,799
Int. Cl.[2] C07C 23/08
U.S. Cl. 570—223 20 Claims



1. A process for producing hexachlorocylopentadiene, comprising:

contacting in a hexachlorocyclopentadiene production zone a feed selected from the group consisting of chlorinated saturated C_5 hydrocarbons chlorinated mono-olefinically unsaturated C_5 hydrocarbons and mixtures thereof with a salt mixture containing cuprous chloride and cupric chloride, said salt mixture being in molten form;

recovering a gaseous effluent containing hexachlorocyclopentadiene, other organics, chlorine, hydrogen chloride and entrained salt mixture;

cooling the gaseous effluent to condense hexachlorocyclopentadiene and other organics and provide a condensate including said entrained salt mixture;

separating said entrained salt mixture from the condensate;

introducing the separated entrained salt mixture into an oxidation reaction zone;

recovering chlorine and hydrogen chloride from the uncondensed gaseous effluent;

introducing recovered chlorine into the hexachlorocyclopentadiene production zone;

introducing recovered hydrogen chloride into the oxidation reaction zone;

contacting in the oxidation reaction zone molten salt mixture from the hexachlorocylopentadiene production zone and said separated entrained salt mixture with molecular oxygen, and said recovered hydrogen chloride to provide a molten salt enriched in cupric chloride; and

passing said molten salt mixture enriched in cupric chloride to the hexachlorocyclopentadiene production zone.

4,231,970
REACTION PRODUCTS OF UNSATURATED HYDROCARBONS WITH P_4S_{10} AND PSX_3

Eugene H. Uhing, Pleasantville, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 17, 1978, Ser. No. 925,129
Int. Cl.[3] C07F 9/04
U.S. Cl. 260—931 5 Claims

1. A composition of the formula:

$$+SCH_2CH_2\underset{|}{P}(S)S+_x$$

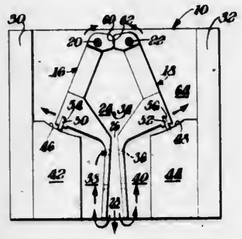
wherein x is ≥ 1.

3. A method comprising reacting P_4S_{10} with ethylene at a reaction temperature of from about 130° C. to about 170° C. under autogenous pressure to form a reaction product characterized as a glossy solid and having an emperical formula $[C_8H_{16}P_4S_{10}]$.

4,231,971
FLOW METHOD AND DEVICE

Kenneth R. Armstrong, Lakewood, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 11, 1979, Ser. No. 29,151
Int. Cl.[3] F02M 9/02
U.S. Cl. 261—44 B 8 Claims

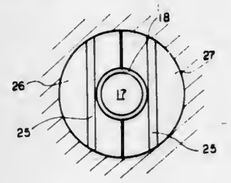


1. In a device for delivering a gaseous medium to utilization equipment having variable pressure conditions at its intake comprising, in combination, means defining a gaseous medium intake zone connecting with means defining a variable area throat zone for constricting the flow of the gaseous medium to increase the velocity thereof to sonic, means for adjustably varying the area of the throat zone in correlation with operating demands imposed upon the utilization equipment, wall means downstream from the throat zone arranged to provide a gradually diverging zone for efficiently recovering a substantial portion of the kinetic energy of the high velocity gaseous medium as static pressure whereby the velocity of the gaseous medium through the throat zone is sonic over a wide range of pressure conditions at the intake of the utilization equipment, the improvement comprising perforations in the wall means downstream and spaced from the throat zone and upstream and spaced from the exit of the gradually diverging zone, and passageway means behind the wall means interconnecting the perforations with the exit from the gradually diverging zone for recirculating a portion of the gaseous medium from the exit of the diverging zone to the perforations to thereby disturb the flow and shift the location of shock upstream from where it would otherwise occur to the location of the perforations when the pressure drop across the device is high.

4,231,972
SUPPLY APPARATUS

Masafumi Nakayama, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 21, 1979, Ser. No. 41,162
Claims priority, application Japan, May 27, 1978, 53-63749
Int. Cl.[3] F02M 7/22
U.S. Cl. 261—44 D 10 Claims



1. A fuel supply apparatus of a venturi type for an internal combustion engine, comprising:

means defining a throat of an air suction passage which is communicable with the combustion chamber(s) of the engine;

a throttle valve located in the air suction passage downstream of said throat;

a resistance member which is movable in response to the suction vacuum of the engine to cooperate with said throat;

a needle valve secured to said resistance member to be movable with the movement of said resistance member;

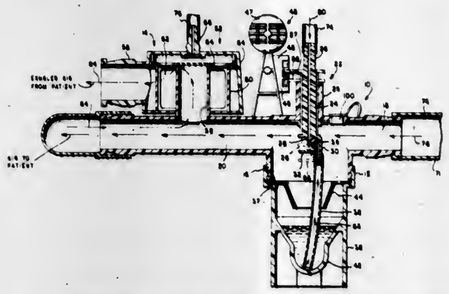
an inner cylindrical member which is adapted to be filled with fuel and which is securely disposed at the center of the air suction passage, said inner cylindrical member comprising a nozzle opening for discharging fuel, said nozzle opening facing said resistance member and said needle valve being movably disposed in said nozzle opening so as to meter the fuel discharged from said nozzle opening in accordance with the movement of said needle valve; and

an outer cylindrical member securely disposed around and being coaxial with said inner cylindrical member, said outer cylindrical member being closed at its end farthest from said resistance member and comprising in its cylindrical wall a plurality of ports which are located downstream of the throttle valve, said outer cylindrical member being spaced apart from said inner cylindrical member to form a passage through which a mixture of air and fuel from said nozzle opening passes in order to be ejected through said plurality of ports into said air suction passage.

4,231,973
NEBULIZER WITH VARIABLE FLOW RATE CONTROL AND ASSOCIATED METHOD

Joe W. Young, Torrance, and Charles Odenthal, Upland, both of Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 29, 1978, Ser. No. 947,109
Int. Cl.[3] A61M 11/02; B01F 3/04
U.S. Cl. 261—78 A 11 Claims



1. A nebulizer for supplying variable amounts of liquid to a gas flowing in a given path at a selected rate, comprising:

conduit means having a first axis for defining said given flow path;

a nebulization chamber intersecting said conduit means and extending away from said axis;

venturi means for forming a movable spray of liquid particles in said flowing gas, said venturi means and spray being movable between said conduit means and said chamber relative to said axis such that the amount of liquid entrained by said flowing gas is regulated according to the displacement of the venturi means from the axis and independent of the rate of gas flow;

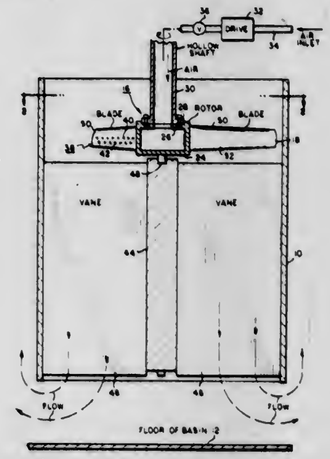
liquid supply means in flow communication with said venturi means for supplying said venturi means with a liquid; and

locking means for removably holding said venturi means in a selected location.

4,231,974
FLUIDS MIXING APPARATUS

Horst P. Engelbrecht, Canandaigua, and Howard K. Johnson, Webster, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,132
Int. Cl.[3] B01F 13/02; B03D 1/18; C02F 1/74, 3/20
U.S. Cl. 261—87 10 Claims



1. In apparatus for introducing a first fluid into a second fluid, said apparatus having a shaft which extends into said second fluid, an impeller on said shaft, said shaft and impeller having a passageway for said first fluid which extends through said shaft and said impeller into communication with said second fluid, the improvement which comprises a pumping impeller comprising a blade having a cross-sectional profile which defines an airfoil with a suction surface and a pressure surface on opposite sides thereof, said airfoil blade having a camber, a leading edge and a trailing edge which defines a chord therebetween, said camber having a maximum length in the range of about 2% to 6% of the length of said chord, the location of said maximum camber length being measured between the midline of said blade and said chord along a perpendicular to said chord in a region measured along said chord a distance of in a range about 20% to 60% away from said leading edge toward said trailing edge, the maximum thickness of said blade between said pressure and suction surfaces being in a range from about 10% to 18% of the length of said chord, and the portion of said fluid passageway in said impeller comprising a hole, extending through said suction surface in and only in a region of said suction surface located between perpendiculars from said chord to said suction surface in a range from about 60% to 80% of the length of said chord along said chord from said leading edge toward said trailing edge, the axis of said hole being perpendicular to said suction surface.

4,231,975
EVAPORATIVE COOLER AND LIQUID-GAS CONTACT PAD THEREFOR

John W. Peltier, 27465 Pacific St., San Bernardino, Calif. 92346

Filed Sep. 27, 1979, Ser. No. 79,362
Int. Cl.[3] B01F 3/04
U.S. Cl. 261—99 1 Claim

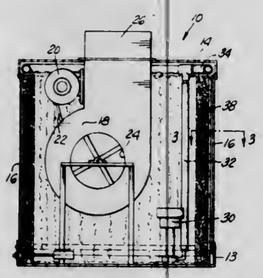
1. An evaporative cooler pad comprising:

a pad of loosely packed, randomly oriented, ribbon-like wood fiber strands of balsam poplar (Populus tacamahaca) having a thin layer of Portland cement surrounding and enclosing each strand;

said strands being separated from one another along the greater part of their respective lengths, forming intercon-

necting interstices, or passageways, from one side of the pad to the other, whereby air is allowed to flow freely through the pad;

said pad being dampened by water that is discharged onto the top part and allowed to flow by gravity down to the bottom of the pad, while air is drawn through said interstices and passageways from one side of the pad to the other;



the cement coating on each of said strands having a fine-grained, granular surface that is porous and produces a strong capillary action on water, causing a thin film of moisture to adhere to the surface of the coating, whereby a minimum of water provides a maximum area of moist surface to be cooled by evaporation, with a minimum increase in relative humidity of the air passing through the pad.

4,231,976

PROCESS FOR THE PRODUCTION OF CERAMIC PLUTONIUM-URANIUM NUCLEAR FUEL IN THE FORM OF SINTERED PELLETS

Klaus Bischoff, Kirchdorf, and Richard W. Stratton, Windisch, both of Switzerland, assignors to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule, Zurich, Switzerland

Filed Mar. 14, 1978, Ser. No. 886,462

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2713108

Int. Cl.[2] G21C *21/00*

U.S. Cl. 264—0.5 **31 Claims**

1. A process for the production of a plutonium-uranium ceramic fuel wherein green pellets are formed by pressing from:

(i) a mixture of (a) an oxide, finely-divided carbon-containing oxide, carbide, nitride, oxycarbide, or carbonitride of plutonium, in the form of microspheres obtained by a wet chemical process, and (b) a like compound of uranium in a form selected from such microspheres and fine-grained to pulverulent materials; or

(ii) a like compound of a plutonium-uranium solid solution of which at least 1% is plutonium, in the form of microspheres obtained by a wet chemical process, alone or in admixture with a material selected from the said plutonium-compound microspheres, the said uranium-compound microspheres, and the said fine-grained to pulverulent materials,

and the green pellets are subjected to a heat treatment that includes a sintering to final density.

4,231,977

METHOD AND APPARATUS FOR IN-SITU PRODUCTION OF CONCRETE SLABS

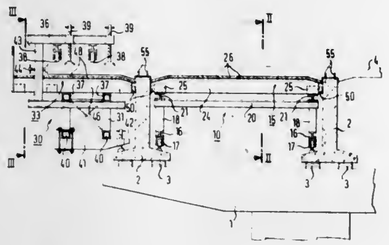
Philipp Schreck, Langbürgenerstrasse 2/13, 8 Munich 90, and Gerold A. Buck, Trollingerweg 39, 7050 Waiblingen, both of Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,403

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736524

Int. Cl.[2] E01D *21/04*

U.S. Cl. 264—33 **14 Claims**



1. A method for the in-situ step-by-step forming of an elongated reinforced concrete slab along the length of transversely spaced longitudinal permanent supports for said concrete slab bridging a span between two spaced supports which comprises progressively and permanently mounting said supports to span the path desired for the concrete slab, mounting on said supports for movement along the lengths of said supports carriages with leading reinforcing core support platforms and trailing slab support platforms spanning the space between the transversely spaced longitudinal supports, building a metal reinforcing core on the leading carriage platform, suspending said core from said supports, lowering the platform beneath the suspended core, advancing the carriages to move the slab support platform beneath the suspended core and the reinforcing core platform in the open space between the transversely spaced supports beyond the suspended core, raising the platforms to levels for forming a concrete slab around the core and for building another reinforcing core ahead of the slab, pouring concrete on the trailing platform around the suspended core, allowing the concrete to set, and repeating the steps of lowering, advancing, and raising the platforms, the building of reinforcing cores, and the pouring of concrete slab around the cores to form a continuous roadway on the longitudinal support.

9. The method of making a concrete roadbed on elevated transversely spaced longitudinally extending girders which comprise mounting carriages on said girders for movement along the length thereof, supporting concrete shaping and core support platforms on said carriages, constructing a metal rod concrete reinforcing core on the core supporting platform, pouring concrete around a previously constructed core on the forming platform, allowing the concrete to set, lowering the platforms, advancing the carriages on the girders to position the concrete forming platform under the newly constructed core and the core supporting platform under the span of the griders, raising the platforms to levels for concrete pouring and core formation, allowing the concrete to set, advancing the carriage to positions for concrete pouring and core forming, and raising the advanced carriages to the levels for such pouring and forming.

4,231,978

HIGH DENSITY LOW POROSITY REFRACTORY PRODUCT AND PROCESS FOR MAKING THE SAME

James A. Crookston, Mexico, Mo., assignor to A. P. Green Refractor, Mexico, Mo.

Continuation-in-part of Ser. No. 666,032, Mar. 11, 1976, abandoned. This application Feb. 26, 1979, Ser. No. 15,855

Int. Cl.[2] B29C *35/04*

U.S. Cl. 264—63 **6 Claims**

1. A process for producing a basic refractory brick or other refractory product, said process comprising the steps of preparing a fine grain refractory material consisting of a mixture of chrome ore and high purity periclase, said refractory being capable of passing a 65 mesh screen, tempering the refractory material with a solution containing magnesium chloride and/or magnesium sulfate, pressure-forming the tempered refractory material into larger size agglomerated, predensified and unsintered pieces, drying the agglomerated pieces at a temperature below the sintering temperature of the refractory material, crushing the agglomerated pieces to provide predensified unsintered grains, sizing the predensified unsintered grains into a suitable mix for pressing to a shape, moistening the mix, pressing the mix into objects of a desired refractory shape, drying the shaped objects, and firing the shaped objects at a temperature of at least 3000° F. to yield refractory products having said desired shape.

4,231,979

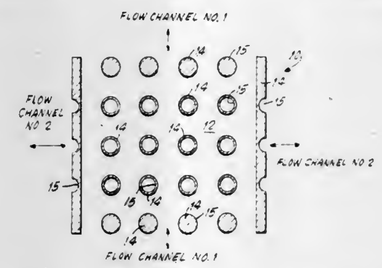
HIGH SURFACE AREA PERMEABLE MATERIAL

Eugene W. White; William M. Hanusiak, both of State College, Pa., and Rodney A. White, Torrance, Calif., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 859,135, Dec. 9, 1977, Pat. No. 4,190,079, which is a division of Ser. No. 713,258, Aug. 10, 1976, Pat. No. 4,075,092. This application Oct. 12, 1979, Ser. No. 84,126

Int. Cl.[3] B01D *3/00*

U.S. Cl. 264—81 **13 Claims**



1. A method of producing an integral, three-dimensional structure providing a plurality of separate, interpenetrating, three-dimensional domains or channels, each of said domains or channels being a closed system of connected porosity or permeability with multiple interconnections only with respect to its respective domain or channel, each of said domains or channels being interpenetrating within said structure, which comprises filling or impregnating with a settable or curable liquid a porous, permeable, three-dimensional structure characterized by having a single interpenetrating, three-dimensional, multiple-connected channel or flowpath therein defined by solid material making up said three dimensional structure such that said flowpath or channel is occupied by said settable or curable liquid, removing said settable or curable liquid from said three-dimensional structure such that the surface of the solid material originally making up said three-dimensional structure and defining said flowpath or channel therein is coated with said settable or curable liquid, curing or setting said curable or settable liquid on said surface and removing from said structure the resulting coated solid material originally making up said structure thereby creating a second interpenetrating, three-dimensional, multiple-connected channel or flowpath within said structure, said second channel or flowpath being defined by the resulting cured or set curable or settable liquid coating the surface of the solid material originally making up said structure.

4,231,980

LARGE BORON NITRIDE ABRASIVE PARTICLES

Francis R. Corrigan, Westerville, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 394,632, Sep. 6, 1973, abandoned. This application Jan. 21, 1977, Ser. No. 760,853

Int. Cl.[3] C04B *35/58*

U.S. Cl. 264—84 **6 Claims**



1. A method for producing large-sized, high density particles comprising the steps of:

(a) placing in a reaction holder a reaction charge consisting essentially of low-density-recrystallized pyrolytic boron nitride and

(b) subjecting said reaction holder and reaction charge to a shock wave to create pressure and temperature conditions in the high density boron nitride direct conversion region of the boron nitride phase diagram where the stable form of boron nitride is high-density boron nitride to produce in said holder high-density boron nitride particles of at least 50 microns in size.

4,231,981

CADMIUM MERCURY TELLURIDE SPUTTERING TARGETS

Horst E. Hirsch, and Robert W. Smyth, both of Trail, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Nov. 13, 1978, Ser. No. 960,198

Int. Cl.[2] C04B *35/50*

U.S. Cl. 264—102 **5 Claims**

1. A method for the preparation of substantially crack-free sputtering targets of cadmium mercury telluride of the general formula $Cd_xHg_{1-x}Te$ wherein x has values in the range of about 0.14 to 0.60 which comprises the steps of preparing finely divided cadmium mercury telluride of desired composition, said finely divided cadmium mercury telluride having particle sizes all less than 150 μ, mixing the particles of the finely divided cadmium mercury telluride to obtain a substantially even particle size distribution, preheating a die of desired dimensions to a temperature in the range of about 100° to 300° C, adding a predetermined amount of mixed particles to said die evacuating the die to a pressure of less than about 133 Pa absolute, applying a compacting pressure to said amount for a period of time not less than about one minute to compact the finely divided cadmium mercury telluride into a coherent

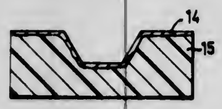
compact having a density of at least 97% of theoretical density, releasing the pressure and removing the compact having predetermined dimensions from the die, said predetermined amount of mixed particles being sufficient to form said compact of predetermined dimensions.

4,231,982

METHOD FOR THE PRODUCTION OF TOOLS FOR DEEP DRAWING, MOULDING, EXTRUDING AND THE LIKE

Hans B. E. Jansson, Sölvesborg, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed May 20, 1975, Ser. No. 579,278
Int. Cl.³ B29C 1/02; B22C 7/00; B21K 5/20
U.S. Cl. 264—112 **6 Claims**



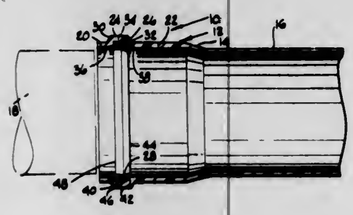
1. A method for producing tools for deep drawing, moulding, extruding and the like, comprising forming a working model having a surface the shape of the tool to be produced, coating said surface with a release agent, thermally spraying on said coated surface a thin layer of an easily fusible metal or metal alloy, backing said sprayed layer with a stiffener of heat-resistant plastic, loosening the working model from the sprayed metal layer stiffened with plastic, thermally spraying on said easily fusible layer a wearing layer of the material of the intended tool, to a depth substantially thicker than the depth of said easily fusible layer, backing the wearing layer with a plastic that withstands a temperature sufficiently high to fuse said easily fusible layer, heating the assembly of easily fusible layer and wearing layer and plastic backings to a temperature sufficiently high to fuse said easily fusible layer, and separating the wearing layer and its plastic backing from the easily fusible layer and its plastic backing.

4,231,983

PLASTIC PIPE JOINT AND METHOD AND ASSEMBLY FOR MAKING SAME

David W. French, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 826,586, Aug. 22, 1977, Pat. No. 4,170,448.
This application Jan. 29, 1979, Ser. No. 7,267
Int. Cl.³ B29D 23/00
U.S. Cl. 264—249 **3 Claims**



1. A method of forming the bell end of a plastic pipe, said method comprising:
(a) heating one end section of said pipe to the state of thermal deformability;
(b) forming from said heated end section a diametrically enlarged axial portion and a transverse end wall joining said enlarged portion with the rest of said pipe;
(c) after forming said enlarged portion, substantially uniformly thickening its cross-sectional configuration by decreasing its length;
(d) while thickening the cross-sectional configuration of said enlarged portion, integrally forming outwardly protruding rib means on the inner surface of said transverse end wall, said rib means being located radially inwardly from the inner surface of said enlarged portion so as to define a space therebetween;
(e) concentrically positioning a circumferential sealing gasket within said enlarged portion and against said end wall such that an end segment of said enlarged portion extends beyond said gasket, said gasket being shaped such that portions thereof are located within said space; and
(f) radially inwardly deforming said end segment whereby to lock said sealing gasket in place.

4,231,984

PROCESS FOR THE PRODUCTION OF MOLDED PHOSPHATE BONDED REFRACTORY ARTICLES

Frans Hofmann, Neuhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Mar. 31, 1978, Ser. No. 892,020
Claims priority, application Switzerland, Apr. 15, 1977, 4695/77
Int. Cl.³ B28B 1/16
U.S. Cl. 264—256 **13 Claims**

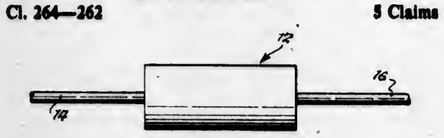
1. A process for the production of a thin-walled phosphate-bonded molded article which is refractory at temperatures above 1300° C. which comprises applying once or repeatedly to a preshaped wire fabric or mesh a composition comprising a refractory filler and $Al(H_2PO_4)_3.H_2O$ or a polyphosphate as binder and thereafter curing said composition at a temperature below 400° C. on said preshaped wire fabric or mesh to provide a single or multi-layered, thin-walled structure, said preshaped wire fabric or mesh permanently remaining in the resultant molded article and serving as a reinforcing agent for said article.

4,231,985

METHOD OF CONNECTING WIRE LEADS TO MINIATURE COIL ASSEMBLIES

Donald C. McElheny, Delevan, N.Y., assignor to American Precision Industries, Inc., Buffalo, N.Y.

Filed Dec. 9, 1976, Ser. No. 748,933
Int. Cl.³ B29C 6/04
U.S. Cl. 264—262 **5 Claims**



1. A method for fastening an end of an electrical wire lead to each open end of a coil core having a through bore extending between its open ends comprising the steps of:
providing a mold to receive each end of said core, said mold forming a cavity about each end of said core;
disposing an electrical lead in the mold cavity at each end of the core, each said lead having a shoulder adjacent its end, each said lead end being of smaller dimension than said bore to provide a clearance between the outer surface of each lead end and the bore surface and positioned coaxially with and extending into said bore with said lead shoulder abutting the core end;
providing a gate communicating between the mold cavity and the bore at each end of said core; and
injecting molding material into said cavity with sufficient pressure so that said clearance becomes filled with said molding material whereby said lead becomes firmly affixed to said coil core to resist axial and rotational movement relative thereto.

4,231,986

GREASE COMPATIBLE MINERAL OIL EXTENDED POLYURETHANE

Melvin Brauer, East Brunswick, and Thaddeus F. Kroplinski, Old Bridge, both of N.J., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 877,905, Feb. 15, 1978, Pat. No. 4,168,258.
This application Apr. 6, 1979, Ser. No. 27,819
Int. Cl.³ B29H 9/00
U.S. Cl. 264—272 **13 Claims**

1. A process for sealing an insulated electrical device comprising the steps of introducing into said device a composition comprising mineral oil, polyurethane precursor and coupling agent,
(a) said polyurethane precursor comprising the reaction product of
(i) a polyisocyanate compound or a polyisocyanate prepolymer prepared by the reaction of a polyisocyanate compound with a polyol selected from the group consisting of castor oil, polyether polyols, hydroxyl bearing homopolymers of dienes, hydroxyl bearing copolymers of dienes, and combinations thereof, wherein at least about 0.25 equivalents of the polyisocyanate compound per 1.0 equivalents of the polyisocyanate compound used is a liquid long chain aliphatic polyisocyanate, and
(ii) a polyol selected from the group consisting of castor oil, polyether polyols, hydroxyl bearing homopolymers of dienes, hydroxyl bearing copolymers of dienes, and combinations thereof,
(b) said mineral oil being characterized by having from about 1.0 to about 30% aromatic carbon atoms, based on the total number of carbon atoms present in the mineral oil, and
(c) said coupling agent being characterized by
(i) being miscible in all proportions with said mineral oil,
(ii) having a total solubility parameter from about 7.0 to about 9.5,
(iii) having a hydrogen bonding index number from about 6.0 to about 12.0, and
(iv) being substantially non-reactive with said polyisocyanate prepolymer and said polyol,
reacting said polyol with said polyisocyanate in the presence of said mineral oil and said coupling agent to obtain a grease compatible, cured, cross-linked, mineral oil extended polyurethane which is non-spewing, and which is characterized by the presence of a polydiene moiety in the polyurethane structure, and which comprises from about 8 to about 45 parts of polyurethane, from about 20 to about 75 parts of mineral oil and from about 10 to about 47 parts of coupling agent, all parts expressed on a weight basis.

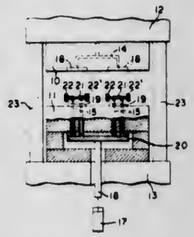
4,231,987

METHOD OF STRIPPING A MOLDED ARTICLE

Masayuki Osawa, and Masaoki Sekine, both of Saku, Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,526
Claims priority, application Japan, Oct. 28, 1977, 52/129457
Int. Cl.³ B29F 1/14
U.S. Cl. 264—328.1 **1 Claim**

1. A molding method comprising the steps of:
contacting a stationary mold with a movable mold to form a mold cavity, said mold cavity having at least one push pin extending therein by a slight distance;
filling said mold cavity with molten resin to form a molded product;
separating said stationary and movable molds;
extending said at least one push pin to separate said molded product from said core;
holding said separated molded product by said at least one push pin;
moving a pair of oppositely oriented guide rails having shaped sections adjacent said molded products being held by said at least one pin; and



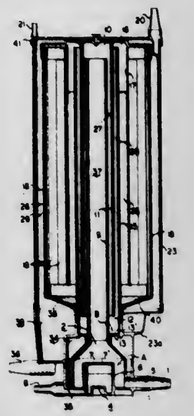
retracting said at least one pin to release said molded product from said at least one pin whereby said molded product may be guided by said pair of guide rails.

4,231,988

ARTIFICIAL LUNG

Motoji Kurata, Hiroshima, Japan, assignor to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Filed Jun. 14, 1979, Ser. No. 48,447
Claims priority, application Japan, Jun. 13, 1978, 53/70328
Int. Cl.³ A61M 1/03
U.S. Cl. 422—47 **4 Claims**



1. An artificial lung comprising:
a blood reservoir tube having top and bottom walls formed thereon;
a first impervious oxygenation tube disposed coaxially with said blood reservoir tube within the same, said first oxygenation tube terminating adjacent to but spaced from the top wall;
a second impervious oxygenation tube disposed coaxially with said blood reservoir tube between said first oxygenation tube and said blood reservoir tube defining a first annular space, said second oxygenation tube being fixedly secured to the top wall and terminating adjacent to but spaced from the bottom wall;
a third impervious oxygenation tube disposed coaxially with said blood reservoir tube between said second oxygenation tube and said blood reservoir tube defining second and third annular spaces, said third oxygenation tube being fixedly secured to the bottom wall and terminating adjacent to but spaced from the top wall;
an innermost wall structure defining a first oxygen chamber therein open to and disposed under said first oxygenation tube;

an intermediate wall structure connected to the lower end of said first oxygenation tube;

an outer wall structure fixedly secured to the bottom wall of said blood reservoir tube, said intermediate wall structure and said outer wall structure defining a second oxygen chamber therebetween open to and disposed below said third oxygenation tube;

a blood inlet connected to the inside of said first oxygenation tube;

a blood outlet connected to the annular space between said third oxygenation tube and said blood reservoir tube; and

an oxygen gas inlet connected to the first and the second oxygen chambers whereby oxygen is blown into blood through the first and the second oxygen chambers while blood is passing through the annular spaces between said oxygenation tubes.

4,231,989

MULTICHANNEL SYSTEM FOR THE HANDLING OF IMMOBILIZED BIOLOGICALLY ACTIVE SUBSTANCES

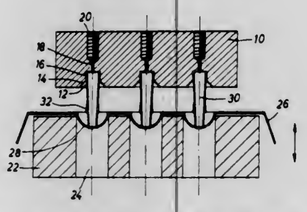
Hans A. Thoma, Munich, Fed. Rep. of Germany, assignor to Chandon Investment Planning Ltd., Cayman Island

Filed Apr. 24, 1978, Ser. No. 899,710

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719234

Int. Cl.[2] G01N *1/14*

U.S. Cl. 422—63 **10 Claims**



1. Multichannel system for the handling of solid immobilized, biologically active substances comprising:

a horizontally arranged receiving plate loosely carrying a plurality of sample tubes open at both ends in a regular arrangement, said tubes containing solid immobilized biologically active substances;

an adapter plate with a plurality of holders arranged above the receiving plate, said adapter plate coming into communication with the sample tubes by means of clamping engagement with said holders when the receiving plate and the adapter plate are moved together at a suitable distance with respect to each other;

a plurality of channels, in the adapter plate connected to one holder and of narrow configuration when compared with the holder;

a multichannel displacer pump, working alternatively as suction pump or pressure pump, said pump connected to said channels;

a carrier plate having a plurality of recesses for holding samples to be analyzed each of said recesses positioned to correspond to one of the sample tubes, said carrier plate being exchangeable with said receiving plate;

means for exchanging said receiving plate with said carrier plate.

4,231,990

APPARATUS FOR THE TREATMENT OF FLUIDS

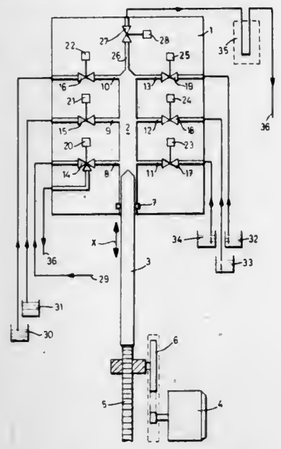
Christian F. Jottier, Herfelingen, Belgium, assignor to S.A. Anarec, Brussels, Belgium

Filed Aug. 21, 1978, Ser. No. 935,293

Claims priority, application Belgium, Aug. 31, 1977, 0180559

Int. Cl.[3] G01N *1/14, 1/16*

U.S. Cl. 422—100 **9 Claims**



1. An apparatus for the treatment of fluids comprising a single air-tight chamber having a variable inner volume, in which at least two fluids may be introduced and treated and from which the fluids may be removed after treatment, a reciprocable piston which tightly closes one end of said chamber, at least two inlet pipes or ducts connected at one end to said chamber and at the other end to a fluid source, a valve being inserted in each of said inlet pipes or ducts near the end thereof connected to said chamber, an outlet pipe equipped with a valve near the end thereof connected to said chamber, means for moving the reciprocable piston and means for selectively opening and closing the valves inserted in said inlet and outlet pipes, a predetermined amount of each fluid being selectively introduced into said chamber via said selectively opened valves inserted in said inlet pipes or ducts by means of a depression or suction created in said chamber, said moving means being operable to move said piston along a predetermined stroke in a direction causing an increase in the inner volume of said chamber to create said suction, the treatment of the fluids in the chamber being effected when all the valves inserted in the inlet and outlet pipes are closed, and the removal of the treated fluids from the treatment chamber being effected via said selectively opened valve inserted in said outlet pipe by the pressure created in said chamber by the piston when the latter is moved in an opposite direction causing such a decrease of the inner volume of the chamber that said inner volume is entirely occupied by the piston.

4,231,991

APPARATUS FOR CRYSTALLIZING AN AMORPHOUS PARTICULATE MATERIAL

Dieter Müller, Sickte, Fed. Rep. of Germany, assignor to Buehler-Miag GmbH, Brunswick, Fed. Rep. of Germany

Filed Sep. 14, 1977, Ser. No. 833,335

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642102

Int. Cl.[3] B01D *9/00*

U.S. Cl. 422—245 **3 Claims**

1. A device for homogeneously crystallizing a continuous flow of an amorphorous gravity fed substance which is in particle form, such as granular polyester and the like, by directly subjecting the substance to a counterflow of hot gas and thereby heating the substance to a transition temperature at which the substance undergoes a transformation to a crystalline state in a crystallizing zone in which clumps are formed, and by grinding such clumps after their formation to produce a continuous flow of crystallized substance in ground-up form, comprising: a vertically elongated hollow housing with a top, a bottom, a feed port, an outlet port, a hot gas intake, a cool gas intake, a gas exhaust, and an interior, the feed port being located at the top of the housing to permit an amorphorous substance to enter the interior of the housing under the influence of gravity, the outlet port being located at the bottom of the housing to permit the substance to be withdrawn from the interior of the housing under the influence of gravity after crystallization, with the path traversed between the ports by the substance defining a processing flow path extending downwardly through the interior of the housing and passing through a zone thereof which is a crystallization zone having an upper boundry and a lower boundry, which is located intermediate the ports, the hot gas intake being attached to the housing intermediate the crystallization zone and the outlet port, the cool gas intake being attached to the housing intermediate the crystallization zone and the feed port, and the gas exhaust being located on the top of the housing adjacent the feed port, whereby a hot gas flow path and a cool gas flow path are



defined, the hot gas flow path passing entirely through the crystallization zone from the hot gas intake to the gas exhaust and the cool gas flow path passing from the cool gas intake to the exhaust entirely above the crystallization zone, the gas flow paths extending upwardly through the interior of the housing in a direction opposed to the direction of the processing flow path and in directly subjected counterflow thereto; a cool gas distributor communicating with the cool gas intake and located within the housing intermediate the crystallization zone and the feed port, the cool gas distributor operating in a manner that cool gas entering the cool gas intake is distributed uniformly within the interior of the housing; and grinding means located within the housing above the hot gas distributor and adjoining only the lower boundry of the crystallization zone and operating in such a manner as to grind clumps formed therein and wherein the grinding means includes at least one perforated plate transversely intersecting the entire flow path and wherein the grinding means includes two horizontal perforated plates which are parallel to each other in vertically separated planes and movable with respect to one another and wherein one plate is fixed and another plate is moveable in its plane and wherein the housing extending outwardly and downwardly intermediate the feed port and the grinding means, and has a maximal cross-sectional area at the location of the grinding means.

4,231,992

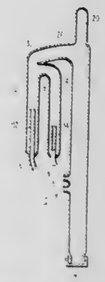
THREE-PHASE COUNTER-DOUBLE-CURRENT APPARATUS

William W. Gorman, Jr., and Esther M. Gorman, both of St. Petersburg, Fla., assignors to E-C Apparatus Corporation, St. Petersburg, Fla.

Filed Aug. 14, 1979, Ser. No. 66,362

Int. Cl.[3] B01D *11/04*

U.S. Cl. 422—258 **10 Claims**



1. A tube element adapted for interconnection in a rotatable array of such elements to implement mixing and subsequent separation of three at least semi-immiscible liquids into light, intermediate and heavy phases, comprising in combination:

(a) an elongated hollow mixing tube closed at a lower end;

(b) a first elongated hollow decanting tube shorter than said mixing tube and disposed spaced from and parallel to said mixing tube with upper ends of said mixing tube and said first decanting tube at substantially the same level;

(c) a first fluid communicating juncture tube coupling the upper ends of the mixing and decanting tubes;

(d) a second elongated hollow decanting tube shorter than said mixing tube and disposed between said first decanting tube and said mixing tube;

(e) a second fluid communicating juncture tube coupling the upper end of said second decanting tube to said first decanting tube at the juncture between said first decanting tube and said first juncture tube;

(f) a first elongated downspout tube, sealingly mounted in the lower end of said first decanting tube and extending upwards therein a first predetermined distance for defining the volume of the lower and intermediate phases;

(g) a second elongated downspout tube sealingly mounted in the lower end of said second decanting tube and extending upwards therein a second predetermined distance for defining the volume of the lower phase;

(h) a first transfer tube coupled at one end to said first downspout tube and adapted to be coupled at its other end to a lower portion of a mixing tube of a tube element on one side in the array; and

(i) a second transfer tube coupled at one end to said second downspout tube and adapted to be coupled at its other end to a lower portion of a mixing tube of a tube element on another, opposite side in the array.

4,231,993

RECOVERY OF METAL VALUES FROM LEAD SMELTER MATTE

Richard G. Sandberg, and Terry L. Hebble, both of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 11, 1979, Ser. No. 47,541

Int. Cl.[3] C01G *3/12, 21/20, 45/02, 53/11*

U.S. Cl. 423—34 **20 Claims**

1. A method of recovering metal values from lead smelter matte containing cobalt, nickel, copper, iron and arsenic which comprises the steps of:

(a) mixing finely divided lead smelter matte, maganese (III)

or manganese (IV) oxide and sulfuric acid to form an aqueous solution having a pH of not more than 3.5 and containing cobalt, nickel, copper, iron, arsenic and manganese sulfates and an insoluble solids residue containing sulfur and lead sulfate;
(b) separating the insoluble solids residue and the aqueous solution;
(c) adjusting the pH of the separated aqueous sulfate solution from step (b) to 3.5 to 4.5 to precipitate ferric iron and arsenic and further adjusting the pH of the solution to a pH of about 3.0 to redissolve coprecipitated copper;
(d) separating the precipitated ferric iron and arsenic from the aqueous solution;
(e) mixing the separated aqueous solution from step (d) with a sulfide precipitating agent at a pH of not more than 3 to selectively precipitate copper sulfide;
(f) separating the copper sulfide from the aqueous solution;
(g) mixing the aqueous solution separated by step (f) with a sulfiding agent at a pH of 3 to 4.5 to form a cobalt-nickel sulfide precipitate;
(h) separating the cobalt-nickel sulfide precipitate from the aqueous solution;
(i) adjusting the pH of the aqueous solution separated by step (h) to a pH of 3 to 7 by means of MgO, NaOH or Na_2CO_3 to form a slurry containing manganese sulfate;
(j) reacting the slurry containing manganese sulfate with oxygen at a temperature of 25° to 75° C. to form a manganese-containing precipitate selected from the group consisting of manganese hydroxide and manganese carbonate;
(k) separating the manganese-containing precipitate from the aqueous solution;
(l) heating the manganese-containing precipitate of step (j) to produce manganese oxide;
(m) returning at least a portion of the separated aqueous solution of step (k) to step (a) to provide sulfuric acid for mixing with said lead smelter matte and said manganese oxide; and
(n) returning at least a portion of the manganese oxide produced by step (l) to step (a) to provide manganese oxide for mixing with said sulfuric acid and said lead smelter matte.

4,231,994

SEPARATION OF ZIRCONIUM FROM HAFNIUM BY SOLVENT EXTRACTION

David J. MacDonald, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 27, 1979, Ser. No. 69,677
Int. Cl.[3] C01G *25/00, 27/00*
U.S. Cl. 423—70 4 Claims



1. In a process for separation of zirconium from hafnium by solvent extraction of an aqueous sulfuric acid feed solution containing the metals with an organic extractant comprising a solution of a high molecular weight tertiary amine in an organic solvent and separation of the organic and aqueous phases, the improvement comprising adding to the feed solution prior to extraction about 0.5 to 10 moles per mole of zirconium in the feed solution of a water-soluble and organic solvent-insoluble α-hydroxycarboxylic acid.

4,231,995

AMMONIA DOUBLE-ALKALI PROCESS FOR REMOVING SULFUR OXIDES FROM STACK GASES

Ivor E. Campbell, New Albany, Ohio; James M. Henderson, New Brunswick, N.J.; Walter Johnson, El Paso, Tex., and William H. Wetherill, Staten Island, N.Y., assignors to Smelter Control Research Association, Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,797
Int. Cl.[3] C01B *17/00*
U.S. Cl. 423—242 11 Claims

1. A process for removing sulfur oxide from stack gases comprising:
(a) contacting said stack gases with an aqueous wash liquid comprising ammonium sulfite as a sulfur oxide reactive compound to form a spent absorbent liquor containing bisulfite, sulfite and sulfate salts of ammonia;
(b) regenerating at least a portion of the reactive compound and precipitating calcium sulfite solids by treating the spent absorbent liquor with a source of calcium ions, the calcium ion concentration of the regenerated liquor being maintained between about 500 and 800 ppm at substantially all times and the pH of the regenerated liquor being maintained between about 5.5 and 6.2 at substantially all times whereby any gypsum solids precipitation in the process is tolerated for a time insufficient to degrade substantially process performance;
(c) separating the precipitated calcium solids from the regenerated liquor;
(d) returning at least a portion of the separated calcium solids to the regeneration step; and
(e) further contacting the regenerated liquor with said sulfur oxide containing stack gases.

4,231,996

METHOD FOR PRODUCING AMMONIA AND HYDROGEN SULFIDE

Metro D. Kulik, Pittsburgh, Pa., assignor to Continental Oil Company, Stamford, Conn.

Continuation-in-part of Ser. No. 966,686, Dec. 5, 1978, abandoned. This application Jun. 20, 1979, Ser. No. 50,239
Int. Cl.[3] C01B *17/04*
U.S. Cl. 423—242 1 Claim

1. In a process for removing sulfur oxides from a gaseous mixture, said process consisting essentially of:
(a) contacting said gaseous mixture with a first aqueous solution containing $(NH_4)_2S_2O_3$ and at least one alkaline compound selected from the group consisting of $NH_3$and NH_4OH to remove said sulfur oxides from said gaseous mixture and produce a second aqueous solution containing at least one compound selected from the group consisting of $(NH_4)_2S_2O_3$, $(NH_4)_2SO_3$ and $(NH_4)HSO_3$;
(b) withdrawing a first portion of said second aqueous stream and passing said first portion to sulfur recovery;
(c) adding at least one alkaline compound selected from the group consisting of NH_3 and NH_4OH and at least one sulfide compound selected from the group consisting of H_2S, NH_4HS and $(NH_4)_2S$ to a second portion of said second aqueous stream to produce said first aqueous solution, said alkaline compound and said sulfide compound being added in a molar ratio (NH_3/H_2S) from about 2.8 to about 3.2;
(d) contacting said first portion of said second aqueous stream with H_2S to convert at least a portion said $(NH_4)_2S_2O_3$, $(NH_4)_2SO_3$ and $(NH_4)HSO_3$ to ammonium polysulfide, thereby producing an aqueous ammonium polysulfide stream; and
(e) heating said aqueous ammonium polysulfide stream to decompose said ammonium polysulfide and produce NH_3, H_2S and sulfur,

the improvement comprising adjusting the concentration of ammonium thiosulfate in said first portion to form about 25 to about 35 weight percent ammonium thiosulfate, contacting said first portion with H_2S at a pressure from about 100 to about 300 psig at a temperature from about 125° to about 182° C. to react at least about 70 percent of said ammonium thiosulfate thereby producing an aqueous product solution containing at least 0.085 g mols of ammonium thiosulfate per liter of solution and ammonium polysulfide which, upon decomposition produces a gaseous mixture of NH_3 and H_2S in a molar ratio (NH_3/H_2S from about 2.8 to about 3.2 and sulfur and recycling said gaseous mixture to step (c).

4,231,997

PREPARATION OF RARE EARTH NITRATES

Frank Pitts, Magalas, France, assignor to Engelhard Minerals & Chemicals Corporation, Menlo Park, N.J.

Filed Apr. 5, 1979, Ser. No. 27,530
Int. Cl.[3] C01F *17/00*
U.S. Cl. 423—263 6 Claims

1. In a process for preparing a rare earth nitrate solution from a rare earth hydroxide containing quadrivalent cerium by dissolving said rare earth hydroxide in nitric acid solution in the presence of a reducing agent to prevent formation of quadrivalent cerium ions in the nitrate solution, the improvement which comprises causing said rare earth hydroxide containing quadrivalent cerium to react with said nitric acid in the presence of a solution of hydrogen peroxide as the reducing agent, said solution of hydrogen peroxide and said rare earth hydroxide being incorporated with said nitric acid in a manner such as to maintain the EMF of the solution below 900 millivolts when EMF is measured between a platinum electrode and a normal calomel electrode and to produce a rare earth nitrate solution which contains trivalent cerium ions and has a pH above 1 and not to exceed 3.5.

4,231,998

METHOD FOR SEPARATING CARBON BLACK FROM FIBERGLASS

Manuel M. Gutierrez, Westminster, Colo., assignor to Tosco Corporation, Los Angeles, Calif.

Filed Aug. 31, 1978, Ser. No. 938,486
Int. Cl.[3] C01B *31/02*; C09C *1/48*
U.S. Cl. 423—449 4 Claims

1. In a process for pyrolyzing and grinding rubber containing polymeric hydrocarbons, carbon black and fiberglass which yields a product comprising a mat of fiberglass strands containing carbon black trapped in the interstices thereof, and separating the product into useful carbon black and fiberglass wherein the improvement comprises the steps of:
(a) passing the mat through an agitating member to at least partially break said mat into a cloud of fiberglass particles and free carbon black particles;
(b) passing an airstream through said cloud of sufficient velocity to pick up and carry off free carbon black particles and substantially carbon free fiberglass particles and not pick up and carry off fiberglass particles carrying carbon black in combination therewith;
(c) separating said free carbon black particles from said substantially carbon black free fiberglass particles;
(d) collecting said separated free carbon black particles as a first useful by-product; and,
(e) combusting said separated fiberglass particles to remove any remaining carbon black carried thereby to form carbon black free fiberglass particles as a second useful by-product.

4,231,999

METHOD IN ASSAYING METHODS INVOLVING BIOSPECIFIC AFFINITY REACTIONS AND REAGENT FOR USE IN SAID METHOD

Jan P. E. Carlsson, Uppsala; Rolf E. A. V. Axén, Billinge, and Håkan N. Y. Drevin, Bruna, all of Sweden, assignors to Pharmacia Diagnostics AB, Uppsala, Sweden

Filed Mar. 2, 1978, Ser. No. 882,678
Int. Cl.[2] G01N *33/16*; A61K *43/00*
U.S. Cl. 424—1 20 Claims

1. In the known method of carrying out assaying methods involving biospecific affinity reactions, in which there is used a component (I) which is labelled with at least one analytically indicatable group and is soluble in the liquid in whose presence the biospecific affinity reaction is carried out, for reaction with a counterpart (II) which exhibits biospecific affinity to (I) or with said counterpart (II) and also one or more additional counterparts exhibiting biospecific affinity to at least one of (I) and (II) and forming an insoluble conjugate in which the labelled component (I) is incorporated and which conjugate is separated from the liquid phase, whereafter the analytically indicatable group is assayed in the insoluble conjugate, the improvement which comprises
(A)
(a) using as the analytically indicatable group one which is bound to the component (I) with a splittable bond of covalent nature, or
(b) using as one of said counterparts a counterpart which is bound to a carrier, which is insoluble in said liquid, with a splittable bond of covalent nature, or
(c) using as the analytically indicatable group one which is bound to the component (I) with a splittable bond of covalent nature and using as one of said counterparts a counterpart which is bound to a carrier, which is insoluble in said liquid, with a splittable bond of covalent nature, said splittable bonds, which can be the same or different, being splittable under conditions which have practically no disturbing influence on the assay method used; and
(B) splitting the insoluble conjugate at said splittable bond or bonds, in the presence of a liquid, to form fragments which are soluble in said liquid and which contain the analytically indicatable group, which group is then assayed in the liquid phase.

4,232,000

RADIOACTIVE SCANNING AGENTS WITH STABILIZER

Mahdi B. Fawal, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 28, 1978, Ser. No. 920,082
Int. Cl.[2] A61K *29/00, 43/00*
U.S. Cl. 424—1 22 Claims

18. A composition useful in the preparation of technetium-99 m-based radiographic scanning agents, comprising: an oxidized pertechnetate solution having dissolved therein a stabilizing amount of a gentisol stabilizer selected from gentisyl alcohol or a pharmaceutically-acceptable salt or ester thereof.

4,232,001

METHODS AND MATERIALS FOR DETECTION OF ESTROPHILIN

Elwood V. Jensen, and Eugene R. DeSombre, both of Chicago, Ill., assignors to University Patents, Inc., Norwalk, Conn.

Filed Sep. 22, 1978, Ser. No. 945,000
Int. Cl.[2] G01N *33/16*; A61K *43/00*
U.S. Cl. 424—1 8 Claims

1. A specific, immunologically active anti-estrophilin antibody obtained as a serum immunoglobulin component from an animal immunized with estrophilin, and characterized by its donation to the immunoglobulin of the following properties;
(1) the ability to precipitate estrophilin from a mixture of estrophilin and said immunoglobulin upon addition of

heterologous species antibodies to the immunoglobulin of the serum donor species;
(2) the ability to mediate rapid absorption of estrophilin from a fluid by support polymer when said immunoglobulin is linked to the support polymer;
(3) the ability of said immunoglobulin to mediate absorption of estrophilin from a fluid by *S. aureus* protein-A linked to a support polymer;
(4) the ability of said immunoglobulin to increase the sedimentation rate of estrophilin; and,
(5) the ability of said immunoglobulin to modify elution characteristics of estrophilin on gel filtration.

4,232,002

PROCEDURES AND PHARMACEUTICAL PRODUCTS FOR USE IN THE ADMINISTRATION OF ANTIHISTAMINES

Stephen G. Nogrady, Sully, near Penarth, Great Britain, assignor to The Welsh National School of Medicine, Penarth, Great Britain

Filed Nov. 30, 1978, Ser. No. 965,171
Claims priority, application United Kingdom, Dec. 1, 1977, 50020
Int. Cl.[2] A61L *9/04*; A61K *9/04, 31/44*
U.S. Cl. 424—45 **5 Claims**

1. A method for the treatment or prophylaxis of reversible airways obstruction in human patients, comprising administering by inhalation to a said patient a therapeutically or prophylactically effective amount of a member selected from the group consisting of clemastine, chlorpheniramine, ketotifen, brompheniramine, and a pharmaceutically acceptable salt thereof, said amount being effective for the treatment or prophylaxis of reversible airways obstruction.

4,232,003

SYNTHETIC PHYSIOLOGICAL MUCUS

Albert E. Posthuma, 3520 Burton Ridge, Apt. D, Grand Rapids, Mich. 49506, and Robert C. Woodhouse, 1664 Alexander, S.E., Grand Rapids, Mich. 49506

Continuation-in-part of Ser. No. 470,522, May 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 332,933, Feb. 16, 1973, abandoned. This application Nov. 26, 1975, Ser. No. 635,436
Int. Cl.[3] A61K *31/78*
U.S. Cl. 424—81 **7 Claims**

1. A method of treating vaginal areas deficient in natural mucus, comprising the steps of:
supplying a pituitous aqueous solution consisting essentially of about 0.3 to about 1.5 grams of polyacrylamide polymer per 100 cc of water, said polyacrylamide polymer having a molecular weight of at least about 3,000,000 and said solution having a pH in the range of about 3 to 10; and
applying said solution to vaginal areas to form a stainless, odorless, nontoxic coating having lubricity, pituitousness and clingyness characteristics resembling those of natural vaginal mucus.

4,232,004

ANTIBODY-SPECIFIC SOLID PHASE IMMUNOADSORBENT, PREPARATION THEREOF, AND ANTIBODY PURIFICATION THEREWITH

Roger Y. Dodd, Bethesda, Md., assignor to American National Red Cross, Washington, D.C.

Filed Sep. 21, 1977, Ser. No. 835,307
Int. Cl.[3] A61K *39/29, 39/12*
U.S. Cl. 424—89 **14 Claims**

1. A solid phase immunoadsorbent for use in the isolation and purification of a specific antibody from a preparation containing said antibody, said immunoadsorbent consisting essentially of a particulate porous glass carrier having an average pore diameter within the range of about 40–200 nm, said porous glass carrier being, within the pH range of about 2–8, capable of selectively and stably binding lipid containing materials, and a lipid containing viral antigen specific to said specific antibody adsorptively bound directly to said carrier surface.

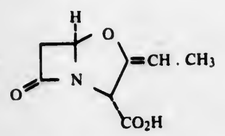
4,232,005

ANTIBACTERIAL AGENTS

Thomas T. Howarth, Ewhurst, England, assignor to Beecham Group Limited, England

Division of Ser. No. 669,697, Mar. 23, 1976. This application Dec. 5, 1977, Ser. No. 857,112
Claims priority, application United Kingdom, Apr. 14, 1975, 15209/75; Sep. 27, 1975, 39663/75
Int. Cl.[3] H61K *35/00*
U.S. Cl. 424—114 **19 Claims**

12. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof a synergistically effective amount of a compound of the formula (III):



(III)

or a pharmaceutically acceptable salt thereof and a antibacterially effective amount of amoxycillin or a pharmaceutically acceptable salt thereof in a weight ratio of 20:1 to 1:5.

4,232,006

ANTIBIOTIC W-10 COMPLEX, ANTIBIOTIC 20561 AND ANTIBIOTIC 20562 AS ANTIFUNGAL AGENTS

David Taplin, Miami, Fla.; Marvin J. Weinstein, East Brunswick, N.J.; Raymond T. Testa, Verona, N.J.; Joseph A. Marquez, Montclair, N.J., and Mahesh G. Patel, Verona, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 767,102, Feb. 2, 1977, Pat. No. 4,137,224. This application Oct. 19, 1978, Ser. No. 953,051
Int. Cl.[3] C07C *103/52*; A61K *37/00, 31/71*; C07H *17/00*
U.S. Cl. 424—177 **4 Claims**

1. A method of eliciting an antifungal effect in a mammal having a fungal infection which comprises administering to said mammal a therapeutically effective quantity of a composition of matter selected from the group consisting of Antibiotic W-10 Complex, Antibiotic 20561 and Antibiotic 20562.

3. A method according to claim 1 which comprises administering to said mammal a therapeutically effective quantity of Antibiotic 20561.

4,232,007

ORAL ANTILIPEMIC AGENTS

Motoyoshi Kajihara; Toshihiro Hamakawa, both of Naruto; Toshiaki Shibata, Tokushima; Takashi Suzue, Naruto, and Setsuro Fujii, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Ltd., Tokyo, Japan

Filed Jul. 12, 1976, Ser. No. 704,933
Claims priority, application United Kingdom, Aug. 26, 1975, 35250/75
Int. Cl.[3] A61K *37/00*
U.S. Cl. 424—177 **1 Claim**

1. A therapeutic method for reducing lipids in blood which comprises administering an antilipemically effective amount of the oral antilipemic agent comprising a pharmaceutically effective amount of at least one acidic polyamino acid having a molecular weight of 10,000 to 100,000 and pharmaceutically acceptable salts thereof, and an adjuvant to a patient affected with hyperlipidemia.

4,232,008

TETRAPEPTIDES AND METHODS

Gideon Goldstein, Short Hills, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 940,531, Sep. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 858,496, Dec. 8, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 960,550
Int. Cl.[2] A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **37 Claims**

1. A polypeptide having the capability of inducing the differentiation of both Th-1$^+$ T-lymphocytes and Bu-1$^+$ B-lymphocytes, said polypeptide having the following sequence:

R—X—LYS—Y—GLN—R'

wherein X and Y are each natural and non-natural amino acid residues selected from the group consisting of L-asparagyl, L-glutamyl, L-threonyl, glycyl, L-valyl, L-leucyl, L-alanyl, L-seryl, sarcosyl, 2-methylalanyl, D-asparagyl, D-glutamyl, D-threonyl, D-valyl, D-leucyl, D-alanyl, and D-seryl and R and R' are each selected from the groups consisting of:

R	R'
Hydrogen	OH
C_1–C_7 alkyl	NH_2
C_6–C_{12} aryl	NHR_7
C_6–C_{20} alkaryl	$N(R_7)_2$
C_6–C_{20} aralkyl	OR_7
C_2–C_7 alkanoyl	
C_2–C_7 alkenyl	GLY
C_1–C_7 alkynyl	GLY-GLY
GLN	
SAR	GLY—GLY—SER—ASN

wherein R_7 is C_1–C_7 alkyl, C_2–C_7 alkenyl, C_2–C_7 alkynyl, C_6–C_{20} aryl, C_6–C_{20} aralkyl, and C_6–C_{20} alkaryl, provided that when R is GLN, R' is other than GLY—GLY—SER—ASN, and the pharmaceutically acceptable salts thereof; further provided that said polypeptide induce the differentiation of both Th-1$^+$ T-lymphocytes and Bu-1$^+$ B-lymphocytes in the chicken induction assay at a concentration of about one ng/ml or less.

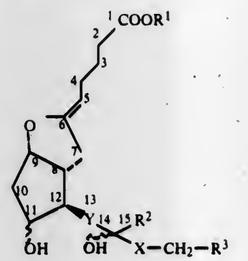
4,232,009

ω-HALO-PGI$_2$ ANALOGUES

Masaki Hayashi, Takatsuki; Yoshinobu Arai, Toyonaka; Shuichi Ohuchida, Kyoto, and Shinsuke Hashimoto, Nishinomiya, all of Japan, assignors to ONO Pharmaceutical Co. Ltd., Osaka, Japan

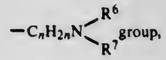
Filed Feb. 22, 1979, Ser. No. 14,082
Claims priority, application Japan, Mar. 1, 1978, 53/022150
Int. Cl.[3] A61K *31/70, 31/58*; C07D *307/935*
U.S. Cl. 424—180 **19 Claims**

1. A prostaglandin I_2 analogue of the formula:



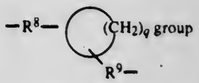
II

wherein Y represents ethylene or trans-vinylene, R^1 represents a hydrogen atom, a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, an aralkyl group containing from 7 to 12 carbon atoms, a cycloalkyl group containing from 4 to 7 carbon atoms unsubstituted or substituted by at least one straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, a phenyl group unsubstituted or substituted by at least one chlorine atom, trifluoromethyl group, straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms or phenyl group, a $-C_mH_{2m}COOR^4$ group, wherein m represents an integer of from 1 to 12 and R^4 represents a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, a $-C_nH_{2n}OR^5$ group, wherein n represents an integer of from 2 to 12 and R^5 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, or a



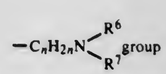
group,

wherein n is as hereinbefore defined and R^6 and R^7, which may be the same or different, each represent a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, R^2 represents a hydrogen atom or a methyl or ethyl group, X represents a straight or branched chain $-C_pH_{2p}-$ group, wherein p represents an integer of from 2 to 8, or a



group

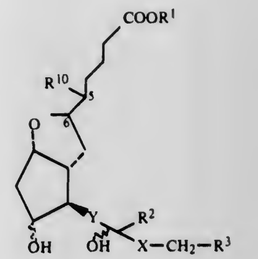
wherein R^8 represents a single bond, or a straight- or branched-chain alkylene group containing from 1 to 4 carbon atoms, R^9 represents a single bond or a straight- or branched-chain alkylene group containing from 1 to 8 carbon atoms, and q represents an integer of from 3 to 6, R^3 represents a chlorine or fluorine atom, the wavy line attached to the carbon atoms in positions 11 and 15 represents α- or β-configuration or mixtures thereof, and the double bond between C_5–C_6 is in the Z configuration, cyclodextrin clathrates thereof, and, when R^1 represents a hydrogen atom, non-toxic salts thereof and, when R^1 represents a



group

in which n, R^6 and R^7 are as hereinbefore defined, non-toxic acid addition salts thereof.

19. A compound of the formula:



III

wherein R^{10} represents a bromine or iodine atom and the other symbols are as defined in claim 1.

4,232,010

CALCIUM-ANTAGONISTIC COMPOSITION

Goro Tsukamoto, Toyonaka; Koichiro Yoshino, Osaka; Tominori Morita, Nishinomiya; Takashi Nose, Suita, and Mitsuo Okazaki, Tama, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

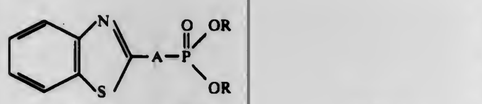
Filed May 14, 1979, Ser. No. 39,311

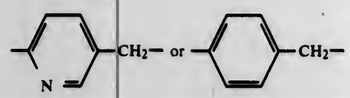
Claims priority, application Japan, May 15, 1978, 53-58021; Feb. 8, 1979, 54-14516; Feb. 8, 1979, 54-14517

Int. Cl.[3] A01N *57/28*; C07F *9/28*; C07D *277/66, 417/02*

U.S. Cl. 424—200 12 Claims

1. A calcium-antagonistic pharmaceutical composition comprising a therapeutically effective amount of a phosphonate of the formula:



wherein A is  and R is C_1-C_4 alkyl, in combination with a pharmaceutically acceptable, non-toxic inert carrier.

4,232,011

1-PHOSPHORYLATED 2-(PHENOXYALKYL)-2-IMIDAZOLINE DERIVATIVES AND THEIR USE IN PEST CONTROL

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Jozef Drabek, Oberwil, Switzerland; Günter Mattern, Liestal, Switzerland, and Walter Traber, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

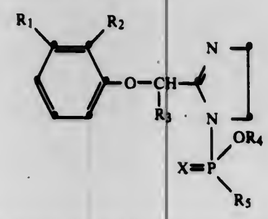
Filed Oct. 22, 1979, Ser. No. 86,888

Claims priority, application Switzerland, Nov. 2, 1978, 11291/78; Jun. 8, 1979, 5367/79

Int. Cl.[3] A01N *57/32*; C07F *9/65*

U.S. Cl. 424—200 12 Claims

1. A compound of the formula I



(I)

wherein R_1 and R_2 are each independently methyl or chlorine, R_3 is hydrogen or C_1-C_4-alkyl, R_4 is methyl or ethyl, R_5 is methoxy, ethoxy, C_1-C_4-alkylthio or phenyl and X is oxygen or sulphur.

11. A method of controlling pests at a locus, which method comprises applying to said locus a pesticidally effective amount of a compound as claimed in claim 1.

4,232,012

COMPOSITION

Thomas S. C. Orr, Melton Mowbray; David E. Hall, Burton-on-the-Wolds, and John Mann, Long Whatton, all of England, assignors to Fisons Limited, London, England

Division of Ser. No. 863,859, Dec. 23, 1977, Pat. No. 4,151,292, which is a continuation-in-part of Ser. No. 742,750, Nov. 18, 1976, Pat. No. 4,066,756. This application Feb. 15, 1979, Ser. No. 12,327

Claims priority, application United Kingdom, Jan. 25, 1977, 2872/77

Int. Cl.[2] A61K *31/625*

U.S. Cl. 424—232 14 Claims

1. A pharmaceutical composition adapted for oesophageal administration to a mammal comprising, as active ingredient, at least one chromone compound selected from 5-(2-hydroxypropoxy)-8-propyl-chromone-2-carboxylic acid; 6,7,8,9-tetrahydro-4-oxo-10-propyl-4H-naphtho-[2,3,-b]-pyran-2-carboxylic acid; 6,7,8,9-tetrahydro-5-hydroxy-4-oxo-10-propyl-4H-naphtho[2,3,-b]pyran-2-carboxylic acid or a pharmaceutically acceptable salt of any one thereof, in combination with an anti-inflammatory selected from aspirin, indomethacin, and mixtures thereof, said composition containing 0.004 to 1200 parts by weight of said anti-inflammatory per part of said active ingredient.

4,232,013

16,17-PYRAZOLINO- AND 16,17-ISOPYRAZOLINO-1,4-PREGNADIENE DERIVATIVES

Gaetano Palladino, and Mario Micciarelli, both of Milan, Italy, assignors to Lark S.p.A., Milan, Italy

Filed Nov. 30, 1978, Ser. No. 965,058

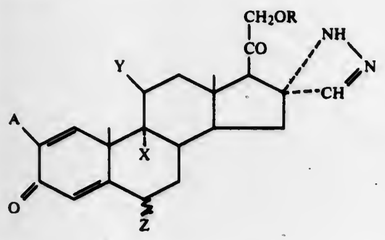
Claims priority, application United Kingdom, Dec. 3, 1977, 50464/77

Int. Cl.[3] A61K *31/58*; C07J *43/00*

U.S. Cl. 424—241 13 Claims

1. A pharmaceutical composition for treating inflammation and rheumatism comprising

a pharmaceutically effective amount of a compound of the formula:



wherein

A is selected from the group consisting of H, Br, and Cl;

X is selected from the group consisting of H, F, or Cl;

Y is selected from the group consisting of β-OH, keto, or Cl;

Z is selected from the group consisting of α-F, β-F, and α-CH_3; and

R is H or an acyl residue selected from the group consisting of a mono- or dicarboxylic organic acid having 2 to 8 carbon atoms, methasulfobenzoic acid, and phosphoric acid, admixed with a pharmaceutically acceptable carrier for topical, intraarticular, and systemic administration.

4,232,014

AMINOALKYLINDANS AND USE AS HYPOTENSIVE AGENTS

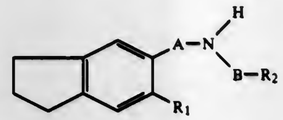
Ian W. Mathison, Big Rapids, Mich., and William E. Solomons, Martin, Tenn., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Jan. 12, 1979, Ser. No. 3,046

Int. Cl.[3] A61K *31/165, 31/135*; C07C *103/20, 87/28*

U.S. Cl. 424—324 12 Claims

1. A compound of the formula



wherein A represents an alkylene group having 2 to 5 carbons in a straight chain, R_1 represents a lower alkyl having 1 to 3 carbons or is a lower alkoxy having 1 to 3 carbons, B represents —CH_2— or



and R_2 represents phenyl or phenyl-lower alkyl and the phenyl group in such substituents is unsubstituted or is substituted with 1 to 3 lower alkoxy groups, and acid addition salts of the amines.

11. A method which comprises orally administering a compound as defined in claim 1, or 5-aminoethyl-6-methylindan, to an animal afflicted with high blood pressure in an amount sufficient to lower the animal's blood pressure.

4,232,015

NOVEL Δ^4-ANDROSTENES

Jean G. Teutsch, Pantin, and Roger Deraedt, Les Pavillons-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

Filed Aug. 6, 1979, Ser. No. 63,939

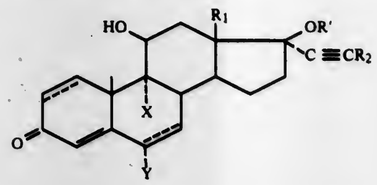
Claims priority, application France, Aug. 16, 1978, 78 23851

The portion of the term of this patent subsequent to Sep. 18, 1996, has been disclaimed.

Int. Cl.[3] C07J *1/00*

U.S. Cl. 424—243 33 Claims

1. A Δ^4-androstene of the formula



wherein R_1 is alkyl of 1 to 3 carbon atoms, R' is an acyl of an organic carboxylic acid or carbonic acid of 1 to 18 carbon atoms, R_2 is selected from the group consisting of alkyl of 1 to 12 carbon atoms, alkenyl of 2 to 12 carbon atoms, —CF_3, aryl of 6 to 12 carbon atoms and aralkyl of 7 to 12 carbon atoms, Y is selected from the group consisting of hydrogen, fluorine and methyl, X is selected from the group consisting of hydrogen, chlorine, bromine and fluorine and the dotted lines in the A and B rings indicate one or 2 double bonds in 1(2) and 6(7) position with the proviso when R_1 is methyl and the B ring is saturated, X is hydrogen when Y is hydrogen and X is not hydrogen when Y is fluorine.

21. A method of relieving inflammation in warm-blooded animals comprising administering to warm-blooded animals an anti-inflammatorily effective amount of at least one compound of claim 1.

4,232,016

3-FLUOROBENZODIAZEPINES

Eike Poetsch; Jürgen Uhl; Dieter Marx; Wighard Strehlow; Helmut Müller-Calgan, and Giuliano Dolce, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

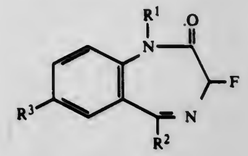
Filed Dec. 9, 1975, Ser. No. 639,163

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2460360; Sep. 23, 1975, 2542251

Int. Cl.[3] C07D *243/24*; A61K *31/55*

U.S. Cl. 414—244 39 Claims

1. A 3-fluorobenzodiazepine of the formula



wherein R^1 is H, alkyl or fluorinated alkyl of 1–4 carbon atoms and up to 9 fluorine atoms or cycloalkylalkyl of 4–8 carbon atoms; R^2 is phenyl, monohalophenyl or pyridyl; R^3 is F, Cl, Br or NO_2, and physiologically acceptable acid addition salts thereof.

29. A method of depressing central nervous system activity in mammals comprising administering to a patient a daily dosage of a compound of claim 1, in admixture with a pharmaceutically acceptable carrier, effective to induce a muscle-relaxing, anticonvulsive or anxiolytic effect.

4,232,017

TREATMENT OF PSYCHIC DISORDERS AND INFLAMMATION WITH FUSED ISOQUINOLINES

Giorgio Winters, and Nunzio Di Mola, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

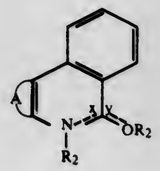
Filed May 22, 1979, Ser. No. 41,356

Claims priority, application United Kingdom, May 26, 1978, 23106/78

Int. Cl.[3] A61K *31/54, 31/47*; C07D *471/04, 513/04*

U.S. Cl. 424—246 9 Claims

1. A tricyclic orthofused heterocyclic compound of the formula



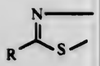
I

wherein A is the group



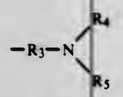
(a)

or the group



(b)

in which R represents hydrogen, (C_{1-4})alkyl, phenyl or tolyl and R_1 may be (C_{1-4})alkyl, phenyl or tolyl, R_2 is selected from (C_{1-4})alkyl, (C_{2-4})alkanoylmethyl, carbo- (C_{1-3})alkoxymethyl, hydroxy(C_{2-4})alkyl, halo(C_{2-4})alkyl and a group



wherein R_3 is an alkylene group from 2 to 4 carbon atoms and R_4 and R_5 independently represent hydrogen or (C_{1-4})alkyl or, taken together with the nitrogen atom, a fully hydrogenated 5- or 6-membered heterocyclic radical which may contain a further heteroatom selected from O, N and S wherein the heteroatoms are in 1, 4-positions when said heterocyclic radical is 6-membered and wherein the heterocyclic radicals may be optionally substituted by a (C_{1-4})alkyl or phenyl group, or R_2 may represent nil, the dotted lines x and y may represent nil or additional bonds; with the proviso that, when the symbol R_2 linked to the oxygen atom is different from nil, x is an additional bond and y and the other symbol R_2 represent nil; with the further proviso that, when the symbol R_2 linked to the nitrogen atom is different from nil, y is an additional bond and x and the other symbol R_2 represent nil; or a salt therewith of a pharmaceutically acceptable acid.

9. A method for treating psychic disorders and inflammation in mammals, which comprises administering thereto a daily dosage of a compound of formula I as claimed in claim 1 or a salt therewith of a pharmaceutically acceptable acid in amount varying from about 0.05 to about 2.00 grams.

4,232,018

HEXAHYDRO-1-HYDROXY-9-HYDROXYMETHYL-3-SUBSTITUTED-6H-DIBENZO[B,D]PYRANS AS ANALGESIC AGENTS

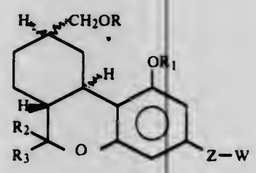
Michael R. Johnson, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 952,314, Oct. 18, 1978, which is a continuation-in-part of Ser. No. 934,319, Aug. 16, 1978, abandoned, which is a division of Ser. No. 807,439, Jun. 17, 1977, Pat. No. 4,133,819. This application Mar. 29, 1979, Ser. No. 24,783

Int. Cl.[2] C07D *413/12*; A61K *31/535*

U.S. Cl. 424—248.55 **10 Claims**

1. A compund selected from the group consisting of those having the formula



wherein

R is selected from the group consisting of hydrogen and alkanoyl having from one to five carbon atoms;

R_1 is $-CO-(CH_2)_p-NR_4R_5$ wherein p is 0 or an integer from 1 to 4; R_4 and R_5 taken together with the nitrogen to which they are attached represent morpholino;

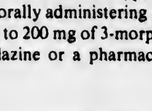
each of R_2 and R_3 is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

(a) alkylene having from one to ten carbon atoms;

(b) $-(alk_1)_m-O-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to ten carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than ten; each of m and n is 0 or 1; and

W is selected from the group consisting of hydrogen and



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro;

with the proviso that when W is hydrogen, Z is $(alk_1-)_m-O-(alk_2)_n-$;

and the pharmaceutically-acceptable acid addition salts thereof.

10. A composition suitable for producing analgesia in a mammal comprising a compound of claim 1 in association with a pharmaceutical carrier.

4,232,019

METHOD FOR THE TREATMENT OF MALE STERILITY

Jean-Pierre Lomard, Massy, France, assignor to Societe Anonyme dite: CM Industries, Paris, France

Filed Jun. 26, 1979, Ser. No. 52,109

Int. Cl.[2] A61U *27/00*

U.S. Cl. 424—248.56 **1 Claim**

1. A method for the treatment of male sterility caused by dyspermatogeny, comprising orally administering daily to the sterile male from 100 to 300 mg of 3-morpholinoethylamino-4-methyl-6-phenylpyridazine or a pharmaceutically acceptable salt thereof.

4,232,020

PROCESS FOR THE TREATMENT OF CHILDREN SUFFERING FROM A HYPERKINETIC SYNDROME

Jean-Pierre Lombard, Massy, France, assignor to C M Industries, France

Filed May 1, 1979, Ser. No. 34,970

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—248.56 **1 Claim**

1. A method for the treatment of hyperkinetic syndrome in children, comprising orally administering daily to the hyperactive child from 50 mg to 200 mg of 3-morpholinoethylamino-4-methyl-6-phenylpyridazine or a pharmaceutically acceptable salt thereof.

4,232,021

ANTI-DEPRESSANT METHODS

Bruno P. H. Poschel, Ann Arbor, and Donald R. Maxwell, Pinckney, both of Mich., assignors to Kefalas A/S, Copenhagen-Valby, Denmark

Filed Jan. 25, 1979, Ser. No. 6,317

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 **4 Claims**

1. A method for treating depression in mammals which comprises administering an effective anti-depressant amount of trans-9-[3(4-hydroxyethyl-1-piperazinyl)-propylidene]-2-trifluoromethylthiaxanthene or a pharmaceutically acceptable acid addition salt thereof, essentially free from its cis isomer.

4,232,022

HETEROCYCLIC COMPOUNDS

Roger J. Ponsford, Horsham, England, assignor to Beecham Group Limited, England

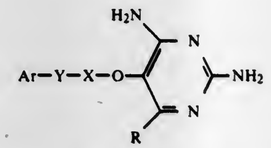
Division of Ser. No. 815,565, Jul. 14, 1977. This application Feb. 9, 1979, Ser. No. 10,630

Claims priority, application United Kingdom, Jul. 29, 1976, 31582/76

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **54 Claims**

28. A method of treating malarial and bacterial infections in humans and animals which comprises administering to a human or animal in need of such treatment an antimalarially or antibacterially effective amount of a compound of the formula (II):



(II)

or a pharmaceutically acceptable salt thereof, wherein R is hydrogen, methyl or ethyl; X is alkylene of 1 to 10 carbon atoms; Y is O or S; and Ar is phenyl, naphthyl, anthranyl, phenanthryl or phenyl substituted by from 1 to 5 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkoxyl, lower acyloxyl, lower alkyl, lower alkenyl, cycloalkyl of 5 or 6 carbon atoms, cycloalkenyl of 5 or 6 carbon atoms and lower alkylthio.

4,232,023

NOVEL SOLUBLE DERIVATIVES OF 2,4-DIAMINO PYRIMIDINE

Pierre R. Dick, Villa "Sama Keur" 95, Ave. de la Lanterne 06, and Max Rombi, 67, Rue Rossini 06, both of Nice, France

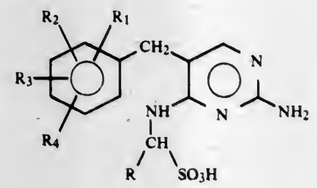
Filed Jul. 7, 1978, Ser. No. 922,845

Claims priority, application France, Jul. 11, 1977, 77 22323

Int. Cl.[3] A61K *31/505*; C07D *239/49*

U.S. Cl. 424—251 **15 Claims**

1. Derivatives of 2,4-diamino pyrimidine corresponding to the general formula II:



in which:

R_1, R_2, R_3 and R_4 independently represent a hydrogen atom, a halogen atom, a methyl group, a methoxy group or a benzyloxy group; and,

R is the radical of a R—CHO aldehyde wherein R represents hydrogen or an alkyl group containing from 1 to 3 carbon atoms, the Z—CH=CH radical wherein Z represents a hydrogen atom or a benzene ring; or

R represents the radical $HO-CH_2-(CHOH)_n-$ in which n has the value 3 or 4.

4. An antibacterial medicament, comprising as active principle a pharmacologically effective amount of, at least one compound according to claim 1.

4,232,024

1-OXO-1H-PYRIMIDO[6,1-b]BENZTHIAZOLE DERIVATIVES

Werner Winter, Heppenheim; Herman Hindermayr, Mannheim; Egon Roesch, Mannheim; Androniki Roesch, Mannheim, and Otto-Henning Wilhelms, Heddesheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

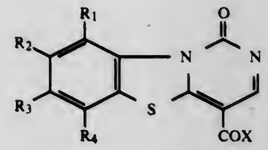
Filed Feb. 26, 1979, Ser. No. 15,372

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810863

Int. Cl.[3] A61K *31/505*; C07D *513/04*

U.S. Cl. 424—251 **10 Claims**

1. A 1-oxo-1H-pyrimido[6,1-b]benzthiazole of the formula



wherein

R_1, R_2, R_3 and R_4 each independently is hydrogen, halogen, hydroxy, nitro, trifluoromethyl, or alkyl, alkoxy or alkylthio containing up to 6 carbon atoms, or

R_2 and R_3 together are alkylenedioxy containing up up to 3 carbon atoms, and

X is hydroxy, alkoxy containing up to 6 carbon atoms or tetrazolyl-5-amino,

or a pharmacologically acceptable salt thereof.

8. An anti-allergy pharmaceutical composition comprising a physiologically acceptable diluent and an anti-allergically effective amount of a compound according to claim 1.

4,232,025

POLYMERIC INSECTICIDAL COMPOSITIONS OF MATTER

James R. Sanborn, and Charles H. Tieman, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed May 7, 1979, Ser. No. 36,630

Int. Cl.[3] A01N *9/22*; C07D *279/04*

U.S. Cl. 424—256 **6 Claims**

1. The product formed by reaction of tetrahydro-2-(nitromethylene) 2H-1,3-thiazine with an oxidized polysaccharide free from more than a minor amount of the carboxyl moiety.

5. A composition adopted for controlling corn earworms, which comprises an effective amount of a product of claim 1 together with an adjuvant therefor.

4,232,026

DIAZADITWISTANES, AND PHARMACEUTICAL COMPOSITIONS FOR TREATING PAIN IN WARM BLOODED ANIMALS CONTAINING THEM

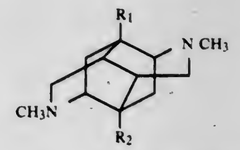
Jan ten Broeke, Somerset, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 20, 1978, Ser. No. 926,353

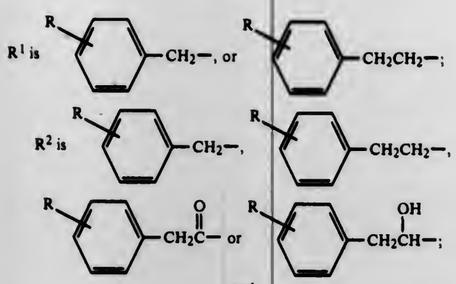
Int. Cl.[3] A61K *31/47*; C07D *471/08*

U.S. Cl. 424—258 **7 Claims**

1. A compound of structural formula:



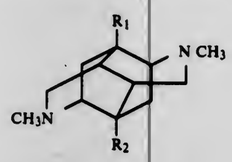
or a pharmaceutically acceptable salt thereof wherein:



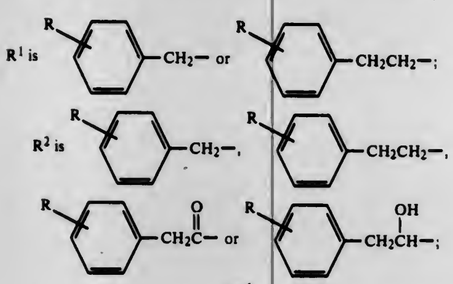
and

R is —H, or —OH.

4. A pharmaceutical composition for treating pain in a warm blooded animal comprising a pharmaceutical carrier and an effective amount of a compound of formula:

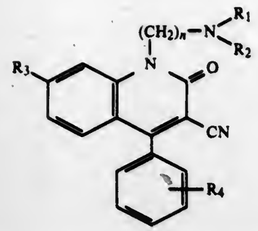


or a pharmaceutically acceptable salt thereof, wherein:



and

R is —H or —OH.



wherein $(CH_2)_n$ is a straight chain alkylene group containing 2 to 5 carbons in the normal chain, and R_1 and R_2 may be the same or different and are hydrogen or lower alkyl containing 1 to 8 carbons, with the proviso that at least one of R_1 and R_2 is lower alkyl, or



may be taken together to form a pyrrolidino, piperidino or morpholino ring, and R_3 and R_4 are the same or different and are hydrogen, lower alkyl containing 1 to 8 carbons, lower alkoxy containing 1 to 8 carbons, bromine, chlorine, fluorine or trifluoromethyl, and physiologically acceptable acid-addition salts thereof.

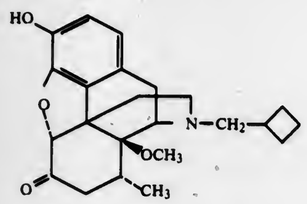
4,232,028

17-CYCLOBUTYLMETHYL-4,5α-EPOXY-3-HYDROXY-14-METHOXY-8α-METHYLMORPHINAN-6-ONE, AND METHOD OF TREATING PAIN WITH IT

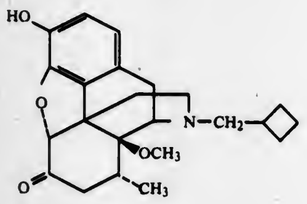
Raj K. Razdan, Belmont, and Anil C. Ghosh, Lexington, both of Mass., assignors to Sisa, Incorporated, Cambridge, Mass.

Filed Jun. 18, 1979, Ser. No. 49,460
Int. Cl.³ A61K *31/485*; C07D *489/08*
U.S. Cl. 424—260 **6 Claims**

1. 17-cyclbutylmethyl-4,5α-epoxy-3-hydroxy-14-methoxy-8α:methylmorphinan-6-one characterized by the formula:



4. A therapeutic method for treating pain without liability of drug dependence in an individual for whom such therapy is indicated which method comprises administering an effective analgesic amount of a compound corresponding to the structural formula:



4,232,027

1,2-DIHYDRO-2-OXO-4-PHENYL-3-QUINOLINECARBONITRILE DERIVATIVES

Chester F. Turk, Kendall Park, and John Krapcho, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 29, 1979, Ser. No. 7,069
Int. Cl.³ C07D *215/20, 413/06*; A61K *31/47*
U.S. Cl. 424—258 **9 Claims**

1. A compound of the structure

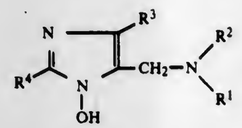
4,232,029

1-HYDROXYIMIDAZOLE-5-METHANAMINE DERIVATIVES

Adolf H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,627
Int. Cl.³ A61K *31/415, 31/44*; C07D *233/70, 403/02*
U.S. Cl. 424—263 **27 Claims**

1. A compound of formula I



(I)

in which R^1, R^2 and R^3 each is lower alkyl, or R^1 is lower alkyl and R^2 and R^3 together form a chain of formula —C(=NOH-)—CH_2— wherein the —CH_2— is joined to the nitrogen, and R^4 is lower alkyl, 1-naphthalenyl, 2-, 3- or 4-pyridinyl, 2- or 3-furyl, 2- or 3-thieny, phenyl or phenyl mono-, di- or trisubstituted with halo, lower alkyl, lower alkoxy, hydroxy, or trifluoromethyl, or a therapeutically acceptable acid addition salt thereof.

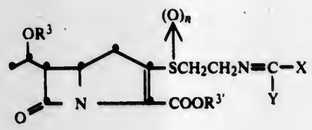
4,232,030

SUBSTITUTED N-METHYLENE DERIVATIVES OF THIENAMYCIN SULFOXIDE AND SULFONE

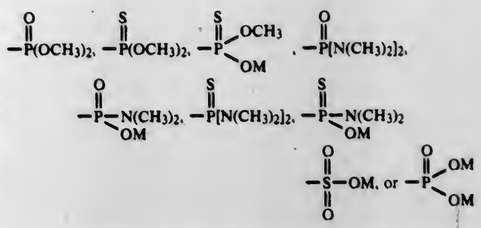
Burton G. Christensen, Metuchen; William J. Leanza, Berkeley Heights, and Kenneth J. Wildonger, Somerville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 15, 1977, Ser. No. 833,619
Int. Cl.³ A61K *31/40*; C07D *487/04*; A61K *31/44*
U.S. Cl. 424—263 **23 Claims**

1. A compound having the structure:



and the pharmaceutically acceptable salts thereof wherein:
n is 1 or 2;
R^3 is selected from the group consisting of: hydrogen, formyl, acetyl, propionyl, butyryl, chloroacetyl, methoxyacetyl, aminoacetyl, methoxycarbonyl, ethoxycarbonyl, methylcarbamoyl, ethylcarbamoyl, phenylthiocarbonyl, 3-aminopropionyl, 4-aminobutyryl, N-methylaminoacetyl, N,N-dimethylaminoacetyl, N,N,N-trimethylaminoacetyl, 3-(N,N-dimethyl)aminopropionyl, 3-(N,N,N-trimethyl)amino propionyl, N,N,N-triethylaminoacetyl, pyridiniumacetyl, guanylthioacetyl, guanidinoacetyl, 3-guanidinopropionyl, N^3-methylguanidinopropionyl, hydroxyacetyl, 3-hydroxypropionyl, acryloyl, propynol, malonyl, phenoxycarbonyl amidinoacetyl, acetamidinoacetyl, amidinopropionyl, acetamidinopropionyl, guanylureidoacetyl, guanylcarbamoyl, carboxymethylaminoacetyl, sulfoacetylaminoacetyl, phosphonoacetylaminoacetyl, N^3-dimethylaminoacetamidinopropionyl, ureidocarbonyl, dimethylaminoguanylthioacetyl, 3-(1-methyl-4-pyridinium)propionyl, 3-(5-aminoimidazol-1-yl)propionyl, 3-methyl-1-imidazoliumacetyl, 3-sydnonylacetyl, o-aminomethylbenzoyl, o-aminobenzoyl,



M is hydrogen or an alkali or alkaline earth metal cation; $R^{3'}$ is selected from the group consisting of: hydrogen, methyl, t-butyl, phenacyl, p-bromophenacyl; pivaloyloxymethyl, 2,2,2-trichloroethyl, allyl, 3-methyl-2-butenyl, 2-methyl-2-propenyl, benzyl, benzylhydryl, p-t-butylbenzyl, phthalidyl, phenyl, 5-indanyl, acetylthiomethyl, acetoxymethyl, propionyloxymethyl, methallyl, 3-butenyl, 4-pentenyl, 2-butenyl, acetoxyacetylmethyl, pivaloylacetylmethyl, diethylamino, dimethylaminoethyl, methoxymethyl, p-acetoxybenzyl, p-pivaloylbenzyl, p-isopropoxybenzyl, 5-indanylmethyl, benzyloxymethyl, methylthioethyl, dimethylaminoacetoxymethyl, crotonolacton-3-yl, acetamidomethyl, acetylthioethyl, pivaloylthiomethyl, methylthiomethyl; X and Y are independently selected from the group consisting of hydrogen, R, —OR, S-R and NR^1R^2 R^1 and R^2 are independently selected from the group consisting of hydrogen; alkyl having 1-6 carbon atoms; alkenyl having 3-6 carbon atoms; cycloalkyl, cycloalkylalkyl, cycloalkenyl and cycloalkenylalkyl having 3-6, 4-7 4-6 and 4-7 carbon atoms, respectively; benzyl; p-methoxybenzyl, p-dimethylaminobenzyl, cinnamyl; 2-thienylmethyl, 3-thienylmethyl, 2-furylmethyl, 1-methyl-5-tetrazolylmethyl; and R is selected from the group consisting of hydrogen; alkyl having from 1-6 carbon atoms; aminoalkyl having 1-6 carbon atoms, aminoalkenyl having 1-6 carbon atoms; alkenyl having 2-6 carbon atoms; alkoxyalkyl having 2-6 carbon atoms; mono-, di- and triloweralkylaminoalkyl having 2-12 carbon atoms; perhaloalkyl having from 1-6 carbon atoms; alkylthioalkyl having 2-6 carbon atoms; phenyl; benzyl; 2-, 3- and 4-pyridyl and 2-thiazolyl.

23. An antibiotic pharmaceutical composition consisting essentially of a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

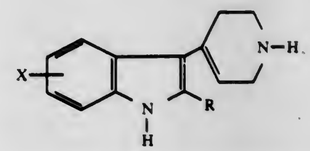
4,232,031

PROCESS FOR PREPARATION OF PIPERIDYL-INDOLES

Claude Dumont, Nogent-sur-Marne; Jacques Guillaume, Sevran, and Lucien Nedelec, Le Raincy, all of France, assignors to Roussel Uclaf, Paris, France

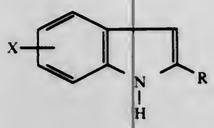
Filed Dec. 6, 1979, Ser. No. 100,909
Claims priority, application France, Dec. 22, 1978, 78 36167
Int. Cl.³ C07D *401/04*; A61K *31/40*
U.S. Cl. 424—263 **6 Claims**

1. A process for the preparation of piperidyl-indoles of the formula



wherein X is selected from the group consisting of hydrogen,

fluorine, chlorine, bromine, alkoxy of 1 to 3 carbon atoms and nitro and R is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms comprising reacting an indole of the formula



with 4-piperidone hydrochloride in an alkaline medium to form the compound of formula I and optionally salifying the latter to obtain its acid addition salt.

4. A compound selected from the group consisting of 5-nitro-3-(1,2,3,6-tetrahydropyridin-4-yl)-1H-indole and its non-toxic, pharmaceutically acceptable acid addition salts.

5. A composition having antidepressive, antiemetic and antiparkinsonian activity comprising an effective amount of 5-nitro-3-(1,2,3,6-tetrahydropyridin-4-yl)-1H-indole and its non-toxic, pharmaceutically acceptable acid addition salts and an inert pharmaceutical carrier.

4,232,032

METHODS, COMPOSITIONS AND CHEMICAL COMPOUNDS FOR USE IN ANIMAL HUSBANDRY

Francis T. Boyle, and Alan Davies, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 23, 1976, Ser. No. 669,498

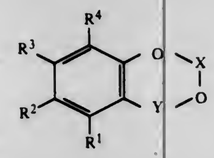
Claims priority, application United Kingdom, Apr. 8, 1975, 14316/75

Int. Cl.[2] C07D *319/04;* A23K *1/00*

U.S. Cl. 424—269 **6 Claims**

1. In the practice of ruminant animal husbandry, the method of suppressing methane production in the rumen and thereby improving the rate of growth or feed efficiency or both which comprises orally administering to animals from 0.01 mg/kg body weight to 30 mg/kg body weight per day per animal of a material selected from the group consisting of:

(a) benzo[1,3]dioxin derivatives of the formula:



I

wherein:

X is 2,2,2-trichloroethylidene, 2,2-dichlorovinylidene or 2,2-dichloro-2-(C_{1-3} alkoxy)ethylidene;

Y is 2,2-dichlorovinylidene or 2,2-dichloroethylidene;

R^1, R^2, R^3 and R^4, which may be the same or different, are: hydrogen, halogen, amino, carbamoyl, carboxy, chloroformyl, cyano, formyl, formyloxymethyl, hydrazinocarbonyl, hydroxy, nitro, sulfamoyl, sulfo, and ammonium sulfonato; alkanoyl, mono-or di-alkanoylamino, alkanoylhydrazonomethyl, alkanoyloxy, alkoxy, alkoxycarbonyl, alkoxyhydroxymethyl, alkyl, mono- and di-alkylsulfamoyl, mono- and di-alkylcarbamoyl, hydrazonoalkyl, hydroxyalkyl and hydroxyalkylcarbamoyl, wherein each alkanoyl, alkoxy and alkyl part is of up to 4 carbon atoms, and is unsubstituted or substituted by one or more halogen atoms; benzoyl, benzoyloxy, benzylideneamino, phenylhydrazonomethyl, mono- and di-phenylsulfamoyl, and phenylthioureido, in each of which the phenyl ring is unsubstituted, or is substituted by one to three halogen, nitro or C_{1-4}-alkoxy substituents; or tetrazol-5-yl;

(b) the γ-lactones of benzo[1,3]dioxin derivatives, as defined above, wherein R^1 is carboxy and R^2 is 1-hydroxyalkyl, unsubstituted or substituted by halogen as defined above;

(c) the base addition salts of benzo[1,3]dioxin derivatives, as defined above, which contain carboxy, or sulfonic acid; and

(d) the acid addition salts of benzo[1,3]dioxin derivatives as defined above, which contain amino, and continuing said administration for as long as improved growth rate or feed efficiency through reduced methane production in the rumen is desired, the amount of said material administered being sufficient to reduce the production of methane in the rumen.

4,232,033

COMBATING FUNGI WITH DIASTEREOMERIC FORM A OF 1-PHENOXY-3,3-DIMETHYL-1-(1,2,4-TRIAZOL-1-YL)-BUTAN-2-OLS

Wolfgang Krämer; Karl H. Büchel; Wolf-Dietrich Pflugbeil, all of Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,832

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743767

Int. Cl.[3] A01N *43/64;* C07D *249/08*

U.S. Cl. 424—269 **7 Claims**

1. The substantially pure diastereomeric form A of a triazolyl-O,N-acetal selected from the group consisting of 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2ol and 1-(4-biphenylyloxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-ol.

4. A fungicidal composition containing as active ingredient the substantially pure diastereomeric form of a compound according to claim 1 in admixture with a diluent.

5. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, the substantially pure diastereomeric form of a compound according to claim 1.

4,232,034

HETEROCYCLIC DERIVATIVES OF 1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES

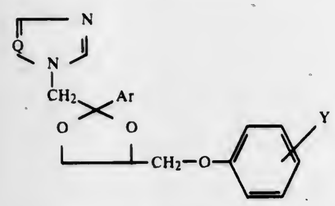
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Division of Ser. No. 853,726, Nov. 21, 1977, Pat. No. 4,160,841, which is a continuation-in-part of Ser. No. 764,265, Jan. 31, 1977, abandoned. This application Jun. 20, 1979, Ser. No. 50,369

Int. Cl.[3] A01N *43/64;* C07D *405/14*

U.S. Cl. 424—269 **8 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



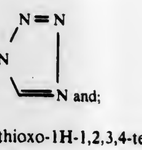
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

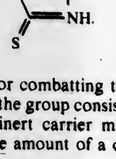
a 1H-1,2,4-triazol-1-yl radical of the formula



(d)

wherein R_6 is selected from the group consisting of hydrogen and lower alkylthio, and, R_7 is selected from the group consisting of hydrogen, lower alkyl and phenyl;

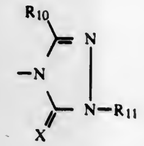
a 4H-1,2,4-triazol-4-yl radical of the formula



(e)

wherein R_8 is selected from the group consisting of hydrogen, lower alkyl, lower alkyloxy, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, and, R_9 is selected from the group consisting of hydrogen and lower alkyl;

a 2,3-dihydro-4H-1,2,4-triazol-4-yl radical of the formula



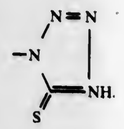
(f)

wherein X is selected from the group consisting of O and S, and, R_{10} and R_{11} are each independently selected from the group consisting of hydrogen and lower alkyl, provided that when said X is S then said R_{11} is hydrogen;

a 1H-1,2,3,4-tetrazol--yl radical of the formula

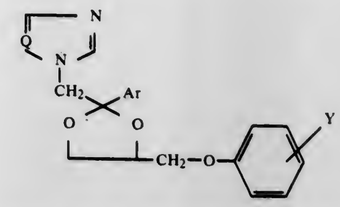
(g);

a 4,5-dihydro-5-thioxo-1H-1,2,3,4-tetrazol-1-yl radical of the formula



(h)

8. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a compound selected from the group consisting of an azole derivative having the formula:



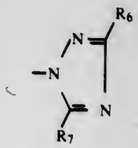
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 subtituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

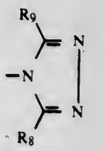
a 1H-1,2,4-triazol-1-yl radical of the formula



(d)

wherein R_6 is selected from the group consisting of hydrogen and lower alkylthio, and, R_7 is selected from the group consisting of hydrogen, lower alkyl and phenyl;

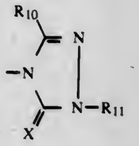
a 4H-1,2,4-triazol-4-yl radical of the formula



(e)

wherein R_8 is selected from the group consisting of hydrogen, lower alkyl, lower alkyloxy, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, and, R_9 is selected from the group consisting of hydrogen and lower alkyl;

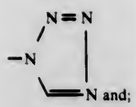
a 2,3-dihydro-4H-1,2,4-triazol-4-yl radical of the formula



(f)

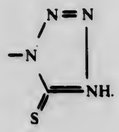
wherein X is selected from the group consisting of O and S, and, R_{10} and R_{11} are each independently selected from the group consisting of hydrogen and lower alkyl, provided that when said X is S then said R_{11} is hydrogen;

a 1H-1,2,3,4-tetrazol-1-yl radical of the formula



(g);

a 4,5-dihydro-5-thioxo-1H-1,2,3,4-triazol-1-yl radical of the formula

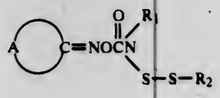


4,232,035
CARBAMATE PESTICIDAL COMPOUNDS COMPOSITIONS AND METHODS OF USE

Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 30, 1975, Ser. No. 645,407
Int. Cl.[3] A01N *43/78, 43/80, 43/02;* C07D *339/06*
U.S. Cl. 424—270 42 Claims

1. A compound of the formula:



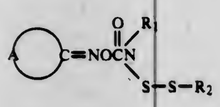
wherein:

R_1 is lower alkyl;

R_2 is alkyl, alkenyl, cycloalkyl, cycloalkenyl, bicycloalkyl, bicycloalkenyl, phenyl, phenylalkyl or phenyl or phenylalkyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkyl, alkylthio, methylenedioxy, dialkylamino, trifluoromethyl, phenoxy, phenylthio substituents or a combination thereof;

A is a divalent aliphatic chain completing a five or six membered ring, which includes in any combination, one or two divalent oxygen, sulfur, sulfinyl, sulfonyl or amido group.

9. A miticidal, insecticidal and nematocidal composition comprising an acceptable carrier and as an active toxicant amiticidally, insecticidally and nematocidally effective amount of a compound of the formula



wherein:

R_1 is lower alkyl;

R_2 is alkyl, alkenyl, cycloalkyl, cycloalkenyl, bicycloalkyl, bicycloalkenyl, phenyl, phenylalkyl or phenyl or phenylalkyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkyl, alkylthio, methylenedioxy, dialkylamino, trifluoromethyl, phenoxy, phenylthio substituents or a combination thereof;

A is a divalent aliphatic chain completing a five or six membered ring, which includes in any combination, one or two divalent oxygen, sulfur, sulfinyl, sulfonyl or amido.

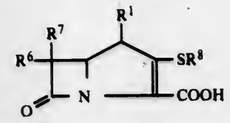
4,232,036
6-, 1- AND 2-SUBSTITUTED-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

Burton G. Christensen, Metuchen, and David H. Shih, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 24, 1978, Ser. No. 954,272
Int. Cl.[3] A61K *31/40;* C07D *487/04*
U.S. Cl. 424—274 6 Claims

1. A compound having the structure:

(h)



wherein R is H; or a pharmaceutically acceptable salt cation; and R^1, R^6, R^7 and R^8 are independently selected from the group consisting of hydrogen, (R^1 is not H) substituted and unsubstituted: alkyl, alkenyl, alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl; aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the alkyl chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radicals are selected from the group consisting of: amino, mono-, di- and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; when R^8 is 2-aminoethyl, and when R^7/R^6 is hydrogen, then R^6/R^7 is not 1-hydroxyethyl.

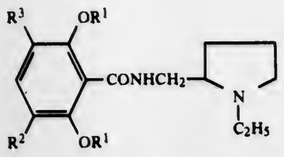
6. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,232,037
2,6-DIALKOXYBENZAMIDES, INTERMEDIATES, PHARAMACEUTICAL COMPOSITIONS AND METHODS FOR TREATMENT OF PSYCHOTIC DISORDERS

Gosta L. Florvall, and Sven O. Ogren, both of Södertalje, Sweden, assignors to Astra Läkemedel Aktiebolag, Södertälje, Sweden

Filed Mar. 8, 1979, Ser. No. 18,784
Claims priority, application Sweden, Mar. 23, 1978, 7803411
Int. Cl.[3] A61K *31/40;* C07D *207/08*
U.S. Cl. 424—274 13 Claims

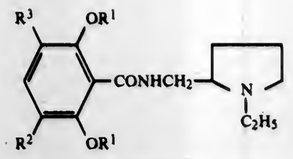
1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof, in which formula R^1 represents an alkyl group with 1–3 carbon atoms, R^2 and R^3 are the same or different and each represents a hydrogen, chlorine or bromine atom.

11. A method for the treatment of psychoses in man, characterized by the administration to a host in need of such treatment of an effective amount of a compound of the formula



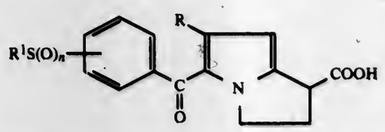
or a pharmaceutically acceptable salt thereof, in which formula R^1 represents an alkyl group with 1–3 carbon atoms, R^2 and R^3 are the same or different and each represents a hydrogen, chlorine or bromine atom.

4,232,038
5-ALKYLSULFINYLBENZOYL- AND 5-ALKYLSULFONYLBENZOYL-1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACIDS

Arthur F. Kluge, Los Altos, and Joseph M. Muchowski, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 31, 1979, Ser. No. 71,443
Int. Cl.[2] C07D *487/04;* A61K *31/40*
U.S. Cl. 424—274 19 Claims

1. A compound selected from the group of those represented by the formula:



and the pharmaceutically acceptable, non-toxic alkyl esters having from one to 12 carbon atoms and salts thereof, wherein n is 1 or 2, R represents hydrogen or a lower alkyl group having from 1 to 4 carbon atoms and R^1 represents lower alkyl group having from 1 to 4 carbon atoms at the ortho, meta or para positions of the aroyl group.

13. A composition for treating inflammation, pain or pyrexia in mammals consisting essentially of a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound of claim 1.

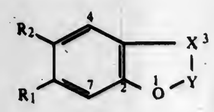
15. A composition for administration to a pregnant mammal to delay onset of parturition consisting essentially of a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound of claim 1.

4,232,039
PHENYL- OR CYCLOALKYL-BENZO-OXACYCLIC COMPOUNDS

Annemarie Closse, Binningen; Walter Haefliger, Basel, and Daniel Hauser, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 795,432, May 10, 1977, abandoned.
This application Apr. 14, 1978, Ser. No. 896,481
Claims priority, application Switzerland, May 17, 1976, 6125/76; Jun. 17, 1976, 7741/76; Nov. 26, 1976, 14928/76; Nov. 26, 1976, 14929/76
Int. Cl.[2] A61K *31/335, 31/34;* C07D *307/79, 313/08*
U.S. Cl. 424—278 14 Claims

1. A compound of formula I

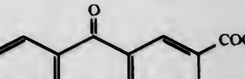


where

R_1 is cycloalkyl of 3 to 8 carbon atoms or phenyl,

R_2 is methyl or chloro,

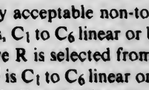
X—Y is



or—$(CH_2)_4$—, and

R_3 is hydrogen or alkyl of 1 to 4 carbon atoms,

with the proviso that when X—Y is



R_2 is chloro when R_3 is hydrogen.

13. A pharmaceutical composition comprising an anti-oedemic, anti-inflammatory or anti-arthritic amount of a compound of claim 1, in association with a pharmaceutically acceptable diluent or carrier.

4,232,040
COMPOSITIONS FOR AND A METHOD OF PREVENTING DIABETIC COMPLICATIONS

L. David Waterbury, Cupertino, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 8, 1978, Ser. No. 884,455
Int. Cl.[3] A61K *31/35, 27/00, 31/425, 31/40*
U.S. Cl. 424—283 25 Claims

1. A method for preventing or relieving diabetes mellitus-associated complications chosen from the group consisting of cataracts, retinopathy, and neuropathy in a diabetic mammal, which method comprises topically administering to said mammal an alleviating or prophylactic amount of a compound of the formula

(I)

and pharmaceutically acceptable non-toxic C_1 to C_6 linear or branched alkyl esters, C_1 to C_6 linear or branched alkyl amides or salts thereof where R is selected from the group hydrogen, $R^1(O)_nS$— where R^1 is C_1 to C_6 linear or branched alkyl when n is the integer 0 or 1, C_1 to C_6 linear or branched hydroxyalkyl, di- C_1 to C_6 linear or branched alkylamino, the alkyl group optionally substituted with hydroxy when n is the integer 2 or hydrogen when n is the integer 3; $R^4C(O)$— where R^4 is C_1 to C_6 linear or branched alkyl or C_5 to C_{10} carbocyclic alkyl; and C_1 to C_6 linear or branched alkoxy optionally substituted with at least one hydroxy and R′ is selected from the group consisting of hydrogen, C_1 to C_{10} linear or branched alkyl, C_1 to C_{10} linear or branched alkoxy, C_1 to C_{10} linear or branched thioalkyl and the radical R^3SO— where R^3 is C_1 to C_6 linear or branched alkyl.

4,232,041

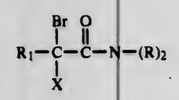
AQUEOUS ANTIMICROBIAL COMPOSITION HAVING IMPROVED STABILITY

George A. Burk, Bay City; Charles E. Reineke, Midland, both of Mich., and Charles A. Wilson, Pittsburg, Calif., assignors to The Dow Chemical Company, Midland, Mich.

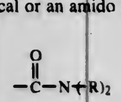
Continuation-in-part of Ser. No. 860,643, Dec. 14, 1977, abandoned. This application Jun. 20, 1979, Ser. No. 50,399
Int. Cl.[3] A01N 37/18, 37/43, 34/40
U.S. Cl. 424—304 15 Claims

1. An aqueous antimicrobial composition (a) which is substantially free of glycols having a molecular weight of less than about 70 and of salts of organic acids and which thereby has improved stability of the active antimicrobial ingredient therein; (b) which has a pH of from about 2 to about 5; and (c) which comprises, based upon the total weight of such composition:

(1) from about 1 to about 25 weight percent of an alpha-halogenated amide antimicrobial compound of the formula:



wherein:
X is hydrogen, halogen or a cyano radical;
each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and
R_1 is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(2) a water miscible organic solvent in an amount sufficient to dissolve said alpha-halogenated amide, said solvent being selected from the group consisting of normally liquid polyalkylene glycols of the ethylene, trimethylene, or tetramethylene series and the mono- and di-saturated hydrocarbyl ethers thereof; and

(3) water in an amount greater than 20 weight percent based upon the total weight of the aqueous antimicrobial composition.

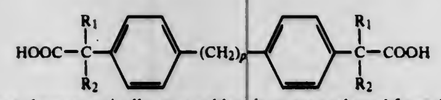
4,232,042

DI-CARBOXYLIC ACID DERIVATIVES

Alexander C. Campbell, Falkirk; Colin L. Hewett, Glasgow, both of Great Britain, and Filippus J. Zeelen, Heesch, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 4, 1976, Ser. No. 729,509
Claims priority, application United Kingdom, Oct. 7, 1975, 41042/75
Int. Cl.[3] C07C 57/38, 69/616; A61K 31/19
U.S. Cl. 424—308 4 Claims

1. A compound of the formula:



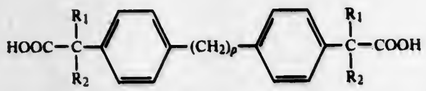
or a pharmaceutically acceptable salt or ester selected from the group consisting of alkyl esters of from 1–4 carbon atoms, phenylethyl esters, phenylpropyl esters, cinnamyl esters and benzyl esters thereof, wherein:

(a) R_1 is alkyl of 1–4 carbon atoms;

(b) R_2 is selected from the group consisting of hydrogen or alkyl of from 1–4 carbon atoms; and

(c) p has the value of 3 or 4.

3. A pharmaceutical composition having hypocholesterolaemic and hypotriglycerolaemic properties comprising a hypotriglycerolaemically and hypocholesterolaemically effective amount of a compound of this formula:



or a pharmaceutically acceptable salt or ester selected from the group consisting of alkyl esters of from 1–4 carbon atoms, phenylethyl esters, phenylpropyl esters, cinnamyl esters and benzyl esters thereof, wherein:

(a) R_1 is alkyl of 1–4 carbon atoms;

(b) R_2 is selected from the group consisting of hydrogen or alkyl of from 1–4 atoms;

(c) p has the value of 3 or 4; and

a non-toxic pharmaceutically acceptable carrier.

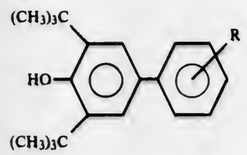
4,232,043

ANTI-INFLAMMATORY METHOD

George G. I. Moore, Birchwood, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 861,892, Dec. 19, 1977, Pat. No. 4,172,151, which is a division of Ser. No. 797,137, May 16, 1977, abandoned. This application Jul. 6, 1979, Ser. No. 55,324
Int. Cl.[2] A61K 31/04, 31/14, 31/045
U.S. Cl. 424—340 5 Claims

1. A method for combatting inflammatory processes in a mammal which comprises administering an effective dose less than the toxic amount of a compound of the formula



wherein R is selected from halogen, methoxy, methyl and 4-nitro to said mammal.

4,232,044

ENZYMATIC IMPROVEMENT OF PROTEIN FLAVOR

Hideo Chiba, Uji; Ryuzo Sasaki, Kyoto; Masaaki Yoshikawa, Joyo; Naofumi Takahashi, Kyoto; Etsuro Sugimoto, Nagoya, and Hirotoshi Samejima, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,095
Claims priority, application Japan, Aug. 19, 1977, 52-99142; Aug. 19, 1977, 52-99143
Int. Cl.[3] A23L 1/20; A23J 3/00
U.S. Cl. 426—44 8 Claims

1. Process for improving the flavor of protein containing aldehydes which comprises reacting said protein with aldehyde dehydrogenase in the presence of a hydrogen acceptor or aldehyde oxidase in the presence of an electron acceptor until the free and bound aldehydes in said protein are converted to the corresponding acids.

4,232,045

PREPARATION OF FREE-FLOWING PARTICULATE YEAST

Seymour Pomper, Stamford, Conn., and Emanuel Akerman, Bronx, N.Y., assignors to Standard Brands Incorporated, Wilton, Conn.

Filed Oct. 6, 1977, Ser. No. 839,865
Int. Cl.[2] C12C 11/26
U.S. Cl. 426—62 4 Claims

1. A process for preparing a free-flowing particulate bulk yeast product consisting assentially of incorporating into bulk baker's yeast having a moisture content of from about 65 to about 70 percent from about 0.5 to about 3 percent, based on the weight of bulk yeast being treated, of a drying agent having a particle size of less than about 100 milli-microns selected from the group consisting of powdered hydrophilic silicon dioxide, micronized wood pulp and micronized cellulose to produce a bulk yeast product having improved flowability without further drying.

4,232,046

LIQUID STARCH-UREA RUMINANT FEED AND METHOD OF PREPARING SAME

Charles W. Deyoe, and Erle E. Bartley, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Oct. 16, 1978, Ser. No. 951,617
Int. Cl.[3] A23K 1/22
U.S. Cl. 426—69 20 Claims

1. A method of preparing a liquid starch-NPN ruminant feed supplement comprising the steps of:

preparing a substantially NPN-free aqueous slurry comprising water and a solids fraction which includes a quantity of an edible, substantially ungelatinized starch-bearing feed material,

said slurry comprising from about 30% to 90% by weight free water, and correspondingly a solids fraction of from about 10% to 70% by weight;

directing a stream of said slurry to a reaction zone;

subjecting said slurry to elevated pressures ranging from about 1 to 200 psig and to heating to a temperature of from about 215° to 388° F. in said zone for gelatinizing from about 50 to 100% of said starch-bearing feed material in said slurry;

passing said slurry out of said treatment zone while the slurry remains substantially NPN-free; and

adding a quantity of an NPN source to said slurry to yield a feed product,

the ratio of starch-bearing feed material to nitrogen from said NPN source ranging from about 4:0.45 to 1:1.80.

4,232,047

FOOD SUPPLEMENT CONCENTRATE IN A DENSE GLASSEOUS EXTRUDATE

Louis Sair, Evergreen Park, and Ralph A. Sair, Lincolnwood, both of Ill., assignors to Griffith Laboratories U.S.A., Inc., Alsip, Ill.

Continuation-in-part of Ser. No. 719,740, Sep. 2, 1976, abandoned, and Ser. No. 779,476, Mar. 21, 1977, abandoned. This application May 30, 1978, Ser. No. 910,274
Int. Cl.[3] A23L 1/22, 1/30
U.S. Cl. 426—96 5 Claims

1. An encapsulated product in the form of spice concentrates and simulated spices,

comprising from about one-half to about forty percent by weight of an agent selected from the group consisting of essential oils, oleoresins, and mixtures thereof,

said agent being dispersed throughout and encased within but recoverable from an enveloping matrix comprising a fused encapsulating material selected from the group consisting of starches, cereal flour, modified starches, gums, proteins, and mixtures thereof,

said agent being distributed throughout said encapsulating material as a micro dispersion of from about five microns to submicron in size, and

said encapsulated product having a density in the range of from about fifty-five to about ninety pounds per cubic foot;

said encapsulated product containing said micro dispersion being the product obtained by blending said encapsulating material, said agent, and from about ten to about forty percent by weight of water based on the total weight of encapsulating material and water to provide a friable blend, subjecting said blend through extrusion to pressure and to heat to form a glasseous melt, and extruding said melt under non-puffing conditions,

the resulting said product constituting a substantially homogeneous, dense, essentially unexpanded, translucent-to-glassy extrudate,

each said encapsulated product exhibiting excellent stability on long-term storage, and being suitable for adding to foods as a flavoring therefor.

4,232,048

PACKAGE CONTAINING PRESSURED LIQUID

Lars-Erik Palm, Höör; Gert Nedstedt, Malmö, and Bengt Nilen, Landskrona, all of Sweden, assignors to AB Ziristor, Lund, Sweden

Continuation of Ser. No. 731,994, Oct. 12, 1976, abandoned. This application Jun. 9, 1978, Ser. No. 913,944
Claims priority, application Sweden, Oct. 28, 1975, 7512022
Int. Cl.[3] B65D 85/72, 77/06
U.S. Cl. 426—115 11 Claims



1. A package for pressurized fluid contents comprising a liquid-tight, elongated, cushion-shaped, flexible inner container containing said fluid contents and a substantially non-extensible elongate outer tubular casing therefor, said cushion-shaped container having a pair of opposed vertical seals along the length of the container and corner lugs folded back against the pair of opposed seals, the upper and lower ends of the elongated container having a convex shape, said casing having a length at least equal to that of said container and a top edge portion with two opposed circumferential portions folded inwardly toward each other against at least a portion of the convex upper end of said container and opposed intermediate circumferential portions of the top edge portion of said casing positioned between the opposed inwardly folded portions, the intermediate circumferential portions remaining unfolded and extending upwardly as extensions of the wall of the casing to resist unfolding of said inwardly folded portions, the container being in contact with an inner surface of said casing along said seals to reinforce the latter, the folded corner lugs of the container being fixed to the inner wall of said casing, the two inwardly folded opposed portions of said casing being fixed to the convex end of said container, the inner edges of the two

opposed inwardly folded circumferential portions at the top of the casing being spaced apart to provide a substantially rectangular opening in said casing to expose a portion of the convex end portion of the container, the exposed portion being provided with at least one pouring opening therein and further including releasable means for covering the pouring opening.

4,232,049

CITRUS JUICE VESICLE CONTAINING FROSTING COMPOSITIONS AND METHOD OF PREPARATION

Jon R. Blake, Brooklyn Center, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed May 31, 1979, Ser. No. 44,799
Int. Cl.[2] A23L *1/34*
U.S. Cl. 426—572 **16 Claims**

1. A frosting composition substantially free of emulsified oleagineous material, comprising:

A. from about 90% to 98% by weight of a comestible base prepared by:
  I. blending to form a blend
    a. from about 25% to 65% by weight of the blend of citrus juice vesicles having a moisture content between about 89% to 96% by weight of the vesicles;
    b. from about 7% to 45% by weight of the blend of a nutritive carbohydrate sweetening agent;
    c. sufficient edible non-volatile acid or sodium salt thereof to provide the blend with a pH ranging between about 2.5 to 5.5;
    d. from about 1% to 5% by weight of the blend of an ungelatinized starch;
    e. from about 8% to 60% by weight of the blend of water, said blend having a Brookfield viscosity of between about 3,000 to 6,000 cp. at 190° F.; and
  II. cooking the blend at a temperature of between 180° F. and 280° F. to form a cooked comestible base having;
    a. a moisture content of between about 30% to 60% by weight of the comestible base;
    b. a Brookfield viscosity of between 7,000 and 10,000 cp. at 190° F.;

B. from about 0.4% to 3% by weight of an acid stable whipping agent; and

C. from about 0.1% to 0.5% by weight of an acid-stable polysaccharide gum selected from the group consisting of locust bean gum, guar gum, xanthan gum and mixtures thereof.

4,232,050

IMITATION ACID-SET CHEESE

Charles E. Rule, Lakewood; Robert G. Manning, and Richard J. Zielinski, both of Middleburg Hts., all of Ohio, assignors to SCM Corporation, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,302
Int. Cl.[3] A23C *19/02*
U.S. Cl. 426—582 **6 Claims**

1. A method for the preparation of an imitation high-moisture acid-set mozzarella cheese characterized as being sufficiently hard to be grated and having the stretch, flavor, meltdown, and browning characteristics of natural mozzarella cheese, comprising the steps of

(a) preparing a formulation consisting essentially of
  about 15-35% edible protein of which at least 40% is sodium caseinate,
  about 15-30% low melting point hydrogenated vegetable oil,
  about 0.5-1.0% calcium ion providing substance,
  about 0.5-1.5% organic emulsifying agent,
  about 0.2-3% edible acid, and
  about 45-53% water,

said vegetable oil having a Wiley Melting Point of about 60°-120° F. said emulsifying agent having an HLB value of more than about 10 and a fluid consistency at ambient temperature,

(b) adding said formulation to a mixing zone and subjecting said formulation to mixing at a temperature in the range of about 130°-172° F.; and

(c) removing the mixed product from said zone and cooling it until a hardened product is obtained.

(d) said organic emulsifying agent being selected from the group consisting of polyglycerol oleate ester having a hydroxyl value of about 400 to 600, a saponification number of about 60 to 100, and acid values of less than about 10; polyoxyethylene (20) sorbitan monoester of fatty acid; a sugar ester which is sucrose monooleate with about 70% monoester; and polyoxyethylene (20) mono- and diglycerides of fatty acids.

4,232,051

METHOD OF SEPARATING LIQUID FROM SOFT PARTICULATE FOOD SOLIDS

Horace Hinds, Jr., Menlo Park, Calif.; David P. Helmerman, Chilton, Wis., and Billy L. Born, Rockford, Ill., assignors to Stoelting, Inc., Kiel, Wis.

Division of Ser. No. 718,744, Aug. 30, 1976, Pat. No. 4,156,384.
This application Jun. 23, 1978, Ser. No. 918,244
Int. Cl.[3] A23C *19/02*
U.S. Cl. 426—582 **10 Claims**

1. In a method for dewatering soft particulate cheese curd in which the cheese curd is placed in a compressed state by compressing it between a belt and a surface, at least one of which is foraminous, to express water from the curd, and in which method such water is drained away from the curd, the improvement for avoiding significant damage to the curd caused by changes in the thickness of a bed of such curd between said surface and said belt, said improvement comprising the steps of providing a variable cross-sectional area separation zone between a curved surface and the belt by supporting said belt for travel over belt intake and discharge rollers respectively disposed ahead of and beyond the extent of the separation zone, said rollers being spaced away from the surface at least as far as the maximum bed thickness and leaving the belt run between said rollers unsupported so that the belt can flex and yield to accomodate beds of various thickness between the belt and the surface, and regulating the cross-sectional area of said zone in response to changes in bed thickness by tightening the belt to a desired belt tension and taking up slack in the belt to maintain said desired tension as said belt run flexes and yields to maintain substantially constant pressure of the belt on the bed and avoid imposing damaging pressure on the cheese curd regardless of bed thickness.

4,232,052

PROCESS FOR POWDERING HIGH FAT FOODSTUFFS

Bernard H. Nappen, Cranford, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 12, 1979, Ser. No. 19,790
Int. Cl.[3] A23D *5/00*; A23L *1/34, 1/36, 1/38*
U.S. Cl. 426—601 **8 Claims**

1. A process for powdering a dry, solid foodstuff which normally forms a paste or grinding having a fat content greater than about 30% to produce a free-flowing powder comprising the steps of adding thereto 25-400% by weight of the fat content of the foodstuff of a grinding agent comprising a food-grade film-forming material which has been spray-dried from solution in the presence of a latent gas and which is characterized by a bulk density within the range of 3 to 25 pounds per cubic foot and grinding the mixture to effect powdering.

4,232,053

COOKED COMESTIBLE BASE CONTAINING CITRUS JUICE VESICLES AND METHOD OF PREPARATION

Jon R. Blake, Brooklyn Center, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed May 31, 1979, Ser. No. 43,993
Int. Cl.[2] A23L *1/212*
U.S. Cl. 426—616 **13 Claims**

1. A process for the preparation of a comestible base, comprising the step of:

cooking a blend at a temperature of between about 180° F. and 280° F. to form a comestible base having
  1. a moisture content of between about 30% to 60% by weight; and
  2. a Brookfield viscosity of between about 7,000 and 10,000 cp. at 190° F.,

said blend having a viscosity of between about 3,000 and 6,000 cp. at 190° F. and comprising
  1. from about 25% to 65% by weight of the blend of citrus juice vesicles having a moisture content between about 89% to 96% by weight of the vesicles;
  2. from about 7% to 45% by weight of the blend of a nutritive carbohydrate sweetening agent;
  3. sufficient edible non-volatile organic acid or sodium salts thereof to provide the blend with a pH ranging between about 2.5 to 5.5;
  4. from about 1% to 5% by weight of the blend of an ungelatinized starch;
  5. from about 8% to 60% by weight of the blend of water.

4,232,054

INGESTABLE COMPOSITION CONSISTING OF A METALLIC NATURAL PROTEINATE AND NUTRITIVE FIBERS

Jean P. Durlach, Paris, France, assignor to Cooperation Pharmaceutique Francaise, France

Filed Jan. 16, 1979, Ser. No. 3,986
Claims priority, application France, Jan. 18, 1978, 78 01402
Int. Cl.[2] A23L *1/10*; A21D *13/02*
U.S. Cl. 426—618 **9 Claims**

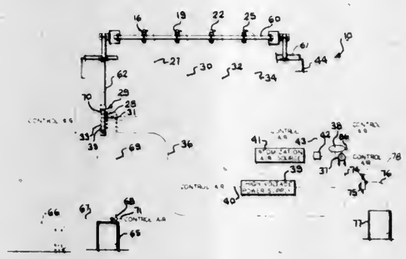
1. An ingestible composition comprising a nutritive cereal fiber and a natural metallic proteinate in the proportion by weight of approximately 5 to 120 parts proteinate for 100 parts fiber.

4,232,055

AUTOMATIC COLOR CHANGE ELECTROSTATIC PAINT SPRAY SYSTEM

Donald O. Shaffer, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 24, 1979, Ser. No. 32,790
Int. Cl.[2] B05B *5/02*; B05D *1/04*
U.S. Cl. 427—33 **7 Claims**



1. A method for electrostatic spraying work pieces with an electrically conductive paint comprising the steps of:

supplying a first electrically conductive paint from a first paint source sequentially through first and second electrically insulated conduits to an electrostatic spray gun to coat one of the work pieces with such first paint;

interrupting paint flow through said first and second conduits;

purging all paint from said first and second conduits with a solvent;

drying at least said first conduit whereby said first conduit is electrically non-conductive; and

supplying a second electrically conductive paint from a second paint source sequentially through a third electrically insulated conduit and said second conduit to said spray gun to coat another of said work pieces with such second paint whereby said non-conductive first conduit insulates said first paint source from paint in said second and third conduits while said second paint is being sprayed.

4. Apparatus for sequentially electrostatic spraying different ones of a plurality of electrically conductive paints from a plurality of paint sources comprising a plurality of electrically non-conductive first paint conduits, a like plurality of first valve means for selectively controlling a flow of paint from a different paint source to each of said first conduits, a second conduit, a plurality of second valve means for selectively connecting said first conduits to said second conduit, each of said paint sources having an associated first valve means, first paint conduit and second valve means, an electrostatic spray gun, means for applying paint from said second conduit to said spray gun, means for simultaneously opening the first and second valve means associated with a first pre-selected paint source whereby paint flows from said pre-selected source through said associated first conduit and said second conduit to said spray gun, means for purging paint with a paint solvent from said first conduit and said second valve means associated with said pre-selected source and from said second conduit and said spray gun, and means for purging such paint solvent from at least said first conduit associated with said pre-selected source to form an electrical insulator between said first and second valve means associated with said pre-selected source whereby, when paint from a different pre-selected source is subsequently supplied through said first valve means, said first conduit and said second valve means associated with said different pre-selected source, through said second conduit and said applying means to said spray gun, such paint from said different pre-selected source is insulated from electrical contact with paint from said first pre-selected source.

4,232,056

THERMOSPRAY METHOD FOR PRODUCTION OF ALUMINUM POROUS BOILING SURFACES

Andrew C. Grant, Amherst, and James W. Kern, North Tonawanda, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,225
Int. Cl.[3] B05D *1/10*
U.S. Cl. 427—37 **9 Claims**

1. Method for making an aluminum porous boiling surface having an open cell structure top coating on a metal substrate comprising

(a) melting an essentially pure aluminum oxide free wire by means of a thermospray gun;

(b) entraining said molten aluminum in an inert gas stream to shield from the surrounding atmosphere, and thereby minimize oxide formation, atomize, and transport, such atomized aluminum particles;

(c) positioning said thermospray gun so that the nozzle to substrate distance is in the range of about 2 to 4 inches;

(d) impinging said inert gas stream containing the aluminum particles on said metal substrate to form bond coating having less than 15 percent porosity and having a thickness of not greater than 4 mils;

(e) than increasing the nozzle to substrate distance to a distance in the range of from 4 to 10 inches; and

(f) impinging said inert gas stream containing the aluminum

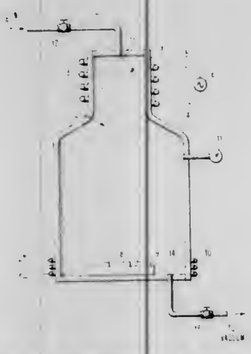
particles on said bond coating to form an open cell structure essentially oxide free top coating, having porosity of greater than 18% and having a thickness of at least four times the thickness of the bond coating, thereby producing a porous boiling surface having sufficient open cell porosity required for effective performance as a boiling surface while exhibiting good adhesion and mechanical strength.

4,232,057

SEMICONDUCTOR PLASMA OXIDATION

Asit K. Ray, Mt. Kisco, and Arnold Reisman, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,648
Int. Cl.³ B05D 3/06
U.S. Cl. 427—39 **4 Claims**



1. The process of linear plasma oxide growth on semiconductor substrates comprising in combination the steps of:
providing a container having a separated plasma generation location and an oxide growth location,
maintaining in said container an oxygen ambient at a pressure in a range of less than 40 millitorr,
applying power external to said container adjacent to said plasma generation location sufficient to form a plasma of said oxygen, and
maintaining a substrate temperature in the range of 300° to 800° C. with a temperature source external to said container adjacent to said oxide growth location.

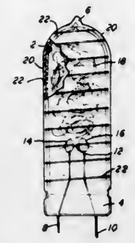
4,232,058

METHOD OF COATING A LAMP WITH A U.V. CURABLE RESIN WITH FIBERS THEREIN

Judith A. Dow, Boston, and Timothy Fohl, Carlisle, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 699,139, Jun. 23, 1976. This application Oct. 13, 1978, Ser. No. 950,961
Int. Cl.³ B05D 1/18, 3/06; F21K 5/02
U.S. Cl. 427—54.1 **4 Claims**

1. A method of applying a protective light-transmitting coating on the exterior surface of a lamp envelope, said method comprising:
mixing lengths of fiber into a liquid photopolymer, said lengths of fiber being between about the length of the maximum dimension of said envelope and 1/16 inch,
dipping said envelope into the mixture of fibers and liquid photopolymer, and
irradiating the coated envelope with a source of ultraviolet light for a period of between about 0.1 second and 10 seconds so as to cure-harden the fiber-reinforced photo-



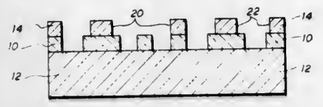
polymer coated on said lamp, whereby a smooth coating surface is provided with minimized protrusion of fibers.

4,232,059

PROCESS OF DEFINING FILM PATTERNS ON MICROELECTRONIC SUBSTRATES BY AIR ABRADING

William G. Proffitt, St. Petersburgh, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 825,209, Aug. 17, 1977, abandoned. This application Jun. 6, 1979, Ser. No. 46,031
Int. Cl.³ B05D 5/12; B24B 1/04
U.S. Cl. 427—96 **5 Claims**



1. A process for delineating a film pattern in an air abrasive electroconductive film coating material on a substantially nonconductive substrate comprising:
forming a substantially continuous film coating of antimony doped tin oxide on the substrate, said film coating having a thickness between about 50 microinches and about 250 microinches;
integrally applying to said film coating a mask film of metallic material which is air abrasive resistant relative to the antimony doped tin oxide;
selectively etching said mask film to generate a mask to form masked and unmasked portions on said film coating corresponding to the desired pattern; and
air abrading said film coating thereby leaving the masked portions of said film coating remaining on the substrate and removing the unmasked portions of said film coating.

4,232,060

METHOD OF PREPARING SUBSTRATE SURFACE FOR ELECTROLESS PLATING AND PRODUCTS PRODUCED THEREBY

Glenn O. Mallory, Jr., Los Angeles, Calif., assignor to Richardson Chemical Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 788,598, Apr. 18, 1977, abandoned, which is a division of Ser. No. 473,147, May 24, 1974, Pat. No. 4,019,910. This application Jan. 22, 1979, Ser. No. 5,169
Int. Cl.² C23C 3/02
U.S. Cl. 427—98 **16 Claims**

1. A method for preparing a printed wiring board which comprises treating a wiring board having a circuitry pattern thereon with a polymetallic catalyzing agent bath including a deposition-enhancing metal selected from the group consisting of nickel, cobalt, and combinations thereof, and a secondary metal selected from the group consisting of tin, molybdenum, copper, tungsten, and combinations thereof, said catalyzing agent bath including copper only when it also includes one or more of tin, molybdenum or tungsten as said secondary metal, said bath including an ester complex of a polyhydric compound, said catalyzing agent bath enhancing subsequent overplating onto said circuitry pattern, said treating step lasting for a time period sufficient to nucleate the surface of the circuitry pattern and insufficient to deposit a generally continuous plating film thereon, said treating step being followed by rinsing



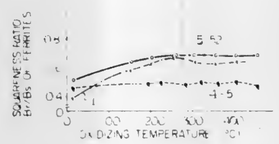
said catalyzing agent bath treated circuit board with an aqueous rinsing agent, said treating step and said rinsing step cooperating to enhance catalyzing agent film formation onto said circuitry pattern in preference to portions of the wiring board that are not within the circuitry pattern to provide a preferentially catalyzed wiring board; and thereafter immersing the preferentially catalyzed wiring board into a bath for overplating the circuitry pattern with a metal selected from the group consisting of nickel, cobalt, and polyalloys including nickel or cobalt.

4,232,061

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Seizi Hattori, Ibaragi; Koichi Makino, Yokohama; Takehiko Nakagawa, Kawasaki, and Masayoshi Shinohara, Kokubunji, all of Japan, assignors to Fujitsu Limited, Japan

Filed Aug. 18, 1977, Ser. No. 825,790
Claims priority, application Japan, Sep. 1, 1976, 51-103736
Int. Cl.² G11B 5/84
U.S. Cl. 427—130 **12 Claims**



1. A process for producing a magnetic recording medium of a thin film of ferrite, comprising the steps of:
forming a thin film of α-Fe_2O_3 containing Cu in an amount of from 1 to 15%, Ti in an amount of from 1 to 10% and Co in an amount of from 1 to 10%, based on the number of atoms of Fe of said ferrite;
reducing said α-Fe_2O_3 to Fe_3O_4 by heating said α-Fe_2O_3 at a temperature in the range of from 225° to 400° C. in a reducing atmosphere; and,
oxidizing said Fe_3O_4 to δ-Fe_2O_3 by heating said Fe_3O_4 at a temperature in the range of from 150° to 450° C. in an oxidizing atmosphere.

4,232,062

METHOD OF COATING GLASS SURFACE WITH HEAT-REFLECTIVE TITANIUM OXIDE FILM

Seiki Okino; Kunio Nakata; Toshiharu Yanai, and Takayoshi Kandachi, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Mar. 14, 1979, Ser. No. 20,464
Claims priority, application Japan, Mar. 16, 1978, 53-29307
Int. Cl.² B05B 5/00
U.S. Cl. 427—160 **11 Claims**
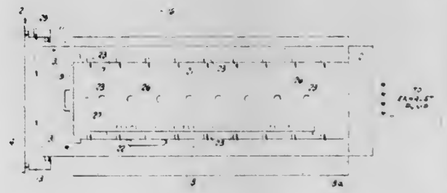
1. In a method of coating a glass surface with a heat-reflecting metal oxide film, which comprises titanium oxide as an essential component thereof, by applying a solution containing a thermally decomposable titanium compound dissolved in an organic solvent onto a surface of a glass body and heating the solution on the glass surface to cause thermal decomposition of the titanium compound to titanium oxide,
the improvement comprising the use of a chelated titanium compound as said thermally decomposable titanium compound, said chelated titanium compound having at least one alkoxy group selected from the group consisting of propoxy groups and butoxy groups and at least one octyleneglycol chelate ligand.

4,232,063

CHEMICAL VAPOR DEPOSITION REACTOR AND PROCESS

Richard S. Rosler, Saratoga, and Robert W. East, San Jose, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 773,974, Mar. 3, 1977, abandoned. This application Nov. 14, 1978, Ser. No. 960,594
Int. Cl.³ B05D 5/12; B05C 13/00
U.S. Cl. 427—94 **7 Claims**



1. In a process for forming films of relatively uniform thickness on a plurality of generally planar wafers in a reaction chamber having an elongated distribution tube of slightly

greater diameter than the wafers with a plurality of axially spaced openings formed therein, the steps of:

A. placing the wafers in the distribution tube with the wafers spaced axially along the tube so that the major surfaces of the wafers are generally perpendicular to the axis of the tube and the spacing between adjacent ones of the wafers is at least as great as the distance between the edges of the wafers and the side wall of the distribution tube;

B. introducing a reactant gas into the chamber outside the tube with the pressure within the chamber at a subatmospheric level; and

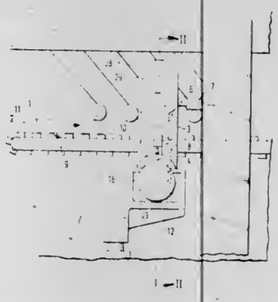
C. permitting the gas to pass through the openings in the tube to the wafers for a time sufficient to deposit a layer of predetermined thickness on the wafers.

4,232,064

METHOD FOR MELTING AND APPLYING A FUSION ADHESIVE

Walter Nicklas, Nuertingen-Oberensingen; Dietrich Hesler, Frickenhausen, and Gerhard Gresser, Oberboihlingen, all of Fed. Rep. of Germany, assignors to Firma Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Division of Ser. No. 918,570, Jun. 23, 1978, Pat. No. 4,178,876.
This application Dec. 7, 1978, Ser. No. 967,105
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731799
Int. Cl.² B05D *5/10*
U.S. Cl. 427—208.4 **4 Claims**



1. A method for melting and applying fusion adhesive to a work piece in a gluing machine, comprising the steps of: supplying the fusion adhesive from a magazine into a melting chamber, pressing said fusion adhesive by power operated feed advance means in the direction and against a heatable melting wall, melting only a zone of the fusion adhesive which rests against said melting wall, supplying the molten adhesive under pressure to an applicator device, and initiating the operation of said feed advance means for the fusion adhesive in response to the movement of said work piece through the gluing machine.

4,232,065

AQUEOUS METAL COORDINATION COMPOUNDS AS PROTECTIVE COATINGS FOR GLASS

Arnold F. Marcantonio, and Rodney E. Dailey, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Jan. 31, 1979, Ser. No. 8,291
Int. Cl.² B05D *3/02, 7/26;* B32B *17/06, 27/06*
U.S. Cl. 427—226 **20 Claims**

1. A method of increasing the chemical durability of glassware comprising treating the surfaces of the glassware while at an elevated temperature of at least 425° C., with a solution containing a coordination compound, said compound being represented by the formula Y_2MX_6 wherein Y is an alkali metal, hydrogen or ammonium, M is titanium, tin or zirconium and X is a halogen, said compound being present in a concentration of about 2 to about 50 weight percent.

5. A method of increasing the abrasion resistance and chemical durability of a glass article comprising contacting the surface of said article while at an elevated temperature of at least 425° C., with an aqueous solution having therein MX_6^{-2} ions at a concentration of about 2 to about 50 weight percent wherein M is titanium, tin or zirconium and X is a halogen, the temperature of the glass being sufficient to immediately and substantially completely vaporize the water content of said solution and above the decomposition temperature of said MX_6^{-2}, and thereafter applying to said surface an organic material selected from the group consisting of polyethylene, polypropylene, polystyrene, polyurethane, and fatty acids and their derivatives and mixtures thereof.

9. A method of increasing the abrasion resistance and chemical durability of a glass article comprising applying to the surface of said article while at an elevated temperature an aqueous solution of about 2 to about 50 weight percent of a coordination compound, said compound being represented by the formula Y_2MX_6 wherein Y is an alkali metal, hydrogen or ammonium, M is titanium, tin or zirconium and X is a halogen, the temperature of the glass being sufficient to immediately and substantially completely vaporize the water content of said solution and above the decomposition temperature of said coordination compound, and thereafter annealing said article so treated at a temperature of at least about 425° C., to thereby decompose said coordination compound on the surface of said glass article and thereafter applying to said annealed article an organic material selected from the group consisting of polyethylene, polypropylene, polystyrene, polyurethane, and fatty acids and their derivatives.

14. A method of increasing the abrasion resistance and chemical durability of a glass article comprising contacting the surface of said article while at an elevated temperature with an aqueous solution of between about 2 to about 50 weight percent of a coordination compound selected from the group consisting of $(NH_4)_2TiCl_6$, $(NH_4)_2TiF_6$, Na_2TiCl_6, Na_2TiF_6, K_2TiCl_6, K_2TiF_6, $(NH_4)_2SnCl_6$, $(NH_4)_2SnF_6$, Na_2SnCl_6, Na_2SnF_6, K_2SnCl_6, K_2SnF_6, $(NH_4)_2ZrCl_6$, $(NH_4)_2ZrF_6$, Na_2ZrCl_6, Na_2ZrF_6, K_2ZrCl_6, K_2ZrF_6, H_2TiCl_6, H_2TiF_6, H_2SnCl_6, H_2SnF_6, H_2ZrCl_6 and H_2ZrF_6, the temperature of the glass being sufficient to immediately and substantially completely vaporize the water content of said solution, the temperature of the glass being at least about 425° C., and above the decomposition temperature of said coordination compound, and thereafter annealing said article so treated at a temperature of at least about 590° C., to thereby decompose said coordination compound on the surface of said glass article, and thereafter applying to said annealed article with an organic material selected from the group consisting of polyethylene, polypropylene, polystyrene, polyurethane, and fatty acids and their derivatives.

4,232,066

METHOD AND APPARATUS FOR DIPPING METAL FENCE POSTS

Joel B. Stevens, McMinnville, and Mark C. Wirfs, Beaverton, both of Oreg., assignors to Cascade Steel Rolling Mills, Inc., McMinnville, Oreg.

Filed Aug. 31, 1978, Ser. No. 938,704
Int. Cl.³ B05C *13/00*
U.S. Cl. 427—430.1 **11 Claims**

1. In a machine for dipping fence posts without interrupting the continuous flow of such posts along a predetermined path in a predetermined direction,

said machine comprising traveling means interposed in a gap in said flow of posts,

said traveling means having means for picking up a group of posts in horizontal positions, elevating such posts to a vertical dipping position, dipping said posts and then returning them back to horizontal, and depositing them in said flow path,

power means for driving said traveling means in said predetermined direction at a faster rate of speed than that of said rate of flow to advance said group beyond the positions they would occupy if left in said flow,

said power means causing the traveling means to return in the opposite direction for picking up a second group of posts to be dipped,



said power means operating at a speed such that the time for completion of a cycle of its travel is not greater than the time necessary for a group of posts in said flow path to move from one space into the next adjacent space.

4,232,067

RECONSOLIDATED WOOD PRODUCT

John D. Coleman, Surrey Hills, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Continuation of Ser. No. 787,735, Apr. 15, 1977, abandoned.
This application Oct. 26, 1978, Ser. No. 954,949
Claims priority, application Australia, Apr. 15, 1976, PC5622
Int. Cl.² B05D *3/12;* B27M *1/02, 1/08;* B32B *21/14, 31/20*
U.S. Cl. 428—17 **26 Claims**

1. Reconsolidated wood product including at least one flexible open lattice work web of naturally interconnected wood strands, said strands extending substantially parallel to each other in the direction of the grain of the natural wood and a bonding agent bonding together said strands which have been consolidated to substantially their original orientation.

8. Process for forming a reconsolidated wood product consisting substantially of the steps of rending natural wood to form a flexible open lattice work web of substantially parallel aligned, naturally interconnected strands, compressing the web to consolidate the strands and bonding said strands together.

4,232,068

SHIM

Thomas L. Hoh, 8311 Gaines Rd., Cincinnati, Ohio 45239, and Robert H. Relly, 3051 Kirklevington Dr., Apt. 72, Lexington, Ky. 40502

Filed Jan. 2, 1979, Ser. No. 20
Int. Cl.³ B32B *3/30, 3/26*
U.S. Cl. 428—43 **9 Claims**

1. A shim for use as a spacing device between two adjacent elements, said shim comprising a planar, U-shaped structure of uniform thickness with parallel leg portions and a connecting base portion, said shim having parallel upper and lower surfaces, said upper and lower surfaces of said shim being longitudinally striated so as to form longitudinal, parallel, narrow, alternate grooves and ridges therein, whereby two or more of said shims may be stacked to achieve a desired shim thickness with said alternate grooves and ridges of said upper and lower surfaces of adjacent shims nesting to prevent lateral shifting of said stacked shims with respect to each other, and a handle portion on said shim, said handle portion being coplanar with said shim leg and base portions, said handle portion being located centrally of said base portion and extending therefrom in a direction opposite said leg portions.

4,232,069

IMPACT RESISTANT COMPOSITE STRUCTURE

Leo J. Windecker, Midland, Tex., assignor to International Harvester Company, Chicago, Ill.

Filed Apr. 16, 1979, Ser. No. 30,208
Int. Cl.² B32B *3/10, 3/14*
U.S. Cl. 428—47 **6 Claims**

1. An impact resistant composite structure comprising:

(a) a base portion having a plurality of plys of high tensile strength fibrous sheets impregnated with an adhesive elastic resin;

(b) a facing portion bonded to said base portion and comprising a plurality of closely spaced tiles having a Rockwell hardness of thirty and embedded in a layer of adhesive elastic resin having a suspended mixture of polymeric microspheres of more than 2 percent in weight relative to the quantity of adhesive elastic resin, said layer of said adhesive elastic resin being at least three times the thickness of said tiles and said tiles being mounted in a plane that generally extends along the centerline of said adhesive elastic resin; and

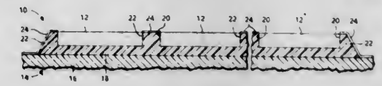
(c) said facing portion including a facing surface having a plurality of layers of high tensile strength fibrous sheets impregnated with an adhesive elastic resin.

4,232,070

NON-ARCING DIELECTRIC MODULAR ARRAY

George T. Inouye, Ranchos Palos Verdes; Nathaniel L. Sanders, Anaheim, and Winston C. Moss, Palos Verdes Estate, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 7, 1978, Ser. No. 958,591
Int. Cl.² B32B *3/14*
U.S. Cl. 428—49 **8 Claims**



1. In combination:

a mounting substrate,

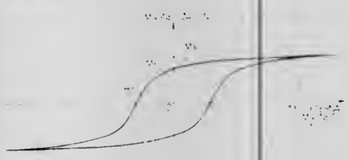
a dielectric element mounted on said substrate having an outer surface spaced from said substrate which tends to accumulate a high electrical charge relative to said substrate in a plasma environment and thereby induce arc discharge between said surface and substrate, and

resilient electrically conductive means about the edges of said element disposed in electrically conductive relation to said element surface and grounded to said substrate to provide an electrically conductive path about said element for bleeding electrical charges from said surface to said substrate and thereby suppressing said arc discharges.

4,232,071
METHOD OF PRODUCING MAGNETIC THIN FILM

Akira Terada, Mito; Seizi Hattori, Tomobe; Yoshikazu Ishii; Akira Nohara, both of Mito; Nobuo Inagaki, Katsuta; Wakatake Matsuda, Zama, and Susumu Kawakami, Tama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Filed Jun. 29, 1977, Ser. No. 811,294
Claims priority, application Japan, Jul. 1, 1976, 51-78611
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—64 9 Claims



1. In a method of producing a γ-Fe_2O_3 continuous thin film magnetic disk medium wherein a deposition source is deposited on an opposed aluminum alloy substrate by means of a reactive vacuum deposition and the film thus formed thermally treated to form the γ-Fe_2O_3 magnetic disk medium, the improvement comprising employing as the deposition source a ferroalloy comprising from about 1 to about 10 at.% titanium, from about 0.5 to about 5 at.% cobalt, and from about 85 to about 98.5 at.% iron.

9. In a magnetic disk medium comprising a continuous Fe_2O_3 thin film on an aluminum alloy substrate the improvement, wherein said film comprises from about 1 to about 10 at.% titanium, from about 0.5 to about 5 at.% Co and from about 85 to about 98.5 at.% iron.

4,232,072
PROTECTIVE COMPOSITIONS FOR RECORDING

Robert P. Pardee, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Continuation-in-part of Ser. No. 722,174, Sep. 10, 1976, Pat. No. 4,096,079. This application Jun. 14, 1978, Ser. No. 915,629
Int. Cl.[2] G11B *5/70*; C10M *1/32*; G11B *5/72*; B32B *3/02*
U.S. Cl. 428—65 9 Claims

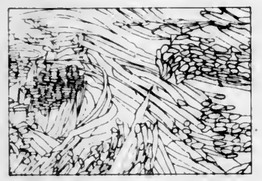
1. A composition for imparting lubricity and wear resistance to a surface having dynamic presentations thereon comprising about 0.001 to about 3.000 weight percent of a composition containing a carboxylate ester, said ester being derived from a perfluoroalkyl alcohol of the formula $C_nF_{2n+1}(CH_2)_mOH$ wherein n is from about 3 to about 14 and m is 1 to 3 and an aliphatic carboxylic acid having about 3 to 30 carbon atoms, and an antistatic agent selected from the group consisting of amines, fatty quaternary ammonium compounds, fatty acid esters, phosphate esters and ethoxylated compounds, and about 97.00 to about 99.999 weight percent of a solvent therefor.

9. A phonograph record having deposited over the playing surface of said phonograph record a composition comprising a carboxylate ester derived fluoroalkanols having the formula $C_nF_{2n+1}(CH_2)_mOH$ wherein n is from about 3 to about 14 and m is 1 to 3, and an aliphatic acid selected from the group consisting of monocarboxylic acid and polycarboxylic acids, said acid having about 3 to 30 carbon atoms, and an antistatic agent selected from the group consisting of amines, fatty quaternary ammonium compounds, fatty acid esters, phosphate esters and ethoxylated compounds.

4,232,073
FIBROUS SHEET MATERIALS RESEMBLING A DEER SKIN AND PROCESS FOR PREPARING SAME

Miyoshi Okamoto, Takatsuki, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 831,047, Sep. 6, 1977, Pat. No. 4,127,696, which is a continuation-in-part of Ser. No. 745,161, Nov. 26, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,806
Claims priority, application Japan, Jun. 17, 1976, 51-70379
Int. Cl.[2] B29D *27/00*
U.S. Cl. 428—91 9 Claims

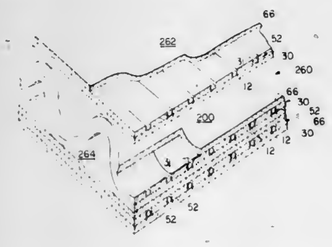


1. A sheet-like material comprising bundles of mixed extra fine fibers having approximately quadrilateral to nonagonal cross-sections, in which bundles each extra fine fiber is surrounded by other extra fine fibers, a majority of the fibers positioned at the inside portion have cross-sections of a greater number of angles than the number of angles of the cross-sections of the fibers positioned at the outside portion and each extra fine fiber has peripheral surfaces to be faced approximately parallel, in a coherent state to the peripheral surfaces of the other extra fine fibers adjacent to said each extra fine fiber, said sheet-like material having, on the surface thereof, raised fibers composed of protruding ends of the extra fine fibers and having a polymeric binder material impregnated therein, said sheet-like material being of the group consisting of non-woven and knitted sheet-like materials.

4,232,074
REINFORCED PAPER PRODUCT AND METHOD FOR THE MANUFACTURING THEREOF

Marc A. Chavannes, 4044 Roberts Point, Sarasota, Fla. 33581

Continuation-in-part of Ser. No. 599,142, Jul. 25, 1975. This application Feb. 15, 1978, Ser. No. 878,158
Int. Cl.[2] B32B *3/28, 5/10*
U.S. Cl. 428—110 38 Claims



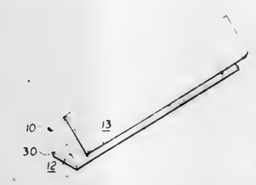
1. A reinforced corrugated paper laminate comprising:
a first paper layer having a plurality of spaced parallel channels formed on the surface of one face thereof, said channels being of a depth less than the thickness of said first paper layer;
a plurality of longitudinal wires in said channels of said first paper layer, the depth of said channels corresponding to the thickness of said longitudinal wires disposed therein, and the width of each of said channels corresponding to the total thickness of said wires disposed therein, and said channels having a cross-sectional area greater than the cross-sectional area of said wires disposed therein;
a second paper layer adhesively secured to said surface of said first paper layer having said channels formed thereon to hold said plurality of wires in place between said first paper layer and said second paper layer to form a wire reinforced paper laminate; and
said wire reinforced paper laminate being corrugated transversely of said longitudinal wires.

6. A reinforced corrugated board comprising:
a first paper medium, said first paper medium being corrugated to form the corrugating medium of said corrugated board;
a second paper medium forming an outer facing of said corrugated board, said second paper medium being adhered to the crests of one side of said corrugated first paper medium to form said corrugated board; and
at least said first paper medium being a wire reinforced medium, each wire reinforced medium being comprised of a first paper layer having a plurality of spaced parallel channels formed on the surface of one face thereof, said channels being of a depth less than the thickness of said first paper layer; a plurality of longitudinal wires in said channels of said first paper layer, the depth of said channels corresponding to the thickness of said longitudinal wires disposed therein and the width of each of said channels corresponding to the total thickness of said wires disposed therein, and said channels having a cross-sectional area greater than the cross-sectional area of said wires disposed therein; and a second paper layer adhesively secured to said surface of said first paper layer having said channels formed thereon to hold said plurality of wires in place between said first paper layer and said second paper layer.

4,232,075
PLASTIC MIRROR ARTICLE AND METHOD OF MAKING SAME

William A. Gantz, and David M. Gantz, both of Berkeley, Calif., assignors to Gantec Corporation, Emeryville, Calif.

Filed Dec. 19, 1978, Ser. No. 970,909
Int. Cl.[2] G02B *5/08*; B32B *31/18, 31/20*
U.S. Cl. 428—124 12 Claims



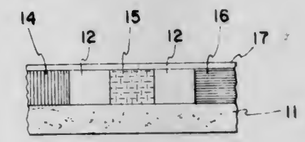
1. A method of forming an optical quality smooth surface on a high impact polystyrene sheet having first and second surfaces comprising the steps of:
(a) placing the first surface of the sheet in contact with a master having a highly polished surface;
(b) pressing the sheet against the highly polished surface;
(c) heating the sheet to a temperature at which the high impact polystyrene flows while maintaining the pressure between the sheet and the highly polished surface;
(d) allowing the sheet to cool to a temperature below that at which the high impact polystyrene flows; and
(e) releasing the pressure between the cooled sheet and the polished surface.

10. An article having a mirrored surface comprising a high impact polystyrene sheet having a press polished first surface and a reflective coating deposited thereon.

4,232,076
METHODS OF OBTAINING DEEP THROUGH PENETRATION OF COLORANTS INTO POLYVINYL CHLORIDE COMPOSITIONS, AND THE RESULTING PRODUCTS

John R. Stetson, Lebannon; Alan A. Graham, Mercerville, both of N.J., and Rudolf Frisch, Yardley, Pa., assignors to Congoleum Corporation, Kearny, N.J.

Filed Nov. 13, 1978, Ser. No. 960,402
Int. Cl.[2] B32B *3/12, 5/16*
U.S. Cl. 428—158 16 Claims



1. A method of obtaining deep through penetration into firmed printable gelled plastisol or sintered dry-blend polyvinyl chloride compositions which comprises: applying a transfer paper or other release surface coated with a low energy, sublimable disperse dye having a molecular weight of from about 200 to about 400 to the surface of a firmed, printable gelled plastisol or sintered dry-blend polyvinyl chloride composition prepared from polyvinyl chloride resin in finely divided particulate form having a particle size of from about 0.5 micron to about 420 microns, from about 25 parts to about 150 parts of plasticizer per one hundred parts of polyvinyl chloride resin, and from about 0.4 parts to about 10 parts of a heat stabilizer per one hundred parts of polyvinyl chloride resin, said low energy, sublimable disperse dye being in direct, intimate contact with said polyvinyl chloride composition; applying heat to said polyvinyl chloride composition and said low energy sublimable disperse dye having a molecular weight of from about 200 to about 400 in the range of from about 300° F. to about 470° for a period of time of from about 6 seconds to about 20 seconds, whereby said low energy, sublimable disperse dye sublimes and, while in the vapor phase, penetrates into said firmed printable gelled plastisol or sintered dry-blend polyvinyl chloride composition and said polyvinyl chloride resin is substantially completely fused by being substantially completely solvated with said plasticizer; and removing said transfer paper or other release surface after said low energy, sublimable disperse dye has penetrated into said firmed, printable gelled plastisol or sintered dry-blend polyvinyl chloride composition and said polyvinyl chloride resin has been fused.

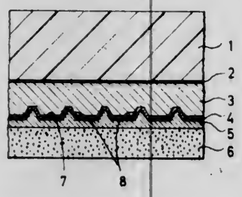
10. A resinous polymer sheet material comprising: a layer of a fused polyvinyl chloride resin composition prepared from a finely divided particulate polyvinyl chloride resin having an average particle size in the range of from about 0.5 micron to about 420 microns, from about 25 parts by weight to about 150 parts by weight of a plasticizer per 100 parts by weight of said polyvinyl chloride resin, and from about 0.4 parts by weight to about 10 parts by weight of a heat stabilizer per 100 parts by weight of said polyvinyl chloride resin, said polyvinyl chloride resin being substantially completely fused by being substantially completely solvated with said plasticizer; and a colored pattern or design of a low energy sublimable disperse dye having a molecular weight of from about 200 to about 400 printed on the surface of and extending deeply through said layer of polyvinyl chloride resin composition, said colored pattern or design of a low energy sublimable disperse dye having a molecular weight of from about 200 to about 400 being formed on the underside face of a heat transfer release substrate and directly and intimately contacting the surface of said layer of a polyvinyl chloride resin composition.

4,232,077

HOT-STAMPING FILM, AND PROCESS AND APPARATUS FOR ITS MANUFACTURE

Fritz Meisel, Sudweg 60, D-8510 Furth, Bayern, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 833,914, Sep. 16, 1977, abandoned. This application Feb. 22, 1979, Ser. No. 14,025
Int. Cl.[3] B32B *3/00*; B44C *1/24*; C09J *7/02*
U.S. Cl. 428—174 9 Claims



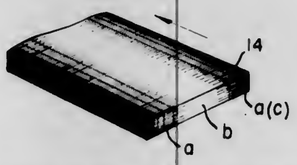
1. A hot-stamping film comprising a carrier film, a transparent covering lacquer layer having a smooth surface adjacent to the carrier film and being provided on its surface facing away from said carrier film with a spatial pattern, a decorative layer contacting the surface of the transparent covering lacquer layer provided with the spatial pattern, and an adhesive layer, optionally with a separating layer between the carrier film and the covering lacquer layer and optionally with an adhesion-promoter layer between the decorative layer and the adhesive layer.

4,232,078

MULTI-COLORED SYNTHETIC RESIN SHEET

Isao Kamada, Otake, Japan, assignor to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,086
Int. Cl.[2] B32B *27/00*
U.S. Cl. 428—195 26 Claims



1. A multi-colored synthetic resin sheet having an upper surface, a lower surface, and a uniformly colored longitudinal cross-section, which has at least two longitudinally adjacent different colors with a boundary portion therein between, with the boundary portion between said colors being in a gradated state on the upper surface, on the lower surface and throughout a transversal cross-section of said sheet.

8. A method of producing a multi-colored synthetic resin sheet which comprises:

adjacently feeding onto a moving belt at least two differently colored liquids comprising polymerizable monomer;

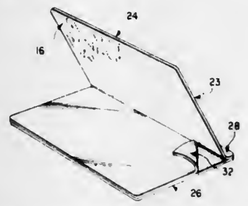
polymerizing and hardening said liquids; thereby obtaining a multi-colored synthetic resin sheet which has an upper surface, a lower surface, and a uniformly colored longitudinal cross-section, which has at least two longitudinally adjacent colors with the boundary portion between said colors being in a gradated state on the upper surface, on the lower surface, and throughout a transversal cross-section of said sheet.

4,232,079

NOVEL I.D. CARDS

Thomas Raphael, Winchester, and Joseph Shulman, Hyde Park, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 755,684, Dec. 30, 1976, Pat. No. 4,151,666. This application Mar. 19, 1979, Ser. No. 21,580
Int. Cl.[2] B32B *3/00*, *5/16*; G09F *3/02*
U.S. Cl. 428—195 15 Claims



1. A protective laminar assembly for lamination to an information-bearing document, said assembly comprising a plastic sheet material having an adherent capability and a verification pattern of a light-transmissive pigment material having an average particle size between about 1 to about 25 microns and a dry brightness value of no greater than about 95 integrated with said sheet material or said adherent capability.

4,232,080

SAFETY WINDOW COMPRISING SELF-HEALING POLYMERIC LAYER

Roger Orain, Vaucresson, France; Hans Heuser; Hans Ohlenforst, both of Aachen, Fed. Rep. of Germany, and Rudolf Pelzer, Herzogenrath, Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 369,087, Jun. 11, 1973, abandoned. This application Mar. 10, 1977, Ser. No. 776,214
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1972, 2228299
Int. Cl.[2] B32B *17/10*, *27/40*; C03C *17/32*, *27/12*
U.S. Cl. 428—215 19 Claims

1. Safety glass characterized by its ability to protect against broken glass laceration and by its ability to absorb the energy of an object impacting against the safety glass throughout a substantial plastic deformation occurring during such impact, said safety glass being transparent and having an elastic plastic layer adhered to the interior surface of a safety glass construction composed of exterior and interior sheets of glass between which there is a layer of an energy absorbing plastic, said interior elastic plastic layer being transparent, anti-lacerative and self-healing and which, during such impact, exhibits an elastic deformation without rupture sufficient to protect against broken glass laceration throughout a substantial plastic deformation of the safety glass without interfering substantially with the energy absorption of said energy absorbing plastic, said elastic plastic layer having an elongation to rupture in excess of 60% with less than 2% plastic deformation and a modulus of elasticity below 2000 daN/cm^2.

11. A transparent, scratch-resistant, laminated safety windshield for use in a vehicle, characterized by its ability to protect an occupant of the vehicle from broken glass laceration and by its ability to absorb energy throughout a substantial windshield plastic deformation occurring during crash impact of the occupant against the windshield, said windshield having two transparent glass sheets, one of which is of a thickness of 3 to 4 mm, and the other is of a thickness of 2 to 3 mm and is adapted to face the interior of the vehicle, and having two transparent plastic sheets, one of which plastic sheets is an energy-absorbing thermoplastic sheet of poly(vinyl butyral) sandwiched between and adhesively bonding said glass sheets and is of a thickness of at least 0.76 mm, and the other of which plastic sheets is an anti-lacerative, self-healing weakly reticulated aliphatic polyurethane sheet of a thickness between 0.1 and 1 mm and adhered to said other glass sheet, said sheet of polyurethane having an elongation to rupture in excess of 60% with less than 2% plastic deformation and a modulus of elasticity below 2000 daN/cm^2 and exhibiting, during such impact, an elastic deformation, without rupture, sufficient to protect against broken glass laceration without interfering substantially with the energy absorption of said energy absorbing sheet of poly(vinyl butyral).

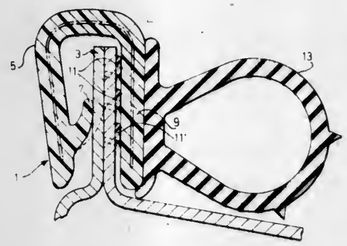
15. A process involving a new use for a known material in which the known material is used in the fabrication of a transparent, laminated, safety glass for use in a vehicle, the safety glass being composed of interior and exterior transparent glass sheets bonded together by a transparent, energy-absorbing plastic sheet capable of absorbing the energy of an object, impacting against either surface of the safety glass, by essentially plastic deformation occurring throughout a substantial path of travel of said object, the known material being a self-healing and transparent plastic, and having a high capacity for elastic deformation including an elongation to rupture in excess of 60% with less than 2% plastic deformation and a modulus of elasticity below 2000 daN/cm^2, said process comprising adhering said known material to the interior surface of the interior glass sheet to provide said interior glass sheet with a self-healing, plastic layer which, during impact, exhibits an elastic deformation, without rupture, sufficient to protect against broken glass laceration without interfering substantially with the energy absorption of said energy absorbing plastic sheet.

4,232,081

EDGE PROTECTOR TRIM STRIP

Ronald E. Pullan, Leeds, England, assignor to Schlegel (U.K.) Limited, Leeds, England

Continuation of Ser. No. 570,518, Apr. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,107, Oct. 30, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,242
Claims priority, application United Kingdom, Apr. 24, 1974, 17886/74
Int. Cl.[2] E06B *7/18*, *7/22*; E04F *19/02*; B32B *15/06*
U.S. Cl. 428—217 30 Claims



1. A one-piece edge protector trim strip for application to an applied position on a flange such as that found around door openings on motor vehicles, said strip having a body of polymeric material of generally U-shaped cross section having a pair of opposed first and second arms having inner opposed first and second surfaces respectively, wherein the improvement comprises:

(a) a first gripper fin of a first deformable polymeric material on said inner first surface of said first arm of said U-shaped body, said first gripper fin extending generally along the length of said strip and projecting toward said inner second surface; and

(b) a plurality of second gripper fins of a second deformable polymeric material softer than said first deformable polymeric material on said inner second surface of said second arm of said U-shaped body, said second gripper fins extending generally along the length of said strip and projecting toward said inner first surface;

whereby when said edge protector trim strip is applied on a flange, said first gripper fin engages and deforms a certain amount against one surface of said flange causing said opposite surface of said flange to engage and deform said second gripper fins a greater amount whereby said more greatly deformed second gripper fins (1) serve to accommodate flanges of different thicknesses, (2) form a good water seal between said opposite surface of said flange and said second gripper fins, and (3) present increased anti-sliding friction surfaces in engagement with said opposite surface of said flange for resisting removal of said film strip from said flange.

29. A method of making a channel-shaped sealing strip comprising the steps of

extruding flexible covering material in relatively hard and relatively soft forms directly onto different regions of a longitudinally extending carrier member so as together they completely cover one surface thereof and join along a line extending longitudinally of that surface, the lateral edges of the carrier member and at least the marginal regions of the other surface of the carrier member being also directly covered by the extruded flexible covering material, at least part of this material being in the relatively soft form,

the material in the relatively soft form on the said one surface additionally being extruded to provide a beading extending longitudinally of the carrier member parallel to the said line,

the material on the said other surface additionally being extruded to provide ribs extending longitudinally of the carrier member parallel to the said line,

the said regions being such that, with the carrier member shaped into channel form, the outside surface of one side wall of the channel so formed is covered by the material in the relatively soft form, the beading runs along this outside surface, the outside surface of the other side wall of the channel is covered by the material in the relatively hard form, and the gripping ribs run along the inside surfaces of the side walls of the channel.

4,232,082

ANTI-ELECTROSTATICALLY GUARDED WORSTED SUITING

Hiroshi Noritake, Takarazuka, Japan, assignor to Nippon Keori Kabushiki Kaisha, Kobe, Japan

Filed Jul. 11, 1979, Ser. No. 56,521
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—225 6 Claims

1. An anti-electrostatically guarded worsted suiting woven or knitted partly of an electroconductive core-spun yarn and mostly of a non-electroconductive core-spun yarn, which comprises

0.03% to 1.0% carbon-black-coated mono-filament fiber of synthetic polymer contained as a core in the electroconductive yarn and more than 35% wool fiber contained both in the electroconductive yarn and in the non-electroconductive yarn,

the electroconductive yarn having as a covering for the mono-filament fiber wool-included fibers of which an aggregate amount is above the fivefold amount of the latter, and being laterally, longitudinally or crosswise equidistantly combined in the suiting,

the wool-included fibers having the average single-fiber finess thereof equal to or less than the one-fifth finess of the mono-filament fiber,

the non-electroconductive yarn including as a core polyester multi-filament fibers.

4,232,083

IMAGING COMPOSITIONS AND METHODS

Donald D. Buerkley, Woodbury; Norman P. Sweeny, North Oaks, and Daniel N. Vivona, Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 22, 1975, Ser. No. 597,998
Int. Cl.[2] B32B *3/16*
U.S. Cl. 428—307 **28 Claims**

1. A color-forming precursor composition comprising an organic color-forming, metal-complexing compound having a plurality of ligand groups and an organic cosolvent for said compound, said compound having the formula

$$R^1(L)_n$$

wherein
n is a number from 2 to about 100,
L is a metal-complexing ligand group, and
R^1 is a polyvalent organic group having a valence of n, provided that when n is 2 or 3 and R^1 is a fatty hydrocarbon group, R^1 contains about 34 and 51 carbon atoms respectively,
said compound being capable of complexing with transition metal ions to form metal-containing colored products which are substantially insoluble in organic cosolvents for said compound.

15. A sheet-like substrate having at least a portion of one major surface coated with the color-forming precursor composition of claim 1.

16. A method of providing a dark, permanent image on a sheet-like substrate comprising
(a) coating at least a portion of one major surface of said substrate with the color-forming precursor composition of claim 1; and
(b) contacting a color-activating composition with a transfer means and subsequently contacting said substrate surface with said transfer means whereby said color-activating composition is brought into contact with said color-forming precursor composition and a dark, permanent image is formed on said substrate.

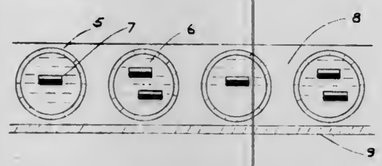
17. A method according to claim 16, wherein said transfer means is a portion of a human body.

4,232,084

SHEETS CONTAINING MICROENCAPSULATED COLOR-CODED MICROMAGNETS

Clarence R. Tate, Fairfield, Ill., assignor to Thalatta, Inc., Fairfield, Ill.

Continuation-in-part of Ser. No. 777,180, Mar. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 775,202, Mar. 7, 1977, abandoned. This application Jan. 25, 1978, Ser. No. 872,214
Int. Cl.[2] B32B *3/26, 5/18*
U.S. Cl. 428—309 **3 Claims**



1. A sheet comprising a hardened transparent film-forming binder and hardened transparent individual microcapsules dispersed in said binder, each microcapsule including a shell wall composed of a material different than the material of said binder, said microcapsules being prepared and completed prior to dispersion in said binder and containing viewable, magnetically responsive, color-coded micromagnets having a constant magnetization vector rotatably dispersed in a liquid, said micromagnets being selected in size from the range of about 25 microns to about 1000 microns, said shell wall surrounding said liquid and forming a barrier wall between said liquid and said binder.

4,232,085

FLEXIBLE POLYURETHANE FOAM HAVING A LOW FLAME SPREAD INDEX

William L. Carlstrom, and Gary L. Maechtle, both of West Bend, Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Continuation-in-part of Ser. No. 930,412, Aug. 2, 1978, abandoned. This application Aug. 14, 1979, Ser. No. 66,448
Int. Cl.[3] B32B *5/20*; C08G *18/14*; B32B *27/40*
U.S. Cl. 428—315 **11 Claims**

6. A foam-forming composition for producing an integral-skinned, flexible polyurethane foam having a low flame spread rating comprising:
organic polyol consisting preponderantly of diol and/or triol;
a foam-forming catalyst;
halogenated alkane blowing agent;
at least 75% (based upon the weight of said polyol) of pentabromoethyl benzene; and
sufficient organic polyisocyanate, consisting predominantly of diisocyanate, to combine stoichiometrically with the said polyol to produce a flexible polyurethane foam.

7. An integral-skinned polyurethane foam having a density of 10 to 50 pounds per cubic foot; having an integral-skin; fabricated by forming a polyurethane foam from the composition of claim 6 in an enclosed mold.

4,232,086

POLYOLEFIN-METAL BONDED STRUCTURES AND PROCESS FOR PREPARING SAME

Fumio Mori, Yokohama; Isao Ichinose, Hiratsuka, and Go Kunimoto, Fujisawa, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 960,931
Claims priority, application Japan, Nov. 12, 1977, 52137259
Int. Cl.[2] B65D *41/12*; B32B *31/06*; B05D *1/36*
U.S. Cl. 428—341 **17 Claims**

1. A polyolefin-metal bonded structure comprising a metal substrate and a polyolefin resin layer bonded to the metal substrate through a primer layer, said primer layer comprising:
(a) a polar group-containing ethylenically unsaturated monomer-modified olefin resin (A) containing said polar groups at a concentration of between about 0.01 and 200 milliequivalents per 100 g of the olefin resin and having a degree of crystallinity of at least about 50%; and
(b) a coating film-forming base resin (B) at an (A)/(B) weight ratio of between about 0.2/99.8 and 40/60,
said primer layer having a multi-layer distribution structure with concentration gradients of components (A) and (B) in the thickness direction such that the base resin (B) is distributed predominantly in the portion of the primer layer contiguous to the surface of the metal substrate and the modified olefin resin (A) is distributed predominantly in the portion of the primer layer contiguous to the polyolefin layer, wherein when said primer layer is divided into three sub-layers with respect to the thickness direction, the distribution ratio, Dx, defined by the following formula:

$$D_x = 10000\ W_X/(W)(C_A)$$

wherein W is the weight of the primer layer per unit surface area (mg/dm^2), C_A is the average % by weight of the modified olefin resin in the primer layer, and W_X is the weight per unit area (mg/dm^2) of the modified olefin resin in each sub-layer, being at least about 50% in the sub-layer, L_S, contiguous to the polyolefin layer and not higher than about 10% in the sub-layer, L_B, contiguous to the surface of the metal substrate.

4,232,087

METHOD OF COATING ORGANIC FIBERS WITH POLYTETRAFLUOROETHYLENE

Elwood G. Trask, Auburn, Me., assignor to Albany International Corp., Albany, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,805
Int. Cl.[3] B32B *27/34*; D02G *3/36*
U.S. Cl. 428—389 **9 Claims**

1. A method of improving the acid resistance, hydrophobicity, oleophobicity and soil release properties of synthetic, organic fibers, which comprises;
coating the fibers with polytetrafluoroethylene particles, in the presence of water and a water soluble, chromium complex of a long chain fluorochemical characterized in part by a molecular structure which consists of a polar end and a non-polar fluorocarbon end which is both organophobic and hydrophobic.

4,232,088

POLYCARBONATE ARTICLES COATED WITH AN ADHERENT, DURABLE ORGANOPOLYSILOXANE COATING AND PROCESS FOR PRODUCING SAME

James S. Humphrey, Jr., Clemmons, N.C., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 895,789, Apr. 12, 1978, abandoned. This application Apr. 2, 1979, Ser. No. 26,059
Int. Cl.[2] B05D *3/06, 1/38*; B32B *27/08, 27/16*
U.S. Cl. 428—412 **29 Claims**

18. A process for producing a uniformly and tenaciously adhered scratch resistant, mar resistant, abrasion resistant, and organic solvent resistant thermoset organopolysiloxane containing coating on at least one surface of a polycarbonate substrate which comprises: (i) applying onto at least one surface of said polycarbonate substrate an ultraviolet light curable primer composition containing (a) at least one polyfunctional acrylic acid ester monomer; (b) at least one organic silicon compound containing at least one organic group having olefinic unsaturation; (c) at least one acrylate modified polymer selected from the group consisting of acrylated urethanes, acrylated alkyl urethanes, acrylated polycaprolactones, acrylated unsaturated acid modified drying oils, acrylated polyesters, and acrylated polyethers; and (d) a photoinitiator; (ii) curing said primer composition by means of ultraviolet light; (iii) applying an organopolysiloxane top coating composition containing a further-curable organopolysiloxane onto said cured primer; and (iv) curing said further-curable organopolysiloxane to a thermoset condition and thereby producing said coating.

4,232,089

POLYOLEFIN FILMS WITH A HIGH RESISTANCE TO STICKING AGAINST WELDING BARS HAVING A TOP COATING COMPRISING A COMBINATION OF AN EPOXY RESIN, AN ACRYLIC RESIN AND NITROCELLULOSE

Fosco Bordini, and Luigi Mauri, both of Terni, Italy, assignors to Moplefan S.p.A., Milan, Italy

Filed Oct. 23, 1978, Ser. No. 953,875
Claims priority, application Italy, Oct. 24, 1977, 28895 A/77
Int. Cl.[2] B32B *27/38*
U.S. Cl. 428—413 **16 Claims**

1. Films of a polyolefin consisting essentially of isotactic macromolecules and carrying on at least one surface thereof a coating constituted by two layers, a first layer consisting of an alkylenimine polymer or a low molecular weight polyamine and a second layer consisting of a mixture of, by weight:
(a) 10–30% of an epoxy resin;
(b) 30–70% of an acrylic or methacrylic polymer or copolymer; and
(c) 10–40% of nitrocellulose having a nitrogen content between 11.5 and 12.5%.
said coated film being readily thermoweldable and showing improved resistance to sticking to the bars of welding machines, without loss of their optical properties, as compared to the uncoated polyolefin films.

4. Process for improving the weld-resistance and resistance to sticking to the welding bars of a polyolefinic film, without altering its optical properties, which comprises applying to said film a first coating consisting of an alkylenimine polymer or a low molecular weight polyamine, and thereafter applying over the first coating a second coating consisting of a mixture of, by weight:
(a) 10–30% of epoxy resins;
(b) 30–70% of acrylic or methacrylic polymers or copolymers; and
(c) 10–40% of nitrocellulose having a nitrogen content between 11.5 and 12.5%.

4,232,090

SEALERLESS PRIMERS

Martin J. Simon, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 348,771, Apr. 6, 1973, which is a continuation-in-part of Ser. No. 156,923, Jun. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 887,333, Dec. 22, 1969, abandoned. This application Apr. 30, 1979, Ser. No. 34,514
Int. Cl.[2] B05D *3/02*; B32B *5/16, 9/00, 17/00*
U.S. Cl. 428—424.4 **8 Claims**

1. An article comprising a metal substrate having adhered thereto a hard, crack-resistant coating, said coating comprising a layer of cured primer composition adhering to said metal substrate and a layer of an acrylic polymer superimposed upon and adhering to said cured primer composition, wherein said cured primer composition is a mixture of
a. a saturated resin which is a saturated polyester having hydroxyl functionality, a saturated polyether having hydroxyl functionality or a saturated polyurethane having hydroxyl functionality, and which has been cured with an aminoplast curing agent produced from the condensation products of amines or amides with an aldehyde, to form a thermoset polymer, and
b. a thermoplastic acrylic polymer which
(1) is selected from the group consisting of addition polymers of esters of alpha-beta ethylenically unsaturated acids and interpolymers of esters of alpha-beta ethylenically unsaturated acids with other ethylenically unsaturated compounds,
(2) is essentially uncured with said aminoplast curing agent, and
(3) is soluble in solvents in which it was soluble before said primer composition was cured.

4,232,091

COMPOSITE MATERIALS AND THEIR PRODUCTION

Rex W. Grimshaw, Rawdon, and Colin Poole, Castleford, both of England, assignors to Hepworth & Grandage Limited, Bradford, England

Filed May 21, 1979, Ser. No. 40,862
Claims priority, application United Kingdom, May 26, 1978, 23438/78
Int. Cl.[3] B32B *15/04, 15/14, 15/20*; B22D *19/02*
U.S. Cl. 428—472 **14 Claims**

9. A composite material comprising aluminium or an aluminium alloy reinforced with a fibre or whisker form of unmodified alumina which has been produced by a process which comprises (a) introducing into a mould containing a mat of unmodified alumina in fibre or whisker form, said mould and said mat having been preheated to a temperature in the range of 700° C. to 1050° C., a molten mass of aluminium or of an alloy of aluminium free from any element which reacts with said alumina in said temperature range in an amount sufficient to cover said mat with molten metal after application of pressure thereto, said aluminium or alloy being at a temperature below that at which said fibres or whiskers are attacked

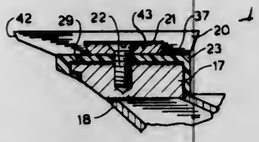
thereby (b) directly applying to the contents of said mould sufficient mechanically applied pressure to overcome the surface tension existing between said unmodified alumina and said molten mass and thereby ensuring that said molten mass fully penetrates the interstices of said alumina mat, said applied pressure being at least 75 kg/cm^2, and (c) allowing said molten aluminium or alloy thereof to solidify in contact with said unmodified alumina mat.

4,232,092

METHOD OF AND MEANS FOR PRECISION MOUNTING OF MEMBERS ON ELONGATE METALLIC SUPPORTING STRUCTURE

Denis A. Goddard, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Nov. 24, 1978, Ser. No. 963,447
Int. Cl.[2] D12G 9/00
U.S. Cl. 428—542 **18 Claims**



10. An elongate metallic supporting structure having means for precision mounting of members thereon, comprising:

said metallic supporting structure being formed to avoid excessive warpage and having a facing area along substantially the full length of said supporting structure prepared for receiving nonmetallic mounting base means;

easily machinable nonmetallic mounting base means applied to and extending in the form of a continuous strip covering said area, said mounting base means comprising a material which is substantially free from tendency to warp during machining;

means securing said mounting base means fixedly onto said area;

and said mounting base means having an exposed receiving surface substantially accurately machined after securing of said mounting base means onto said area, for facilitating receiving and mounting of said members on said surface in predetermined substantially accurate attitude unaffected by irregularities that may be present in said area, and which irregularities might otherwise make it difficult to attain said substantially accurate attitude of said members in the absence of said machined nonmetallic base means.

4,232,093

HIGH TEMPERATURE SKIN CONSTRUCTION

Robert C. Miller, Encino, Calif., assignor to Summa Corporation, Culver City, Calif.

Filed Oct. 29, 1973, Ser. No. 410,691
Int. Cl.[3] B21C 37/00
U.S. Cl. 428—591 **60 Claims**

1. A metallic skin construction suitable for usage as a high temperature airfoil surface comprising:

a screen having a first set of wires and a second set of wires with the second set of wires being positioned generally transverse to the direction of the first set of wires;

the wires in said first set of wires having a generally undulating form which defines first corrugations;

the wires in said second set of wires having a generally undulating form which defines second corrugations;

the wires of said first set of wires being movable with respect to the wires of said second set of wires such that said first and second corrugations are free to expand and contract in a relatively independent manner with respect to each other;

a metallic foil having an imperforate surface;

means joining the foil to the screen at discretely spaced points, and

the foil being sufficiently thin to deform without rupturing during relative movement of the foil and screen at intermediate locations between the discretely spaced points,

whereby thermal stresses on said skin construction are absorbed by deformation of said first and second corrugations in which the first and second corrugations act in a relatively independent manner as expansion joints in providing for controlled expansion of the skin construction without rupturing of said imperforate metallic skin surface.

2. A metallic skin construction suitable for usage as a high temperature airfoil surface comprising:

means providing an imperforate metallic skin surface in said skin construction;

means providing first corrugations and second corrugations in said skin construction with said first and second corrugations being free to expand and contract in a relatively independent manner with respect to each other;

said first corrugations having a size and spacing which permits resilient expansion of said skin construction in the direction along the plane of said metallic skin surface and in a direction transverse to the direction of said first corrugations;

said second corrugations positioned in a direction substantially transverse to said first corrugations;

said second corrugations having a size and spacing which permits resilient thermal expansion of said skin construction in a direction along the plane of said metallic skin surface and in a direction transverse to the direction of said second corrugations,

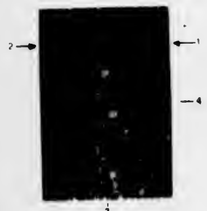
whereby thermal stresses imposed on said skin construction are absorbed by deformation of said first and second corrugations which first and second corrugations act in a relatively independent manner as expansion joints in providing for controlled expansion of the skin construction without rupture of said imperforate metallic skin surface.

4,232,094

SPRAYED COATINGS ON METAL SURFACES

Cyril E. Rhodes, Zeist, and Martin B. Verburgh, Amersfoort, both of Netherlands, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Dec. 10, 1973, Ser. No. 423,646
Claims priority, application Netherlands, Dec. 12, 1972, 7216832
Int. Cl.[2] B21F 27/02; B05D 3/06
U.S. Cl. 428—614 **10 Claims**



1. A method of producing an improved layer bonding in a bearing tool component subjected to relatively high stresses and comprising a sprayed exterior coating layer on a base member, said method comprising the steps of: spraying said exterior coating layer on said base member; and applying heat directly only to said exterior coating layer in an amount sufficient for remelting only said layer, in a chamber evacuated to a pressure of 10^{-1} torr or less, so that the properties of said base member remain substantially unaltered and the bonding improved.

8. A rolling bearing ring produced by the method defined in claim 1.

4,232,095

FILLER METAL IN A WELDED ASSEMBLY

Miroslav Pirner, Neuhausen am Rheinfall; Heinrich Zoller, Aesch, and Heinz Bichsel, Neuhausen am Rheinfall, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 914,531, Jun. 12, 1978, abandoned. This application Mar. 2, 1979, Ser. No. 16,927
Claims priority, application Switzerland, Jun. 29, 1977, 7983/77
Int. Cl.[3] B32B 15/20
U.S. Cl. 428—654 **10 Claims**

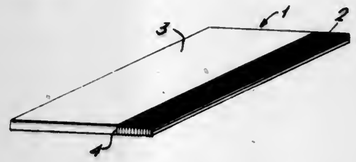
1. A filler metal in a welded assembly with aluminum alloys, said filler metal consisting essentially of: zinc from 1.0 to 4.0%; magnesium from 2.0 to 5.0%; copper from 0.2 to 0.5%; manganese from 0.3 to 0.5%; titanium from 0.05 to 0.2%; chromium from 0.05 to 0.3%; zirconium from 0.05 to 0.2%; balance aluminum, said filler metal producing welded aluminum assemblies wherein the weld has the same strength as the parent metal plus has resistance to weld boundary corrosion, weld cracking and stress corrosion without a corresponding increase in susceptibility to exfoliation corrosion in the heat affected zone.

4,232,096

COMPOSITE STEEL MATERIAL AND COMPOSITE STEEL TOOL MADE FROM THIS MATERIAL

Olof K. Franzen, Hedemora, Sweden; Ulf Hallström, L'Etang la ville, France, and Bengt A. Petersson, Söderfors, Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Continuation of Ser. No. 860,048, Dec. 13, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,908
Claims priority, application Sweden, Dec. 17, 1976, 7614267
Int. Cl.[2] C22C 38/06; B32B 15/18
U.S. Cl. 428—683 **3 Claims**



1. Composite steel material consisting of two metallically joined steel components having different chemical compositions, characterized in that a first component is a high speed tool steel or other high alloy tool steel having a carbon activity and a hardness and wear resistance in the same order as that of high speed tool steel, and that a second component is a steel essentially consisting of

0.40–0.45 weight-% carbon
0.40–1.00 weight-% silicon
0.40–1.00 weight-% manganese
2.5–4.0 weight-%chromium
0.50–1.50 weight-% molybdenum
0.20–0.45 weight-% vanadium
balance iron and normal impurities

4,232,097

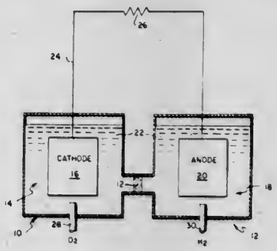
FUEL CELL OXYGEN ELECTRODE

Howard R. Shanks; Albert J. Bevolo; Gordon C. Danielson, all of Ames, Iowa, and Michael F. Weber, Wichita, Kans., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 7, 1979, Ser. No. 18,211
Int. Cl.[3] H01M 4/92
U.S. Cl. 429—44 **8 Claims**

1. A cathode for use in a hydrogen-oxygen fuel cell comprising:

a substrate of electrically conductive tungsten bronze crystal of the formula A_xWO_3 where A is an alkali metal selected from the group consisting of sodium, potassium, lithium, rubidium and cesium and x is at least 0.2 and a catalytic



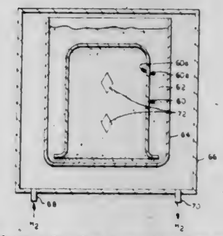
layer on the substrate wherein the alkali metal ions of the substrate have been replaced by platinum ions to form a platinum tungsten bronze of the formula Pt_yWO_3 where y is at least 0.5.

4,232,098

SODIUM-SULFUR CELL COMPONENT PROTECTED BY A HIGH CHROMIUM ALLOY AND METHOD FOR FORMING

Dong-Sil Park, Schenectady; Debajyoti Chatterji, Latham, and Manfred W. Breiter, Schenectady, all of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 22, 1978, Ser. No. 889,046
Int. Cl.[3] H01M 10/39; B32B 15/18; B05D 7/22
U.S. Cl. 429—104 **15 Claims**



1. An electrically conductive, corrosion resistant component for a sodium-sulfur cell comprising a ferrocarbon substrate and a non-porous chromium-iron-carbon duplex alloy surface layer chemically diffusion-bonded to the substrate, said duplex alloy surface layer comprising contiguous outer and inner layers, said outer layer containing in excess of about 60 weight % chromium, and said inner layer containing less than about 50 weight % chromium in direct contact with the substrate.

4,232,099

NOVEL BATTERY ASSEMBLY

Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 442,376, Feb. 14, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 656,063
Int. Cl.[2] H01M 6/46
U.S. Cl. 429—152 **2 Claims**

1. A planar battery which comprises, in combination and in superposed relationship, electrical energy generating components including:

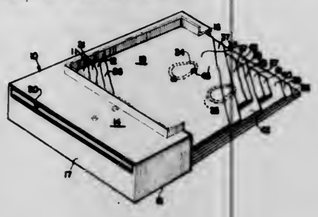
(a) a planar anode;

(b) a planar cathode superposed substantially coextensive the anode;

(c) a planar separator positioned intermediate and extending

substantially coextensive the facing surfaces of the anode and the cathode including electrolyte free marginal portions and an aqueous electrolyte permeable central portion;

(d) an aqueous electrolyte disposed in the central portion of the separator and in contact with the facing surfaces of the anode and the cathode; and



(e) an electrically nonconducting polyacrylate sealant comprising more than fifty percent by weight acrylate, said sealant being a butyl acrylate/diacetone acrylamide/-styrene/methacrylic acid (60/30/4/6), said sealant being located only peripherally of said centrally disposed aqueous electrolyte located on electrolyte free marginal surfaces of the separator, permeating said separator, and securing said separator to contiguous facing surfaces of said anode or said cathode.

4,232,100

ELECTRODE PLATE FOR LEAD ACCUMULATORS

Ulf S. G. Magnusson, and Lars E. Uhrbom, both of Hultsfred, Sweden, assignors to Nordiska Ackumulatorfabriker Noack AB, Stockholm, Sweden

Filed Apr. 17, 1978, Ser. No. 897,214

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723946

Int. Cl.³ H01M 4/14, 4/16

U.S. Cl. 429—217 **6 Claims**

1. An electrode plate for lead accumulators, the surfaces of which plate are provided with a dust-fixing coating of a copolymer of styrene and acrylic acid ester, characterized in that the coating comprises a film of a water-insoluble plastics material.

4,232,101

PHOTOSENSITIVE PAPER FOR ELECTROPHOTOGRAPHY WITH AN ELECTRICALLY CONDUCTIVE COATING OF A FLUORINE RESIN

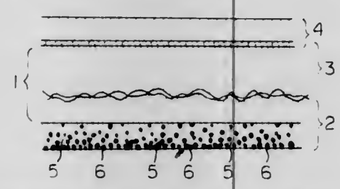
Hideo Fukuda, Katano; Hiroichi Morikawa, Osaka; Yasutoki Kamezawa, Kyoto, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company Ltd., Osaka, Japan

Filed Jun. 27, 1978, Ser. No. 919,674

Claims priority, application Japan, Jan. 9, 1978, 53-528

Int. Cl.² G03G 5/10

U.S. Cl. 430—56 **10 Claims**



1. A photosensitive paper for electrophotography which comprises a paper substrate, an electrophotographic photosensitive layer formed on one surface of the paper substrate and an electrically conductive coating layer formed on the other surface of the paper substrate, said electrically conductive coating layer comprising an electrically conductive binder medium and from 0.1 to 20% by weight based on the entire binder medium of a fine powder of a fluorine resin having a particle size of 0.5 to 10μ distributed predominantly in the surface portion of said electrically conductive coating layer.

4,232,102

IMAGING SYSTEM

Anthony M. Horgan, Pittsford, and Richard W. Radler, Jr., Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 833,130, Sep. 14, 1977, abandoned. This application May 18, 1979, Ser. No. 40,332

Int. Cl.³ G03G 5/087, 5/14

U.S. Cl. 430—58 **16 Claims**



1. An imaging member comprising a layer of particulate photoconductive material dispersed in an organic resinous binder, said photoconductive material comprising trigonal selenium containing a mixture of alkali metal selenite and alkali metal carbonate of from about 0.01 to about 12.0 percent total weight based on the weight of the trigonal selenium wherein ratio of the selenite to carbonate ranges from 90 to 10 parts by weight to 10 to 90 parts by weight.

4,232,103

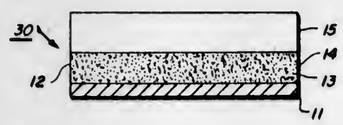
PHENYL BENZOTRIAZOLE STABILIZED PHOTOSENSITIVE DEVICE

William W. Limburg, Penfield, and Damodar M. Pai, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

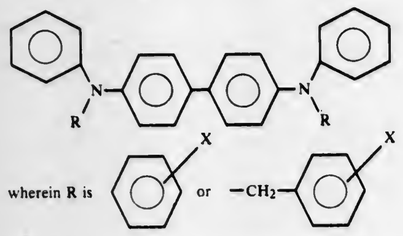
Filed Aug. 27, 1979, Ser. No. 69,649

Int. Cl.³ G03G 5/04, 5/14

U.S. Cl. 430—59 **5 Claims**



1. In an imaging member comprising a hole generation layer and a contiguous hole transport layer, said generation layer comprising a photoconductive material exhibiting the capability of photogeneration of holes and injection of said holes, said hole transport layer comprising a transparent electrically inactive polycarbonate resinous material having dispersed therein from about 25 to about 75% by weight of the composition of one or more of the following diamines:



and wherein X is independently selected from the group consisting of an alkyl group having from 1 to about 4 carbon atoms and chlorine in the ortho, meta or para position, said transport layer also containing a chlorine-containing organic solvent in an amount less than about 3% by weight of the transport layer, the improvement consisting of stabilizing said transport layer against the deleterious effects of ultraviolet light by the presence in said transport layer of a stabilizing proportion of a substituted or unsubstituted 2-(2'-hydroxyphenyl)-benzotriazole.

4,232,104

SUBSTRATES FOR USE IN SCREEN PHOTOSENSITIVE ELEMENT

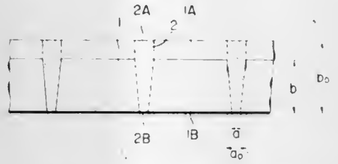
Sohji Shinozaki, and Yoshiaki Takei, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 9, 1978, Ser. No. 905,036

Claims priority, application Japan, May 11, 1977, 52-53220

Int. Cl.² G03G 5/04

U.S. Cl. 430—68 **2 Claims**



1. In a conductive substrate for use in a screen photosensitive element, which substrate is provided all over its surface with a plurality of micro-openings, said substrate having an insulating layer formed on the surface of one side thereof including an internal circumferential surface of each of said micro-openings and having a conductive layer formed at least on said insulating layer positioned at said surface of one side of said substrate and further a photoconductive photosensitive layer formed on the surface of the other side of said substrate opposite to said one side of said substrate having formed thereon said insulating and conductive layers, the improvement comprising a structure of the substrate, characterized in that each of said micro-openings is formed, the internal circumferential surface of which is inclined over substantially the whole of the direction of the thickness of said substrate so that a wire surface width of said substrate at the side of said insulating layer, which wire surface width corresponds to one circumferential edge of each of said micro-openings, is smaller than that at the side of said photoconductive photosensitive layer, whereby at the time of spraying said substrate from the side of said smaller wire surface width with an insulating material capable of forming said insulating layer the insulating material is allowed to readily adhere to said surface of one side of said substrate and said internal circumferential surface of each of said micro-openings without lowering the percent of opening and further the ratio of the smaller wire surface width to the larger wire surface width and the ratio of the depth of the inclined portion of each micro-opening to the thickness of said substrate are respectively within the range of from 1/5 to 4/5.

4,232,105

PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATE WITH HYDROPHILIC SUBLAYER

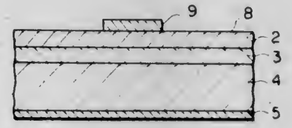
Hideaki Shinohara, Houya; Masaru Kato, and Yoshiaki Takamatsu, both of Tokyo, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,700

Claims priority, application Japan, Sep. 14, 1978, 53-112335

Int. Cl.² G03C 1/52; G03F 7/02

U.S. Cl. 430—160 **11 Claims**



1. A photosensitive lithographic printing plate comprising:

a supporting layer comprising a substrate and having a hydrophilic surface, and;

a photosensitive layer which is formed on said hydrophilic surface of said supporting layer and which comprises a mixture of:

(A) a photosensitive diazo resin modified with a phenol compound, which resin has been prepared by pre-condensation polymerizing an aromatic diazonium compound and an aldehyde compound in the presence of an acid catalyst, by blending salt pre-condensation product with a phenol compound, and by completely condensation polymerizing said blend, and;

(B) a water-soluble acrylic polymer compound containing, as a polymarization component, at least one member selected from the group consisting of acrylic acid and α- and β-substituted acrylic acid derivatives,

which printing plate is characterized in that said hydrophilic surface is formed by a surface of a hydrophilic layer located between said substrate and said photosensitive layer, said hydrophilic layer comprising (I) a resinous component consisting of (a) from 5 to 40% by weight of at least one urea compound resin selected from the group consisting of non-modified urea-formaldehyde resins, cation-modified urea-formaldehyde resins modified with 5 to 20% based on the weight of the urea, of at least one multifunctional basic compound having two or more basic groups, nonion-modified urea-formaldehyde resins modified with 5 to 15%, based on the weight of the urea, of at least one polyol compound and anion-modified urea-formaldehyde resins modified with 5 to 15%, based on the weight of the urea, of at least one acid salt of sulfurous acid, and (b) from 60 to 95% by weight of at least one polyamide resin selected from the group consisting of nylon 6, nylon 66, nylon 610, modified polyamide resins which have been prepared by modifying at least one member selected from the group consisting of nylon 6, nylon 66 and nylon 610, with a modifying agent consisting of a member selected from the group consisting of mixtures of formaldehyde and aliphatic alcohols and epoxy compounds, and mixtures of epichlorohydrin and polyamine compounds, and (II) a pigment component mixed into said resinous component.

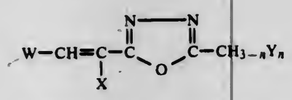
4,232,106

PHOTOSENSITIVE COMPOSITIONS CONTAINING 2-HALOMETHYL-5-VINYL-1,3,4-OXADIAZOLES AS FREE RADICAL PROGENITORS

Masayuki Iwasaki; Shigeru Sato, both of Minami-ashigara; Yasuo Inoue, and Akira Nagashima, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 16, 1978, Ser. No. 961,164
Claims priority, application Japan, Nov. 28, 1977, 52/142473
Int. Cl.[2] G03C 1/68, 1/52
U.S. Cl. 430—170 **13 Claims**

1. In a photosensitive composition containing (1) a phosensitive compound selected from the group consisting of a photosensitive diazo compound, a photosensitive azide compound, an ethylenically unsaturated compound, and a compound which catalytically reacts with acids formed upon exposure to light and (2) a free radical generating agent, the improvement which comprises, said free radical generating agent being a 2-halomethyl-5-vinyl-1,3,4-oxadiazole compound represented by the following general formula (I):



(I)

wherein W represents a substituted or unsubstituted aryl group, X represents a hydrogen atom, an alkyl group or an aryl group, Y represents a fluorine atom, a chlorine atom or a bromine atom, and n represents an integer of 1 to 3.

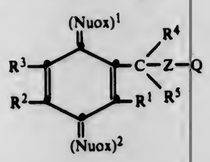
4,232,107

PHOTOGRAPHIC MATERIAL SUITED FOR USE IN DIFFUSION TRANSFER PHOTOGRAPHY AND METHOD OF DIFFUSION TRANSFER PHOTOGRAPHY USING SUCH MATERIAL

Wilhelmus Janssens, Aarschot, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

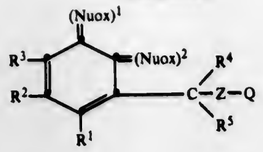
Filed Mar. 15, 1979, Ser. No. 20,651
Claims priority, application United Kingdom, Mar. 22, 1978, 11445/78
Int. Cl.[3] G03C 1/40, 5/54, 1/10, 1/48
U.S. Cl. 430—223 **12 Claims**

1. A photographic silver halide material comprising a support carrying at least one unexposed alkali-permeable silver halide hydrophilic colloid emulsion layer which contains in operative contact therewith or therein a quinone-type compound that is immobile in an alkali-permeable colloid medium and that contains a photographically useful group and a ballast group, wherein said compound is capable of being reduced by a silver halide developing agent at a rate slower than that of imagewise developable silver halide in the photographic material and in reduced state is capable of releasing said photographically useful group under alkaline conditions, characterized in that said quinone-type compound corresponds to one of the following formulae (A) or (B):



(A)

-continued



(B)

wherein:

each of $(Nuox)^1$ and $(Nuox)^2$ (same or different) represents an oxidized nucleophilic group,

Z represents a bivalent atomic group which is electronegative with respect to the carbon atom carrying R^4 and R^5,

Q together with the Z group represents a releasable photographically useful group,

each of R^1, R^2 and R^3 is hydrogen, halogen, alkyl, alkoxy, or an acylamino group or R^1 and R^2 when in adjacent positions on the ring together form a ring fused with the remainder of the molecule, or R^2 and R^3 together form a ring fused with the remainder of the molecule,

each of R^4 and R^5 (same or different) represents hydrogen or a hydrocarbon group, and in at least one of the substituents R^1, R^2, R^3, R^4 or R^5 a ballasting group X of sufficient size is present to render said compound immobile in an alkali-permeable layer of the photographic material.

9. A photographic material according to claim 1, characterized in that the material is a film unit that is adapted to be processed by passing said unit between a pair of juxtaposed pressure-applying members, said unit comprising (1) a photosensitive element, which contains a silver halide emulsion layer having associated therewith said quinone type compound that is initially immobile in an alkali-permeable colloid medium and wherefrom through the reducing action of a silver halide developing agent and alkalinity a dye is split off in diffusible state, (2) an image dye-receiving layer, (3) means for discharging an alkaline processing composition within the film unit, said means being a rupturable container, which is adapted to be positioned during processing of the film so that a compressive force applied to the container by the pressureapplying members will effect a discharge of the container's contents within the film, and (4) a silver halide developing agent, which is soluble in an alkaline processing composition located within said film unit.

4,232,108

MARKING TRANSFER SHEETS

Rolf Dessauer, Greenville, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 884,500, Mar. 8, 1978, which is a continuation-in-part of Ser. No. 617,540, Sep. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 516,483, Oct. 21, 1974, abandoned. This application May 1, 1979, Ser. No. 35,106
The portion of the term of this patent subsequent to Jun. 14, 1996, has been disclaimed.
Int. Cl.[2] G03C 1/90, 1/52, 5/24, 5/04
U.S. Cl. 430—259 **9 Claims**

1. A marking transfer sheet comprising an imaging layer on a carrier support, the imaging layer comprising

(a) a radiation-sensitive composition which, upon exposure to radiation, is capable of forming a colored substance that can absorb at least a portion of the wavelength of light in the visible spectrum, the radiation-sensitive composition being present in an amount sufficient to produce, upon exposure to radiation, a detectable difference in diffuse reflectance density between exposed and unexposed areas,

(b) pigment capable of diffusely reflecting the wavelengths of light absorbed by the colored substance, the pigment being present in a density of about from 0.05 to 0.34 gram per square foot, and

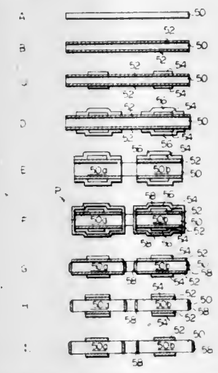
(c) radiation-transmissive, colorless, polymeric, film-forming, thermoplastic binder.

4,232,109

METHOD FOR MANUFACTURING SUBMINIATURE QUARTZ CRYSTAL VIBRATOR

Shigeru Kizaki, Hanno, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 925,936, Jul. 19, 1978. This application Feb. 14, 1979, Ser. No. 12,126
Int. Cl.[3] H01L 41/08; H03H 9/14
U.S. Cl. 430—312 **6 Claims**



1. A method of manufacturing a flexural mode quartz crystal vibrator, comprising the steps of:

grinding an X-cut quartz crystal plate having top, bottom and side surfaces;

forming a first metallic film on said top and bottom surfaces of said quartz crystal plate;

forming an electrode pattern on said first metallic film by means of a negative photo resist;

forming a tuning fork pattern on said top and bottom surfaces of said quartz crystal plate by means of a positive photo resist;

etching said first metallic film and said quartz crystal plate masked by said tuning fork pattern to form a tuning fork shape having first and second tines;

forming a second metallic film being different in material from said first metallic film on said first and second tines so as to cover said positive resist and the sides of each tine;

removing said positive photo resist formed on said first metallic film and said second metallic film formed on said positive photo resist to form side electrodes on the sides of said each tine;

etching said first metallic film masked by said negative photo resist to form said electrode pattern; and

removing said negative photo resist from said first metallic film to form planar electrodes on the top and bottom surfaces of said each tine.

4,232,110

SOLID STATE DEVICES FORMED BY DIFFERENTIAL PLASMA ETCHING OF RESISTS

Gary N. Taylor, Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1979, Ser. No. 19,711
Int. Cl.[2] H05K 3/00; G03C 5/00
U.S. Cl. 430—313 **34 Claims**

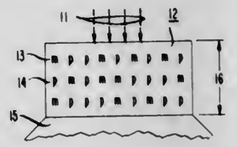
1. A method of producing a solid state device including at least one pattern delineation step by steps comprising:

(a) selectively irradiating a resist film on a substrate with actinic radiation;

(b) treating said film to fix the pattern; and

(c) exposing said film to a plasma to produce a negative resist pattern;

the invention characterized in that said film comprises a polymer and at least one type of monomer, and characterized further in that the step of selectively irradiating the film locks the monomer or monomers in the portions of the film that are selectively irradiated, the step of treating



the film reduces the amount of unlocked monomer or monomers in the film, and the step of exposing the film to a plasma removes the unirradiated portion of the film at a faster rate than the irradiated portion due to the presence of the locked monomer or monomers in the irradiated portion of the film, so that the differential etch ratio is at least 1.05.

4,232,111

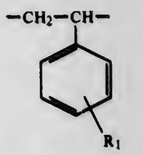
PHOTOGRAPHIC PHOTOSENSITIVE ELEMENT WITH PROTECTIVE LAYER AND IMAGE FORMING METHOD USING SAME

Takushi Miyazako, and Shigeru Nagatomo, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 686,984, May 17, 1976, abandoned, which is a continuation of Ser. No. 506,812, Sep. 17, 1974, abandoned. This application Oct. 11, 1977, Ser. No. 840,950
Claims priority, application Japan, Sep. 17, 1973, 48-104761
Int. Cl.[2] G03C 5/24, 1/78, 1/96
U.S. Cl. 430—355 **11 Claims**

1. A photographic photosensitive element containing at least one silver halide emulsion layer and as the uppermost layer thereof a protective layer containing about 10 to about 70% by weight of a copolymer consisting of

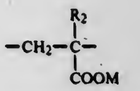
(a) 30 to 70 mole % of the recurring unit represented by the formula (I)



(I)

wherein R_1 is a hydrogen atom or a methyl group; and

(b) 70 to 30 mole % of the recurring unit represented by the formula (II)



(II)

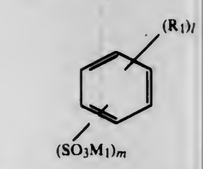
wherein R_2 is a hydrogen atom or a methyl group and M is selected from the group consisting of hydrogen, lithium, sodium, potassium and NH_4.

4,232,112
PROCESS FOR TREATING SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Satoru Kuse, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

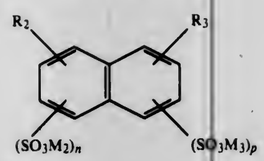
Filed Feb. 5, 1979, Ser. No. 9,583
Claims priority, application Japan, Feb. 10, 1978, 53-14280
Int. Cl.² G03C 5/32, 7/16
U.S. Cl. 430—393 **5 Claims**

1. In a process of developing an imagewise exposed silver halide color photographic photosensitive material with a color developing solution and then bleach-fixing with a bleach-fixing solution, the improvement which comprises adding, to at least one of the color developing solution and the bleach-fixing solution, at least one whitening agent selected from the group consisting of 4,4'-diaminostilbene-disulfonic acid derivatives and at least one additive selected from compounds of the following formulae (I) and (II):



(I)

and



(II)

wherein R_1, R_2 and R_3 are individually hydrogen, an alkyl group or an alkenyl group, M_1, M_2 and M_3 are individually hydrogen or a cation, l and m are individually an integer of 1 to 3 inclusive, and n and p are individually an integer to satisfy an inequality of $1 \leqq n+p \leqq 8$.

4,232,113
LIQUID CONCENTRATED DEVELOPER COMPOSITION, AND CONFECTION READY TO MIX WITH WATER INCLUDING IT, FOR USE IN COLOR PHOTOGRAPHY

Carlo Marchesano, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 14, 1979, Ser. No. 20,313
Int. Cl.² G03C 5/30
U.S. Cl. 430—450 **21 Claims**

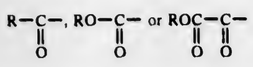
1. A concentrated color photographic developer solution to be mixed with an alkaline aqueous composition characterized by the fact that said concentrated solution is a liquid composition having no more than 5% volume of the total volume of said concentrated composition as water and includes 5 to 50 g per 100 ml of said solution of a p-phenylene-diamine compound dissolved in a photographically neutral organic solvent which is miscible with water.

4,232,114
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS CONTAINING ANTI-COLOR FOGGING AGENTS

Keiichi Adachi; Tadao Shishido, and Akio Mitsui, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Continuation-in-part of Ser. No. 800,817, May 26, 1977, abandoned. This application Sep. 1, 1978, Ser. No. 939,108
Claims priority, application Japan, May 31, 1976, 51-63099
Int. Cl.² G03C 1/76
U.S. Cl. 430—504 **11 Claims**

1. A color photographic light-sensitive element comprising a support having thereon a red-sensitive silver halide photographic emulsion layer containing a cyan color-forming coupler, a green-sensitive silver halide photographic emulsion layer containing a magenta color-forming coupler, a blue-sensitive silver halide photographic emulsion layer containing a yellow color-forming coupler and, optionally, one or more non-light-sensitive subsidiary layers, wherein said blue-sensitive silver halide photographic emulsion layer contains at least one asymmetrical hydroquinone compound selected from the group consisting of 2-methyl-5-tert-octylhydroquinone, 2-tert-butyl-5-tert-amylhydroquinone, 2-tert-butyl-5-tert-hexylhydroquinone, 2-methyl-5-tert-hexylhydroquinone, 2-methyl-5-tert-amylhydroquinone, 2-methyl-5-(1'-methylcyclohexyl)-hydroquinone, and precursors thereof wherein either or both hydroxyl groups thereof are modified with an acyl group represented by the formulae:



wherein R represents an alkyl group, said at least one asymmetrical hydroquinone compound serving to reduce color fogging without reducing the sensitivity and light fastness of a yellow dye image formed in said blue-sensitive silver halide photographic emulsion layer.

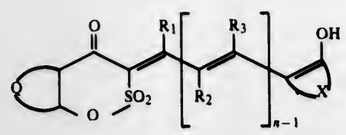
4,232,115
BLEACHABLE PHOTOGRAPHIC SENSITIZING DYES

Ross A. Lee, Webster, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 890,788, Mar. 27, 1978, abandoned. This application Feb. 22, 1979, Ser. No. 15,005
Int. Cl.³ C07D 327/06, 411/06, 405/14
U.S. Cl. 430—522 **10 Claims**

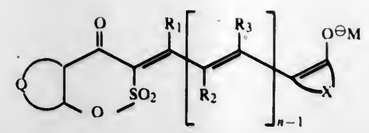
1. As a new composition of matter, a sensitizing or filter dye having one of the following general formulas:

(A)



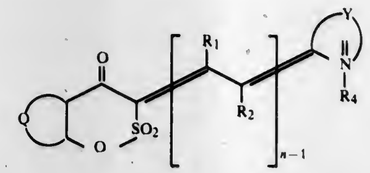
wherein Q represents sufficient carbon atoms to complete a benzo or naphto nucleus, or a substituted benzene or napthalene nucleus, R_1, R_2 and R_3 each represent H or a C_1-C_3 alkyl group, n=1, 2 or 3, and X represents sufficient nonmetallic atoms to complete a 5- or 6-membered heterocyclic or carbocyclic nucleus;

(B)



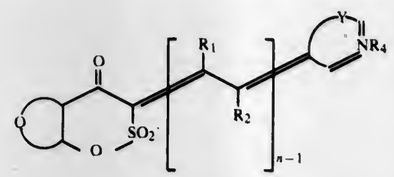
wherein Q, R_1, R_2, R_3 and n are the same as in formula A, and M is a mono-, di-, or trivalent metal;

(C)



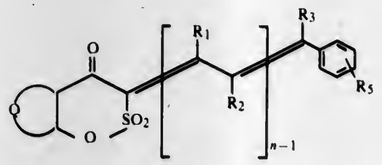
wherein Q, R_1, R_2 and n are the same as in formula A, R_4 is a C_1-C_{12} alkyl, and Y represents sufficient nonmetallic atom to complete a 5- or 6-membered heterocyclic nucleus;

(D)



wherein Q, R_1, R_2, n, R_4, and Y are the same as in formula C; and

(E)



wherein Q, R_1, R_2, R_3 and n are the same as in formula A and R_5 can be H, a C_1-C_{12} alkyl group, an NO_2 group, an alkyloxy or alkylthio group wherein the alkyl group contains 1-6 carbon atoms, or a dialkylamino group wherein each alkyl group contains 1-6 carbon atoms.

4,232,116
LIGHT-HANDLEABLE PHOTOGRAPHIC MATERIALS

Peter B. Jamieson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 719,289, Aug. 31, 1976, Pat. No. 4,140,531. This application Jan. 31, 1979, Ser. No. 7,949
Int. Cl.³ G03C 1/84
U.S. Cl. 430—510 **14 Claims**

1. Ultraviolet radiation sensitive photographic film material comprising:
1. a base,
2. at least one layer adjacent to said base comprising a photographic silver halide emulsion, and
3. a yellow filter dye layer adjacent to and over said at least one emulsion layer,

the silver halide in said silver halide emulsion comprising at least 50 mole % silver chloride and the remainder comprising silver bromide and silver iodide whereby the emulsion has a high natural sensitivity to ultra violet radiation and a low visible light sensitivity,

said yellow filter dye layer having an optical density of no more than 0.3 between 250 and 380 nm, an optical density which increases from 380 to 420 nm to at least 1.0, and an optical density above 400 nm which proportionately does not decrease any faster with increasing wavelengths than does the log. sensitivity of said silver halide emulsion, and

said film material having a sensitivity to radiation such that upon image-wise exposure to radiation of 460 to 520 nm and development for 2½ minutes at 20° C. in a developer comprising:

methyl-p-aminophenol sulfate	2.2 g
hydroquinone	8.8 g
sodium carbonate	48.0 g
sodium sulfite	72.0 g
potassium bromide	4.0 g
hexametaphosphate	2.2 g
distilled water to	1000 ml

followed by conventional rinsing, fixing, and drying, gives an optical density of no more than 0.1 above chemical fog plus base, where said image-wise exposure is to 0.2 erg/mm² of an equienergy spectrum light restricted to a wavelength band of 460 to 520 nm.

4,232,117
PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS HAVING IMPROVED FILM PHYSICAL PROPERTIES

Takashi Naoi, and Ikutard Horie, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 13, 1978, Ser. No. 877,524
Claims priority, application Japan, Feb. 14, 1977, 52-14817
Int. Cl.² G02C 1/78
U.S. Cl. 430—539 **17 Claims**

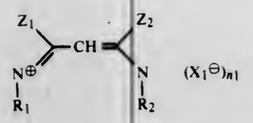
1. A silver halide photographic light-sensitive element exhibiting good transparency after development comprising at least one silver halide emulsion layer on a support and two or more hydrophilic colloid layers on at least one side of said support, wherein (i) a hydrophilic colloid layer positioned farther from the support contains gelatin, a matting agent having an average particle size of 1 to 5μ and colloidal silica having an average particle size less than that of the matting agent and (ii) a hydrophilic colloid layer which is positioned nearer the support than the position of hydrophilic colloid layer (i) consists essentially of gelatin and a polymer latex comprising an aqueous dispersion of a water-insoluble polymer wherein the polymer has an average particle size of about 20 mμ to about 200 mμ, said matting agent being present in an amount effective to decrease the adhesion of the hydrophilic colloid layer in which it is present, said collidal silica being present in an amount effective to improve the antiadhesive property of the hydrophilic layer in which it is present and said polymer latex being present in an amount effective to improve dimensional stability, gelatin present in the element layers serving as a hydrophilic binder.

4,232,118
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

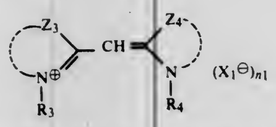
Ken Okauchi; Takeo Koitabashi, and Noboru Fujimori, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1979, Ser. No. 16,546
Claims priority, application Japan, Mar. 10, 1978, 53/26528
Int. Cl.³ G03C 1/14
U.S. Cl. 430—574 **7 Claims**

1. A photographic material having a light sensitive silver halide emulsion layer coated on a support which contains a compound of the following general formula I and a compound of the following general formula II:



wherein Z_1 represents a group of non-metal atoms required to complete a 5 membered heterocyclic residue containing an oxygen atom; Z_2 represents a group of non-metal atoms required to complete a 5 membered heterocyclic residue containing an oxygen, sulfur or selenium atom; R_1 and R_2 each represent aliphatic groups, at least one of them containing a sulfo or carboxyl group; $X_1\ominus$ represents an acid anion and n_1 represents a number of 0 or 1, said n_1 being 0 when an intramolecular salt is formed;



wherein Z_3 and Z_4 each represent groups of non-metal atom required for forming a thiazole, benzothiazole, naphthothiazole, selenazole, benzoselenazole, naphthoselenazole nucleus, R_3 and R_4 each represent aliphatic groups, at least one of them containing a sulfo or carboxyl group, $R_2\ominus$ represents an anion and n_2 represents a number of 0 or 1, said n_2 being 0 when an intramolecular salt is formed.

4,232,119

REAGENT FOR USE IN IMMUNOCHEMICAL ASSAY METHODS

Jan P. E. Carlsson, Uppsala; Rolf E. A. V. Axén, Bälinge, and Håkan N. Y. Drevin, Brunna, all of Sweden, assignors to Pharmacia Diagnostics AB, Uppsala, Sweden

Filed Mar. 2, 1978, Ser. No. 882,545
Claims priority, application Sweden, Mar. 4, 1977, 7702464
Int. Cl.[2] C12Q *1/66*
U.S. Cl. 435—7 **5 Claims**

1. A reagent for use in immunochemical assay methods carried out in the presence of an aqueous liquid, wherein said reagent comprises a conjugate of one or more molecules of immunoglobulin and one or more units of an analytically indicatable group, which molecules and units are bound together via bridges containing the group —S—S—, said conjugate being soluble in said aqueous liquid.

4,232,120

INSTRUMENT AND METHOD FOR TRANSFERRING MICROBIOLOGICAL SAMPLES IN A PREDETERMINATED GASEOUS ENVIRONMENT

Eduard Engelbrecht, Park Vronesteyn 49, Voorburg, Netherlands

Filed Jan. 22, 1979, Ser. No. 5,348
Claims priority, application Switzerland, Feb. 2, 1978, 1129/78
Int. Cl.[3] C12Q *1/24*
U.S. Cl. 435—30 **9 Claims**

1. An apparatus for transferring or inoculating microbiological cultures requiring a protective gaseous environment during handling and incubation, which comprises

(a) a needle arranged to be successively introduced into different receptacles to transfer a portion of microbiological culture carried by the needle from one receptacle to another receptacle;

(b) a hollow base means on which the needle is disposed; and

(d) gas distributing means comprising a nozzle carried by the base and operable to direct a flow of gas substantially parallel to, and around, the needle to form the gaseous environment as a protective shield between the portion of the microbiological culture carried by the needle and the ambient atmosphere.

4,232,121

PROCESS FOR SELECTING METHINE DYES WHICH INHIBIT CELL GROWTH

Paul B. Gilman, Jr.; Robert T. Belly; Thaddeus D. Koszelak, and Seymour Zigman, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,275
Int. Cl.[3] C12Q *1/18*
U.S. Cl. 435—32 **11 Claims**

1. A process for selecting methine dyes which inhibit cell growth, the process comprising (1) determining the reduction potential (E_R) of the dyes, (2) determining the ability of the dyes to bind to the cells and (3) selecting those dyes which have a reduction potential more negative than about = 0.8 volt and which bind to the cells to the extent of 10% or greater.

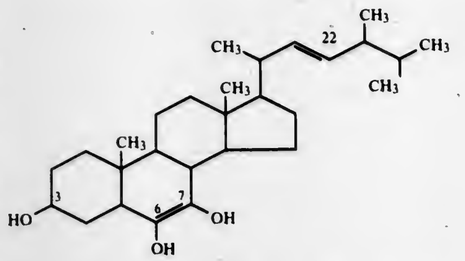
4,232,122

ANTIOXIDANTS, ANTIOXIDANT COMPOSITIONS AND METHODS OF PREPARING AND USING SAME

Fritz W. Zilliken, Remagen, Fed. Rep. of Germany, assignor to Z-L Limited Partnership, Janesville, Wis.

Division of Ser. No. 804,594, Jun. 8, 1977, Pat. No. 4,157,984. This application Jan. 17, 1979, Ser. No. 4,028
Int. Cl.[3] C12P *33/00*
U.S. Cl. 435—52 **6 Claims**

1. A method of preparing a compound having the structure:



comprising fermenting soybeans with the fungus Rhizopus oligosporus and/or the fungus Rhizopus oryzae, contacting the resulting soybean product with 60–70% aqueous methanol to separate from said fermented soybean product an extract containing said compound, and isolating said compound from said extract.

4,232,123

METHOD FOR MAKING WATER-SOLUBLE HYDROLYZATES OF KERATINACEOUS MATERIALS

Klaus Braeumer, Weinheim; Zdenek Eckmayer, Heidelberg; Alexander Berg, Holzminden; Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim and RUM/o/ hm GmbH, Darmstadt, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 876,239, Feb. 9, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,963
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705669
Int. Cl.[3] C12P *21/06, 13/12;* C14C *1/00;* C07G *7/00*
U.S. Cl. 435—69 **8 Claims**

1. A method for making a water-soluble hydrolyzate of keratinaceous starting material, wherein the keratinaceous starting material is selected from the group consisting of loose hair, loose wool, scales, nails, claws, hooves and horns, which method comprises first subjecting said starting material to acid treatment in a treating bath at a pH of 2 or below and at an elevated temperature above 80° C. to effect mild hydrolysis thereof and then enzymatically degrading said acid-treated material in an aqueous bath at a temperature between about 30° C. and 70° C. for 4 hours to 24 hours in the presence of urea with an alkaline bacterial proteinase having an activity optimum in a range between pH 9 and pH 13, the initial pH of the enzymatic treatment being within the pH range optimum for the enzyme employed.

4,232,124

METHOD OF PRODUCING PLASMINOGEN ACTIVATOR

George F. Mann, 117 Venner Rd., London, England (SE26)

Continuation of Ser. No. 839,433, Oct. 5, 1977, abandoned. This application Apr. 23, 1979, Ser. No. 32,218
Int. Cl.[3] C12N *9/72, 9/48*
U.S. Cl. 435—212 **6 Claims**

1. A method for producing plasminogen activator which comprises culturing human diploid lung cells in vitro in an aqueous nutrient maintenance medium free of serum containing therein an inducer which enhances production of plasminogen activator by the cells until plasminogen activator content in the nutrient medium exceeds 100 CTA units/ml and thereafter separating nutrient medium from the cells.

4,232,125

AMINOALKYLATION OF AROMATIC POLYMERS USING ALDEHYDE, DIACYLAMINE AND STRONG ACID CATALYST

Gary R. Buske, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1979, Ser. No. 13,956
Int. Cl.[3] C08C *19/22;* C08F *8/30*
U.S. Cl. 521—32 **17 Claims**

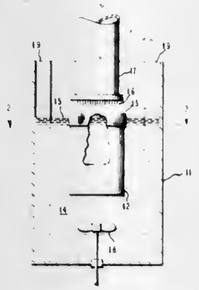
1. A method for diacylaminoalkylating a cross-linked polymer of a monovinylidene aromatic compound, said method comprising the step of contacting the polymer with an aldehyde and either phthalimide or maleimide in the presence of a strong acid catalyst and under conditions sufficient to diacylaminoalkylate the polymer.

4,232,126

NONTACKY SHAPED OBJECTS FROM POLYMER LATICES

Mark J. Marquisee, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 838,365, Sep. 30, 1977, which is a continuation-in-part of Ser. No. 700,965, Jun. 29, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 971,687
Int. Cl.[2] C08J *9/00;* B01J *13/00*
U.S. Cl. 521—65 **20 Claims**



1. A method of preparing nontacky, elastomeric shaped objects which comprises bringing shaped bodies of a normally tacky, uncured elastomer latex having a solids content of 20% to 65% by weight into contact with an aqueous bath containing, based on the total weight of the bath,

(a) 0.5 to 25% by weight of a soluble coagulating salt for the latex, and

(b) 0.01 to 5% by weight of a soluble or colloidally dispersed, hydrous, inorganic oxide selected from the group consisting of silicic acid polymers aluminic acid polymers, silicic acid-aluminic acid copolymers, and mixtures thereof,

said bath having a pH of 2 to 7 such that, when a drop of 1.0 N NaOH is added to the bath, the drop is immediately surrounded by a cloudy coating of gelled, hydrous, inorganic oxide, thereby coagulating the latex and forming highly porous shaped objects of the coagulated elastomer coated with water insoluble, hydrous, inorganic oxide.

14. A coagulating and coating bath which comprises,

(a) 0.5 to 25% by weight of a soluble coagulating salt for a normally tacky, uncured elastomer latex, and

(b) 0.01 to 5% by weight of a soluble or colloidally dispersed, hydrous, inorganic oxide selected from the group consisting of silicic acid polymers, aluminic acid polymers, silicic acid-aluminic acid copolymers, and mixtures thereof,

said bath having a pH of 2 to 7 such that, when a drop of 1.0 N NaOH is added to the bath, the drop is immediately surrounded by a cloudy coating of gelled, hydrous inorganic oxide.

4,232,127

FURAN-MODIFIED ISOCYANURATE FOAMS

Moses Cenker, Trenton, and Thirumurti L. Narayan, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 19, 1974, Ser. No. 534,559
The portion of the term of this patent subsequent to Jul. 15, 1992, has been disclaimed.
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—106 **12 Claims**

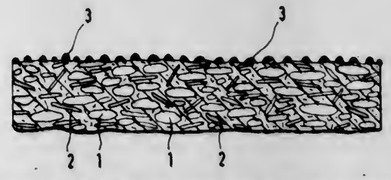
1. A composition of matter consisting essentially of:
an isocyanurate rigid foam having furan linkages bound to the backbone of the isocyanurate foam structure.

4,232,128

POROUS SHAPED CELLULOSE HYDRATE ARTICLE WITH AN IMPROVED CLEANING EFFECT

Wolfgang Michel, Wiesbaden, and Heinz Kälberer, Walluf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,903
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656968
Int. Cl.[2] A47L *13/16*
U.S. Cl. 521—134 **15 Claims**



1. A porous shaped article comprising cellulose hydrate and polyolefin fibrids wherein said fibrids are present in an amount from about 10 to about 80 percent by weight of the shaped article.

4,232,129

DISPERSIBLE VINYLIDENE CHLORIDE POLYMER MICROGEL POWDERS AS ADDITIVES FOR URETHANE POLYMER FOAM

Dale S. Gibbs; Jack H. Benson, and Reet T. Fernandez, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 15, 1978, Ser. No. 942,512
Int. Cl.³ C08K 5/05, 5/13
U.S. Cl. 521—137 14 Claims

1. A composition of matter for use in the preparation of urethane polymer foam having enhanced physical properties comprising (A) a liquid organic reactant which is used in the preparation of said foam, the reactant being a nonsolvent for vinylidene chloride polymers and (B) a crosslinked vinylidene chloride polymer microgel powder which is dispersed in the nonsolvent, said powder being obtained by a method comprising the steps of

(I) preparing a microgel latex by emulsion polymerizing (a) about 50 to about 90 parts by weight of vinylidene chloride, (b) about 10 to about 50 parts by weight of a copolymerizable ethylenically unsaturated comonomer, and (c) a minor amount of a copolymerizable crosslinking polyfunctional comonomer, wherein the microgels in the resulting latex have a gel content of about 25 to 99 percent and a second order transition temperature of at least about 30° C., and

(II) recovering the microgel powder from the latex;

wherein the microgels prior to recovery have a diameter less than about 1 micron.

4,232,130

FILTER ELEMENTS

Samuel Baxter, Penhow, England, and Pushpkumar D. Cuangani, Glasgow, Scotland, assignors to Monsanto Chemicals Limited, London, England

Division of Ser. No. 486,549, Jul. 8, 1974, which is a continuation of Ser. No. 193,790, Oct. 29, 1971, abandoned. This application Dec. 22, 1975, Ser. No. 643,287
Claims priority, application United Kingdom, Nov. 18, 1970, 54806/70; Apr. 16, 1971, 9646/71
Int. Cl.³ C08J 9/00, 9/14
U.S. Cl. 521—143 6 Claims



1. A foam product comprising polypropylene or high density polyethylene, said foam having a substantially open-cell structure wherein a majority of the cells have a diameter ranging from 40 to 1000 microns with more than half of the cell walls present containing one or more perforations, and wherein the microstructure of said foam is characterized by the presence of fiber elements which bridge across said perforations in the cell walls.

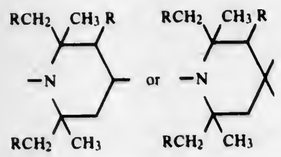
4,232,131

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

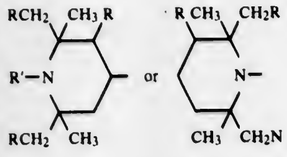
Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned.
This application Nov. 13, 1978, Ser. No. 959,783
Claims priority, application Switzerland, May 11, 1976, 5890/76
Int. Cl.³ C08L 77/00
U.S. Cl. 525—184 21 Claims

1. A polyamide, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1-5 C atoms and R' denotes hydrogen, alkyl with 1-12 C atoms, alkenyl with 3-8 C atoms, alkinyl with 3-6 C atoms, aralkyl with 7-12 C atoms, alkanoyl with 1-8 C atoms or alkenoyl with 3-5 C atoms, and copolymers thereof with polyalkylpiperidine-free components.

4,232,132

ELASTOMERIC THERMOPLASTIC MIXTURES OF POLYPROPYLENE AND ETHYLENE/VINYL ACETATE COPOLYMERS

Ulrich Grigo, Krefeld; Josef Merten, Korschenbroich, and Rudolf Binsack, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,788
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1978, 2811550
Int. Cl.² C08L 23/12, 31/04
U.S. Cl. 525—222 6 Claims

1. An elastomeric thermoplastic mixture consisting of

(A) from 40 to 95% by weight of polypropylene which is greater than 90% isotactic and

(B) from 5 to 60% by weight of an ethylene/vinyl acetate copolymer having a vinyl acetate content of from 20 to 80% by weight, said copolymer having been partially cross-linked to a gel content of 3 to 50% by weight before admixture with said polypropylene.

4,232,133

POLYISOCYANURATE CONTAINING MOLDING COMPOSITIONS

L. James Ferrarini, Jr., West Chester, Pa., and Joseph Feltzin, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Jul. 27, 1978, Ser. No. 928,690
Int. Cl.³ C08L 75/04
U.S. Cl. 525—452 22 Claims

1. A resin blend useful in preparing non-sticky molding compositions by the reaction therewith of polyisocyanates which comprises:

5-95% by weight of polyethylenically unsaturated polyisocyanurate resin having a molecular weight in the range of 2,000-200,000,

5-95% by weight of an ethylenically unsaturated monomer, and;

1.5-30% by weight of a relatively non-polar polyol free of ethylenic unsaturation having a molecular weight in the range of 300-2,000 selected from the group consisting of polyols of polyethylene glycol, polypropylene glycol, polytetramethylene glycol, aromatic ethers which are condensation products of propylene oxide and aromatic polyols, and dihydroxy terminateed polyesters derived from glycols or polyether glycols and dicarboxylic acids.

4,232,134

PROCESS FOR ISOLATING BORON-CONTAINING PHENOL/FORMALDEHYDE RESINS

Manfred Schmidt; Eberhard Bandtel, both of Krefeld; Walter Traudisch, Leverkusen; Georg Spott, and Dieter Freitag, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 6, 1979, Ser. No. 91,823
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849115
Int. Cl.³ C08G 8/10, 8/20, 8/28
U.S. Cl. 525—506 9 Claims

1. A process for isolating boron-containing phenol/formaldehyde resins from their reaction media which, in addition to the end product, also contains starting compounds and solvents used, characterised in that isolation is carried out by concentration through evaporation in a spiral flow evaporator which has the following characteristics:

A which represents $\frac{\text{throughput}}{\text{tube cross section}}$ $\frac{\text{kg}}{\text{h} \cdot \text{mm}^2}$ =

from 0.1 to 1.5 and

B which represents $\frac{\text{throughput}}{\text{evaporation surface}}$ $\frac{\text{kg}}{\text{h} \cdot \text{mm}^2}$ =

from 100 to 400.

4,232,135

COATING COMPOSITIONS

John Bentley, Taplow, and Morice W. Thompson, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 26, 1978, Ser. No. 972,899
Claims priority, application United Kingdom, Jan. 10, 1978, 871/78
Int. Cl.³ C08L 51/00, 53/00, 61/20, 67/00
U.S. Cl. 525—309 10 Claims

1. A coating composition in which the film-forming material consists of:

(a) from 30% to 85% by volume of disperse phase consisting of particles having a size or size distribution in the range 0.01-20 microns, not less than 50% by volume of those particles being polymer microparticles, and the disperse phase being in a state of stable dispersion in

(b) from 70% to 15% by volume of a liquid continuous phase which is capable of curing to a film-forming polymeric material by means of a condensation polymerisation reaction, the said state of stable dispersion being a substantially de-floculated, sterically stabilised state achieved by means of a dispersing agent the molecule of which contains a polymeric component which is solvatable by the continuous phase liquid and another component which is relatively non-solvated thereby and is capable of associating with the surface of the microparticles,

the total volume of components (a) and (b) being 100% and the disperse phase being capable of taking part in the said condensation polymerisation reaction.

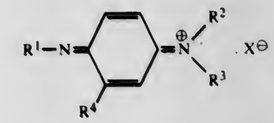
4,232,136

PROCESS FOR THE CONTROLLED HARDENING OF UNSATURATED POLYESTER RESINS

István Kovácsay; Mária Szajkó née Lőrinczi; István Dubovszky; László Magdányi, all of Budapest; Ferenc Szailer, Budaors, and Ede Szatmári, Budapest, all of Hungary, assignors to Muanyagipari Kutato Intezet and Finomvegyszer Szovetkezet, both of Budapest, Hungary, part interest to each

Filed Feb. 27, 1979, Ser. No. 15,736
Claims priority, application Hungary, Jun. 3, 1978, MU 597
Int. Cl.³ C08F 18/00, 118/14
U.S. Cl. 525—327 4 Claims

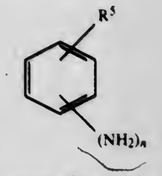
1. A process for the controlled hardening of unsaturated polyester resins at temperatures of −5° C. to +150° C. using an organic peroxide initiator optionally along with an accelerator and/or promotor, characterized in that an organic dyestuff of the formula



(I)

wherein

R^1 stands for a group of the formula



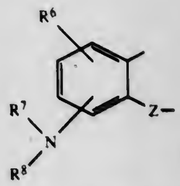
(II)

and in this formula R^5 is C_{1-4} alkyl and n is an integer from 1 to 3,

R^2 and R^3 each represent C_{1-4} alkyl,

R^4 stands for hydrogen, or

R^1 and R^4 form together a group of the formula



(III)

and in this formula R^6, R^7 and R^8 each represent hydrogen or C_{1-4} alkyl and Z stands for oxygen or sulfur or —NH—, and

X stands for chlorine or bromine, is admixed with a said polyester resin and/or said organic peroxide in an amount of 0.001 to 0.05% by weight, calculated on the weight of the polyester resin.

4,232,137
COOLING AN ALPHA-METHYLSTYRENE POLYMERIZATION MASS

Howard B. Irvin; Ronnie L. Lewis, and George A. Moczygemba, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 14, 1978, Ser. No. 942,214
Int. Cl. C08F 2/06
U.S. Cl. 526—71 9 Claims

1. A method for producing a polymeric mass from an alpha-methylstyrene which comprises preparing a solution of it in an inert diluent, the inert diluent having two components other than said alpha-methyl styrene and being composed of at least one solvent of a character and present in the solution in an amount sufficient to maintain a polymer when produced in solution in the polymeric mass and a liquid component which is readily vaporizable under the desired conditions of polymerization, said component being of a character and being present in an amount such as to remove by vaporization of at least a portion thereof undesirable or excess heat from the reaction mass and then producing said mass under polymerization conditions including the vaporization of said portion of said component.

4,232,138
OLEFIN POLYMERIZATION CATALYST

David E. Boone, Lisle, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 751,441, Dec. 16, 1976, abandoned.
This application Dec. 19, 1977, Ser. No. 861,869
Int. Cl.³ C08F 4/02, 10/02
U.S. Cl. 526—122 10 Claims

1. A supported alpha-olefin polymerization catalyst component formed by (A) reacting magnesium hydroxide with antimony pentachloride in a molar ratio of about 10:1 to about 1:5 for about 5 to about 100 hours at about 20° to 130° C. and (B) reacting the resulting product (1) with a Group IVB or VB transition metal compound for about 1 to 100 hours at about 20° to 130° C., the molar ratio of said transition metal compound to said Group II metal compound being about 1:30 to about 5:1, and (2) with an aluminum trihalide selected from the group consisting of aluminum trichloride or aluminum tribromide for about 3 to 100 hours at about 20° to 130° C., the molar ratio of said aluminum trihalide to said magnesium hydroxide being about 1:10 to about 10:1.

4,232,139
PROCESS FOR PRODUCING POLYMERS OR COPOLYMERS OF OLEFINS CONTAINING AT LEAST 3 CARBON ATOMS

Syuji Minami, Ohtake, and Norio Kashiwa, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed May 27, 1977, Ser. No. 801,234
Claims priority, application Japan, Jun. 2, 1976, 51-63536
Int. Cl.³ C08F 4/02, 10/06
U.S. Cl. 526—125 9 Claims

1. A process for producing a polymer or copolymer of an olefin containing at least 3 carbon atoms which comprises polymerizing or copolymerizing at least one olefin containing at least 3 carbon atoms, or copolymerizing the olefin with up to 10 mole% of ethylene and/or a diolefin, in the presence of a catalyst composed of (A) a magnesium-containing solid titanium composition and (B) an organo-aluminum compound; characterized in that the solid titanium composition (A) is a composition consisting essentially of the product formed by contacting (i) a halogen-containing magnesium organo-aromatic compound of the formula Mg(OR)Cl wherein R represents a radical selected from the group consisting of phenyl, naphthyl, lower alkyl-substituted phenyl, lower alkyl-substituted naphthyl, lower alkoxy-substituted phenyl, lower alkoxy-substituted naphthyl, halogen-substituted phenyl, halogen-substituted naphthyl, phenyl lower alkyl, lower alkyl-substituted phenyl lower alkyl, lower alkoxy-substituted phenyl lower alkyl and halogen-substituted phenyl lower alkyl, with (ii) an organic acid ester at a temperature of about 0° to 200° C. in the absence of mechanical pulverization, and further contacting the resultant product with (iii) a tetravalent titanium compound of the formula $Ti(OR')_gX_{4-g}$ wherein R' is an alkyl group containing 1 to 8 carbon atoms, X is a halogen atom and g is 0 to 4, at room temperature to 130° C. in the absence of mechanical pulverization, so as to form the solid titanium composition in which the amounts of titanium, magnesium, halogen and organic acid ester are respectively 1-5% by weight, 10-25% by weight, 40-65% by weight and 5-20% by weight, said organic acid ester (ii) being a member selected from the group consisting of

(a) esters formed between carboxylic acids or halogensubstituted derivatives selected from saturated or unsaturated aliphatic carboxylic acids containing 1 to 18 carbon atoms and halogen-substituted derivatives thereof and alcohols or phenols selected from saturated or unsaturated aliphatic primary alcohols containing 1 to 18 carbon atoms, saturated or unsaturated alicyclic alcohols containing 3 to 8 carbon atoms, phenols containing 6 to 10 carbon atoms and C_1-C_4 saturated or unsaturated aliphatic primary alcohols bonded to the ring carbon atom of a C_3-C_{10} aliphatic or aromatic ring,

(b) aliphatic lactones containing 3 to 10 carbon atoms,

(c) an ester formed between an alicyclic carboxylic acid containing 6 to 12 carbon atoms and a saturated aliphatic primary alcohol containing 1 to 8 carbon atoms,

(d) esters formed between aromatic carboxylic acids containing 7 to 18 carbon atoms and alcohols or phenols selected from saturated or unsaturated aliphatic primary alcohols containing 1 to 18 carbon atoms, saturated or unsaturated alicyclic alcohols containing 3 to 8 carbon atoms, phenols containing 6 to 10 carbon atoms and C_1-C_4 saturated or unsaturated aliphatic primary alcohols bonded to the ring carbon atoms of a C_3-C_{10} aliphatic or aromatic ring, and

(e) aromatic lactones containing 8 to 12 carbon atoms and the organo-aluminum compound (B) is selected from the group consisting of trialkyl aluminum, alkenyl aluminum, alkyl aluminum alkoxide, alkyl aluminum hydride and alkyl aluminum halide.

4,232,140
PROCESS FOR POLYMERIZING OLEFINS

Morris R. Ort, Wilbraham, Mass., assignor to Cities Service Company, Tulsa, Okla.

Division of Ser. No. 573,695, May 1, 1975, abandoned. This application Oct. 23, 1978, Ser. No. 953,715
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.³ C08F 2/34, 4/02, 10/02
U.S. Cl. 526—129 8 Claims

1. In a process for preparing non-rubbery, semicrystalline polymers and copolymers by contacting an ethylene-containing stream with a supported catalyst comprising (a) a vanadium chloride and (b) at least one alkylaluminum compound of the formula $R_nAl(OR)_{3-n}$, wherein R is an alkyl group containing 1-12 carbons and n is 0.5-3.0, on (c) an anhydrous inert inorganic support material under gas-phase polymerization conditions in the presence of hydrogen, the improvement which comprises conducting the polymerization in the presence of trichlorofluoromethane.

4,232,141
METHOD FOR THE PREPARATION OF VINYL CHLORIDE POLYMERS

Shunichi Koyanagi; Hajime Kitamura, and Kazuhiko Kurimoto, all of Ibaragi, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Jul. 18, 1978, Ser. No. 925,704
Claims priority, application Japan, Jul. 29, 1977, 52-91194
Int. Cl.³ C08F 2/20, 14/06
U.S. Cl. 526—344.2 9 Claims

1. In a method for the polymerization of vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride dispersed in an aqueous polymerization medium containing a water-soluble suspending agent as dissolved therein and in the presence of a water-insoluble polymerization initiator which is solid at room temperature, the improvement comprising the steps of:

(a) first grinding coarser particles of the polymerization initiator in an aqueous medium containing a dispersing agent to form an aqueous dispersion of the polymerization initiator having a particle size not exceeding 50 μm, and then

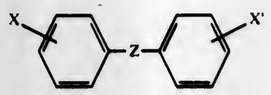
(b) introducing the aqueous dispersion of the polymerization initiator into the aqueous polymerization medium for the polymerization of the monomer or monomers over a duration equal to or less than one-tenth of the half-life period of the polymerization initiator at the temperature of the polymerization mixture while the polymerization mixture is maintained at a temperature in the range of from room temperature to a temperature which which the half-life period of the polymerization initiator is at least 120 minutes.

4,232,142
PRODUCTION OF POLYARYLENE ETHER SULPHONES AND KETONES

Dennis A. Barr, Welwyn, and John B. Rose, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, Great Britain

Division of Ser. No. 335,902, Feb. 26, 1973, Pat. No. 4,051,109, which is a continuation-in-part of Ser. No. 580,290, Sep. 19, 1966, abandoned. This application Nov. 18, 1975, Ser. No. 632,979
Claims priority, application United Kingdom, Sep. 24, 1965, 40734/65; Jan. 31, 1966, 4176/66; Jan. 31, 1966, 4177/66; Jan. 31, 1966, 4178/66; Mar. 7, 1966, 9764/66
Int. Cl.³ C08G 65/38
U.S. Cl. 528—125 11 Claims

1. A process for preparing an aromatic polymer which comprises heating a condensed oligomer obtained by reaction in a solvent of a dihalo benzenoid compound of the formula



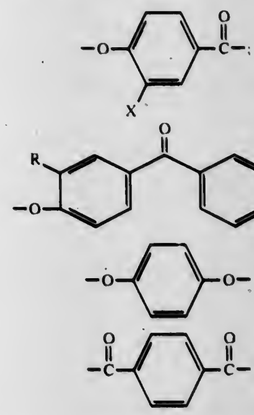
wherein Z represents $-SO_2$ or $-CO-$; X and X' are halogen atoms which are ortho or para to Z with a substantially equivalent amount of an alkali metal hydroxide followed by removal of solvent; said condensed oligomer being heated at 200°-400° C. under a nonreactive atmosphere in the substantial absence of a solvent.

4,232,143
POLYESTER WHICH EXHIBITS ANISOTROPY IN THE MELT CONTAINING p-OXYBENZOYL UNITS AND 4,4'-DIOXYBENZOPHENONE UNITS OR METHYL AND CHLORO DERIVATIVES THEREOF

Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 17, 1979, Ser. No. 76,800
Int. Cl.³ C08G 63/60
U.S. Cl. 528—128 15 Claims

1. Fiber-forming copolyesters consisting essentially of units I, II, III and IV having the structural formulas:



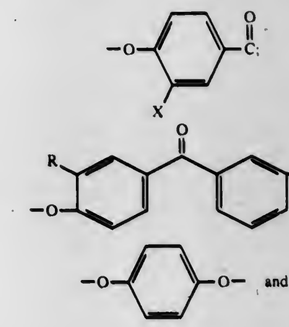
where X and R are independently hydrogen, methyl- or chloro-, with the proviso that when X is methyl-, R is hydrogen or methyl-, and when X is chloro-, R is hydrogen or chloro-, in the proportions of about 54-70 mol % of Unit I, about 10-16 mol % of Unit II, from 0 to about 8 mol % of Unit III and an amount of Unit IV equivalent on a molar basis to Units II and III.

4,232,144
POLYESTER WHICH EXHIBITS ANISOTROPY IN THE MELT CONTAINING P-OXYBENZOYL UNITS AND 4-OXY-3'-CARBONYLBENZOPHENONE UNITS OR METHYL AND CHLORO DERIVATIVES OF SAID UNITS

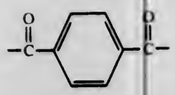
Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 17, 1979, Ser. No. 76,797
Int. Cl.³ C08G 8/02, 63/60
U.S. Cl. 528—128 16 Claims

1. Fiber-forming copolyesters consisting essentially of Units I, II, III and IV having the structural formulas:



-continued



IV

where X and R are independently hydrogen, methyl- or chloro-, in the proportions of about 56–70 mol % of Unit I, about 10–20 mol % of Unit II, from 7 to about 12 mol % of Unit III and an amount of Unit IV equivalent on a molar basis to Unit III.

4,232,145

INJECTION MOLDABLE GLASS CLEAR TRANSPARENT POLYAMIDE

Eduard Schmid, Bonaduz, and Wolfgang Griehl, Chur, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Zurich, Switzerland

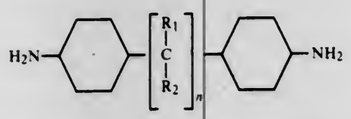
Continuation of Ser. No. 745,897, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 731,810, Oct. 12, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,643

Int. Cl.[3] C08G *69/36*

U.S. Cl. 528—324 **19 Claims**

1. A copolyamide having a glass transition temperature (Tg) of 140°–170° C. consisting essentially of the polymeric condensation product of

(a) a diamine of the formula



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen and methyl, n is an integer from 0 to 6, and wherein each cyclohexane ring may be partially or wholly substituted with methyl groups;

(b) a substantially stoichiometric amount, based on the amount of component (a), of a dicarboxylic acid or acid mixture, consisting of from 50 to 100% of isophthalic acid, from 0 to 50 mol or weight % of terephthalic acid, and from 0 to 15 mol % of other polyamide-forming dicarboxylic acid or acids; and

(c) 30 to 40% by weight, based on the total weight of components (a), (b) and (c), of a further polyamide-forming component which is selected from the group consisting of amino lauric acid, laurolactam and aminoundecanoic acid, some of said group may be replaced by a member of the class consisting of aliphatic dicarboxylic acids and aliphatic diamines, stoichiometric mixtures of aliphatic dicarboxylic acids and aliphatic diamines, and blends of said salts and mixtures, said member subject to the conditions that the average number of carbon atoms per amide group or between each pair of amide-forming groups is at least 9, that the minimum number of carbon atoms between the amide-forming groups is at least 6, and that, when component (b) is not 100% isophthalic acid or isophthalic acid/terephthalic acid mixture, the sum of the weights of the other polyamide-forming dicarboxylic acids in (b) and of component (c) must be from 30 to 40% by weight, based on the total weight of components (a), (b) and (c), said product having a melt viscosity of 2000 to 15000 poises at about 300° C.

4,232,146

PROCESS FOR PREPARING LAYERED ORGANOPHOSPHORUS INORGANIC POLYMERS

Peter M. Di Giacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Sep. 26, 1978, Ser. No. 945,971

Int. Cl.[2] C08G *79/04, 79/00*

U.S. Cl. 528—395 **38 Claims**

1. A process for the production of phosphous containing organo substituted inorganic polymers which comprises reacting in a liquid medium at least one organophosphorus acid compound of the formula:

$$[(HO)_2OP]_nR$$

wherein n is 1 or 2 and R is an organo group covalently coupled to phosphorus with at least one tetravalent metal ion selected from the group consisting of zirconium, cerium, thorium, uranium, titanium, lead and mixtures thereof to precipitate, from the liquid medium, a solid inorganic polymer in which the molar ratio of phosphorus to tetravalent metal is about 2 to 1, the organo group is covalently bonded to phosphorus and phosphorus is linked to the tetravalent metal through oxygen.

4,232,147

4-N-ACYLFORTIMICIN B-1,5-CARBAMATES

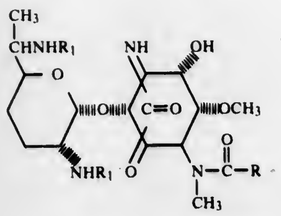
John S. Tadanier, and Jerry R. Martin, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

- Filed Sep. 26, 1979, Ser. No. 79,143

Int. Cl.[3] C07H *17/00*

U.S. Cl. 536—4 **7 Claims**

1. A 4-N-acylfortimicin B-1,5-carbamate represented by the formula



wherein R is acyl and R_1 is hydrogen or benzyloxycarbonyl.

4,232,148

6-DEOXYNEAMINES

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 885,872, Mar. 13, 1978, and a continuation-in-part of Ser. No. 830,684, Sep. 6, 1977. This application Mar. 5, 1979, Ser. No. 17,114

Int. Cl.[3] C07H *15/22*

U.S. Cl. 536—17 R **65 Claims**

1. 3',4'-Di-O-acetyl-1,2',3,6'-tetrakis-N-(trifluoroacetyl)-neamine.

4,232,149

1-(5-FLUORURACIL-1)-2,5-DI-O-ACETYL-β-D-GLUCOFURANURONO-6,3-LACTONE

Ruta A. Paegle, ulitsa Fr. Tiesnieka, 2, kv. 2; Marger J. Lidaka, ulitsa Mezhotnes, 37, kv. 1; Regina A. Zhuk, ulitsa Gorkogo, 77, kv. 20; Juris A. Maurinsh, ulitsa Olgas, 3, kv. 7; Aina A. Zidermane, ulitsa Engelsa, 111-a, kv. 9, and Marite K. Kilevitsa, ulitsa Dzelzavas, 59, kv. 13, all of Riga, U.S.S.R.

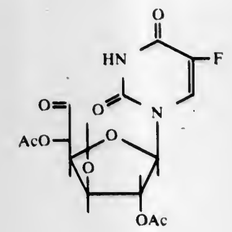
Filed Jul. 27, 1978, Ser. No. 928,659

Claims priority, application U.S.S.R., Aug. 2, 1977, 2526564

Int. Cl.[3] C07H *17/00*; **A61K** *31/70*

U.S. Cl. 536—23 **1 Claim**

1. 1-(5-Fluoruracil-1)-2,5-di-O-acetyl-β-D-glucofuranurono-6,3-lactone having the formula



4,232,150

OLIGOSACCHARIDE PRECURSORS TO SUBSTITUTED O-α-D AND O-β-D-MULTIGALACTOPYRANOSYL AND GLUCOPYRANOSYL 1→4 AND 1→6 GALACTOPYRANOSYL 1→6α-D-GLUCOPYRANOSES

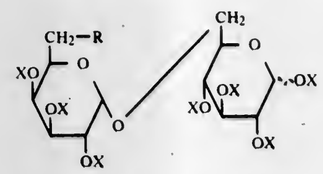
Vijay G. Nair, New York, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 9, 1979, Ser. No. 55,852

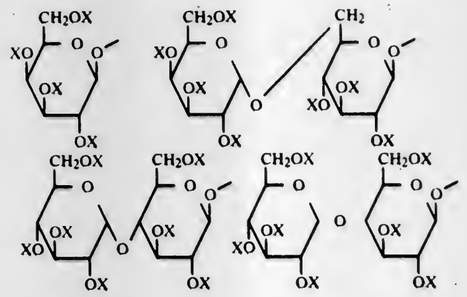
Int. Cl.[3] C07H *13/02*

U.S. Cl. 536—119 **13 Claims**

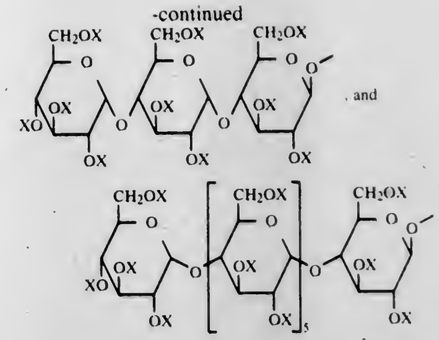
1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen and $COCH_3$; and R is selected from the group consisting of



-continued



and

4,232,151

DIHYDROTRIAZINYLTHIOOXACEPHALOSPORINS

Wataru Nagata, Nishinomiya; Yoshio Hamashima, Kyoto; Teruji Tsuji, Takasuki, all of Japan, and William H. W. Lunn, Indianapolis, Ind., assignors to Shionogi & Co., Ltd., Osaka, Japan

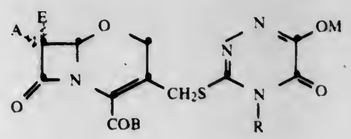
Filed Jul. 13, 1978, Ser. No. 924,375

Claims priority, application Japan, Jul. 14, 1977, 52-84715

Int. Cl.[3] C07D *498/00*

U.S. Cl. 544—90 **56 Claims**

1. A compound of the formula



wherein R is lower alkyl; E is hydrogen or methoxy; M is hydrogen or a hydroxy protecting group; COB is carboxy, protected carboxy or a carboxy salt; and A is

(1) azido, isocyanato, isocyano;

(2) amino;

(3) trimethylsilylamino, methoxydimethylsilylamino, dimethoxymethylsilylamino or trimethylstannylamino;

(4) a hydrocarbonated amino group selected from the group consisting of 1-carbethoxy-1-propen-2-ylamino, 1-carbamoyl-1-propen-2-ylamino, 1-N-phenylcarbamoyl-1-buten-2-ylamino, 1-propen-2-ylamino, 1-phenylpentene-2-ylamino, methylamino, t-butylaminotritylamino, methylideneamino, ethylideneamino, 1-halo-2-phenylethylideneamino, 1-chlorobenzylideneamino, 1-methoxybenzylideneamino, 1-loweralkoxy-2-phenylethylideneamino, 1-loweralkoxy-2-phenoxyethylideneamino and di-t-butyl-4-hydroxybenzylideneamino;

(5) a diacylamino derived from a C_4 to C_{10} polybasic carboxylic acid;

(6) a o-nitrophenylsulfenylamino group; or

(7) an acylamino group wherein the acyl group is

(a) C_1–C_{10} alkanoyl or benzoyl;

(b) halo-C_1–C_4 alkanoyl;

(c) trifluoromethylthioacetyl or cyanoacetyl;

(d) (2- or 4-pyridon-1-yl)acetyl or (2-iminothiazolin-4-yl)acetyl;

(e) a group of the formula

Ar—CQQ'—CO—

wherein Q and Q' are hydrogen or methyl; Ar is a cyclic group selected from phenyl, dihydrophenyl, furyl, thienyl, pyrrolyl, oxazolyl, isoxazolyl, oxadiazolyl, oxa-

triazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thiatriazolyl, pyrazolyl, imidazolyl, triazolyl, tetrazolyl, pyridyl, pyrimidyl, pyridinyl, pyridazinyl or triazinyl which cyclic groups are unsubstituted or are substituted by halogen, lower alkyl, hydroxy, both a halogen and a hydroxy, lower alkoxy, formyloxy, acetyloxy, propionyloxy, pentanoyloxy, carbamoyloxy, benzoyloxy, methoxycarbonyloxy, ethoxycarbonyloxy, t-butoxycarbonyloxy, benzyloxycarbonyloxy, nitrobenzyloxycarbonyloxy, methoxybenzyloxycarbonyloxy, benzyloxy, methoxybenzyloxy, aminobenzyloxy, methylbenzyloxy, isopropylbenzyloxy, nitrobenzyloxy, diphenylmethoxy, phthalidyloxy, phenoxy, tolyloxy, xylyloxy, indanyloxy, amino, C_1-C_{10} alkanoylamino, lower alkanesulfonylamino, hydroxymethyl, or aminomethyl;

(f) a group of the formula

Ar—G—CQQ′—CO—

wherein Ar, Q and Q′ are the same as defined above and G is oxygen or sulfur;

(g) a group of the formula

Ar—CHT—CO—

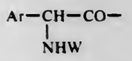
wherein Ar is the same as defined above; T is (i) hydroxy, formyloxy, acetyloxy, propionyloxy, pentanoyloxy, carbamoyloxy, benzoyloxy, methoxycarbonyloxy, ethoxycarbonyloxy, t-butoxycarbonyloxy, benzyloxycarbonyloxy, nitrobenzyloxycarbonyloxy or methoxybenzyloxycarbonyloxy; (ii) carboxy, carboxy protected by lower alkoxy, benzyloxy, methoxybenzyloxy, aminobenzyloxy, methylbenzyloxy, isopropylbenzyloxy, nitrobenzyloxy, diphenylmethoxy, phthalidyloxy, phenoxy, tolyloxy, xylyloxy, indanyloxy, cyano or carbamoyl; or (iii) sulfo or lower alkoxysulfonyl;

(h) a group of the formula

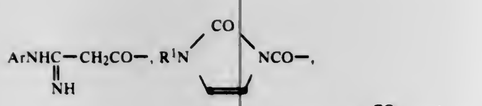
L—O—CO—

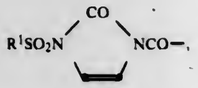
wherein L is t-butyl, 1,1-dimethylpropyl, cyclopropylmethyl, 1-methylcyclohexyl, isobornyl, ethoxy-t-butyl, 2-alkanesulfonylethyl, 2,2,2-trichloroethyl, benzyl, methoxybenzyl, nitrobenzyl, aminobenzyl, diphenylmethyl, tolylmethyl, phenyl, xylyl or pyridylmethyl;

(i) a group of the formula

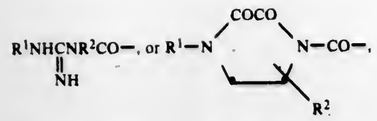


wherein Ar is the same as defined above; W is C_1-C_{10} alkanoyl, halo-C_1-C_4 alkanoyl, or a group represented by the formula Ar—CQQ′—CO—as defined above, Ar—CO—, LOCO—,



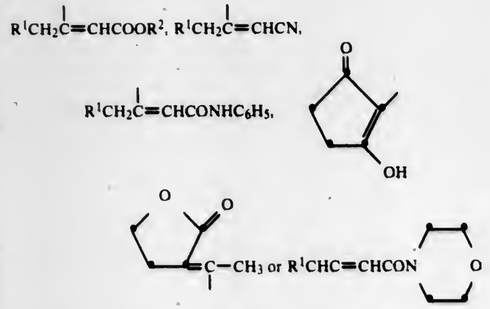


$R^1NHCONR^2$—CO—, $R^1NHCSNR^2CO$—,



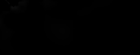
wherein Ar and L are as defined above and R^1 and R^2 are hydrogen, C_1-C_4 alkyl, or C_1-C_{10} alkanoyl; or

W is an enolic group of active carbonyl compounds represented by the formula



wherein R^1 and R^2 are the same as defined above; or NHW is phthalimido or succinimido;

(j) an acyl group of the formula



wherein Ar and R^1 are the same as defined above; or

(k) a 5-aminoadipoyl group in which the carboxy or amino group is optionally protected with a conventional carboxy or amino protecting group;

and when A is amino or an acyl group having an amino substituent, an acid addition salt of the compounds represented thereby; provided that when E is methoxy, E is in the 7-alpha position on the cephem ring.

4,232,152

AMINE SALTS OF TERTIARY AMINO ACIDS

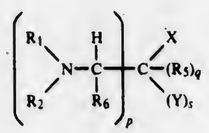
Ibrahim S. Bechara, Boothwyn; Rocco L. Mascioli, Media, and Philip J. Zaluska, Schnecksville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 746,313, Dec. 1, 1976, Pat. No. 4,134,994. This application Oct. 23, 1978, Ser. No. 954,131

Int. Cl.³ C07D *295/314, 233/06, 233/60*

U.S. Cl. 544—119 **4 Claims**

1. An amine salt of a tertiary amino acid represented by the formula:



wherein in the formula:

R_1 and R_2 are combined to form a cyclic amine selected from the group consisting of piperidinyl, piperizinyl, morpholino, imidazolo and imidazolino radicals;

R_5 is hydrogen, a lower alkyl group having from 1 to 6 carbon atoms, an alkenyl group having from 2 to 6 carbon atoms, an aryl group, a cycloaliphatic or alkyl substituted cycloaliphatic group with the alkyl portion having from 1 to 6 carbons, or a keto alkyl group with the alkyl portion having from 1 to 6 carbon atoms;

R_6 is hydrogen, or a radical selected from the group consisting of alkyl, phenyl and napthyl groups;

X is an amine salt of a carboxylic acid group;

Y is a nitrile group; and

p, q, and s are each 1.

4,232,153

PROCESS FOR THE PRODUCTION OF CHLORO-DI (ALKYLAMINO)-s-TRIAZINES

Luciano Baldi; Renato Francese, both of Turin, and Franco Collecchia, Borgaro, all of Italy, assignors to Rumianca S.p.A., Turin, Italy

Filed Jul. 7, 1978, Ser. No. 922,698

Claims priority, application Italy, Jul. 7, 1977, 25474 A/77

Int. Cl.³ C07D *251/50*

U.S. Cl. 544—204 **22 Claims**

1. In a process for the preparation of chloro-bis(alkylamino)-s-triazine by means of stepwise replacement of two chlorine atoms of cyanuric chloride with alkylamino groups at a temperature not exceeding 90° C. during the first replacement of a chlorine atom and at a temperature not exceeding 100° C. during the second replacement of a chlorine atom, the improvement which comprises;

(a) continuously feeding cyanuric chloride in the form of a solution in an inorganic solvent to the inlet end of a first tubular reaction zone, continuously feeding an inorganic base, a first alkylamine and water to said first tubular reaction zone, said inorganic base and said first alkylamine being fed in at least in part at the inlet end of said first reaction zone, said cyanuric chloride, inorganic base and first alkylamine being fed in in substantially stoichiometric proportions and reacted in said first reaction zone under turbulent conditions to convert substantially completely said cyanuric chloride to 2,4-di-chloro-6-alkylamino-s-triazine, and continuously discharging the reaction product of (a) from the outlet end of said first tubular reaction zone;

(b) continuously feeding said reaction product of (a), upon possible cooling and possible removal of aqueous phase from said reaction product of (a), to the inlet end of a second tubular reaction zone, continuously feeding to said second reaction zone an inorganic base, a second alkylamine and water, said inorganic base of (b) and said second alkylamine being fed in at least in part at the inlet end of said second tubular reaction zone, said 2,4-di-chloro-6-alkylamino-s-triazine, inorganic base of (b) and second alkylamine being fed in in substantially stoichiometric proportions and reacted in said second reaction zone under turbulent conditions to convert substantially completely said 2,4-di-chloro-6-alkylamino-s-triazine into chloro-bis(alkylamino)-s-triazine; and wherein the reaction times in said first and second reaction zones are less than 10 minutes; and

(c) continuously discharging the reaction product of (b) from the second reaction zone and recovering the chloro-bis(alkylamino)-s-triazine from said reaction product of (b).

4,232,154

CARBOCYCLIC ANALOGS OF CYTOSINE NUCLEOSIDES EXHIBITING ANTIVIRAL AND ANTINEOPLASTICACTIVITY

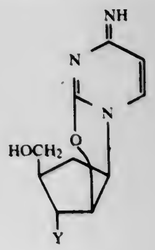
Y. Fulmer Shealy, Birmingham, and C. Allen O'Dell, Fairfield, both of Ala., assignors to United States of America, Washington, D.C.

Division of Ser. No. 860,086, Dec. 13, 1977, Pat. No. 4,177,348. This application Jul. 17, 1979, Ser. No. 58,177

Int. Cl.² C07D *239/46, 498/04;* **A61K** *31/505*

U.S. Cl. 544—250 **1 Claim**

1. A compound having the formula



wherein Y is hydrogen or hydroxy.

4,232,155

PURINE COMPOUNDS

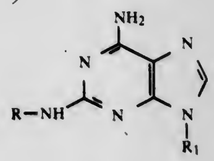
Takayuki Naito, Kawasaki; Susumu Nakagawa, Tokyo; Tetsuro Yamasaki; Taka-Aki Okita, both of Ichikawa, and Haruhiro Yamashita, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 13, 1979, Ser. No. 74,849

Int. Cl.³ C07D *473/16*

U.S. Cl. 544—277 **5 Claims**

1. A compound having Formula I



(I)

wherein

R is lower alkyl of 1 to 4 carbon atoms inclusive or cyclohexyl;

R_1 is cyclohexyl or 2-cyclohexenyl; or a pharmaceutically acceptable acid addition salt thereof.

4,232,156

ACYL-PYRIMIDINES

Ivon Flament, Petit-Lancy, Switzerland, assignor to Firmenich, S.A., Geneva, Switzerland

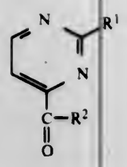
Division of Ser. No. 867,367, Jan. 6, 1978, Pat. No. 4,166,869. This application Feb. 2, 1979, Ser. No. 9,390

Claims priority, application Switzerland, Jan. 10, 1977, 227/77

Int. Cl.³ C07D *239/24*

U.S. Cl. 544—335 **5 Claims**

1. A compound of formula



(I')

wherein either symbol R^1 represents a hydrogen atom and R^2 stands for an isobutyl radical, or symbol R^1 represents a methyl radical and R^2 stands for a methyl, an ethyl or an isobutyl radical.

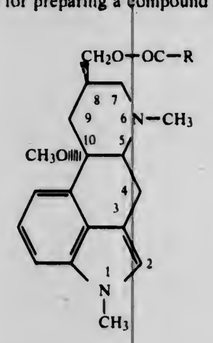
4,232,157

PROCESS FOR PREPARING LYSERGOL DERIVATIVES

Corvi M. Enrico, Via Scalabrini 49, 29100 Piacenza, Italy

Filed Apr. 3, 1979, Ser. No. 26,685
Claims priority, application Italy, Apr. 5, 1978, 22011 A/78
Int. Cl.³ C07D *457/02*
U.S. Cl. 546—68 **7 Claims**

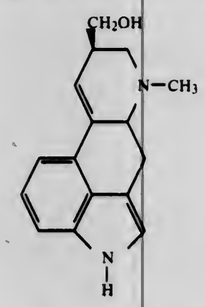
1. A process for preparing a compound of the formula:



(I)

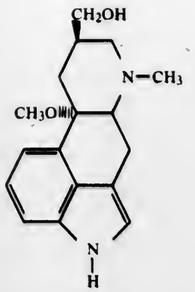
wherein R is the radical of an organic carboxylic acid selected from the group consisting of nicotinic acid, 5-bromo-nitocinic acid and 2-furoic acid, said process comprising:

(a) converting lysergol, having the formula:



(IX)

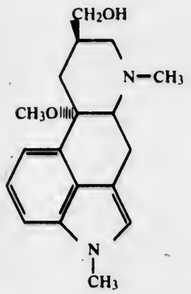
to 10-alpha-methoxy-lumilysergol of the formula:



(X)

by irradiation with U. V. rays:

(b) methylating the compound (X) at the indole nitrogen atom by means of a methylating agent to obtain the 1-methyl derivative of the formula:



(XI)

(c) reacting the alcohol (XI) with a molar excess of an organic carboxylic acid of the formula R—COOH, wherein R is defined above, to obtain the compound (I).

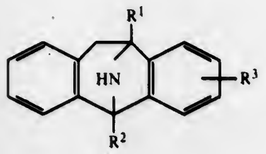
4,232,158

10,11-DIHYDRO-5H-DIBENZO[a,d]CYCLOHEPTEN-5,10-IMINES

Kenneth L. Shepard, Ambler, Pa., and Daniel G. Brenner, Medford, Mass., assignors to Merck & Co., Inc., Rahway, N.J.

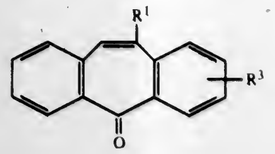
Filed Jun. 4, 1979, Ser. No. 45,494
Int. Cl.³ C07D *487/08*
U.S. Cl. 546—72 **2 Claims**

1. A process for the preparation of a compound of structural formula:



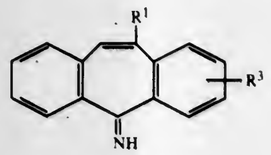
wherein
R^1 and R^2 are independently
(1) C_{1-5} alkyl,
(2) C_{2-5} alkenyl,
(3) phenyl-C_{1-3} alkyl,
(4) C_{3-6} cycloalkyl, or
(5) C_{3-6} cycloalkyl-C_{1-3} alkyl; or
R^1 is hydrogen
R^3 is
(1) hydrogen, or
(2) halogen;
which comprises the following steps, in sequence:

(a) treatment of a compound of formula:



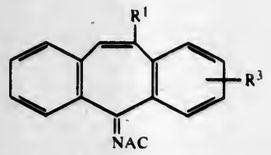
with gaseous ammonia in the presence of titanium tetrachloride;

(b) treatment of the resulting imine of structure:



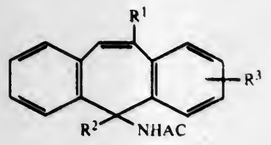
with an acylating agent selected from tosyl chloride, benzenesulfonyl chloride, C_{1-3} alkanoyl chloride, benzoyl chloride and a C_{1-3} lower alkyl chloroformate in the presence of an acid acceptor;

(c) treatment of the resulting acylimine of structure:

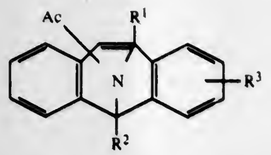


wherein Ac is, tosyl, benzenesulfonyl, C_{1-3} alkanoyl, benzoyl, or C_{1-3} alkoxycarbonyl with an organolithium of formula R^2Li;

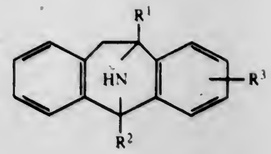
(d) treatment of the resulting acylamide of structure:



with an alkali metal hydroxide to produce the acylimine of structure:



(e) treatment of the acylimine of Step (d) with a strong acid or strong base, or where Ac is an arylsulfonyl group with a strong acid or, sodium bis(2-methoxyethoxy)aluminum hydride to produce the imine of formula:



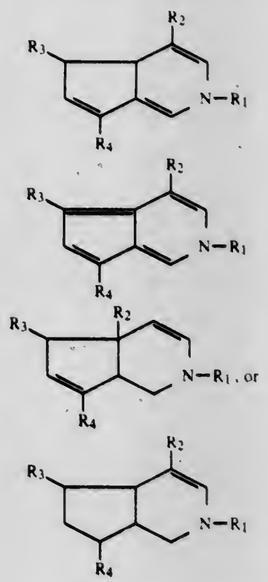
4,232,159

NITROGEN-CONTAINING MONOTERPENE DERIVATIVES

Ryousuke Touyama, Kobe; Hiroyuki Inouye, Kyoto; Tetsuro Shingu, Nishinomiya; Yoshio Takeda, Tokushima; Takeshi Ikumoto, Kobe; Hidetoshi Okuyama, and Osamu Yamamoto, both of Kobe, all of Japan, assignors to Taito Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1978, Ser. No. 953,275
Int. Cl.³ C07D *221/02*
U.S. Cl. 546—112 **1 Claim**

1. Nitrogen-containing monoterpene derivatives of the general formulae:



wherein:
R_1 represents a lower alkyl group, phenyl, lower alkyl group containing carboxylic acid or its ester,
R_2 represents —COOH or —COOR, wherein R represents a lower alkyl group,
R_3 represents hydrogen or a lower alkyl group, and
R_4 represents a lower alkyl group or $—CH_2OH$.

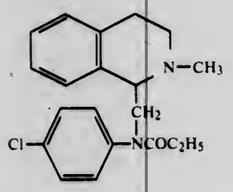
4,232,160

ISOQUINOLINE PROPIONAMIDES EXHIBITING ANALGESIC PROPERTIES

Robert N. Schut, Edwardsburg, Mich.; Edgar O. Snoke, and John W. Van Dyke, Jr., both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 18, 1978, Ser. No. 952,212
Int. Cl.[3] C07D *217/16*; A61K *31/47*
U.S. Cl. 546—146 2 Claims

1. N-[(1,2,3,4-Tetrahydro-2-methyl-1-isoquinolyl)methyl]N-(4-chlorophenyl)propionamide having the structural formula:



2. The compound of claim 1 in the form of its hydrochloric acid addition salt.

4,232,161

4-[6-(2-CHLORO-4-METHOXYPHENOXY)HEXYL]-3,5-DIETHYL-1-(2-PYRIDINYL)-1H-PYRAZOLE

Guy D. Diana, Stephentown, and Philip M. Carabateas, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 8,412, Feb. 1, 1979, which is a division of Ser. No. 822,246, Aug. 5, 1977, Pat. No. 4,171,365. This application Oct. 24, 1979, Ser. No. 87,880
Int. Cl.[3] C07D *401/04*
U.S. Cl. 546—279 1 Claim

1. 4-[6-(2-Chloro-4-methoxyphenoxy)hexyl]-3,5-diethyl-1-(2-pyridinyl)-1H-pyrazole.

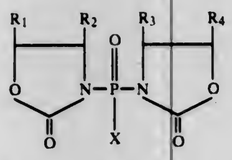
4,232,162

P-SUBSTITUTED N,N'-BIS-(3-OXAZOLIDINYL-2-ONE)PHOSPHORAMIDES AND PROCESS FOR THE PREPARATION THEREOF

Antonio L. P. Coll, and Jose D. Meseguer, both of Barcelona, Spain, assignors to Antibioticos, S.A., Madrid, Spain

Filed Jul. 24, 1978, Ser. No. 927,161
Claims priority, application Spain, Aug. 11, 1977, 461,552
Int. Cl.[3] C07D *263/32*
U.S. Cl. 548—111 3 Claims

1. P-substituted N,N'-bis-(3-oxazolidinyl-2-one) phosphoramides of the Formula (I)



(I)

where R_1, R_2, R_3 and R_4 represent a group selected from among hydrogen, alkyls having from one to four carbon atoms or an aromatic nucleus and X is halogens.

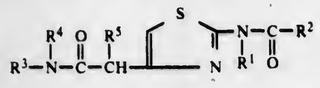
4,232,163

2-ACYLAMINOTHIAZOL-4-YLACETAMIDES AS POST EMERGENT SELECTIVE HERBICIDES

Roger P. Cahoy, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1978, Ser. No. 937,290
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.[2] C07D *277/44*
U.S. Cl. 548—195 23 Claims

1. The selectively phytotoxic 2-acylaminothiazol-4-ylacetamide compound having the general structural formula



in which R^1 is hydrogen or methyl, R^2 is ethyl, isopropyl, cyclopropyl, tert.butyl, methylamino, dimethylamino, ethylamino or methoxymethylamino, R^3 is phenyl, 4-chlorophenyl, 3,4-dichlorophenyl, 4-methylphenyl or 4-methoxyphenyl, R^4 is hydrogen or C_1 to C_3 lower alkyl and R^5 is hydrogen or methyl, with the further stipulation that either, but not both R^4 and R^5 may be hydrogen.

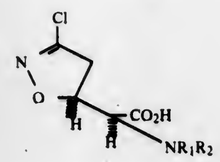
4,232,164

PURIFICATION OF AT-125

David G. Martin, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 906,028, May 15, 1978, abandoned. This application Jun. 23, 1978, Ser. No. 918,569
Int. Cl.[3] C07D *261/04*
U.S. Cl. 548—240 9 Claims

1. A process for purifying (αS,5S)-α-amino-3-chloro-4,5-dihydro-5-isoxazoleacetic acid (AT-125) which comprises (i) converting a mixture of impure AT-125 to a mixture containing a derivative of AT-125 having the formula

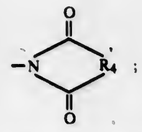


I

(ii) separating the derivative from the mixture and (iii) regenerating pure AT-125 form the derivative, wherein R_1 and R_2 are different and are selected from the group consisting of hydrogen,

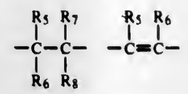


or when taken together with the nitrogen atom form the group

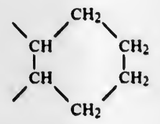


wherein R_3 is alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, aryl of from 6 to 20 carbon atoms, inclusive, and aralkyl and substituted aralkyl of from 7

to 20 carbon atoms, inclusive; and R_4 is selected from the group consisting of (a)



where R_5, R_6, R_7 and R_8 are selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, inclusive. (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylene, with the proviso that other than when R_1 and R_2 form a ring with the nitrogen atom, one of R_1 and R_2 must always be hydrogen.

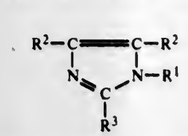
4,232,165

2-SUBSTITUTED-1-ALKYL-5-NITROIMIDAZOLES

Helmut Hagen, Frankenthal, and Rolf-Dieter Kohler, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,175
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827351
Int. Cl.[3] C07D *233/93*
U.S. Cl. 548—339 2 Claims

1. A 2-substituted 1-alkyl-5-nitroimidazole of the formula



I

where R^1 is an alkyl group of 1 to 7 carbon atoms, one R^2 is nitro and the other R^2 is an alkyl group of 1 to 7 carbon atoms or hydrogen, R^3 is



and X is halogen, wherein the R^2 attached to the carbon in the 5 position is nitro and wherein R^1 and R^2 are either unsubstituted or substituted by an alkyl group of 1 to 4 carbon atoms or nitro.

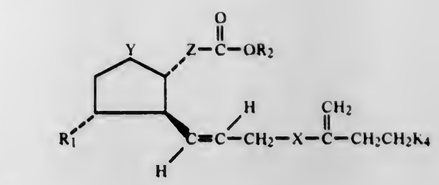
4,232,166

15-DEOXY-16-HYDROXY-17-METHYLENE PROSTAGLANDINS OF THE E AND F SERIES

Allan Wissner, Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1979, Ser. No. 46,723
Int. Cl.[3] C07C *177/00*
U.S. Cl. 560—121 11 Claims

1. An optically active compound of the formula:



wherein X is:



Y is:



R_1 is hydrogen or hydroxyl;
R_2 is hydrogen or C_1 to C_6 alkyl;
R_3 is hydrogen, methyl or ethyl;
R_4 is hydrogen or C_1 to C_3 alkyl;
Z is selected from the group consisting of a divalent moiety of the formula $—(CH_2)_n—$, $—(CH_2)_mOCH_2—$, and $—(CH_2)_mSCH_2—$, wherein n is 5 to 7, and m is 3 to 5, and the racemic mixture thereof, and when R_1 is hydrogen, the pharmaceutically acceptable salts thereof.

4,232,167

PREPARATION OF ALKYL MERCAPTOCARBOXYLATE/DIALKYL THIODICARBOXYLATE MIXTURE USING SULFUR AND/OR WATER COCATALYST

Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 737,949, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 720,475, Sep. 3, 1976, abandoned. This application Dec. 5, 1978, Ser. No. 966,718
Int. Cl.[2] C07C *148/00*, *149/20*
U.S. Cl. 560—154 9 Claims

1. A method of preparing mixed esters comprising:
reacting hydrogen sulfide with an olefinically unsaturated carboxylate of the formula

$$CR_2{=}CR{-}(CR_2{\rightarrow}_n CO_2R'$$

wherein R' is an alkyl radical containing 1 to 5 carbon atoms and R is hydrogen or R', wherein n is zero or an integer having the value of 1, 2 or 3, and wherein the total number of carbon atoms in all of the R and R' groups is 1 to 15 per molecule,
using an addition catalyst selected from organic and inorganic bases in the presence of a lower alkanol and a cocatalyst consisting essentially of at least one of sulfur and water wherein said sulfur or water is present in amounts within the range of from 0.0001 to 0.2 part by weight per part by weight of unsaturated carboxylate.

4,232,168

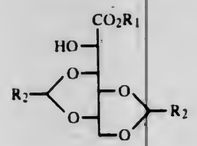
PREPARATION OF ASCORBIC ACID INTERMEDIATES

Thomas C. Crawford, New London County, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,880
Int. Cl.[2] C07C *67/00, 69/67, 51/00, 59/33*
U.S. Cl. 560—174 **6 Claims**

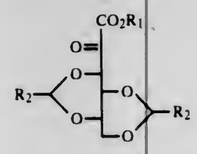
1. A process for preparing 2-keto-L-gulonic acid or ester or D-enantiomers thereof which comprises

(a) contacting D- or L-gulono-1,4-lactone with either at least two equivalents of an aldehyde dialkyl of the formula $R_2CH(OR_1)_2$ or at least two equivalents of an aldehyde of the formula R_2CHO and at least one equivalent of an alcohol of the formula R_1OH in the presence of an acid having a pK_a less than 3 at a temperature of from about 0° to about 70° C. to obtain a compound of the formula



wherein R_1 is alkyl having 1 to 6 carbon atoms and R_2 is alkyl having 1 to 6 carbon atoms, phenyl or monosubstituted or disubstituted phenyl wherein said substituents are alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, chloro, bromo, fluoro or nitro,

(b) oxidizing the product of step (a) with an agent which oxidizes secondary alcohols to ketones to obtain a compound of the formula



and (c) hydrolyzing the compound formed in step (b) under acid conditions at a temperature of from about 35° to 150° C.

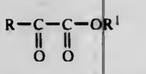
4,232,169

PROCESS FOR PREPARING ALPHA-OXO-ESTERS

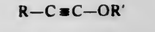
Luciano Re; Alberto Brandt, both of Rome, and Luciano Bassignani, Passo Corese, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 831,237, Sep. 7, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 33,014
Claims priority, application Italy, Oct. 6, 1976, 28041 A/76
Int. Cl.[2] C07C *67/00, 69/67, 69/95*
U.S. Cl. 560—174 **10 Claims**

1. A process for preparing alpha-oxoesters corresponding to the general formula



in which R and R^1, the same or different, may be alkyl, aryl, arylalkyl or cycloalkyl groups, and in addition R may be hydrogen, consisting of reacting an acetylenic compound of the formula



wherein R and R^1 are the same as hereinabove defined, with a mixture of osmium tetroxide and an alkali metal or alkaline earth metal chlorate in the liquid phase at a temperature of about 0° C. to about 100° C. and thereafter recovering the product.

4,232,170

PROCESS FOR HOMOGENEOUS HYDROGENATION OF ESTERS

Roger A. Grey, Denville, and Guido P. Pez, Boonton, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 31, 1979, Ser. No. 7,876
Int. Cl.[3] C07C *69/675, 31/38, 27/04*
U.S. Cl. 560—179 **8 Claims**

1. A process for hydrogenating an ester selected from the group consisting of methyl acetate, ethyl acetate, methyl propionate, methyl trifluoroacetate, trifluoroethyl triflouroacetate and dimethyl oxalate, comprising contacting a solution of hydrogenation catalyst and said ester, neat or in an inert solvent therefor, with an atmosphere containing hydrogen gas, at a temperature of about 0° to 150° C., under a pressure of about 0 to 150 psig (101 to 1135 kPa absolute) of gaseous hydrogen, said catalyst being of the group consisting of potassium tris (triphenylphosphine) ruthenium hydride, potassium triphenylphosphine diphenylphosphide ruthenium hydride, potassium tris (triphenylphosphite) ruthenium hydride, potassium tris triphenylphosphine rhodium hydride, and potassium tris (methyldiphenylphosphine) ruthenium hydride.

4,232,171

PROCESS FOR PRODUCING METHYL FORMATE

Mikio Yoneoka; Minoru Osugi, and Takeo Ikarashi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,681
Claims priority, application Japan, Apr. 21, 1978, 53-47436
Int. Cl.[2] C07C *67/40, 69/06*
U.S. Cl. 560—239 **10 Claims**

1. In the process for preparing methyl formate by dehydrogenating methanol by contacting methanol with a copper-containing catalyst in the vapor phase, the improvement comprising utilizing as the copper-containing catalyst, a catalyst comprising copper and a cement selected from the group consisting of Portland cement, calcium-aluminate cement and mixtures thereof.

4,232,172

PROCESS FOR THE PREPARATION OF 3,6-DICHLORO-SALICYCLIC

Manfred Becher, Bingen, and Richard Sehring, Ingelheim am Rhein, both of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 878,074
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709721
Int. Cl.[3] C07C *51/15*
U.S. Cl. 562—423 **3 Claims**

1. The method of increasing the yield of 3,6-dichloro-salicylic acid in a process comprising carboxylating potassium 2,5-dichloro-phenolate with carbon dioxide in xylene at elevated pressure, which consist of adding an effective yield-increasing amount of finely powdered, anhydrous potassium carbonate to the carboxylation reaction mixture.

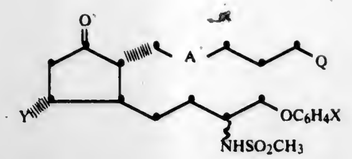
4,232,173

15-SULFONAMIDOPROSTAGLANDIN DERIVATIVES

Thomas K. Schaaf, Old Lyme, and James F. Eggler, Stonington, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,520
Int. Cl.[3] C07C *177/00*
U.S. Cl. 562—430 **7 Claims**

1. A 15-sulfonamidoprostaglandin derivative of the formula:



or the pharmacologically acceptable salt thereof, wherein:
Q is $-CO_2H$, $-CO_2R$, tetrazol-5-yl, $-CONHSO_2R$ or $-CONHCOR$;
A is ethylene or cis-vinylene;
Y is H or OH;
X is H, F, Cl, Br, OCH_3, CF_3 or CH_3; and
R is alkyl of 1 to 4 carbons or phenyl.

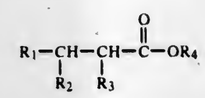
4,232,174

CATALYST AND DEHYDROGENATION PROCESS

Robert J. Statz, and James K. Doty, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1979, Ser. No. 24,858
Int. Cl.[2] C07C *57/02, 69/52*
U.S. Cl. 562—599 **4 Claims**

1. In the process for the oxidative dehydrogenation of a saturated compound of the general formula:



wherein each of R_1, R_2, R_3 and R_4 is selected from hydrogen and lower alkyl groups containing 1–4 carbon atoms, by heating the compound in the presence of a catalyst and oxygen to yield the corresponding unsaturated compound, the improvement which comprises heating the compound in the presence of a catalyst of the general formula:

$$Me_aCr_bFePb_cP_dO_e$$

wherein Me is an alkali metal selected from the group consisting of lithium, sodium, potassium, rubidium, and cesium, a is about from 0.01 to 0.3, b is about from 0.05 to 0.4, c is about from 0.6 to 1.0, d is about from 1.0 to 6.0 and e is sufficient to provide oxygen to satisfy the oxidative states of the remaining components.

4,232,175

NITROSATION OF AROMATIC COMPOUNDS

William E. Smith, and Thomas W. McGee, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 8, 1977, Ser. No. 858,508
Int. Cl.[3] C07C *79/24*
U.S. Cl. 568—706 **14 Claims**

1. A method of preparing a nitrosating agent in an aqueous solution comprising the sequential steps of:

(a) bringing together an alkali metal nitrite with a strong mineral acid in a first aqueous medium at a temperature in the range from about −15° C. to about 35° C.;

(b) generating oxides of nitrogen in said first medium by maintaining or elevating the temperature of the medium to a range from about 15° C. to about 35° C. during or following the bringing together of said nitrite and acid, said oxides evolving into the atmosphere above the medium; and

(c) removing said evolved oxides of nitrogen to a second acidic, aqueous solution, comprising an acid or mixture of acids selected from the group consisting of nitric acid, hydrochloric acid, sulfuric acid and acetic acid, maintained at a temperature in the range from about −15° C. to about 10° C. to produce the nitrosating agent in said solution.

8. A method of nitrosating a phenylic compound nitrosatable in a nuclear position with a nitrosating agent in solution comprising the sequential steps of:

(a) bringing together an alkali metal nitrite with a strong mineral acid in a first aqueous medium at a temperature in the range from about −15° C. to about 35° C.;

(b) generating oxides of nitrogen in said first medium by maintaining or elevating the temperature of the medium to a range from about 15° C. to about 35° C., said oxides evolving into the atmosphere above the medium;

(c) removing said evolved oxides of nitrogen into a second acidic, aqueous solution maintained at a temperature in the range from about −15° C. to about 10° C.; and

(d) bringing together said nitrosatable phenylic compound with said evolved oxides of nitrogen in the seond acidic, aqueous solution, comprising an acid or mixture of acids selected from the group consisting of nitric acid, hydrochloric acid, sulfuric acid and acetic acid, at a temperature in the range of from about −20° C. to about 25° C.

4,232,176

METHOD OF REMOVING ALUMINUM-CONTAINING CATALYST FROM PHENOL ALKYLATION PRODUCTS

Engel R. Adigamov, Revoljutsionnaya ulitsa, 11, kv. 31, Bashkirskaya ASSR, Sterlitamak; Yakov A. Gurvich, Sretensky bulvar, 6, kv. 61, Moscow; Alexandr G. Liakumovich, ulitsa Galeeva, 10, kv. 8, Kazan; Igor J. Logutov, ulitsa Druzhby, 47, kv. 50, Bashkirskaya ASSR, Sterlitamak; Jury I. Michurov, prospekt Lenina, 13, kv. 4, Bashkirskaya ASSR, Sterlitamak; Alexei S. Polenov, prospekt Oktyabrya, 15, kv. 16, Bashkirskaya ASSR, Sterlitamak, and Vladimir A. Yanshevsky, Kommunisticheskaya ulitsa, 42, kv. 12, Novokuibyshevsk, all of U.S.S.R.

Filed Jun. 14, 1976, Ser. No. 695,753
Int. Cl.[3] C07C *37/70, 37/84*
U.S. Cl. 568—756 **3 Claims**

1. A method of removing aluminum-containing catalyst from phenol alkylation products, which consists essentially of treating said alkylation products with water at a temperature of 185°–200° C. till crystalline meta-aluminate is formed, and separating the resultant meta-aluminate.

4,232,177

CATALYTIC DISTILLATION PROCESS

Lawrence A. Smith, Jr., Houston, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

Filed Feb. 21, 1979, Ser. No. 13,559
Int. Cl.[3] C07C *1/20, 11/09;* **B01D** *3/32*
U.S. Cl. 585—324 **3 Claims**

1. A method of producing isobutene comprising:

(a) feeding methyl tertiary butyl ether to a distillation column reactor into a feed zone said feed zone being at the upper end of a fixed bed acid cation exchange resin packing,

(b) concurrently in said distillation column reactor:

(1) contacting said methyl tertiary butyl ether with a fixed bed cation exchange resin packing in a distillation reaction zone thereby catalytically dissociating methyl tertiary butyl ether into methanol and isobutene,

(2) fractionating the resulting mixture in said fixed bed ion exchange resin packing,

(c) withdrawing isobutene from the distillation column reactor at a point above said feed zone, and

(d) withdrawing methanol from the distillation column reactor at a point below said feed zone.

4,232,178
PROCESS FOR THE PREPARATION OF AN AROMATIC HYDROCARBON MIXTURE USING IRON CRYSTALLINE SILICATES

Lambert Schaper, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 29, 1979, Ser. No. 43,194
Claims priority, application Netherlands, May 30, 1978, 7805840
Int. Cl.³ C07C *15/00*
U.S. Cl. 585—408 **7 Claims**

1. A process for the preparation of an aromatic hydrocarbon mixture from a mixture of aliphatic compounds which comprises contacting in a reaction zone as feed, a mixture of aliphatic oxygen-containing hydrocarbons having the general formula $C_nH_mO_p$, which mixture consists of a predominant molar amount of one or more compounds selected from monovalent alcohols, ethers, ketones, and aldehydes with at least three carbon atoms in the molecule for which $m-2p/n$ is greater than 1 and the rest of the feed comprises a minor molar amount of one or more compounds selected from carboxylic acids, polyvalent alcohols, carbohydrates, carboxylic anhydrides, and aldehydes with less than three carbon atoms in the molecule for which $m-2p/n$ is at most 1 at an elevated temperature of from 250° to 650° C., with an aromatization catalyst comprising a crystalline silicate, which

(a) is thermally stable to temperatures above 600° C.,
(b) after dehydration at 400° C. in vacuum, is capable of adsorbing more than 3%w water at 25° C. and saturated water vapour pressure, and
(c) in dehydrated form, has the following overall composition expressed in moles of the oxides:

$$(1.0\pm0.3)(R)_{2/n}O.[a\ Fe_2O_3.b.Al_2O_3.c\ Ga_2O_3].\ y(d\ SiO_2.e\ GeO_2),$$

where:
R=one or more mono or bivalent cations,
$a \geqq 0.5$
$b \geqq 0$,
$c \geqq 0$,
$a+b+c=1$,
$y \geqq 10$,
$d \geqq 0.1$,
$e \geqq 0$,
$d+e=1$,
n=the valency of R, and

withdrawing a hydrocarbon product from said reaction zone which product can be separated into a mixture of aliphatic hydrocarbons with one to four carbon atoms in the molecule and a hydrocarbon mixture of five or more carbon atoms in the molecule containing aromatic hydrocarbons.

4,232,179
PROCESS FOR PREPARING ETHENE

Helcio V Valladares Barrocas, Niterol; Joao B. de Castro M. da Silva, and Ruy Coutinho de Assis, both of Rio de Janeiro, all of Brazil, assignors to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil

Filed Aug. 9, 1978, Ser. No. 932,283
Claims priority, application Brazil, Aug. 9, 1977, 7705256[U]
Int. Cl.³ C07C *1/24*
U.S. Cl. 585—640 **12 Claims**

1. Process for preparing ethene by dehydrating ethyl alcohol in the presence of catalyst, characterized in that ethyl alcohol is heated by indirect heat exchange, up to a temperature in the range from 180°-600° C., introducing thus heated ethyl alcohol into one or more adiabatic reactors containing in its interior a catalyst fixed bed, said adiabatic reactor being maintained in a pressure range between 0.2 and 20 kg/cm^2 absolute, and said fixed catalyst bed being maintained at a temperature comprised within the range from 600° C. on the top to 180° C. in the bottom, by means of a sensible heat carrying stream heated up to a temperature up to 800° C., the weight ratio between the sensible heat carrying fluid stream and the stream of ethyl alcohol varies within a 0.2:1 to 20:1 range, and the ratio between the amounts of ethyl alcohol and the catalyst is comprised within a range from 10 to 0.01 g/h of ethyl alcohol per gram of catalyst; removing the effluent from said adiabatic reactor and sending the same to the purification step.

4,232,180
PREPARATION OF UNSYMMETRICAL POLYENES

Walter J. Kelly, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 564,003, Mar. 31, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,649
Int. Cl.³ C07C *6/06*
U.S. Cl. 585—645 **2 Claims**

1. A method of preparing a polyene product comprised of a symmetrical/unsymmetrical/symmetrical polyene mixture and containing at least 75 weight percent unsymmetrical polyene with a single terminal double bond through a cross-metathesis reaction which comprises contacting a mixture of 1-pentene and cyclopentene, at a temperature in the range of about −5° C. to about 40° C. with a cross-metathesis catalyst which comprises (A) at least one compound selected from diethylaluminum chloride, dipropyl aluminum chloride, ethylaluminum dichloride, propylene aluminum dichloride and tetrabutyltin; (B) at least one metal derivative selected from tungsten hexachloride and tungsten hexafluoride and (C) at least one alcohol selected from 2-chloroethanol and 2,2,2,-trichloroethanol; where the molar ratio of A/B catalyst components is in the range of about 0.5/1 to about 8/1 and the molar ratio of B/C catalyst components is in the range of about 0.5/1 to about 5/1 and where the molar ratio of the monomers 1-pentene/cyclopentene is in the range of about 0.5/1 to about 20/1.

4,232,181
HYDROISOMERIZATION OF PENTANE UTILIZING PD EXCHANGED MORDENITE

Joseph R. Kiovsky, Kent, and William J. Goyette, Brimfield, both of Ohio, assignors to Norton Company, Worcester, Mass.

Division of Ser. No. 913,812, Jun. 8, 1978, which is a continuation of Ser. No. 825,979, Aug. 19, 1977, abandoned, which is a continuation of Ser. No. 421,505, Dec. 3, 1973, abandoned. This application Jun. 28, 1979, Ser. No. 53,078
Int. Cl.² C07C *5/30*
U.S. Cl. 585—739 **1 Claim**

1. A method of isomerizing comprising passing a mixture of hydrogen and pentane over Pd exchanged mordenite at a temperature between 450° F. and 550° F., characterized in that said mordenite contain less than 0.2% by weight exchanged sodium, has a silica to alumina ratio of between 10 and 17, contains from 0.38 to 0.8 milliequivalents per gram of acid sites stronger than 48% aqueous sulfuric acid.

4,232,182
PROCESS FOR PURIFYING ISOPRENE

Alexandr G. Liakumovich, prospekt Lenina, 23, Kv. 4; Boris I. Pantukh, ulitsa Khudaiberdine, 162, kv. 89, both of Sterlitamak, and Tatyana M. Lesteva, 4 Sovetskaya ulitsa, 3a, kv. 12, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 764,645, Feb. 1, 1977, abandoned, which is a continuation of Ser. No. 682,105, Apr. 30, 1976, abandoned, which is a continuation of Ser. No. 570,994, Apr. 22, 1975, abandoned. This application Nov. 21, 1977, Ser. No. 853,816
Int. Cl.³ C07C *7/04, 7/12, 11/18*
U.S. Cl. 585—820 **6 Claims**

1. A process for purifying isoprene produced by catalytic decomposition of dimethyldioxane from carbonyl compounds and cyclopentadiene which consists of the steps of passing isoprene at a temperature of from 40° to 70° C. through a bed of a solid product selected from the group consisting of an anion exchange resin and alkali, and subjecting said isoprene to close fractionation on at least 50 theoretical plates and at a reflux ratio of at least 3 recycling 20 to 80 wt.% of said purified isoprene following close fractionation for admixture with the starting isoprene to be purified.

4,232,183
ELECTRICAL CONNECTION SYSTEM FOR PANEL STRUCTURES

Nelson H. Person, 1465 W. Catalpa St., Chicago, Ill. 60640

Filed Aug. 29, 1977, Ser. No. 828,918
Int. Cl.³ H02G *3/00*
U.S. Cl. 174—48 **43 Claims**

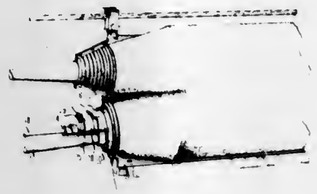


1. In a free standing, space dividing partition structure accommodating electrical conductors and employing a plurality of wall panels and cooperable elongated hollow supporting columns therefor, in which at least a pair of adjacent panels are supported, by a common column structure, at their vertical end edges by cooperable connecting means on said panels and said common hollow column structure, the combination of the hollow column structure having a plurality of access openings in the side walls thereof through which electrical conductors may extend from one wall panel of such a pair into the column structure and from the column structure into the other wall panel of such pair with the interior of the column structure forming a connecting conduit for such conductors between the respective wall panels of such pair, said column structure being constructed in the form of a plurality of aligned sections, at least one of which is rotatably adjustable relative to another about the column axis, said one section having at least one of said conductor access openings therein, and means for retaining such sections in assembled relation.

4,232,184
CABLE ADAPTER FOR CONVERTING A CABLE CLOSURE NOZZLE TO A TWO CABLE ENTRANCE

Carl W. Faust, Dover, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1979, Ser. No. 20,533
Int. Cl.³ H02G *15/013, 15/113*
U.S. Cl. 174—92 **11 Claims**



1. A cable adapter for converting a one cable closure nozzle to a selectable diameter two cable entrance comprising:

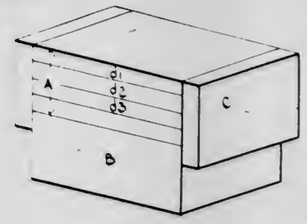
a unitary molded member of electrically insulative material having first and second adjacent pluralities of concentric openings of various diameters therein, said openings extending along the length of said unitary member in increasing order of diameter, said unitary member adapted for engagement with said cable closure nozzle at the largest diameter openings so as to facilitate a sealed entrance of first and second axially aligned cables into said cable closure; and

means, extending along the length of said member at a plurality of discrete longitudinal positions and about a plurality of discrete spaced-apart points on the circumferential periphery of said member, for stiffening said member so that given first and second concentric openings in said first and second pluralities of said openings remain in firm contact with said first and second axially aligned cables, respectively, upon engagement of said unitary member with said cables.

4,232,185
ELECTRICAL INSULATOR WITH SEMICONDUCTIVE GLAZE

Noboru Higuchi, Nagoya; Takayuki Ogasawara, Konan, and Shoji Seike, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 28, 1978, Ser. No. 900,935
Claims priority, application United Kingdom, May 2, 1977, 18383/77
Int. Cl.³ H01B *3/10, 3/12*
U.S. Cl. 174—140 C **2 Claims**



1. An insulator comprising an insulator body and a glaze coating on said body, said glaze coating consisting of a tin oxide type semiconductive glaze including tin oxide and antimony oxide, wherein, in order to render the current distribution more uniform within the thickness of the glaze coating, the ratio of maximum to minimum volume resistivity of incremental parts of the glaze in any portion of the glaze coating is not more than 30, said portion having a thickness of at least 100 microns in the direction from the glaze surface inwardly towards the insulator body.

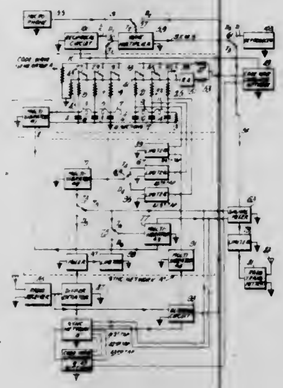
4,232,186
METHOD OF AND MEANS FOR GENERATING COMPLEX ELECTRICAL CODING WAVES FOR SECRET COMMUNICATIONS

Alda V. Bedford, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 22, 1944, Ser. No. 546,189
Int. Cl.³ H04K *9/04*
U.S. Cl. 178—22 **23 Claims**

10. Apparatus for generating a complex wave comprising means for generating a plurality of different concurrent short period series of pulses, a plurality of electrical networks, means for applying a different one of said series of pulses to each of said electrical networks, means for deriving a plurality of differently delayed unmodulated pulse signals from each of said networks in response to said applied series of pulses, means for combining said derived signals from predetermined ones of said networks, and means for selecting in a predetermined manner said delayed signal components, and means for deriv-

ing from said selected signal components a complex wave having a period longer than either of said selected pulse peri-



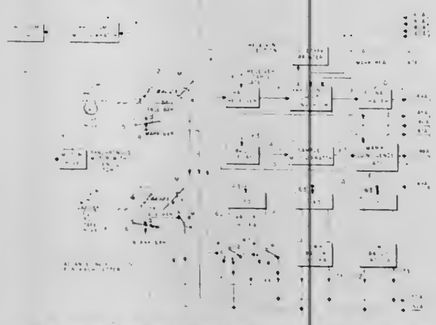
ods, said complex wave having a substantially longer period than either of said short period pulse series.

4,232,187

TELETYPE CHARACTER MODIFICATION UNIT

Gerald Weiss, New York; Gerson Scharf, Bronx; Anthony A. Guido, Yonkers, and Benjamin Lazerdwitz, Bronx, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 5, 1962, Ser. No. 171,319
Int. Cl.³ H04K *9/00*
U.S. Cl. 178—22 **13 Claims**



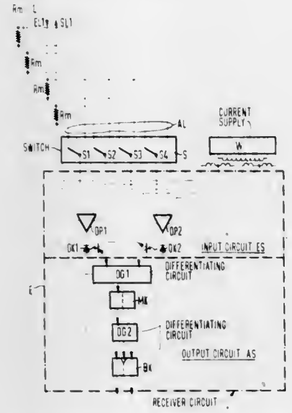
3. A teletype modification unit comprising: a signal shaper having input means for receiving mark-space teletype pulses; a synchronization circuit coupled to said signal shaper; a plurality of delay means coupled to said synchronization circuit; a space coincidence circuit; a mark coincidence circuit; means to selectively couple said plurality of delay means to said space coincidence circuit, and means to selectively couple said plurality of delay means to said mark coincidence circuit.

4,232,188

CIRCUIT ARRANGEMENT FOR RECEIVING SIMPLEX AND DUPLEX CURRENT TELEGRAPH CHARACTERS

Dieter Giersberg, Feldkirchen-Westerham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,349
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806884
Int. Cl.³ H04L *5/14*
U.S. Cl. 370—24 **11 Claims**



1. A circuit arrangement for receiving single-current and double-current telegraph characters, comprising:

telegraph line means for receiving telegraphic pulses;

resistance means in said telegraph line means for carrying line current;

an input circuit including amplifier means connected to evaluate the voltage drop across said resistance means; and

an output circuit connected to said input circuit, including

a first differentiating circuit operable in response to the output of said amplifier means to provide a first trigger signal,

a monostable circuit connected to said first differentiating circuit and triggered thereby to provide a pulse of a predetermined length;

a second differentiating circuit connected to said monostable circuit and operable to differentiate said pulse and provide a second trigger signal, and

a bistable circuit connected to said second differentiating circuit and responsive to said second trigger signal to provide an output signal,

whereby said monostable circuit, in response to each positive-going transition and each negative-going transition, and said bistable circuit in response to each negative-going transition from said monostable circuit provides the signal condition existing on the telegraph line means.

4,232,189

AM STEREO RECEIVERS

Clifford D. Leitch, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

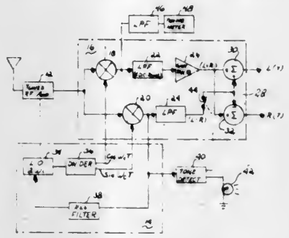
Filed Aug. 31, 1977, Ser. No. 829,518
Int. Cl.³ H04R *5/04*
U.S. Cl. 179—1 G **9 Claims**

1. A radio receiver for receiving and directly demodulating a composite stereo signal including two program signals which have been modulated onto a carrier signal in accordance with pure or modified quadrature modulation techniques comprising:

means for receiving said composite stereo signal and for directly supplying said signal to a stereo demodulator without converting said signal to an intermediate frequency;

stereo demodulator means responsive to said composite stereo signal for demodulating said signal to recover said program signals and including first and second detector means, each responsive to said composite stereo signal and to a corresponding phase reference signal for respectively demodulating in-phase and quadrature-phase components of said composite stereo signal, and signal processing means responsive to the demodulated in-phase and quadrature-phase components provided by said first and second detector means for processing said signals to recover said program signals therefrom; and

means for providing said phase reference signals and for



synchronizing said signals in frequency with said composite stereo signal, with the phases of said reference signals being selected so that said in-phase and quadrature-phase components of said composite stereo signal are demodulated by said detector means, said reference signal providing means including oscillator means for providing said phase reference signals and responsive to a control signal for varying the frequency of said phase reference signals, and means for filtering the demodulated quadrature-phase component so as to derive a control signal, said control signal being provided to said oscillator means for controlling the frequency of oscillation thereof,

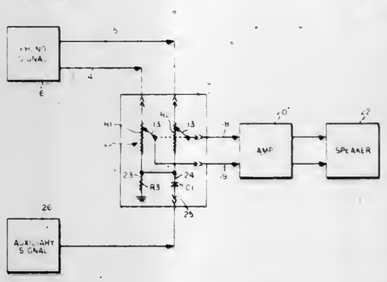
whereby said program signals are recovered without use of an intermediate frequency stage so that degradation of stereo separation due to the presence of an intermediate frequency stage is avoided.

4,232,190

APPARATUS FOR COMBINING PHONOGRAPH SIGNAL WITH AUXILIARY AUDIO SIGNAL

Michael N. Laiacona, 213 Shipbuilders Creek, Webster, N.Y. 14580

Filed Feb. 6, 1978, Ser. No. 875,238
Int. Cl.³ H04R *5/00*
U.S. Cl. 179—1 B **5 Claims**



1. Audio signal apparatus for combining an auxiliary audio signal with each of a plurality of audio signals emanating from a primary audio signal source such as a phonograph or the like, comprising

a primary signal source for producing a plurality of first audio signals,

an auxiliary device for producing independently of said primary source a second audio signal from a source having a relatively high impedance compared to that of said primary signal source,

means for combining said second signal with each of said first signals to produce a plurality of composite audio signals each comprising components of said first and second signals, and

an amplifier for amplifying said composite signals and for applying the amplified signals to one or more speakers,

said combining means including means for attenuating the low frequency portion of said second signal prior to combining said first signals with said second signal, thereby to prevent distortion of the amplified composite signals, and

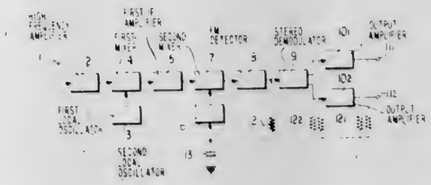
said combining means further including means for selectively adjusting the amplitude of said first and second signals, respectively, whereby one of the signal components of each of said composite signals may be amplified greater than the other.

4,232,191

FM RECEIVING DEVICE

Takeshi Matsuzuka, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1978, Ser. No. 878,797
Claims priority, application Japan, Feb. 23, 1977, 52-21222
Int. Cl.² H04H *5/00*; H03D *7/16*
U.S. Cl. 179—1 GD **11 Claims**



1. A double super heterodyne, stereo FM receiver comprising

a first local oscillator;

a first mixer responsive to an FM stereo input signal and the output from said first local oscillator for deriving a first intermediate frequency signal;

a second local oscillator;

a second mixer responsive to said first intermediate frequency signal and the output from said second local oscillator for deriving a second intermediate frequency signal;

an FM detector for demodulating the second intermediate frequency signal;

a stereo demodulator DC coupled to said FM detector and responsive to the demodulated output signal from said FM detector for deriving left and right audio signals, said stereo demodulator being capable of passing a DC component from the FM detector: and

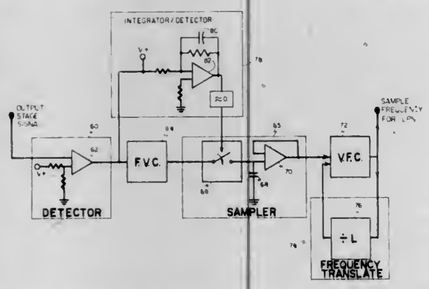
means for controlling the frequency of said second local oscillator in response to said DC component taken from a point after said stereo demodulator so that the DC component is reduced to substantially zero to thereby lessen shock noise during tuning of the receiver.

4,232,192

MOVING-AVERAGE NOTCH FILTER

Aloysius A. Beex, Hopkins, Minn., assignor to Starkey Labs, Inc., Minneapolis, Minn.

Filed May 1, 1978, Ser. No. 901,771
Int. Cl.[2] H04R 3/02
U.S. Cl. 179—1 FS **19 Claims**



1. A sound amplification system comprising:
first transducer means for providing a signal in accordance with sound-wave excitations in the environment;
amplification means for amplifying said signal;
filter means having a notch therein corresponding to an oscillation frequency of said signal which is to be suppressed; and
second transducer means for converting the output from the filter means into excitations detectable by a listener,
wherein the improvement comprises said filter means being a moving-average filter means having a frequency response with at least one notch therein, the output Y_K of said moving-average filter being derived in accordance with the system equation

$$Y_K = \sum_{i=0}^{M} b_i X_{K-i} S$$

wherein the b's are weighting coefficients, the X's are input samples from said amplification means, S and K are constants, and each output Y_K is composed of M+1 samples, and wherein the phase characteristic of said moving-average filter means is well-defined in the vicinity of and at said notch to limit the number of possible oscillation frequencies at the notch to a finite number,
wherein said moving-average filter means further comprises:
clock means for generating a clock signal;
memory means for sampling the output from said amplification means in accordance with said clock signal and for storing and shifting at least M+1 samples in accordance with said clock signal; and
automatic clock control means for controlling the frequency of said clock signal in accordance with the output from said moving-average filter means to thereby control the location of said at least one notch in the frequency response of said moving-average filter means.

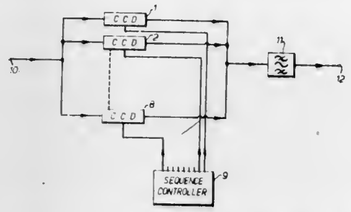
4,232,193

MESSAGE SIGNAL SCRAMBLING APPARATUS

Roger E. J. Gerard, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed May 3, 1978, Ser. No. 902,570
Claims priority, application United Kingdom, May 12, 1977, 20074/77
Int. Cl.[3] H04K 1/06
U.S. Cl. 179—1.5 R **5 Claims**

1. A message signal scrambling apparatus including a plurality of charge coupled devices connected in parallel each for storing a signal of at least one time slot duration, input and output terminal means for applying signals to and taking signals from the parallel combination respectively, and control means arranged to clock signals, applied in operation to the input terminal means, into and out of each one of the charge coupled devices in a predetermined coded manner so that the applied signal is scrambled in time, the charge coupled devices



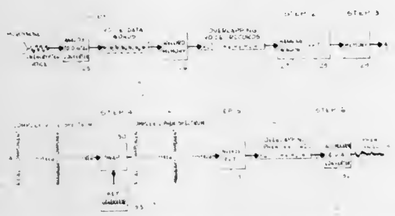
having storage capacities in excess of one time slot so that in operation the control means is arranged to clock information into and out of the devices at one predetermined rate and to clock the information stored in the devices along said devices at a different, slower, predetermined rate.

4,232,194

VOICE ENCRYPTION SYSTEM

Robert H. Adams, Sun Valley, Calif., assignor to Ocean Technology, Inc., Burbank, Calif.

Filed Mar. 16, 1979, Ser. No. 21,255
Int. Cl.[3] H04K 1/06
U.S. Cl. 179—1.5 R **17 Claims**



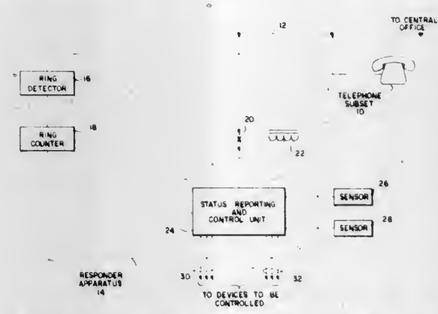
1. In an encoder or decoder for a voice encryption system, the combination of:
an analog-to-digital converter for converting a first analog signal to a sequence of digital words;
storage means for storing words from said analog-to-digital converter output in overlapping first records;
weighting means having the overlapping digital records as an input for producing digital records in the time domain and weighted by a window function;
first means for converting a time domain weighted record to the frequency domain producing a plurality of digital segments each representing a different frequency band;
means for transposing segments of said digital segments;
means for combining said transposed segments to produce a second record in the frequency domain;
second means for converting a frequency domain digital second record to a time domain digital second record;
accumulator means for storing time domain second records; and
a digital-to-analog converter for converting said time domain second records to a second analog signal.

4,232,195

TELEPHONE RESPONDER APPARATUS

Everhard H. B. Bartelink, 15 Ridge Rd., Concord, N.H. 03301

Filed Jul. 19, 1978, Ser. No. 926,104
Int. Cl.[3] H04M 3/38
U.S. Cl. 179—2 A **13 Claims**



1. Apparatus connectable at a telephone subscriber's premises to a subscriber circuit including a telephone subset, said apparatus being adapted to enable the transmission of a status report of conditions at the premises in response to the receipt of a telephone call from a remote location, said apparatus comprising:
A. means for detecting ring signals received on the subscriber circuit during an incoming telephone call;
B. means coupled to said ring signal detecting means for counting the number of incoming ring signals received on the subscriber circuit, said counting means being responsive to the receipt of a predetermined number n of incoming ring signals, where n is greater than one, for establishing an off-hook condition on the subscriber circuit;
C. status reporting means responsive to the establishment of the off-hook condition on the subscriber circuit by said counting means for generating and transmitting a reporting signal over the subscriber circuit during the off-hook condition, said status reporting signal being recognizable by a calling party and being indicative of conditions at the premises;
D. means responsive to the transmission of the status reporting signal by said status reporting means for returning the subscriber circuit to an on-hook condition; and
E. means for enabling the performance of a control function at the premises in response to the receipt of a second telephone call from a remote location subsequent to the aforementioned first telephone call, said control function means including electrical switching means operable in response to the receipt by said counting means of a predetermined number m of incoming ring signals during the second telephone call.

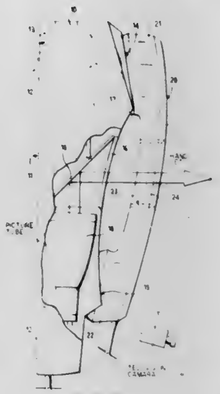
4,232,196

VIDEO TELEPHONE APPARATUS

Frederico Filippi, Via Mazzini N. 40, Turin, Italy

Filed Dec. 27, 1978, Ser. No. 973,627
Int. Cl.[3] H04M 11/08
U.S. Cl. 179—2 TV **7 Claims**

1. A video telephone apparatus useful at indoor positions, the apparatus comprising: a casing having a frontal wall and a longitudinal axis; a picture tube having an axis, said picture tube being positioned within said casing with its said axis substantially parallel to said longitudinal axis of said casing; a hand-set having an axis and including a transmitter; and a receiver with a handle portion therebetween; an aperture in said handle portion; seating means on said casing for allowing said hand-set to be removably positioned therein when not held by a user; a window in said frontal wall of said casing, said window having a contour substantially identical to that of said aperture in said handle portion and being visible through said aperture when said hand-set is positioned in said seating means; and image reflecting means positioned in said casing between



said picture tube and said window for reflecting images from said picture tube to make them viewable via said window.

4,232,197

PROCESSOR FOR A TDMA BURST MODEM

Anthony Acampora, Freehold, and Rollin E. Langseth, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1978, Ser. No. 936,714
Int. Cl.[2] H04J 3/06
U.S. Cl. 370—97 **11 Claims**



1. A processing arrangement for interfacing a TDMA burst modem and slow speed terminal processing equipment in a communication system which interchanges bursts of information in assigned time slots of a repetitive TDMA communication sequence, each TDMA communication sequence including a sequence marker signal disposed at a predetermined location therein for reception by the burst modem, the processing arrangement comprising:
first means (**50**) capable of both detecting the sequence marker signals in the repetitive TDMA communication sequence and generating an output signal in response to the detection thereof;
second means (**52, 62**) capable of generating a window signal for each burst of information within the TDMA communication sequence desired to be processed by the slow speed terminal processing equipment in response to an output signal from the first means
CHARACTERIZED IN THAT
the first means comprises circuitry which also generates an output signal corresponding in time to the normally received sequence marker signals;

the second means generates a window signal which starts at a first predetermined interval and ends at a second predetermined interval from each output signal from the first means, said first and second predetermined interval being scheduled to occur slightly before and slightly after, respectively, the anticipated reception of the desired burst of information; and

the processing arrangement further comprises

a memory (**48**, **56**) capable of directly storing the portion of the TDMA communication sequence being received during the interval of the window signal generated by the second means in a first section thereof (**48**) for subsequent detection of the burst information and slow speed processing thereof by the terminal equipment.

4,232,198

DEVICE FOR ESTABLISHING CONFERENCE CALLS VIA AT LEAST ONE TELEPHONE EXCHANGE SWITCHING SYSTEM

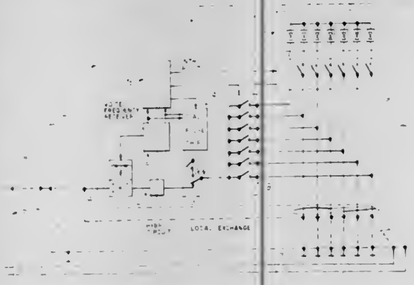
Bloomfield J. Warman, 67, King Harold's Way, Bexleyheath, Kent, England

Filed Oct. 3, 1978, Ser. No. 948,271

Claims priority, application United Kingdom, Oct. 6, 1977, 41713/77

Int. Cl.³ H04M *3/56*

U.S. Cl. 179—18 BC **10 Claims**



1. A device for use in establishing conference calls via at least one telephone exchange switching system, said device comprising (a) an inlet arranged to be accessed by a calling party via said telephone exchange switching system, (b) a plurality of outlets arranged to provide access to respective lines of said telephone exchange system for the setting of outgoing telephone calls, (c) a conference bridge for providing a two way speech path between any two or more ports thereof, (d) first switching means for selectively connecting said inlet of said conference device either to one of said ports of said conference bridge or to any one of said plurality of outlets, (e) second switching means for connecting any one or more of said outlets of the device to ports of said conference bridge, and (f) control means connected to said inlet and responsive to predetermined incoming command signals received at said inlet for actuation of said first and second switching means upon a calling party having gained access to said inlet by actuating said first switching means to obtain a direct connection to selected outlets in order, by transmission of dialling or other call setting signals as required by said exchange, to establish outgoing telephone calls to called parties and subsequently by actuating said second switching means to connect the called parties to said conference bridge and by actuating said first switching means to connect the calling party to said conference bridge.

4,232,199

SPECIAL SERVICES ADD-ON FOR DIAL PULSE ACTIVATED TELEPHONE SWITCHING OFFICE

John T. Boatwright, Concord; David G. Prince, New Durham; William F. Haskett, and Helmut Koch, both of Concord, all of N.H., assignors to Summa Four, Inc., Concord, N.H.

Filed Oct. 18, 1978, Ser. No. 952,487

Int. Cl.² H04M *1/66, 3/42*

U.S. Cl. 179—18 B **41 Claims**



1. In a telephone system of the type including a plurality of subscriber subsets connected by a corresponding plurality of subscriber lines to a telephone switching office that includes dial pulse actuated switching equipment, apparatus connectible within the office for augmenting the switching capabilities thereof by enabling the provision of a plurality of special services to subscribers not otherwise providable by the office itself, said apparatus comprising:

A. line circuit means associated with each subscriber line to receive a special service, each of said line circuit means including

i. means for sensing circuit status of the subscriber line including signals transmitted from the subscriber subset over the subscriber line to the office, and

ii. switch means actuated to modify the connection between the subscriber line and the office switching equipment;

B. buffer storage means for storing subscriber line circuit status and signal information sensed by said line circuit sensing means;

C. a first bidirectional data bus for transferring information between said buffer storage means and each of said line circuit means;

D. memory means for storing subscriber identification and class of service information;

E. processor means responsive to subscriber identification and class of service information stored in said memory means and to subscriber line circuit status and signal information stored in said buffer storage means for recognizing that a special service is to be provided on one of the subscriber lines and for controlling said switch means in the appropriate one of said line circuit means so as to effect the connection modification necessary to provide the special service on that line; and

F. a second bidirectional data bus for transferring information between said processor means, said memory means and said buffer storage means, said second bus being isolated from said first bus by said buffer storage means.

4,232,200

DIALING SYSTEM

Alfred M. Hestad; Jan Synek, and Harold O. Hansen, all of Chicago, Ill., assignors to United Networks, Inc., Chicago, Ill.

Filed Oct. 23, 1978, Ser. No. 953,885

Int. Cl.² H04M *1/274, 19/08*

U.S. Cl. 179—90 K **14 Claims**

1. An improved telephone dialing system comprising a telephone substation;

said substation comprising:

a network;

bridge means connecting said network to the telephone lines;

hook switch contacts between said bridge means and said telephone lines;

at least a first and a second conductor means extending from said bridge means for coupling said network through said bridge means and said hook switch contacts to said telephone lines;

first switching means in at least one of said first and second conductors for completing the connection of said network to said bridge means;

control means for switching said first switching means between conducting and non-conducting states;



said control means operated responsive to an open loop condition;

said dial signal generating means including memory means for storing telephone numbers therein;

first isolating circuit means to couple said memory means to said telephone lines for powering said memory means when said telephone substation is in the on-hook condition;

internal power supply means for powering said dial signal generating means in the off-hook condition; and

said bridge means including second isolating circuit means for connecting said internal power supply means to receive power from said telephone lines.

4,232,201

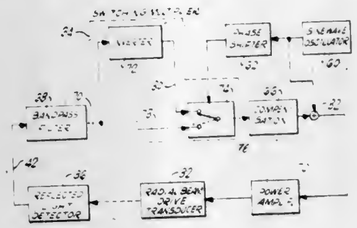
DITHERED CENTER TRACKING SYSTEM

Lawrence S. Canino, Torrance, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Filed Nov. 24, 1978, Ser. No. 963,196

Int. Cl.³ G11B *21/02*

U.S. Cl. 179—100.1 G **14 Claims**



1. For use in an information storage and retrieval system having a detection means for deriving an information signal from an information track, apparatus for controlling the position of the detection means to follow the information track, said apparatus comprising:

first transducer means for moving the detection means transversely with respect to the information track;

second transducer means for deriving an information signal from the detection means;

means for generating an oscillatory dither signal for application to said first transducer means;

means for bandpass filtering said information signal to obtain an intermediate signal indicative of the effect of dither on said information signal;

means for correcting the phase of said dither signal to obtain a phase-corrected dither signal for correlation with said intermediate signal;

means for deriving an error signal from said intermediate signal and the polarity of said phase-corrected dither signal, wherein said error signal at any instant has a magnitude proportional to that of said intermediate signal and a polarity derived from the product of the intermediate signal polarity and the phase-corrected dither signal polarity; and

means for combining said error signal and said dither signal for application to said first transducer means.

4,232,202

RECORD PLAYER FOR A STATIONARY RECORD DISC

Yoshihisa Mori; Norio Mashimo, and Takeo Eguchi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1978, Ser. No. 942,269

Claims priority, application Japan, Sep. 19, 1977, 52-112486

Int. Cl.³ G11B *3/40*

U.S. Cl. 179—100.4 E **14 Claims**



1. A record player for use on a stationary record disc having a surface on which signals are recorded in a spiral sound groove comprising

a freely movable body adapted to be steerably supported on said surface of the record disc for random movement in respect to the latter;

drive means operatively associated with said randomly movable body for propelling said movable body relative to the record disc;

sound pick-up means for engaging and tracking the spiral sound groove of said record disc and reproducing the signals recorded therein as said movable body is propelled;

means mounting said sound pick-up means in respect to said movable body for movement in a plane substantially parallel to the plane of the surface of said record disc; and

control means for steering said movable body and thereby controlling the direction of movement of said movable body on said record disc in response to movement of said sound pick-up means relative to said movable body while engaging and tracking the spiral groove on said record disc.

4,232,203

INTEGRAL TELEPHONE SET AND HANDSET

George V. Lenaerts, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 5, 1979, Ser. No. 9,655
Int. Cl.³ H04M 1/02, 1/03
U.S. Cl. 179—103 11 Claims



1. An integral combined telephone set and handset comprising an elongate hollow member having a perforated mouth position at one end, a perforated ear position at the other end, and a pushbutton dial position intermediate the mouth and ear positions, and an elongate rigid support member extending longitudinally in said hollow member, said support member comprising a steel sheet member having upper and lower surfaces and a porcelain layer on both surfaces; a contact circuit on the upper surface, the contact circuit including a plurality of switch positions each having a contact area; a spring contact assembly mounted on the upper surface and including a plurality of snap-action spring contact members, a member aligned with each switch position and contact area; a pushbutton assembly mounted on the upper surface over said spring contact assembly and including a plurality of pushbuttons, each pushbutton aligned with a spring contact member; said pushbuttons extending through apertures at said pushbutton dial position; circuit means on the lower surface of said support member, said circuit means including an electrical circuit pattern and electrical devices connected to said circuit pattern and said contact circuit; a transmitter mounted at one end on said support member and adjacent to said mouth position; a receiver mounted at the other end on said support member and adjacent to said ear position; a line switch mounted in said hollow member and including actuating means extending from within said hollow member; and a ringer mounted in said hollow member, the arrangement such that said support member carries the electrical and electronic circuit components of a telephone set.

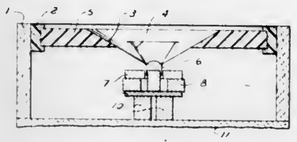
4,232,204

HIGH FIDELITY LOUDSPEAKER

Hernan H. Rojas, Santiago, Chile, assignor to Comercial e Industrial Sound-Tronic Ltd., Santiago, Chile

Filed Jun. 22, 1978, Ser. No. 917,886
Int. Cl.² H04R 9/06
U.S. Cl. 179—115.5 R 3 Claims

1. An acoustic box having side walls connected to a front panel through a resilient suspension, said front panel being made of expanded polystyrene and associated with a standard loudspeaker cone and a small diffuser cone which are concentric and are driven by a single common driving coil, said front panel operating as a low frequency reproducer, said standard cone operating as the panel driving means for the low frequency range and also as a reproducer for the medium frequencies, and the smaller diffuser operating as a high frequency reproducer, the whole arrangement conforming to an indivisible system and as an electro-acoustical transducer having a



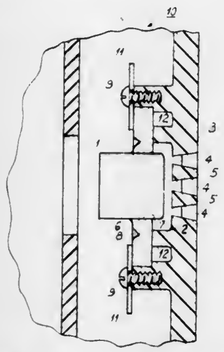
linear response in the audible range, and wherein the driving coil is embedded in a moulded plastic tube to prevent deformation, and said driving coil is permanently immersed in a magnetic field.

4,232,205

MICROPHONE MOUNT

Rene Ribeyre, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Aug. 1, 1978, Ser. No. 930,255
Claims priority, application France, Aug. 30, 1977, 77 26309
Int. Cl.² H04R 1/28
U.S. Cl. 179—146 R 4 Claims



1. A mounting fixture for mounting a microphone interiorly of a housing enclosure for enclosing a sound recording device, said sound recording device including mechanical transport means for a recording medium, and wherein the improvement comprises:

said mounting fixture including an intermediate member of lead placed between said microphone and said enclosure for providing support for and acoustic decoupling of said microphone from said enclosure; whereby vibrations transmitted from said transport means to said microphone are dampened.

4,232,206

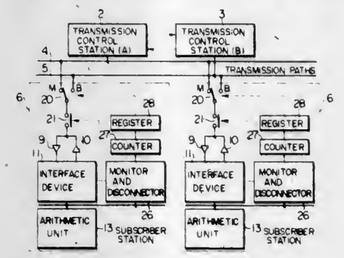
SIGNAL TRANSMISSION CONTROL SYSTEM

Eiji Tooyama, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 19, 1978, Ser. No. 971,110
Claims priority, application Japan, Dec. 19, 1977, 52-151818
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 S 6 Claims

1. A signal transmission control system comprising; two individual signal transmission paths, a pair of transmission control stations one of which serves as a primary control station and being coupled to one of said signal transmission paths, while the other of said transmission control stations

serves as a stand-by control station coupled to the other of said signal transmission paths, and a plurality of subscriber stations normally connected to said one transmission path and adapted to perform reception and transmission of information data to one another in accordance with access signals issued from said primary transmission control station, wherein each of said subscriber stations is composed of first means for disconnecting the associated subscriber station a part of which is constituted by said first means itself from said one transmission path when said access signal is unavailable properly within a predetermined time span, second means for performing self-checking in



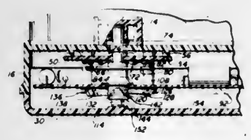
said associated subscriber station after said subscriber station has been disconnected from said one transmission path, means for holding said associated subscriber station in the disconnected state when abnormality is detected in said subscriber station as a result of said self-checking, and third means for switching said associated subscriber station to said other signal transmission path when no abnormality is found in said associated subscriber station as the result of said self-checking, and wherein upon occurrence of an abnormality in the signal transmission, the signal transmission control functions of said primary control station are transferred to said stand-by transmission control station.

4,232,207

ROTARY SWITCH ASSEMBLY

Bernhard R. Kuhl, Mount Prospect, and Edward J. Safranek, Arlington Heights, both of Ill., assignors to The Echlin Manufacturing Company, Branford, Conn.

Filed Jul. 5, 1978, Ser. No. 922,091
Int. Cl.³ H01H 19/54
U.S. Cl. 200—11 R 5 Claims



1. A switch comprising:

housing means having a first wall and a second wall displaced from and substantially parallel to said first wall, said first wall having a first aperture therein;

printed circuit board means having a second aperture therein and contact elements disposed about said second aperture, said printed circuit board means being mounted in said housing between said first and second walls with said first and second apertures in substantial alignment;

shaft means extending through said first and second apertures, including resilient contact means for selectively engaging certain of said contact elements in response to rotational positioning of said shaft means, said shaft means including a portion extending to and abutting said second wall to transmit externally generated longitudinal forces directed along the axis of said shaft means toward said housing means to said second wall whereby stresses exerted on said printed circuit board are reduced;

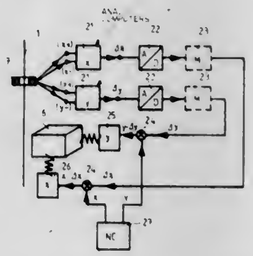
rotation control means mounted to said housing means and including detent means and post means, said shaft means including radially extending arm means disposed to be engagable with said detent means for establishing a plurality of substantially stable rotational positions for said shaft means and with said post means for limiting the rotational travel of said shaft means, said rotation control means further including an annular collar for slidably engaging said shaft means, said annular collar being substantially aligned with said second aperture and cooperatively operating therewith to position said shaft means to thereby substantially establish the axis of rotation of said shaft means.

4,232,208

APPARATUS AND METHOD FOR ELECTRICAL DISCHARGE MACHINING

Ernst Bühler, Tenero, Switzerland, assignor to A.G. für industrielle Elecktronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Aug. 25, 1978, Ser. No. 936,027
Claims priority, application Switzerland, Mar. 6, 1978, 2419/78
Int. Cl.³ B23P 1/12
U.S. Cl. 219—69 W 13 Claims



1. In the art of electrical discharge machining of the type in which a workpiece (6) is cut by a wire electrode (1) which is guided between two guides (5) in a commanded guide path, including a rest or reference position

a method to correct for random, undesired deflection of the wire from the guide path comprising the steps of

commanding relative movement of the wire (1) and the workpiece (6) in said commanded guide path in accordance with command information;

said guide path having coordinate directions (x, y) perpendicular to each other;

measuring the deflection of the wire electrode from the rest position in said guide path in the two perpendicular coordinate directions by means of at least one displacement pick-up system (7), said displacement pick-up system being located around the wire electrode between the wire guides and the workpiece, and generating information indicative of the distance and direction of deflection of the wire from said rest position and hence the commanded guide path;

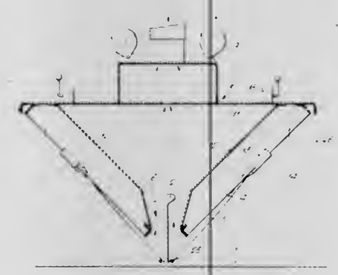
and substantially continuously correcting the commanded guide path of the wire electrode relative to the workpiece by additionally controlling the relative position of the electrode and the workpiece as a function of the deflection information in such a way that the deflected wire electrode remains positioned on its commanded path.

4,232,209

APPARATUS FOR WELDING OF STIFFENERS OR THE LIKE ON A PLATE

Einar Redersen, N. Varasen 7, 5200 Os, Norway, assignor to Einar Pedersen, Os, Norway

Filed Sep. 13, 1978, Ser. No. 941,780
Claims priority, application Norway, Sep. 15, 1977, 773179
Int. Cl.³ B23K *9/32, 9/12, 9/28*
U.S. Cl. 219—137.41 **16 Claims**



1. Apparatus for welding of stiffeners or the like to a plate comprising:

a box having a longitudinal dimension for accepting a portion of the length of a stiffener, said box having a slot along a wall thereof through which the stiffener extends into the interior of the box,

means for positioning the box relative to the stiffener to be welded,

a plurality of guiding means mounted to the box along its length for holding welding electrodes at a position adjacent the place where the stiffener is to be welded to the plate, and

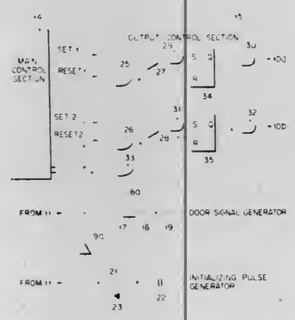
means for applying reduced gas pressure to the box to remove materials produced during the welding operation.

4,232,210

OUTPUT POWER CONTROL SYSTEM FOR MICROWAVE OVENS

Yoshio Oida, Funabashi; Masayuki Sasaki, Kawasaki, and Hidetoshi Semi, Kamakura, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jun. 22, 1978, Ser. No. 918,151
Claims priority, application Japan, Jun. 22, 1977, 52-73300
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 C **3 Claims**



1. An output power control system for a microwave oven, comprising:

an AC power source;

a magnetron tube for microwave oscillation;

switch means and a semiconductor element connected in series between said AC power source and said magnetron tube for controlling the power to said magnetron tube;

a DC power source coupled to said AC power source; and

an output power control circuit coupled to said DC power source and supplying first and second control signals to said switch means and said semiconductor element, respectively;

said output power control circuit comprising:

a door signal generating means coupled to said DC power source for producing door signals representing the open and closed state of a door of said microwave oven;

an initiating pulse generating means coupled to said DC power source for producing a pulse to initiate the operation of said output power control circuit when said AC power source is turned on;

a main control section receiving said door signal and said initiating pulse for periodically detecting said door signals, said main control section producing first and second set signals when said door is closed at said periodic detection and producing first and second reset signals when said door is opened at said periodic detection; and

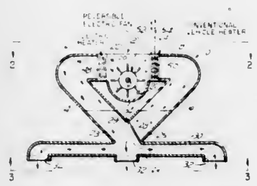
an output control section coupled to said door signal generating means, said initiating pulse generating means, said main control section, said switch means, and said semiconductor element, said output control section comprising first means which produces said first and second control signals for causing said magnetron tube to oscillate when receiving said first and second set signals and which stops producing said first and second control signals when receiving said first and second reset signals, and second means which instantaneously stops said first and second control signals when said door is opened during the oscillation period of said magnetron tube.

4,232,211

AUTOMOBILE AUXILIARY HEATER

Johnnie L. Hill, 18272 Pinehurst, Detroit, Mich. 48221

Filed Oct. 19, 1978, Ser. No. 952,709
Int. Cl.³ B60H *1/02*; F24H *3/02*; H05B *3/00*
U.S. Cl. 219—202 **9 Claims**



1. An auxiliary heating device for an automobile having an electrical supply circuit and an engine liquid cooling system, said heating device comprising

a housing structure including a main air inlet duct having therein a fan chamber with an outside air intake passageway leading thereto and also including first and second branch air outlet ducts connected to said main air duct at spaced locations thereon on opposite sides of said fan chamber,

said first and second branch outlet ducts having first and second individual air outlets respectively disposed remote from said main air inlet duct,

an electric air heater disposed in the space between said fan chamber and said first branch air outlet duct and adapted to be electrically connected to the automobile electrical supply circuit,

an engine liquid air heater disposed in the space between said fan chamber and said second branch air outlet duct and adapted to be connected to the automobile engine liquid cooling system,

a reversible electric fan in said fan chamber constructed and arranged to draw outside air through said outside air intake passageway and to discharge the thus indrawn air into either said first branch outlet duct or said second branch outlet duct in response to rotation of said reversible electric fan in opposite directions,

a heated air distribution duct connected to said first and second branch air outlet ducts and disposed in communication with said first and second individual air outlets thereof and having heated air discharge means,

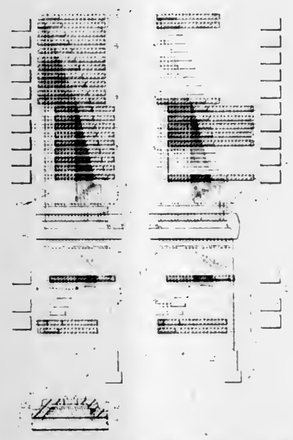
and damper means disposed adjacent said first and second branch duct outlets and selectively movable alternately between opposite positions simultaneously opening communication between the one of said individual branch duct outlets through which air is discharged by the fan and said heated air distribution duct and closing communication between the other of said individual branch duct outlets and said heated air distribution duct.

4,232,212

THERMAL PRINTERS

David R. Baraff, Ottawa, and Lawrence H. Hobbs, West Carleton, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 3, 1978, Ser. No. 948,240
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—216 **12 Claims**



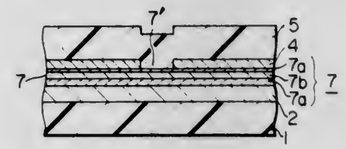
1. A thermal printing device comprising an electrically insulating substrate supporting a film of resistive material and first and second conductor patterns electrically contacting said film of resistive material so as to establish resistive heating paths through said resistive material between closely spaced end parts of said first and second conductors, the conductors of the first pattern being matrix-addressed by a third pattern of conductors, the conductors of the third pattern electrically connected to respective sets of said first pattern of conductors at contact regions formed as rectifying junctions remote from the resistive material, the second and third conductor patterns being tailored for application of addressing signals.

4,232,213

THERMAL HEAD

Nobuyoshi Taguchi, Higashiosaka; Koji Matsuo, Nara; Hiromu Takahashi, Hirakata, and Fujio Oda, Ashiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 15, 1979, Ser. No. 3,537
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—216 **5 Claims**



1. In a thin-film thermal head comprising an insulating substrate having a glass layer on the surface thereof, a thin-film heat-generating resistor layer formed on said insulating substrate, a pair of electrodes formed on said thin-film heat-generating resistor layer to form a heat-generating section, and a wear-resistant layer formed to protect said heat-generating section;

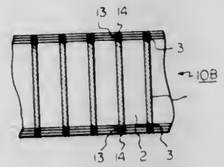
wherein said thin-film heat-generating resistor layer comprises a low resistivity layer made of an alloy of Si and a particular metal of high melting point and a high resistivity layer including at least Si, said low resistivity layer being formed on said glass layer of said insulating substrate through said high resistivity layer.

4,232,214

PTC HONEYCOMB HEATING ELEMENT WITH MULTIPLE ELECTRODE LAYERS

Ryoichi Shiol, and Tamotu Yamauchi, both of Nikaho, Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed Feb. 22, 1979, Ser. No. 14,283
Claims priority, application Japan, Feb. 22, 1978, 53/18573; Feb. 22, 1978, 53/18574
Int. Cl.³ H05B *3/08*
U.S. Cl. 219—541 **14 Claims**



1. A heating element comprising a semiconductor ceramic body of a honeycomb structure, the material of said semiconductor ceramic body having a positive temperature coefficient of resistance over a Curie point and composed of barium titanate, wherein a pair of inner electric conductive layers comprising mainly silver are provided on both end surfaces of said semiconductor ceramic body, electrically connected to a source for supplying power to said semiconductor ceramic body, and wherein an outer electric conductive layer consisting of at least one metal selected from the group, which consists of nickel, zinc and chromium is provided on each of the inner layers.

4,232,215

HUMAN REPRODUCTION INDEXING DEVICE

John P. Hanley, 625 Ivy Ct., Kenilworth, Ill. 60043

Filed Oct. 2, 1978, Ser. No. 947,568
Int. Cl.[3] G06C *3/00, 27/00*
U.S. Cl. 235—78 RC 16 Claims



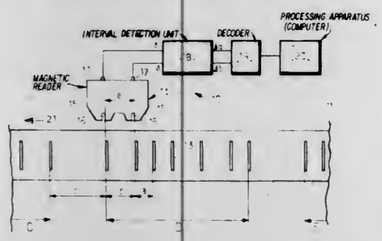
1. An indexing device comprising: a base member having calendar indicia representing the calendar dates for the days of one month interval disposed on at least one surface thereof, and an index member having indexing means including an indexing portion and an indicator portion, said index member being assembled together with said base member and being movable relative thereto to permit said indexing portion to be selectively aligned with said calendar indicia, said indicator portion being disposed in a predetermined relationship relative to said indexing portion whereby when said index member is set with said indexing portion aligned with a given one of the calendar indicia, said indicator portion is located to indicate a preselected group of the calendar dates.

4,232,216

METHOD AND DEVICE FOR READING CODED INFORMATION IN THE FORM OF INTERVALS OF PREDETERMINED SIZES

Michel Helle, Marcq, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 12, 1978, Ser. No. 968,789
Claims priority, application France, Dec. 30, 1977, 77 39749
Int. Cl.[2] G06K *7/10, 7/08;* G11B *5/09;* G06K *9/04*
U.S. Cl. 235—449 16 Claims



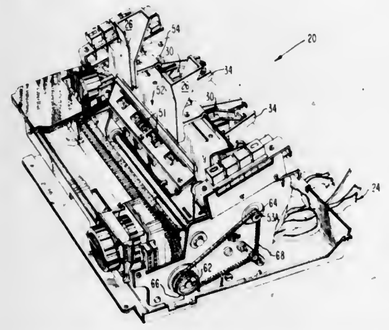
1. A method of recognizing an item of information defined by a plurality of different intervals between consecutive pulses of a first pulsed signal, said method comprising:
generating a second pulsed signal the pulses of which are delayed with respect to corresponding pulses of the first pulsed signal by a delay interval e; and
comparing the first and second pulsed signals to produce an output signal representing the item of information, the delay interval being selected and the comparison being such that a first interval a is identified when a leading edge of a pulse of the second signal occurs during a pulse of the first signal and a second interval b is identified when a trailing edge of a pulse of the second signal occurs during a pulse of the first signal.

4,232,217

STEPPER MOTOR DRIVE FOR A MECHANICAL CAMSHAFT

Jurgen A. Juziuk, Livonia; Ronald H. Mack, Plymouth; Eugene F. Banka, Livonia, all of Mich., and Edward A. Nicol, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 27, 1979, Ser. No. 33,890
Int. Cl.[3] G06K *13/00, 13/02, 13/16, 13/20*
U.S. Cl. 235—480 6 Claims



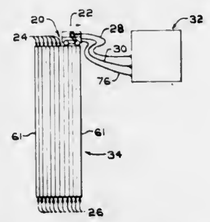
1. A drive system for processing passbook data comprising:
an incremental drive for actuating the system;
means for controlling the incremental drive;
a first rotatable cam set;
means for sensing data on a document;
first means for following the configuration of the first rotatable cam set to position the sensing means;
a second rotatable cam set;
means for positioning the documents;
second means for following the configuration of the second rotatable cam set to actuate the document positioning means;
a third rotatable cam set;
means for backing the document during data transfer to the document; and
third means for following the configuration of the third rotatable cam set to properly place the means for backing the document during data transfer to the document.

4,232,218

PLATE COUNTER

Hobart E. Kenton, Lower Burrell, and Forrest W. Decker, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1978, Ser. No. 891,365
Int. Cl.[2] G06M *9/00*
U.S. Cl. 250—222 PC 8 Claims



1. An apparatus for determining number of sheets in a stack, the shets each having an energy reflecting surface portion, comprising:

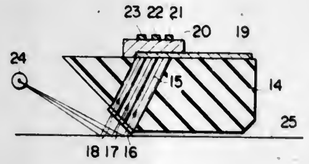
a carriage;
means mounted on said carriage for directing energy rays toward a side of the stacked sheets;
means for sensing density of reflected energy rays mounted on said carriage in spaced relation to said means for directing energy rays;
means connected to said sensing means for generating a density signal;
first wheel means mounted on said carriage adjacent said means for directing energy rays;
second wheel means mounted on said carriage in spaced relation to said first wheel means and adjacent said sensing means;
means for generating a signal indicating relative displacement as said carriage moves on said first or second wheel means from a predetermined location along said side of the stacked sheets;
means for interconnecting said first wheel means; said second wheel means and said means for generating a displacement signal when at least one of said wheel means moves over the stacked sheets; and
means for acting on the density signal and the displacement signal to determine the number of sheets in the stack.

4,232,219

PHOTOSENSOR

Hideaki Yamamoto, Hachioki; Toshihisa Tsukada, Sekimachi; Eiichi Maruyama, Kodaira, and Hiroya Inagaki, Sekimachi, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed Feb. 27, 1979, Ser. No. 15,615
Claims priority, application Japan, Mar. 3, 1978, 53/23461
Int. Cl.[3] G02B *5/14*
U.S. Cl. 250—227 14 Claims



1. A photosensor comprising a fiber substrate having a light-receiving window formed in one surface thereof, the one surface being spaced from an information surface to be read, a bundle of optical fibers being disposed within said substrate and positioned within said light-receiving window, a plurality of color filters of different characteristics being disposed on an end face of said bundle of optical fibers, and a plurality of arrays of photosensitive elements corresponding to said color filters, said arrays of photosensitive elements being integrated onto said fiber substrate and disposed in the region of the end face of said bundle of optical fibers positioned farthest away from the information surface.

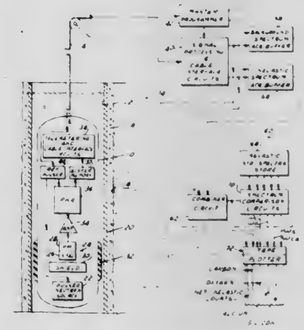
4,232,220

BACKGROUND SUBTRACTION SYSTEM FOR PULSED NEUTRON LOGGING OF EARTH BOREHOLES

Russel C. Hertzog, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 4, 1979, Ser. No. 36,201
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 15 Claims

1. A method for determining the characteristics of earth formations surrounding a well borehole comprising the steps of:
repetitively irradiating the earth formations surrounding the well bore with relatively short duration pulses of high energy neutrons;
detecting during each such pulse of high energy neutrons, gamma radiation due to the inelastic scattering of neutrons by materials comprising the earth formations surrounding the borehole and providing information representative thereof;
detecting immediately following each such pulse of high



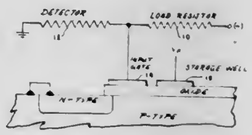
energy neutrons, background gamma radiation due to thermal neutron capture and providing information representative thereof; and
correcting said inelastic gamma representative information to compensate for said background representative information.

4,232,221

METHOD AND APPARATUS FOR TRIMMING IR/CCD MOSAIC SENSORS

Michael F. Millea, Manhattan Beach, and David H. Seib, Costa Mesa, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 22, 1979, Ser. No. 5,111
Int. Cl.[3] G01N *23/00;* H01J *37/00*
U.S. Cl. 250—311 5 Claims



1. A threshold level trimming apparatus for IR/CCD mosaic sensors comprising in combination:
a scanning electron microscope for irradiating a specimen, said scanning electron microscope producing an electron beam output, said scanning electron microscope including a cathode ray tube unit for visual observation of said specimen,
an IR/CCD sensor unit comprising a plurality of IR/CCD mosaic sensors, said IR/CCD sensor unit being positioned

in said scanning electron microscope for exposure to said electron beam output, said IR/CCD sensor unit being registered within the scanning electron microscope coordinate system to permit any region of said IR/CCD sensor unit to be irradiated, a bias level being applied to each of said plurality of IR/CCD mosaic sensors, some of said plurality of IR/CCD mosaic sensors producing an output signal, said bias level being increased until each of said plurality of IR/CCD mosaic sensors produce an output signal, the bias level which produces an output signal in each of said plurality of IR/CCD mosaic sensors being the established threshold level, and,

a readout unit connected to said IR/CCD sensor unit to indicate the output signal in each of said plurality of IR/CCD mosaic sensors, each of said plurality of IR/CCD mosaic sensors having an input gate which is positioned on an insulating region, said scanning electron microscope irradiating the insulating region of each of said IR/CCD mosaic sensors whose threshold level is below the established threshold level to introduce a positive charge into said insulating region and bring all input gates to the same threshold level for a no-signal condition.

4,232,222

BINOCULAR NIGHT GLASS

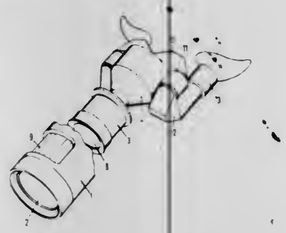
Johan H. M. Deltrap, Oostvoorne, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Sep. 1, 1978, Ser. No. 938,762

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1977, 2739927

Int. Cl.³ H01J *31/49*

U.S. Cl. 250—333 **4 Claims**



1. A binocular night glass for both infrared and visible light, comprising

an image converter including a series arrangement of a first image converting tube section of the proximity-focus type and a second image converting tube section which produces an image reversal,

said image converting tube sections having a photocathode on the front thereof responsive to both infrared and visible light radiation,

said image converting tube sections having an image screen on the rear thereof for producing an intensified image,

an optical input system including a front object lens and a ring for adjusting the focal point of the front object lens for forming an image on the photocathode on the front of the image converter,

a collimating lens having a focal plane located in the image screen on the rear of the image converter,

a central tube member housing said image converter and said collimating lens,

a pair of viewing devices each including a pair of 90° prisms, an object lens interposed between each pair of prisms, and an eye piece receiving respective portions of the parallel rays from the collimating lens to form a binocular with said collimating lens, and

said prisms arranged so that light paths through the viewing devices are reflected alongside the central tube member over the collimating lens to position the eye pieces closely behind the plane defined by the rear end of the central tube member.

4,232,223

GAS ANALYZER

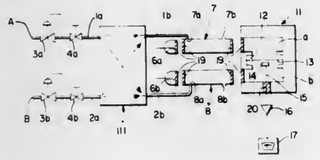
Toshikazu Ohnishi; Kozo Ishida, and Osamu Saitoh, all of Miyanohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Jun. 19, 1979, Ser. No. 49,971

Claims priority, application Japan, Oct. 18, 1978, 53-128756

Int. Cl.² G01N *21/26*

U.S. Cl. 250—343 **5 Claims**



1. A gas analyzer for measuring the concentration of a gaseous component in a test gas, said gas analyzer comprising:

first and second separate cells adapted to alternately be filled with a test gas containing a gaseous component to be analyzed and a standard gas;

light source means for directing rays of energy through said first and second cells and through the said test gas and standard gas alternately contained therein;

detector means, positioned to receive said rays of energy after passage thereof through said first and second cells, for detecting the concentration of said gaseous component within said test gas; and

changeover means, connected to said first and second cells and adapted to be connected to sources of said test gas and said standard gas, for alternately supplying said test gas and said standard gas, at fixed intervals and in fixed amounts, into said first and second cells, said changeover means comprising a single block having therein first and second inlets adapted to be connected to said source of test gas and said source of standard gas, respectively, first and second outlets respectively connected to said first and second cells, and rotary valve means movable between a first position respectively connecting said first and second inlets with said first and second outlets and a second position respectively connecting said first and second inlets with said second and first outlets.

4,232,224

NUCLEAR REACTOR PRIMARY COOLANT LOOP FLOWMETER WITH PHASE SHIFT TRACKING COMPENSATION

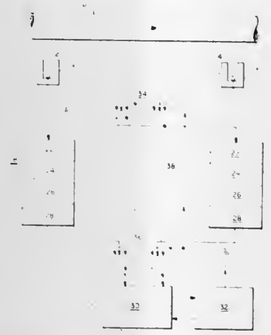
Kingsley F. Graham, Murrysville, and Raj Gopal, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1978, Ser. No. 946,463

Int. Cl.² G01F *1/00*

U.S. Cl. 250—356 **8 Claims**

1. An improved nuclear reactor primary coolant loop flowmeter having a first detector positioned substantially adjacent to the coolant loop at a first location, which is responsive to the gamma radiation emanating from the Nitrogen-16 activity within the reactor coolant at the first location to provide a representative electrical output, a first detector channel for conditioning and communicating the first detector's output, a second detector positioned substantially adjacent to the coolant loop at a second location downstream of the first location, which is responsive to the gamma radiation emanating from the Nitrogen-16 activity within the reactor coolant at the second location to provide a representative electrical output, a second detector channel for conditioning and communicating the second detector's output, and means having inputs from the first and second detector channels' outputs for cross-correlating the first and second detectors' outputs and delaying the first output with respect to the second until the cross-correlation function approaches a maximum so as to determine the delay time between corresponding points in the first and second outputs, wherein the improvement comprises means for switching the first detector output to the second detector channel and the second detector output to the first detector channel and means for adding the delay times monitored between corresponding points in the first and second outputs by the cross-correlating means with the first and second detectors connected in both switching positions to provide an output proportional to the primary coolant flow rate.



4,232,225

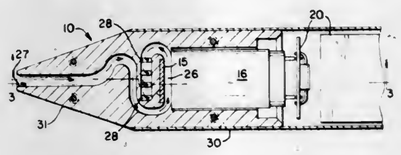
CHEMILUMINESCENT METHOD AND APPARATUS FOR THE DETECTION OF OZONE

Jagir S. Randhawa, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1979, Ser. No. 4,625

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—361 C **7 Claims**



1. An apparatus for the continuous detection and measurement of ozone in the atmosphere as a function of altitude, said apparatus comprising a main body portion and a nose portion, said main body portion housing a reaction chamber, detector and amplifying means for generating a signal proportional to the concentration of ozone in said reaction chamber, a body of ozone reactive chemiluminescent material in said reaction chamber, a transmitter means for transmitting said signal, said nose portion being frustoconical for aerodynamic stability and having an opening communicating with a duct for the admission of an ambient air flow through said opening into said duct, said air flow occurring as said apparatus falls through said atmosphere, said duct excluding stray light and directing said air flow into said reaction chamber over and in contact with said body of chemiluminescent material, the ozone in said air flow reacting with said chemiluminescent material to form molecular oxygen and emit light, said air flow being directed in a continuous stream through said reaction chamber into at least one exit duct and an exit chamber, said exit duct excluding stray light from said reaction chamber, said exit chamber including a pair of openings on opposite sides directing said air flow equally through said openings out of said apparatus to maintain equilibrium, the light emitted by the reaction of said ozone with said chemiluminescent material being proportional to the concentration of ozone in said air flow and being detected by said detector and amplifying means, the signal generated by said detector and amplifying means being transmitted to a receiver for visual display.

4,232,226

DIAGNOSTIC INSTALLATION FOR PRODUCING TOMOGRAPHIC IMAGES

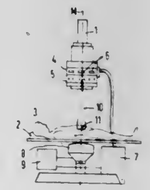
Robert Huettner, Heroldsbach; Gerhard Kuetterer, and Hartmut Sklebitz, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,417

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836282

Int. Cl.³ A61B *6/00, 6/02*; G21K *1/04*

U.S. Cl. 250—445 T **15 Claims**



1. A diagnostic installation for producing laminographic images, comprising a support table for a patient, a plurality of radiation sources arranged in an array on one side of the support table and each being operable for producing a beam of rays penetrating the patient lying on the support table, and an image detection installation on the other side of the support table, and means for effecting the activation of the radiation sources in a desired sequence, and for controlling the image field of the image detection installation in a coordinated manner so that sharply defined images are formed of only those details disposed at a common layer region where the beams of rays converge and intersect a corresponding longitudinal layer of the body, characterized in that beam path control means (**21***a*–**21***q*) are arranged in every path of rays of the radiation beam (**10**), of each radiation source (**6**), said beam path control means having respective shiftable apertures for adjusting the path of each beam of rays relative to an axis (M) of the array of radiation sources to effect a laminographic depth adjustment.

4,232,227

X-RAY EXAMINATION APPARATUS

Johann Finkenzeller; Guënter Holzermer, and Gerhard Wenzek, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,069

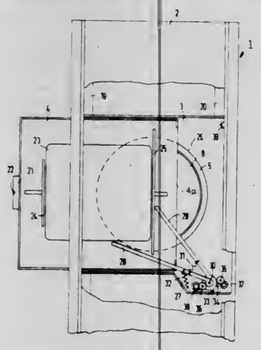
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744139

Int. Cl.² G03B *41/16*

U.S. Cl. 250—468 **8 Claims**

1. An x-ray examination apparatus comprising an examination table (**1**), a patient support platform (**2**) resting on the examination table, an x-ray source with a remote-controllable collimator restricting the radiation beam, a longitudinal transport carriage (**3**) transportable along the length of and supported by the patient support platform, and a cassette support (**4**) capable of insertion into an operating position on the longitudinal transport carriage and having clamping means (**24**, **25**)

mounted thereon for positioning an insertable x-ray film cassette in fixed relation to said cassette support, said cassette support having means comprising said clamping means for providing cassette receiving regions of continuously varying size within a predetermined range, two sensor means (**28, 29**) being mounted on the transport carriage (**3**) and being operable in a sensing condition for sensing the length and width of the x-ray film cassette (**23**) clamped in the inserted cassette support (**4**), mechanical-electrical transducers (**37, 38**) mounted by the longitudinal transport carriage and each coupled with a respective one of said sensor means and continuously operated as a function of the mechanical position of the associated sensor means while the sensor means is in said sensing condition, and means comprising said sensor means and the mechanical-electrical transducers both mounted in the longitudinal transport carriage for enabling the complete removal of the cassette support from the longitudinal transport carriage without removing the sensor means and without removing the mechani-



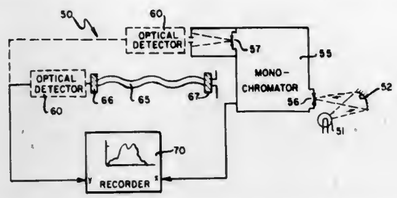
cal-electrical transducers from their mounted relationship to said longitudinal transport carriage, said sensor means having sensor positioning means (**31-34**) for automatically moving said sensor means to respective rest positions during removal of the cassette support from the longitudinal transport carriage, one of said sensor means (**28**) being positioned by said sensor positioning means so as to be displaced from its rest position in accordance with the dimension of a cassette parallel to the cassette support insert direction when the cassette support (**4**) with the cassette secured in said cassette receiving region is inserted into said operating position on the longitudinal transport carriage, and the other of said sensor means (**29**) being actuated from its rest position for sensing the transverse dimension of a cassette occupying said cassette receiving region with the displacement of the one sensor means (**28**) from its rest position, such cassette transverse dimension being transverse to the cassette support insertion direction in which the cassette support is inserted into said operating position on the longitudinal transport carriage.

4,232,228
METHOD OF LIGHTENING RADIATION DARKENED OPTICAL ELEMENTS

Frederich R. Reich, Richland, and Albert R. Schwankoff, W. Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 7, 1979, Ser. No. 64,597
Int. Cl.³ A61K *27/02*
U.S. Cl. 250—492 R **19 Claims**

1. A method of lightening a radiation-darkened optical element, comprising directing electromagnetic radiation having a wavelength in the range of from about 2000 to about 20,000

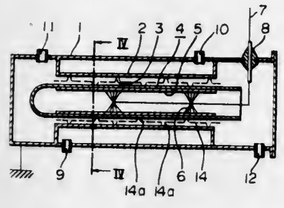


angstroms into a preselected area of the optical element for a period of time sufficient to effect the desired lightening.

4,232,229
OZONIZER

Masaaki Tanaka; Takanori Ueno, and Norikazu Tabata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1979, Ser. No. 10,683
Claims priority, application Japan, Feb. 13, 1978, 53-15129; Jun. 20, 1978, 53-74538
Int. Cl.³ C01B *13/12*
U.S. Cl. 250—541 **12 Claims**



1. An ozonizer comprising:
a pair of electrodes including a grounding electrode and a high voltage electrode;
a dielectric substrate disposed between said grounding electrode and said high voltage electrode;
a perforated metal substrate disposed in a gap space between said grounding electrode and said dielectric substrate and being in electrical contact with said grounding electrode, said perforated metal substrate comprising,
first spacing means interspaced between said perforated metal substrate and said dielectric substrate for maintaining a constant separation gap therebetween,
second spacing means disposed between said perforated metal substrate and said grounding electrode to maintain said perforated metal substrate in position between said dielectric substrate and said grounding electrode,
wherein a uniform separation distance promoting a uniform silent discharge is maintained between said perforated metal substrate and said dielectric substrate by said first and second spacing means.

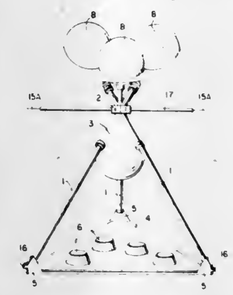
4,232,230
OCEAN WAVE ENERGY CONVERTER

Foerd Ames, 8 Wawatek Rd., Cold Spring Harbor, N.Y. 11724

Filed Jun. 14, 1979, Ser. No. 48,324
Int. Cl.³ F03B *13/10*
U.S. Cl. 290—53 **5 Claims**

1. Apparatus for converting the energy of wave motion on the surface of a body of water to electricity, comprising:
(a) a plurality of linear electric generators, each including a tubular outer member surrounding a relatively reciprocable inner member.

(b) structural means maintaining said generators in a fixed relationship to each other, approximating elements of a cone, said outer members crossing in near intersection in the region of the apex thereof.
(c) a plurality of flotation devices disposed above said apex



region, each secured to the inner member of one of said generators and adapted to ride on said surface and follow the wave motion, and
(d) a damper plate attached to the lower ends of said outer generators members and adapted to be disposed below said surface in a region relatively free of wave motion.

4,232,231
ROAD VEHICLE ELECTRICAL SYSTEMS

Kenneth R. B. Reed, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

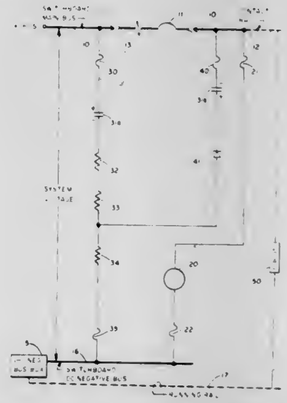
Filed Jan. 15, 1979, Ser. No. 3,684
Int. Cl.³ H04Q *3/00*; H02J *1/00*
U.S. Cl. 307—10 R **2 Claims**

1. An automotive vehicle electrical system comprising a plurality of switch devices, a multiplicity of load devices each controlled by a corresponding load control device arranged in a number of groups, a transmitter device controlled by said switches and a plurality of receiver devices associated respectively with said groups of load control devices, the transmitter device cyclically generating on a data rail connected to all said receivers a pulse train consisting of a series of digital words, each such word including a first set of bits defining an address code appropriate to one of the receivers and a second set of bits defining a utilization code indicating the required state of the load control devices in the group associated with that receiver in accordance with the condition of associated ones of the switch devices, and wherein each receiver includes an input register for receiving signals from said data rail, address code recognition means operative when the address code part of each word has been received by the input register and means controlled by said address code recognition means for preventing the input register from receiving command data from the data rail except when said address code recognition means has recognised the address code forming the first part of the data word.

4,232,232
VOLTAGE SENSING AND LOAD MEASURING AUTOMATIC RECLOSING SYSTEM FOR D-C CIRCUIT BREAKERS

James P. DeLacy, Havertown, and Robert H. Lechner, Southampton, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 22, 1979, Ser. No. 5,190
Int. Cl.³ H02H *11/00*
U.S. Cl. 307—139 **9 Claims**



1. The process of monitoring the condition of a feeder circuit and operating a d-c feeder breaker in the feeder circuit comprising the steps of:
monitoring the voltage in a voltage-measuring mode across said feeder circuit and closing said breaker if the feeder voltage is above a first value, or initiating a load-measuring mode if said feeder voltage is lower than a second value that is lower than said first value;
when in said load-measuring mode, injecting a current into said feeder circuit and measuring the voltage drop across said feeder circuit in response to the injected current;
maintaining said feeder breaker open when the voltage measured during said load-measuring mode is below a given value;
and closing said feeder breaker when said voltage measured during said load-measuring mode is above said given value.

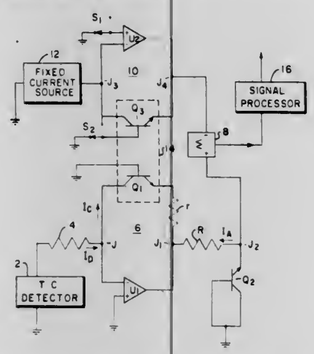
4,232,233
METHOD FOR EXTENDING TRANSISTOR LOGARITHMIC CONFORMANCE

David E. Clouser, Claymont, Del., and Steven J. Engel, West Chester, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 29, 1978, Ser. No. 974,582
Int. Cl.³ G06G *7/24*
U.S. Cl. 307—229 **7 Claims**

1. Apparatus comprising,
a thermal conductivity detector,
a first operational amplifier having an inverting input, a non-inverting input, and an output,
a first resistor connected between the output of said thermal

conductivity detector and the said inverting input of said first operational amplifier,
means connecting the non-inverting input of said first operational amplifier to a point of reference potential,
a first transistor having its emitter connected to the output of said first operational amplifier, its base connected to a point of reference potential, and its collector connected to the inverting input of said first operational amplifier,
a second transistor connected as a diode and a second resistor connected between a point of reference potential and the output of said first operational amplifier,
a subtracting means having first and second inputs and an output,
a connection between the first input of said subtracting means and the junction of said second resistor and said second transistor,
a second operational amplifier having inverting and non-inverting inputs and an output,



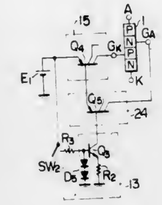
a connection between the output of said second operational amplifier and the second input of said subtracting means,
a source of fixed current equal to the current supplied by said thermal conductivity detector to the inverting input of said first operational amplifier under a no-signal condition,
a connection between said source and the inverting input of said second operational amplifier,
a third transistor having its emitter connected to the output of said second operational amplifier and its collector connected to inverting input of said second operational amplifier,
said first and third transistors being a matched pair,
means for setting the non-inverting input of said second operational amplifier at a given potential with respect to the reference potential, and
means for setting the base of said third transistor at a potential having a predetermined relationship to the reference potential.

4,232,234
SEMICONDUCTOR SWITCH CIRCUIT

Shinzi Okuhara, Fujisawa; Ichiro Ohhinata, Yokohama, and Michio Tokunaga, Zushi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 28, 1977, Ser. No. 811,143
Claims priority, application Japan, Jul. 2, 1976, 51/77796
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 G **4 Claims**

1. A semiconductor switch circuit comprising:
a bilateral switch including a pair of 4-terminal PNPN switches connected in inverse parallel, each having a cathode gate and an anode gate;
a current supplying circuit for supplying a current to the cathode gates of said bilateral switch;
a current sinking circuit of constant current type; and
a current change-over circuit including current path changeover means for selectively switching a current flowing out from the anode gates of said bilateral switch and a current driving said current supplying circuit, respectively, to said current sinking circuit depending on a potential of said PNPN switches constituting said bilateral switch,

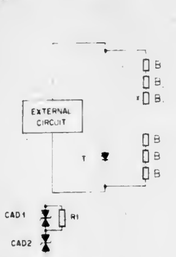


wherein said current supplying circuit includes a PNP transistor having two collectors which are respectively connected to the cathode gates of said PNPN switches constituting said bilateral switch.

4,232,235
COMBINING THYRISTOR CIRCUITS OF VARIOUS CIRCUIT CONFIGURATIONS

Werner Faust, Wettingen, and Peter Etter, Oberehrendingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 700,560, Jun. 28, 1976, abandoned.
This application Jan. 9, 1978, Ser. No. 867,945
Claims priority, application Switzerland, Jul. 2, 1975, 8575/75
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 R **12 Claims**

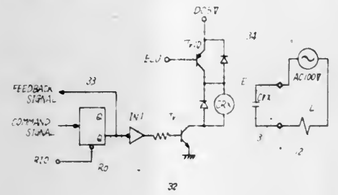


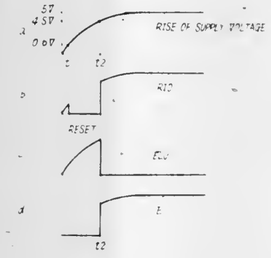
1. A circuit, comprising:
(A) first and second nodes;
(B) an input and an output lead connected to said first and second nodes, respectively, each of said input and output leads adapted to be coupled to an external circuit; and
(C) a thyristor circuit including first and second parallel branches each coupled between said first and second nodes;
(1) said first branch consisting of a thyristor, the anode of said thyristor being directly coupled to one of said first and second nodes, the cathode of said thyristor being directly coupled to the other of said first and second nodes; and
(2) said second branch including a plurality of series connected sub-circuits, each of said sub-circuits including at least one electrical element, at least two of said sub-circuits having different voltage-current characteristic curves, at least one of said sub-circuits including first and second sub-branches connected together in parallel, said first sub-branch containing a controlled avalanche diode comprising first and second series connected diodes connected in opposed polarity fashion and exhibiting controlled avalanche behavior, and said second sub-branch including a resistor.

4,232,236
OUTPUT CONVERTING CIRCUIT FOR A PROGRAMMABLE SEQUENCE CONTROLLER

Toshihiko Yomogida, Kariya, and Yasuo Suzuki, Aichi, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Jan. 16, 1979, Ser. No. 3,790
Claims priority, application Japan, Jan. 30, 1978, 53-9125
Int. Cl.[3] H03K *17/06, 17/30*
U.S. Cl. 307—297 **4 Claims**





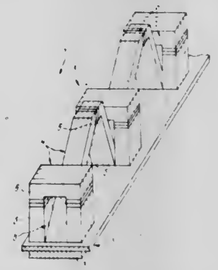
1. An output converting circuit for a programmable sequence controller wherein, in accordance with a sequence control program, the operational state of an input element is tested so as to generate a command signal to energize or deenergize a load based upon the result of the test, comprising:
a memory circuit for storing said command signal;
a load drive element connected between said load and a first electric supply;
a load drive element control circuit responsive to said command signal stored in said memory circuit for controlling said load drive element;
a switching element connected in series between a power input terminal of said load drive element control circuit and a second electric supply; and
a supply voltage detecting circuit for detecting a voltage level of said second electric supply so as to output a signal to enable said switching element to switch on only when the voltage level of said second electric supply is not lower than a predetermined level sufficient for normal operation of said load drive element control circuit.

4,232,237
ASYNCHRONOUS LINE-FED MOTOR

Alexandr D. Popov, ulitsa Koroleva, 12, kv. 154, and Vladimir A. Solomin, ulitsa Dachnaya, 14, kv. 31, both of Rostov-na-Donu, U.S.S.R.

Filed Jun. 11, 1979, Ser. No. 47,251
Claims priority, application U.S.S.R., Jun. 12, 1978, 2632465
Int. Cl.[3] H02K *41/00*
U.S. Cl. 310—13 **2 Claims**

1. An asynchronous line-fed motor comprising:
an inductor with a magnetic circuit and a concentrated multiphase winding;
a secondary current-carrying element arranged in immediate proximity to said inductor and separated by an air gap from said magnetic circuit;
said magnetic circuit containing two groups of laminated cores;
each of said laminated cores being composed of rods linked by a yoke;
said inductor and said secondary current-carrying element being movable relative to each other to produce a traveling magnetic field;
the lamination of said cores of the first group being perpendicular to the direction of travel of the magnetic field, said laminated cores of the first group being arranged in a row parallel with the direction of travel of the magnetic field;
said laminated cores of the second group being trapezium-

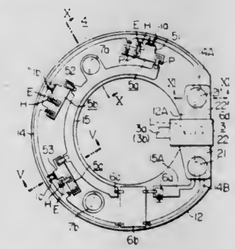


shaped, their lamination being parallel with the direction of travel of the magnetic field;
each of said laminated cores of the first group being provided with at least one slot;
each of said laminated cores of the second group having rods received in said slots of the adjacent laminated cores of the first group;
said concentrated multiphase winding containing a set of coils;
one part of said coils of said concentrated multiphase winding being wound around said rods of said laminated cores of the first group;
the other part of said coils of said concentrated multiphase winding being wound around said yokes of said laminated cores of the second group.

4,232,238
RECTIFIER ASSEMBLY FOR AC GENERATORS FOR USE WITH VEHICLES

Akihiro Saito, and Keigo Naoi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 6, 1979, Ser. No. 17,899
Claims priority, application Japan, Mar. 6, 1978, 53/24520
Int. Cl.[3] H02K *11/00*
U.S. Cl. 310—68 D **4 Claims**



1. A rectifier assembly for an AC generator to be mounted in vehicles comprising;

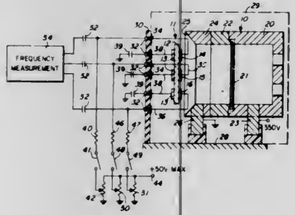
a heat radiating metallic plate of a horseshoe configuration, whose one surface is covered by an insulating layer,
a pair of electrically conductive plates fixed on said insulating layer of said heat radiating plate and spaced from each other to give a space therebetween,
a semiconductor rectifier unit for rectifying an AC output of the AC generator to produce a DC output, said rectifier unit being mounted to said heat radiating plate at the space between said conductive plates,
said rectifier unit including at least one main rectifier element whose output terminal is connected to one of said conductive plates and an auxiliary rectifier element whose output terminal is connected to the other conductive plate, and
means for fixing said heat radiating plate to the AC generator.

4,232,239

FREQUENCY ADJUSTMENT OF PIEZOELECTRIC RESONATOR UTILIZING LOW ENERGY OXYGEN GLOW DEVICE FOR ANODIZING ELECTRODES

Lawrence N. Dworsky, Coral Springs; Jeffery A. Whalin, Hialeah, and Warren P. Glotzbach, Tamarac, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 16, 1979, Ser. No. 20,909
Int. Cl.³ H01L *41/22*
U.S. Cl. 310—312 **10 Claims**



1. The method of adjusting the frequency response of a piezoelectric resonator device which includes a piezoelectric wafer with a plurality of resonating sections each having an anodizable electrode thereon, and with such electrodes of a plurality of sections being positioned adjacent to each other;
such method including the steps of:
applying oxygen plasma to the adjacent electrodes,
selectively applying direct current potentials to the individual electrodes to cause anodization thereof, and
measuring the frequency response of the resonator device during such anodization of the electrodes.

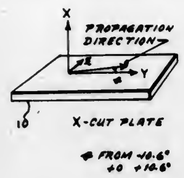
4,232,240

HIGH PIEZOELECTRIC COUPLING X-CUTS OF LEAD POTASSIUM NIOBATE, $PB_2KNB_5O_{15}$, FOR SURFACE ACOUSTIC WAVE APPLICATIONS

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 31, 1979, Ser. No. 43,982
Int. Cl.³ H01L *41/18*
U.S. Cl. 310—313 A **3 Claims**

1. A lead potassium niobate crystalline substrate member particularly adapted for use in acoustic wave devices which is characterized by having an acoustic wave propagation surface defined by a plane that substantially coincides with the Euler



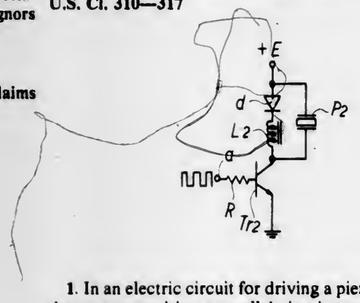
angles Lambda=90.0°, Mu=90.0° and a range of Theta from about −10.6° to −1.0° and from about +0.1° to +10.6°.

4,232,241

ELECTRIC CIRCUIT FOR DRIVING A PIEZOELECTRIC VIBRATOR

Mitsuhiro Hamatani, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,309
Claims priority, application Japan, May 26, 1977, 52-67936
Int. Cl.² H01L *41/10*
U.S. Cl. 310—317 **4 Claims**



1. In an electric circuit for driving a piezoelectric vibrator of the type comprising a parallel circuit comprised of a coil connected in parallel with the piezoelectric vibrator with one side of the parallel circuit connected to a voltage supply source and the other side of the parallel circuit connected to a switching means for switching between ON and OFF states in response to pulse signals applied thereto to thereby apply driving forces to said piezoelectric vibrator; the improvement comprising means including a diode connected in series with said coil such that the series-connected diode and coil are in parallel with said piezoelectric vibrator for applying the reverse induced voltage produced in said coil during the OFF states of said switching means to said piezoelectric vibrator to thereby apply driving forces of greater magnitude to said piezoelectric vibrator than would otherwise occur without said diode.

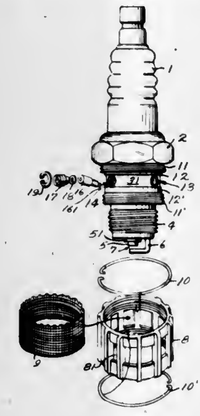
4,232,242

SPARKING PLUG WITH EFFICIENT AIR SUPPLYING SYSTEM AND A REMOVABLE SITTING DEVICE

Yun T. Hsu, 30-27, Chun In Rd., Chun In Village, Tong Sun Hsiang, I Lan Hsien, Taiwan

Filed Aug. 7, 1978, Ser. No. 931,727
Int. Cl.² H01T *13/02, 13/06*
U.S. Cl. 313—120 **6 Claims**

1. A spark plug comprising:
a central ceramic insulator holding an electrode; said electrode extending to an end terminal;
a medium body portion surrounding said insulator; an annular air tunnel terminating at said end terminal being formed between said medium body portion and said insulator;
a protection sheath surrounding said medium body portion so as to form an annular air chamber between said sheath and said medium body portion, said sheath having openings therein for receiving air into said chamber;
a plurality of holes formed in said medium body portion each extending from said air chamber to said tunnel;
a cylindrical mesh filter within said protection sheath for filtering air to said plurality of holes; and



a plurality of unidirectional flow inlet valves, one each received in each of said holes for directing air flow between said chamber and said tunnel toward said end terminal.

4,232,243

HIGH PRESSURE ELECTRIC DISCHARGE LAMP

Sydney A. R. Rigden, Hemel Hempstead, England, assignor to The General Electric Company Limited, London, England

Continuation-in-part of Ser. No. 839,654, Oct. 5, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,437
Claims priority, application United Kingdom, Oct. 19, 1976, 43310/76; Dec. 20, 1976, 53088/76
Int. Cl.² H01J *61/073, 61/09, 61/18*
U.S. Cl. 313—217 **10 Claims**



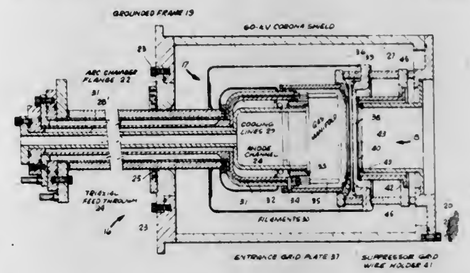
1. In a high pressure electric discharge lamp including a discharge envelope which contains a filling consisting of mercury, rare gas, and at least two metal halides which are vaporizable at the operating temperature of the lamp, and which has mounted within it a pair of tungsten electrodes between which an electric discharge passes through the filling in operation of the lamp, each said electrode being attached to an electrically conducting lead extending to the exterior of the discharge envelope and connected to a terminal carried by an outer envelope of light-transmissive vitreous material in which the discharge envelope is enclosed, the improvement consisting of, in combination,
the incorporation within a cavity in the structure of each said electrode of a quantity of activator material consisting essentially of scandium oxide, the said activator material being in the form of a solidified melt substantially filling the said cavity and adherent to the electrode structure, and
the provision in the discharge envelope of said filling in which the metal halides consist of at least one metal iodide and at least one metal bromide, including at least one member of the group consisting of scandium iodide and scandium bromide, in relative proportions such that the percentage atomic ratio of the total amount of bromine to the total amount of iodine in said metal halides is in the range of 20:80 to 60:40.

4,232,244

COMPACT, MAINTAINABLE 80-KEV NEUTRAL BEAM MODULE

Joel H. Fink, and Arthur W. Molvik, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 25, 1978, Ser. No. 954,679
Int. Cl.³ H05H *1/00*
U.S. Cl. 313—363 **9 Claims**



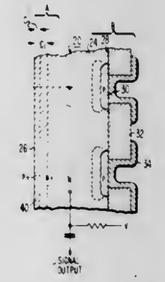
1. In a neutral beam module comprising at least an ion source, an ion accelerator, an isolation valve, and a neutralizer positioned within a housing defining a vacuum wall and having at least one magnetic shield positioned in and adjacent said housing, the improvement comprising: an electrically grounded frame removably secured within one end of said housing, said ion accelerator and said ion source being aligned with one another and with each being removably mounted within said grounded frame, and means located within said grounded frame for reducing long-path breakdown, said means including at least one gradient shield means surrouding at least said ion source and positioned substantially midway between said ion source and said grounded frame, said ion source and said ion accelerator being immersed in a vacuum.

4,232,245

REDUCED BLOOMING DEVICES

Eugene D. Savoye, Lancaster; Thomas W. Edwards, Mt. Joy, and Lloyd F. Wallace, Coatsville, all of Pa., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 620,750, Oct. 8, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,713
Int. Cl.³ H01J *29/44*
U.S. Cl. 313—367 **12 Claims**



1. A charge storage device having a signal sensing element

with an input signal sensing surface region and a charge storage region, and reading means for selectively contacting portions of said charge storage region, and sensing element comprising:

(a) a single crystal semiconductor wafer having

(1) a plurality of discrete storage regions along a second surface and extending into said wafer a distance less than the wafer thickness, said discrete regions being of a first conductivity type;

(2) a bulk region in said wafer defined as a region extending between and bounded at opposite sides by said discrete regions and said signal sensing surface region; said bulk region being of a second conductivity type;

(3) means for controlling blooming within said signal sensing surface region comprising a region of similar conductivity type to that associated with said bulk, and having a dopant concentration exceeding that of said bulk for controlling recombination of excess carriers, excited within localized regions of said bulk, at a first opposed surface of the wafer; said dopant concentration having a peak spaced from and located less than about 1500 A from said first surface of the wafer;

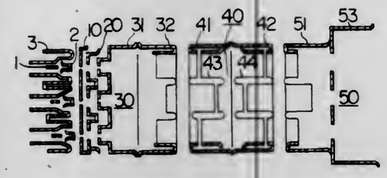
(b) passivation means for stabilizing the energy levels along said first surface of the wafer, said means substantially fixing the energy level relationship of the conducting band of the minority carriers in the bulk relative to the Fermi energy level of the semiconductor wafer.

4,232,246

ELECTRON GUN ASSEMBLY FOR A COLOR PICTURE TUBE

Soichi Sakurai, Mobara; Kunio Ando, Yokohama, and Kenichi Fukuzawa, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1978, Ser. No. 877,862
Claims priority, application Japan, May 25, 1977, 52/59766
Int. Cl.³ H01J 29/50
U.S. Cl. 313—414 **5 Claims**



1. An electron gun assembly for a color picture tube comprising:

two side electron guns and a central electron gun sandwiched spacedly between said two side electron guns in an in-line relation; each of said central and said two side electron guns including a main focussing lens system comprised of a cathode side grid electrode, an anode side grid electrode and an intermediate grid electrode provided between said cathode side and said anode side grid electrodes, said cathode side and anode side grid electrodes being kept at the same electric potential; said cathode side, said anode side and said intermediate grid electrodes of said main focussing lens system of each of said central electron gun and said two side electron guns having a cylindrical portion of the same inside diameter, respectively; a height of said cylindrical portion of each of the intermediate grid electrodes being selected to be substantially larger than said inside diameter of said cylindrical portion,

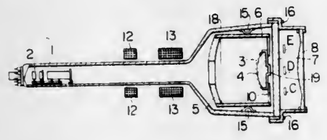
wherein a height (h_{c3}) of said cylindrical portion of said cathode side grid electrode of said central electron gun is selected to be $h_{c3} > 0.07D$ and a height (h_{s3}) of said cylindrical portion of said cathode side grid electrode of each of said two side electron guns is selected to be $h_{s3} > 0.41D$, where D is the inside diameter of the cylindrical portion, and further wherein said cathode side grid electrodes of said central and said two side electron guns are integrally formed only by means of a single cap electrode, without an inner electrode coupled to the cap electrode, so that the heights h_{c3} and h_{s3} are formed entirely by the cap electrode.

4,232,247

PROJECTION TUBE WITH X-RAY SHIELDING MEANS ON TARGET

Matsuo Ochi, Neyagawa, and Keisuke Miyoshi, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 11, 1978, Ser. No. 968,408
Claims priority, application Japan, Dec. 12, 1977, 52-167312[U]
Int. Cl.³ H01J 29/06, 29/28
U.S. Cl. 313—474 **3 Claims**



1. A projection tube comprising: means for producing an electron beam; means for focussing and deflecting said electron beam; a target having a fluorescent screen disposed to be irradiated with said electron beam; X-ray shielding means disposed to cover an entire back surface and entire peripheral surfaces of said target without obstructing said fluorescent screen; a concave mirror disposed to project forward light emitted from said fluorescent screen; and means disposed to correct the light projected by said concave mirror.

4,232,248

INTERNAL METAL STRIPE ON CONDUCTIVE LAYER

Bernard B. McCue, Christian Island, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,627
Int. Cl.³ H01J 29/18
U.S. Cl. 313—479 **3 Claims**



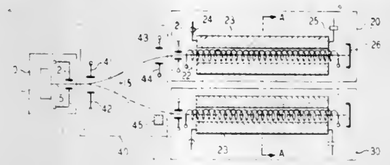
1. A cathode-ray tube comprising an evacuated glass envelope including a funnel, a neck integral with said funnel, a faceplate sealed to said funnel, and a luminescent layer on the interior surface of said faceplate, a conductive layer adhered to at least a portion of the interior surface of said envelope, a conductive metal body attached to said interior envelope surface, and a conductive coating contacting both said layer and said metal body, said conductive coating consisting essentially of tin metal and about 2 to 5 weight percent of denitrified glass.

4,232,249

BEAM-SWITCHED TRAVELING WAVE TUBE

Dietrich A. Alsberg, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 28, 1978, Ser. No. 946,661
Int. Cl.² H01J 25/34
U.S. Cl. 315—3.6 **8 Claims**



1. A traveling wave tube arrangement comprising an electron (**10**) gun capable of generating a beam (**15**) of electrons,

a first delay structure (**20**) capable of receiving and modulating the beam of electrons,

CHARACTERIZED IN THAT

the traveling wave tube arrangement further comprises

n − 1 additional delay structures (**30**), where n is greater than 1, each additional delay structure being disposed so as to be capable of receiving and modulating the beam of electrons; and

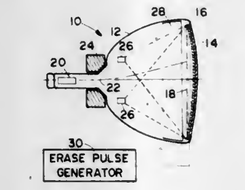
deflecting means (**40**) disposed between the electron gun and the n delay structures, said deflecting means selectively deflecting the beam of electrons to any one of the n delay structures.

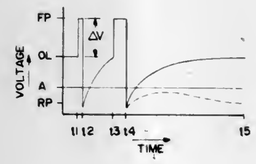
4,232,250

NO-FLASH ERASE OF DIRECT VIEWING BISTABLE STORAGE CRT

Mark A. Richards, Pasadena, Calif., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 19, 1979, Ser. No. 31,676
Int. Cl.³ H01J 29/50, 31/00
U.S. Cl. 315—13 ST **9 Claims**





1. The method of erasing a charge image stored by a dielectric material provided on a target electrode in a bistable storage tube, which image is being maintained in a stored condition by bombardment of the dielectric material with low velocity electrons from a source thereof, said method comprising the subsequential steps of:

(a) increasing the voltage differential between said electron source and target electrode from a normal operating level to a selected higher, fade positive level sufficiently rapidly to raise the potential of the non-image areas of the dielectric material above the first crossover point on the secondary emission curve for the material,

(b) maintaining said voltage differential at said higher level for a first time period not longer than about ten milliseconds,

(c) reducing said voltage differential to a selected lower level sufficiently rapidly to lower the potential of said dielectric material below said first crossover point,

(d) increasing said voltage differential to a normal operating level over a second time period,

(e) repeating steps (a), (b) and (c), and

(f) increasing said voltage differential to a normal operating level at a rate sufficiently slow to permit the dielectric material to be maintained at a potential below its first crossover point by the bombardment of said low velocity electrons.

4,232,251

MULTI-DIGIT LUMINESCENT DISPLAY TUBE

Takao Kishino, and Gentaro Tanaka, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Continuation-in-part of Ser. No. 831,083, Sep. 6, 1977, abandoned. This application Mar. 27, 1979, Ser. No. 24,261
Claims priority, application Japan, Sep. 3, 1976, 51-117701[U]
Int. Cl.² H01J 63/06; H05B 41/14
U.S. Cl. 315—167 **5 Claims**



1. A multi-digit luminescent display tube comprising:

a vacuum container;

a plurality of pattern display sections arranged in the form of a matrix composed of a plurality of rows and columns and adapted to luminescently display a plurality of patterns such as characters and numerals, said pattern display sections being contained in said vacuum container, each of said pattern display sections being composed of a plurality of anodes each having a luminescent material layer thereon, those of said anodes which form the corresponding parts of the pattern display sections being electrically connected in common to each other;

a plurality of control grids provided above said pattern display sections respectively so as to accelerate and control thermions moving toward said pattern display sections, said control grids on each column or row being electrically connected in common to each other;

a plurality of cathode filaments for emitting thermions when heated provided above and opposite to said pattern display sections and control grids in the direction of row or column vertical to the direction along which said control grids are electrically connected in common to each other, said cathode filaments being independently connected to respective power supplies for heating;

a filament control circuit for switching electric potential of each of said power supplies either to a positive or negative

potential with respect to electric potential of a power supply for driving said pattern display sections and control grids synchronously with the scanning of the control grids; and

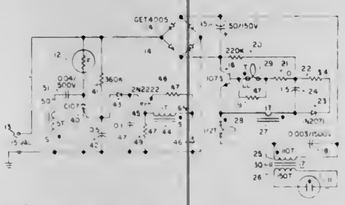
a plurality of shield means provided midway between the rows or columns of the matrix of said pattern display sections in the direction along which said cathode filaments are arranged for preventing thermions emitted from said cathode filaments from being accelerated by the action of control grids not below and opposite thereto, whereby thermions emitted from a selected cathode filament impinge only on a pattern display section corresponding thereto.

4,232,252

LIGHTING NETWORK INCLUDING A GAS DISCHARGE LAMP AND STANDBY LAMP

William Peil, North Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Continuation-in-part of Ser. No. 909,300, May 24, 1978, abandoned. This application Apr. 13, 1979, Ser. No. 29,954
Int. Cl.³ H05B *41/46*
U.S. Cl. 315—92 **15 Claims**



1. A lighting network comprising:

(a) a main gas discharge lamp having terminals for connection to a source of electrical energy, said main lamp having a low temperature ignited state with a low light output; and an operating temperature ignited state with a normal light output,

(b) first power supply means coupled to said main lamp terminals for supplying an operating potential;

said lamp potential, when connected to said power supply means, being low at said low temperature ignited state and normal at said operating temperature ignited state,

(c) a standby lamp for use when said main lamp is below normal light output,

(d) a second power supply means for operating said standby lamp, and

(e) control means including:

(1) an amplitude discriminator ,comprising a transistor amplifier exhibiting cut-off at a low input range and active operation with input inversion at a higher input range to effect a transfer characteristic in which electrical inputs in said low and higher ranges respectively, produce an output quantity in respectively a first range and a second range distinct from said first range,

(2) means coupling a voltage proportional to said main lamp voltage to said discriminator to effect amplifier cut-off when said main lamp is in the low voltage, low temperature ignited state, and active input inversion when said main lamp is in the normal voltage, operating temperature ignited state, and

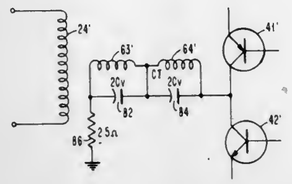
(3) switching means coupled to the output of said discriminator for applying power from said first power supply means to said standby lamp for amplitude discriminator outputs in said first range and for removing power for outputs in said second range.

4,232,253

DISTORTION CORRECTION IN ELECTROMAGNETIC DEFLECTION YOKES

Joost Mortelmans, Campbell, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,654
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—370 **16 Claims**



9. An electromagnetic deflection yoke for correcting cross coupling distortion comprising

one winding arranged in said yoke for deflection in a given direction,

another winding arranged in said yoke for the complementary direction of deflection;

the arrangement of said windings resulting in a capacitor existing therebetween,

a capacitor connected in series with said one winding and a source of deflection voltage wave, and

another capacitor shunted across said source of deflection voltage wave,

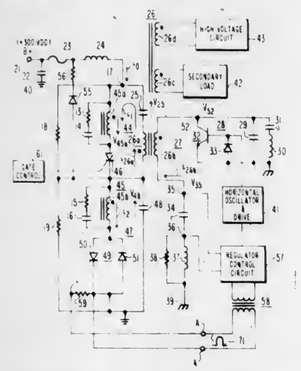
the sum of the capacitances of said capacitors being equal to said existing capacitance between said one winding and said other winding of the deflection yoke.

4,232,254

REGULATED DEFLECTION CIRCUIT

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,538
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—408 **13 Claims**



1. A regulated deflection circuit, comprising: a deflection circuit comprising a deflection winding and deflection switching means coupled to said deflection winding for forming first and second deflection intervals;

first and second resonant energy circuits;

supply means coupled to said first and second resonant energy circuits for storing energy in said first and second resonant energy circuits;

deflection circuit energy transfer means coupled to said deflection circuit and to at least one of said first and second resonant energy circuits for transferring energy to said deflection circuit;

first means coupled to said first and second resonant circuits for transferring energy between said first and second resonant circuits;

first and second switches coupled respectively to said first and second resonant circuits for generating resonant oscillations in said first and second resonant circuits; and

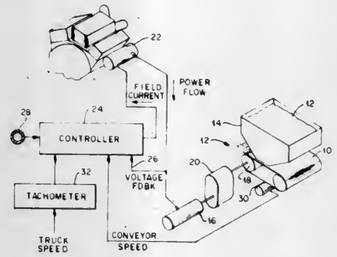
control means coupled to said first and second switches and responsive to an energy level of said deflection circuit, for controlling the conduction of said first and second switches, the conduction angle overlap of said first and second switches controlling the energy transfer to said deflection circuit.

4,232,255

DELIVERY CONTROL SYSTEM FOR VEHICLE-MOUNTED SPREADER

Eric T. Carlen, R.R. #1, Wirtz, Va. 24184

Filed Nov. 6, 1978, Ser. No. 957,729
Int. Cl.³ H02P *5/20*
U.S. Cl. 318—143 **7 Claims**



1. An electrical control system for regulating the rate of delivery of bulk material by a moving vehicle having a supply hopper and a conveyor device communicating with the hopper, said system comprising:

a conveyor drive system including a direct current drive motor;

an electrical generator for providing electrical power to said direct current motor, said generator being mechanically driven by the vehicle engine and having a negative feedback loop connected at its output;

a first transducer for providing a first voltage proportional to the conveyor speed;

a second transducer for providing a second voltage proportional to the vehicle speed;

manually adjustable means for providing a reference voltage representative of the desired material delivery rate in weight of material per unit of distance;

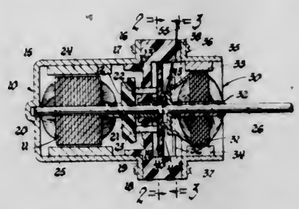
a controller connected to said first transducer, said second transducer, said manually adjustable means and the negative feedback loop of said electrical generator and responsive to the voltages produced thereby to control the generator field current to cause said drive motor to drive the conveyor at the speed required for the desired material delivery rate.

4,232,256

UNITARY ELECTRIC MOTOR AND BI-DIRECTIONAL CONTROLLER ARRANGEMENT

Leonard E. Moriconi, Southfield, and Yoshitaka Yoshida, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 28, 1978, Ser. No. 946,503
Int. Cl.³ H02P *3/00*
U.S. Cl. 318—292 **3 Claims**



1. A unitary electric motor and bi-directional controller arrangement comprising:

an electric motor having an armature electrically energizable through a commutator, a pair of brushes each having a surface in sliding contact with said commutator and a housing including means for rotatably supporting said armature;

electrically energizable means of the type having an operating member that may be actuated through selected opposite first and second directions of travel relative to a normal neutral position in response to the electrical energization of said electrically energizable means in respective opposite senses mounted upon said motor housing; and

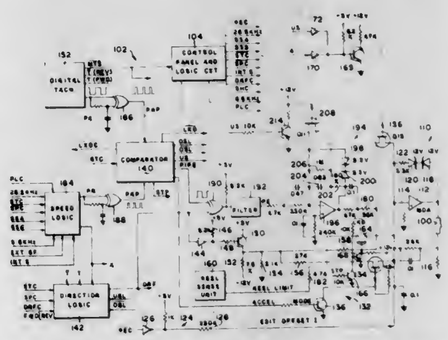
means actuated by said operating member and so positioned as to be in sliding contact with another surface of each of said motor brushes for completing first and second electrical circuits through which the electrical energization of said motor armature may be effected in respective opposite senses in response to the operation of said operating member through said first direction of travel and through said second direction of travel upon the energization of said electrically energizable means in responsive opposite senses.

4,232,257

WEB TRANSPORT CAPSTAN CONTROL SYSTEM

Robert P. Harshberger, Jr., San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 3, 1976, Ser. No. 682,849
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—314 **52 Claims**



1. In a bidirectional web transport system having a web storage system disposed to supply and take up a length of web

member moving along a web path, a single capstan positioned along the web path to engage and control the motion of a length of web member extending along the web path, a capstan motor coupled to drive the capstan, a tachometer coupled to sense capstan motor motion and generate actual motion information indicative of the speed and direction thereof and a reference motion signal generator generating a reference motion signal indicative of a commanded capstan motor reference speed, the improvement comprising:

a direction indicator circuit coupled to generate a direction signal indicative of actual capstan motor motion direction in response to the actual motion information;

a comparator coupled to respond to the reference motion signal and actual motion information by generating an overspeed signal when actual capstan motor speed exceeds the reference speed and a motion error signal having a magnitude and polarity indicative of a difference between actual speed and reference speed, the motion error signal having a first polarity tending to cause capstan motor energization for motion in a first direction when actual speed is less than the reference speed and having a second polarity opposite the first polarity tending to cause capstan motor energization for motion in a second direction opposite the first direction when actual speed is greater than the reference speed;

an inverter circuit coupled to receive and selectively invert the motion error signal in response to actual motion information and motion command information, the motion error signal having a first state of inversion when actual capstan motor motion is in the second direction and actual speed is greater than a commanded reference speed or when commanded capstan motor motion is in the second direction and actual capstan motor speed is not greater than a commanded reference motor speed or when motion stop is commanded and actual capstan motor motion is in the first direction, the motion error signal having a second state of inversion opposite the first state when actual capstan motor motion is in the second direction and actual speed is greater than a commanded reference speed, or when a commanded capstan motor motion is in the first direction and actual capstan motor speed is not greater than a commanded reference motor speed or when motion stop is commanded and actual capstan motor is in the second direction; and

a motor drive circuit coupled to energize the capstan motor in accordance with the magnitude and polarity of the motion error signal as selectively inverted by the inverter circuit.

4,232,258

SPEED CONTROL APPARATUS FOR ELECTRIC MOTOR

Nobuyoshi Matsumura, Yao, Japan, assignor to Maruzen Sewing Machine Co., Ltd, Moriguchi, Japan

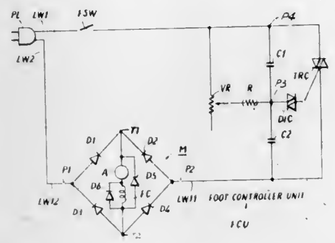
Filed Mar. 20, 1978, Ser. No. 888,404

Claims priority, application Japan, Apr. 6, 1977, 52-40158; Sep. 9, 1977, 52-131550; Dec. 1, 1977, 52-144808

Int. Cl.[2] H02P 7/24

U.S. Cl. 318—345 H **3 Claims**

1. A speed control apparatus for an electric motor in an electrically driven sewing machine, comprising alternating current voltage source means, foot operated controller means connected to said alternating current voltage source means through two lead wires, said foot operated controller means comprising a foot operated controller pedal, a variable resistor operatively coupled to said pedal for generating a control voltage in association with the degree of depression of said pedal, a triac having a gate electrode for phase controlling the alternating current from said alternating current voltage source means, a diac connected between said variable resistor and the gate electrode of said triac, and an electric motor adapted to receive the alternating current as phase controlled through said lead wires from said foot operated controller means, said foot controller means further comprising capacitor means connected in parallel with said variable resistor, said capacitor means comprising first and second capacitors connected in series and across said triac, the junction of said first and second capacitors being connected to said diac, whereby



said capacitor means is discharged when the induced voltage across the electric motor becomes decreased so as to supply the discharging electric charge to said diac, thereby to increase the conduction angle of said triac.

4,232,259

SERVO-SYSTEM

Nobuo Kaieda, and Yoshihiro Okano, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,817

Claims priority, application Japan, Dec. 28, 1976, 51-160537; Dec. 28, 1976, 51-160538

Int. Cl.[3] G05B 5/01

U.S. Cl. 318—615 **15 Claims**



1. A servo-system responsive to a dc input signal comprising:

a high-gain direct-coupled differential dc amplifier having said dc input signal as one input thereto,

comparison signal generating means for generating a comparison signal,

an adder for adding the output of said dc amplifier to said comparison signal,

a filter circuit for filtering the output of said adder and for applying the filtered output as a second input to said dc amplifier,

a servo-motor,

a servo-amplifier connected between said dc amplifier and said servo-motor for driving said servo-motor in accordance with the differential output of said dc amplifier, and

coupling means for coupling said comparison signal generating means to said servo-motor to vary said comparison signal in accordance with displacement of said servo-motor to zero-balance the output of said direct-coupled dc amplifier.

4,232,260

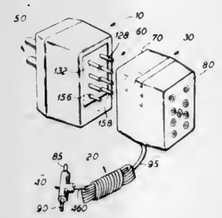
UNIVERSAL BATTERY CHARGER/ADAPTER UNIT

Fred M. Lambkin, 462 N. Morgan, Chicago, Ill. 60622

Filed Apr. 19, 1978, Ser. No. 897,938

Int. Cl.[3] H01M 10/46; H01F 27/00

U.S. Cl. 320—2 **4 Claims**



1. An improved power unit which includes a transformer with a secondary having multiple taps, a rectifier means and a first one-half of a connector having a plurality of pins, the secondary taps are connected to selected pins on the one-half of a connector, the improvement comprising:

an input terminal and output terminals for the rectifier means are connected to other pins on the first one-half of a connector;

a second one-half of a connector having a plurality of plugs is connected to an output cable and selected plugs of said second one-half of a connector are connected together so that when the two parts of the connector are plugged together a selected secondary terminal of the transformer is connected to the input terminal of the rectifying means and the output terminals of the rectifying means are connected to the output cable.

3. A universal battery charger adapter unit comprising:

a power unit;

said power unit having an input port for electrical power and a plurality of output means for electrical power;

said power unit containing a means for electrical conversion operably connected to said input port and said plurality of output means so as to provide a plurality of output voltages, a selected one of which is applied to a member of said plurality of output means, when a selected voltage is applied to said input port;

a means for electrical connection including a cable for transmission of electrical energy;

said cable being connectable at a first end to said plurality of output means as well as

connected at a second end to a battery nest for charging rechargeable batteries and operable to connect selected members of said plurality of output means so as to apply a selected output voltage to said battery nest;

said battery nest having means whereby a plurality of variable size batteries may be simultaneously charged;

said means whereby a plurality of variable size batteries may be simultaneously charged comprising at least one shim insertable into said battery nest and operable to compensate for the varying physical dimensions of a corresponding member of the plurality of variable size batteries being charged; and

wherein said shim includes an electrical means operable to limit the charging rate of a corresponding member of the plurality of variable size batteries being charged.

4,232,261

MOS CONTROL CIRCUIT FOR INTEGRATED CIRCUITS

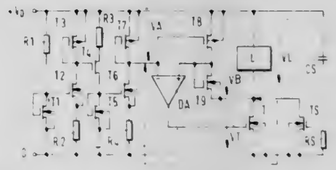
Ernst Lingstaedt, Munich; Gerhard Moegen, Baldham, and Gottfried Wotruba, Poing, all of Fed. Rep. of Germany, assignors to Eurosil GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,359

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2708021

Int. Cl.[3] G05F 1/56

U.S. Cl. 323—22 R **12 Claims**



1. An integrated CMOS circuit for controlling input voltage to an integrated CMOS load so as to have a value of a reference voltage including a MOS field-effect control transistor connected in series with said load across a power supply and a differential amplifier having an output connected to the gate of said control transistor, characterized by

a first and a second reference voltage source defining together said reference voltage and being connected in series with the voltage between inputs of said differential amplifier and with said load in a closed loop connection whereby said input voltage to said load is dependent upon the sum of said reference voltages,

said reference voltages corresponding to the threshold voltages of MOS field-effect transistors in said integrated CMOS load, and

said reference voltage sources including saturated MOS field-effect transistors which are complementary to each other.

4,232,262

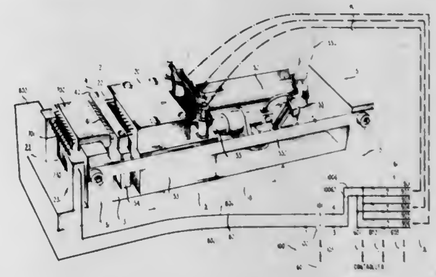
CONNECTOR CONTACT TERMINAL CONTAMINATION PROBE

George C. Emo, 743 Jonsol Ct., Gahanna, Ohio 43230, and Thomas G. Grau, 24 Dogwood Dr., Mendam Township, Morris Township, N.J. 07960

Filed Oct. 12, 1978, Ser. No. 950,724

Int. Cl.[3] G01R 31/04, 27/02, 1/067

U.S. Cl. 324—65 P **18 Claims**



1. Apparatus for testing connectors, said apparatus having circuitry (100) for measuring electrical resistance; and testing apparatus (1) for coupling said measuring circuitry to contact terminals (701) of a connector (700)

CHARACTERIZED IN THAT

said testing apparatus comprises

electrode apparatus (2, 4) having electrodes (221, 230) for engaging the connector contact terminals, said electrode apparatus having a probe assembly (20) for mounting ones of said electrodes and a guide support member (40) for slidably supporting said mounting electrodes;
support apparatus (3) for receiving a connector and holding the connector in a fixed relationship with said electrode apparatus;
positioning apparatus (5) for enabling said guide support member to align said one electrodes with the connector contact terminals and said probe assembly to extend said aligned electrodes through said guide support member to engage said aligned electrodes with the connector contact terminals; and
coupling apparatus (6) for selectively coupling said engaged electrodes with the measuring circuitry to measure the resistance of contamination films and foreign material appearing on the connector contact terminals.

4,232,263

MEASURING INSTALLATION FOR FREQUENCY ANALYSIS OF SIGNAL LEVELS WITHIN A LARGE AMPLITUDE RANGE

Theodor Schwierz, Klingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,006
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758154
Int. Cl.³ G01R 23/16
U.S. Cl. 324—77 B **7 Claims**



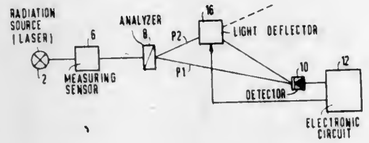
1. A measuring installation for the frequency analysis of signal levels within a large amplitude range consisting of a frequency conversion installation with a synthesizer controllably generating the conversion frequencies, an intermediate frequency amplifier arrangement that can be controlled in its amplification, and a signal level evaluation and display installation, characterized in that for the execution of an extremely fast frequency analysis, the intermediate frequency amplifier arrangement has two or more selective amplifiers (SV1, SV2, SV3) arranged in series with automatic amplification regulation, and whose band width diminishes from amplifier to amplifier in the direction of the path of the received signal level to be amplified; and the regulating variables occurring at the individual amplifiers SV1, SV2 and SV3 are summed with consideration of the prescribed regulating characteristics in an adder (Ad); and the sum value is delivered from the output of the adder Ad to the signal level evaluation and display installation (AA).

4,232,264

ARRANGEMENT FOR THE MAGNETO-OPTICAL MEASUREMENT OF CURRENTS

Alfred Papp, and Hauke Harms, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,351
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758611
Int. Cl.² G01R 31/02, 33/02
U.S. Cl. 324—96 **4 Claims**



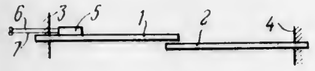
1. An arrangement for the magneto-optical measurement of currents, utilizing a rotation of the plane of polarization of a linearly polarized light beam which is dependent on the current to be measured comprising:
(a) a radiation source developing a linearly polarized light beam;
(b) a measuring sensor adapted to be disposed at a conductor carrying the current to be measured, having said beam as an input and providing an output beam whose plane of polarization has been rotated in dependence on the current being measured;
(c) an analyzer interposed in said output beam for splitting said beam into two partial beams having orthogonal directions of polarization;
(d) a detector arranged so that one of said partial beams is incident thereon;
(e) a light deflector interposed in the other of said partial beams and adapted to alternatingly, at a high frequency, pass said other partial beam and direct said other partial beam to be incident on said detector; and
(f) electronic circuit means receiving at the high frequency of said light deflector first and second output signals from said detector dependent respectively on said one partial beam and said both partial beams for combining said signals to eliminate the noise component of the measurement signal.

4,232,265

DEVICE FOR MEASURING INTENSITY OF MAGNETIC OR ELECTROMAGNETIC FIELDS USING STRAIN GAUGES MOUNTED ON FERROMAGNETIC PLATES

Vladimir A. Smirnov, ulitsa Lavochkina, 52, kv. 208, Moscow, U.S.S.R.

Filed Apr. 17, 1978, Ser. No. 897,746
Int. Cl.³ G01R 33/02, 19/00
U.S. Cl. 324—260 **8 Claims**



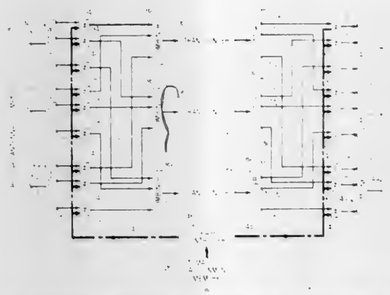
1. A device for measuring the intensity of a magnetic or electromagnetic field produced by a field source comprising:
a first elongate flat plate formed of a ferromagnetic material having first and second end portions, said first end portion thereof being rigidly fixed to a first support member so that said first plate extends from said first support member in a cantilevered manner;
a second elongate flat plate formed of a ferromagnetic material having respective first and second end portions, said first end portion thereof being rigidly fixed to a second support member so that said second plate extends from said second support member in a cantilevered manner, said second end portion of said first plate being located in spaced opposed relationship to said second end portion of said second plate to define a gap therebetween, said first and second plates forming a flux path for said field source;
at least one of either said first and second plates and first and second support members comprising a deformation section in the region immediately proximate to the respective points at which said first and second plates are rigidly fixed to said first and second support members, respectively, said at least one deformation section being subject to deformation upon deflection of said first and second plates by said magnetic field;
at least one resistance strain gauge means mounted on a respective one of said deformation sections and said at least one resistance strain gauge means having an axis appropriately aligned on said at least one of either said first and second plates for generating an electrical signal output indicative of the deformation of said deformed section caused by a relative displacement of said second end portions of said first and second plates upon deflection thereof; and
a measuring circuit coupled to said at least one strain gauge means for measuring the electrical signal output thereof.

4,232,266

TECHNIQUE FOR SHARING A PLURALITY OF TRANSPONDERS AMONG A SAME OR LARGER NUMBER OF CHANNELS

Anthony Acampora, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 5, 1978, Ser. No. 939,180
Int. Cl.² H04J 3/06
U.S. Cl. 370—79 **10 Claims**



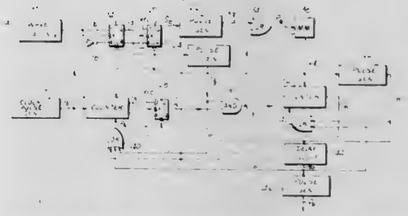
1. An on-board satellite switching subsystem comprising:
first antenna means (12_1–12_n, FIG. 1; 30_1–30_p, FIG. 2) capable of receiving during a frame period bursts of information in a time division multiplexed (TDM) mode from each of a plurality of m ground areas destined for either one of the same and other ones of said ground areas;
second antenna means (20_1–20_n, FIG. 1; 44_1–44_p, FIG. 2) capable of transmitting the bursts of information received by said first antenna means toward the destined ground areas; and
switching means (14, 16_1–16_n, 18, 22, FIG. 1; 16_1–16_n, 34_1–34_n, 40_1–40_n, 46, FIG. 2) capable of selectively transferring the received bursts of information between the first and second antenna means for appropriate transmission to the destined ground areas
CHARACTERIZED IN THAT
the switching means comprises
a plurality of n transponders (16_1–16_n), where $n \leqq m$;
first directing means (14, FIG. 1; 34_1–34_n, FIG. 2) capable of selectively routing said n concurrent bursts of information from the n transponders to the second antenna means to permit appropriate transmission of said n bursts of information to the n of m destined ground areas; and
a controller (22, FIG. 1; 46, FIG. 2) coupled to the first and second directing means capable of generating a predetermined repetitive sequence of control signals which are capable of causing the selective routing of the n currently received bursts of information in each portion of the repetitive sequence through the first and second directing means to the n transponders such that nonuniform traffic requirements of the m ground areas are accommodated and the n transponders are efficiently utilized during each repetitive sequence.

4,232,267

DIGITAL SIGNAL SELECTIVE CIRCUIT

Hidemitsu Hanajima, Atsugi, and Yasuo Shigeta, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 25, 1978, Ser. No. 909,392
Claims priority, application Japan, Jun. 1, 1977, 52-63256
Int. Cl.² H03K 5/153, 13/00, 9/06
U.S. Cl. 328—138 **20 Claims**



1. A digital signal selective circuit responsive to a periodic input signal having an operating characteristic occurring at a desired regular periodic interval for a desired length of time, comprising:
clock signal generating means for providing reference clock pulses;
first counting means for counting said reference clock pulses and for registering a resulting count therein which provides a measurement of the length of time since the last occurrence of said operating characteristic;
means for providing an output pulse in response to said operating characteristic occurring at a time when said count in said first counting means is within a predetermined range, said means for providing an output pulse including bistable circuit means providing a predetermined signal level whenever the count in said first counting means is within said predetermined range, and logic circuit means providing an output pulse in response to the simultaneous occurrence of said predetermined signal level and said operating characteristic; and
second counting means for counting each said output pulse and providing an output signal when said second counting means attains a predetermined count.

4,232,268

SECAM CHROMA DEMODULATOR CIRCUIT

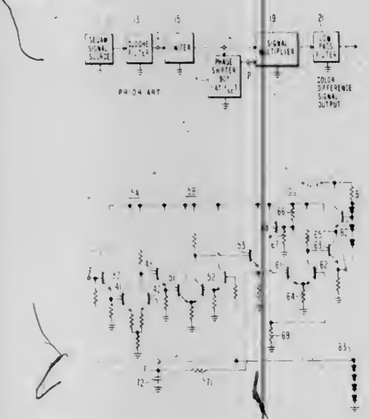
Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 12, 1979, Ser. No. 3,028

Claims priority, application United Kingdom, Jan. 18, 1978, 02067/78

Int. Cl.[2] H03D 3/14

U.S. Cl. 329—103 **8 Claims**



1. In apparatus for recovering color-difference signal information from a chrominance signal encoded in SECAM fashion but undesirably subject to variations in amplitude over a given range, the combination of:

a multi-stage limiter-amplifier responsive to said chrominance signal;

a phase-shifting network having an input terminal for imparting to a signal supplied to said input terminal a phase shift of a frequency-dependent magnitude, said phase-shift magnitude being substantially 90° when the frequency of a signal supplied to said input terminal corresponds to a SECAM color subcarrier resting frequency;

means for applying the output of said limiter-amplifier to said network input terminal;

a signal multiplier, having a pair of input terminals and an output terminal, for developing at said output terminal the products of multiplication of respective signals applied to said pair of input terminals;

means for applying the output of said limiter-amplifier to one of said signal multiplier input terminals;

means for applying the output of said phase-shifting network to the other of said signal multiplier input terminals; and

low pass filter means coupled to said signal multiplier output terminal for developing a color-difference signal output;

wherein one of the stages of said multi-stage limiter-amplifier includes means for providing said one amplifier stage with a hysteresis characteristic of a form ensuring development by said limiter-amplifier of an output signal with a rectangular wave-shape possessing rise and fall times which are substantially independent of amplitude variations of the signal input to said limiter-amplifier over said given range.

4,232,269

DIGITALLY PROGRAMMABLE ACTIVE RC BANDPASS FILTER WITH CONSTANT ABSOLUTE BANDWIDTH

Gideon Willoner, North Vancouver, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Aug. 25, 1978, Ser. No. 936,999

Int. Cl.[2] H03F 1/34

U.S. Cl. 330—85 **2 Claims**



1. A tunable narrow-band bandpass filter in which the absolute bandwidth and the center frequency can be controlled independently comprises:

a 3-terminal RC active network in which a ground terminal provides one connection to both the input and the output ports, a first terminal provides the ungrounded connection to the input port, and a second terminal provides the ungrounded connection to the output port, said RC active network comprising:

a first resistor having one terminal end thereof connected to said first terminal of the input port, said first resistor establishing the bandwidth in accordance with the relationship $\delta = \sqrt{3}/2RO$, where δ is the relative bandwidth, and RO is the value of the first resistor;

a first operational amplifier having the non-inverting input terminal connected to the other terminal end of said first resistor, having an inverting input terminal and having an output terminal connected to the second terminal of said active network;

a first capacitor having one terminal end connected to the other terminal end of said first resistor and having the other terminal end connected to said ground terminal:

a feedback network including certain resistive elements the resistance value of which set the center frequency of the filter in accordance with the relationship $Wo = 1/RC$, where $Wo = 2\pi fo$, and fo is the center frequency, R is the value of the resistance of the resistor and C is the value of the capacitor in the network; said feedback network having an input terminal connected to the output terminal of said first operational amplifier, having a first output terminal connected to the inverting input terminal of said first operational amplifier and having a second output terminal connected to the non-inverting input of said first operational amplifier; and

switch means interposed in said feedback network to effect a connection between said resistive elements and said first and second output terminals of the feedback network when said switch means is actuated and opening said connection otherwise; and

programmable timing means providing a plurality of timed outputs for selective connection to said switch means, each timed output setting a predetermined time period during which said switch means is actuated and thereby selectively varying the effective value of the certain resistive elements so that the center frequency of the filter may be programmably changed.

4,232,270

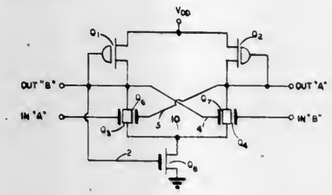
HIGH GAIN DIFFERENTIAL AMPLIFIER WITH POSITIVE FEEDBACK

Melvin L. Marmet, Corona, and Clarence W. Padgett, Westminster, both of Calif., assignors to Rockwell International Corporation, Segundo, Calif.

Filed Jun. 14, 1979, Ser. No. 48,559

Int. Cl.[3] H03F 3/45, 3/16

U.S. Cl. 330—253 **8 Claims**



8. A high gain differential amplifier comprising:

a first inverter stage including first series connected depletion and enhancement mode transistor devices, and additional enhancement mode transistor device connected in parallel with said first enhancement mode device;

a second inverter stage including second series connected depletion and enhancement mode transistor devices, and a second enhancement mode transistor device connected in parallel with said first enhancement mode transistor device;

said first and second inverter stages cascaded together between first and second electrical junctions;

voltage source means connected to each of said inverter stages at a first of said electrical junctions;

each of said inverter stages having respective input and output terminal means;

the output means of said first inverter stage being connected to the control electrode of said second enhancement mode transistor device in said second inverter stage, and said output means of said second inverter stage being connected to the control electrode of said enhancement mode transistor device of said first inverter stage;

current source means comprising an additional enhancement mode transistor device connected to each of said inverter stages at the second of said electrical junctions; and

positive feedback means connecting the control terminal of said additional enhancement mode transistor device with the control terminal of said first inverter stage depletion mode transistor device and a point between the first series connected depletion and enhancement mode transistor devices of said first inverter stage for maximizing the gain of said differential amplifier.

4,232,271

INSTRUMENTATION AMPLIFIER WITH EXTENDED COMMON MODE RANGE

Robert C. Dobkin, Hillsborough; Tim D. Isbell, San Jose; Bernard D. Miller, Santa Clara, and Lawrence R. Sample, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 5, 1979, Ser. No. 9,639

Int. Cl.[3] H03F 3/45

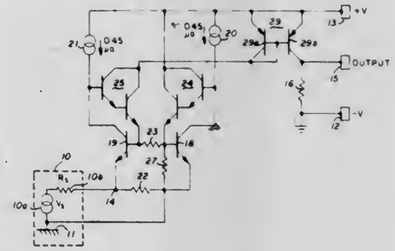
U.S. Cl. 330—258 **10 Claims**

1. A differential input instrumentation amplifier circuit capable of operating from a single power supply and configured to accommodate a range of common mode input signal voltages that includes voltage values that lie within and below the range represented by the span of said power supply, said circuit comprising:

means for coupling said circuit to a power supply having a first ground terminal and a second terminal;

first and second transistors, each having emitter, base, and collector electrodes;

means for coupling said emitters of said first and second transistors to provide the differential input terminals of said amplifier, said input being connectible to a source of signal having a pair of terminals, one of which is a remote ground connection that can cause said pair of terminals to assume a potential substantially different from that of said first ground terminal;



means for coupling constant current devices between said second terminal of said power supply and said collectors of said first and second transistors;

means for biasing the bases of said first and second transistors at one base to emitter diode drop above their respective emitters; and

means for sensing the current in at least one of said means for biasing to provide a signal output representative of the differential input to said emitters.

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FEEDBACK-STABILIZED MULTISTAGE FREQUENCY-SELECTIVE AMPLIFIER

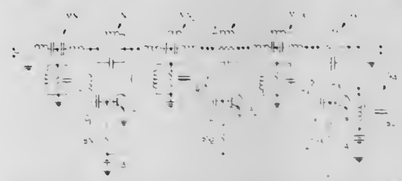
Bruno Fabri, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Nov. 1, 1978, Ser. No. 956,441

Claims priority, application Italy, Nov. 2, 1977, 69446 A/77

Int. Cl.[3] H03F 3/191

U.S. Cl. 330—294 **6 Claims**



1. A feedback-stabilized frequency-selective amplifier comprising:

a plurality of cascaded amplification stages each including an active component with an input electrode, an output electrode and a common electrode;

a plurality of coupling networks and a like plurality of feedback networks alternately inserted in a series chain between a signal-input terminal and a signal-output terminal, said input electrode of each active component being connected to a junction of a coupling network and a partly inductive feedback network of said chain in a network pair respectively associated therewith, said output electrode of each active component being connected to a downstream end of the associated feedback network; and

a supply of direct current connected between the common electrodes of all active components and a downstream end of said chain proximal to said signal-output terminal for feeding operating power to said stages, said coupling networks having lower impedances than the associated

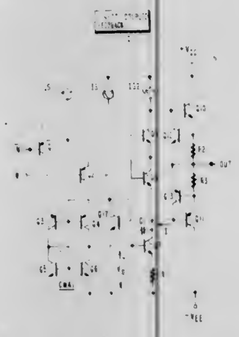
feedback networks for signal frequencies lying within a predetermined band, at least the coupling and feedback networks downstream of the first of said stages having inductive branches conductively interconnected at their junctions with formation of a continuous low-resistance path for direct current from said supply to the output electrodes of all active components.

4,232,273

PNP OUTPUT SHORT CIRCUIT PROTECTION

Arthur J. Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,500
Int. Cl.³ H03F 3/30, 3/45
U.S. Cl. 330—298 **12 Claims**



7. An amplifier having a current limited output comprising:
a common-emitter output transistor amplifier including a first transistor having emitter, base and collector electrodes and an emitter degeneration resistor connecting its emitter electrode to a point of reference potential;
a second transistor of conductivity type opposite to the first transistor, having emitter, base and collector electrodes, and having its collector electrode connected at the base electrode to the first transistor;
respective means for supplying signal current to the base of the first transistor and supply current to the emitter electrode of the second transistor;
potential generating means connected between the base electrode of the second transistor and said point of reference potential for establishing substantially constant potential therebetween, so that the potential at the emitter electrode of said second transistor, when said second transistor is caused to saturate by the means for supplying signal current, establishes the maximum potential across and therefore the maximum current through said emitter degeneration resistor.

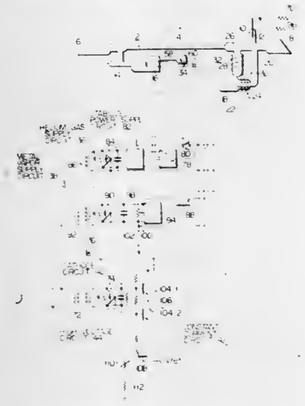
4,232,274

METAL VAPOR LASER SYSTEM

Katumi Tokudome, Saitama; Michio Ishikawa, Kawagoe, and Shuzo Hattori, Nagoya, all of Japan, assignors to Kimmon Electric Co., Ltd., Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,349
Int. Cl.² H01S 3/13
U.S. Cl. 331—94.5 S **14 Claims**

1. A metal vapor laser discharge system comprising a metal vapor laser discharge means and control means for said metal vapor laser discharge means;
said metal vapor laser discharge means including:
a laser vessel filled with an ionizable helium gas;
anode and cathode electrodes which are disposed in said laser vessel with a space therebetween for forming a discharge path;
a gas pressure detecting element in said laser vessel for detecting the helium gas pressure in said laser vessel and providing an output signal which is a function of the detected helium gas pressure;
a metal reservoir containing metal for supplying an ionizable metal vapor into said laser vessel; and
a helium gas supplemental container which is coupled with said laser vessel through a helium gas passing wall permitting helium gas to diffuse due to heating and to pass therethrough, and is filled with the helium gas at a higher pressure than that in said laser vessel; and
said control means for said metal vapor laser discharge means including:
constant current means which is connected between the anode and cathode electrodes and maintains substantially constant the discharge current between the anode and cathode electrodes;
metal heating means provided around said metal reservoir;
metal vapor supply means for controlling said metal heating means in accordance with the discharge voltage between the anode and cathode electrodes to maintain substantially constant the ionized metal vapor in said laser vessel; and
helium gas supplemental means for controlling the heating means for heating said helium gas passing wall of said helium gas supplemental container in accordance with the output signal from said gas pressure detecting element to maintain substantially constant the helium gas pressure in said laser vessel.

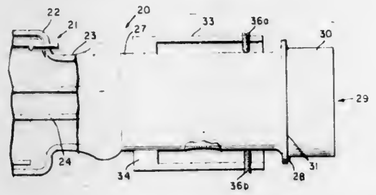


4,232,275

ADJUSTABLE MIRROR MOUNT FOR A LASER

William P. Kolb, Jr., Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 9, 1978, Ser. No. 959,391
Int. Cl.³ H01S 3/086
U.S. Cl. 331—94.5 D **6 Claims**



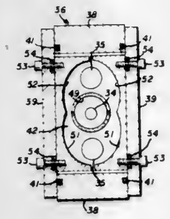
1. An adjustable mirror mount for a laser, comprising:
a cylinder having one end attachable to a laser discharge tube and an opposite end attachable to a mirror;
a collar disposed about said cylinder, said collar being mounted to said cylinder and extending substantially the length of said cylinder; and
means extending from said collar and impinging upon said cylinder for deflecting said cylinder along its axis.

4,232,276

LASER APPARATUS

Akiyoshi Iwata, Sunnyvale, Calif., assignor to Quanta-Ray, Inc., Mountain View, Calif.

Filed Oct. 11, 1977, Ser. No. 841,019
Int. Cl.² H01S 3/02
U.S. Cl. 331—94.5 D **1 Claim**



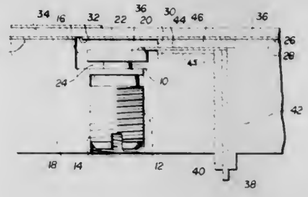
1. In a laser:
laser gain medium means for excitation with optical pump energy for inverting the population densities of certain predetermined energy levels of said gain medium which are capable of supporting laser transitions of a predetermined wavelength;
optical resonator means for reflecting optical radiation at said predetermined laser transition wavelength to and fro through said laser gain medium means;
pump means for supplying optical pump energy to said laser gain medium;
said pump means including, housing means for housing at least one flash lamp, pump reflector means disposed within said housing means for reflecting optical pump energy emitted from the flash lamp into said laser gain medium;
fluid flow channeling means for channeling liquid coolant through the region of said housing means between said pump reflector means and said flash lamp, said flow of such liquid coolant being in contact with said flash lamp and said pump reflector means;
ultraviolet light reject filter means interposed between said flash lamp and said laser gain medium means for filtering out ultraviolet light wavelengths of optical pump energy otherwise transmitted from said flash lamp to said laser gain medium;
wherein said fluid flow channeling means includes means for channeling the liquid coolant through the region within said housing means between said laser gain medium means and said filter means between said filter means and said flash lamp, such flow of liquid coolant being in contact with said filter means, said laser gain medium means, and said flash lamp; and
wherein said ultraviolet filter means comprises a sleeve structure surrounding said laser gain medium means, and wherein said sleeve means is split longitudinally to facilitate removal thereof for access to said laser gain medium for cleaning thereof without disturbing the optical alignment of said laser gain medium within said resonator means.

4,232,277

MICROWAVE OSCILLATOR FOR MICROWAVE INTEGRATED CIRCUIT APPLICATIONS

Lawrence E. Dickens, Baltimore, and Douglas W. Maki, Arnold, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1979, Ser. No. 19,193
Int. Cl.³ H03B 7/14, 9/14
U.S. Cl. 331—107 DP **15 Claims**



1. A microwave oscillator utilizing a semiconductor negative resistive device and being particularly adapted for microwave integrated circuit applications such as the pump oscillator for a parametric amplifier comprising, in combination:
a metal body in the form of a planar substrate configuration having resonator cavity means formed therein and having a surface over which is formed a microstrip ground plane, said metal body additionally having a bore therein extending to said resonator cavity means;
a mounting base including a semiconductor assembly, including a semiconductor device adapted to operate as a negative resistive element mounted on one end of said base and being inserted in said bore with said semiconductor assembly extending into said cavity means while said base is fastened to said metal body;
wherein said cavity means includes a radial resonator cavity section formed by a metallic disc resonator element electrically coupled to and being secured to the top portion of said semiconductor assembly within said resonator cavity means;
means included in said metal body and coupled to said semiconductor assembly for applying electrical power to said semiconductor device for operating said device as a negative resistance element;
a non-metallic substrate formed on said metal body over said ground plane;
a length of microstrip conductor formed on the outer surface of said non-metallic substrate extending from a region remote from the locality of said cavity means to a region proximate thereto; and
means coupling microwave energy from said cavity means to said length of microstrip conductor.

4,232,278

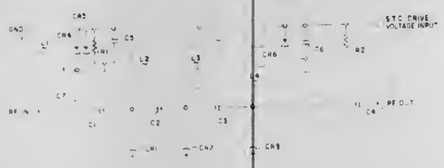
HIGH POWER MICROWAVE INTEGRATED CIRCUIT RECEIVER PROTECTOR WITH INTEGRAL SENSITIVITY TIME CONTROL

Michael J. Gawronski, Baltimore, and Harry Goldie, Randallstown, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 6, 1979, Ser. No. 55,423
Int. Cl.³ H01P 1/15; H04B 1/10
U.S. Cl. 333—13 **3 Claims**

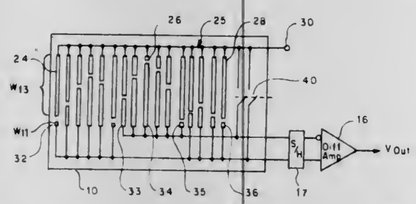
1. A microwave integrated circuit receiver protector for controlling the input to a radar receiver during periods of transmit and receive comprising:
a. a circuit board substrate having a ground plane, a microwave input line, and a microwave output line of substantially the same impedance as the input line;

b. an input PIN diode having a predetermined base region thickness coupled to with the said input line;
c. means including a Schottky barrier diode coupled to with the said input line and the said input PIN diode for providing turn-on bias to the said input PIN diode;
d. means including a discharge resistor coupled to with the said means for providing turn-on bias, and the said input PIN diode for providing fast recovery of the said input PIN diode from the said turn-on bias;



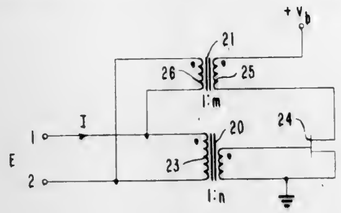
e. an output PIN diode having a determined base region thickness that is less than the said input PIN diode base region thickness coupled to with the said output line;
f. means for applying a dc voltage to the said output PIN diode whereby the said output PIN diode functions as a passive limiter during the transmit period and a controlled sensitivity time controlled attenuator during receive; and
g. means including a limiting PIN diode coupling the said input PIN diode to the said output PIN diode.

4,232,279
LOW NOISE CHARGE COUPLED DEVICE TRANSVERSAL FILTER
Paul R. Prince, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Continuation of Ser. No. 759,297, Jan. 14, 1977, abandoned, which is a continuation of Ser. No. 597,731, Jul. 21, 1975, abandoned. This application Nov. 15, 1978, Ser. No. 960,903
Int. Cl.[2] H03H *7/28;* **G11C** *19/28;* **H03K** *5/156;* **H01L** *29/78*
U.S. Cl. 333—165 **14 Claims**



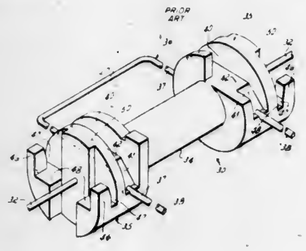
6. A charge coupled transversal filter for providing a selected impulse response having first and second polarity portions, said impulse response being defined by a plurality of weighting coefficients of first and second polarities, comprising
a substrate,
a plurality of weighting electrodes positioned adjacent to each other and along said substrate, each weighting electrode having first and second portions split with an insulating gap, each of said second portions having a length proportional to one of said weighting coefficients, said electrodes corresponding to coefficients of a second polarity having gaps forming an inverted configuration of said impulse response,
reference means coupled to the first portions of said split electrodes,
first and second leads coupled to the second portions representing respective first and second polarity weighting coefficients, for respectively forming the first and second polarity portions of said impulse response, and
combining means coupled to said first and second leads for inverting the signal on said second lead.

4,232,280
NETWORK FOR SIMULATING LOW TEMPERATURE RESISTORS
Robert L. Forward, Oxnard, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Mar. 8, 1979, Ser. No. 18,688
Int. Cl.[3] H03H *11/52*
U.S. Cl. 333—213 **6 Claims**



1. A two-terminal network for simulating a resistance comprising:
at least one transformer having a first and second winding;
a field effect transistor having at least a source, drain and gate electrodes;
first means for coupling one of said network terminals to one side of said first winding of said transformer;
second means for coupling the other side of said first winding of said transformer to the other of said network terminals;
third means for coupling said source and gate electrodes of said field effect transistor across said second winding of said transformer; and
fourth means for coupling said drain electrode of said field effect transistor to said one side of said first winding of said transformer.

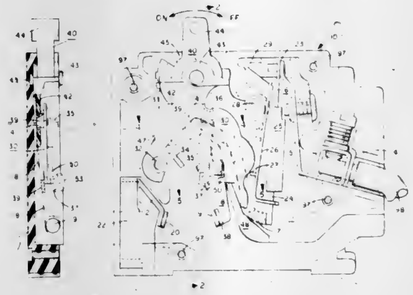
4,232,281
IN-LINE PACKAGE RELAY
Philip N. Smith, Cincinnati, Ohio, assignor to Standex International Corporation, Salem, N.H.
Filed Jun. 1, 1978, Ser. No. 911,386
Int. Cl.[3] H01H *1/66, 51/00, 11/02*
U.S. Cl. 335—152 **13 Claims**



1. A reed relay comprising,
a bobbin having flanges at each end,
a glass-encapsulated switch located centrally of said bobbin and having a switch terminal projecting from each end,
coil terminals embedded in said flanges and projecting from a side of said bobbin at right angles to the axis of said bobbin,
transverse notches in said flanges,

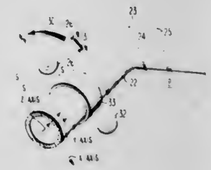
said switch terminals lying in said notches and projecting to a side of said bobbin at right angles to the axis of said bobbin,
and a housing molded around said bobbin,
said coil and switch terminals lying in at least one plane parallel to the axis of said bobbin.

4,232,282
CIRCUIT BREAKER HAVING MEANS TO FACILITATE ASSEMBLY THEREOF
Gustavo A. Menocal, Wilmington, N.C., assignor to Gould Inc., Rolling Meadows, Ill.
Filed Dec. 18, 1978, Ser. No. 970,279
Int. Cl.[3] H01H *73/06*
U.S. Cl. 335—202 **10 Claims**



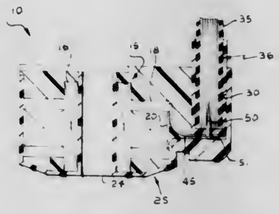
1. A circuit breaker including a stationary contact, a movable contact, an arm having said movable contact mounted on one end thereof, a cradle mounted for movement between a reset and a tripped position, a latch for holding said cradle in said reset position, trip means for automatically releasing said latch responsive to the occurrence of predetermined fault current conditions, an operating member to which the other end of said arm is pivotally connected, a main spring connected between said cradle and said arm and exerting a force component biasing the latter lengthwise toward said operating member, a narrow molded insulating housing defining a chamber, said housing including a base having an open side and integral formations for operatively positioning the previously recited elements of said circuit breaker within said chamber with a manually engageable forward handle portion of said operating member extending outside of said housing through a front opening thereof, said housing also including a cover closing the open side of said base; with said cradle in said reset position, said handle portion being movable between On and Off positions to reposition the other end of said arm relative to the line of action of said spring whereby force exerted by the latter is effective to move said arm and bring about respective closing and opening of said contacts; with said cradle in said tripped position, said spring moving said arm to a contact open position and said handle portion to a trip indicating position intermediate said On and Off positions; with said cradle in said tripped position, said handle portion in said trip position and said cover removed, said spring providing a force component biasing said one end of said arm toward said open side and into engagement with a blocking formation of said cradle; said blocking formation limiting movement of said arm toward said open side; said arm having a transverse projection extending toward said open side; with said cover closing said open side, the inside of said cover engaging said transverse projection to force said arm away from said open side and disengage said arm from said blocking formation.

4,232,283
ELECTRON BEAM MOVING APPARATUS FOR A COLOR CATHODE RAY TUBE
Joseph L. Werst, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Mar. 27, 1979, Ser. No. 24,392
Int. Cl.[3] H01J *29/51*
U.S. Cl. 335—212 **7 Claims**



1. An electron beam moving apparatus for a color cathode ray tube, with three in-line electron beams located within the envelope of said cathode ray tube, said electron beams traveling along the longitudinal axis of said cathode ray tube, comprising:
a first magnetic field producing structure with at least two magnetic poles separated along a first polar axis;
a support housing for locating said first magnetic field producing structure adjacent a first outer electron beam of said three in-line electron beams; and
first means for rotationally securing said first magnetic field producing structure for permitting alignment of said first polar axis with said longitudinal axis and for permitting rotation of said first polar axis away from alignment with said longitudinal axis in both horizontal and vertical planes.

4,232,284
IGNITION COIL AND ELECTRICAL CONNECTOR THEREFOR
Russell E. Phelon, East Longmeadow, Mass., and Henry A. Hawken, Granby, Conn., assignors to Power Parts, Inc., Carolina, P.R.
Filed May 7, 1979, Ser. No. 36,851
Int. Cl.[3] H01F *27/04, 15/10*
U.S. Cl. 336—90 **4 Claims**



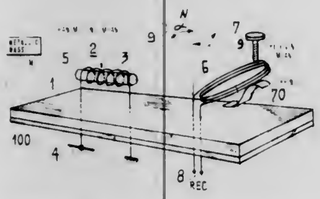
1. Ignition coil for an internal combustion engine comprising a housing, a secondary coil disposed within said housing and being convolutely wound of alternate layers of conductor wire and insulating paper, the outer end of said conductor wire being bonded in electrical contact with a conductive foil terminal disposed on the outer surface of the coil, a lead wire extending into said housing for connecting the voltage induced in said secondary coil to a spark gap device of the engine, a spring contact member interconnecting in a tensioned condition said lead wire and said conductive foil terminal.

4,232,285

ELECTROMAGNETIC DETECTOR RESPONSIVE TO A MODIFICATION OF A MAGNETIC FIELD

Jean-Raymond Narbaits-Jaureguy; Henri Billottet, and Pierre Granier, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1977, Ser. No. 852,726
Claims priority, application France, Nov. 19, 1976, 76 34916
Int. Cl.[3] G08G *1/02*; G01N *27/72*; E01F *11/00*
U.S. Cl. 340—38 L **21 Claims**



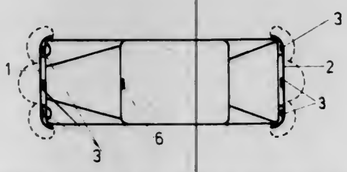
1. An electromagnetic detector responsive to the proximity of a metallic mass, comprising:
a metallic base having a flat upper surface;
a supply of alternating current;
transmitting means on said base, including a first coil with an axis parallel to said surface, connected to said supply for generating a surrounding electromagnetic field inducing eddy currents in said base;
receiving means on said base, including a second coil with an axis inclined to said surface, spaced from said transmitting means and positioned to pick up a measuring field produced by said eddy currents together with a component of the surrounding field as modified by a metallic mass in the vicinity, thereby generating a resulting signal varying with the presence or absence of such mass; and
processing means connected to said receiving means and to a source of reference oscillation energized from said supply for evaluating said resulting signal to indicate the proximity of said mass.

4,232,286

APPARATUS TO INDICATE THE SPACING BETWEEN A VEHICLE AND A METAL ARTICLE

Walter Voll, Industriestrasse 40, 8728 Hassfurt, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,803
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722498
Int. Cl.[3] G08G *1/16*; G01N *27/82*
U.S. Cl. 340—51 **14 Claims**



1. Apparatus mounted on a vehicle and arranged to provide a signal indicative of the spacing between the vehicle and a metal article being less than a predetermined amount, said predetermined amount being small compared with the length of the vehicle, the apparatus in combination with said vehicle comprising sensor units mounted to at least one fender and comprising at least one sensor unit mounted to a respective end portion of said at least one fender, of said vehicle, said sensor units being arranged in parallel with each other and each comprising:
(a) a coil;
(b) oscillator circuit means coupled to said coil and arranged in combination with said coil to generate a respective stray electromagnetic field, and to provide an output signal in response to any disturbance of said electromagnetic field as a result of the spacing between said vehicle and said metal article being less than said predetermined amount;
(c) regulating circuit means arranged to receive said output signal and to compensate the disturbance of said electromagnetic field after a predetermined delay in response to said output signal, and
(d) evaluating circuit means arranged to receive said output signal provided by said oscillator circuit means;
said apparatus further comprising spacing indicating circuit means mounted internally of the vehicle, and a single conductor line and earth return means electrically connecting said parallel arrangement of said sensor units to the indicating circuit means, the evaluating circuit means of each one of said sensor units being arranged in response to the respective output signal to cause a change in current in said single conductor line.

4,232,287

TONE GENERATOR

Michael Slavin, Troy, and Juhan Telmet, Fraser, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Division of Ser. No. 814,417, Jul. 11, 1977. This application Feb. 21, 1979, Ser. No. 13,094
Int. Cl.[3] B60R *21/10*
U.S. Cl. 340—52 E **6 Claims**



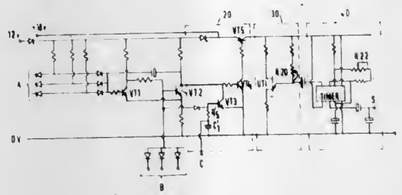
1. A positive temperature coefficient (PTC) resistance element for a seat belt monitoring system for an automobile that is adapted to provide timed audible and visual signals when operation of said automobile is initiated without the seat belt being properly buckled; said PTC resistance element being characterized by a body of PTC material having an anomaly temperature; said body having electrically conductive contact surface layers on different discrete surfaces of said body, one of said conductive surface layers being adapted to be connected to a source of electrical power, the other of said conductive surface layers defining first, second and third contact areas electrically isolated from each other, said contact areas being apportioned and disposed so that said first and second contact areas are substantially larger than said third contact area, and said second contact area is disposed between said first and third contact areas, said first contact area being adapted to be connected to an electrical ground, said second contact area being adapted to be connected to provide said visual signal and said third contact area being adapted to be connected to provide said audible signal.

4,232,288

VEHICLE ALARM

Raymond J. Masterman, 21 Hartfield Crescent, Wimbledon, London SW19, England

Filed Aug. 22, 1978, Ser. No. 935,842
Claims priority, application United Kingdom, Aug. 23, 1977, 35318/77
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—63 **9 Claims**



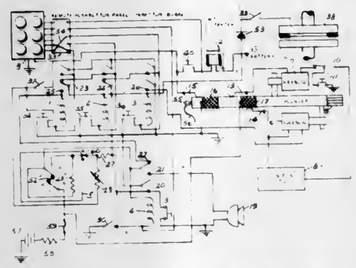
1. A vehicle alarm system comprising:
an alarm;
means for coupling a first vehicle accessory to said alarm for triggering said alarm whenever the magnitude of the impedance from said first vehicle accessory to vehicle ground is greater than a first predetermined threshold level;
means for coupling a second vehicle accessory to said alarm for triggering said alarm whenever the magnitude of the impedance from said second vehicle accessory to vehicle ground is less than a second predetermined threshold level; and
means for coupling said alarm to a vehicle battery for triggering said alarm whenever said vehicle battery is electrically disconnected from said alarm.

4,232,289

AUTOMOTIVE KEYLESS SECURITY SYSTEM

Don H. Daniel, 5114 Huisache, Bellaire, Tex. 77401

Filed Oct. 24, 1978, Ser. No. 954,234
Int. Cl.[3] B60R *25/04*
U.S. Cl. 340—64 **10 Claims**



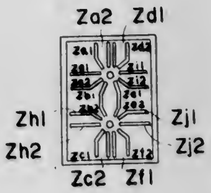
1. In an electric permutation lock and alerting system having, in cascade, a plurality of combination selecting stages operable by remote switch means, actuation of first said stage being dependent on actuation of said remote switch means, actuation of each successive said stage being dependent on successive actuation of said remote switch means plus actuation of each prior said stage, actuation of final said stage causing an unlock voltage to operate a plunger means, having lock and unlock means to move said plunger means in opposite directions, wherein the improvement comprises an automotive application whereby said plunger means, in locked position, blocks the unlock travel path and movement, in the unlock direction, of a remote hood latch cable, and wherein said blockage of said movement in unlock direction prevents access to the engine compartment.

4,232,290

HANDWRITTEN CHARACTER IDENTIFICATION

Syoichi Yasuda, Nara, and Yoshiki Nishioka, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 814,419, Jul. 11, 1977, abandoned, which is a continuation of Ser. No. 579,578, May 21, 1975, abandoned. This application Jul. 13, 1978, Ser. No. 924,362
Claims priority, application Japan, May 21, 1974, 49/57643
Int. Cl.[3] G06K *9/50*
U.S. Cl. 340—146.3 Z **13 Claims**



1. A method of identifying an alpha-numeric handwritten character comprising the steps of:
forming said handwritten character within a predetermined area,
said area being divisible into definable regions by a first reference pattern containing first and second spaced constraining dots and a plurality of radius vector means, extending from the region of each of said constraining dots, each of said radius vector means having at least two vector segments,
said radius vector means extending from said first constraining dot including six vertical radius vector segments including four radius vector segments Za_1, Za_2, Zd_1, Zd_2 extending upwardly from said first constraining dot and two radius vector segments Zb_1, Ze_1, extending downwardly from said first constraining dot toward said second constraining dot and four horizontal radius vector segments including two radius vector segments, Zg_1, Zg_2, extending from one side of said first constraining dot and two radius vector segments, Zi_1, Zi_2 extending from the opposite side of said first constraining dot,
said radius vector means extending from said second constraining dot including six vertical radius vector segments including four radius vector segments Zc_1, Zc_2, Zf_1, Zf_2 extending downwardly from said second constraining dot and two radius vector segments Zb_2, Ze_2 extending upwardly from said second constraining dot toward said first constraining dot and four horizontal radius vector segments including two radius vector segments Zh_1, Zh_2 extending from one side of said second constraining dot and two radius vector segments Zj_1, Zj_2 extending from the opposite side of said second constraining dot,
said area also being divisible into definable regions by a second reference pattern in the form of a character font consisting of horizontal and vertical font segments including six horizontal font segments Sa, Sd, Sb, Se, Sc, Sf and four vertical font segments, Sg, Si, Sh, Sj, said font segments collectively forming a figure eight configuration,
each character to be idenfified having a shape which can be approximated by a predetermined combination of font segments,
the identity and location of each font segment in said area being definable by conditions of coincidence of portions of said handwritten character with predetermined pairs of said radius vector segments,
detecting which predetermined pairs of said radius vector

segments have portions which are coincident with portions of said handwritten character formed in said area to establish said conditions of coincidence and to identify those font segments satisfying said conditions of coincidence from the following logic equations:

$$Sa = Za_1 \cdot Za_2$$
$$Sb = Zb_1 + Zb_2$$
$$Sc = Zc_1 \cdot Zc_2$$
$$Sd = Zd_1 \cdot Zd_2$$
$$Se = Ze_1 + Ze_2$$
$$Sf = Zf_1 \cdot Zf_2$$
$$Sg = Zg_1 \cdot Zg_2$$
$$Sh = Zh_1 \cdot Zh_2$$
$$Si = Zi_1 \cdot Zi_2$$
$$Sj = Zj_1 \cdot Zj_2$$

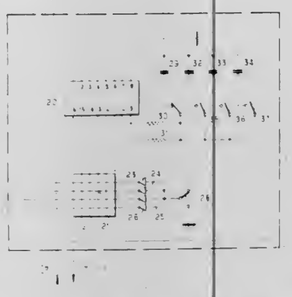
identifying said handwritten character by correlating the identified font segments with said predetermined combinations of font segments to determine the approximate shape of said handwritten character, and therefore, the identity thereof.

4,232,291

ELECTRONIC LOCK, THE CODE OF WHICH CAN EASILY BE MODIFIED BY THE USER

Raymond Bernier, Vincennes, France, assignor to International Detection Protection, France

Filed Oct. 13, 1978, Ser. No. 951,412
Claims priority, application France, Oct. 25, 1977, 77 32838
Int. Cl.[2] H04Q *1/32*; E05B *49/00*; B60R *25/04*; G08B *13/08*
U.S. Cl. 340—147 MD **2 Claims**



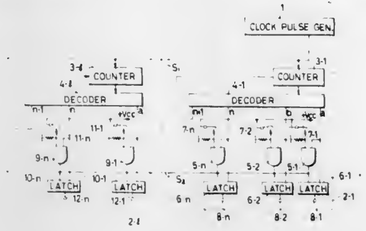
1. An electronic lock and key system for generating latch actuating and security signals, comprising: a lock circuit unit; a detachable key circuit unit; means for establishing a removable electrical connection between the key circuit unit and the lock circuit unit; each circuit unit including externally accessible and programmable contact matrix means each establishing a specific code; the key circuit unit comprising pulse code modulated oscillator means having a plurality of control terminals connected to the key contact matrix means and a signal output on which pulses coded according to a key code are sequentially transmitted; the lock circuit unit comprising shift-register means converting the said sequentially transmitted coded pulses into a parallel logic signal and gating means, having a plurality of control inputs connected to the lock contact matrix means, said gating means being connected to the shift register means and comparing the said parallel logic signal to the lock code programmed on the lock contact matrix means, said gating means having an output on which a latch actuating signal is generated each time the said lock code and the said parallel logic signal coincide and a security signal each time the said lock code and the said parallel logic signal do not coincide, the said means for establishing a removable electrical connection essentially consisting of a power supply lead and a signal transmitting lead, the signal transmitting lead connecting the signal output of the said oscillator means to the said shift-register means.

4,232,292

DATA TRANSMITTER DEVICE

Katsuya Yasuda, Yokohama, and Akio Adachi, Kawasaki, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Mar. 5, 1979, Ser. No. 17,769
Claims priority, application Japan, Mar. 7, 1978, 53-24961
Int. Cl.[2] H04Q *5/00*
U.S. Cl. 340—147 SY **15 Claims**



1. A data transmission system comprising: a clock pulse generator generating output clock pulses, a plurality of transmitters, each transmitter including scanning means receiving clock pulses, a plurality of switches for inputting data, gate circuit means receiving the outputs of said plurality of switches through one input thereof, memory means for temporarily storing the outputs of said gate circuit means, and wherein said scanning means applies output signals to said gate circuit means successively in synchronization with the clock pulses of said clock pulse generator, said transmitters being interconnected first by a synchronous line adapted to apply the output pulses of said clock pulse generator to the scanning means in said plurality of transmitters and secondly by a signal line connecting the output terminals of said gate circuit means in said plurality of transmitters.

4,232,293

LINE INTERFACE UNIT FOR VOICE AND WIDE BAND SIGNAL COUPLING

Harold H. Harris, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 17, 1979, Ser. No. 76,148
Claims priority, application Canada, Jul. 27, 1979, 332660
Int. Cl.[3] H04M *11/00*; H04Q *3/14*; H04B *3/42*
U.S. Cl. 340—147 R **5 Claims**



1. A line unit for interfacing an analog line with a digital telecommunication facility, the line unit comprising:

an analog to digital (A/D) converter, having an analog input for receiving analog signals, for encoding said analog signals for use in the digital telecommunication facility;

a control means for generating a plurality of control signals, one at any one time, in response to directions received in the line unit by way of the telecommunication facility; and

a line circuit including:

a first signal path for carrying a voice band analog signal and including a hybrid circuit for connection to the analog line;

a second signal path for carrying a wide band analog signal in a frequency range extending from direct current into the voice band;

a first switch connected in series between an analog output of the hybrid circuit in the first signal path and the analog input of the A/D converter, for coupling the analog signal from the hybrid circuit to the analog input in response to a first one of the control signals;

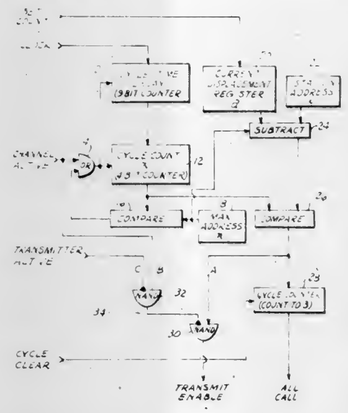
a second switch connected in series between the second signal path and the analog input of the A/D converter, for coupling the analog signal on the second signal path to the analog input in response to a second one of the control signals.

4,232,294

METHOD AND APPARATUS FOR ROTATING PRIORITIES BETWEEN STATIONS SHARING A COMMUNICATION CHANNEL

Robert G. Burke, Santa Ana, and Robert F. Martin, Villa Park, both of Calif., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 30, 1979, Ser. No. 34,236
Int. Cl.[3] H04Q *9/00*
U.S. Cl. 340—147 LP **11 Claims**



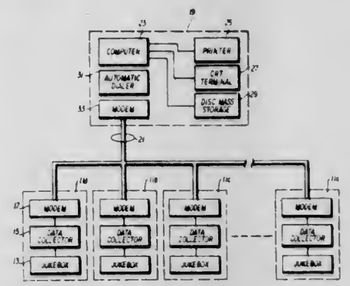
1. Apparatus for allocating use of a communication channel shared by a plurality of stations, each station having a respective address and each station having a controller responsive to an enable signal to enable the station to seize use of the channel, said apparatus comprising, at each station: register means for storing a representation of the address of the station having the highest priority; means responsive to the representation stored in said register means and to the address associated with the respective station for establishing a priority number for the respective station; cyclic counter means for storing a count number; clock means for continuously advancing the count number in said counter means; and compare means responsive to a comparison between said count number and said priority number for providing said enable signal to said controller.

4,232,295

JUKEBOX POLLING SYSTEM

George B. McConnell, Vienna, Va., assignor to Data Information Systems Corporation, Alexandria, Va.

Filed Apr. 13, 1979, Ser. No. 30,055
Int. Cl.[2] H04Q *9/14*
U.S. Cl. 340—152 R **6 Claims**



1. A data acquisition and transmission system for monitoring a plurality of remotely located check-controlled song reproduction devices each device including means for identifying a song position, said system comprising:

a song collector and transmitter unit physically connected to a song reproduction device so as to receive signals identifying a record position selected;

said unit being capable of interpreting signals received from said song reproduction device so as to count all occurrences of all record positions selected;

said unit including means to memorize the identification signal for each record position;

said means capable of storing the number of times each record position is selected over a period of times;

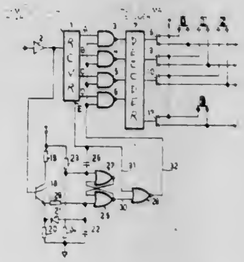
said unit including a transmitting means capable of transmitting stored information to a collector/scanner.

4,232,296

REMOTE CONTROL/DIGITAL TUNING INTERFACE WITH PARALLEL OPERATION WITH MANUAL SWITCHES

Dominik Filipovic, Toronto, Canada, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 808,785, Jun. 22, 1977, abandoned.
This application Feb. 26, 1979, Ser. No. 15,033
Claims priority, application Canada, Jun. 29, 1976, 255915
Int. Cl.[3] H04Q *5/00*
U.S. Cl. 340—167 R **3 Claims**



1. A system for interfacing a remote control unit with a receiver having a plurality of switches, said system comprising a remote control receiver having input means for receiving a signal encoded with a plurality of function control bits and an extra bit, a plurality of outputs for supplying said function

control bits respectively, and an output for supplying said extra bit; a plurality of gates having first inputs coupled respectively to said plurality of outputs of said remote control receiver, second inputs, and outputs; a decoder having inputs coupled to said gate outputs respectively, and a plurality of outputs; a plurality of electronic switches having control inputs coupled to said decoder outputs respectively, and conduction electrodes adapted to be coupled in parallel to said receiver switches; and means coupled between said extra bit output means and said second inputs of said gates for ensuring that said function control bits are supplied to said decoder inputs only during the duration of said extra bit.

4,232,297

REMOTE CONTROL ARRANGEMENT USING PULSE SPACING MODULATOR

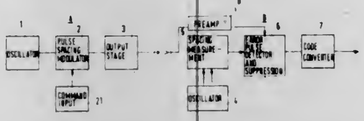
Albrecht Gerlach, Emmendingen; Dieter Holzmann; Guenter Lindstedt, both of Freiburg, and Rolf-Dieter Burth, Oberried, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 970,059

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802867

Int. Cl.³ H04Q *9/10*

U.S. Cl. 340—168 S **4 Claims**



1. In a remote control system of the type including a transmitter capable of transmitting a digital control command signal comprising a predetermined number of pulses, each indicative of a binary one or a binary zero, with a binary one manifesting a separation from a successive pulse of a fixed period 2T, with a binary zero manifesting a separation from a successive pulse of a fixed period T, said control signal always of a given pattern as starting with a first prepulse Z, followed by a second start pulse X separated from said first prepulse Z by a fixed period 3T, with a first command pulse C always following said X pulse by the period T with a fixed number of information pulses indicative of binary ones and zeroes, as determined by said fixed period separation, following said first command pulse, with a terminating end pulse Y spaced from said last information pulse by the period 3T, whereby a complete control command signal is always of the form Z,X,C, X_1,X_2 . . . X_N,Y, where:

X_1=first binary bit (zero or one)

X_2=second binary bit (zero or one)

X_N=last binary bit (zero or one)

wherein:

if X_1 is a zero, it is separated from X_2 by T, and if X_1 is a one, it is separated from X_2 by 2T,

the combination therewith of receiving apparatus for detecting said command signal as transmitted, comprising:

preamplifier means responsive to the reception of said command signal and responsive to said Z pulse for reducing the gain of said preamplifier upon receipt of any pulse indicative of a Z pulse, whereby a reduction of gain is indicative of an anticipated following transmission of the remainder of said command signal, said preamplifier providing at an output, an amplified version of said command signal,

an oscillator circuit for providing a continuous train of pulses, each separated by a substantially smaller period than said fixed period T, with said pulse train at a given random frequency with respect to said command signal,

an up-down counting means responsive to said continuous train of pulses for counting said pulses in an up direction in a first mode and a down direction in a second mode,

first logic means coupled to said counter and responsive to said start pulse X for causing said up counter to commence counting said train of pulses in said first mode,

memory means coupled to said up-down counter and operative to store said count upon receipt of a control signal,

second logic means coupled to said memory means and responsive to said first command pulse C to provide said control signal to cause said memory to store said count indicative of a given number of pulses emanating from said oscillator during the period T as separating said X pulse from said first command pulse C, said logic means including means for coupling said control signal to said up-down counter to cause said counter to commence counting in said second mode,

zero detecting means coupled to said up-down counter and operative to decode an all zero state indicative of said counter counting down said period T, said detecting means including means for transferring said count as stored in said memory to said up-down counter to again cause said counter to count down from said stored count,

binary counting means coupled to said zero detecting means and responsive to said input signal to provide an output indicative of the number of all zero states manifested by said up-down counter between successive pulses of said command signal, whereby a count of one manifests the receipt of a binary zero indicative of a T pulse separation, a count of two manifests the receipt of a binary one indicative of a 2T pulse separation and a count of three manifests receipt of a terminating pulse indicative of a 3T separation,

register means coupled to said binary counting means and responsive to said input signal for storing values indicative of binary ones and zeroes as determined by said T or 2T separation, with said data as stored indicative of said information bits of said digital command signal.

4,232,298

REMOTELY-CONTROLLABLE RELAYS AND FILTERS THEREFOR

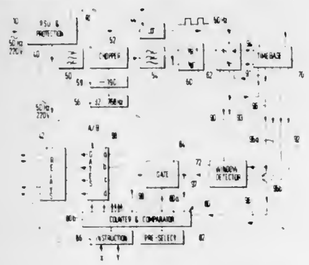
Anthony J. Ley, Bievres, France, assignor to ENERTEC, Montrouge, France

Filed May 12, 1978, Ser. No. 905,394

Claims priority, application United Kingdom, May 16, 1977, 20563/77; Sep. 23, 1977, 39652/77

Int. Cl.² G01R *23/02*; H03K *9/06*; H04Q *9/10*

U.S. Cl. 340—171 R **21 Claims**



1. A remotely-controllable relay for effecting a switching operation in response to a control signal in the form of an alternating ripple voltage at a first predetermined frequency superimposed upon and asynchronous with an alternating power supply voltage in an electric-power distribution network, comprising:

an input for receiving the network voltage and supplying a signal derived therefrom;

means for generating a signal at a second predetermined frequency independent of the power supply frequency and selected to be different from the nominal value of said first frequency and further selected such that the difference frequency of the first and second frequencies is less than any of the first, second and power supply frequencies;

means connected for receiving and mixing said second-frequency signal and said signal supplied by the input, whereby to produce an output signal including, if said control signal is present on the network, a component at the difference frequency;

filter means connected to receive the output signal of the mixing means, and arranged to pass said difference frequency and to attenuate higher frequencies; and

means connected to the filter means to detect the presence of said component and to effect said switching operation in accordance therewith.

4,232,299

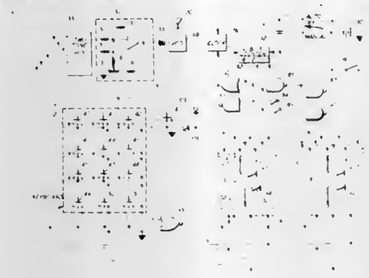
WIRELESS OUTPUT/INPUT SYSTEM

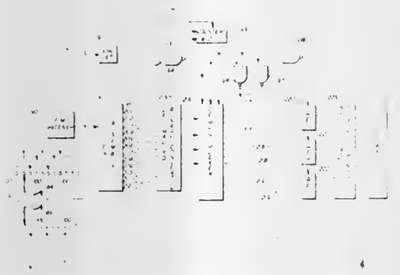
Robert M. Eisenberg, Woodbine, Md., assignor to The Singer Company, Binghamton, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,356

Int. Cl.³ H04Q *9/12*

U.S. Cl. 340—171 R **19 Claims**





1. A remote controlled wireless transmitter receiver system for entering, and verifying control information or instructions and data into a general purpose electronic computing device, said remote controlled wireless transmitter receiver system comprising:

a portable hand held housing,

means connected to said housing for manually entering information, instructions and data,

a multi tone generator whose inputs are coupled to said entering means, said multi tone generator outputs different frequencies for different information that it receives,

amplifying means for amplifying and converting the frequency output of said multi tone generator into voltages, the input of said amplifying means being coupled to the output of said tone generator,

transmitter means whose input is coupled to the output of said amplifying means for producing and transmitting a radiated radio frequency output which is modulated in frequency at a rate and amplitude proportional to the voltage produced by said amplifying means,

means for supplying power coupled to said entering means, said multi tone generator, amplifying means and said transmitter means,

receiver means within said housing for receiving radio frequency information transmitted by said general purpose electronic computer device,

decoding means for decoding and converting the output of said receiver means, the input of said decoding means being coupled to the output of said receiver means,

a plurality of registers for temporarily storing the information produced by said decoding means, the input of said registers being connected to the output of said decoding means, and the output of said registers being coupled to the input of means to verify said information, and

timing means whose input is coupled to the output of said receiver means and whose output is coupled to the load input of said registers,

whereby said registers are able at the proper times to receive and to transmit said entered control information or instructions and data to said electronic computing device.

4,232,300

LEVEL MEASURING SYSTEM USING ADMITTANCE SENSING

William S. Wright, Dublin, and Kenneth M. Loewenstern, Warminster, both of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Filed Nov. 24, 1978, Ser. No. 963,299

Int. Cl.³ G08C *19/10*; G01R *27/00*

U.S. Cl. 340—840.39 **12 Claims**



1. In a transmitter system comprising a power supply and a load at one location and two-wire transmitter means at another location interconnected by two pairs of transmission lines carrying a variable signaling current; said transmitter means comprising:

an admittance sensing means including a first condition sensing element for sensing an admittance characteristic of material corresponding to the level or condition thereof and a second compensating sensing element for sensing an admittance characteristic of the composition of said material; p1 a single oscillator;

a first admittance sensing network coupled to said first sensing element and said oscillator;

a second admittance sensing network coupled to said second sensing element and said oscillator; and

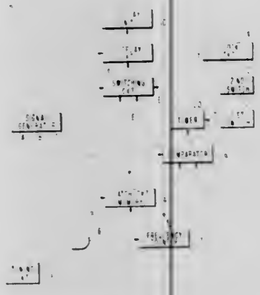
output means coupled to said first and said second admittance sensing networks for varying the signaling current in each of said pairs of transmission lines in response to the condition and composition of said material respectively.

4,232,301

APPARATUS FOR AUTOMATICALLY SELECTIVELY DISPLAYING INFORMATION OF A PLURALITY OF KINDS

Koh Nomoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1978, Ser. No. 889,800
Claims priority, application Japan, Mar. 25, 1977, 52/33728
Int. Cl.[2] G08B *19/00*; G04B *19/24*; H04B *1/16*
U.S. Cl. 340—789 **14 Claims**



1. An apparatus comprising:
first means for producing a first information signal representative of information of a first kind;
second means for producing a second information signal representative of information of a second kind, the information of said second kind being optionally variable, said second information signal being variable in response to a variation in the information of said second kind;
display means for displaying the information of any of at least said first and said second kinds;
memory means for memorizing said second information signal;
comparator means for comparing the second information signal from said second means with the memorized second information signal from said memory means to produce a control signal representative of the result of the comparison; and
switch means for switching the supply of information signals to said display means from said first information signal to said second information signal for a predetermined period of time in response to said control signal.

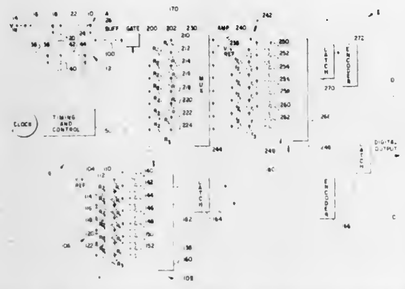
4,232,302

VIDEO SPEED LOGARITHMIC ANALOG-TO DIGITAL CONVERTER

Carl T. Jagatich, Chagrin Falls, Ohio, assignor to Ohio Nuclear, Inc., Solon, Ohio

Filed Aug. 24, 1978, Ser. No. 936,328
Int. Cl.[3] H03K *13/175*
U.S. Cl. 340—347 AD **19 Claims**

1. A high speed logarithmic analog-to-digital converter comprising:
(a) means for receiving an analog input signal;
(b) means for producing a first plurality of logarithmically incremented reference signals;
(c) a first comparing means operatively connected with said analog input and with said first plurality of reference signals for comparing an analog input signal with the first plurality of reference signals to ascertain at least one of said first reference signals to which the analog input signal is comparable;
(d) means operatively connected with the first comparing means for forming a first digital representation of the comparable first reference signal;
(e) means for producing an attenuated analog input signal, said attenuated analog input signal producing means operatively connected with said analog input signal receiving means;
(f) means for producing a second plurality of logarithmically incremented reference signals;
(g) a second comparing means operatively connected with said means for producing an attenuated analog input signal and said means for producing a second plurality of logarithmically incremented reference signals for comparing said attenuated analog input signal with the second plurality of reference signals to ascertain at least one of said first reference signals to which the selected analog input signal is comparable; and
(h) means operatively connected with said second comparing means for forming a digital representation of the comparable second reference signal.

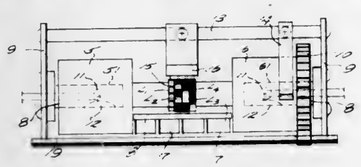


4,232,303

MULTIITEM INDICATING DEVICE

Yasuyuki Sakakibara, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 13, 1979, Ser. No. 29,906
Claims priority, application Japan, Apr. 17, 1978, 53-50645
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—366 R **5 Claims**



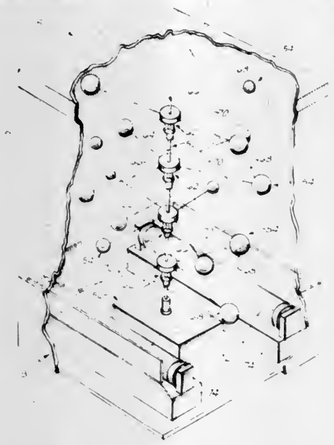
1. A multiitem indicating device for indicating a title of a desired item out of a plurality of items, the indication units and the electrically detected value corresponding to the desired item comprising:
a pair of drums coaxially connected by a connecting shaft so as to be rotated integrally about an axis thereof;
a plurality of titles and corresponding indication units being indicated around the surfaces of said pair of drums, respectively, so as to be opposed to each other along an axis of said pair of drums;
an angular position detecting means for detecting an angular position of said pair of drums and producing electric signals corresponding to said angular position;
a switching means for selecting a detected value out of a plurality of detected values in accordance with said electric signals produced by said angular position detecting means; and
a figure indicator provided in a groove surrounded by said pair of drums and said connecting shaft, and electrically connected to said switching means for indicating said selected detected value.

4,232,304

VIBRATORY-ROTARY MOTION CONVERTERS AND DISPLAY DEVICES INCORPORATING SUCH CONVERTERS

Benton A. Durley, III, Rte. 45, Druce Lake, P.O. Box 304, Grayslake, Ill. 60030

Filed Jun. 11, 1979, Ser. No. 47,168
Int. Cl.[3] G08B *5/24*
U.S. Cl. 340—366 B **52 Claims**



1. A device for converting vibratory motion into rotary motion,
said device comprising a vibratory member having a generally cylindrical external surface,
supporting means for supporting said vibratory member for axial vibratory motion along the cylindrical axis of said surface,
vibration producing means for causing such axial vibratory motion of said vibratory member,
a rotary member slidably and rotatably mounted around said cylindrical surface of said vibratory member for rotary motion relative thereto about the cylindrical axis of said cylindrical surface,
a shoulder member on said vibratory member and having a shoulder facing toward said rotary member,
and at least one flexible resilient arm on said rotary member and having an end portion extending toward said shoulder for engagement therewith,
said flexible resilient arm being oriented for flexing motion in a direction such that said end portion of said arm has axial and circumferential components of motion relative to said cylindrical axis,
said rotary member being biased toward said shoulder to produce a yieldable biasing force between said shoulder and said end portion of said flexible arm so that axial vibration of said vibratory member produces flexure of said arm and consequent rotation of said rotary member.

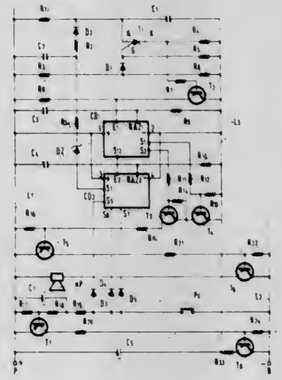
4,232,305

SYSTEM FOR CONTROLLING AN ELECTRONIC WARNING DEVICE

Daniel Lelaidier, Neuilly sur Marne, and Pierre Godard, Tremblay les Gonesse, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Dec. 18, 1978, Ser. No. 970,160
Claims priority, application France, Dec. 28, 1977, 77 39468
Int. Cl.[2] G08B *3/10*
U.S. Cl. 340—384 E **7 Claims**

1. A system for generating an audible warning signal, the system comprising:
a loudspeaker;
a power transistor connected for driving the loudspeaker;
a single time base oscillator having an output for providing a clock signal at a frequency which is variable over a predetermined range of frequencies and an input for a command signal for varying said output frequency; and
a divider having an input connected to the output of the single time base oscillator to divide the clock signal and a plurality of outputs for producing predetermined integral submultiples of the output frequency from said single time base oscillator, said plurality of outputs including
a first output whereat the oscillator frequency has been divided by a first predetermined integral number of times to produce an audio signal at an audio frequency;
a second output whereat the time base oscillator frequency has been divided a second predetermined integral number of times to produce a signal for adjusting the mark/space ratio of the audio signal;



gating means having a first input coupled to the first output of the divider, a second input coupled to the second output of the divider and an output coupled to the power transistor, said adjusting signal being gated with the audio signal by said gating means to adjust the mark/space ratio of the audio signal, and the adjusted audio signal being applied to the power transistor;
a third output whereat the time base oscillator frequency has been divided a third predetermined integral number of times, greater than said first integral number, to produce a cyclic modulation signal at a frequency lower than the audio signal, said third output of the divider being coupled to the input of the time base oscillator to vary the frequency of the clock signal; and
a fourth output whereat the time base oscillator frequency has been divided a fourth predetermined integral number of times, greater than said third integral number, to produce a timing signal to turn off the audible warning signal after it has sounded for a predetermined period.

4,232,306

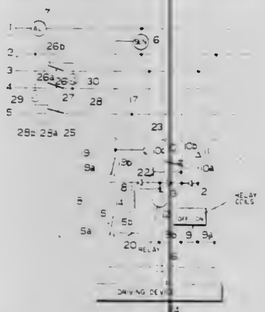
SUPERVISORY CONTROL SYSTEM AND APPARATUS

Shuzo Mizuno, Tokyo, Japan, assignor to Kabushiki Kaisha Kogen, Tokyo, Japan

Filed Sep. 14, 1978, Ser. No. 942,420
Claims priority, application Japan, Sep. 20, 1977, 52-112170; Dec. 30, 1977, 52-158948
Int. Cl.[2] G08B *29/00*
U.S. Cl. 340—506 **11 Claims**

1. A supervisory control system comprising
a plurality of sensors;
an alarm device for providing an alarm by activation of said sensors;
a series of operating units, a given one of said sensors being

associated with a given one of said operating units for providing a sensor signal thereto when said one sensor is actuated, each operating unit comprising a relay for activating a load and transfer means for transferring the operatable state of its corresponding operating unit, said relay being connected for actuation by a selective signal and/or a sensor signal, and said transfer means being connected to



allow the operation of its corresponding operating unit by a selective signal and to make possible the operation of the next operating unit by the next selective signal;

means for transmitting continual selective signals to said operating units; and

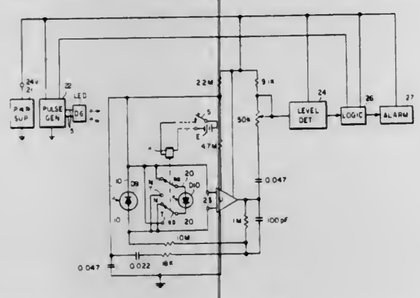
display means for displaying information transmitted from said operating unit during the operation thereof.

4,232,307

ELECTRICAL TEST CIRCUIT FOR OPTICAL PARTICLE DETECTOR

Angelo A. Marsocci, Duxbury, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Dec. 18, 1978, Ser. No. 970,620
Int. Cl.³ G08B *21/00, 17/10*
U.S. Cl. 340—515 **4 Claims**



1. An optical particle detector comprising:

wall means forming a chamber,

means for directing light on a path through the chamber,

a first photovoltaic cell optically disposed to respond primarily to light scattered by a predetermined density of particles in the light path to produce an alarm level signal,

a second photovoltaic cell optically disposed to respond to light from outside the path,

an alarm output connected to the first photovoltaic cell in a predetermined polarity, and

switching means having a first position including connections from the second photovoltaic cell to the alarm output in a first polarity opposing the signal from the first cell, and including a second position including connections from the second cell to the alarm output in the reverse of the first polarity thereby to reinforce and raise the level of the signal of the first cell at the output in the second position to alarm level so as to indicate operativeness of the light directing means and first cell.

4,232,308

WIRELESS ALARM SYSTEM

Maw H. Lee, Broadview Heights, and John E. Keim, Lodi, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Jun. 21, 1979, Ser. No. 50,802
Int. Cl.³ G08B *1/00*
U.S. Cl. 340—539 **10 Claims**



1. A wireless alarm system comprising:

a transmitter for radiating a radio frequency signal in response to and during the application of electrical power to the transmitter;

a battery for providing electrical power to the transmitter;

transmitter timer circuitry for intermittently applying to the transmitter electrical power provided by the battery, the timer circuitry being electrically series-inserted between the transmitter and the battery;

switching means responsive to a predetermined alarm condition detected at the general site of the transmitter, activation of the switching means initiating operation of the transmitter timer circuitry, the operating timer circuitry intermittently applying power to the transmitter at regular predetermined intervals while the switching means remains activated, the transmitter intermittently radiating the signal in response to the intermittent application of power to the transmitter; and

a radio frequency receiver for reception of the radiated signal, the radio frequency receiver activating at least one alarm indicator in response to reception of the radiated signal, the duration of alarm indicator activation being substantially greater than the duration of the radio frequency signal radiated by the transmitter during the application of power to the transmitter by the timer circuitry.

4,232,309

ROLLER SHUTTER

Manfred Dillitzer, Grobenzell, Fed. Rep. of Germany, assignor to Perfecta Rolladen Karl & Co., Westendorf, Fed. Rep. of Germany

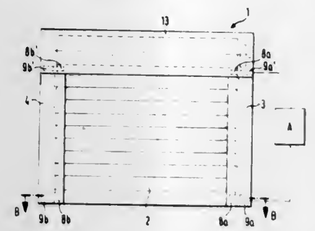
Filed Nov. 9, 1978, Ser. No. 959,144
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 7735191[U]
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—547 **6 Claims**

1. An alarm actuated roller shutter comprising:

a pair of opposed guide rails having a guide cross sectional chamber;

a roller shutter having a plurality of interconnected armor links disposed for movement along said guide rails, said links protruding into the guide cross sectional chambers at the lateral ends of said links;

at least one magnetic switch for actuating an alarm system, said magnetic switch comprising a first means having contacts which are actuated in response to a magnetic field and a second means for producing the magnetic field, one of said first and second means located on one of the lowermost of said links on the inner side of said roller shutter and the other of said first and second means fixedly



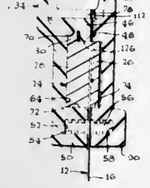
mounted adjacent the guide cross sectional chamber of at least one of said guide rails, said first means being actuated by said second means in the fully closed position of said roller shutter, said one means being accessible when the roller shutter is raised by a substantial distance.

4,232,310

PROTECTIVE WINDOW SCREEN ASSEMBLY

Clarence P. Wilson, Torrance, Calif., assignor to Imperial Screen Company, Inc., Lawndale, Calif.

Filed May 18, 1979, Ser. No. 40,660
Int. Cl.³ G08B *13/08*; A47G *5/00*
U.S. Cl. 340—550 **15 Claims**



1. An alarm screen assembly comprising:

a screen mesh sheet formed primarily of nonconductive strands and also including a plurality of insulated electrically conductive security strands extending parallel to one another, said mesh sheet having a pair of opposite sides and said security strands extending largely perpendicular to and between said sides;

a pair of electrically conductive cross wires extending along opposite sides of said mesh sheet and electrically connected to said security strands; and

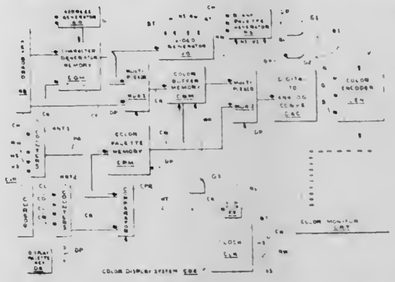
a spline extending along the border of said mesh sheet, said spline having upper and lower spine portions lying on opposite faces of said mesh sheet and over the locations where said cross wires are connected to said security strands, and said spline portions joined together through said mesh sheet, whereby to protect the electrical connections from moisture and aid in mounting the mesh sheet.

4,232,311

COLOR DISPLAY APPARATUS

Roi D. Agneta, Fort Salonga, N.Y., assignor to Chyron Corporation, Melville, N.Y.

Filed Mar. 20, 1979, Ser. No. 22,133
Int. Cl.² G06F *3/14*
U.S. Cl. 340—703 **5 Claims**



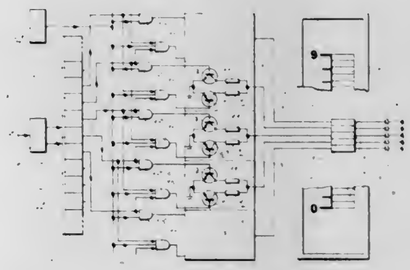
1. In a color display system wherein a graphic is displayed in color in response to indicia representing the graphic shape and other indicia representing the color of the graphic, the method of selecting indicia representing colors for graphics to be displayed comprising the steps of storing a plurality of sets of indicia, each set representing a different color of a palette of colors, displaying in response to each set of indicia a color patch, selecting different color patches to establish a subset of working colors and in response to the selection of each color patch storing the set of indicia associated therewith in a register of an addressed memory, and thereafter, when assigning a working color to a graphic to be displayed, coupling to the indicia associated with the graphic the address of the register containing the indicia associated with the assigned working color so that the indicia representing the colors of the graphic to be displayed is obtained from the addressed memory.

4,232,312

ANALOGUE ELECTRICAL INDICATORS HAVING A SERIES OF ELECTRICALLY-ENERGIZABLE ELEMENTS

Edward S. Eccles, Bishops Cleeve, and Harry Gibson, Bredon, both of England, assignors to Smiths Industries Limited, London, England

Filed Mar. 6, 1978, Ser. No. 882,031
Int. Cl.² G06F *3/14*
U.S. Cl. 340—753 **11 Claims**



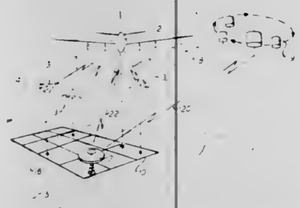
1. In an electrical indicator of the kind in which an analogue representation in accordance with the value of an input variable is provided by selective brightening along a reference scale of a consecutive series of electrically-energizable light-emitting elements, the said indicator including energizing means for energizing a predetermined plurality of consecutive

elements of said consecutive series so as to provide brightening throughout only a corresponding limited region of said series, the improvement wherein said energizing means includes means for energizing an element of said series outermost in the said region to a lower brightness level than another of said elements within said region, and means for displacing said energized region along the length of the consecutive series in dependence upon the value of the input variable.

4,232,313
TACTICAL NAGIVATION AND COMMUNICATION SYSTEM

Herman B. Fleishman, Millington, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1972, Ser. No. 293,259
Int. Cl.[3] G01S *13/00, 3/02;* G01C *21/00*
U.S. Cl. 343—6 R **17 Claims**



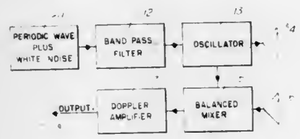
1. The method of navigation in a defined area for community of vehicles including a control vehicle and at least one user vehicle comprising the steps of:
causing said control vehicle to establish a relative grid coordinate system covering the defined area;
causing said control vehicle to transmit by radio relative grid origin and alignment data to each user vehicle;
causing said control vehicle and each user vehicle to periodically establish their respective positions in the relative grid coordinate system by radio range measurements;
navigating said control vehicle and each user vehicle by inertial navigation during the time periods between the periodic radio range measurements; and
periodically updating the navigation information of each user vehicle by combining such inertial information with navigation information transmitted by radio by said control vehicle.

4,232,314
FM AUTOCORRELATION FUZE SYSTEM

Donald J. Adrian, Arlington, Calif., assignor to The United States of America as Represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1958, Ser. No. 770,236
Int. Cl.[3] G01S *13/34;* F42C *13/04*
U.S. Cl. 343—7 PF **6 Claims**

1. An FM doppler fuze system comprising means for combining a periodic wave with white noise, white noise being a random mixture of frequencies possessing a constant power spectral density, means for modulating a carrier frequency with said periodic wave plus noise and transmitting a signal in the direction of a target, means for mixing a portion of said transmitted signal and a return echo signal from a target, and means for passing the band of expected doppler frequencies



from the output of said mixer to provide an output operable to actuate the detonation circuit of a fuze.

4,232,315
RANGE DETECTOR

Neil C. Kern, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 8, 1966, Ser. No. 594,316
Int. Cl.[3] G01S *13/64, 13/70, 13/18*
U.S. Cl. 343—7.3 **6 Claims**



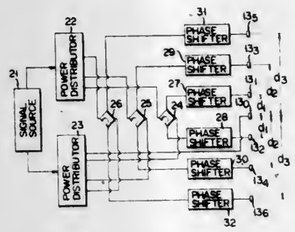
1. A range determining system including in combination, transmitter means for producing pulses of high frequency oscillations and including antenna means for radiating and receiving said pulses, means coupled to said antenna for selecting said pulses after reflection with the reflected pulses having Doppler frequency components produced by relative movement between said antenna means and the reflecting object, first mixer means for reducing the frequency of the oscillations of the received pulses, second mixer means coupled to said transmitter means for reducing the frequency of the oscillations of the transmitted pulses, first delay means connected to said second mixer means, a first zero beat mixer having inputs connected to said first mixer means and to said first delay means for deriving the Doppler frequency components from reflected pulses which have a delay corresponding to the delay of said first delay means, second delay means connected to said first delay means, a second zero beat mixer having inputs connected to said first mixer means and to said second delay means for deriving the Doppler frequency components from reflected pulses which have a delay corresponding to the sum of the delays of said first and second delay means, first and

second bandpass filter means each including limiter means for providing gain control and connected to the outputs of said first and second zero beat mixers respectively for selecting the Doppler frequency components within a given band, multiplier means connected to said first and second filter means for multiplying the signals therefrom, low pass filter means connected to said multiplier means for selecting signals below a given frequency, and peak detector means connected to said low pass filter for producing an indication when the signals from said first and second bandpass filter means are of the same frequency.

4,232,316
AIRCRAFT LANDING-GUIDING APPARATUS

Eiichi Chaki, Kamakura; Taneaki Chiba, Yokohama, and Tetsuo Sato, Funabashi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 29, 1978, Ser. No. 964,521
Claims priority, application Japan, Dec. 5, 1977, 52-145808
Int. Cl.[3] H04B *7/00*
U.S. Cl. 343—108 R **6 Claims**

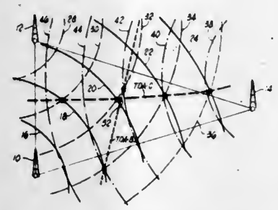


1. An aircraft landing-guiding apparatus comprising:
an antenna system constituted by a plurality of antenna elements arranged on the lateral side of a runway and aligned in a direction intersecting its course substantially at a right angle for radiating a sideband pattern and carrier pattern from both sides alike;
means for generating a sideband signal and carrier signal; and
phase-shifting means coupled to each antenna element for shifting the phases of the sideband signal and carrier signal coupled thereto at a predetermined rate so as to cause the directionality of the sideband pattern and that of the carrier pattern to intersect the runway course at prescribed angles.

4,232,317
QUANTIZED HYPERBOLIC AND INVERSE HYPERBOLIC OBJECT LOCATION SYSTEM

Charles C. Freeny, Jr., P.O. Box 9811, Ft. Worth, Tex. 76107

Filed Nov. 1, 1978, Ser. No. 956,579
Int. Cl.[3] G01S *5/06*
U.S. Cl. 343—112 R **15 Claims**

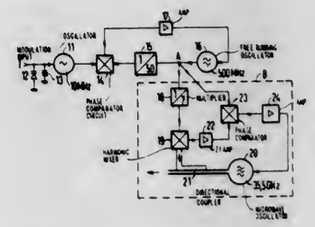


1. A radio frequency triangulation object location method for identifying the location coordinates of predetermined known geographical locations within a data base region wherein signals are transmitted via a vehicle unit for reception via at least three antennas, the method comprising the steps of:
positioning the vehicle unit at each of the known predetermined geographical locations within the data base region;
transmitting signals for reception by the antennas from the vehicle unit at each of the predetermined geographical locations; and
determining base location coordinates for each of the known predetermined geographical locations within the data base region in response to the signals transmitted via the vehicle unit at each of the predetermined geographical locations, wherein the signal strength of the signals received by each antenna exceeds a predetermined minimum level.

4,232,318
DUPLEX MICROWAVE RADIO COMMUNICATION SYSTEM

Friedbert Becker, Munich; Gunter Biethan, Neuried, and Peter Kloeber, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,052
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744110; Sep. 30, 1977, 2744127
Int. Cl.[2] H04L *5/14*
U.S. Cl. 370—29 **7 Claims**



1. A duplex microwave radio system for the transmission of analog and digital data between movable transmitting and receiving stations which move along pre-given link paths and fixed transmitting and receiver stations which are arranged along these paths at known spacings and which are active for transmitting and receiving in both directions so that the stations of a link path are in communication with a central transmitting receiving station, characterized in that at least one of the movable or fixed stations has a transmitting branch with a modulation input (1) and with a microwave oscillator (3) which is used in common for the transmitting and receiving branches, a stabilization circuit (4) for said microwave oscillator and a microwave mixer (5), an amplifier and demodulator (6) in the receiving branch and a modulation output (11) produced by said receiving branch, characterized in that transmitting and receiving branches are coupled together with a circulator (7) having three arms, one of the arms connected to the transmitting branch and a second one of the arms connected to the receiving branch, a 3-dB-coupler (8) connected to the third one of said arms, two antennae which are displaced in radiation direction by 180° are connected to said 3-dB-coupler (8), and in addition to the received signal, a signal from the microwave oscillator (3), which is decreased by the decoupling attenuation of the circulator (7), is fed to said microwave mixer in the receiving branch to serve as a local oscillator signal and the output of said mixer supplied to said amplifier and demodulator and the output of said amplifier-demodulator connected to a master station with a signal cable.

4,232,319

BROADBAND TRANSMITTING ANTENNA FOR TEST CHAMBER

Richard E. Fusinski, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 14, 1979, Ser. No. 75,700
Int. Cl.³ H01Q 1/36; G01R 29/08
U.S. Cl. 343—703 1 Claim



1. A broadband transmitting antenna adapted for electromagnetic interference testing of objects within a test chamber of physical dimensions smaller than the quarter-wavelength of the longest wave signal transmitted, the antenna comprising, in combination:

first conducting means associated with the floor of said test chamber and effective to establish a ground plane thereat; and

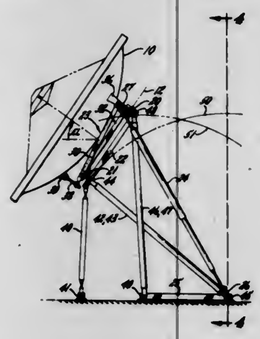
second conducting means comprising a plurality of tuned quarter-wavelength monopole antenna elements of progressively decreasing length, said elements being joined at one end in a common feed point and fanning out in a triangular array suspended above and in a plane substantially parallel to the first conducting means, whereby said antenna operates as a tuned quarter-wavelength array for transmitted electromagnetic signals having quarter-wavelengths no longer than the longest monopole antenna element and further operates as a capacitive antenna device in the volume between the first and second conducting means by generating a varying electric field therein having components with quarter-wavelengths longer than the longest monopole antenna element.

4,232,320

MOUNT FOR EARTH STATION ANTENNA

Rene Savalle, Jr., Tinley Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Apr. 21, 1978, Ser. No. 898,638
Int. Cl.² H01Q 3/08
U.S. Cl. 343—765 8 Claims



1. A mount for an earth station antenna, said mount comprising

an hour angle beam supporting the antenna for pivotal movement of the antenna about an hour angle axis determined by the position of the hour angle beam and an adjustable azimuth strut connected to the antenna for pivoting the antenna about said hour angle axis,

a foundation on the earth's surface for supporting the antenna,

first and second pairs of struts pivotally supporting the hour angle beam at pivot points spaced from each other in the direction of the hour angle axis to permit adjustment of the hour angle axis so that the antenna can be pointed at a satellite, the lower ends of said first and second pairs of struts being pivotally connected to said foundation on horizontally spaced axes with the lower ends of the pair of struts connected to the lower pivot point on the hour angle beam being spaced farther away from the lower end of the hour angle beam than the lower ends of the other pair of struts, so that pivotal movement of the hour angle beam pivots the upper and lower ends of the hour angle beam along different arcs, and

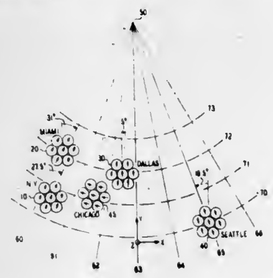
elevation adjusting means connected to the hour angle beam for adjusting said hour angle axis by pivoting the hour angle beam on said struts.

4,232,321

MULTIPLE BEAM SATELLITE ANTENNA WITH PREFERRED POLARIZATION DISTRIBUTION

Edward A. Ohm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1978, Ser. No. 963,461
Int. Cl.² H01Q 1/28, 3/26
U.S. Cl. 343—778 7 Claims



1. In a satellite communications system, a method of transmitting electromagnetic energy from a satellite to a remote receiving area on the surface of a celestial body which results in a reduced amount of cross-polarization coupling along the transmission path, the satellite being in orbit directly above a subsatellite point (51) on the celestial body and comprises an antenna arrangement comprising (a) at least a main reflector aperture, a feed and a focal surface disposed transversely about the feed axis, the focal surface being comprised of a plurality of focal points, each of which corresponds to a respective point in the remote receiving area and a projection of the subsatellite point (50) on the focal surface and (b) plural feed elements disposed on the focal surface, the method comprising the step of:

(a) energizing one or more feed elements (e.g., 113, 114) for transmitting at least one beam of electromagnetic energy comprising any combination of a first and a second direction of essentially linear polarization which are orthogonal to one another toward the portions of the receiving area on the celestial body associated with the particular points on the focal surface where the energized feed elements are disposed,

CHARACTERIZED IN THAT

the method comprises the further step of:

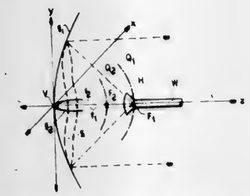
(b) in performing step (a), energizing the one or more feed elements for transmitting the at least one beam of electromagnetic energy so that when the first direction of polarization is used by any particular one of the energized feed elements, the first direction is aligned parallel to a line on the focal surface connecting the corresponding subsatellite point and the point where the particular feed element is disposed (60-66), and when the second direction of polarization is used by any particular one of the feed elements, the second direction is aligned orthogonal to the line on the focal surface connecting the corresponding subsatellite point and the point on the focal surface where the particular feed element is disposed (70-73).

4,232,322

ANTENNA HAVING RADIATION PATTERN WITH MAIN LOBE OF GENERALLY ELLIPTICAL CROSS-SECTION

Salvatore De Padova; Enrico Pagana, both of Turin, and Giorgio Rosenga, Collegno, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Nov. 20, 1978, Ser. No. 961,943
Claims priority, application Italy, Nov. 25, 1977, 69656A/77
Int. Cl.³ H01Q 9/14
U.S. Cl. 343—781 P 6 Claims



1. An antenna having a radiation pattern with a main lobe of generally elliptical cross-section, comprising:

a reflector with a concave surface whose cross-sections in two mutually orthogonal planes substantially define segments of respective parabolas of different parameters p and q with $p \neq q$, said parabolas having a common vertex and different foci on a common axis passing through said vertex, said surface intersecting a plane transverse to said common axis in a generally elliptical curve; and

a source of microwaves trained upon said concave surface, said source being located with its phase center of radiation in a zone bounded by two imaginary spherical surfaces of respective radii p/2 and q/2 centered on said vertex and passing through said foci, thereby establishing a radiation pattern with a main lobe of generally elliptical cross-section.

4,232,323

MAGNETOGRAPHIC APPARATUS

Norio Kokaji, Hino; Kunio Kinoshita, Hachioji; Toshihiro Urano, Machida, and Katsunori Saito, Akikawa, all of Japan, assignors to Iwatsu Electric Co., Ltd., Japan

Filed Aug. 9, 1978, Ser. No. 932,310
Claims priority, application Japan, Aug. 16, 1977, 52-98106
Int. Cl.³ G03G 19/00
U.S. Cl. 346—74.1 17 Claims

1. A magnetographic apparatus comprising:

(a) a device for generating a magnetic latent image pattern signal;

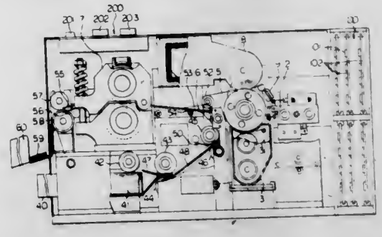
(b) a rotatable magnetic recording drum having a layer of metallic plating, wherein the specific resistivity of the surface of said drum is not greater than 10^{12} ohmcentimeter;

(c) a magnetic recording head for recording magnetic latent images having a magnetic field of predetermined strength on said drum in accordance with said magnetic latent image pattern signal;

(d) a developing device which supplies magnetic toner to said recording drum for developing said magnetic latent images into visible images formed by adhered toner, wherein said developing device comprises:

(i) a rotatable developing surface located adjacent the drum;

(ii) at least one magnet for developing a magnetic field to hold the toner on the developing surface, wherein the magnetic field of the magnet is sufficiently weak in the region where the developing surface is nearest the drum such that the magnetic field of the magnetic latent images attracts the the toner from the developing surface and the magnetic field of the magnet does not erase the magnetic latent images;



(e) a transferring device for electrostatically transferring said magnetic toner adhered to said magnetic latent images to a recording sheet;

(f) a fixing device for fixing said magnetic toner transferred to said recording sheet;

(g) a cleaning device having a blade in the shape of a metallic plate for cleaning the remaining magnetic toner on said recording drum;

(h) a recording sheets conveying device, and

(i) a control device for controlling a magnetic latent image recording process and causing the repetition of a sequence of processes consisting of a developing process, a transferring process, a process for fixing images and a process for conveying recording sheets whereby a plurality of individual copies of said magnetic latent image may be formed from a single magnetic image after said latent image is initially recorded on said drum.

4,232,324

APPARATUS FOR ARRANGING SCANNING HEADS FOR INTERLACING

Sherman H. Tsao, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,818
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 14 Claims

1. A scanning apparatus including:

a medium to be scanned;

an array of a plurality of scanning elements for scanning said medium, said scanning elements being arranged in a single line in the indexing direction;

said scanning elements being spaced non-uniform distances from each other in the indexing direction;

one of said medium and said array having relative movement with respect to the other in a pass direction perpendicular to the indexing direction to cause scanning of substantially parallel lines on said medium;

one of said medium and said array having relative movement with respect to the other in the indexing direction so that each relative movement of said scanning elements and said medium in the pass direction starts a pitch distance from the prior start, the pitch distance being equal to the product of the total number of said scanning elements and the

distance between the centers of two adjacent parallel lines on said medium; and

said scanning elements being spaced from each other a distance greater than the distance between the centers of two adjacent parallel lines on said medium while still obtaining scanning of each of the parallel lines on said medium during a plurality of passes in the pass direction.



4,232,325

THERMAL PRINTING DEVICE WITH SPRING SUPPORT TINES

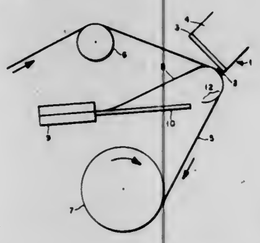
Michael Bradshaw, and Roger D. Edwards, both of Solihull, England, assignors to Leeds and Northrup Ltd., Birmingham, England

Filed Sep. 24, 1979, Ser. No. 77,965

Claims priority, application United Kingdom, Nov. 8, 1978, 43595/78

Int. Cl.³ G01D 15/10, 15/28

U.S. Cl. 346—76 R 3 Claims



1. Thermal printing device comprising an array of selectively energizable resistors, paper-feed means for advancing heat-sensitive paper over the array of resistors, and a resilient comb having a plurality of tines each of which, in operation, presses the paper locally against a number of the resistors.

4,232,326

CHEMICALLY SENSITIVE FIELD EFFECT TRANSISTOR HAVING ELECTRODE CONNECTIONS

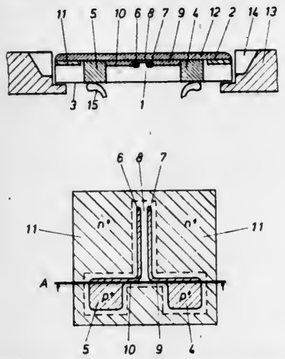
Arno Neidig, Plankstadt; Gerhard Popp, and Gabriele Gilbers, both of Lampertheim, all of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 26, 1978, Ser. No. 928,309

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1977, 2736200

Int. Cl.² H01L 29/78, 29/34, 23/48

U.S. Cl. 357—23 5 Claims



1. In a chemically sensitive field effect transistor (FET), particularly an ion-sensitive FET (ISFET), wherein a semiconductor body of a first conduction type, and having a front face and a rear face on opposite sides thereof, is provided with two diffusion zones, a source diffusion zone and a drain diffusion zone, which are spaced apart on and extend to a determined depth from said front face and which are formed of a second conduction type with opposite polarity to the first conduction type, and wherein said diffusion zones bound a channel and are connected to conductor paths which contact connection lines, said transistor having a stabilization layer on said front face, a chemically sensitive layer on said front face, and additional stabilization layers, particularly on the edges thereof, the improvement comprising:

said conductor paths connected to said diffusion zones formed of highly doped regions of the second conduction type; and

a pair of connection zones respectively connected to said diffusion zones through said conductor paths, said connection zones laterally offset relative to said diffusion zones and extending through said semiconductor body from the front face to the rear face thereof, said connection lines contacting said connection zones at said rear face;

whereby said connection lines are connected to said diffusion zones through said connection zones and said conduction paths.

4,232,327

EXTENDED DRAIN SELF-ALIGNED SILICON GATE MOSFET

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

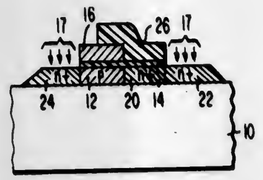
Filed Nov. 13, 1978, Ser. No. 959,848

Int. Cl.² H01L 29/78

U.S. Cl. 357—23 3 Claims

1. In an improved extended drain field effect transistor of the type including a body of semiconductor material in which spaced drain and source regions of a first conductivity type, with a given concentration of conductivity modifiers, are embedded at the surface of the body, the drain and source regions spaced a given distance one from the other to define the channel region, a first layer of insulating material disposed over the channel region, and a gate member disposed on the first insulating layer over the channel region, the improvement comprising:

the portion of the channel region adjacent the source region having a second conductivity type opposite the first conductivity type;



the remainder of the channel region, adjacent the drain region, forming a drift region of the first conductivity type with a lower concentration of conductivity modifiers therein than the drain and source regions; and

the gate member is disposed solely over the channel region with the edges thereof in alignment with respective edges of the source and drift regions.

4,232,328

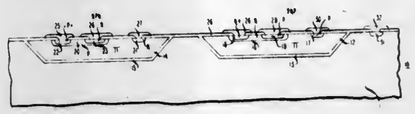
DIELECTRICALLY-ISOLATED INTEGRATED CIRCUIT COMPLEMENTARY TRANSISTORS FOR HIGH VOLTAGE USE

Adrian R. Hartman, New Providence; Terence J. Riley, Warren, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1978, Ser. No. 971,632

Int. Cl.³ H01L 27/04

U.S. Cl. 357—49 6 Claims



1. A composite semiconductor device 10 for a high voltage integrated circuit having a plurality of pockets 12, 14 of monocrystalline semiconductor material of P conductivity type dielectrically isolated from each other by a layer of insulating material 13, 15 underlying the bottom and sides thereof, said pockets being supported in a layer 11 of polycrystalline semiconductor material and having a surface in a common plane of said device,

CHARACTERIZED IN THAT

(a) there is a first pocket 12 containing a pnπp transistor and a second pocket 14 containing a npπn transistor, and

(b) the semiconductor material of said pockets has a resistivity in the range of from about 75 ohm cm to about 300 ohm/cm.

4,232,329

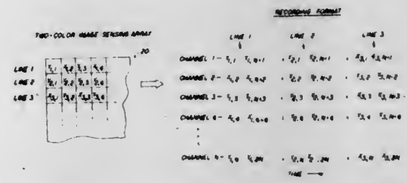
MULTICHANNEL RECORDING FORMAT FOR A SAMPLED-ANALOG COLOR VIDEO SIGNAL

Jerry R. Horak; Peter L. P. Dillon, both of Rochester, and Ronald R. Firth, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,269

Int. Cl.³ A04N 5/76

U.S. Cl. 358—9 12 Claims



5. Video recording apparatus of the type adapted to record a color video signal on a plurality of parallel tracks on a recording medium by means of a multi-channel essentially-fixed recording head, characterized by: said color video signal being composed of successive groups of analog color samples, successive samples in at least some of said groups alternating between one color and another, a group representing a line of a video frame or field, and said recording apparatus including means for separating a group, sample-by-sample, and assigning said samples to a plurality of channels of substantially equal bandwidth such that the samples carried by said channels comprise subgroups of samples of like color.

4,232,330

METHOD AND SYSTEM FOR SEPARATING THE CHROMINANCE AND LUMINANCE SIGNALS IN COLOR TELEVISION SIGNALS HAVING QUADRATURE-MODULATED CHROMINANCE SUBCARRIERS

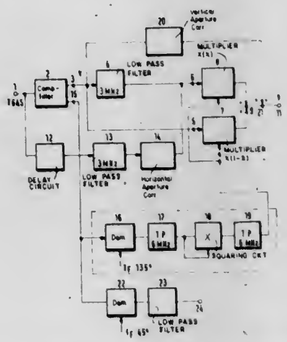
Jürgen Heitmann, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 16,990

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810697

Int. Cl.³ H04N 9/535

U.S. Cl. 358—31 20 Claims



1. In a color television system having a composite color television signal including a luminance signal having high and low frequency components, a chrominance subcarrier, and chrominance signals quadrature-modulated on said chrominance subcarrier, a method for separating said luminance signal from said chrominance signals, comprising the steps of

filtering said composite color television signal to create a

low frequency and a main luminance signal having, respectively, only said low frequency components and at least said high frequency components of said luminance signal;

creating a correlation signal indicative of the degree of correlation between time sequential lines in said composite color television signal;

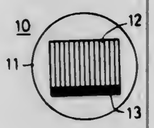
and combining said low frequency luminance signal and said main luminance signal in a ratio controlled by said correlation signal thereby creating a final luminance signal substantially free of chrominance signal components.

4,232,331

CIRCUIT FOR STABILIZING THE BLACK LEVEL IN AN OUTPUT SIGNAL OF A CAMERA TUBE IN A COLOR TELEVISION CAMERA

Koichiro Motoyama, Ninomiya; Itsuo Takanashi, Yokohama; Tadayoshi Miyoshi, Yokohama; Shintaro Nakagaki, Yokohama; Sumio Yokokawa, Yokohama, and Kenichi Miyazaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 3, 1978, Ser. No. 948,253
Claims priority, application Japan, Oct. 4, 1977, 52/118553
Int. Cl.³ H04N 9/07, 5/16
U.S. Cl. 358—44 **6 Claims**



1. A circuit for stabilizing a black level of an output signal of a camera tube in a color television camera in which said camera tube includes an optical filter means having an optically black part extending in parallel with a beam scanning direction of the camera tube, said stabilizing circuit comprising: a clamping circuit means for clamping at a clamping voltage an output signal of the camera tube during a horizontal beam blanking period and for restoring a DC component of the output signal; means responsive to a sampling pulse supplied every vertical scanning period within a scanning period of the black level signal portion corresponding to the optically black part of the optical filter means for sampling and holding an output signal of the clamping circuit means; and feedback circuit means for substantially negatively feeding back a holding voltage from said sampling and holding means to the clamping circuit means as said clamping voltage.

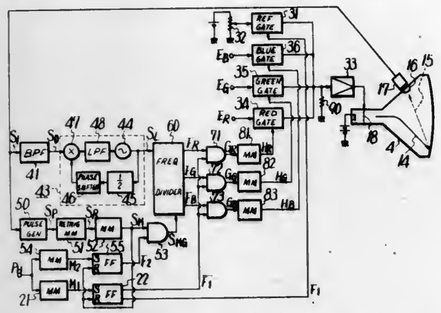
4,232,332

COLOR TELEVISION RECEIVER

Akira Toyama; Akio Ohkoshi, both of Tokyo; Takashi Toyama, Kokubunji; Takahiro Yukawa, Tokyo, and Takashi Hosono, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,236
Claims priority, application Japan, Dec. 26, 1977, 52-156915
Int. Cl.³ H04N 9/24
U.S. Cl. 358—67 **17 Claims**

1. A control system for a beam index cathode ray tube of the type which generates an index signal in response to the position of a scanning electron beam comprising: means responsive to said index signal for generating a plurality of sequentially repeating color gating signals, means for providing gaps between at least some adjacent ones of said color gating signals, color gate means responsive to said color gating signals for sequentially gating a corresponding plurality of color signals for modulating the intensity of said electron beam, said gaps being effective to produce corresponding dips in said index signal, and means for detecting a phase of said dips with respect to said index signal and for controlling said color gating signals in response to said phase.

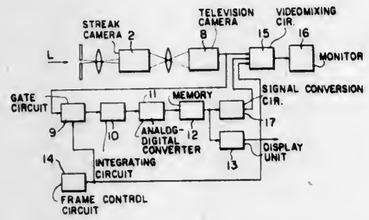


4,232,333

STREAK IMAGE ANALYZING DEVICE

Teruo Hiruma, and Yutaka Tsuchiya, both of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 5, 1979, Ser. No. 1,186
Int. Cl.³ H04N 5/32
U.S. Cl. 358—93 **3 Claims**



1. A streak image analyzing device which comprises:

(a) gate means which is opened after a first predetermined time in an effective horizontal scanning period specified as desired from a horizontal synchronizing signal and is closed after a second predetermined time in said effective horizontal scanning period specified as desired from said horizontal synchronizing signal;

(b) integrating means for integrating a video signal obtained by vertically scanning a streak image in the sweeping direction of said streak image for every horizontal scanning time with the aid of said gate means; and

(c) memory means having memory positions in correspondence to scanning lines, for successively storing the integration value of said integrating means,

so that data stored in said memory means are outputted as relations between time and intensity.

4,232,334

COSMETIC APPARATUS AND METHOD

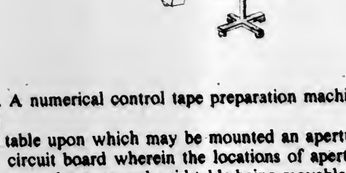
Evelyna C. Dyson, Guttenburg, N.J., assignor to Revlon, Inc., New York, N.Y.

Filed May 22, 1979, Ser. No. 41,536
Int. Cl.³ H04N 7/18; G03B 21/26; G09B 29/00; G09F 9/30
U.S. Cl. 358—93 **12 Claims**

1. A cosmetic apparatus for selecting a make-up pattern which best matches a customer's face and for displaying a mutually scaled and registered overlay of the selected make-up pattern and at least an outline of the customer's face comprising:

means for providing an outline of the customer's face defined by a selected number of significant facial points having predetermined locations relative to an image of the customer's face;

means for storing a number of different reference face patterns each of which is similarly defined by a selected number of significant facial points having similar predetermined locations relative to reference faces, and for storing



a respective suitably scaled make-up pattern corresponding to each of said stored face patterns;

means for matching said outline of the customer's face with said stored reference face patterns to select the stored reference face pattern which most closely matches the customer's face;

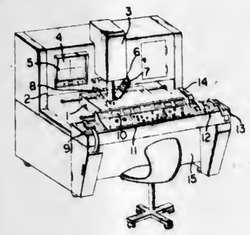
means for displaying a mutually scaled and registered overlay of the make-up pattern corresponding to the so-selected reference face pattern and at least the so-provided outline of the customer's face.

4,232,335

NUMERICAL CONTROL TAPE PREPARATION MACHINE

Hiroshi Nakagawa, Katano; Hidetoshi Kaya, Ibaragi, and Makoto Kawai, Yahata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 13, 1978, Ser. No. 869,259
Claims priority, application Japan, Jan. 18, 1977, 52-4581
Int. Cl.³ H04N 7/18
U.S. Cl. 358—101 **5 Claims**



1. A numerical control tape preparation machine comprising:

a table upon which may be mounted an apertured printed circuit board wherein the locations of apertures therein are to be measured, said table being movable in two axial directions mutually perpendicular to each other and in an aperture viewing plane parallel to the table surface;

drive motors for driving said table along said two axes;

memory means for storing the displacement of said table along said axes;

a television camera unit installed at right angles relative to said table for receiving light reflected from said object to be measured, said camera unit having an optical system including an objective lens and a reticule having crossed and graduated lines and rotatably mounted in an image focusing plane of said objective lens, said image focusing plane being parallel to said aperture viewing plane and an eyepiece for simultaneously converting said printed circuit board apertures and said crossed and graduated lines into images;

an illumination device for directing light toward said table surface to illuminate a part of said object to be measured;

a monitoring television receiver coupled to said television camera unit for displaying at least a portion of said apertured printed circuit board to be measured on an enlarged scale;

recording means for recording on a numerical control tape the information in said memory means based on said information; and

a manually operable unit for controlling the drives of said drive motors,

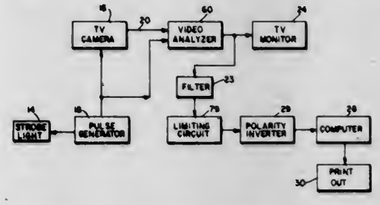
said illumination device comprising (i) a light source for illuminating the entire portion of said apertured printed circuit board to be measured which is displayed on said monitoring television receiver and (ii) a spot-light illumination means for simultaneously and intensely illuminating a desired region with a dot-like spot within said entire portion of said apertured printed circuit board which is displayed on said monitoring television camera.

4,232,336

INSPECTION OF ELONGATED MATERIAL

James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,511
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **10 Claims**



1. The method of inspecting elongated material such as strands, sheets, bundles or webs for surface variations which comprises the steps of

(a) moving said elongated material along a predetermined path,

(b) positioning a stroboscopic light source adjacent the path of said elongated material so it will direct its illumination at an angle relative to said elongated material causing surface variations thereof to make a pattern of light and shadowed areas,

(c) positioning a television camera adjacent the path of said elongated material such that the illuminated portion of said material will be in its field of view,

(d) generating an electrical pulse at selected intervals to activate said light for a predetermined length of time and to trigger the scanning of a frame by said television camera,

(e) converting the image of the frame developed by said television camera into a video signal,

(f) electrically applying said video signal to the input of separator circuit means which is adapted to produce a control pulse on its output terminal of predetermined duration for each horizontal synchronization pulse contained in said video signal,

(g) electrically applying the video signal and the control pulse from the separator circuit means to separate input terminals of gate means adapted to pass said video signal through to its output terminal whenever said control pulse is applied to said second input terminal,

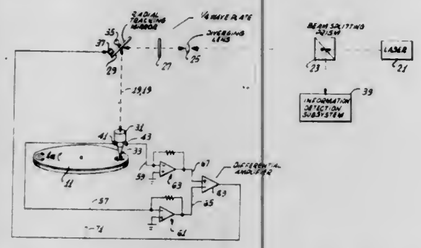
(h) electrically applying the output signal from said gate means to comparator means for converting all pulses of greater than a predetermined amplitude contained within said passed video signal into a digitized signal, and
(i) using the digitized signal as a source of information in the inspection of said elongated material.

4,232,337

METHOD AND APPARATUS FOR TRACKING AN OPTICALLY READABLE INFORMATION TRACK

John S. Winslow, Altadena, and Richard L. Wilkinson, Torrance, both of Calif., assignors to MCA Discovision, Inc., Universal City, Calif.

Filed Dec. 13, 1978, Ser. No. 968,739
Int. Cl.³ H04N 5/76, 3/02
U.S. Cl. 358—128.5 **21 Claims**



1. Tracking apparatus for use in a system for recovering information from an optically readable record medium, wherein the information is stored in a track having sides adapted to scatter in a predetermined direction any radiation impinging thereon, said tracking apparatus operating to controllably position an incident beam of radiation in a prescribed relationship relative to the track, said tracking apparatus comprising:
optical means for directing the incident beam of radiation onto the record medium as the medium is moved relative thereto, said incident beam of radiation being reflected by the medium in accordance with the stored information to produce an intensity-modulated reflected beam of radiation;
said optical means further operating to direct the reflected beam of radiation to information recovery means for detecting the modulated intensity thereof;
means, separate from the information recovery means, for detecting radiation scattered by the sides of the track, to produce an error signal indicative of the position of the incident beam of radiation relative to the centerline of the track; and
means responsive to the error signal for controllably positioning the incident beam of radiation in the prescribed relationship relative to the track.

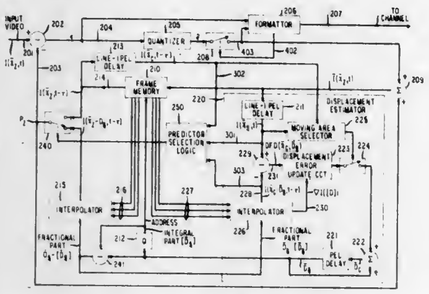
4,232,338

METHOD AND APPARATUS FOR VIDEO SIGNAL ENCODING WITH MOTION COMPENSATION

Arun N. Netravali, Matawan, and John D. Robbins, Aberdeen, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 8, 1979, Ser. No. 46,953
Int. Cl.³ H04N 7/12
U.S. Cl. 358—136 **18 Claims**

1. Apparatus for encoding a video signal including a plurality of samples each representing the intensity of an element of a picture, including:
means (220) for estimating the displacement of objects in said picture which occur between the present frame and a previous frame;
first means (210, 226) for predicting the intensities of a set of previously processed ones of said pels based upon the intensities at displaced locations in said previous frame determined by said estimates;
second means (210, 213) for predicting the intensities of said first set of pels based upon the intensities of the spatially corresponding locations in said previous frame;



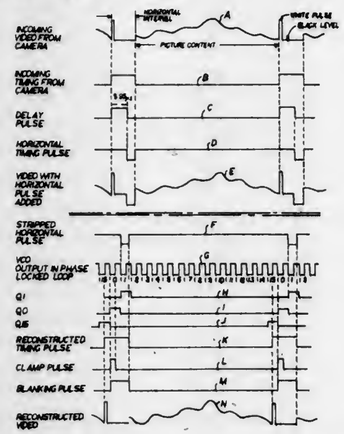
means (250) for computing first and second sums of the prediction errors associated with predictions made by said first and second means using displaced frame difference and frame difference techniques, respectively; and
means (240) responsive to said computing means for predicting the intensity value of the present pel using the one of said prediction techniques which has the smaller prediction error sum.

4,232,339

TELEVISION SIGNAL HORIZONTAL INTERVAL TIMING RECONSTRUCTION SYSTEM

Charles F. Smiley, and Billy G. Zachum, both of Quincy, Ill., assignors to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 768,098, Feb. 14, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,553
Int. Cl.³ H04N 5/06, 5/04
U.S. Cl. 358—150 **5 Claims**



4. In a television camera system wherein a camera head generates at least one video signal and a timing signal, with said at least one video signal comprising regularly occurring video information intervals containing information representing a video image and blanking intervals separating said video information intervals, said blanking intervals each containing at least one time slot having a reference signal level therein, and

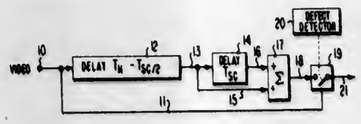
with said timing signal comprising a periodic train of pulses occurring in timed relation to said blanking intervals of said at least one video signal, where said timing and video signals are to be communicated over a multichannel transmission link to a remote camera control unit, apparatus for communicating said video and timing signals over only a single channel of said multichannel transmission link, comprising:
modifying means for modifying the pulses of said timing signal so as to provide a periodic modified signal which may be additively combined with said video signal without altering said video information or said reference signal level;
combining means for additively combining said modified signal and said video signal so as to provide a sum signal having a periodic portion with a distinctive amplitude and corresponding in time to said modified signal;
transmitting means for transmitting said sum signal to said camera control unit over a single communication channel;
pulse stripping means at said camera control unit responsive to said periodic distinctive portion of said sum signal for regenerating said modified signal therefrom; and,
reconstructing means at said camera control unit responsive to said sum signal and to said regenerated modified signal for reconstructing said video and timing signals therefrom.

4,232,340

DEFECT COMPENSATION FOR COLOR TELEVISION

Jack S. Fuhrer, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,532
Int. Cl.³ H04N 5/76
U.S. Cl. 358—167 **7 Claims**



1. A defect compensation circuit of the type which substitutes a delayed signal for real-time signal defects, including a signal delaying means arranged to respond to the real-time signals to provide a delayed signal a prescribed time thereafter, a defect detection means responsive to the occurrence and to the absence of signal defects in said real-time signal for generating first and second control signal manifestations respectively, an output terminal and first switch means responsive to said first control signal manifestations for applying the real-time signal to said output terminal and responsive to said second control signal manifestations for applying the delayed signal to said output terminal, improved to include means for avoiding undesirable shifts in the d-c component at said output terminal, which means comprises:
means for tracking and retaining the d-c component of the real-time signal applied to said output terminal during said first control signal manifestations and for continuing to apply this d-c component to said output terminal to the exclusion of the d-c component of the delayed signal during said second control signal manifestations.

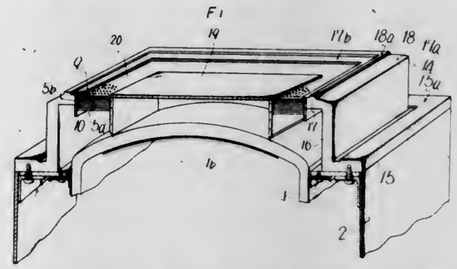
4,232,341

IMAGE DISPLAY APPARATUS

Toshiro Watanabe, Zushi, and Koji Suzuki, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 8, 1978, Ser. No. 958,640
Claims priority, application Japan, Nov. 11, 1977, 52/135941
Int. Cl.³ H04N 5/72, 5/64
U.S. Cl. 358—250 **10 Claims**

10. An image display apparatus comprising:
a cathode ray tube having a phosphor screen on which an image is to be formed;
main image display means for displaying said image on said screen of said cathode ray tube without substantial reduction in resolution of said image; and



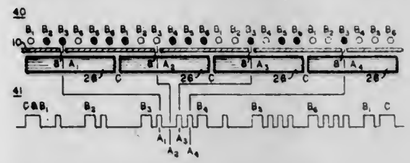
moderated image display means having light scattering means for displaying a peripheral part of said image on said screen but with a reduction in resolution of said image.

4,232,342

MULTIPLEXING FOR FACSIMILE SYSTEMS

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 740,805, Nov. 11, 1976, Pat. No. 4,117,518, and a continuation-in-part of Ser. No. 608,089, Aug. 27, 1975, abandoned, and a continuation-in-part of Ser. No. 350,943, Apr. 13, 1973, Pat. No. 3,943,525, and a continuation-in-part of Ser. No. 421,425, Dec. 3, 1973, abandoned. This application Jul. 17, 1978, Ser. No. 925,389
Int. Cl.³ A04N 1/22
U.S. Cl. 358—296 **13 Claims**



3. A method for generating a signal in a facsimile system having scanning elements and printing elements in a linear array and grouped into segments along a line for simultaneous operation of each said group comprising the steps of
scanning a document line by means of a plurality of scanning elements grouped to correspond to a plurality of contiguous segments of the document line,
developing an amplitude from each said group of scanning elements, each said amplitude corresponding to light reflected from an elemental area of one of the segments,
sampling sequentially in a predetermined order each said amplitude thereby generating a time division multiplexed sequence of amplitudes from amplitudes present simultaneously,
transforming the sequence of amplitudes into a signal having a similar sequence of corresponding amplitudes for transmission through a channel to a graphic receiver to control the printing elements for a facsimile reproduction of the scanned elemental areas.

4,232,343

METHOD AND APPARATUS FOR RECORDING GRAPHIC OR IMAGE INFORMATION BY MEANS OF PUNCTIFORM RECORDING SPOTS

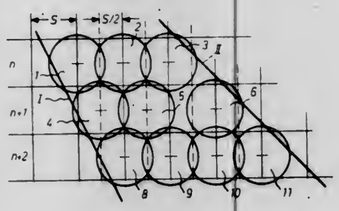
Rüediger Sommer, Raisdorf, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,427

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751326

Int. Cl.[2] B41J *3/10*

U.S. Cl. 358—296 8 Claims



1. An apparatus for recording graphic or image information derived from a video signal source by means of punctiform recording spots that are arranged, line-by-line according to a recording grid or multi-lined within a matrix, and the recording effected, step-by-step, with a recording frequency corresponding to the fixed point intervals or pitch of the grid or matrix, comprising

(a) means, including a pulse generator having a frequency of a fraction of said recording frequency and representing fractional pitch-steps,

(b) means connected to said video signal source and the pulse generator for quantizing said video signal with respect to such pulses,

(c) means connected to said video signal source and the pulse generator for producing a series of pulses, the duration of each pulse being approximately equal to the duration of a full pitch step,

(d) means connected to said means for producing a series of pulses and said means for quantizing the video signal for producing a control signal when the quantized video signal has a duration less than even multiple of a full pitch step,

(e) means connected to said means for producing a series of pulses, for retarding said series of pulses a first predetermined number of fractional pitch steps and for retarding said series of pulses a second predetermined greater number of fractional pitch steps,

(f) means connected to said means for producing a control signal, for retarding said control signal with said greater number of fractional pitch steps and for inverting said retarded control signal,

(g) an output for generating the recording signal for the punctiform recording and

(h) means connected to said output and said means for retarding and inverting the control signal and said means for retarding said series of pulses for supplying to said output as recording signals

either the series of pulses, retarded with said second greater number of fractional pitch steps if no control signal is generated by said means for generating the control signal

or the series of pulses retarded with said second greater number of fractional pitch steps without the last pulse of said series and with an additional pulse retarded with one fractional pitch step.

4,232,344

DEVICE FOR REPRODUCING A HALFTONE PICTURE BY SCANNING

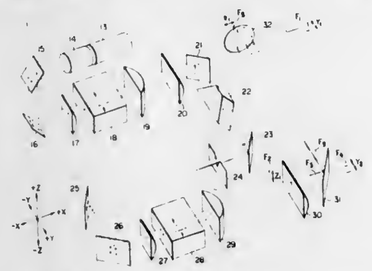
Seiya Sakamoto, Kyoto; Tetsuo Hohki, Ibaragi, and Isao Saito, Shiga, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 28, 1978, Ser. No. 964,189

Claims priority, application Japan, Dec. 6, 1977, 52-145683

Int. Cl.[3] H04N *1/22*

U.S. Cl. 358—298 11 Claims



1. A device for reproducing a halftone picture by scanning, wherein a recording light beam to be projected on a photo-sensitive material is suitably controlled by means of picture signals obtained from the scanning of an original picture, comprising:

a light source for the recording light beam;

a first deflection element adapted to deflect the light beam selectively in a certain direction;

a second deflection element adapted to deflect the light beam selectively in a direction orthogonal to the deflecting angle of the first deflection element;

an aperture plate arranged between the first and second deflection elements and having a width which is reduced along the direction of the deflection of the first deflection element;

an anamorphic optical system arranged between the first deflection element and the aperture plate and adapted to flatten the beam so as to reduce its cross sectional dimension orthogonal to the direction in which it is deflected by the second deflection element;

an optical system for focusing the light beam from the second deflection element onto the photosensitive material; and

control means for controlling deflection angles at the first and second deflection elements so as to change the width of the light beam in cooperation with said aperture plate and to shift the center of the light beam so as to allow it to be in the center of each halftone dot, both in accordance with the picture signals.

4,232,345

APPARATUS FOR PRODUCING A SEAMLESS COPY FROM AN UNJOINTED ORIGINAL

Peter M. Zollman, Walton-on-Thames, and Keith G. Doyle, Sunbury-on-Thames, both of England, assignors to Zed Instruments Limited, Surrey, England

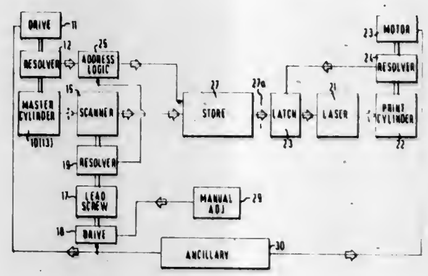
Continuation-in-part of Ser. No. 928,410, Jul. 27, 1978, abandoned, which is a continuation of Ser. No. 808,980, Jun. 13, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,841

Claims priority, application United Kingdom, Jun. 11, 1976, 24350/76; Jun. 23, 1976, 26126/76

Int. Cl.[3] H04N *1/22, 1/26, 1/38*

U.S. Cl. 358—299 17 Claims

1. Copying apparatus for producing a seamless copy from an unjointed original having leading and trailing edges separated by a gap, said apparatus comprising: a first rotary carrier for carrying an original and a second rotary carrier including a copy surface; a "read" scanning means movable relative to the first carrier for scanning the original on the first carrier; a laser; means for passing the information from the "read" scan to said laser to modulate the output of the laser; means for causing relative movement between the modulated laser output and the second carrier so as to perform a "write" scan to transfer a pattern derived from the "read" pattern to the copy surface; said means for passing information including a store for storing



data obtained in scanning the original; means for measuring the circumferential length of the original when on the first carrier; and store-controlling means connected to the output of the measuring means and effective to control the store in accordance with the measuring means output to ensure that each scan of the second carrier is filled by data from the original outside the gap.

4,232,347

VIDEO TAPE CONTROL TIME CODE READING

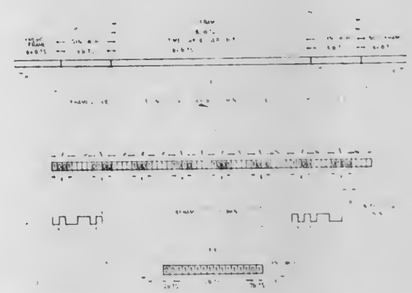
Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 960,856

Claims priority, application Japan, Nov. 18, 1977, 52-138756

Int. Cl.[2] G11B *15/52*

U.S. Cl. 360—73 15 Claims



2. A method for distinguishing between first and second different control time codes having at least frame codes which identify repeating sequences of contiguous frame numbers therein reproduced from a video magnetic tape containing video signals recorded thereon, comprising the steps of:

sensing the presence and absence of predetermined frame numbers in the reproduced control time code; and

detecting in dependence on the presence and absence of said predetermined frame numbers, whether said reproduced control time code is said first or said second control time code.

4,232,346

APPARATUS FOR REPEATED REPRODUCTION OF INTELLIGENCE ON SELECTED PORTIONS OF MAGNETIC TAPE

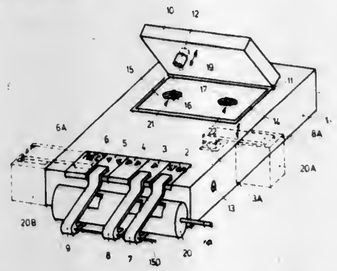
Richard Kobler, Oberägeri, Switzerland, assignor to Edith Kobler, Oberägeri and Ernst Frey, Unterägeri, both of, Switzerland

Filed Aug. 28, 1978, Ser. No. 937,211

Claims priority, application Switzerland, Aug. 31, 1977, 10634/77

Int. Cl.[3] G11B *15/18, 15/06, 19/18*

U.S. Cl. 360—71 42 Claims



1. An apparatus for controlling the forward and backward movement of an intelligence storing mobile carrier in a machine for recording and reproducing the intelligence, characterized by a single user-actuatable switch operative for controlling, during an initial reproduction, the selection of the carrier of any desired start position and any desired end position of a portion of a selectable length to be repeatedly reproduced, and means for causing the carrier repeatedly to move between the selected start and end positions subsequent to the actuation of said single switch.

4,232,348

TAPE END WARNING APPARATUS

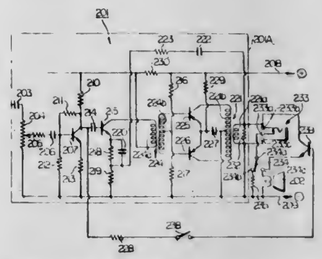
Ken Satoh, and Tuneo Yanagida, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 713,344, Aug. 11, 1976, Pat. No. 4,157,575. This application Nov. 13, 1978, Ser. No. 959,574

Claims priority, application Japan, Aug. 19, 1975, 50-113951; Aug. 22, 1975, 50-115878; Aug. 22, 1975, 50-115879; Oct. 3, 1975, 50-135385; Oct. 3, 1975, 50-135386; Dec. 17, 1975, 50-168208

Int. Cl.[3] G11B *15/06, 23/30*

U.S. Cl. 360—74.1 8 Claims



1. A tape end warning apparatus for use in a tape recorder of the type which includes an audio amplifier, a loud speaker, a first switch for connecting an output of said amplifier to said loudspeaker when said tape recorder is in a playback mode and for disconnecting said output of said amplifier to said loudspeaker when said tape recorder is in a record mode, a tape cassette receiving chamber, a drive shaft extending into said receiving chamber and adapted to engage a drive shaft recess in a tape cassette when a tape cassette is placed within said

receiving chamber, and drive means for driving said drive shaft, said tape end warning apparatus comprising:

a feedback circuit, including a normally open switch, forming an electrical feedback path between said output and an input of said amplifier when said normally open switch is closed;

an end tape detecting means for closing said normally open switch when an end of tape condition is detected, said end of tape detecting means including:

(1) a lever which is pivotable about a predetermined axis, said lever rotatably supporting said drive shaft at a point spaced from said axis, said lever adapted to pivot when the tension of a tape carried by a cassette placed in said receiving chamber increases due to an end of tape condition; and

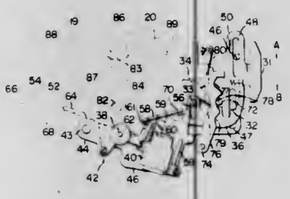
(2) said lever adapted to close said normally open switch when said lever is rotated due to said end of tape condition whereby said feedback circuit connects the output of said amplifier to the input of said amplifier and said loudspeaker generates an audible alarm signal.

4,232,349

MODE SWITCHING MECHANISM FOR A CASSETTE TAPE RECORDER

Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,897
Claims priority, application Japan, Apr. 20, 1978, 53/46838
Int. Cl.[2] G11B 5/54, 21/22
U.S. Cl. 360—105 **9 Claims**



1. A mode switching mechanism for a cassette tape recorder, comprising a first fulcrum member and a second fulcrum member, a rockable support lever supporting a pinch roller and a magnetic head, an operation member slidable from neutral position in either of opposite directions, a switching lever which is rocked when the operation member is slid in either direction, so as to rock the support lever from stop mode position into record mode position or play mode position, characterized in that said switching lever is biased by a spring to rock around said first fulcrum member or said second fulcrum member and that said operation member has a first contact for rocking said switching lever about the first fulcrum member against the bias of the spring when the operation member is slid in one direction and a second contact for rocking said switching lever about the second fulcrum member against the bias of the spring when the operation member is slid in the other direction.

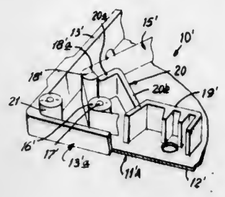
4,232,350

TAPE CASSETTE

Teruo Ohta, Sendai, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,615
Claims priority, application Japan, Mar. 20, 1978, 53-30995
Int. Cl.[3] G11B 23/08
U.S. Cl. 360—132 **12 Claims**

1. In a tape cassette comprising a housing, a coil of wound tape rotatable in said housing, and guide means including a guide roller disposed in said housing and being engaged by tape extending from said coil and passing said guide roller at the side thereof facing away from said coil, a guide pin and a bracket guide engaged with said tape at locations therealong which are respectively upstream and downstream from said guide roller considered in respect to the direction of movement of said tape from said coil, with the tape also passing said guide pin at the side of the latter which faces away from said coil; the improvement which comprises an L-shaped shield member extending between said bracket guide and said guide pin within



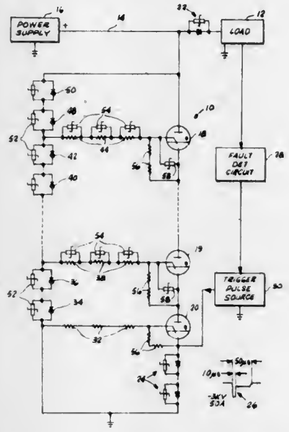
said housing at the side of said guide roller which faces toward said coil so that, upon loosening of the turns of said tape making up said coil, said shield member prevents contact of said guide roller with the outermost loosened turn, said shield member having angularly related arms which include an acute angle therebetween opening generally toward said guide roller.

4,232,351

HIGH-VOLTAGE CROWBAR CIRCUIT WITH CASCADE-TRIGGERED SERIES IGNITRONS

William R. Baker, Orinda, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 3, 1979, Ser. No. 740
Int. Cl.[3] H02H 9/04
U.S. Cl. 361—56 **16 Claims**



1. A crowbar circuit for shunting current from a high voltage level to a low voltage level, comprising:

a first triggerable high voltage current conducting device for connection to the high-voltage level;

a second triggerable high voltage current conducting device for connection between the low-voltage level and said first device;

a trigger pulse source for generating a trigger pulse; and

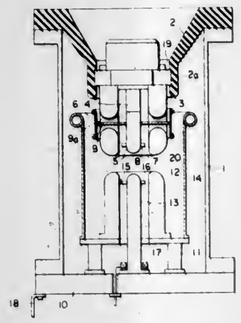
passive means responsive to the trigger pulse from said source for triggering said second device to conduct, said responsive means being operable upon conduction of said second device to apply substantially the full trigger pulse to said first device for triggering said first device to conduct.

4,232,352

PROTECTIVE GAP DEVICES FOR PROTECTING CIRCUIT BREAKERS

Shinichi Menju, Atsugi; Iwao Ohshima, Tokyo, and Shigeru Takahashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1978, Ser. No. 924,069
Claims priority, application Japan, Jul. 19, 1977, 52-85670
Int. Cl.[3] H02H 3/22
U.S. Cl. 361—120 **3 Claims**



1. A protective gap device for protecting a circuit breaker comprising a cylindrical metal shell filled with an arc extinguishing medium; a high voltage electrode unit including a first main electrode supported by an insulating member which is arranged to close one end of said shell, a first trigger electrode secured to said first main electrode, and a ring-shaped metal member surrounding said first main electrode and connected electrically to said first trigger electrode through conductors which extend through a plurality of holes provided in said first main electrode; and a low voltage electrode unit including a second trigger electrode secured to a grounded metal plate closing the other end of said shell, a second main electrode attached to said grounded metal plate, and a metal cylinder connected electrically to said second main electrode and spaced from said metal shell.

4,232,353

DOOR LOCK SECURITY SYSTEM

Roger Mosciatti, 6 Wycomb Pl., Coram, N.Y. 11727; Thomas P. Foley, 12 Janes La., Lloyd Harbor, N.Y. 11743, and Frederick G. Moritz, 20 Aberdeen Rd., Hauppauge, N.Y. 11787

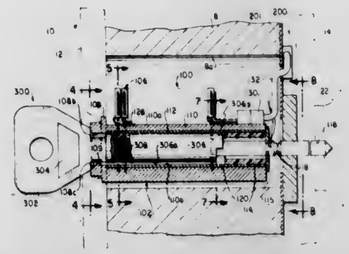
Filed Jun. 19, 1978, Ser. No. 917,082
Int. Cl.[3] E05B 49/00
U.S. Cl. 361—172 **49 Claims**

1. In a security apparatus for a mechanical door lock of the type including a key-receiving cylinder rotatably mounted in said lock and coupled by means of a mechanical linkage to lock and unlock said lock upon being rotated, a cylinder assembly comprising:

a main body adapted to be mounted in said lock in place of said key-receiving cylinder;

means on said main body adapted to receive and engage a combination encoding key for mechanically coupling the rotation of said key to said mechanical linkage; and

a plurality of sensor elements mounted on said body, each sensor element including a primary and secondary winding and a core component made of low reluctance material, on which said windings are wound, each core component having a gap therein which causes said core component to have a high reluctance, whereby the electromagnetic coupling between the primary and secondary winding on each core component is loose.

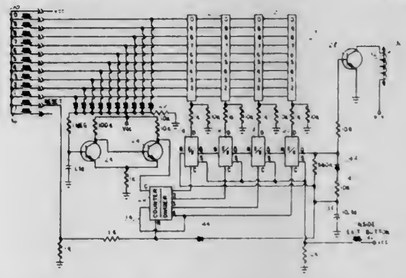


4,232,354

ELECTRICALLY ACTUATED LOCK FOR A DOOR OR SIMILAR ACCESS MEANS

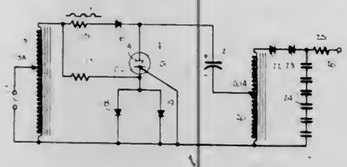
Rand W. Mueller, and Daniel L. Stec, both of 41400 Executive Dr., Mt. Clemens, Mich. 48045

Filed Jan. 2, 1979, Ser. No. 85
Int. Cl.[3] E05B 49/00
U.S. Cl. 361—172 **4 Claims**



1. In an electrically actuated lock for a door or similar access means having an opening input combination of a multiple number of data bits, said lock comprising latching means for securing said door, means upon electrical stimulation thereof for withdrawing said latching means to release said door, a plurality of transfer means, one such transfer means for each data bit, each transfer means for receiving first and second inputs responsive to an actuator input and having an output responsive to both said first and second inputs, said transfer means connected in series wherein the output of one transfer means serves as an actuator input for the next transfer means, individually actuated switching means accessible to the lock user for producing a pulsed input representing a data bit, a selected one of said switching means for providing the inputs to each transfer means, and the last of said series connected transfer means associated with said withdrawing means wherein the output thereof causes said electrical stimulation of the withdrawing means and release of said door, each switching means being associated with a pulse generator and counter means for sending a selected number of input pulses to said transfer means, said selected number being equal to the number of data bits in said combination, and means for rendering the counter of said pulse generator and counter means inoperable after said selected number of pulses has been sent to said transfer means.

4,232,355
IONIZATION VOLTAGE SOURCE
Richard H. Finger, Hollywood, and Thomas J. Michel, Miami Lakes, both of Fla., assignors to Santek, Inc., Hollywood, Fla.
Filed Jan. 8, 1979, Ser. No. 1,696
Int. Cl.[2] H01T *19/00*
U.S. Cl. 361—235 11 Claims

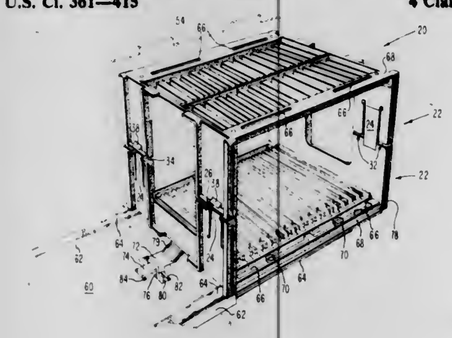


1. A voltage source adapted to apply voltage excitation to a gas-ionization electrode in a wave form resulting in the generation of copious amounts of ionized gas without, however, producing substantial amounts of undesirable chemical by-products, the time required to produce incipient dielectric breakdown resulting in said byproducts being greater than that required to effect ionization of the gas, said gas having a predetermined ionization potential, said source comprising:

A means to produce a unipolar voltage wave having a steady state direct-current component which is below said ionization potential yet at a level serving to create an electric field conducive to subsequent gas-ionization; and

B means to impose a gas-ionization component on the steady state component in the form of periodic surges which are separated by relatively long intervals, each surge being composed of at least one sharp unipolar pulse having a steep rise time and a fast slew rate, and having a high peak amplitude, the duration of the pulse relative to the incipient breakdown time being insufficient to break down the gas chemically, but the peak amplitude thereof being such as to effect intense ionization of the gas, the steady state component acting to prevent the electric field from collapsing completely in the interval between surges, thereby keeping the gas at a level approaching its ionization potential.

4,232,356
LOGIC CARD FRAME
Michael A. Saunders, Farmington, and Robert W. Irwin, Livonia, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Feb. 7, 1979, Ser. No. 9,932
Int. Cl.[3] H05K *7/14*
U.S. Cl. 361—415 4 Claims



1. A logic card frame for housing removable printed circuit boards comprising:

a pair of identical one piece molded half frames integrally molded with a multiplicity of circuit board tracks for guiding an inserted printed circuit board;

a flexure, integrally molded with the printed circuit board track, that exerts opposing, sideways pressure on a side portion of the inserted printed circuit board in the circuit board track;

means for restricting vertical vibration of the inserted printed circuit board;

means for locking together the pair of identical one piece molded half frames to form the logic card frame;

a mounting base;

means on the mounting base for sliding the logic card frame from an inserted to a withdrawn position for exposing and servicing the housed printed circuit boards;

means for mounting the logic card frame in a slidable fashion on the sliding means;

means for retaining the logic card frame in the inserted position; and

means, integral with each identical one piece molded half frame, for stacking multiple logic card frames.

4,232,357
AUTOMOBILE MECHANIC'S AID
Markus S. Dietz, 965 Country Acres, Wichita, Kans. 67212
Filed Jan. 19, 1979, Ser. No. 4,651
Int. Cl.[3] B60Q *1/00*
U.S. Cl. 362—61 14 Claims



1. An automobile mechanic's aid comprising a wheeled base and an upstanding support column fixed thereto, said base having at least three wheels defining at least three non-colinear points of support whereby the base is adapted to rest stably in an upright condition upon a horizontal supporting surface, a mounting bracket slidably mounted on the column for selective vertical positioning therealong, means for releasably retaining the bracket on the column at a selected vertical position, a tray carried by the mounting bracket for vertical movement therewith, an electric lamp means carried by the bracket for vertical movement therewith, and energization means for enabling selective electrical energization of the lamp from alternating current power mains and an electric battery, said energization means also being carried by the bracket for vertical movement therewith, whereby a mechanic can vertically position the bracket to place needed tools and lamp in convenient and illuminating positions relative to a portion of an automobile requiring his attention, with the lamp being energizable from such automobile if necessitated by remoteness from power mains.

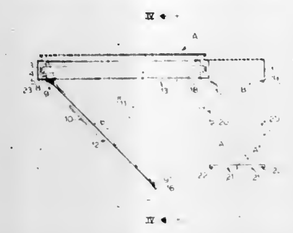
4,232,358
LIGHT FRAME FOR DRAFTING TABLE
Webb Nichols, 5 North Square, Boston, Mass. 02113
Filed Dec. 21, 1978, Ser. No. 971,746
Int. Cl.[3] G09F *13/04*
U.S. Cl. 362—97 13 Claims

1. A light frame for attachment to the underside of equipment having a flat top surface which has a light transmission portion, said frame comprising:

(a) a housing having an opening at the top for alignment with the light transmission portion;

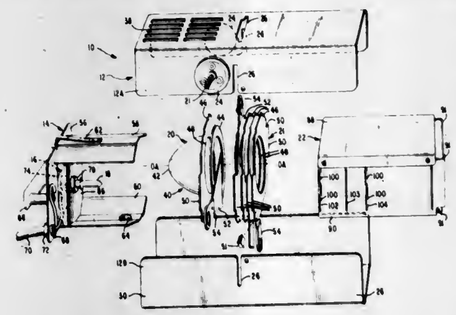
(b) light source means attached to the housing;

(c) a mirror attached to the housing for reflecting light from the source through the opening in the housing;



(d) means mounting the mirror for pivotal movement on the housing from a closed position for reflecting light from the light source through the opening in the housing, to a deployed position angularly inclined with respect to the top surface for projection and control of the shape of the images projected through the opening.

4,232,359
SPOTLIGHT OR OTHER ILLUMINATOR
Gordon T. Leon, San Pedro, and Joseph L. Byron, Burbank, both of Calif., assignors to Berkey-Colortran, Inc., Burbank, Calif.
Filed Apr. 9, 1979, Ser. No. 28,329
Int. Cl.[3] F21V *7/00*
U.S. Cl. 362—268 17 Claims



1. An illuminator including

a housing having an optical axis;

lamp support means removably mounted to said housing for selective movement and retention generally along said optical axis;

lamp focus means removably attached to said lamp support means and moveable with respect thereto for selective generally radial movement and retention with respect to said optical axis;

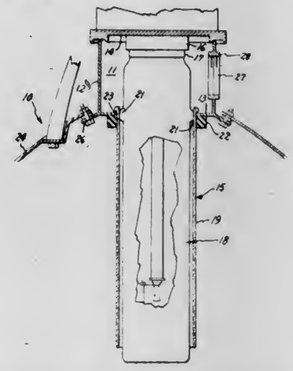
an illumination source attached to said lamp focus means;

lens holding assembly removably mounted to said housing for selective movement and retention generally along said optical axis;

one or more lenses removably mounted to said lens holding assembly, each lens independently moveable with respect to said housing and each other;

light output control means removably mounted in said housing and having an access opening to receive said illumination source.

4,232,360
HEAT RECOVERY HIGH INTENSITY DISCHARGE LAMP CONSTRUCTIONS
Himanshu B. Vakil, and Seth D. Silverstein, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 11, 1978, Ser. No. 868,531
Int. Cl.[2] F21V *29/00*
U.S. Cl. 362—294 11 Claims



1. A composite high intensity discharge lamp structure adapted for the recovery of heat emitted by such lamps comprising in combination a transparent longitudinally extending envelope formed with a closed end, means for mounting said lamp affixed to and closing said envelope at the opposite end theeof, arc tube support means mounted within said envelope, an arc tube affixed thereto extending generally axially of said envelope and a transparent sleeve mounted outside of and connected to said envelope, said sleeve being open at both ends and being spaced from said envelope along the coextensive lengths thereof, the volume between said sleeve and said envelope defining at least in part a zone providing a large convective heat transfer coefficient extending around said envelope opposite said arc tube, said zone having a thickness in the range of between 1 mm. and 2 cm. and a length equal to at least about 10 percent of the length of said arc tube.

4,232,361
ADJUSTABLE LIGHT FIXTURE
Jeffrey C. Kelsall, Streamwood, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.
Filed Dec. 7, 1978, Ser. No. 967,367
Int. Cl.[3] F21V *21/04*
U.S. Cl. 362—364 5 Claims

1. A lighting fixture comprising:

a hollow elongated housing having an open end and a closed end;

a plurality of elongated tracks mounted at one end to the closed end of said housing, a series of spaced protrusions disposed along said tracks;

a support plate receivable within said housing and movable along said tracks;

lamp assembly means mounted on said support plate;

rollers mounted on said support plate for engaging said protrusions;

said tracks being resilient and extending downwardly from the closed end of said housing and outwardly from the central axis of said housing, said tracks assuming a bias in a direction transverse to their length when deflected toward the central axis of said housing whereby said series of protrusions and said rollers form a series of overcenter

arrangements with each of said rollers selectively engagable between adjacent ones of said protrusions in response



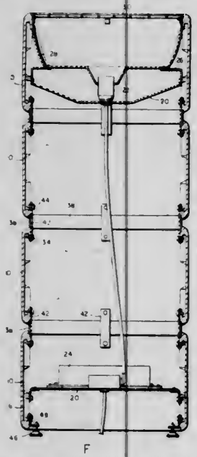
to the application of a positioning force to one of said plate and lamp assembly means.

4,232,362

FAMILY OF MODULAR LAMPS FOR INDIRECT LIGHTING

Thomas A. Williams, Wakefield, Mass., and Alfred O. Scholze, New Canaan, Conn., assignors to Lam, Inc., Wakefield, Mass.

Filed Oct. 5, 1978, Ser. No. 948,679
Int. Cl.³ F21S 1/12
U.S. Cl. 362—410 **27 Claims**



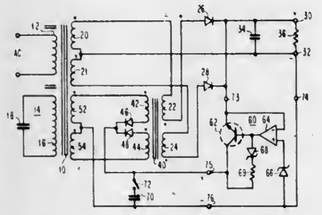
1. A free-standing modular lamp stand comprising an assembly of light modules of predetermined configuration arranged to be stacked in vertically-spaced relation with spacers positioned between modules of a horizontal section less than the horizontal section of the modules arranged in concentric relation to the modules such that there are outwardly-facing grooves between successive modules, said assembly including a module at the base upon which the lamp stand is designed to rest and a module at the top for providing lighting, said top module defining an upwardly-facing recess and a luminaire assembly mounted in said recess in a position to direct light upwardly through the top opening of the module at the top of the stack of modules.

4,232,363

AC TO DC CONVERTER WITH ENHANCED BUCK/BOOST REGULATION

Hobart A. Higuchi, and Sammy K. Yee, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1978, Ser. No. 965,828
Int. Cl.³ H02P 13/04, 13/26
U.S. Cl. 363—75 **21 Claims**



1. A closed loop potential regulated power supply circuit arrangement comprising

a power transformer having a primary winding, a principal power supply secondary winding and an auxiliary power supply secondary winding,

a rectifier assembly coupled to said principal power supply secondary winding,

an electric load connected to said rectifier assembly,

a compensating potential transformer having an exciting winding and having a pair of compensating windings individually interposed between the terminals of said principal power supply secondary winding and said rectifier assembly,

a rectifying assembly,

control circuitry having an input circuit connected directly across said rectifier assembly and having an output circuit connected across a series circuit including said exciting winding, said rectifying assembly and said auxiliary power supply secondary winding,

characterized in that said control circuitry comprises:

a transistor device having a base electrode, and having a collector-emitter electrode circuit connected in series between said rectifier assembly and one terminal of said series circuit,

control amplifier circuitry having an input circuit connected across said electric load and having an output circuit connected between said base electrode of said transistor device and said series circuit, and

reference voltage device interposed in said input circuit of said control amplifier circuitry.

4,232,364

ADAPTIVE SAMPLED-DATA CONTROLLER

Robert J. Bibbero, Merion Station, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 18, 1978, Ser. No. 970,738
Int. Cl.³ G05B 13/02, 21/02
U.S. Cl. 364—105 **8 Claims**

7. A method for controlling a parameter of a process variable in which a controller compares the parameters with a setpoint value and produces an output controller signal proportional to the difference between the parameters and the setpoint, including the steps of:

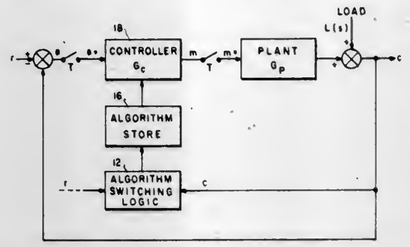
sampling the value of the setpoint at predetermined intervals;

storing the sample setpoint values;

adding each sample value to a previously sampled value in order to obtain an algebraic difference therebetween;

comparing said algebraic difference with a predetermined criteria; and

selecting one of a plurality of stored algorithms for use by the controller on the basis of the result of the step in which



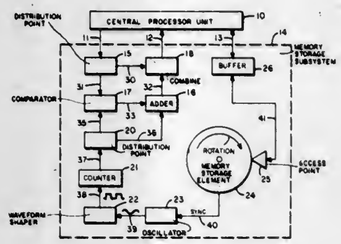
the algebraic difference was compared with the predetermined criteria.

4,232,365

APPARATUS FOR DETERMINING THE NEXT ADDRESS OF A REQUESTED BLOCK IN INTERLACED ROTATING MEMORIES

Robert M. Englund, Golden Valley, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 1, 1978, Ser. No. 882,491
Int. Cl.³ G06F 13/04; G11C 8/00
U.S. Cl. 364—200 **4 Claims**



1. In a data processing system having a central processor unit (CPU) coupled to a memory storage subsystem which contains an interlaced serial rotational memory storage element of capacity 2^M cells whose cells may be accessed only at such point in time as they rotate to a position directly adjacent to a memory storage element access point and wherein the cells of said interlaced serial rotational memory storage element are accessed by said CPU as 2^{M-N} blocks of 2^N cells per block, where M is greater than N, and wherein each of said 2^M cells is identified with a different corresponding one of 2^M addresses and each of said 2^M addresses contains a block number identifying a one of said 2^{M-N} blocks and a word number identifying a one of said 2^N cells within the block identified by said block number, wherein said 2^{M-N} blocks are arranged such that said 2^{M-N} cells of each of said 2^{M-N} blocks are equally spaced about the entire rotation of said interlaced serial rotational memory storage element, and having a means responsively coupled to said interlaced serial rotational memory storage element for maintaining a one of said 2^M cells currently directly adjacent to said memory storage element access point, whereby said one of said 2^M addresses so maintained changes with the rotation of said memory storage element, and having a first transferring means responsively coupled to said memory storage subsystem and said CPU for transferring from said CPU to said memory storage subsystem an address corresponding to a one of the 2^N cells within a desired one of said 2^{M-N} blocks to be accessed by said CPU, and having a means responsively coupled to said maintaining means and said first transferring means for determining from said one of said 2^M addresses corresponding to the one of said 2^M cells currently directly adjacent to said memory storage element access point and from said one of said 2^M addresses corresponding to said one of said 2^N cells within said desired one of said 2^{M-N} blocks to be accessed by said CPU, an address corresponding to a one of the 2^N cells within said desired one of said 2^{M-N} blocks to next become adjacent to said memory storage element access point, and having a second transferring means responsively coupled to said determining means and said CPU for transferring said address determined by said determining means to said CPU to permit it to access said desired one of 2^{M-N} blocks from said determined address, said determining means comprising:

first disassembly means responsively coupled to said first transferring means for disassembling said requested address transferred from said CPU into a requested block number identifying one of said 2^{M-N} blocks to be accessed and a requested word number identifying one of said 2^N storage cells within said requested block number;

second disassembly means responsively coupled to said maintaining means for disassembling said address of said storage cell directly adjacent to said memory storage element access point into a memory block number identifying one of said 2^{M-N} blocks and a memory word number identifying one of said 2^N storage cells within said memory block number;

a comparator responsively coupled to said first disassembly means and said second disassembly means which compares said requested block number with said memory block number;

means responsively coupled to said comparator and said second disassembly means for selectively adding 1 to said memory word number if and only if said comparator indicates said requested block number is less than or equal to said memory block number; and

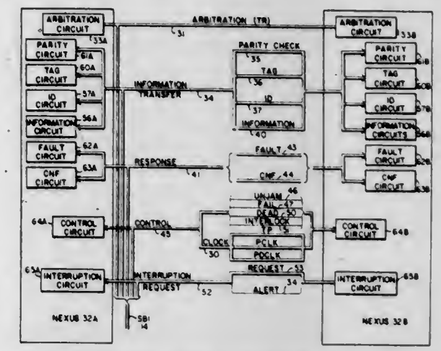
means responsively coupled to said first disassembly means, said selective adding means, and said second transferring means for combining said requested block number with said memory word number as potentially modified by said selective adding means to produce said determined address to be transferred to said CPU.

4,232,366

BUS FOR A DATA PROCESSING SYSTEM WITH OVERLAPPED SEQUENCES

John V. Levy, Palo Alto, Calif.; David P. Rodgers, Acton, Mass.; Robert E. Stewart, and Richard J. Casabona, both of Stow, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 845,415, Oct. 25, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,601
Int. Cl.³ G06F 9/46
U.S. Cl. 364—200 **43 Claims**



1. A data processing system comprising

A. timing means for generating timing signals, that define successive transaction intervals,

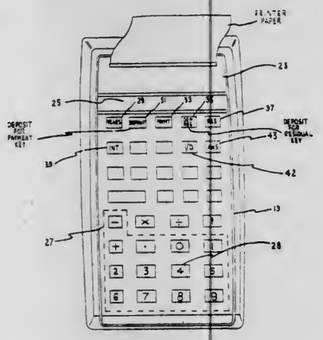
B. system interconnection means including:
i. bus access control signal interconnection means for transferring bus access control signals,
ii. information signal interconnection means for transferring information signals, and
iii. confirmation signal interconnection means for transferring confirmation signals,
C. a plurality of nexus means each including:
i. bus access control means connected to said bus access control signal interconnection means and to said timing means for transferring bus access control signals and for controlling the access of its respective nexus means to said system interconnection means in response to bus access control signals,
ii. information transfer means connected to said information signal interconnection means, said bus access control means, and said timing means for transferring information signals, and
iii. confirmation transfer means connected to said confirmation signal interconnection means, said information transfer means, and said timing means for indicating the status of an information transfer a predetermined interval after the information transfer by transferring confirmation signals,
said information transfer means and said confirmation transfer means being responsive to the timing signals from said timing means to establish transaction sequences each comprising a plurality of successive transaction intervals, each transaction sequence including an information transfer interval and a subsequent confirmation interval, said information transfer means transferring information during the information transfer interval of a particular transaction sequence and said confirmation transfer means transferring corresponding confirmation signals during the confirmation interval of that particular transaction sequence, said system interconnection means being able to transfer information signals and confirmation signals corresponding to different transaction sequence during a particular transaction interval whereby plural transaction sequences are overlapped.

4,232,367

APPARATUS FOR MAXIMIZING INTEREST EARNINGS AND PROVIDING PAYMENTS FROM PRINCIPAL WITHOUT INTEREST PENALTY

Robert H. Youden, 715 DeSoto Dr., Palo Alto, Calif. 94303, and Charles S. Robertson, 1116 E. Rose Cir., Los Altos, Calif. 94022

Filed Jun. 12, 1978, Ser. No. 914,497
Int. Cl.³ G06F *15/30*
U.S. Cl. 364—408 **6 Claims**



11

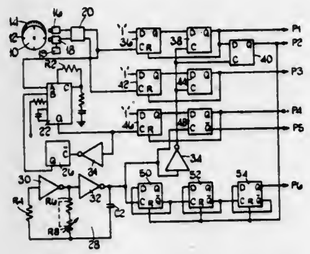
1. Calculator apparatus for determining minimum principal amounts depositable into passbook and term accounts having pre-determined interest rates and minimum deposit requirements to provide maximum interest earnings and payments from principal without interest penalty, the apparatus comprising:
keyboard means having a plurality of keys for entering data including keys for entering a selected number of years and a key for initiating minimum principal calculations;
first memory means coupled to the keyboard means for storing entered data;
logic means coupled to the first memory means and including a second memory means having a program, the predetermined interest rates and the minimum deposit requirements stored therein for calculating, under control of the stored program and in response to actuation of the key for initiating minimum principal calculations, minimum principal amounts in accordance with the predetermined interest rates, the minimum deposit requirements and the number of years and payment amount selected, the minimum principal amounts being depositable into the passbook and term accounts to provide maximum interest earnings and payments from principal without interest penalty; and
printer means coupled to the logic means for printing the calculated minimum principal amounts.

4,232,368

INTERNAL COMBUSTION ENGINE FUNCTION CONTROL SYSTEM

William F. Hill, Stafford, and John P. Southgate, Georgeham, Nr. Braunton, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 8, 1978, Ser. No. 940,697
Claims priority, application United Kingdom, Sep. 16, 1977, 38694/77
Int. Cl.² G06F *15/20*; F02P *5/04*
U.S. Cl. 364—431 **10 Claims**



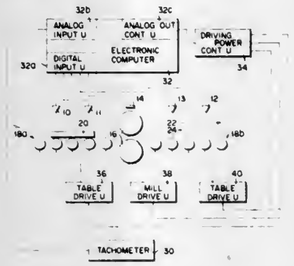
1. An internal combustion engine function control system comprising first and second signal generating means mechanically driven by the engine, said first signal generating means producing a train of signals at a first frequency equal to the required function frequency, and the second signal generating means producing a train of signals at a second frequency which is a multiple of the first frequency, engine parameter sensitive means for varying the phase of the first signal train relative to that of the second signal train between limits such that the combined ordinal succession of the signals is maintained constant, and function timing means for causing triggering of an output circuit at the end of a delay following the generation of a signal from said first signal generating means, such delay consisting of the sum of a first delay equal to the period between the generation of said signal from said first signal generating means and the generation of a selected one of said train of signals produced by said second signal generating means and a second delay, the first and second delays being determined by the frequency and phase relationship of the two signal trains.

4,232,369

METHOD OF CONTROLLING THE DECELERATION OF A REVERSING MILL

Shigeki Fukushima, Fuchu, and Tadahiro Ohashi, Kokubunji, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 31, 1978, Ser. No. 929,563
Int. Cl.³ G06F *15/46*; G05B *15/00*; B21B *37/00*
U.S. Cl. 364—476 **11 Claims**



1. A system for controlling the deceleration of a reversing mill, comprising:
reversible main mill rolls for rolling a piece;
a pair of roller tables provided on both sides of said main mill rolls and along the path of said main mill rolls for moving said piece;
drive means for driving said main mill rolls and said roller tables;
a plurality of piece position sensors arranged on both sides of said main mill rolls and along said roller tables for detecting the position of said piece and for generating a detection signal;
load cell means for generating a signal when said piece is bitten by said main mill rolls and when said piece is released from said main mill rolls; and
control means for controlling said drive means;
wherein said control means actuates said drive means so as to accelerate said piece up to a predetermined bite speed, to start accelerating said piece up to a predetermined rolling speed in response to a detection signal of said load cell means representing that said piece is bitten by said main mill rolls, and to start deceleration said piece down to a predetermined kickout speed at a predetermined rate when said piece reaches a predetermined deceleration starting point from a position where it has been detected by a selected one of said piece position sensors which are arranged on the piece feed side of said main mill rolls, said selected hot piece detector being located nearer to said deceleration starting point than the other detectors and farther from said main mill rolls than said deceleration starting point, said deceleration starting point being determined such that said piece is decelerated down to the predetermined kickout speed the moment it is released from said main mill rolls, said deceleration starting point being located at a point where said piece exists upon the lapse of a period of time derived from said rolling speed and the distance between said selected piece position sensor and said deceleration starting point and set in a timer which starts in response to the detection signal from said selected piece position sensor, whereby the moment said piece is released from said main mill rolls, deceleration at a predetermined rate is started on said piece in response to an output signal of said load cell means thereby to stop said piece after it has traveled a predetermined kickout distance.

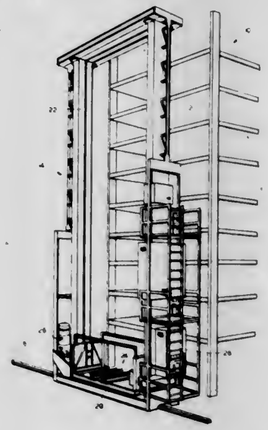
6. A method for controlling the deceleration of a reversing mill having reversible main mill rolls for rolling a piece, a pair of roller tables provided on both sides of said main mill rolls and along the path of said main mill rolls for moving said piece, drive means for driving said main mill rolls and said roller tables, a plurality of piece position sensors arranged on both sides of said main mill rolls and along said roller tables for detecting the position of said piece and for generating a detection signal, load cell means for generating a signal when said piece is bitten by said main mill rolls and when said piece is released from said main mill rolls, and control means for controlling said drive means, wherein said method comprises the steps of:
accelerating said piece on said roller tables up to a predetermined bite speed and causing said piece to travel at said bite speed;
accelerating said piece up to a predetermined rolling speed, starting when said piece is bitten by said main mill rolls, and causing said piece to travel at said predetermined rolling speed;
decelerating said piece at a predetermined deceleration rate, starting when said piece reaches a deceleration-starting point so that said piece is released from said main mill rolls at a predetermined kickout speed; and
decelerating said piece released from said main mill rolls at another rate so as to stop said piece after said piece has traveled a predetermined kickout distance.

4,232,370

CONTROL SYSTEM FOR A STORAGE/RETRIEVAL MACHINE IN AN AUTOMATED MATERIAL HANDLING SYSTEM

David R. Tapley, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 854,178, Nov. 23, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,321
Int. Cl.³ G06F *15/40*
U.S. Cl. 364—478 **5 Claims**



1. A control system for controlling the operation of a storage/retrieval (S/R) machine in a material handling system, the S/R machine being directed by the control system to perform an ordered sequence of movements between addressable stations in response to a control command for the stacking and/or retrieving of material units, the control system comprising:
input means for operator communication of a control command specifying an S/R machine operation:
programmable processing means operatively coupled with the input means and responsive to an operator control command for directing the S/R machine to perform an ordered sequence of movements corresponding to the specific control command, the programmable processing means being controlled by a stored program and including,
memory means for storing program instructions, and

central processing means operatively coupled with the memory means and responsive to the stored program for executing the instructions to cause the S/R machine to perform the specified S/R machine operation,

the memory means comprising a first memory block having a host control program of instructions encoded in an, elementary program language, and a second memory block having a user application program of instructions encoded in a non-elementary program, the central processing means including first means operatively coupled with the first memory block and the second memory block and being responsive to a selected instruction in the first memory block for accessing selected instructions in the second memory block,

the first memory block including second means operatively coupled with the first means for emulating the selected instructions from the second memory block,

the central processing means including third means operatively coupled with the second means for producing control signals for the S/R machine in accordance with the selected instructions from the second memory block,

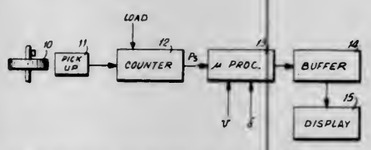
said first memory block being physically separate from the second memory block and being a read only memory.

4,232,371

APPARATUS FOR INDICATING THE AMOUNT OF TAPE WOUND UPON A REEL

Hidetoshi Kamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,319
Claims priority, application Japan, Dec. 29, 1977, 52-158870
Int. Cl.[3] G06F *15/20*
U.S. Cl. 364—561 **12 Claims**



1. Apparatus for indicating the amount of tape wound upon one reel, such as a supply reel or a take-up reel, in a two-reel cartridge, which apparatus is operative without regard to previous use of said cartridge when said cartridge is loaded into a processing device of the type which includes loading means for withdrawing a portion of the tape wound upon said one reel from said cartridge, said apparatus comprising:

means for generating a signal representing the angular velocity of said one reel when said one reel rotates in response to the withdrawal of said tape from said cartridge;

combining means for combining said signal with predetermined signals representing predetermined characteristics of said tape; and

indicating means responsive to said combining means for indicating the amount of tape wound upon said one reel as a function of said generated signal.

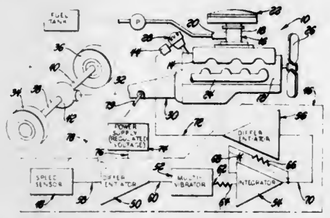
4,232,372

POSITIVE AND NEGATIVE ACCELERATION RESPONSIVE MEANS AND SYSTEM

John G. Berent, Madison Heights, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Division of Ser. No. 689,159, May 24, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,395
Int. Cl.[3] G01P *15/00*
U.S. Cl. 364—566 **14 Claims**

1. Acceleration responsive system means, comprising first means responsive to the velocity of monitored structure means, said first means being effective for producing a first electrical output signal corresponding to the magnitude of said velocity, second means adapted to receive said first electrical output signal and in response thereto create a second electrical output triggering signal, third means adapted to receive said second electrical output triggering signal and effective to employ said second electrical output triggering signal in order to thereby create a third pulse-type electrical output in timed relationship to said second electrical output triggering signal, fourth means adapted to receive and integrate said pulse-type electrical output in order to thereby create a fourth output voltage of a



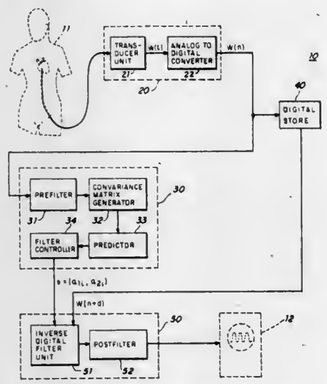
magnitude reflective of the magnitude of said velocity, fifth means effective for receiving said fourth output voltage and sensing the rate of change of the magnitude of said fourth output voltage in order to thereby produce an output control signal of a magnitude related to said rate of change of said magnitude of said fourth output voltage, and electrical load means for receiving said electrical output control signal for responding thereto.

4,232,373

COMPENSATION OF FLUIDIC TRANSDUCERS

Leland B. Jackson, and Dov Jaron, both of Kingston, R.I., assignors to Regents for Education of the State of Rhode Island, Providence, R.I.

Filed Apr. 14, 1978, Ser. No. 896,357
Int. Cl.[2] G06F *7/38*
U.S. Cl. 364—572 **8 Claims**



1. The method of compensating digitized pressure waveform output indicators of a fluid-filled catheter transducer which comprises the steps of:

(a) generating from the digitized pressure waveform output indications pole signals that are associated with the fluid-filled catheter; and,

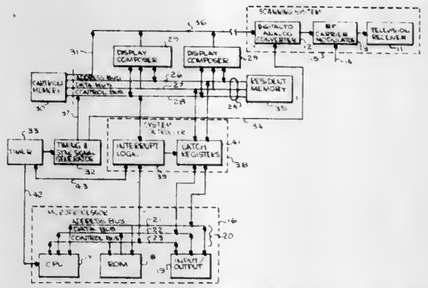
(b) inverse filtering the digitized pressure waveform output indications under the control of said pole signals to cancel said pole signals.

4,232,374

SEGMENT ORDERING FOR TELEVISION RECEIVER CONTROL UNIT

David H. Chung, Palo Alto, and John V. Cosley, Cupertino, both of Calif., assignors to Umtech, Inc., Sunnyvale, Calif.

Filed Aug. 11, 1977, Ser. No. 823,619
Int Cl.[3] G06F *3/153*; A63F *9/22*
U.S. Cl. 364—900 **12 Claims**



1. A method of arranging information defining a display for a display surface area which is scanned by a scanning system to produce said display, comprising the steps of:

A. storing at predetermined locations in memory apparatus, sets of information respectively defining a plurality of spatial display segments, each of which at least partially defines an object image that it may be desired be included in said display;

B. placing in memory apparatus in a predetermined order correlated with the order of appearance in said display of those spatial display segments to be included therein, indicia uniquely associated with each of the sets of information defining those spatial display segments to appear in said display, which said indicia at least partly defines the geometrical location on said display surface area at which the spatial display segment to which it is associated is to appear; and

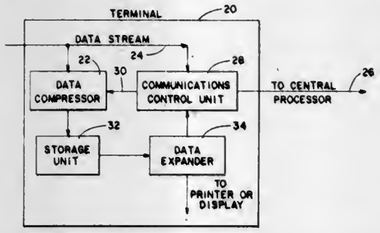
C. responding to said predetermined order of indicia by extracting from said memory apparatus in their order of appearance in said display, those sets of information defining the spatial segments to be included in said display.

4,232,375

DATA COMPRESSION SYSTEM AND APPARATUS

John F. Paugstat, Saleaville, and Donald J. Girard, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 12, 1978, Ser. No. 914,821
Int. Cl.[3] G06F *7/20, 7/34*; H03K *13/00*
U.S. Cl. 364—900 **12 Claims**



1. In a system for transmitting a plurality of data messages each comprising redundant and non-redundant characters between a data terminal device and a central processor in which a character is considered redundant if the character is the same in succeeding data messages, a data compression apparatus for generating a compressed data record representing the data messages generated as part of a merchandising operation by the data terminal device comprising in combination:

first storage means for storing the characters of the data messages generated by the data terminal devices;

means for generating a plurality of first control signals in response to the disabling of said central processing means and the storing of the data message in said first storage means;

timing control means operated in response to the generation of each of said first control signals to output a plurality of timing control signals;

second storage means for storing data representing a compressed data record;

table look-up means coupled to said first and second storage means and said timing control means for storing a plurality of first non-redundant characters together with an associated one of a plurality of start of compressed data record characters; said table look-up means operated in response to the generation of another of said timing control signals to receive a first non-redundant character from said first storage means for storing in said second storage means one of said plurality of start of compressed data record characters in accordance with the first non-redundant character received from said first storage means, said start of compressed data record character also contains information representing the first non-redundant character;

third storage means coupled to said first storage means for storing a character of the first data message in response to the generation of one of said timing control signals;

means coupled to said first and third storage means for comparing the corresponding character of each succeeding data message with the character stored in said third storage means to determine if the character is redundant or non-redundant; and

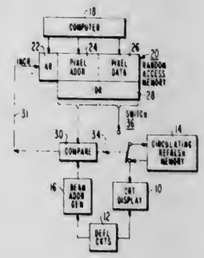
control means responsive to the operation of said comparing means for storing in said second storage means the non-redundant character of the data message when a comparison is not found.

4,232,376

RASTER DISPLAY REFRESH SYSTEM

Donald F. Dion, and David R. Wojcik, both of Burlington, Mass., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1979, Ser. No. 20,937
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—222 **6 Claims**



1. A raster display refresh system, comprising

a cathode ray tube display unit having beam deflection means,

a beam address generator synchronized with said beam deflection means,

a circulating refresh memory operative in synchronism with said beam deflection means to repeatedly supply a frame of picture element data signals to said cathode ray tube,

a small random access memory having storage locations

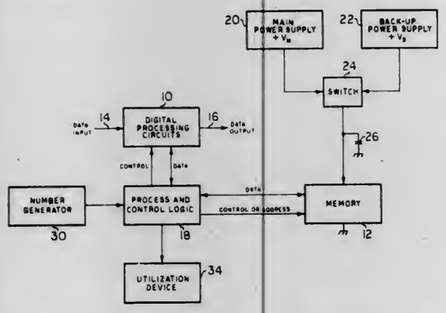
each for storing, in order of raster scan sequence, a picture element address and associated picture element data,
an address counter to sequentially access said storage locations, and
a comparator means operative when the picture element address from an accessed storage location matches the beam address from the beam address generator to transfer the accessed picture element data from the random access memory to the circulating refresh memory and to increment said address counter.

4,232,377

MEMORY PRESERVATION AND VERIFICATION SYSTEM

James L. Tallman, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 16, 1979, Ser. No. 30,509
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—229 **2 Claims**



1. A memory preservation and verification system comprising:
power supply means coupled to said memory for energization thereof, said power supply means including a main power supply and a backup power supply;
means for generating a first digital number;
process and control logic means for generating a second digital number and storing both of said first and second digital numbers in said memory, said second digital number being mathematically related to said first digital number;
said process and control logic means also for retrieving said first and second digital numbers and checking the relationship therebetween to thereby provide a verification of the validity of the contents of said memory; and
utilization means for providing an indication of said verification.

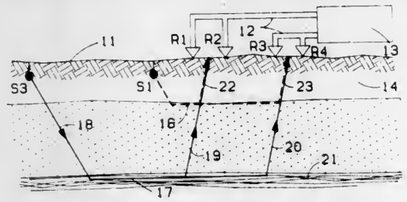
4,232,378

FORMATION ABSORPTION SEISMIC METHOD

Halbert E. Adams, Garland, Tex.; Edgar R. Cooper, New Orleans, La.; Lowell D. Ford, Gretna, La.; Delbert C. Johnson, Marrero, La., and Gregory L. Warren, Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 20, 1978, Ser. No. 944,091
Int. Cl.[3] G01V *1/16*
U.S. Cl. 367—36 **7 Claims**

1. A seismic prospecting method for finding zones of anomalous absorption of seismic waves between pairs of refractive layers in subsurface formations, comprising:
a. locating a number of seismic wave detectors in a plurality of groups in a first spread at least near the surface of the earth;
b. initiating seismic waves at a first source location near the surface of the earth a distance L_1 from one end of said spread, and making a reproducible record of at least the amplitude of initially received refracted seismic waves at said plurality of groups of detectors from this initiation;
c. repeating step b for seismic waves initiated at a distance L_2 from said one end of said spread, L_2 being at least substantially greater than L_1;
d. repeating step b for seismic waves initiated substantially at a distance L_1 from the opposite end of said first spread;
e. repeating step b for seismic waves initiated at least substantially at a distance L_2 from said opposite end of said first spread;
f. locating a second spread of detectors in which at least the majority of said groups of detectors have not been moved, but at least one such group of detectors in said second spread is at a new location at an end of said second spread;



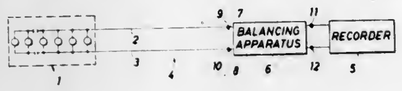
g. repeating step b, c, d and e for the detector groups forming said second spread, whereby the relative amplitudes of said initially received seismic waves corrected for size of shot, range and group may be determined for refracted waves received at each group for seismic wave initiations at the various locations L_2, and
h. plotting on a cross-section map on up-coming lines representing at least approximately the up-coming paths of refracted waves to the various detector group locations, the corresponding value of said relative corrected amplitudes of said initially received seismic waves at said various detector groups, so that zones on anomalous absorption of refracted waves may be ascertained.

4,232,379

AUTOMATIC BALANCING SYSTEM FOR SEISMIC EQUIPMENT

Lukas Ensing, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 22, 1978, Ser. No. 963,052
Claims priority, application United Kingdom, Dec. 29, 1977, 54145/77
Int. Cl.[2] G01V *1/22*
U.S. Cl. 367—43 **29 Claims**



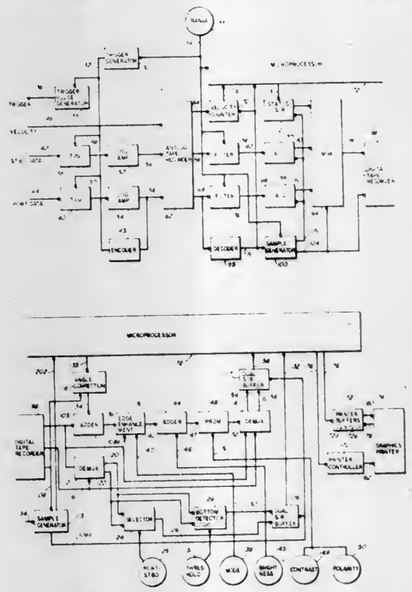
18. Method for reducing ground current interference with electrical signals representative of seismic wave signals, said electrical signals passing from at least one geophone to a recording system via an electric circuit including a balancing circuit coupled to ground potential, whereby a bridge circuit is formed which includes the geophone, the electric circuit, and at least a part of the recording system, wherein the balancing circuit comprises one or more pairs of arms, each pair having at least one arm with a variable impedance, said method comprising:
automatically adjusting said variable impedances of said pairs of arms in a predetermined sense;
detecting variations in the unbalance of said bridge circuit; and
automatically readjusting the variable impedances in a sense opposite to said predetermined sense if the unbalance has increased as a result of said adjusting.

4,232,380

UNDERWATER MAPPING APPARATUS AND METHOD

Roger L. Caron, Westford, Mass.; Peter J. Clifford, Barrington, R.I., and Francis R. Germain, Winchester, Mass., assignors to EG & G, Inc., Wellesley, Mass.

Filed Apr. 14, 1978, Ser. No. 896,474
Int. Cl.[3] G01S *15/89*
U.S. Cl. 367—88 **19 Claims**



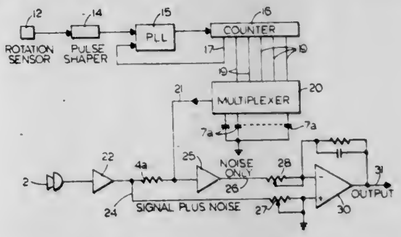
1. In an apparatus for producing a plan view display of a seabed from a side scan sonar signal system in which the sonar generating and receiving means move with respect to the seabed, said apparatus comprising
at least one transmitting transducer assembly for repeatedly generating side scan sonar signals in response to a trigger signal, said trigger signals each defining the beginning of a measurement cycle,
at least one receiving transducer assembly for providing a received electrical signal output, said output having an amplitude corresponding to the intensity of received returning sonar signals,
means responsive to the receiving transducer assembly output for providing a compressed electrical signal output having a dynamic range less than the dynamic range of said received sonar signals, and
a display device,
the improvement wherein said display is linear at least along an axis corresponding to a direction normal to the direction of movement of said generating and receiving means, and comprising
sampling means for periodically sampling said compressed electrical signal within each measurement cycle to generate a sequence of sampled signal values,
height determining means for repeatedly determining the height of said sonar generating and receiving means above the seabed,
means responsive to said height determination and said sampled signals for generating a sequence of linear data values corresponding to a mapping of said sampled signals onto a sequence of equi-distant locations along a horizontal seabed-representing axis,
said display device having means for receiving and displaying said linear data, and
a display control means for actuating said display device to produce said plan view map of said seabed.

4,232,381

NOISE CANCELLATION USING TRACKING FILTER

Lyle V. Rennick, Mission Viejo, and Julian W. Macias, Irvine, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Jun. 8, 1979, Ser. No. 47,377
Int. Cl.[3] H04B *1/06*
U.S. Cl. 367—135 **19 Claims**



1. In an acoustic signal-handling system carried by a vehicle having a noise-producing engine capable of operation at various engine speeds, means for eliminating engine-related noise from the total acoustic signal received by said acoustic signal system, comprising:
a. engine rotation sensing means;
b. commutating filter means having an effective pole contact and a plurality of position contacts swept through by said pole contact during each complete cycle of its operation, a plurality of capacitor means connected at one end of each to respective ones of said position contacts and at the other end to a stable potential source;
c. means responsive to said engine rotation sensing means for effectively driving said pole contact sequentially through said position contacts at a rate of one cycle of said pole contact of each revolution of said engine;
d. microphone means exposed to the acoustic environment of said system for receiving desired signals;
e. difference circuit means having an output proportional to the difference between two separate inputs;
f. filter input resistance means having an input end and an output end;
g. means connecting the output of said microphone means to said input end of said resistance means and to one of said inputs of said difference circuit means in parallel; and
h. means connected both said pole contact and said output end of said resistance means in parallel to the second said input of said difference circuit means, whereby said engine-related noise picked up by said microphone means is cancelled from the output of said difference circuit means.

4,232,382

INCREMENTING SIGNAL HOLD CIRCUIT FOR A CLOCK/CALCULATOR

Edward A. Heinsen, Corvallis, Oreg., and Vijay V. Marathe, Sunnyvale, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 26, 1977, Ser. No. 800,761
Int. Cl.[3] G04C *3/00*; G04G *5/02*; G06F *7/38*
U.S. Cl. 368—1 **10 Claims**

1. A clock calculator comprising:
an input device;
a display;

a clock means coupled to the display for storing time data, the clock means including incrementing circuit means for producing an increment signal to periodically update the time data;

calculator circuit means coupled to the input device, the display and the clock means for performing arithmetic operations on time data from the clock means;



data transfer means connected to the calculator circuit means and the clock means for transferring data between the calculator circuit means and the clock means; and

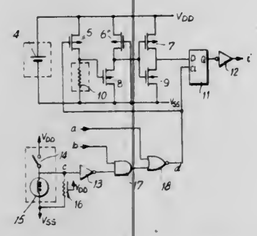
hold circuit means coupled to the clock means for holding any increment signal that occurs when arithmetic operations are being performed on the time data and for updating the time data in accordance with any held increment signal when the time data is transferred back to the clock means from the calculator circuit means.

4,232,383

ELECTRONIC TIMEPIECE BATTERY MONITORING CIRCUIT

Hiroyuki Chihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 26, 1978, Ser. No. 899,926
Claims priority, application Japan, Apr. 26, 1977, 52-48292
Int. Cl.³ G04C *23/00*; G04B *1/00*; G08B *21/00*
U.S. Cl. 368—66 **11 Claims**



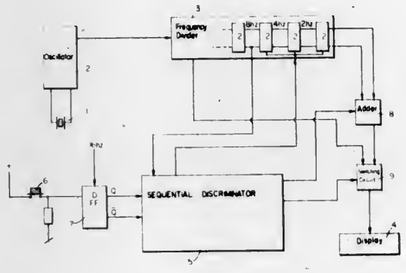
1. In an electronic timepiece including a battery for producing a supply voltage and a battery detection circuit for detecting when the supply voltage of said battery falls below a predetermined level and in response thereto produces a detection signal, the improvement comprising monitoring means for producing an indication signal in response to said detection signal being applied thereto, a load means adapted to be selectively coupled to said battery and in response thereto place an additional load thereon, and inhibit means coupled to said battery detection circuit and said monitoring means, said inhibit means being further coupled to said load means for inhibiting said detection signal from being applied to said monitoring means when said load means is coupled to said battery.

4,232,384

TIMESETTING ARRANGEMENT FOR ELECTRICAL TIMEPIECES

Jean-Pierre Jaunin, Nidau, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Continuation of Ser. No. 766,659, Feb. 8, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,046
Claims priority, application United Kingdom, Feb. 23, 1976, 7023/76
Int. Cl.³ G04B *17/12*; G04C *9/00*
U.S. Cl. 368—185 **8 Claims**



1. An electrically driven timepiece including:

a high frequency oscillator means for producing pulses of a predetermined frequency;

a frequency-divider/pulse-transmission means, including a frequency divider, connected to said high frequency oscillator means for dividing said pulses of said predetermined frequency into display actuating pulses of a display-actuating frequency and transmitting the pulses to a time display means;

a time display means including at least minute and second displays connected to said frequency-divider/pulse-transmission means for receiving said display-actuating pulses and for advancing said minute and second displays in response thereto, said time display means including a stepping motor arranged to drive time displaying hands;

a single user-accessible switch for correcting and setting the display, said switch being capable of assuming at least two positions including a neutral and an active position;

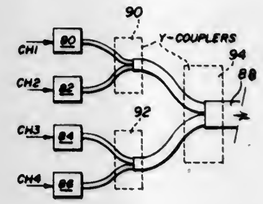
a sequential-discriminator/memory circuit means connected between said switch and said frequency-divider/pulse-transmission means for generating combinations of controls in response to time cycle patterns with which the single switch is moved between the neutral and active positions, a first such control being the insertion of a pulse into the frequency divider transmission means for each movement of said switch from said neutral position to said active position, a second such control blocking transmission of pulses by the frequency-divider/pulse-transmission means to prevent advancement of the displays in response to the switch being held in the active position for a predetermined length of time, and a third such control operating on the frequency-divider/pulse-transmission means to increase the rate at which pulses are transmitted to the time display to thereby advance the displays at a faster than normal rate in response to the switch being held in the active position for a predetermined length of time, and thereafter being moved to the neutral positon and quickly returned to the active position.

4,232,385

FREQUENCY DIVISION MULTIPLEXING SYSTEM FOR OPTICAL TRANSMISSION OF BROADBAND SIGNALS

Elmer H. Hara, Ottawa, Canada, and Takeshi Ozeki, Tokyo, Japan, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jul. 7, 1978, Ser. No. 922,715
Claims priority, application Canada, Jul. 12, 1977, 282545
Int. Cl.³ H04B *9/00*
U.S. Cl. 370—3 **9 Claims**



1. A frequency division multiplex system for transmitting a plurality of radio frequency signals of differing frequencies from a transmitter station to a receiver station, comprising:

(a) a plurality of modulated light sources in said transmitter station, each providing a light signal;

(b) a plurality of radio frequency signal sources, each signal source having a different frequency signal modulating a respective light source;

(c) a single major optical fiber of a given diameter having a solid core and outer cladding layer coupling the transmitter station to the receiver station for transmitting a mixed light signal comprised of the light signals from each light source;

(d) a plurality of minor small diameter individual optical fibers each having a solid core and outer cladding layer and each being connected at one end to a respective one of said light sources, the other ends of said plurality of smaller diameter fibers being joined with adjacent like fiber ends in a plurality of input pairs providing a plurality of optical fiber Y-couplers, each Y-coupler having two optical fiber inputs butt jointed to one optical fiber output of a larger diameter than said inputs, each said light source being connected as one input of a first respective Y-coupler via one minor optical fiber, the larger diameter output optical fiber of each Y-coupler being connected as an input optical fiber of a subsequent Y-coupler having an output optical fiber of successively larger diameter than the associated pair of input fibers until only two outputs remain, said two outputs being connected to said major optical fiber having the largest diameter by a last Y-coupler; and

(e) detector means located in said receiver station and operatively associated with said major optical fiber for detecting said plurality of different radio frequency signals from said mixed light signal.

4,232,386

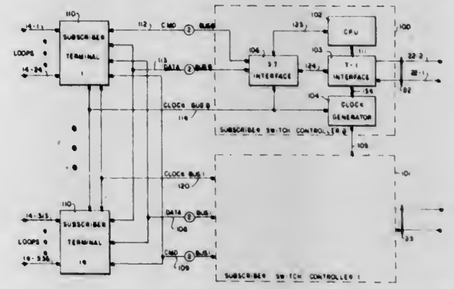
SUBSCRIBER SWITCH CONTROLLER FOR CONTROLLING CONNECTIONS BETWEEN A PLURALITY OF TELEPHONE SUBSCRIBER LINES AND A PAIR OF MULTITIME-SLOT DIGITAL DATA BUSES

John C. McDonald; James R. Baichtal, both of Los Altos, and Alexander C. Ling, Mountain View, all of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,498
Int. Cl.² H04Q *11/04*
U.S. Cl. 370—68 **12 Claims**

8. In a telephone system operating in time frames each consisting of a plurality of time slots having a first time slot rate, said system including a base switch connected to a plurality of multitime-slot buses for switching data between any of the time slots and including a subscriber switch connected to a plurality of local subscriber lines and to a pair of said plurality of buses for switching encoded data between said subscriber lines and time slots on said pair of buses specified by said base switch, said subscriber switch including a pair of subscriber switch controllers for enabling the switching of encoded data between said plurality of subscriber lines and said pair of buses, an arrangement wherein each of said controllers comprises:

interface means responsive to control signals for switching first encoded data from said subscriber lines in specified



time slots in one of said pair of buses and for switching second encoded data from one of said pair of buses to specified ones of said subscriber lines,

processor means responsive to said time slots specified by said base switch for generating said control signals,

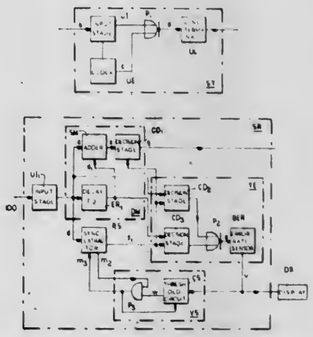
said interface means including attenuation memory means for storing predetermined encoded data representing predetermined attenuation states and means connected to said receive data bus for addressing said attenuation memory means at locations corresponding to an attenuated value for switching said attenuated data to said subscriber lines.

4,232,387

DATA-TRANSMISSION SYSTEM USING BINARY SPLIT-PHASE CODE

Ezio Cottatellucci, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 18, 1978, Ser. No. 970,147
Claims priority, application Italy, Dec. 21, 1977, 31006 A/77
Int. Cl.³ G08C *25/00*; H04L *7/02*
U.S. Cl. 371—47 **6 Claims**



1. A system for the transmission of binary signals, comprising:

a first station and a second station interconnected by a communication link;

clock means at said first station establishing a sequence of pulse cycles of predetermined duration T;

a data source generating two-level message pulses synchronized with said clock means to coincide with said pulse cycles;

transcoding means at said first station connected to said source and to said clock means for converting each message pulse into a pair of mutually complementary binary pulses occurring in respective half-cycles of the corresponding pulse cycle, the order of occurrence of said complementary pulses depending upon the respective message-pulse level, said transcoding means being connected to said communication link for transmitting a train of said complementary binary pulses to said second station;

input means at said second station connected to said communication link for receiving an incoming train of said complementary binary pulses;

delay means connected to said input means for generating a replica of said incoming train phase-shifted by T/2 with reference thereto;

algebraic summing means connected to said input means and to said delay means for subtractively combining said incoming train and said replica thereof into a ternary pulse train with a high, a low and an intermediate pulse level, said intermediate level occurring only in the first halves of certain cycles of said incoming train;

synchronizing means connected to said input means for establishing a series of timing pulses normally occurring during the second halves of respective cycles of said incoming train; and

decision means connected to said summing means and to said synchronizing means for sampling said ternary pulse train at the instant of occurrence of each timing pulse to generate a binary pulse sequence corresponding to said message pulses.

4,232,388

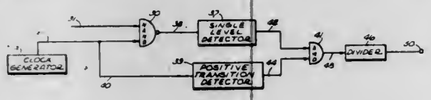
METHOD AND MEANS FOR ENCODING AND DECODING DIGITAL DATA

Jordan Isailovic, Torrance, Calif., assignor to MCA DiscoVision, Inc., Universal City, Calif.

Division of Ser. No. 848,550, Nov. 4, 1977. This application Jul. 21, 1978, Ser. No. 927,263

Int. Cl.³ H04L 7/02

U.S. Cl. 375—110 **1 Claim**



1. A data synchronizing system of the type employed for recovering clock synchronization information from an encoded self-clocking bit stream of combined clock and data information, said encoded bit stream formed from an unencoded digital signal, the unencoded digital signal having two voltage levels and formed from a plurality of standard data cell intervals, said unencoded signal having transitions between the voltage levels occurring only at a time coinciding with the transition time between adjacent standard data cell intervals, said synchronizing system comprising:

means for generating a clock signal wave train having at least two full cycles corresponding to each standard unencoded data cell interval, said clock signal having sequentially positioned positive-going signal level transitions and negative-going signal level transitions, said clock signal having a positive-going signal level transitions coinciding with transition time between adjacent standard unencoded data cell intervals;

means for receiving an encoded waveform of combined clock and data information, said encoded bit stream having two voltage levels with negative-going and positive-going voltage level transitions occurring in the encoded waveform representing said clock information and data information, the intervals between transitions being variable in length and occurring at increments of a single standard data cell interval and one and a half standard data cell intervals and two standard data cell intervals, said increment of two standard data cells in length starting and ending with signal level transitions occurring at a time coinciding with the time between successive data cell intervals in said unencoded waveform;

first detection means responsive to said encoded waveform of digital data for generating a series of pulses, and one of said pulses corresponds to each signal level transition contained in said encoded waveform of digital data;

zero detection means responsive to said clock signal and to said series of pulses generated by said first detection means for generating an output synchronizing pulse signal having a signal level transition coinciding with each second signal level transition in each pair of signal level transitions spaced two standard data cell intervals apart; and

means for applying said output synchronizing signal to said clock generating means for maintaining said positive-going signal level transition of said clock signal in synchronism with the transition time between standard data cell intervals.

4,232,389

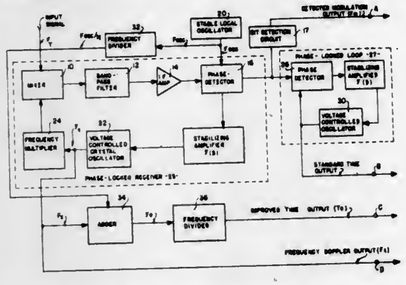
RECEIVER FOR SATELLITE NAVIGATIONAL POSITIONING SYSTEM

Roger D. Loller, Newbury Park, Calif., assignor to JMR Instruments, Inc., Chatsworth, Calif.

Filed Apr. 9, 1979, Ser. No. 28,266

Int. Cl.³ H04B 7/00

U.S. Cl. 455—12 **8 Claims**



1. A receiver for use in a satellite system, said system comprising a plurality of satellites each of which includes means for producing a radio frequency carrier and a clock having a frequency related to the frequency of the carrier, said carrier being phase-modulated with digital data, and said clock being adjustable in response to injection signals from a ground station to provide a precise repeatable time interval during which the digital data is transmitted, said receiver including: a receiver system phase-locked with the radio frequency carrier from the satellite and including a heterodyne mixer for receiving the radio frequency carrier, means connected to said heterodyne mixer and including a phase detector for recovering the digital data from the carrier, a stable local oscillator for supplying a reference signal to said phase detector, first circuit means including a voltage controlled oscillator connected to the phase detector and responsive to a phase error signal from the phase detector for supplying a heterodyne signal to the mixer having a predetermined frequency relationship with the carrier, and second circuit means connected to said stable local oscillator and to said first circuit means for producing an output timing signal having a frequency which is a predetermined sub-multiple of the frequency of said carrier.

4,232,390

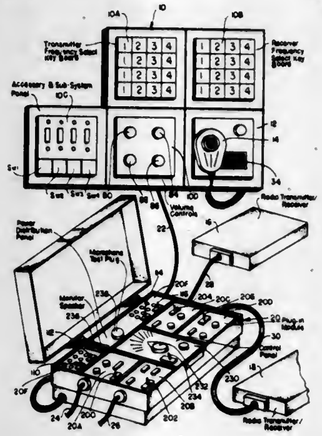
MOBILE RADIO VEHICLE CONTROL SYSTEM

Richard V. McEvilly, Jr., 236 Tulane Rd., Costa Mesa, Calif. 92626

Filed Sep. 1, 1977, Ser. No. 829,797

Int. Cl.³ H04B 1/40

U.S. Cl. 455—77 **8 Claims**



1. A mobile radio control system for use in a vehicle having a dash area and a rear area, said system comprising:

a console in said dash area including a first keyboard having a plurality of manually-operated transmitter frequency selection switches and a second keyboard having a plurality of receiver frequency selection manually-operated switches;

transmitter frequency-selecting switching circuitry connected to said switches of said first keyboard;;

receiver frequency-selecting switching circuitry connected to the switches of the second keyboard;

at least one radio transmitter/receiver unit in said rear area;

a combiner unit including circuitry interfacing said radio transmitter/receiver unit with said switching circuitries; and

cable means connecting said transmitter frequency-selecting switching circuitry to said combiner unit to cause the actuation of said switches of said first keyboard to select the transmitter frequency of said radio unit and connecting said receiver frequency-selecting switching circuitry to said combiner unit to cause the actuation of the switches of the second keyboard to select the receiver frequency of the radio transmitter/receiver unit.

4,232,391

VESSEL LOCATION SYSTEM

Hugo A. Zanutti, Clemson 271-B University Gardens, Rio Piedras, P.R. 00927

Filed Jan. 19, 1978, Ser. No. 870,610

Int. Cl.³ H04B 1/034; G08B 1/08

U.S. Cl. 455—96 **13 Claims**

1. A vessel location system comprising;

a stationary box disposed on the vessel,

an ejectable box received by the stationary box and being seaworthy,

means associated with said boxes for retaining the ejectable box in a retained position relative to the stationary box,

means for biasing the ejectable box away from the stationary box so that when the ejectable box is released it is ejected with force from the vessel,

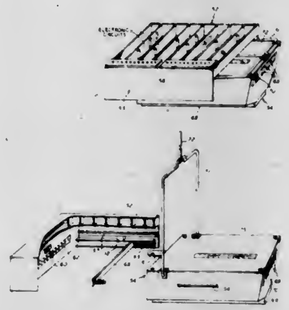
connector means associated with said boxes having interlocked connector parts on each box,

means aboard the vessel that is water-activated during a shipwreck condition for releasing the retaining means to enable the ejectable box to be ejected under force of the biasing means,

means aboard the ejectable box for transmitting a distress signal to permit rescuers to locate the ejectable box,

said means for transmitting including a distress signal transmitter and associated power source both aboard the ejectable box,

input electrical power means including means coupling via the connector means to the power source as long as the connector parts are intercoupled in the retained position,



and switch means responsive to releast of the ejectable box for coupling the power source to the transmitter,

said distress signal transmitter including an antenna and means for mounting the antenna from the ejectable box,

said ejectable box fitting at least partially within an open section of the stationary box, said mounting means for the antenna including an antenna pivot means permitting the antenna to be folded to a position between the two boxes when in a retained position.

4,232,392

RADIO TRANSMISSION SYSTEMS

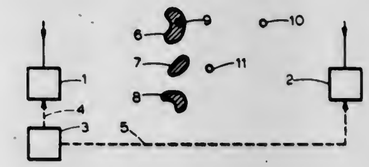
Richard C. French, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,046

Claims priority, application United Kingdom, Sep. 9, 1977, 37729/77

Int. Cl.³ H04B 1/02

U.S. Cl. 455—105 **5 Claims**



1. A radio transmission system, comprising a base station having a plurality of spaced radio transmitters, in which an information signal is simultaneously transmitted in the same carrier frequency channel from all the radio transmitters, each information signal being transmitted at least twice, said system having transmitter control means operable to reduce the transmission power of at least one, but not all, of the transmitters for the duration of at least one, but not all, of the transmissions of each information signal, in which the transmission power at

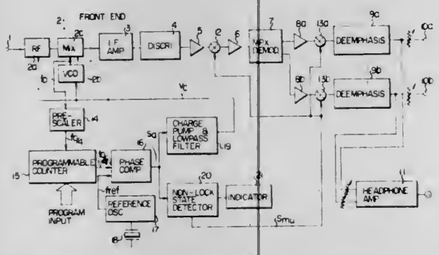
one or more of the remaining transmitters remains the same for all transmissions of each information signal, wherein each transmitter, the transmission power of which can be reduced by the control means, is provided with a respective attenuator and switch, the switch being controllable by the control means to switch the attenuator into a transmission circuit to provide said reduction of the transmission power of that transmitter.

4,232,393

MUTING ARRANGEMENT OF A RADIO RECEIVER WITH A PHASE-LOCKED LOOP FREQUENCY SYNTHESIZER

Michiaki Kumaoka, and Sinzi Aoshma, both of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 21, 1978, Ser. No. 972,069
Claims priority, application Japan, Feb. 2, 1978, 53/11681[U]
Int. Cl.³ H04B *1/10, 1/16*
U.S. Cl. 455—154 **5 Claims**



1. A radio receiver comprising:

a signal transmission path including a mixer circuit for converting a radio-frequency signal into an intermediate frequency signal, an intermediate frequency amplifier for amplifying said intermediate frequency signal, and a detection circuit for demodulating said intermediate frequency signal;

a local oscillator circuit means having a phase-locked loop comprised of a voltage-controlled oscillator for providing a local-frequency signal to said mixer circuit, a frequency divider for dividing the output frequency of said voltage-controlled oscillator, a reference signal generator to produce a reference frequency signal, a phase comparator for comparing in phase said reference frequency signal with the output signal of said frequency divider, and a loop filter connected between said phase comparator and said voltage-controlled oscillator for supplying said voltage-controlled oscillator with a control voltage signal having a magnitude which is a function of the phase difference between the input signals of said phase comparator;

a non-lock detection circuit means connected to the output of said phase comparator for detecting a non-lock state of said phase-locked loop in which the output signals of said frequency divider and said reference signal generator are not coincident in phase; and

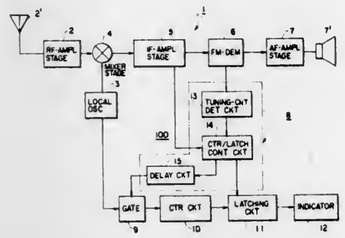
mute gate circuit means provided at the output side of said detection circuit of said signal transmission path of the receiver and responsive to said non-lock detection circuit means to mute the demodulated output signal at said signal transmission path, thereby interrupting production of an audio signal from the output of the receiver when the output signals of said frequency divider and signal reference signal generator are not coincident in phase.

4,232,394

STATION-SIGNAL FREQUENCY INDICATION SYSTEM FOR RADIO RECEIVER

Masakazu Fujishima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 18, 1979, Ser. No. 49,788
Claims priority, application Japan, Jun. 22, 1978, 53-75636
Int. Cl.³ H04B *1/16*; G01R *21/10*
U.S. Cl. 455—158 **10 Claims**



1. A station-signal frequency indicating system for a radio receiver, comprising:

a counter circuit associated with said radio receiver for repetitively counting during a sequence of one or more counting periods a signal having a frequency related to a tuning frequency of said radio receiver to represent the tuning frequency of said radio receiver by a count obtained in said counter circuit at the end of each counting period for which counting is carried out by said counter circuit;

a latching circuit for receiving and temporarily retaining the count obtained in said counter circuit at the end of said each counting period;

an indicator means for displaying the count retained in said latching circuit; and

a control circuit coupled to said radio receiver for stopping said latching circuit from renewing its retaining count at the moment that said radio receiver becomes tuned exactly to a given station signal, and thereafter causing said latching circuit to keep its retaining count unchanged until said radio receiver becomes substantially detuned from said given station signal, whereby the frequency of said given station signal is displayed by said indicator means so long as this station signal is being received by said radio receiver.

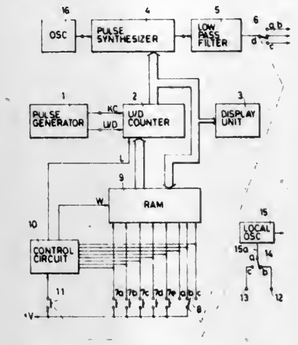
4,232,395

MULTIBAND RADIO RECEIVER WITH ELECTRONIC PRESET TUNING SYSTEM

Tomohisa Yokogawa, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,227
Claims priority, application Japan, Jun. 20, 1977, 52/73120
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—173 **2 Claims**

1. In a multiband radio receiver having an automatic frequency control signal source, a local oscillator, a reference biasing signal source and a digitally controlled preset tuning system which stores digital values corresponding to preset frequencies in response to the operation of a preset switch, the improvement characterized by an AFC switch normally operating to supply the output of said automatic frequency control signal source to said local oscillator, said AFC switch ganged with said preset switch such that when said preset switch is operated, said AFC switch is switched to supply the output of the said reference biasing signal source to said local oscillator, whereby when said preset switch is operated, said local oscillator provides a signal to said radio receiver under the control of said reference bias potential and at all other times provides a signal to said radio receiver under the control of said automatic frequency control signal source.

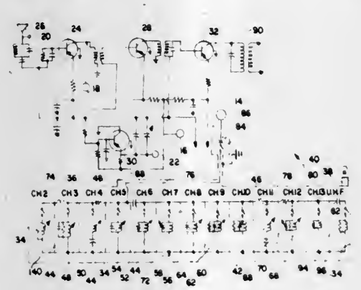


4,232,396

TELEVISION CHANNEL LOCK-OUT APPARATUS

Arnold S. Grimes, 7001 NW. 16th St., Apt. 413 A, Plantation, Fla. 33313

Filed Jul. 14, 1978, Ser. No. 924,633
Int. Cl.³ H04N *5/44*
U.S. Cl. 455—179 **11 Claims**



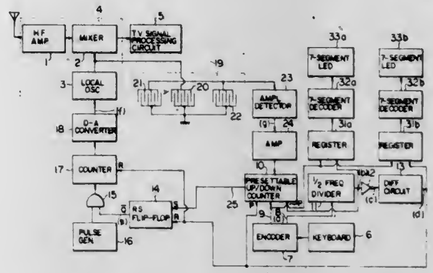
1. A television channel lock-out apparatus comprising a plurality of individual series circuits, each of said plurality of individual series circuits having at least one reactive element in series with an individual switch element, said individual series circuits having one end thereof coupled together, said individual switch element selectively coupling the other end of said individual series circuits together to one end of a parallel electrical circuit, said one end of said individual series circuits coupled to the other end of said parallel circuit, said parallel electrical circuit having said at least one reactive element coupled to one of a plurality of selected portions of a multichannel television receiver circuit and a ground terminal thereof, said plurality of selected portions including a signal antenna terminal, a radio frequency amplifier terminal, a mixer input terminal and a local oscillator terminal of said receiver circuit, means for enabling said individual series circuits to be independently, selectively and concurrently coupled to said selected portion of said television receiver circuit so that said television receiver has a selected number of the otherwise operable channels which are thereby rendered inoperable.

4,232,397

AUTOMATIC CHANNEL SELECTION APPARATUS

Toshinori Murata, and Shigeo Matsuura, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 25, 1978, Ser. No. 936,923
Claims priority, application Japan, Aug. 26, 1977, 52-101750
Int. Cl.³ H04B *1/32*
U.S. Cl. 455—179 **5 Claims**



1. An automatic channel selection apparatus comprising:

an electronic tuner having a local oscillator an oscillation frequency of which is controlled in accordance with an applied voltage;

a voltage sweep circuit for sweeping the voltage to be applied to said local oscillator;

means for deriving from an output of said local oscillator, signals of different phases and combining said signals;

a detector for envelope-detecting an output of said meas; and

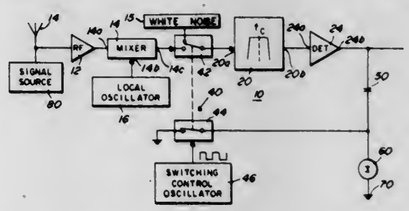
means for counting the number of the output signals of said detector which changes periodically each time the oscillation frequency of said local oscillator changes by a given amount which is inversely proportional to the phase difference between said signals to stop the voltage sweep of said voltage sweep circuit when the count reaches a specified count.

4,232,398

RADIO RECEIVER ALIGNMENT INDICATOR

Larrie A. Gould, Arlington, and Kim W. Reed, Fort Worth, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 9, 1978, Ser. No. 876,386
Int. Cl.³ H04B *1/06*
U.S. Cl. 455—226 **2 Claims**



1. Indicator means for indicating the relative alignment of an FM radio receiver, having a tuned intermediate frequency (IF) stage followed by a detector stage, which detector stage produces an output representative of the change in frequency of a signal applied at its input, comprising:

signal generator means for generating a predetermined frequency alignment signal and a noise source means for generating a random noise signal;

switching means for alternately coupling, at a predetermined rate, the predetermined frequency alignment signal and the noise signal to said IF stage; and

comparator means for comparing the output of said detector

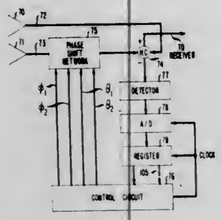
stage responsive to the predetermined frequency alignment signal being coupled to the IF stage with the output of said detector stage responsive to the noise signal being applied to said IF stage and producing an error signal indicative of the tuning of said IF stage with respect to said predetermined frequency alignment signal.

4,232,399

CONTINUOUSLY VARIABLE PHASE SHIFT NETWORK

George L. Helter, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1978, Ser. No. 948,889
Int. Cl.[3] H04B 7/08; H03H 11/20
U.S. Cl. 455—276 8 Claims



5. A variable phase shift network having an input port (1) and an output port (2) including:

a first wavepath (10) including first phase shifting means (11) capable of producing a phase shift that is continuously variable between at least 0 and 180 degrees;

a second wavepath (12) including second phase shifting means (13) capable of producing a phase shift that is continuously variable at least between 180 and 360 degrees; characterized by:

switching means (14) for connecting one or the other of said wavepaths (10 or 12) between the input port (1) and the output port (2) of said network;

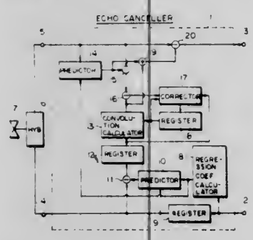
and a control circuit (15) for causing the phase shifts simultaneously produced by said phase shifting means (11, 13) to vary oppositely to each other, and for activating said switching means.

4,232,400

ECHO CONTROL SYSTEM

Seiichi Yamamoto, and Seishi Kitayama, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1979, Ser. No. 37,176
Claims priority, application Japan, May 16, 1978, 53/57129
Int. Cl.[2] H04B 1/16; H03B 1/00
U.S. Cl. 455—305 5 Claims



1. In an echo control system for an adaptive echo canceller which cancels an echo signal while successively estimating the transmission characteristic of an echo path by the use of a received signal to a receiving path and the echo signal passing the echo path from the receiving path and a transmission path, the improvement comprising:

first means connected to the receiving path for developing from the received signal for each of successive predetermined durations an autoregression coefficient in a case of using the received signal as the output of an autoregressive model,

second means connected to the receiving path and the first means for developing a first difference signal between the received signal and a predicted value of the received signal obtained by the use of the autoregression coefficient,

third means connected to the first means and the transmission path for developing a second difference signal between the echo signal and a predicted value of the echo signal produced by the use of the autoregression coefficient,

fourth means operatively connected to the second means and the third means for storing the estimated transmission characteristic of the echo path,

fifth means operatively connected to the second means, the third means and the fourth means for successively correcting the contents of the fourth means in accordance with an identification method by learning by the use of the first difference signal and the second difference signal,

sixth means connected to the fourth means for developing an echo replica, and

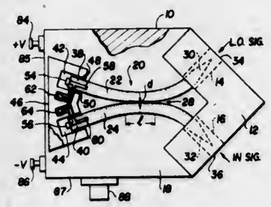
seventh means inserted in the transmission path and connected to the sixth means for subtracting the echo replica from the echo signal to substantially cancel the echo signal.

4,232,401

MILLIMETER WAVE IMAGE GUIDE INTEGRATED BALANCED MIXER

Yu-Wen Chang, Rancho Palos Verdes, and Jeffrey A. Paul, Torrance, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 20, 1979, Ser. No. 67,974
Int. Cl.[3] H04B 1/26
U.S. Cl. 455—328 11 Claims



1. A millimeter image waveguide balanced mixer integrated circuit adapted to be powered from a source of electrical power and coupled to IF amplifier means, comprising in combination:

a metal substrate having a conductive surface defining an image plane;

two adjacent lengths of image guide consisting of dielectric material having a relatively low propagation loss to millimeter wave signals applied thereto and including a layer of metallization on one surface thereof which is bonded to said conductive surface, said length of image waveguides having an intermediate signal coupling region consisting of a slot type of separation of predetermined length and width to provide a signal coupling region;

image waveguide to metal waveguide transition means consisting of a portion of said conductive surface and a metal body having a pair of rectangular or cross-sectional channels formed in one surface thereof which is secured to said conductive surface to form a pair of hollow metal waveguide sections providing first and second signal ports, are

respectively adapted to receive an input signal and a local oscillator signal and wherein like end portions of said two lengths of image guide are respectively tapered and located inside of said metal waveguide sections;

a cavity structure consisting of a metallized body of dielectric material and including a layer of metallization on one surface which is bonded to said conductive surface, said body including two separate cavities, each having metallized outer surfaces and an opening adapted to respectively receive like opposite end portions of said two lengths of image guide and respectively including decoupling slots on either side of said image guide for decoupling the image guides from the respective cavities,

said end portions additionally having conductor line patterns formed on the upper surface of the respective image guides opposite said one surface for coupling IF signals away from said cavities;

an active millimeter wave mixer device located in each of said cavities and including means for being coupled to said source of electrical power and being coupled to said line pattern of the respective image guide for coupling IF signals thereto; and

means coupling IF signals from said respective line patterns to said IF amplifier.

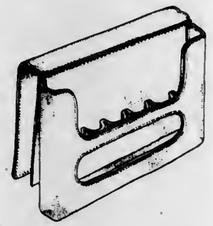
DESIGNS

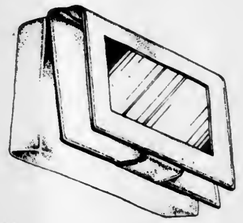
GRANTED NOV. 4, 1980

ERRATA

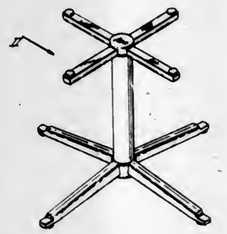
For CLASS	See PATENT NO.
D99-047	257,478

257,471
PURSE
Milton I. Siegel, 767 Weemac Rd., Martinsville, N.J. 08836
Filed May 15, 1978, Ser. No. 906,143
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52





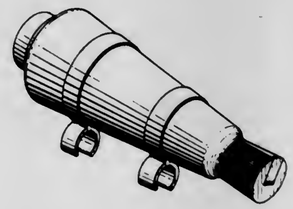
257,472
LOUDSPEAKER STAND
Timothy J. F. Roach, 6 Old Slade La., Iver, Buckinghamshire, England
Filed Dec. 19, 1978, Ser. No. 971,476
Claims priority, application United Kingdom, Jun. 29, 1978, 985234/78
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—29



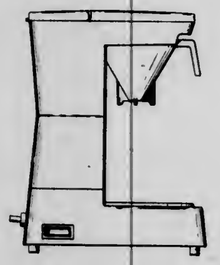
257,473
BAR STOOL
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Oct. 17, 1977, Ser. No. 842,771
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35

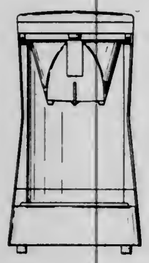


257,474
LIQUID DISPENSER FOR MOUNTING ON SHOWERS
Jacqueline L. McDonald, 5000 Oak St.; Donald C. Eyer, 415 W. 49th Ter., both of Kansas City, Mo. 64112, and Russell S. Jones, 7402 W. 62nd St., Shawnee Mission, Kans. 66202
Filed Oct. 12, 1978, Ser. No. 950,804
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

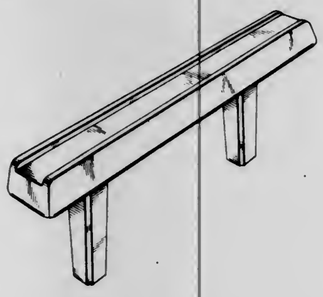


257,475
COFFEEMAKER OR THE LIKE
Detlef M. T. von der Luehe, Repulse Bay, Hong Kong, assignor to Melitta, Inc.
Filed Jul. 19, 1978, Ser. No. 926,002
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—41

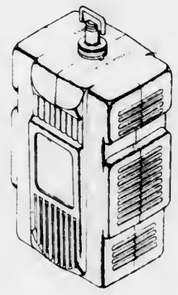




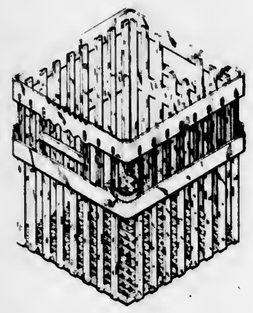
257,476
HANDLE FOR GLASS FIREPLACE SCREEN
W. James Sirois, Beaverton, Oreg., assignor to Pacific Fireplace Furnishings, Inc., Tualatin, Oreg.
Filed Jul. 2, 1979, Ser. No. 53,841
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—316



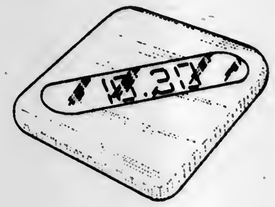
257,477
BOTTLE
Raymond F. DeLuca, 15 Whittaker St., Stamford, Conn. 06902
Filed Mar. 28, 1978, Ser. No. 891,478
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—408



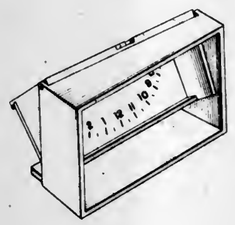
257,478
EGG CRATE OR SIMILAR ARTICLE
James C. Carroll, and Victor D. Johns, both of Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 13, 1978, Ser. No. 959,953
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D99—47



257,479
WATCH
Alain Carré, Paris, France, assignor to Waterman S.A., Paris, France
Filed Oct. 3, 1978, Ser. No. 948,654
Claims priority, application France, Apr. 7, 1978, 78 76482
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30



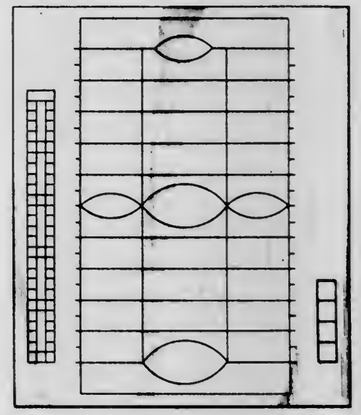
257,480
SUN CLOCK
Scott R. Glendinning, 1731 Tacoma, Berkeley, Calif. 94707
Filed Sep. 25, 1978, Ser. No. 945,186
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—45



257,481
BORING TOOL HOLDER
Samuel Mazliach, Miami, Fla., assignor to Automotive Parts Industries, Inc.
Filed Oct. 2, 1978, Ser. No. 947,777
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140



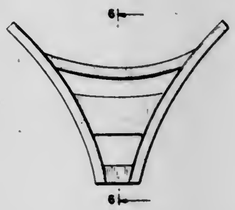
257,482
FOOTBALL GAME DART BOARD
Blake C. Leduc, 1571 E. 195th St., Euclid, Ohio 44117
Filed Apr. 13, 1978, Ser. No. 895,951
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—6



257,483
GAME RACKET THROAT PIECE
Charles A. Drake, San Diego, Calif., assignor to Leach Industries
Filed Feb. 8, 1979, Ser. No. 10,332
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



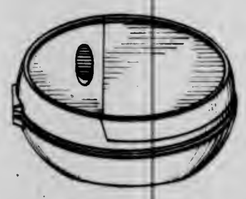
257,484
GAME RACKET THROAT PIECE
Charles A. Drake, San Diego, Calif., assignor to Leach Industries
Filed Feb. 8, 1979, Ser. No. 10,293
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



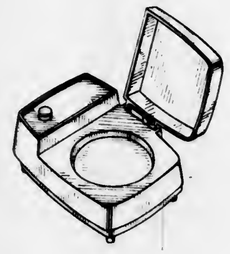
257,485
ROOM HEAT RECIRCULATOR
Lawrence G. Montecalvo, 5845 Shafer Rd., Warren, Ohio 44481
Filed Dec. 26, 1979, Ser. No. 107,451
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



257,486
STERILIZER UNIT
Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.
Filed Feb. 21, 1978, Ser. No. 879,100
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. D24—9



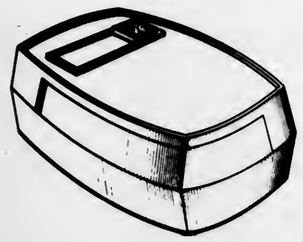
257,487
STERILIZER UNIT
Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.
Filed Feb. 21, 1978, Ser. No. 879,623
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. D24—9



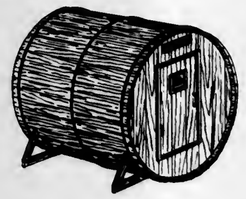
257,488
STERILIZER UNIT
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.
Filed Feb. 21, 1978, Ser. No. 879,713
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. D24—9



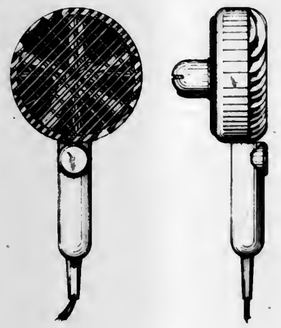
257,489
DISINFECTOR CASING FOR CONTACT LENS OR THE LIKE
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.
Filed Oct. 12, 1978, Ser. No. 951,055
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9



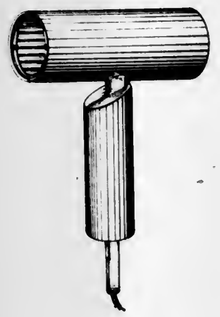
257,490
SAUNA
Ronald C. Davis, 1243 Law St., San Diego, Calif. 92109
Filed Feb. 21, 1979, Ser. No. 13,084
Term of patent 14 years
Int. Cl. D24—*99*; D25—*02*
U.S. Cl. D24—37



257,491
HAIR DRYER
Morison S. Cousins, New York, N.Y., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 18, 1978, Ser. No. 970,743
Term of patent 14 years
Int. Cl. D28—*3*
U.S. Cl. D28—13



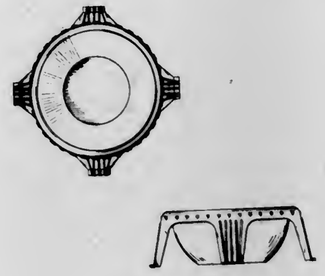
257,492
HAIR DRYER
Morison S. Cousins, New York, and Michael A. Cousins, Huntington, both of N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Dec. 18, 1978, Ser. No. 970,745
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



257,493
DOG HOUSE
Lawrence E. Lodrick, 2436 Harrison Ave. North, Rochester, Mich. 48063
Filed Mar. 5, 1979, Ser. No. 17,123
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



257,494
DISPOSABLE PET DISH
Kathy S. Imhoff, 1609 Anita La., Newport Beach, Calif. 92660
Filed Jan. 4, 1979, Ser. No. 1,012
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



257,495
HOUSING FOR AN ELECTRIC CATTLE PROD
Daniel M. Bros, Edina; William G. Bartel, Wayzata, and LaVerne M. Larsen, Edina, all of Minn., assignors to Hot Shot Products Co., Savage, Minn.
Filed May 29, 1979, Ser. No. 43,481
Term of patent 14 years
Int. Cl. D30—*05*
U.S. Cl. D30—32



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TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF NOVEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & C Boehmer Limited: *See—*
Beard, John M., 4,231,510, Cl. 229-39.00B.

A. P. Green Refractor: *See—*
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A/S Akers Mek. Verksted: *See—*
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A/S Raufoss Ammunisjonsfabrikker: *See—*
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A.W. Faber-Castell: *See—*
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AB Ziristor: *See—*
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Abbott Laboratories: *See—*
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,231,924, Cl. 260-112.50R.
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ABC Elevators, Inc.: *See—*
Harding, Allen W., 4,231,148, Cl. 29-469.000.

Abe, Haruo, to Minolta Camera Kabushiki Kaisha. Variable field curvature lens system. 4,231,636, Cl. 350-175.0FS.

Acampora, Anthony; and Langseth, Rollin E., to Bell Telephone Laboratories, Incorporated. Processor for a TDMA burst modem. 4,232,197, Cl. 370-97.000.

Acampora, Anthony, to Bell Telephone Laboratories, Incorporated. Technique for sharing a plurality of transponders among a same or larger number of channels. 4,232,266, Cl. 370-79.000.

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Ackley, Charles E., Jr.: *See—*
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,231,462, Cl. 198-380.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Capsule positioning guide and associated vacuum manifold for capsule orienting mechanisms. 4,231,462, Cl. 198-380.000.

Acutherm, Inc.: *See—*
Vance, Robert L.; and Noll, Robert W., 4,231,513, Cl. 236-49.000.

Adachi, Akio: *See—*
Yasuda, Katsuya; and Adachi, Akio, 4,232,292, Cl. 340-147.0SY.

Adachi, Keiichi; Shishido, Tadao; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive elements containing anti-color fogging agents. 4,232,114, Cl. 430-504.000.

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Adams, Jerry. Foliage guide. 4,231,185, Cl. 47-1.00R.

Adams, Robert H., to Ocean Technology, Inc. Voice encryption system. 4,232,194, Cl. 179-1.50R.

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Adigamov, Engel R.; Gurvich, Yakov A.; Liakumovich, Alexandr G.; Logutov, Igor J.; Michurov, Jury I.; Polenov, Alexei S.; and Yanshevsky, Vladimir A. Method for removing aluminum-containing catalyst from phenol alkylation products. 4,232,176, Cl. 568-756.000.

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Janssens, Wilhelmus, 4,232,107, Cl. 430-223.000.

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Somekh, Sasson; and Ahlquist, C. Norman, 4,231,811, Cl. 148-1.500.

Ahlrich, Willard K. Filtered ventilating system. 4,231,769, Cl. 55-242.000.

Aihara, Takayuki: *See—*
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Aileo, Jackson A., to Gentex Corporation. Helmet assembly for accurately positioning visual display system. 4,231,117, Cl. 2-6.000.

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Air Products and Chemicals, Inc.: *See—*
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,232,152, Cl. 544-119.000.

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Alf, Herbert; Ernst, Volker; Hainle, Rudi; and Leipelt, Rudolf, to Filterwerke Mann & Hummel GmbH. Device for controlling the intake air temperature of a carburetor-equipped internal combustion engine. 4,231,343, Cl. 123-556.000.

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Allied Chemical Corporation: *See—*
Grey, Roger A.; and Pez, Guido P., 4,232,170, Cl. 560-179.000.
Pez, Guido P., 4,231,948, Cl. 260-429.500.

Allis-Chalmers Corporation: *See—*
Klas, Kenneth H., 4,231,215, Cl. 56-11.600.

Alsberg, Dietrich A., to Bell Telephone Laboratories, Incorporated. Beam-switched traveling wave tube. 4,232,249, Cl. 315-3.600.

Amax Inc.: *See—*
Schaeffer, Bernard J., 4,231,528, Cl. 241-182.000.

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Andreasson, Lars I. Tool for use primarily in conjunction with a rock-breaker unit. 4,231,435, Cl. 173-128.000.
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Antos, George J., to UOP Inc. Attenuated superactive multimetallic catalytic composite. 4,231,897, Cl. 252-441.000.
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Ashes, John R.: *See*—
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Ashley, ugene, to General Electric Company. Ignition system. 4,231,282, Cl. 89-7.000.
Associated Concrete Products, Inc.: *See*—
Dunton, Harvey R., 4,231,801, Cl. 106-97.000.
Astra Lakemedel Aktiebolag: *See*—
Florvall, Gosta L.; and Ogren, Sven O., 4,232,037, Cl. 424-274.000.
Atchison, Cheryle M. Surgical dressing. 4,231,358, Cl. 128-168.000.
Aterianus, John S.; and Crawford, Donald C., to FMC Corporation. Apparatus for accumulating articles such as bags. 4,231,558, Cl. 270-60.000
ATEX/U.S.A., Inc.: *See*—
Giorgetti, Maurizio, 4,231,906, Cl. 260-19.00N.
Atkinson, Ward J.: *See*—
Widdowson, Richard E.; and Atkinson, Ward J., 4,231,713, Cl. 417-222.000.
Atlantic Richfield Company: *See*—
Kao, Jar-lin; and Sheng, Ming N., 4,231,937, Cl. 260-340.200.
Auergesellschaft GmbH: *See*—
Zloczysti, Stefan; and Woike, Bernd, 4,231,360, Cl. 128-201.180.
Auger, Edward J.: *See*—
McGuire, John J.; and Auger, Edward J., 4,231,188, Cl. 47-80.000.
Augier, Robert; Carbonari, Jean P.; and Eliche, Jean, to Societe Anonyme de Recherche et d'Etudes Techniques. Jointing device for long-limbed framework elements in reinforced concrete and framework comprising framework elements jointed by such devices. 4,231,198, Cl. 52-91.000.
Austin, John J., to Champion International Corporation. Package and blank therefor. 4,231,509, Cl. 229-22.000.
Axen, Rolf E. A. V.: *See*—
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., 4,231,999, Cl. 424-1.000.
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., 4,232,119, Cl. 435-7.000.
Aya, Kazim K. Turbocharged engine with pressurized gas recirculation. 4,231,225, Cl. 60-612.000.
Ayache, Michel R.; Delonge, Jean-Claude L.; and Marey, Daniel J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Cooling fluid bleed for axis of turbine rotor. 4,231,704, Cl. 416-95.000.
Babcock & Wilcox Company, The: *See*—
Boll, Richard H., deceased; and Ghering, Walter L., 4,231,262, Cl. 73-861.040.
Babler, Fridolin, to Ciba-Geigy Corporation. Process for the mass coloration of linear polyesters. 4,231,918, Cl. 260-40.00P.
Backx, Leo J. J.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,232,034, Cl. 424-269.000.
Badoz, Jean-Marie; and Merceron, Daniel, to Socapex; and Souriau et Cie. Contact element for insulation pierce type. 4,231,632, Cl. 339-97.00R.
Bahr, Theodor: *See*—
Ortner, Herbert; Bahr, Theodor; and Musselmann, Walter, 4,231,526, Cl. 241-28.000.
Baichtal, James R.: *See*—
McDonald, John C.; Baichtal, James R.; and Ling, Alexander C., 4,232,386, Cl. 370-68.000.
Baird, William C., Jr.: *See*—
Mauldin, Charles H.; and Baird, William C., Jr., 4,231,898, Cl. 252-441.000.
Baisden, C. Robert. Exhaust gas pollution control system. 4,231,763, Cl. 55-1.000.
Baker, William R., to United States of America, Energy. High-voltage crowbar circuit with cascade-triggered series ignitrons. 4,232,351, Cl. 361-56.000.
Bakshi, Kiran R.: *See*—
Paradis, Stephen G.; Marquis, David M.; and Bakshi, Kiran R., 4,231,943, Cl. 260-346.750.
Balch, Duane C. Locking crankcase drain valve assembly. 4,231,544, Cl. 251-144.000.
Baldi, Luciano; Francese, Renato; and Collecchia, Franco, to Rumianca S.p.A. Process for the production of chloro-di (alkylamino)-s-triazines. 4,232,153, Cl. 544-204.000.
Ball Corporation: *See*—
Marcantonio, Arnold F.; and Dailey, Rodney E., 4,232,065, Cl. 427-226.000.
Pardee, Robert P., 4,232,072, Cl. 428-65.000.
Balland, Jean, to Manufacture de Produits Chimiques Protex Societe Anonyme. Dyeing process using a sequestrating agent. 4,231,749, Cl. 8-584.000.
Balligand, Pierre; Corfa, Yves; Lemercier, Pierre; Marchal, Paul; and Vertut, Jean, to Commissariat a l'Energie Atomique. Method and apparatus for mining nodules from beneath the sea. 4,231,171, Cl. 37-54.000.
Banda, Syunji, to Kabushiki Kaisha Suwa Seikosha. Poly-layer liquid crystal display device. 4,231,639, Cl. 350-335.000.
Bandtel, Eberhard: *See*—
Schmidt, Manfred; Bandtel, Eberhard; Traudisch, Walter; Spott, Georg; and Freitag, Dieter, 4,232,134, Cl. 525-506.000.
Banka, Eugene F.: *See*—
Juziuk, Jurgen A.; Mack, Ronald H.; Banka, Eugene F.; and Nicol, Edward A., 4,232,217, Cl. 235-480.000.

Baraff, David R.; and Hobbs, Lawrence H., to Northern Telecom Limited. Thermal printers. 4,232,212, Cl. 219-216.000.
Barbee, Eugene H., to Eastman Kodak Company. Apparatus and method for uniformly heating or cooling a moving web. 4,231,164, Cl. 34-16.000.
Barber, Jacques: *See*—
Guerinault, Jean-Marc; and Barber, Jacques, 4,231,631, Cl. 339-94.00A.
Barber, William H.: *See*—
Beckert, Werner F.; Barber, William H.; and Dengel, Ottmar H., 4,231,891, Cl. 252-188.000.
Bare, W. Wayne, to Bare, W. Wayne. Disposable animal trap. 4,231,180, Cl. 43-61.000.
Barger, Frank L.: *See*—
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,231,459, Cl. 196-46.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Hertell, Siegfried, 4,231,728, Cl. 418-79.000.
Baron, John, to E. T. Oakes Limited. Mixing apparatus. 4,231,666, Cl. 366-304.000.
Barr, Dennis A.; and Rose, John B., to Imperial Chemical Industries Limited. Production of polyarylene ether sulphones and ketones. 4,232,142, Cl. 528-125.000.
Barre, Rene E. L. Apparatus for molding glass objects with tongs and spades. 4,231,779, Cl. 65-323.000.
Barrineau, Wade H., III. Adjustable shelf assembly. 4,231,301, Cl. 108-146.000.
Barron, John W.; and Van Moorsel, William H., to CF Industries, Inc. After-treatment processes and apparatus, especially for urea and ammonium nitrate plants. 4,231,839, Cl. 159-47.0UA.
Bartelink, Everhard H. B. Telephone responder apparatus. 4,232,195, Cl. 179-2.00A.
Bartley, Erle E.: *See*—
Deyoe, Charles W.; and Bartley, Erle E., 4,232,046, Cl. 426-69.000.
Barylo, Ivan I.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.
BASF Aktiengesellschaft: *See*—
Boehlke, Klaus; and Kempter, Fritz E., 4,231,854, Cl. 204-294.000.
Dehnert, Johannes; and Juenemann, Werner, 4,231,746, Cl. 8-680.000.
Hagen, Helmut; and Kohler, Rolf-Dieter, 4,232,165, Cl. 548-339.000.
BASF Wyandotte Corporation: *See*—
Cenker, Moses; and Narayan, Thirumurti L., 4,232,127, Cl. 521-106.000.
Bassignani, Luciano: *See*—
Re, Luciano; Brandt, Alberto; and Bassignani, Luciano, 4,232,169, Cl. 560-174.000.
Bastian, Lloyd E.: *See*—
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., 4,231,505, Cl 228-14.000.
Battelle Memorial Institute: *See*—
Trojer, Felix; and Briggs, John, 4,231,776, Cl. 65-33.000.
Battista, Orlando A. Dental floss and dental aid holder. 4,231,381, Cl. 132-89.000.
Bauer, Peter. Fluidic oscillator with resonant inertance and dynamic compliance circuit. 4,231,519, Cl. 239-102.000.
Bausch & Lomb Incorporated: *See*—
Peck, Theodore H., 4,231,638, Cl. 350-255.000.
Baxter Associates, Inc.: *See*—
Baxter, Kenneth W., 4,231,175, Cl. 40-374.000.
Baxter, Kenneth W., to Baxter Associates, Inc. Variable-visibility filing system. 4,231,175, Cl. 40-374.000.
Baxter, Samuel; and Cuangani, Pushpkumar D., to Monsanto Chemicals Limited. Filter elements. 4,232,130, Cl. 521-143.000.
Bayer Aktiengesellschaft: *See*—
Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, 4,232,132, Cl. 525-222.000.
Hugl, Herbert; and Wolfrum, Gerhard, 4,231,748, Cl. 8-668.000.
Knofel, Hartmut; and Konig, Klaus, 4,231,952, Cl. 260-453.00P.
Kramer, Wolfgang; Buchel, Karl H.; Pflugbeil, Wolf-Dietrich; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,232,033, Cl. 424-269.000.
Schmidt, Manfred; Bandtel, Eberhard; Traudisch, Walter; Spott, Georg; and Freitag, Dieter, 4,232,134, Cl. 525-506.000.
Baysinger, Robert L.: *See*—
Newport, Harry E., Jr.; and Baysinger, Robert L., 4,231,732, Cl. 431-46.000.
BBC Brown, Boveri & Company, Limited: *See*—
Faust, Werner; and Etter, Peter, 4,232,235, Cl. 307-252.00R.
Neidig, Arno; Popp, Gerhard; and Gilbers, Gabriele, 4,232,326, Cl. 357-23.000.
Beard, John M., to A & C Boehmer Limited. Light bulb container. 4,231,510, Cl. 229-39.00B.
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., to Air Products and Chemicals, Inc. Amine salts of tertiary amino acids. 4,232,152, Cl. 544-119.000.
Becher, Manfred; and Sehring, Richard, to Celamerck GmbH & Co. KG. Process for the preparation of 3,6-dichloro-salicyclic. 4,232,172, Cl. 562-423.000.
Becker, Friedbert; Biethan, Gunter; and Kloeber, Peter, to Siemens Aktiengesellschaft. Duplex microwave radio communication system. 4,232,318, Cl. 370-29.000.
Becker, Michael. Device for intramuscular injections, especially of insulin. 4,231,368, Cl. 128-218.00A.
Beckert, Werner F.; Barber, William H.; and Dengel, Ottmar H., to United States of America, Navy. Solid compositions for generation of gases containing a high percentage of hydrogen or its isotopes. 4,231,891, Cl. 252-188.000.
Beckman Instruments, Inc.: *See*—
Chapman, Robert L.; and Harman, John N., III, 4,231,256, Cl. 73-421.50R.
Becton, Dickinson & Company: *See*—
Walsh, J. William; and Bietry, Raymond E., Jr., 4,231,661, Cl. 356-340.000.
Bedford, Alda V., to RCA Corporation. Method of and means for generating complex electrical coding waves for secret communications. 4,232,186, Cl. 178-22.000.
Beecham Group Limited: *See*—
Howarth, Thomas T., 4,232,005, Cl. 424-114.000.
Ponsford, Roger J., 4,232,022, Cl. 424-251.000.
Beerens, Hugo, to Schloemann-Siemag Aktiengesellschaft. Cooling strand for cooling small-section steel. 4,231,382, Cl. 134-64.00R.
Beerens, Hugo; Feldmann, Hugo; and Schlanzke, Claus G., to Schloemann-Siemag Aktiengesellschaft. Apparatus for cooling rapidly moving rolled material. 4,231,553, Cl. 266-113.000.
Beex, Aloysius A., to Starkey Labs, Inc. Moving-average notch filter. 4,232,192, Cl. 179-1.0FS.
Behrendt, Wolfgang; Bohnhage, Detlef; Friedemann, Peter; Frolich, Bernhard; and Orzessek, Reinhold, to Olympia Werke AG. Typewriter ribbon feed mechanism. 4,231,667, Cl. 400-208.000.
Behrens, Dieter: *See*—
Hahn, Reinhard; and Behrens, Dieter, 4,231,790, Cl. 75-0.5BB.
Beier, Alfred: *See*—
Buchholz, Peter; Warnecke, Rolf; and Beier, Alfred, 4,231,727, Cl. 418-76.000.
Beisch, Hans R.; and Hempelmann, Heinrich J., to Norris Industries, Inc. Wheel trim retention means. 4,231,619, Cl. 301-37.00P.
Beizer, Viktor N.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.
Belfiore, Flavio. Alignment tool. 4,231,161, Cl. 33-181.00R.
Belitsky, Anatoly N.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.
Bell Telephone Laboratories, Incorporated: *See*—
Acampora, Anthony; and Langseth, Rollin E., 4,232,197, Cl. 370-97.000.
Acampora, Anthony, 4,232,266, Cl. 370-79.000.
Alsberg, Dietrich A., 4,232,249, Cl. 315-3.600.
Faust, Carl W., 4,232,184, Cl. 174-92.000.
Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., 4,232,328, Cl. 357-49.000.
Heiter, George L., 4,232,399, Cl. 455-276.000.
Netravali, Arun N.; and Robbins, John D., 4,232,338, Cl. 358-136.000.
Ohm, Edward A., 4,232,321, Cl. 343-778.000.
Schmidt, Paul F., 4,231,809, Cl. 148-1.500.
Taylor, Gary N., 4,232,110, Cl. 430-313.000.
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., to Centurion Data Corporation. Check with electrically conductive layer. 4,231,593, Cl. 283-6.000.
Belly, Robert T.: *See*—
Gilman, Paul B., Jr.; Belly, Robert T.; Koszelak, Thaddeus D.; and Zigman, Seymour, 4,232,121, Cl. 435-32.000.
Beloit Corporation: *See*—
Crouse, Jere W., 4,231,272, Cl. 83-98.000.
Goddard, Denis A., 4,232,092, Cl. 428-542.000.
Bendell, Abraham D. Foldable cushioning and support. 4,231,127, Cl. 5-462.000.
Bender, Reinhold H. W., to American Home Products Corporation. Dane salt and process for preparing aminopenicillins therefrom. 4,231,954, Cl. 260-465.00D.
Benedict, Neil W., to Ajax Tool Works, Inc. Pneumatic hammer with twist retainer. 4,231,581, Cl. 279-19.400.
Benson, Jack H.: *See*—
Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., 4,232,129, Cl. 521-137.000.
Bentley, John; and Thompson, Morice W., to Imperial Chemical Industries Limited. Coating compositions. 4,232,135, Cl. 525-509.000.
Berbeco, George R., to Charleswater Products, Inc. Electrically conductive foam and method of preparation and use. 4,231,901, Cl. 252-511.000.
Berent, John G., to Colt Industries Operating Corp. Positive and negative acceleration responsive means and system. 4,232,372, Cl. 364-566.000.

Berg, Alexander: *See—*
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,232,123, Cl. 435-69.000.
Berg, Charles A., to Owens-Illinois, Inc. Solar powered heat pump construction. 4,231,772, Cl. 62-2.000.
Bergen Expo Systems, Inc.: *See—*
Demick, Eugene; and Van Haasteren, Adrian J., Jr., 4,231,643, Cl. 353-86.000.
Bergles, Eduard, to Fichtel & Sachs AG. Derailleur mechanism. 4,231,264, Cl. 474-80.000.
Bergwerksverband GmbH: *See—*
Romey, Ingo; and Kokot, Hellmut, 4,231,856, Cl. 208-39.000.
Berkey-Colortran, Inc.: *See—*
Leon, Gordon T.; and Byron, Joseph L., 4,232,359, Cl. 362-268.000.
Bernacchia, George, Jr., to National Custom Van Corp. Method of converting a van-type vehicle to a multi-passenger commercial transportation vehicle. 4,231,144, Cl. 29-401.100.
Bernacki, Stephen E.: *See—*
Raffel, Jack I.; and Bernacki, Stephen E., 4,231,819, Cl. 148-175.000.
Bernier, Raymond, to International Detection Protection. Electronic lock, the code of which can easily be modified by the user. 4,232,291, Cl. 340-147.0MD.
Bernstein, Seymour: *See—*
Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, 4,232,150, Cl. 536-119.000.
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,231,958, Cl. 260-507.00R.
Berriman, Lester P.: *See—*
Eversole, James F.; and Berriman, Lester P., 4,231,383, Cl. 137-1.000.
Berringer, Robert T.: *See—*
Myron, Donald L.; and Berringer, Robert T., 4,231,843, Cl. 176-50.000.
Betz Laboratories, Inc.: *See—*
Lavin, Walter M.; McFarlane, James I.; and Rose, Dennis L., 4,231,894, Cl. 252-389.00A.
Bevolo, Albert J.: *See—*
Shanks, Howard R.; Bevolo, Albert J.; Danielson, Gordon C.; and Weber, Michael F., 4,232,097, Cl. 429-44.000.
Bibbero, Robert J., to Honeywell Inc. Adaptive sampled-data controller. 4,232,364, Cl. 364-105.000.
Bichsel, Heinz: *See—*
Pirner, Miroslav; Zoller, Heinrich; and Bichsel, Heinz, 4,232,095, Cl. 428-654.000.
Bickford, John H.; and Snyder, Robert F., to Raymond Engineering Inc. Torque wrench with clutches in series. 4,231,454, Cl. 192-4.00R.
Biethan, Gunter: *See—*
Becker, Friedbert; Biethan, Gunter; and Kloeber, Peter, 4,232,318, Cl. 370-29.000.
Bietry, Raymond E., Jr.: *See—*
Walsh, J. William; and Bietry, Raymond E., Jr., 4,231,661, Cl. 356-340.000.
Billottet, Henri: *See—*
Narbaits-Jaureguy, Jean-Raymond; Billottet, Henri; and Granier, Pierre, 4,232,285, Cl. 340-38.00L.
Binsack, Rudolf: *See—*
Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, 4,232,132, Cl. 525-222.000.
Bird, Martin J., to Persons-Majestic Manufacturing Company. Cycle seat and clamp therefor. 4,231,611, Cl. 297-195.000.
Birkeholm, Mogens. Apparatus for braking a train of vehicles. 4,231,442, Cl. 180-14.00R.
Birt, David E., to E M I Limited. Moulding video discs. 4,231,730, Cl. 425-385.000.
Bischoff, Klaus; and Stratton, Richard W., to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule. Process for the production of ceramic plutonium-uranium nuclear fuel in the form of sintered pellets. 4,231,976, Cl. 264-0.500.
Blachly, Donald L.; and Terpstra, Daniel A., to Emerson Electric Co. Portable work bench. 4,231,557, Cl. 269-139.000.
Black Clawson Company, The: *See—*
Zink, Stanley C., 4,231,318, Cl. 118-122.000.
Black, Donald L. Automatic fish snatcher. 4,231,178, Cl. 43-16.000.
Blake, Jon R., to General Mills, Inc. Citrus juice vesicle containing frosting compositions and method of preparation. 4,232,049, Cl. 426-572.000.
Blake, Jon R., to General Mills, Inc. Cooked comestible base containing citrus juice vesicles and method of preparation. 4,232,053, Cl. 426-616.000.
Bland, Gerald F.; and Payne, Guy D., to Outboard Marine Corporation. Actuation means for marine propulsion device transmission. 4,231,316, Cl. 440-86.000.
Blanpain, Guy; and Grandfils, Pierre, to Charbonnages de France. Heavy duty adjustable prop with a ball-and-socket joint. 4,231,672, Cl. 403-62.000.
Blechschmidt, James L.: *See—*
Ekonen, Martin A.; and Blechschmidt, James L., 4,231,554, Cl. 267-65.00D.
Bleys, Cyriacus A.: *See—*
Haski, Andre L.; and Bleys, Cyriacus A., 4,231,255, Cl. 73-379.000.
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., to Polaroid Corporation. Sulfam(na)phthaleins. 4,231,929, Cl. 260-243.300.
Boatwright, John T.; Prince, David G.; Haskett, William F.; and Koch, Helmut, to Summa Four, Inc. Special services add-on for dial pulse activated telephone switching office. 4,232,199, Cl. 179-18.00B.
Bobrowski, Louis G.: *See—*
Amtmann, James S.; and Bobrowski, Louis G., 4,231,626, Cl. 312-350.000.
Bochan, John, to General Electric Company. Washing machine with delayed action drive clutch. 4,231,237, Cl. 68-23.700.
Bock, Erik, to Superfos Emballage. Container seal and closure. 4,231,486, Cl. 220-266.000.
Boehlke, Klaus; and Kempter, Fritz E., to BASF Aktiengesellschaft. Anode for cathodic electrocoating. 4,231,854, Cl. 204-294.000.
Boehringer, John R.; and Lecky, John H. Pulmonary exerciser. 4,231,375, Cl. 128-725.000.
Boehringer Mannheim GmbH: *See—*
Winter, Werner; Hindermayr, Herman; Roesch, Egon; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,232,024, Cl. 424-251.000.
Boeing Commercial Airplane Company: *See—*
Nash, Gilbert J.; and Seidel, Gerhard E., 4,231,481, Cl. 220-1.500.
Boeing Company, The: *See—*
Dickey, Fred M.; White, Jerry R.; and Crill, James, 4,231,656, Cl. 355-71.000.
Ishimitsu, Kichio K.; and Tinoco, Edward N., 4,231,536, Cl. 244-135.00A.
Johnson, Roger F.; and Mitzel, Allen M., 4,231,160, Cl. 33-174.00P.
Painter, Mark C., 4,231,616, Cl. 297-481.000.
Bogan, David B. Underground storage vault. 4,231,482, Cl. 220-5.00A.
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, to Ciba-Geigy Corporation. 1-Phosphorylated 2-(phenoxyalkyl)-2-imidazoline derivatives and their use in pest control. 4,232,011, Cl. 424-200.000.
Bohlin, Nils I., to AB Volvo. Side collision protection system for motor vehicles. 4,231,607, Cl. 296-63.000.
Bohnhage, Detlef: *See—*
Behrendt, Wolfgang; Bohnhage, Detlef; Friedemann, Peter; Frolich, Bernhard; and Orzessek, Reinhold, 4,231,667, Cl. 400-208.000.
Boll, Richard H., deceased (by United National Bank & Trust Co., executor); and Ghering, Walter L., to Babcock & Wilcox Company, The. System for measuring entrained solid flow. 4,231,262, Cl. 73-861.040.
Bollinger, Frederic G., to Monsanto Company. Substituted 2-imino-1,3-dithio and 1,3-oxathio heterocyclic compounds as herbicidal antidotes. 4,231,783, Cl. 71-90.000.
Bondarenko, Alexandr S.: *See—*
Zverev, Anatoly I.; and Bondarenko, Alexandr S., 4,231,518, Cl. 239-81.000.
Boone, David E., to Standard Oil Company (Indiana). Olefin polymerization catalyst. 4,232,138, Cl. 526-122.000.
Bordini, Fosco; and Mauri, Luigi, to Moplefan S.p.A. Polyolefin films with a high resistance to sticking against welding bars having a top coating comprising a combination of an epoxy resin, an acrylic resin and nitrocellulose. 4,232,089, Cl. 428-413.000.
Borg-Warner Corporation: *See—*
Gopalakrishnan, Sankaraiyer; and Kuivinen, William L., 4,231,702, Cl. 415-56.000.
Hallberg, Irving H.; Paul, Howard C.; Ralston, Ronald R.; and Hunninghaus, Roy E., 4,231,335, Cl. 123-440.000.
Born, Billy L.: *See—*
Hinds, Horace, Jr.; Heimerman, David P.; and Born, Billy L., 4,232,051, Cl. 426-582.000.
Born, Thorwald; and Bruning, Karl-Heinz. Polyurethane-based binder system for the production of casting molds or cores. 4,231,914, Cl. 260-31.80N.
Borror, Alan L.: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,231,929, Cl. 260-243.300.
Botzenhardt, Helmut: *See—*
Kern, Horstmar; and Botzenhardt, Helmut, 4,231,207, Cl. 52-730.000.
Boucraut, Frantz M., to Valton S.A. Device for gripping and displacing knitted or woven articles. 4,231,563, Cl. 271-18.300.
Boudreault, Jean-Pierre, to Gaylord Regethermic Canada Ltd. Container. 4,231,490, Cl. 220-354.000.
Bounds, William E. Catcher device for condiment mill. 4,231,527, Cl. 241-169.100.
Bourbon, Jean. Pouring spout with pivoted nonuse position. 4,231,497, Cl. 222-527.000.
Bourgeois, Ronald D. Self-timing automatic conveyor system. 4,231,465, Cl. 198-460.000.
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Bowden, Donald R.; and Sparks, Robert O., to Solar Unlimited, Inc. Interface circuit for adding solar heat to a building heating and cooling system. 4,231,352, Cl. 126-422.000.
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Brabetz, Bernhard; and Hackl, Helmut, to Siemens Aktiengesellschaft. Drill comprised of hard metal for drilling contact holes in circuit boards and the like. 4,231,692, Cl. 408-230.000.
Bradshaw, Michael; and Edwards, Roger D., to Leeds and Northrup Ltd. Thermal printing device with spring support tines. 4,232,325, Cl. 346-76.00R.
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, to Carl Freudenberg, Firma; and R/m GmbH. Method for making water-soluble hydrolyzates of keratinaceous materials. 4,232,123, Cl. 435-69.000.
Brandes, Gunter; Wollner, Johannes; Neier, Wilhelm; and Webers, Werner, to Deutsche Texaco Aktiengesellschaft. Method of conducting reactions in a trickel-type reactor. 4,231,966, Cl. 568-396.000.
Brandes, Wilhelm: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Pflugbeil, Wolf-Dietrich; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,232,033, Cl. 424-269.000.
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Re, Luciano; Brandt, Alberto; and Bassignani, Luciano, 4,232,169, Cl. 560-174.000.
Brandt, Lennart H.; and Mansson, Staffan T., to AB Volvo Penta. Boat propeller device. 4,231,317, Cl. 440-50.000.
Brauer, Melvin; and Kroplinski, Thaddeus F., to NL Industries, Inc. Grease compatible mineral oil extended polyurethane. 4,231,986, Cl. 264-272.000.
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Braukmann, Heinz W., 4,231,386, Cl. 137-117.000.
Braukmann, Heinz W., 4,231,548, Cl. 251-282.000.
Braukmann, Heinz W., to Braukmann Armaturen AG. Differential pressure relief valve. 4,231,386, Cl. 137-117.000.
Braukmann, Heinz W., to Braukmann Armaturen AG. Balance valve disc and seat structure. 4,231,548, Cl. 251-282.000.
Braun, Walter; Burst, Hermann; and Peter, Dietmar, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Automobile bumper. 4,231,600, Cl. 293-128.000.
Breiter, Manfred W.: *See—*
Park, Dong-Sil; Chatterji, Debajyoti; and Breiter, Manfred W., 4,232,098, Cl. 429-104.000.
Brenner, Daniel G.: *See—*
Shepard, Kenneth L.; and Brenner, Daniel G., 4,232,158, Cl. 546-72.000.
Bretzger, Graham. Assembly for and method of making mold and casting of one-piece impellers. 4,231,413, Cl. 164-15.000.
Bridge, John F.: *See—*
Hart, Milburn L.; and Bridge, John F., 4,231,823, Cl. 156-64.000.
Bridges, Wilbur L.: *See—*
Sullivan, Daniel S., III; and Bridges, Wilbur L., 4,231,956, Cl. 260-465.80R.
Briggs, John: *See—*
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Brooks, Forrest E., to Telex Computer Products, Inc. Method of tuning a flyback transformer for minimum ringing. 4,231,150, Cl. 29-593.000.
Browne, Lawrence T. Article placement system. 4,231,153, Cl. 29-739.000.
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Gresens, Harry; and Schuierer, Manfred, 4,231,165, Cl. 34-28.000.
Bruning, Karl-Heinz: *See—*
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Buchel, Karl H.: *See—*
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Buchholz, Peter; Warnecke, Rolf; and Beier, Alfred, to Volkswagenwerk Aktiengesellschaft. Vacuum producing rotary vane pump with shaft lubrication. 4,231,727, Cl. 418-76.000.
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Schreck, Philipp; and Buck, Gerold A., 4,231,977, Cl. 264-33.000.
Buckwalter, Mervin R.; Bulson, Walter T.; and Ray, Leonard N., Jr., to Armstrong Cork Company. Process for shading during the vapor phase dyeing of carpet. 4,231,743, Cl. 8-471.000.
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Muller, Dieter, 4,231,991, Cl. 422-245.000.
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Dowben, Robert M.; and Bunting, James R., 4,231,750, Cl. 23-230.00B.
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Burk, George A.; Reineke, Charles E.; and Wilson, Charles A., to Dow Chemical Company, The. Aqueous antimicrobial composition having improved stability. 4,232,041, Cl. 424-304.000.
Burke, James W.; and Cook, John N., to Kru-Bur, Inc. Cannister mounting bracket. 4,231,391, Cl. 137-343.000.
Burke, Robert G.; and Martin, Robert F., to Control Data Corporation. Method and apparatus for rotating priorities between stations sharing a communication channel. 4,232,294, Cl. 340-147.0LP.
Burke, Thomas P.: *See—*
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,231,593, Cl. 283-6.000.
Burns, David C., to Westinghouse Electric Corp. Tube lock drill tool. 4,231,690, Cl. 408-80.000.
Burns, Richard W. Torch igniter. 4,231,734, Cl. 431-274.000.
Burroughs Corporation: *See—*
Juziuk, Jurgen A.; Mack, Ronald H.; Banka, Eugene F.; and Nicol, Edward A., 4,232,217, Cl. 235-480.000.
Saunders, Michael A.; and Irwin, Robert W., 4,232,356, Cl. 361-415.000.
Burroughs Wellcome Co.: *See—*
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Burst, Hermann: *See—*
Braun, Walter; Burst, Hermann; and Peter, Dietmar, 4,231,600, Cl. 293-128.000.
Burth, Rolf-Dieter: *See—*
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Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,231,841, Cl. 162-5.000.
Buske, Gary R., to Dow Chemical Company, The. Aminoalkylation of aromatic polymers using aldehyde, diacylamine and strong acid catalyst. 4,232,125, Cl. 521-32.000.
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Chapman, Richard A.; Buss, Dennis D.; and Kinch, Michael A., 4,231,149, Cl. 29-578.000.
Butler, James K. Microtomy knife breaker. 4,231,503, Cl. 225-2.000.
Button, Peter A. Range finder. 4,231,162, Cl. 33-284.000.
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Versluis, Ronald, 4,231,395, Cl. 137-514.700.
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Leon, Gordon T.; and Byron, Joseph L., 4,232,359, Cl. 362-268.000.
Byun, Dong J. Automatic soda-acid fire extinguisher system. 4,231,430, Cl. 169-57.000.
C M Industries: *See—*
Lombard, Jean-Pierre, 4,232,020, Cl. 424-248.560.
C. R. Bard, Inc.: *See—*
Young, Joe W.; and Odenthal, Charles, 4,231,973, Cl. 261-78.00A.
Cahoy, Roger P., to Gulf Oil Corporation. 2-Acylaminothiazol-4-ylacetamides as post emergent selective herbicides. 4,232,163, Cl. 548-195.000.
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, to Montedison S.p.A. Process for the de-inking of printed waste paper. 4,231,841, Cl. 162-5.000.
Campanella, Matthew J.; Maladra, Anthony; and Goldberg, Bennett C., to MKD Corporation. Waiter/table control for electronic cash registers. 4,231,511, Cl. 235-375.000.
Campanini, Sergio, to Echlin Manufacturing Company, The. Brake actuators. 4,231,286, Cl. 92-64.000.
Campbell, Alexander C.; Hewett, Colin L.; and Zeelen, Filippus J., to Akzona Incorporated. Di-Carboxylic acid derivatives. 4,232,042, Cl. 424-308.000.
Campbell, Ivor E.; Henderson, James M.; Johnson, Walter; and Wetherill, William H., to Smelter Control Research Association, Inc. Ammonia double-alkali process for removing sulfur oxides from stack gases. 4,231,995, Cl. 423-242.000.
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Lintell, Robert J.; and Campbell, James D., 4,231,534, Cl. 244-3.160.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Hara, Elmer H.; and Ozeki, Takeshi, 4,232,385, Cl. 370-3.000.
Canadian Industries Limited: *See—*
Istvanffy, Stephen M.; and Linse, Vonne D., 4,231,506, Cl. 228-109.000.
Canino, Lawrence S., to MCA Discovision, Inc. Dithered center tracking system. 4,232,201, Cl. 179-100.10G.
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Ichikawa, Junji; Takahashi, Yuji; and Saito, Jun, 4,231,565, Cl. 271-105.000.
Caplan, Sidney W.; and Molson, William N., to Component Systems, Inc. Building system employing prefabricated wall panels. 4,231,197, Cl. 52-36.000.
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Diana, Guy D.; and Carabateas, Philip M., 4,232,161, Cl. 546-279.000.
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Carciello, Neal: *See—*
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Carey, David L.: *See—*
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Carl Still GmbH & Co. KG, Firma: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, 4,231,844, Cl. 201-34.000.
Carlberg, Bob L.; and Hart, Robert A., to Conoco, Inc. Permanent cobalt catalyst for sulfite oxygen scavenging. 4,231,869, Cl. 210-763.000.
Carlen, Eric T. Delivery control system for vehicle-mounted spreader. 4,232,255, Cl. 318-143.000.
Carlin, William W., to PPG Industries, Inc. Method of preparing a cathode electrocatalyst. 4,231,813, Cl. 148-6.300.
Carlson, Robert C., to Minnesota Mining and Manufacturing Company. Ester solutions of complex salts. 4,231,886, Cl. 252-117.000.
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., to Pharmacia Diagnostics AB. Method in assaying methods involving biospecific affinity reactions and reagent for use in said method. 4,231,999, Cl. 424-1.000.
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., to Pharmacia Diagnostics AB. Reagent for use in immunochemical assay methods. 4,232,119, Cl. 435-7.000.
Carlsson, Per-Olov A. V.; and Stenberg, Kaj O., to Gambro AB. Diffusion apparatus utilizing tubular semi-permeable membrane. 4,231,875, Cl. 210-232.000.
Carlsson, Per-Olov A. V.; and Stenberg, Kaj O., to Gambro AB. Assembly for the closure of the end of a flattened tube. 4,231,880, Cl. 210-321.00B.
Carlstrom, William L.; and Maechtle, Gary L., to Freeman Chemical Corporation. Flexible polyurethane foam having a low flame spread index. 4,232,085, Cl. 428-315.000.
Caron, Roger L.; Clifford, Peter J.; and Germain, Francis R., to EG & G, Inc. Underwater mapping apparatus and method. 4,232,380, Cl. 367-88.000.
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Manfroni, Ezio, 4,231,547, Cl. 251-210.000.
Carrier Corporation: *See*—
Eaton, Burrows P.; and Wright, William, 4,231,421, Cl. 165-68.000.
Galvin, Michael E.; and Whitwell, Robert J., 4,231,228, Cl. 62-77.000.
Gratzer, Nelson R.; and Wright, William E., 4,231,230, Cl. 62-503.000.
Ripka, Chester D., 4,231,417, Cl. 165-3.000.
Carstens, Marion R., to Georgia Tech Research Institute. Air-actuated pipeline transportation system with wheeled vehicles. 4,231,689, Cl. 406-155.000.
Carter, James A.: *See*—
Bovier, Edward M.; and Carter, James A., 4,231,803, Cl. 106-213.000.
Carter, Neil A., to Owens-Corning Fiberglas Corporation. Method of making jacketed foam pipe insulation. 4,231,825, Cl. 156-78.000.
Carter, Walter H.; and Sides, Jerry L., to Texaco Inc. Method of using tracer fluids for enhanced oil recovery. 4,231,426, Cl. 166-252.000.
Carternock, Frederick A., to Integrated Technology Limited. Paving machines. 4,231,678, Cl. 404-103.000.
Casabona, Richard J.: *See*—
Levy, John V.; Rodgers, David P.; Stewart, Robert E.; and Casabona, Richard J., 4,232,366, Cl. 364-200.000.
Cascade Steel Rolling Mills, Inc.: *See*—
Stevens, Joel B.; and Wirfs, Mark C., 4,232,066, Cl. 427-430.100.
Cash, Theodore P.: *See*—
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Casma Di V. Marinoni & Figli: *See*—
Schoker, Hans, 4,231,134, Cl. 16-49.000.
Castoe, John H. Jack adapter for front end alignments. 4,231,550, Cl. 254-124.000.
Casutt, Max: *See*—
Heffner, George R.; and Casutt, Max, 4,231,556, Cl. 269-22.000.
Caterpillar Tractor Co.: *See*—
Cobb, Delwin E.; and Young, Maurice E., 4,231,726, Cl. 418-75.000.
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Becher, Manfred; and Sehring, Richard, 4,232,172, Cl. 562-423.000.
Cenker, Moses; and Narayan, Thirumurti L., to BASF Wyandotte Corporation. Furan-modified isocyanurate foams. 4,232,127, Cl. 521-106.000.
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Okino, Seiki; Nakata, Kunio; Yanai, Tosiharu; and Kandachi, Takayoshi, 4,232,062, Cl. 427-160.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Paulus, Philippe; and Hancart, Jules, 4,231,812, Cl. 148-6.15R.
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Mengoli, Giuliano; Daolio, Sergio; Giulio, Ugo; and Folonari, Carlo, 4,231,851, Cl. 204-181.00R.
Urbinati, Mario; and Conti, Luigi, 4,231,344, Cl. 123-518.000.
Centurion Data Corporation: *See*—
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,231,593, Cl. 283-6.000.
Ceprini, Mario Q.; Collins, John D.; Hoch, Samuel; and Wood, Donald A., to Albright & Wilson Limited. Process for preparing organotin esters. 4,231,949, Cl. 260-429.700.
CF Industries, Inc.: *See*—
Barron, John W.; and Van Moorsel, William H., 4,231,839, Cl. 159-47.0UA.
Chaki, Eiichi; Chiba, Taneaki; and Sato, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Aircraft landing-guiding apparatus. 4,232,316, Cl. 343-108.00R.
Challenger, Inc.: *See*—
Ellmore, John W., 4,231,191, Cl. 49-28.000.
Champion International Corporation: *See*—
Austin, John J., 4,231,509, Cl. 229-22.000.
Champion Spark Plug Company: *See*—
Shaffer, Donald O., 4,232,055, Cl. 427-33.000.
Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Position determining system. 4,231,260, Cl. 73-597.000.
Chan, Ka-Kong; and Pawson, Beverly A., to Hoffmann-La Roche Inc. Fluorinated polyenes. 4,231,944, Cl. 260-347.400.
Chandon Investment Planning Ltd.: *See*—
Thoma, Hans A., 4,231,989, Cl. 422-63.000.
Chang, Clarence D.; Lang, William H.; and LaPierre, Rene B., to Mobil Oil Corporation. Synthesis of alkyl and alkylaminonitriles. 4,231,955, Cl. 260-465.100.
Chang, Ifay F.; and Shafer, Merrill W., to International Business Machines Corporation. Manganese doped zinc silicate luminescent phosphors with III-V oxide substitutions. 4,231,892, Cl. 252-301.60F.
Chang, Kwen-Jen: *See*—
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, 4,231,923, Cl. 260-112.50R.
Chang, Yu-Wen; and Paul, Jeffrey A., to United States of America, Army. Millimeter wave image guide integrated balanced mixer. 4,232,401, Cl. 455-328.000.
Chapman, John F., to Rolls-Royce Limited. Multi-layer acoustic linings. 4,231,447, Cl. 181-213.000.
Chapman, Richard A.; Buss, Dennis D.; and Kinch, Michael A., to Texas Instruments Incorporated. Narrow band-gap semiconductor CCD imaging device and method of fabrication. 4,231,149, Cl. 29-578.000.
Chapman, Robert L.; and Harman, John N., III, to Beckman Instruments, Inc. Thermoelectric gas dryer. 4,231,256, Cl. 73-421.50R.
Charbonnages de France: *See*—
Blanpain, Guy; and Grandfils, Pierre, 4,231,672, Cl. 403-62.000.
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Dixon, Robert W., 4,231,387, Cl. 137-218.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Chamuel, Jacques R., 4,231,260, Cl. 73-597.000.
Charleswater Products, Inc.: *See*—
Berbeco, George R., 4,231,901, Cl. 252-511.000.
Chatterji, Debajyoti: *See*—
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Chavannes, Marc A. Reinforced paper product and method for the manufacturing thereof. 4,232,074, Cl. 428-110.000.
Cheek, Edward E., to Dravo Corporation. Dry stacker and reclaimer. 4,231,467, Cl. 198-508.000.
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Smith, Lawrence A., Jr., 4,232,177, Cl. 585-324.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Kaufhold, Manfred; Hepp, Dieter; and Menzel, Gerhard, 4,231,915, Cl. 260-31.80R.
Magiera, Leonhardt; Grundmann, Raban; and Krockenberger, Dieter, 4,231,968, Cl. 570-109.000.
Chemsoil Corporation: *See*—
Collins, Dwight D., 4,231,780, Cl. 71-40.000.
Chen, Nai Y.; Miale, Joseph N.; and Reagan, William J., to Mobil Oil Corporation. Method of producing a steam stable aluminosilicate zeolite catalyst. 4,231,899, Cl. 252-455.00Z.
Cheng, Richard C. M. Track section for model vehicles. 4,231,517, Cl. 238-10.00F.
Cheng, Yao-Hui. Enamelled basin structure. 4,231,123, Cl. 4-651.000.
Chepurnykh, Sergei F.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.
Cherkson, Leonard A., to Mount Isa Mines Limited. Borehole direction measurement means. 4,231,252, Cl. 73-151.000.
Chevron Research Company: *See*—
Paradis, Stephen G.; Marquis, David M.; and Bakshi, Kiran R., 4,231,943, Cl. 260-346.750.
Chiba, Hideo; Sasaki, Ryuzo; Yoshikawa, Masaaki; Takahashi, Naofumi; Sugimoto, Etsuro; and Samejima, Hirotoshi, to Kyowa Hakko Kogyo Co., Ltd. Enzymatic improvement of protein flavor. 4,232,044, Cl. 426-44.000.
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Chaki, Eiichi; Chiba, Taneaki; and Sato, Tetsuo, 4,232,316, Cl. 343-108.00R.
Chihara, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece battery monitoring circuit. 4,232,383, Cl. 368-66.000.
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Nikolov, Ivan D.; Chorbov, Iliya G.; and Peychev, Ivan M., 4,231,416, Cl. 164-318.000.
Christensen, Burton G.; Leanza, William J.; and Wildonger, Kenneth J., to Merck & Co., Inc. Substituted N-methylene derivatives of thienamycin sulfoxide and sulfone. 4,232,030, Cl. 424-263.000.

Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 6-, 1- and 2-Substituted-1-carbadethiapen-2-em-3-carboxylic acids. 4,232,036, Cl. 424-274.000.
Christensen, Fredrich M. Apparatus for draining a cooling system. 4,231,384, Cl. 137-62.000.
Christensen, Inc.: *See*—
Swersky, Gerald S.; and Mason, Keith J., 4,231,437, Cl. 175-325.000.
Chrysler Corporation: *See*—
Teague, Kenneth W., 4,231,390, Cl. 137-315.000.
Chuard, Marcel: *See*—
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Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.
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Chyron Corporation: *See*—
Agneta, Roi D., 4,232,311, Cl. 340-703.000.
Ciba-Geigy Corporation: *See*—
Babler, Fridolin, 4,231,918, Cl. 260-40.00P.
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,232,011, Cl. 424-200.000.
Koller, Stefan, 4,231,942, Cl. 260-346.710.
Marky, Michael, 4,231,957, Cl. 260-505.00C.
Model, Ernst, 4,231,931, Cl. 260-325.0PH.
Moser, Paul, 4,231,921, Cl. 260-45.75R.
Reinehr, Dieter; and Gsell, Laurenz, 4,231,962, Cl. 564-272.000.
Rody, Jean; and Rasberger, Michael, 4,232,131, Cl. 525-184.000.
Cities Service Company: *See*—
Ort, Morris R., 4,232,140, Cl. 526-129.000.
Citizen Watch Co., Ltd.: *See*—
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Clark Equipment Company: *See*—
Tapley, David R., 4,232,370, Cl. 364-478.000.
Clark, Grady W.; Holder, John D.; and Pasto, Arvid E., to United States of America, Energy. Internal zone growth method for producing metal oxide metal eutectic composites. 4,231,796, Cl. 75-206.000.
Clausen, Dieter; and Uhlemayr, Albert, to Michael Huber Munchen, GmbH. Manufacture and use of heat transfer printings. 4,231,742, Cl. 8-470.000.
Clifford, Peter J.: *See*—
Caron, Roger L.; Clifford, Peter J.; and Germain, Francis R., 4,232,380, Cl. 367-88.000.
Cline, Warren K.; and Martin, Richard H., to Olin Corporation. Wrapper for smoking articles containing magnesium oxide. 4,231,377, Cl. 131-9.000.
Close, Albert R., to American Safety Equipment Corporation. Automatic retractor inhibitor. 4,231,591, Cl. 280-806.000.
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, to Sandoz Ltd. Phenyl- or cycloalkyl-benzo-oxacyclic compounds. 4,232,039, Cl. 424-278.000.
Clouser, David E.; and Engel, Steven J., to Hewlett-Packard Company. Method for extending transistor logarithmic conformance. 4,232,233, Cl. 307-229.000.
Coast Catamaran France S.A.: *See*—
Pelletier, Jean, 4,231,309, Cl. 114-162.000.
Cobb, Delwin E.; and Young, Maurice E., to Caterpillar Tractor Co. Gear pump having fluid deaeration capability. 4,231,726, Cl. 418-75.000.
Cohen, Floraine. Pet accessory for use with a commode. 4,231,321, Cl. 119-1.000.
Cole-Parmer Instrument Company: *See*—
Hogan, Lawrence R., 4,231,725, Cl. 417-477.000.
Coleman, John D., to Commonwealth Scientific and Industrial Research Organization. Reconsolidated wood product. 4,232,067, Cl. 428-17.000.
Coll, Antonio L. P.; and Meseguer, Jose D., to Antibiotics, S.A. P-Substituted N,N'-bis-(3-oxazolidinyl-2-one)phosphoramides and process for the preparation thereof. 4,232,162, Cl. 548-111.000.
Collecchia, Franco: *See*—
Baldi, Luciano; Francese, Renato; and Collecchia, Franco, 4,232,153, Cl. 544-204.000.
Collender, Robert B. Stereoscopic motion picture-circular to linear scan translator-method and apparatus. 4,231,642, Cl. 352-58.000.
Collins, Dwight D., to Chemsoil Corporation. Treatment of phosphate rock on soil in situ with sulfuric acid. 4,231,780, Cl. 71-40.000.
Collins, John D.: *See*—
Ceprini, Mario Q.; Collins, John D.; Hoch, Samuel; and Wood, Donald A., 4,231,949, Cl. 260-429.700.
Coloplast International A/S: *See*—
Sorensen, Erik L.; and Larsen, Hans-Ole, 4,231,369, Cl. 128-283.000.
Colt Industries Operating Corp: *See*—
Berent, John G., 4,232,372, Cl. 364-566.000.
Colwell, William W. Hydraulic pump system. 4,231,714, Cl. 417-229.000.
Comercial e Industrial Sound-Tronic Ltd.: *See*—
Rojas, Hernan H., 4,232,204, Cl. 179-115.50R.
Cominco Ltd.: *See*—
Hirsch, Horst E.; and Smyth, Robert W., 4,231,981, Cl. 264-102.000.
Commissariat a l'Energie Atomique: *See*—
Balligand, Pierre; Corfa, Yves; Lemercier, Pierre; Marchal, Paul; and Vertut, Jean, 4,231,171, Cl. 37-54.000.
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Coleman, John D., 4,232,067, Cl. 428-17.000.
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Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Helle, Michel, 4,232,216, Cl. 235-449.000.
Component Systems, Inc.: *See*—
Caplan, Sidney W.; and Molson, William N., 4,231,197, Cl. 52-36.000.
Compton, Peter A.; and Wood, John G., to Mars Limited. Plastics containers. 4,231,476, Cl. 206-519.000.
Congoleum Corporation: *See*—
Stetson, John R.; Graham, Alan A.; and Frisch, Rudolf, 4,232,076, Cl. 428-158.000.
Conoco, Inc.: *See*—
Carlberg, Bob L.; and Hart, Robert A., 4,231,869, Cl. 210-763.000.
Conrow, Ransom B.: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,231,958, Cl. 260-507.00R.
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Mengoli, Giuliano; Daolio, Sergio; Giulio, Ugo; and Folonari, Carlo, 4,231,851, Cl. 204-181.00R.
Conti, Luigi: *See*—
Urbinati, Mario; and Conti, Luigi, 4,231,344, Cl. 123-518.000.
Continental Group, Inc., The: *See*—
Hasegawa, Gary K., 4,231,487, Cl. 220-269.000.
Newman, Fred C., 4,231,605, Cl. 294-87.200.
Continental Oil Company: *See*—
Kulik, Metro D., 4,231,996, Cl. 423-242.000.
Lancet, Michael S.; and Curran, George P., 4,231,760, Cl. 48-197.00R.
Control Data Corporation: *See*—
Burke, Robert G.; and Martin, Robert F., 4,232,294, Cl. 340-147.0LP.
Cook, John N.: *See*—
Burke, James W.; and Cook, John N., 4,231,391, Cl. 137-343.000.
Cooper, Edgar R.: *See*—
Adams, Halbert E.; Cooper, Edgar R.; Ford, Lowell D.; Johnson, Delbert C.; and Warren, Gregory L., 4,232,378, Cl. 367-36.000.
Cooper, Izates C., to Myers, Lawrence F. Guide line holder. 4,231,156, Cl. 33-1.0LE.
Cooper, William J., to International Telephone and Telegraph Corporation. Method of making a bellows. 4,231,824, Cl. 156-73.100.
Cooperation Pharmaceutique Francaise: *See*—
Durlach, Jean P., 4,232,054, Cl. 426-618.000.
Copal Company Limited: *See*—
Saito, Toshihisa; and Inoue, Nobuyoshi, 4,231,650, Cl. 354-246.000.
Cordis Dow Corp.: *See*—
Lipps, Bennie J.; Murphy, William P., Jr.; and Mather, Frank W., III, 4,231,871, Cl. 210-87.000.
Corfa, Yves: *See*—
Balligand, Pierre; Corfa, Yves; Lemercier, Pierre; Marchal, Paul; and Vertut, Jean, 4,231,171, Cl. 37-54.000.
Cornell-Hoskinson Manufacturing Corp.: *See*—
Hoskinson, Gordon H., 4,231,304, Cl. 110-257.000.
Corning Glass Works: *See*—
Lawless, William N., 4,231,231, Cl. 62-514.00R.
Lipp, George D., 4,231,371, Cl. 128-303.100.
Cornish, Robert N., to Holset Engineering Company Limited. Thermostatically controlled fan clutch. 4,231,457, Cl. 192-82.00T.
Corrigan, Francis R., to General Electric Company. Large boron nitride abrasive particles. 4,231,980, Cl. 264-84.000.
Corris, Charles J.; Hollingsworth, Charles M.; Kosicki, Witold W.; and Potter, Robert T., to Horsman Dolls Inc. Remote-control doll assembly. 4,231,184, Cl. 46-265.000.
Corsetti, Richard M., to Craig Systems Corporation. Demountable transporter for containers. 4,231,709, Cl. 414-458.000.
Cosley, John V.: *See*—
Chung, David H.; and Cosley, John V., 4,232,374, Cl. 364-900.000.
Cottatellucci, Ezio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Data-transmission system using binary split-phase code. 4,232,387, Cl. 371-47.000.
Cotton, Incorporated: *See*—
Winch, Allen R., 4,231,129, Cl. 8-149.100.
Coutinho de Assis, Ruy: *See*—
Valladares Barrocas, Helcio V; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, 4,232,179, Cl. 585-640.000.
Cowx, Henry; and Urbain, Jean-Luc. Rubber latex compounds. 4,231,912, Cl. 260-29.7SQ.
CRAF Sud: *See*—
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,231,927, Cl. 260-239.100.
Craig, James C.: *See*—
Wilson, James F.; and Craig, James C., 4,231,827, Cl. 156-214.000.
Craig Systems Corporation: *See*—
Corsetti, Richard M., 4,231,709, Cl. 414-458.000.
Crawford, Donald C.: *See*—
Aterianus, John S.; and Crawford, Donald C., 4,231,558, Cl. 270-60.000.

Crawford, Thomas C., to Pfizer Inc. Preparation of ascorbic acid intermediates. 4,232,168, Cl. 560-174.000.
Crawley, Lantz S.: *See—*
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,231,935, Cl. 260-326.50B.
Crill, James: *See—*
Dickey, Fred M.; White, Jerry R.; and Crill, James, 4,231,656, Cl. 355-71.000.
Crookston, James A., to A. P. Green Refractor. High density low porosity refractory product and process for making the same. 4,231,978, Cl. 264-63.000.
Crotzer, Milburn E.: *See—*
Lang, Glenn E.; Crotzer, Milburn E.; and Fuoto, John S., 4,231,328, Cl. 122-504.000.
Crouse, Jere W., to Beloit Corporation. Trim chute and method. 4,231,272, Cl. 83-98.000.
Croxton, John M., to J. Nesbit-Evans & Co. Ltd. Hospital beds. 4,231,124, Cl. 5-63.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
De Padova, Salvatore; Pagana, Enrico; and Rosenga, Giorgio, 4,232,322, Cl. 343-781.00P.
Fabri, Bruno, 4,232,272, Cl. 330-294.000.
Cuangani, Pushpkumar D.: *See—*
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Cuatrecasas, Pedro: *See—*
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, 4,231,923, Cl. 260-112.50R.
Cuomo, Jerome J.; Gangulee, Amitava; and Kobliska, John, to International Business Machines Corporation. Amorphous metallic and nitrogen containing alloy films. 4,231,816, Cl. 148-31.550.
Curran, George P.: *See—*
Lancet, Michael S.; and Curran, George P., 4,231,760, Cl. 48-197.00R.
Czajkowski, Albert J.; and Schafer, David E., to Monsanto Company. Compositions and methods for reducing herbicidal injury. 4,231,786, Cl. 71-100.000.
Dadea, Giovanni M.: *See—*
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,231,841, Cl. 162-5.000.
Dahle, Orvar; Einarsson, Olov; Lindkvist, Folke; and Valdemarsson, Stefan, to ASEA Aktiebolag. Method and apparatus for attaching two objects. 4,231,145, Cl. 29-432.000.
Dahn, C. James; Morita, Douglas R.; and Tulis, Allen J., to United States of America, Air Force. Submissile disposal system. 4,231,293, Cl. 102-7.200.
Dailey, Rodney E.: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
Forster, Hans-Joachim, 4,231,295, Cl. 104-245.000.
Frankle, Gerhard; and Woschee, Dieter, 4,231,346, Cl. 123-457.000.
Haberle, Fritz; Riechers, Daniel; and Heusel, Richard, 4,231,601, Cl. 293-136.000.
Krugener, Rolf; and Kurth, Hermann W., 4,231,244, Cl. 70-422.000.
Scherenberg, Hans O.; and Andres, Rudolf, 4,231,592, Cl. 280-808.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Sakamoto, Seiya; Hohki, Tetsuo; and Saito, Isao, 4,232,344, Cl. 358-298.000.
Dalton, Raymond F., to Imperial Chemical Industries Limited. Composition used for extracting copper from aqueous copper salts. 4,231,888, Cl. 252-182.000.
Daniel, Don H. Automotive keyless security system. 4,232,289, Cl. 340-64.000.
Danielson, Gordon C.: *See—*
Shanks, Howard R.; Bevolo, Albert J.; Danielson, Gordon C.; and Weber, Michael F., 4,232,097, Cl. 429-44.000.
Daolio, Sergio: *See—*
Mengoli, Giuliano; Daolio, Sergio; Giulio, Ugo; and Folonari, Carlo, 4,231,851, Cl. 204-181.00R.
Data Information Systems Corporation: *See—*
McConnell, George B., 4,232,295, Cl. 340-152.00R.
Daugiras, Kristupas; and Elguindy, Samir M., to Vapor Corporation. Linear output force door operator. 4,231,192, Cl. 49-363.000.
Davidson, William W., Jr., to North Shore Precision Research Corporation. Printing press. 4,231,291, Cl. 101-137.000.
Davies, Alan: *See—*
Boyle, Francis T.; and Davies, Alan, 4,232,032, Cl. 424-269.000.
Davis, Carl W.; and Murray, Joseph E., Jr., to Polaroid Corporation. Camera with telescoping dual actuators. 4,231,645, Cl. 354-145.000.
Davis, Kerwin L., to Esco Corporation. Excavating tooth. 4,231,173, Cl. 37-142.00R.
Davis, Kirk E., to Lubrizol Corporation, The. Nitro phenol-amine condensates, methods of making same, fuels and additive concentrates containing them. 4,231,757, Cl. 44-63.000.
Davy-Loewy Ltd.: *See—*
Middleton, Anthony E.; and McQuillin, Brian, 4,231,701, Cl. 414-730.000.
Day, William H., to National Research Development Corporation. Endoprosthetic orthopaedic devices. 4,231,120, Cl. 3-1.910.
Dayco Corporation: *See—*
Ensley, Rufus N.; Haren, Doyle V.; Logan, Arthur D.; and McLean, Michael E., 4,231,835, Cl. 156-361.000.
de Blok, Jan F.: *See—*
Vander, Timen; Thijssen, Nicolaas J.; de Blok, Jan F.; and Middel, Jan, 4,231,845, Cl. 202-113.000.
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Schletter, Peter, 4,231,324, Cl. 119-14.170.
de Castro M. da Silva, Joao B.: *See—*
Valladares Barrocas, Helcio V; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, 4,232,179, Cl. 585-640.000.
Dechenne, Roger; and Hubert, Guy, to Solvay & Cie. Hollow article made of an oriented thermoplastic. 4,231,483, Cl. 220-66.000.
Decker, Forrest W.: *See—*
Kenton, Hobart E.; and Decker, Forrest W., 4,232,218, Cl. 250-222.0PC.
Deep Steam Extraction (1974) Ltd.: *See—*
Probost, Miroslav, 4,231,133, Cl. 15-300.00A.
De Felice, Wilfried, to Hoechst Aktiengesellschaft. Blister package for medicaments safe from children. 4,231,477, Cl. 206-532.000.
Dehnert, Johannes; and Juenemann, Werner, to BASF Aktiengesellschaft. Dyeing of cellulose-containing textile material and novel dyes for use therein. 4,231,746, Cl. 8-680.000.
DeLacy, James P.; and Lechner, Robert H., to Gould Inc. Voltage sensing and load measuring automatic reclosing system for D-C circuit breakers. 4,232,232, Cl. 307-139.000.
Delgado, Luis D., to Vicon Espana S.A. Rake with pivotable arms. 4,231,218, Cl. 56-377.000.
Delonge, Jean-Claude L.: *See—*
Ayache, Michel R.; Delonge, Jean-Claude L.; and Marey, Daniel J., 4,231,704, Cl. 416-95.000.
Deltrap, Johan H. M., to N.V. Optische Industrie "De Oude Delft". Binocular night glass. 4,232,222, Cl. 250-333.000.
Demick, Eugene; and Van Haasteren, Adrian J., Jr., to Bergen Expo Systems, Inc. Photographic film projection dissolve system for arc lamp projectors. 4,231,643, Cl. 353-86.000.
Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,231,932, Cl. 260-326.00A.
Dengel, Ottmar H.: *See—*
Beckert, Werner F.; Barber, William H.; and Dengel, Ottmar H., 4,231,891, Cl. 252-188.000.
Denny, Arthur F.; and Sherman, John D., to Union Carbide Corporation. Zeolite agglomerates for detergent formulations. 4,231,887, Cl. 252-174.190.
De Padova, Salvatore; Pagana, Enrico; and Rosenga, Giorgio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Antenna having radiation pattern with main lobe of generally elliptical cross-section. 4,232,322, Cl. 343-781.00P.
Dependable-Fordath, Inc.: *See—*
Flock, Steven D.; and Hayes, Roger A., 4,231,664, Cl. 366-35.000.
Deraedt, Roger: *See—*
Teutsch, Jean G.; and Deraedt, Roger, 4,232,015, Cl. 424-243.000.
Derrick, Danny O.; and Looney, Donald F. Attachment device for flexible films and fabrics. 4,231,141, Cl. 24-243.00K.
DeSombre, Eugene R.: *See—*
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Dessauer, Rolf, to Du Pont de Nemours, E. I., and Company. Marking transfer sheets. 4,232,108, Cl. 430-259.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Adaptive computation in a digital tone synthesizer. 4,231,278, Cl. 84-1.190.
Deutsche Nemectron GmbH: *See—*
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Brandes, Gunter; Wollner, Johannes; Neier, Wilhelm; and Webers, Werner, 4,231,966, Cl. 568-396.000.
Develop KG Dr. Eisbein & Co.: *See—*
Moser, Kurt; and Wegmann, Helmut, 4,231,652, Cl. 355-3.0DR.
DeVries, Robert C.; Lee, Minyoung; Szala, Lawrence E.; and Tuft, Roy E., to General Electric Company. Polycrystalline diamond body and process. 4,231,195, Cl. 51-307.000.
Deyoe, Charles W.; and Bartley, Erle E., to Kansas State University Research Foundation. Liquid starch-urea ruminant feed and method of preparing same. 4,232,046, Cl. 426-69.000.
Diagnostic Reagents, Inc.: *See—*
Dowben, Robert M.; and Bunting, James R., 4,231,750, Cl. 23-230.00B.
Diamond Shamrock Corporation: *See—*
Pohto, Gerald R.; and Olson, Richard O., 4,231,143, Cl. 29-281.500.
Diana, Guy D.; and Carabateas, Philip M., to Sterling Drug Inc. 4-[6-(2-Chloro-4-methoxyphenoxy)hexyl]-3,5-diethyl-1-(2-pyridinyl)-1H-pyrazole. 4,232,161, Cl. 546-279.000.
Diasonics: *See—*
Waxman, Albert S.; and Havlice, James F., 4,231,373, Cl. 128-660.000.
Dick, Pierre R.; and Rombi, Max. Novel soluble derivatives of 2,4-diamino pyrimidine. 4,232,023, Cl. 424-251.000.
Dickens, Lawrence E.; and Maki, Douglas W., to United States of America, Army. Microwave oscillator for microwave integrated circuit applications. 4,232,277, Cl. 331-107.0DP.
Dickerson, Carroll D.: *See—*
Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,231,588, Cl. 280-661.000.
Dickey, Fred M.; White, Jerry R.; and Crill, James, to Boeing Company, The. Apparatus and method of converting an image on a transparency to line art on a recording medium. 4,231,656, Cl. 355-71.000.
Dietz, Markus S. Automobile mechanic's aid. 4,232,357, Cl. 362-61.000.

Di Giacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Process for preparing layered organophosphorus inorganic polymers. 4,232,146, Cl. 528-395.000.
Digital Equipment Corporation: *See—*
Levy, John V.; Rodgers, David P.; Stewart, Robert E.; and Casabona, Richard J., 4,232,366, Cl. 364-200.000.
Dillard, Bill J.: *See—*
Hill, Lewis J.; and Dillard, Bill J., 4,231,242, Cl. 70-347.000.
Dillitzer, Manfred, to Perfecta Rolladen Karl & Co. Roller shutter. 4,232,309, Cl. 340-547.000.
Dillon, Peter L. P.: *See—*
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., 4,232,329, Cl. 358-9.000.
Di Mola, Nunzio: *See—*
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Dines, Martin B.: *See—*
Di Giacomo, Peter M.; and Dines, Martin B., 4,232,146, Cl. 528-395.000.
Dion, Donald F.; and Wojcik, David R., to RCA Corporation. Raster display refresh system. 4,232,376, Cl. 365-222.000.
Ditzel, Heinz; and Ditzel, Werner. Indexing devices. 4,231,159, Cl. 33-174.0TD.
Ditzel, Werner: *See—*
Ditzel, Heinz; and Ditzel, Werner, 4,231,159, Cl. 33-174.0TD.
Dixon, Robert W., to Chas. M. Bailey Co., Inc. Backflow preventing valve. 4,231,387, Cl. 137-218.000.
Dlugopolski, Joseph, to Fidelity Container Corporation. Outer mailing jacket. 4,231,472, Cl. 206-309.000.
Dobkin, Robert C.; Isbell, Tim D.; Miller, Bernard D.; and Sample, Lawrence R., to National Semiconductor Corporation. Instrumentation amplifier with extended common mode range. 4,232,271, Cl. 330-258.000.
Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG Apparatebau KG: *See—*
Schael, Wilfried, 4,231,366, Cl. 128-214.00E.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Braun, Walter; Burst, Hermann; and Peter, Dietmar, 4,231,600, Cl. 293-128.000.
Dr. Ing. Rudolf Hell GmbH: *See—*
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Dodd, Roger Y., to American National Red Cross. Antibody-specific solid phase immunoadsorbent, preparation thereof, and antibody purification therewith. 4,232,004, Cl. 424-89.000.
Dolce, Giuliano: *See—*
Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Muller-Calgan, Helmut; and Dolce, Giuliano, 4,232,016, Cl. 414-244.000.
Dolmar Maschinenfabrik GmbH & Co.: *See—*
Mathner, Manfred; and Thomsen, Peter, 4,231,221, Cl. 60-319.000.
Domicent, Alain. Painting booth. 4,231,289, Cl. 98-115.0SB.
Dorius, Carl B., to American Gilsonite Company. Water retardant insulation composition comprising treated low density granular mineral material and finely divided limestone or similar carbonate or silicate mineral particles and method for using same. 4,231,884, Cl. 252-62.000.
Doss, Dwight E.: *See—*
Keeling, Michael C.; and Doss, Dwight E., 4,231,807, Cl. 136-251.000.
Doty, James K.: *See—*
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Dow Chemical Company, The: *See—*
Burk, George A.; Reineke, Charles E.; and Wilson, Charles A., 4,232,041, Cl. 424-304.000.
Buske, Gary R., 4,232,125, Cl. 521-32.000.
Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., 4,232,129, Cl. 521-137.000.
Smith, William E.; and McGee, Thomas W., 4,232,175, Cl. 568-706.000.
Dow Corning Corporation: *See—*
Fearon, Frederick W. G.; and Vincent, Gary A., 4,231,909, Cl. 260-29.1SB.
Plueddemann, Edwin P., 4,231,910, Cl. 260-29.40R.
Dow, Judith A.; and Fohl, Timothy, to GTE Products Corporation. Method of coating a lamp with a U.V. curable resin with fibers therein. 4,232,058, Cl. 427-54.100.
Dowben, Robert M.; and Bunting, James R., to Diagnostic Reagents, Inc. Methods for performing chemical assays using fluorescence and photon counting. 4,231,750, Cl. 23-230.00B.
Downs, Edgar S. Radiant heater. 4,231,735, Cl. 431-328.000.
Doyle, Holly T.: *See—*
Thomas, Wendl; Doyle, Holly T.; and Doyle, Robert O., 4,231,577, Cl. 273-238.000.
Doyle, Keith G.: *See—*
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Doyle, Robert O.: *See—*
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Drabek, Jozef: *See—*
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,232,011, Cl. 424-200.000.
Dravo Corporation: *See—*
Cheek, Edward E., 4,231,467, Cl. 198-508.000.
Drechsel, Arno. Step-by-step irrigator. 4,231,522, Cl. 239-233.000.
Dresser Industries, Inc.: *See—*
Armstrong, Kenneth R., 4,231,971, Cl. 261-44.00B.
Eversole, James F.; and Berriman, Lester P., 4,231,383, Cl. 137-1.000.
Thompson, George J., 4,231,699, Cl. 414-687.000.
Drevin, Hakan N. Y.: *See—*
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., 4,231,999, Cl. 424-1.000.
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., 4,232,119, Cl. 435-7.000.
Drews, Ulrich; Schnurle, Hans; Horbelt, Michael; Schmidt, Bernhard; and Werner, Peter, to Robert Bosch GmbH. Apparatus for controlling an electrical switching element in internal combustion engines. 4,231,345, Cl. 123-510.000.
Drexelbrook Controls, Inc.: *See—*
Wright, William S.; and Loewenstern, Kenneth M., 4,232,300, Cl. 340-840.390.
Drury, Robert F., to Du Pont de Nemours, E. I., and Company. Synthesis of 2,5-dihydrofuran. 4,231,941, Cl. 260-346.110.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Carbamate pesticidal compounds compositions and methods of use. 4,232,035, Cl. 424-270.000.
Dube, Marcel. Double-glazed building panel and filling system. 4,231,202, Cl. 52-171.000.
Dubovszky, Istvan: *See—*
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.
Dumont, Claude; Guillaume, Jacques; and Nedelec, Lucien, to Roussel Uclaf. Process for preparation of piperidyl-indoles. 4,232,031, Cl. 424-263.000.
Duncan, Rodney A.; and Hall, Wendel W. Mirror connector. 4,231,540, Cl. 248-487.000.
Dungs, Horst: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, 4,231,844, Cl. 201-34.000.
Dunton, Harvey R., to Associated Concrete Products, Inc. Cement and concrete mixture. 4,231,801, Cl. 106-97.000.
Du Pont de Nemours, E. I.; and Company: *See—*
Dessauer, Rolf, 4,232,108, Cl. 430-259.000.
Drury, Robert F., 4,231,941, Cl. 260-346.110.
Gier, Thurman E., 4,231,838, Cl. 156-600.000.
Irwin, Robert S., 4,232,143, Cl. 528-128.000.
Irwin, Robert S., 4,232,144, Cl. 528-128.000.
Lee, Ross A., 4,232,115, Cl. 430-522.000.
Levitt, George, 4,231,784, Cl. 71-92.000.
Marquisee, Mark J., 4,232,126, Cl. 521-65.000.
Statz, Robert J.; and Doty, James K., 4,232,174, Cl. 562-599.000.
Durig, Richard F., to United States of America, Air Force. Static self-contained laser seeker system for active missile guidance. 4,231,533, Cl. 244-3.160.
Duris, Jean, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Apparatus for heat treatment of continuous textile products. 4,231,167, Cl. 34-66.000.
Durlach, Jean P., to Cooperation Pharmaceutique Francaise. Indigestable composition consisting of a metallic natural proteinate and nutritive fibers. 4,232,054, Cl. 426-618.000.
Durley, Benton A., III. Vibratory-rotary motion converters and display devices incorporating such converters. 4,232,304, Cl. 340-366.00B.
Dworkin, Robert D., to M & T Chemicals Inc. Synergistic heat stabilizer compositions containing an antimony or a bismuth compound. 4,231,895, Cl. 252-400.00A.
Dworsky, Lawrence N.; Whalin, Jeffery A.; and Glotzbach, Warren P., to Motorola, Inc. Frequency adjustment of piezoelectric resonator utilizing low energy oxygen glow device for anodizing electrodes. 4,232,239, Cl. 310-312.000.
Dyson, Evelyna C., to Revlon, Inc. Cosmetic apparatus and method. 4,232,334, Cl. 358-93.000.
E-C Apparatus Corporation: *See—*
Gorman, William W., Jr.; and Gorman, Esther M., 4,231,992, Cl. 422-258.000.
E M I Limited: *See—*
Birt, David E., 4,231,730, Cl. 425-385.000.
E. R. Squibb & Sons, Inc.: *See—*
Turk, Chester F.; and Krapcho, John, 4,232,027, Cl. 424-258.000.
E-Systems, Inc.: *See—*
Proffitt, William G., 4,232,059, Cl. 427-96.000.
E. T. Oakes Limited: *See—*
Baron, John, 4,231,666, Cl. 366-304.000.
East, Robert W.: *See—*
Rosler, Richard S.; and East, Robert W., 4,232,063, Cl. 427-94.000.
Eastern Company, The: *See—*
Pelcin, Albert L., 4,231,597, Cl. 292-164.000.
Eastman Kodak Company: *See—*
Barbee, Eugene H., 4,231,164, Cl. 34-16.000.
Gilman, Paul B., Jr.; Belly, Robert T.; Koszelak, Thaddeus D.; and Zigman, Seymour, 4,232,121, Cl. 435-32.000.
Henry, James W., 4,232,336, Cl. 358-106.000.
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., 4,232,329, Cl. 358-9.000.
Isaacson, Henry V., 4,231,919, Cl. 260-42.530.
Eaton, Burrows P.; and Wright, William, to Carrier Corporation. Wound fin heat exchanger support. 4,231,421, Cl. 165-68.000.
Ebauches S.A.: *See—*
Randin, Jean-Paul, 4,231,641, Cl. 350-357.000.
Ebreo, Mark A.; and Koches, Andrew, to William Prym, Inc. Key clip adapted for a key case. 4,231,140, Cl. 24-237.000.

Eccles, Edward S.; and Gibson, Harry, to Smiths Industries Limited. Analogue electrical indicators having a series of electrically-energizable elements. 4,232,312, Cl. 340-753.000.

Echlin Manufacturing Company, The: *See*—
Campanini, Sergio, 4,231,286, Cl. 92-64.000.
Kuhl, Bernhard R., and Safranek, Edward J., 4,232,207, Cl. 200-11.00R

Eckmayer, Zdenek: *See*—
Braeuner, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,232,123, Cl. 435-69.000.

Edel, Gunter: *See*—
Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, 4,231,669, Cl. 401-258.000.

Edwards, Roger D.: *See*—
Bradshaw, Michael; and Edwards, Roger D., 4,232,325, Cl. 346-76.00R

Edwards, Roy E.; Price, Anthony G.; and Rees, John R., to Girling Limited. Master cylinder assemblies for vehicle hydraulic braking systems. 4,231,224, Cl. 60-581.000.

Edwards, Thomas W.: *See*—
Savoye, Eugene D.; Edwards, Thomas W.; and Wallace, Lloyd F., 4,232,245, Cl. 313-367.000.

EG & G, Inc.: *See*—
Caron, Roger L.; Clifford, Peter J.; and Germain, Francis R., 4,232,380, Cl. 367-88.000.

Eggler, James F.: *See*—
Schaaf, Thomas K.; and Eggler, James F., 4,232,173, Cl. 562-430.000.

Eggleston, Philip W., and Taylor, Eugene R., Jr., to Fisher Controls Company, Inc. High-temperature bidirectional metal seal. 4,231,546, Cl. 251-173.000.

Eguchi, Takeo: *See*—
Mori, Yoshihisa, Mashiino, Norio; and Eguchi, Takeo, 4,232,202, Cl. 179-100.40E.

Einarsson, Olov: *See*—
Dahle, Orvar; Einarsson, Olov; Lindkvist, Folke; and Valdemarsson, Stefan, 4,231,145, Cl. 29-432.000.

Eisenman, Fred S., to GAF Corporation. Halophenoxy-alkoxy phosphonates and thiophosphonates. 4,231,781, Cl. 71-87.000.

Eisenberg, Robert M., to Singer Company, The. Wireless output/input system. 4,232,299, Cl. 340-171.00R.

Ekonen, Martin A., and Blechschmidt, James L., to Ford Motor Company. Control valve for vehicle air springs and the like. 4,231,554, Cl. 267-65.00D

Electric Power Research Institute, Inc.: *See*—
Park, Dong-Sil; Chatterji, Debajyoti; and Breiter, Manfred W., 4,232,098, Cl. 429-104.000

Electrofabrication & Engineering Co. Ltd.: *See*—
Falconer, John D.; Proudlock, George T.; and Monsen, Geoffrey, 4,231,484, Cl. 220-89.00A

Elgindy, Samir M.: *See*—
Daugiras, Kristupas; and Elgindy, Samir M., 4,231,192, Cl. 40-163.000

Eliche, Jean: *See*—
Anglet, Robert; Carbonari, Jean P.; and Eliche, Jean, 4,231,198, Cl. 52-91.000

Ellmore, John W., to Challenger, Inc. Automatic door opener system. 4,231,191, Cl. 49-28.000

Elmer, Charles W., to Inland Steel Company. Fluid pressure measuring device. 4,231,261, Cl. 73-716.000.

Elphingstone, Eugene A.; and Norman, Lewis R., to Halliburton Company. Treating subterranean well formations. 4,231,882, Cl. 252-8.55C

Elsaber, Martin: *See*—
Schmid, Manfred; Elsaber, Martin; and Weik, Manfred, 4,231,234, Cl. 66-27.000

Emerson Electric Co.: *See*—
Blakely, Donald E.; and Terpstra, Daniel A., 4,231,557, Cl. 269-139.000
Newport, Harry E., Jr.; and Baysinger, Robert L., 4,231,732, Cl. 431-46.000

Emhart Industries, Inc.: *See*—
Willits, Benjamin R., 4,231,229, Cl. 62-196.00A.

Emo, George C., and Grau, Thomas G., Connector contact terminal contamination probe. 4,232,262, Cl. 324-65.00P

Emonet, Henri. Lost motion tool retainer. 4,231,580, Cl. 279-19.100.

ENTELEC: *See*—
Ley, Anthony J., 4,232,298, Cl. 340-171.00R

Erlo Grundlagen Forschungs AG: *See*—
Hribal, Hans; and Wimmer, Josef, 4,231,394, Cl. 137-512.000.

Engel, Steven J.: *See*—
Clouser, David E.; and Engel, Steven J., 4,232,233, Cl. 307-229.000.

Engelbrecht, Eduard. Instrument and method for transferring microbiological samples in a predetermined gaseous environment. 4,232,120, Cl. 435-30.000.

Engelbrecht, Horst P.; and Johnson, Howard K., to General Signal Corporation. Fluids mixing apparatus. 4,231,974, Cl. 261-87.000.

Engelhard Minerals & Chemicals Corporation: *See*—
Pitts, Frank, 4,231,997, Cl. 423-263.000.

Englund, Robert M., to Sperry Corporation. Apparatus for determining the next address of a requested block in interlaced rotating memories. 4,232,365, Cl. 364-200.000.

Engstrom, William R. Extracorporeal circuit blood heat exchanger. 4,231,425, Cl. 165-156.000

Enrico, Corvi M. Process for preparing lysergol derivatives. 4,232,157, Cl. 546-68.000.

Ensing, Lukas, to Shell Oil Company. Automatic balancing system for seismic equipment. 4,232,379, Cl. 367-43.000.

Ensley, Rufus N.; Haren, Doyle V.; Logan, Arthur D.; and McLean, Michael E., to Dayco Corporation. Apparatus for and method of making carpeting strip having integral seam-forming portion. 4,231,835, Cl. 156-361.000.

Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H.: *See*—
Tuson, Samuel, 4,231,681, Cl. 405-195.000.
Tuson, Samuel, 4,231,682, Cl. 405-202.000.

Epstein, Joseph W.: *See*—
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,231,935, Cl. 260-326.50B.

Erckel, Rudiger: *See*—
Gunther, Dieter; Erckel, Rudiger; Rosch, Gunter; and Probst, Heinz, 4,231,741, Cl. 8-571.000.

Erickson, Thomas D., to Owens-Corning Fiberglas Corporation. Fibrous glass manufacture using refractory bushing. 4,231,773, Cl. 65-1.000.

Ernst, Volker: *See*—
Alf, Herbert; Ernst, Volker; Hainle, Rudi; and Leipelt, Rudolf, 4,231,343, Cl. 123-556.000.

Erwin, Robert L., to Kinsey, J. D., a part interest. Rotary, segmented, expansible valves. 4,231,440, Cl. 137-246.220.

Esco Corporation: *See*—
Davis, Kerwin L., 4,231,173, Cl. 37-142.00R.

Esmond, William G. Capillary mass transfer device. 4,231,878, Cl. 210-321.00B.

Estes, John H.: *See*—
Koniz, Leon F.; and Estes, John H., 4,231,751, Cl. 23-230.00R.

Etablissements VanDoren: *See*—
Van Doren, Bernard M.; and Frank, Jacques G., 4,231,404, Cl. 144-2.00R.

Ethyl Corporation: *See*—
Malec, Robert E., 4,231,883, Cl. 252-33.400.

Etter, Peter: *See*—
Faust, Werner; and Etter, Peter, 4,232,235, Cl. 307-252.00R.

Eur-Control Kalle AB: *See*—
Ingemarsson, Gosta, 4,231,881, Cl. 210-396.000.

Eurosil GmbH: *See*—
Lingstaedt, Ernst; Moegen, Gerhard; and Wotruba, Gottfried, 4,232,261, Cl. 323-22.00R.

Eversole, James F.; and Berriman, Lester P., to Dresser Industries, Inc. Method for controlling mass flow rate. 4,231,383, Cl. 137-1.000.

Exxon Research & Engineering Co.: *See*—
Mauldin, Charles H.; and Baird, William C., Jr., 4,231,898, Cl. 252-441.000.
Sullivan, Daniel S., III; and Bridges, Wilbur L., 4,231,956, Cl. 260-465.80R.

F F Fabricators, Inc.: *See*—
Smith, Dennis W.; and Mazzacano, Paul J., 4,231,676, Cl. 404-6.000.

F. W. Payne & Son (Bickley) Limited: *See*—
Hewitt, James A., 4,231,172, Cl. 37-71.000.

Fabri, Bruno, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Feedback-stabilized multistage frequency-selective amplifier. 4,232,272, Cl. 330-294.000.

Fabricant, Norman. Dental toy. 4,231,181, Cl. 46-116.000.

Faith, James D.: *See*—
Ohnhaus, Buff; and Faith, James D., 4,231,253, Cl. 73-861.620.

Falcon Safety Products, Inc.: *See*—
Vall, Seymour, 4,231,308, Cl. 114-144.00R.

Falconer, John D.; Proudlock, George T.; and Monsen, Geoffrey, to Electrofabrication & Engineering Co. Ltd. Safety device for pressure vessels. 4,231,484, Cl. 220-89.00A.

Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., to American Cyanamid Company. 1-Phenyl-3-azabicyclo[3.1.0]hexanes. 4,231,935, Cl. 260-326.50B.

Farber, Karl: *See*—
Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, 4,231,669, Cl. 401-258.000.

Faust, Carl W., to Bell Telephone Laboratories, Incorporated. Cable adapter for converting a cable closure nozzle to a two cable entrance. 4,232,184, Cl. 174-92.000.

Faust, Werner; and Etter, Peter, to BBC Brown, Boveri & Company, Limited. Combining thyristor circuits of various circuit configurations. 4,232,235, Cl. 307-252.00R.

Fawzi, Mahdi B., to Procter & Gamble Company, The. Radioactive scanning agents with stabilizer. 4,232,000, Cl. 424-1.000.

Fearon, Frederick W. G.; and Vincent, Gary A., to Dow Corning Corporation. Polychloropropylsiloxane plasticized polyvinyl chloride compositions. 4,231,909, Cl. 260-29.1SB.

Feess, Erich; and Reinhardt, Friedrich, to Hoechst Aktiengesellschaft. Process for pad-dyeing and printing fabrics made of cellulose and/or regenerated modified cellulose and optionally polyester fibers. 4,231,745, Cl. 8-552.000.

Feinland, Seymour; and Kleinschmitt, David, to Pitney Bowes Inc. Phase shift correction for displacement measuring systems using quadrature. 4,231,662, Cl. 356-373.000.

Feldmann, Hugo: *See*—
Beerens, Hugo; Feldmann, Hugo; and Schlanzke, Claus G., 4,231,553, Cl. 266-113.000.

Feltzin, Joseph: *See*—
Ferrarini, L. James, Jr.; and Feltzin, Joseph, 4,232,133, Cl. 525-452.000.

Fenton, James E., to Ford Motor Company. Air fuel control system for Stirling engine. 4,231,222, Cl. 60-524.000.

Fernandez, Reet T.: *See*—
Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., 4,232,129, Cl. 521-137.000.

Ferrarini, L. James, Jr.; and Feltzin, Joseph, to ICI Americas Inc. Polyisocyanurate containing molding compositions. 4,232,133, Cl. 525-452.000.

Ferro Corporation: *See*—
Ryan, John R.; and Shalita, Paul, 4,231,830, Cl. 156-232.000.

Fichtel & Sachs AG: *See*—
Bergles, Eduard, 4,231,264, Cl. 474-80.000.

Fidelity Container Corporation: *See*—
Dlugopolski, Joseph, 4,231,472, Cl. 206-309.000.

Filipovic, Dominik, to U.S. Philips Corporation. Remote control/digital tuning interface with parallel operation with manual switches. 4,232,296, Cl. 340-167.00R.

Filippi, Frederico. Video telephone apparatus. 4,232,196, Cl. 179-2.0TV.

Filterwerke Mann & Hummel GmbH: *See*—
Alf, Herbert; Ernst, Volker; Hainle, Rudi; and Leipelt, Rudolf, 4,231,343, Cl. 123-556.000.

Finger, Richard H.; and Michel, Thomas J., to Santek, Inc. Ionization voltage source. 4,232,355, Cl. 361-235.000.

Finike Italiana Marposs S.p.A.: *See*—
Possati, Mario, 4,231,158, Cl. 33-149.00J.

Fink, Joel H.; and Molvik, Arthur W., to United States of America, Energy. Compact, maintainable 80-KeV neutral beam module. 4,232,244, Cl. 313-363.000.

Finkenzeller, Johann; Holzermer, Guenter; and Wenzek, Gerhard, to Siemens Aktiengesellschaft. X-ray examination apparatus. 4,232,227, Cl. 250-468.000.

Finley, Billy L. Roof ventilating aperture seal. 4,231,288, Cl. 98-43.00R.

Finomvegyszer Szovetkezet: *See*—
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.

Firmenich, S.A.: *See*—
Flament, Ivon, 4,232,156, Cl. 544-335.000.

Firth, Ronald R.: *See*—
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., 4,232,329, Cl. 358-9.000.

Fischer, Adolf: *See*—
Hanisch, Horst; Winkelmann, Heinrich; and Fischer, Adolf, 4,231,265, Cl. 474-152.000.

Fisher Controls Company, Inc.: *See*—
Eggleston, Philip W.; and Taylor, Eugene R., Jr., 4,231,546, Cl. 251-173.000.

Fisons Limited: *See*—
Orr, Thomas S. C.; Hall, David E.; and Mann, John, 4,232,012, Cl. 424-232.000.

Fladby, Tron-Halvard, to A/S Akers Mek. Verksted. Process for regeneration of a filter medium. 4,231,870, Cl. 210-797.000.

Flament, Ivon, to Firmenich, S.A. Acyl-pyrimidines. 4,232,156, Cl. 544-335.000.

Fleischer, Henry. Collapsible frames for baby carriers. 4,231,587, Cl. 280-647.000.

Fleishman, Herman B., to United States of America, Navy. Tactical nagivation and communication system. 4,232,313, Cl. 343-6.00R.

Flock, Steven D.; and Hayes, Roger A., to Dependable-Fordath, Inc. Method and apparatus for combining high speed horizontal and high speed vertical continuous mixing of chemically bonded foundry sand. 4,231,664, Cl. 366-35.000.

Florvall, Gosta L.; and Ogren, Sven O., to Astra Lakemedel Aktiebolag. 2,6-Dialkoxybenzamides, intermediates, pharamaceutical compositions and methods for treatment of psychotic disorders. 4,232,037, Cl. 424-274.000.

FMC Corporation: *See*—
Aterianus, John S.; and Crawford, Donald C., 4,231,558, Cl. 270-60.000.
Gibbons, Harold M., deceased, 4,231,398, Cl. 137-615.000.
McGinley, Emanuel J.; and Zuban, Joseph M., 4,231,802, Cl. 106-197.00C.

Fohl, Timothy: *See*—
Dow, Judith A.; and Fohl, Timothy, 4,232,058, Cl. 427-54.100.

Foley, James W.: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,231,929, Cl. 260-243.300.

Foley, Thomas P.: *See*—
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,232,353, Cl. 361-172.000.

Folonari, Carlo: *See*—
Mengoli, Giuliano; Daolio, Sergio; Giulio, Ugo; and Folonari, Carlo, 4,231,851, Cl. 204-181.00R.

Fontana, Jack: *See*—
Zeldin, Arkady; Carciello, Neal; Kukacka, Lawrence; and Fontana, Jack, 4,231,917, Cl. 260-37.0SB

Foote, John P., to U.S. Armament Corporation. Automatic and semiautomatic small caliber conversion system. 4,231,177, Cl. 42-16.000.

Ford, Lowell D.: *See*—
Adams, Halbert E.; Cooper, Edgar R.; Ford, Lowell D.; Johnson, Delbert C.; and Warren, Gregory L., 4,232,378, Cl. 367-36.000

Ford Motor Company: *See*—
Ekonen, Martin A.; and Blechschmidt, James L., 4,231,554, Cl. 267-65.00D.
Fenton, James E., 4,231,222, Cl. 60-524.000.
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,231,254, Cl. 73-362.0AR.
Schechter, Michael M., 4,231,285, Cl. 92-34.000.
Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,231,588, Cl. 280-661.000.

Forster, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Traffic system for track-tied vehicles with steerable axle. 4,231,295, Cl. 104-245.000.

Forward, Robert L., to Hughes Aircraft Company. Network for simulating low temperature resistors. 4,232,280, Cl. 333-213.000.

Fox, Ulles E.: *See*—
Gorenc, Edward J.; Fox, Ulles E.; and Lesko, Imre A., 4,231,246, Cl. 72-412.000.

Fradin, Raymond. Flexible and sewable hinge. 4,231,135, Cl. 16-150.000.

Francese, Renato: *See*—
Baldi, Luciano; Francese, Renato; and Collecchia, Franco, 4,232,153, Cl. 544-204.000.

Frank, Jacques G.: *See*—
Van Doren, Bernard M.; and Frank, Jacques G., 4,231,404, Cl. 144-2.00R.

Frank & Schulte GmbH: *See*—
Schramm, Hans; and Schramm, Klaus, 4,231,798, Cl. 75-256.000

Frankle, Gerhard; and Woschee, Dieter, to Daimler-Benz Aktiengesellschaft. Control arrangement for a supercharged diesel engine. 4,231,346, Cl. 123-457.000.

Franklin Electric Subsidiaries, Inc.: *See*—
Hall, James F., Jr.; Lake, Ralph J., Jr.; and Scholder, William G., 4,231,439, Cl. 177-25.000.

Franz, Henry H. Bottle packaging and unpackaging machine. 4,231,697, Cl. 414-37.000.

Franz, John E.; and Kaufman, Robert J., to Monsanto Company. N-Carbobenzoxy-N-phosphonomethylglycine thioesters. 4,231,762, Cl. 71-87.000.

Franzen, Olof K.; Hallstrom, Ulf; and Petersson, Bengt A., to Uddeholms Aktiebolag. Composite steel material and composite steel tool made from this material. 4,232,096, Cl. 428-683.000.

Frederick, Sherman B.: *See*—
Hedtke, Robert G.; Harrom Harley A.; Kelley, Wilfred H., Jr.; and Frederick, Sherman B., 4,231,456, Cl. 187-9.00R

Freeman Chemical Corporation: *See*—
Carlstrom, William L.; and Maechtle, Gary L., 4,232,085, Cl. 428-315.000.

Freeny, Charles C., Jr. Quantized hyperbolic and inverse hyperbolic object location system. 4,232,317, Cl. 343-112.00R

Freitag, Dieter: *See*—
Schmidt, Manfred; Bandtel, Eberhard; Traudisch, Walter; Spoth, Georg; and Freitag, Dieter, 4,232,134, Cl. 525-506.000.

French, David W., to Johns-Manville Corporation. Plastic pipe joint and method and assembly for making same. 4,231,985, Cl. 264-249.000.

French, Richard C., to U.S. Philips Corporation. Radio transmission systems. 4,232,392, Cl. 455-105.000.

Frey, Ernst: *See*—
Kobler, Richard, 4,232,346, Cl. 360-71.000

Friedemann, Peter: *See*—
Behrendt, Wolfgang; Bohnhage, Detlef; Friedemann, Peter; Frolich, Bernhard; and Orzessek, Reinhold, 4,231,667, Cl. 400-208.000.

Friedling, Gerard; and Chuard, Marcel. Removable two-way connector for a faucet nozzle. 4,231,400, Cl. 137-798.000

Friedman, Mendel: *See*—
Koenig, Nathan H.; and Friedman, Mendel, 4,231,747, Cl. 8-127.600.

Frisch, Rudolf: *See*—
Stetson, John R.; Graham, Alan A.; and Frisch, Rudolf, 4,232,026, Cl. 428-158.000.

Fritjofsson, Sture F. E.: *See*—
Ljungqvist, Stig-Ove E.; Hammarstrom, Bernt S.; and Fritjofsson, Sture F. E., 4,231,836, Cl. 156-405.00P

Frohberger, Paul-Ernst: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Pfugbeil, Wolf-Dietrich; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,232,033, Cl. 424-269.000

Frolich, Bernhard: *See*—
Behrendt, Wolfgang; Bohnhage, Detlef; Friedemann, Peter; Frolich, Bernhard; and Orzessek, Reinhold, 4,231,667, Cl. 400-208.000.

Fuehrer, Reece R., to General Motors Corporation. Vehicle brake system with transmission and internal brake. 4,231,455, Cl. 192-4.00A

Fuhrer, Jack S., to RCA Corporation. Defect compensation for solid-state television. 4,232,340, Cl. 358-167.000

Fuhrmann, Wolfgang: *See*—
Zurner, Hansjurgen; and Fuhrmann, Wolfgang, 4,231,543, Cl. 251-57.000

Fuji Photo Film Co., Ltd.: *See*—
Adachi, Kenichi; Shishido, Tadao; and Mitsui, Akio, 4,232,114, Cl. 430-504.000.
Iwasaki, Masayuki; Sato, Shigeru; Inoue, Yasuo; and Nagashima, Akira, 4,232,106, Cl. 430-170.000
Miyazako, Takushi; and Nagatomo, Shigeru, 4,232,111, Cl. 430-355.000.

Naoi, Takashi; and Horie, Ikutard, 4,232,117, Cl. 430-539.000.
Tabei, Masatoshi; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,231,808, Cl. 136-260.000.

Fujii, Setsuro: *See*—
Kajihara, Motoyoshi; Hamakawa, Toshihiro; Shibata, Toshiaki; Suzue, Takashi; and Fujii, Setsuro, 4,232,007, Cl. 424-177.000.

Fujii, Yuji, to Shimano Industrial Company, Limited. Brake holder with protuberances for holding a shoe body in place. 4,231,451, Cl. 188-73.100.

Fujikawa, Kanichi: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,231,787, Cl. 71-107.000.

Fujimori, Noboru: *See*—
Okauchi, Ken; Koitabashi, Takeo; and Fujimori, Noboru, 4,232,118, Cl. 430-574.000.

Fujimoto, Toshio. Clasp for personal ornaments or furnishings. 4,231,137, Cl. 24-201.00B.

Fujishima, Masakazu, to Nippon Gakki Seizo Kabushiki Kaisha. Station-signal frequency indication system for radio receiver. 4,232,394, Cl. 455-158.000.

Fujishita, Toshio: *See*—
Hirai, Kentaro; Fujishita, Toshio; and Ishiba, Teruyuki, 4,231,930, Cl. 260-245.500.

Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenake, Yoshimichi; and Tsutaya, Tadao, to Kobe Steel, Limited. Fired iron-ore pellets having macro pores. 4,231,797, Cl. 75-256.000.

Fujita, Masao; and Kitaori, Kiyoshi, to Nissan Shatai Kabushiki Kaisha; and Kokusan Kinzoku Kogyo Kabushiki Kaisha. Screw plug assembly. 4,231,240, Cl. 70-173.000.

Fujitsu Limited: *See*—
Hattori, Seizi; Makino, Koichi; Nakagawa, Takehiko; and Shinohara, Masayoshi, 4,232,061, Cl. 427-130.000.
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.

Fujiu, Masayoshi; and Hida, Tetsuo, to Showa Denki K.K. Method for incineration of organic chlorine compound and incinerator used therefor. 4,231,303, Cl. 110-245.000.

Fukazawa, Jinpei: *See*—
Hatsuno, Hiroshi; Fukazawa, Jinpei; Fukushima, Mitsuo; and Ogawa, Shinji, 4,231,251, Cl. 73-119.00A.

Fukuda, Hideo; Morikawa, Hiroichi; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company Ltd. Photosensitive paper for electrophotography with an electrically conductive coating of a fluorine resin. 4,232,101, Cl. 430-56.000.

Fukui, Akito: *See*—
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,231,961, Cl. 564-65.000.

Fukushima, Mitsuo: *See*—
Hatsuno, Hiroshi; Fukazawa, Jinpei; Fukushima, Mitsuo; and Ogawa, Shinji, 4,231,251, Cl. 73-119.00A.

Fukushima, Shigeki; and Ohashi, Tadahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of controlling the deceleration of a reversing mill. 4,232,369, Cl. 364-476.000.

Fukuzawa, Kenichi: *See*—
Sakurai, Soichi; Ando, Kunio; and Fukuzawa, Kenichi, 4,232,246, Cl. 313-414.000.

Funada, Fumiaki; Nonomura, Keisaku; Uede, Hisashi; and Wada, Tomio, to Sharp Kabushiki Kaisha. Matrix type liquid crystal display panel. 4,231,640, Cl. 350-336.000.

Fuoto, John S.: *See*—
Lang, Glenn E.; Crotzer, Milburn E.; and Fuoto, John S., 4,231,328, Cl. 122-504.000.

Fusinski, Richard E., to General Motors Corporation. Broadband transmitting antenna for test chamber. 4,232,319, Cl. 343-703.000.

Futaba Denshi Kogyo K.K.: *See*—
Kishino, Takao; and Tanaka, Gentaro, 4,232,251, Cl. 315-167.000.

GAF Corporation: *See*—
Eiseman, Fred S., 4,231,781, Cl. 71-87.000.

Gafa, Salvatore: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,231,841, Cl. 162-5.000.

Galvin, Michael E.; and Whitwell, Robert J., to Carrier Corporation. Combination process tube and vibration attenuator for a refrigeration circuit. 4,231,228, Cl. 62-77.000.

Gambro AB: *See*—
Carlsson, Per-Olov A. V.; and Stenberg, Kaj O., 4,231,875, Cl. 210-232.000.
Carlsson, Per-Olov A. V.; and Stenberg, Kaj O., 4,231,880, Cl. 210-321.00B.

Gambro Dialysatoren GmbH & Co. KG: *See*—
Spranger, Kurt, 4,231,879, Cl. 210-321.00B.

Gangulee, Amitava: *See*—
Cuomo, Jerome J.; Gangulee, Amitava; and Kobliska, John, 4,231,816, Cl. 148-31.550.

Gantec Corporation: *See*—
Gantz, William A.; and Gantz, David M., 4,232,075, Cl. 428-124.000.

Gantz, David M.: *See*—
Gantz, William A.; and Gantz, David M., 4,232,075, Cl. 428-124.000.

Gantz, Jeanne A.; and Kelso, David W. Optical image multiplying device. 4,231,634, Cl. 350-4.200.

Gantz, William A.; and Gantz, David M., to Gantec Corporation. Plastic mirror article and method of making same. 4,232,075, Cl. 428-124.000.

Garcea, Giampaolo, to Alfa Romeo S.p.A. Timing variator for the timing system of a reciprocating internal combustion engine. 4,231,330, Cl. 123-90.150.

Garcia, Barbara A.: *See*—
Henrick, Clive A.; and Garcia, Barbara A., 4,231,953, Cl. 260-465.00D.

Gardiner, William J.: *See*—
Wrast, Richard E.; Gardiner, William J.; and Shedd, Francis A., 4,231,826, Cl. 156-138.000.

Garner, Lloyd L.; and Harris, Charles R., to Smith International, Inc. Straight hole insert drill bit. 4,231,438, Cl. 175-353.000.

Garsky, Victor M., to American Home Products Corporation. Pentapeptides with analgesic activity on peripheral administration. 4,231,925, Cl. 260-112.50R.

Gates Rubber Company, The: *See*—
Wrast, Richard E.; Gardiner, William J.; and Shedd, Francis A., 4,231,826, Cl. 156-138.000.

Gatti, Alfonso: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,231,841, Cl. 162-5.000.

Gawronski, Michael J.; and Goldie, Harry, to United States of America, Air Force. High power microwave integrated circuit receiver protector with integral sensitivity time control. 4,232,278, Cl. 333-13.000.

Gaylord Regethermic Canada Ltd.: *See*—
Boudreault, Jean-Pierre, 4,231,490, Cl. 220-354.000.

Gayman, Charles. Closure lock-prop. 4,231,599, Cl. 292-339.000.

Gazdik, Charles E.; and McBride, Donald G., to International Business Machines Corporation. Electronic package assembly method. 4,231,154, Cl. 29-840.000.

Gebhardt, James L.; and Hutchins, Ferris L., Jr., to Mead Corporation, The. Merchandising display. 4,231,299, Cl. 108-91.000.

Gebhardt, James L., to Mead Corporation, The. Apparatus and method for forming an elongated structural element from plastic material and for applying a decorative film thereto. 4,231,831, Cl. 156-233.000.

Geesen, Donald H., to PPG Industries Canada Ltd. Method of concentrating an aqueous solution by multiple effect evaporating. 4,231,840, Cl. 159-47.00R.

General Electric Company: *See*—
Ashley, ugene, 4,231,282, Cl. 89-7.000.
Bochan, John, 4,231,237, Cl. 68-23.700.
Corrigan, Francis R., 4,231,980, Cl. 264-84.000.
DeVries, Robert C.; Lee, Minyoung; Szala, Lawrence E.; and Tuft, Roy E., 4,231,195, Cl. 51-307.000.
Humphrey, James S., Jr., 4,232,088, Cl. 428-412.000.
Kelly, Peter B., 4,231,573, Cl. 273-51.000.
Mark, Victor; and Hedges, Charles V., 4,231,920, Cl. 260-45.70S.
McMillan, Stephen L., 4,231,166, Cl. 34-48.000.
Peil, William, 4,232,252, Cl. 315-92.000.
Vakil, Himanshu B.; and Silverstein, Seth D., 4,232,360, Cl. 362-294.000.

General Electric Company Limited, The: *See*—
Rigden, Sydney A. R., 4,232,243, Cl. 313-217.000.

General Industries, Inc.: *See*—
Grenier, Wilfred J., 4,231,542, Cl. 251-15.000.

General Mills, Inc.: *See*—
Blake, Jon R., 4,232,049, Cl. 426-572.000.
Blake, Jon R., 4,232,053, Cl. 426-616.000.

General Motors Corporation: *See*—
Fuehrer, Reece R., 4,231,455, Cl. 192-4.00A.
Fusinski, Richard E., 4,232,319, Cl. 343-703.000.
Hawk, Rufus L.; and Unterborn, Ralph D., 4,231,721, Cl. 417-413.000.
Johnston, William J., 4,231,342, Cl. 123-557.000.
Moriconi, Leonard E.; and Yoshida, Yoshitaka, 4,232,256, Cl. 318-292.000.
Palma, James D., 4,231,525, Cl. 239-585.000.
Van Slooten, Louis J., 4,231,267, Cl. 74-569.000.
Widdowson, Richard E.; and Atkinson, Ward J., 4,231,713, Cl. 417-222.000.
Yu, Ruey J., 4,231,902, Cl. 252-519.000.

General Signal Corporation: *See*—
Engelbrecht, Horst P.; and Johnson, Howard K., 4,231,974, Cl. 261-87.000.

General Steel Industries, Inc.: *See*—
Jackson, Keith L., 4,231,296, Cl. 105-136.000.

Gentex Corporation: *See*—
Aileo, Jackson A., 4,231,117, Cl. 2-6.000.

Georg Fischer Aktiengesellschaft: *See*—
Hofmann, Franz, 4,231,984, Cl. 264-256.000.
Wernli, Max, 4,231,415, Cl. 164-160.000.

Georgia Tech Research Institute: *See*—
Carstens, Marion R., 4,231,689, Cl. 406-155.000.

Gerard, Roger E. J., to Marconi Company Limited, The. Message signal scrambling apparatus. 4,232,193, Cl. 179-1.50R.

Gerber Scientific Instrument Company, The: *See*—
Logan, David J., 4,231,659, Cl. 355-132.000.

Gerlach, Albrecht; Holzmann, Dieter; Lindstedt, Guenter; and Burth, Rolf-Dieter, to ITT Industries, Inc. Remote control arrangement using pulse spacing modulator. 4,232,297, Cl. 340-168.00S.

Germain, Francis R.: *See*—
Caron, Roger L.; Clifford, Peter J.; and Germain, Francis R., 4,232,380, Cl. 367-88.000.

Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule: *See*—
Bischoff, Klaus; and Stratton, Richard W., 4,231,976, Cl. 264-0.500.

Gewerkschaft Eisenhutte Westfalia: *See*—
Rosenberg, Harry; and Plevak, Lubomir, 4,231,685, Cl. 405-296.000.

Ghering, Walter L.: *See*—
Boll, Richard H., deceased; and Ghering, Walter L., 4,231,262, Cl. 73-861.040.

Ghosh, Anil C.: *See*—
Razdan, Raj K.; and Ghosh, Anil C., 4,232,028, Cl. 424-260.000.

Gibbons, Gladys M., executrix: *See*—
Gibbons, Harold M., deceased, 4,231,398, Cl. 137-615.000.

Gibbons, Harold M., deceased (by Gibbons, Gladys M., executrix), to FMC Corporation. Cargo hose to marine tanker connection apparatus. 4,231,398, Cl. 137-615.000.

Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., to Dow Chemical Company, The. Dispersible vinylidene chloride polymer microgel powders as additives for urethane polymer foam. 4,232,129, Cl. 521-137.000.

Gibson, Harry: *See*—
Eccles, Edward S.; and Gibson, Harry, 4,232,312, Cl. 340-753.000.

Gibson, Robert C.; and Korenko, Michael K., to United States of America, Energy. High weldability nickel-base superalloy. 4,231,795, Cl. 75-171.000.

Gier, Thurman E., to Du Pont de Nemours, E. I., and Company. Method for flux growth of $KTiOPO_4$ and its analogues. 4,231,838, Cl. 156-600.000.

Giersberg, Dieter, to Siemens Aktiengesellschaft. Circuit arrangement for receiving simplex and duplex current telegraph characters. 4,232,188, Cl. 370-24.000.

Gilbers, Gabriele: *See*—
Neidig, Arno; Popp, Gerhard; and Gilbers, Gabriele, 4,232,326, Cl. 357-23.000.

Gilman, Paul B., Jr.; Belly, Robert T.; Koszelak, Thaddeus D.; and Zigman, Seymour, to Eastman Kodak Company. Process for selecting methine dyes which inhibit cell growth. 4,232,121, Cl. 435-32.000.

Gilpatric, Donald S. Apparatus for growing oysters and other molluscs. 4,231,322, Cl. 119-4.000.

Gilson, Channing W. Food dispensing utensil. 4,231,496, Cl. 222-414.000.

Giorgetti, Maurizio, to ATEX/U.S.A., Inc. Ink composition for non woven fabrics of synthetic fibers. 4,231,906, Cl. 260-19.00N.

Girard, Donald J.: *See*—
Paugstat, John F.; and Girard, Donald J., 4,232,375, Cl. 364-900.000.

Girling Limited: *See*—
Edwards, Roy E.; Price, Anthony G.; and Rees, John R., 4,231,224, Cl. 60-581.000.

Gislaved AB: *See*—
Ljungqvist, Stig-Ove E.; Hammarstrom, Bernth S.; and Fritjofsson, Sture F. E., 4,231,836, Cl. 156-405.00P.

Giulio, Ugo: *See*—
Mengoli, Giuliano; Daolio, Sergio; Giulio, Ugo; and Folonari, Carlo, 4,231,851, Cl. 204-181.00R.

Glass, Charles A.: *See*—
Walker, Maurice; Wheeley, Buren R.; and Glass, Charles A., 4,231,209, Cl. 53-48.000.

Gleichner, Hans, to Schneider Medintag AG. Clinically usable pump apparatus for a dilatation device. 4,231,715, Cl. 417-307.000.

Glesser, Louis S. Blade sharpener. 4,231,194, Cl. 51-211.00R.

Global Marine, Inc.: *See*—
Person, Abraham, 4,231,312, Cl. 114-264.000.

Glotzbach, Warren P.: *See*—
Dworsky, Lawrence N.; Whalin, Jeffery A.; and Glotzbach, Warren P., 4,232,239, Cl. 310-312.000.

Gnieser, Jurgen: *See*—
Mona, Roberto; and Gnieser, Jurgen, 4,231,862, Cl. 210-601.000.

Godard, Pierre: *See*—
Lelaidier, Daniel; and Godard, Pierre, 4,232,305, Cl. 340-384.00E.

Goddard, Denis A., to Beloit Corporation. Method of and means for precision mounting of members on elongate metallic supporting structure. 4,232,092, Cl. 428-542.000.

Goldberg, Bennett C.: *See*—
Campanella, Matthew J.; Maladra, Anthony; and Goldberg, Bennett C., 4,231,511, Cl. 235-375.000.

Goldie, Harry: *See*—
Gawronski, Michael J.; and Goldie, Harry, 4,232,278, Cl. 333-13.000.

Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Tetrapeptides and methods. 4,232,008, Cl. 424-177.000.

Gomez, Nicolas Q.; and Martin, Raul. Method and components for construction of building from concrete slabs. 4,231,199, Cl. 52-91.000.

Goode, David P. Window mount ski rack. 4,231,501, Cl. 224-42.46R.

Goodrich, Charles B.: *See*—
Tundermann, John H.; and Goodrich, Charles B., 4,231,729, Cl. 425-79.000.

Goodyear Tire & Rubber Company, The: *See*—
Kelly, Walter J., 4,232,180, Cl. 585-645.000.
Vannan, Frederick F., Jr., 4,231,410, Cl. 152-356.00R.

Gopal, Raj: *See*—
Graham, Kingsley F.; and Gopal, Raj, 4,232,224, Cl. 250-356.000.

Gopalakrishnan, Sankaraiyer; and Kuivinen, William L., to Borg-Warner Corporation. Two-stage turbo compressor. 4,231,702, Cl. 415-56.000.

Gordon, James R. Conveyor skirtboard apron. 4,231,471, Cl. 198-836.000.

Gordon, Richard S.: *See*—
Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., 4,231,788, Cl. 71-113.000.

Gorenc, Edward J.; Fox, Ulles E.; and Lesko, Imre A. Crimping tool for tubular-like objects and method. 4,231,246, Cl. 72-412.000.

Gorman, Esther M.: *See*—
Gorman, William W., Jr.; and Gorman, Esther M., 4,231,992, Cl. 422-258.000.

Gorman, William W., Jr.; and Gorman, Esther M., to E-C Apparatus Corporation. Three-phase counter-double-current apparatus. 4,231,992, Cl. 422-258.000.

Gorski, Michael E.: *See*—
Prickett, William H., 4,231,654, Cl. 355-38.000.

Gould Inc.: *See*—
DeLacy, James P.; and Lechner, Robert H., 4,232,232, Cl. 307-139.000.
Luke, Roger D.; and Rhodes, John M., 4,231,633, Cl. 339-242.000.
Menocal, Gustavo A., 4,232,282, Cl. 335-202.000.

Gould, Larrie A.; and Reed, Kim W., to Motorola, Inc. Radio receiver alignment indicator. 4,232,398, Cl. 455-226.000.

Goyette, William J.: *See*—
Kiovsky, Joseph R.; and Goyette, William J., 4,232,181, Cl. 585-739.000.

Graham, Alan A.: *See*—
Stetson, John R.; Graham, Alan A.; and Frisch, Rudolf, 4,232,076, Cl. 428-158.000.

Graham, Kingsley F.; and Gopal, Raj, to Westinghouse Electric Corp. Nuclear reactor primary coolant loop flowmeter with phase shift tracking compensation. 4,232,224, Cl. 250-356.000.

Graham, Paul W. L.; and Moore, Thomas W., Jr., to Owens-Illinois, Inc. Method of strengthening glass articles. 4,231,778, Cl. 65-117.000.

Grandfils, Pierre: *See*—
Blanpain, Guy; and Grandfils, Pierre, 4,231,672, Cl. 403-62.000.

Granier, Pierre: *See*—
Narbaits-Jaureguy, Jean-Raymond; Billottet, Henri; and Granier, Pierre, 4,232,285, Cl. 340-38.00L.

Grant, Andrew C.; and Kern, James W., to Union Carbide Corporation. Thermospray method for production of aluminum porous boiling surfaces. 4,232,056, Cl. 427-37.000.

Gratzer, Nelson R.; and Wright, William E., to Carrier Corporation. Refrigerant accumulator and method of manufacture thereof. 4,231,230, Cl. 62-503.000.

Grau, Thomas G.: *See*—
Emo, George C.; and Grau, Thomas G., 4,232,262, Cl. 324-65.00P.

Greenbaum, George. Agricultural device having air-water-soil strata. 4,231,187, Cl. 47-80.000.

Greenwood, David L. Syringe adaptor assembly. 4,231,494, Cl. 222-325.000.

Greive, Aloys, to Hamel GmbH, Zwirnmaschinen. Drive system for a yarn eye or yarn winder. 4,231,531, Cl. 242-18.100.

Grenier, Wilfred J., to General Industries, Inc. Automatically resetting flush valve. 4,231,542, Cl. 251-15.000.

Gresens, Harry; and Schuierer, Manfred, to Bruckner Apparatebau GmbH. Process for heat-treating a fabric web. 4,231,165, Cl. 34-28.000.

Gresser, Gerhard: *See*—
Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, 4,232,064, Cl. 427-208.400.

Greutert, Albert: *See*—
Zimmermann, Anton; and Greutert, Albert, 4,231,876, Cl. 210-232.000.

Grey, Roger A.; and Pez, Guido P., to Allied Chemical Corporation. Process for homogeneous hydrogenation of esters. 4,232,170, Cl. 560-179.000.

Griehl, Wolfgang: *See*—
Schmid, Eduard; and Griehl, Wolfgang, 4,232,145, Cl. 528-324.000.

Griepentrog, Hartmut, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method and apparatus for vaporizing liquid natural gases. 4,231,226, Cl. 60-648.000.

Griffith Laboratories U.S.A., Inc.: *See*—
Sair, Louis; and Sair, Ralph A., 4,232,047, Cl. 426-96.000.

Griffiths, David T., to Youngflex S.A. Seat frames. 4,231,615, Cl. 297-452.000.

Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Elastomeric thermoplastic mixtures of polypropylene and ethylene/vinyl acetate copolymers. 4,232,132, Cl. 525-222.000.

Grimes, Arnold S. Television channel lock-out apparatus. 4,232,396, Cl. 455-179.000.

Grimes, Jerry L. Gas delivery face shield. 4,231,363, Cl. 128-205.250.

Grimm, Herbert: *See*—
Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, 4,231,669, Cl. 401-258.000.

Grimshaw, Rex W.; and Poole, Colin, to Hepworth & Grandage Limited. Composite materials and their production. 4,232,091, Cl. 428-472.000.

Grise, Ernest J., Jr., to Akzona Incorporated. Method and apparatus for alleviating tight spots in false twist textured yarn. 4,231,219, Cl. 57-290.000.

Griswold, Frank B. Instep protector for safety shoes. 4,231,170, Cl. 36-72.00R.

Groen, Johannes, to Holland Dental B.V. Apparatus for removably supporting at least one medical, particularly dental instrument, such as a dental drill or the like. 4,231,737, Cl. 433-78.000.

Gross, Jerome A. Interpenetrating nailable fastener for sheet metal. 4,231,280, Cl. 85-31.000.

Groth, Hugh F.; Vogel, John D.; and Hunt, Guilbert M., to Sherwin-Williams Company, The. Liquid power driven coating apparatus. 4,231,668, Cl. 401-146.000.

Grow Group Inc.: *See*—
Tsou, Ivan H., 4,231,907, Cl. 260-23.0AR.

Grumman Aerospace Corporation. *See*—
Haslett, Robert A., 4,231,423, Cl. 165-105.000.

Grumman Flexible Corporation. *See*—
Heffner, George R., and Casutt, Max, 4,231,556, Cl. 269-22.000.

Grundmann, Raban: *See*—
Magiera, Leonhardt, Grundmann, Raban; and Kroekenberger, Dieter, 4,231,968, Cl. 570-109.000.

Gruppo Lepetit S.p.A.: *See*—
Winters, Giorgio; and Di Mola, Nunzio, 4,232,017, Cl. 424-246.000.

Gsell, Laurenz: *See*—
Reinehr, Dieter; and Gsell, Laurenz, 4,231,962, Cl. 564-272.000.

GTF Lenkurt Electric (Canada) Ltd.: *See*—
Willoner, Gideon, 4,232,269, Cl. 330-85.000.

GTE Products Corporation: *See*—
Dow, Judith A.; and Fohl, Timothy, 4,232,058, Cl. 427-54.100.

Guermault, Jean-Marc; and Barber, Jacques, to Safi-Societe des Accumulateurs Fixes et de Traction. Through-connector providing an electrical connection through a single or double plastic wall and application thereof to an electrical battery. 4,231,631, Cl. 339-94.00A.

Gugel, Georg, to Kraftwerk Union Aktiengesellschaft. Manipulator for inspection and possible repair of the tubes of heat exchangers, especially of steam generators for nuclear reactors. 4,231,419, Cl. 165-11.00A.

Guido, Anthony A.: *See*—
Weiss, Gerald; Schart, Gerson; Guido, Anthony A.; and Lazardwitz, Benjamin, 4,232,187, Cl. 178-22.000.

Guillaume, Jacques: *See*—
Dumont, Claude; Guillaume, Jacques; and Nedelec, Lucien, 4,232,031, Cl. 424-263.000.

Gulf Oil Corporation: *See*—
Calloy, Roger P., 4,232,163, Cl. 548-195.000.
Larson, Olaf A.; and Matthews, Charles W., 4,231,617, Cl. 299-2.000.

Gunther, Dieter; Erekel, Rudiger; Rosch, Gunter; and Probst, Heinz, to Hoechst Aktiengesellschaft. Mixtures of optical brighteners. 4,231,741, Cl. 8-571.000.

Gurvich, Yakov A.: *See*—
Adigamov, Engel R.; Gurvich, Yakov A.; Liakumovich, Alexandr G.; Logutov, Igor J.; Michurov, Jury I.; Polenov, Alexei S.; and Vanshevsky, Vladimir A., 4,232,176, Cl. 568-756.000.

Gutierrez, Manuel M., to Tosco Corporation. Method for separating carbon black from fiberglass. 4,231,998, Cl. 423-449.000.

H. C. Price Co.: *See*—
Hart, Milburn L.; and Bridge, John F., 4,231,823, Cl. 156-64.000.

Haberle, Fritz; Riechers, Daniel; and Heusel, Richard, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles. 4,231,601, Cl. 293-136.000.

Hackl, Helmut: *See*—
Brabetz, Bernhard; and Hackl, Helmut, 4,231,692, Cl. 408-230.000.

Haberer, Norman G.; and Troy, J. Harold, to Westinghouse Electric Corp. Method and apparatus for manufacturing a filament served bendable conductor. 4,231,151, Cl. 29-605.000.

Haefliger, Walter: *See*—
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,232,039, Cl. 424-278.000.

Haferl, Peter F.: to RCA Corporation. Regulated deflection circuit. 4,232,254, Cl. 315-408.000.

Hafner, Joseph A.: Siding structure. 4,231,206, Cl. 52-529.000.

Hagen, Helmut; and Kohler, Rolf-Dieter, to BASF Aktiengesellschaft. 2-Substituted-1-alkyl-nitroimidazoles. 4,232,165, Cl. 548-339.000.

Hager, David P.: Dog food container and feeder. 4,231,326, Cl. 119-52.00R.

Hagimomori, Eiichi: *See*—
Menju, Shinichi; Takahashi, Kunio; Hagimomori, Eiichi; Murakami, Yoichi; and Zamia, Enchi, 4,231,258, Cl. 73-572.000.

Hahn, Reinhard; and Behrens, Dieter, to Hermann C. Starck Berlin. Process for the preparation of tantalum and niobium powders of improved efficiency. 4,231,790, Cl. 75-0.5BB.

Hainle, Rudi: *See*—
Alf, Herbert; Ernst, Volker; Hainle, Rudi; and Leipelt, Rudolf, 4,231,343, Cl. 123-556.000.

Hall, David E.: *See*—
Orr, Thomas S. C.; Hall, David E.; and Mann, John, 4,232,012, Cl. 424-232.000.

Hall, James F., Jr.; Lake, Ralph J., Jr.; and Scholder, William G., to Franklin Electric Subsidiaries, Inc. Automatic check weigher. 4,231,439, Cl. 177-25.000.

Hall, Wendel W.: *See*—
Duncan, Rodney A.; and Hall, Wendel W., 4,231,540, Cl. 248-487.000.

Hallberg, Irving H.; Paul, Howard C.; Ralston, Ronald R.; and Hunninghaus, Roy E., to Borg-Warner Corporation. Control system for regulating air/fuel ratio. 4,231,335, Cl. 123-440.000.

Halliburton Company: *See*—
Elphingstone, Eugene A.; and Norman, Lewis R., 4,231,882, Cl. 252-8.55C.

Hallstrom, Ulf: *See*—
Franzen, Olof K.; Hallstrom, Ulf; and Petersson, Bengt A., 4,232,096, Cl. 426-683.000.

Hamakawa, Toshihiro: *See*—
Kajihara, Motoyoshi; Hamakawa, Toshihiro; Shibata, Toshiaki; Suzue, Takashi; and Fujii, Setsuro, 4,232,007, Cl. 424-177.000.

Hamal, Heinrich: *See*—
Kuhne, Rudolf; and Hamal, Heinrich, 4,231,964, Cl. 564-305.000.

Hamamatsu Terebi Kabushiki Kaisha: *See*—
Hiruma, Teruo; and Tsuchiya, Yutaka, 4,232,333, Cl. 358-93.000.

Hamashima, Yoshio: *See*—
Nagata, Wataru; Hamashima, Yoshio; Tsuji, Teruji; and Lunn, William H. W., 4,232,151, Cl. 544-90.000.

Hamatani, Mitsuhiro, to Kabushiki Kaisha Seikosha. Electric circuit for driving a piezoelectric vibrator. 4,232,241, Cl. 310-317.000.

Hamel GmbH, Zwirnmaschinen: *See*—
Greive, Aloys, 4,231,531, Cl. 242-18.100.

Hammarstrom, Bernth S.: *See*—
Ljungqvist, Stig-Ove E.; Hammarstrom, Bernth S.; and Fritjofsson, Sture F. E., 4,231,836, Cl. 156-405.00P.

Hanajima, Hidemitsu; and Shigeta, Yasuo, to Sony Corporation. Digital signal selective circuit. 4,232,267, Cl. 328-138.000.

Hancart, Jules: *See*—
Paulus, Philippe; and Hancart, Jules, 4,231,812, Cl. 148-6.15R.

Hanisch, Horst; Winkelmann, Heinrich; and Fischer, Adolf, to Winkelmann and Pannhoff and Bayerische Motoren Werke Aktiengesellschaft. Tooth grip belt pulley. 4,231,265, Cl. 474-152.000.

Hanley, John P. Human reproduction indexing device. 4,232,215, Cl. 235-78.0RC.

Hannie, Steven G.; and Tucker, Terry D., to Parsons Manufacturing, Incorporated. Grain cleaning apparatus. 4,231,861, Cl. 209-240.000.

Hansen, Harold O.: *See*—
Hestad, Alfred M.; Synek, Jan; and Hansen, Harold O., 4,232,200, Cl. 179-90.00K.

Hanusiak, William M.: *See*—
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,231,979, Cl. 264-81.000.

Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Method of producing a sintered diamond compact. 4,231,762, Cl. 51-309.000.

Hara, Elmer H.; and Ozeki, Takeshi, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Frequency division multiplexing system for optical transmission of broadband signals. 4,232,385, Cl. 370-3.000.

Hara, Katsumasa. Device for air-massage. 4,231,355, Cl. 128-24.200.

Harding, Allen W., to ABC Elevators, Inc. Elevator erection method. 4,231,148, Cl. 29-469.000.

Haren, Doyle V.: *See*—
Ensley, Rufus N.; Haren, Doyle V.; Logan, Arthur D.; and McLean, Michael E., 4,231,835, Cl. 156-361.000.

Harman, John N., III: *See*—
Chapman, Robert L.; and Harman, John N., III, 4,231,256, Cl. 73-421.50R.

Harms, Hauke: *See*—
Papp, Alfred; and Harms, Hauke, 4,232,264, Cl. 324-96.000.

Harnois, Georges A. Method and device for arranging a storage area. 4,231,201, Cl. 52-169.600.

Harris, Charles R.: *See*—
Garner, Lloyd L.; and Harris, Charles R., 4,231,438, Cl. 175-353.000.

Harris Corporation: *See*—
Leitch, Clifford D., 4,232,189, Cl. 179-1.00G.
Smiley, Charles F.; and Zachum, Billy G., 4,232,339, Cl. 358-150.000.

Harris, Harold H., to Northern Telecom Limited. Line interface unit for voice and wide band signal coupling. 4,232,293, Cl. 340-147.00R.

Harrom, Harley A.: *See*—
Hedtke, Robert G.; Harrom, Harley A.; Kelley, Wilfred H., Jr.; and Frederick, Sherman B., 4,231,450, Cl. 187-9.00R.

Harshberger, Robert P., Jr., to Ampex Corporation. Web transport capstan control system. 4,232,257, Cl. 318-314.000.

Hart, Milburn L.; and Bridge, John F., to H. C. Price Co. Method and apparatus for centering two concentric cylinders. 4,231,823, Cl. 156-64.000.

Hart, Robert A.: *See*—
Carlberg, Bob L.; and Hart, Robert A., 4,231,869, Cl. 210-763.000.

Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Dielectrically-isolated integrated circuit complementary transistors for high voltage use. 4,232,328, Cl. 357-49.000.

Hartzler, Harold E., to Miles Laboratories, Inc. 2,5-Dioxo-3H,6H-furo[3,2-b]furan-3a,6a-diacetic acid and salts thereof. 4,231,939, Cl. 260-343.600.

Hasegawa, Gary K., to Continental Group, Inc., The. Pull tab having memory for effecting rolling up of tab and removable panel portion. 4,231,487, Cl. 220-269.000.

Hashimoto, Shinsuke: *See*—
Hayashi, Masaki; Arai, Yoshinobu; Ohuchida, Shuichi; and Hashimoto, Shinsuke, 4,232,009, Cl. 424-180.000.

Haskett, William F.: *See*—
Boatwright, John T.; Prince, David G.; Haskett, William F.; and Koch, Helmut, 4,232,199, Cl. 179-18.00B.

Haski, Andre L.; and Bleys, Cyriacus A., to Haski, said Andre L., by said Cyriacus A. Bleys. Rate measuring device for joint and/or muscular performance. 4,231,255, Cl. 73-379.000.

Haski, said Andre L.: *See*—
Haski, Andre L.; and Bleys, Cyriacus A. (said Cyriacus A. Bleys assors. to), 4,231,255, Cl. 73-379.000.

Haslett, Robert A., to Grumman Aerospace Corporation. Heat pipe panel and method of fabrication. 4,231,423, Cl. 165-105.000.

Hatanaka, Takefumi. Automatic document shredder. 4,231,530, Cl. 241-223.000.

Hatsuno, Hiroshi; Fukazawa, Jinpei; Fukushima, Mitsuo; and Ogawa, Shinji, to Ricoh Company, Ltd. Apparatus for sensing Schnarren phenomenon in fuel injection line. 4,231,251, Cl. 73-119.00A.

Hatsushika, Masabumi: *See*—
Takeuchi, Yo; Ohbori, Koichi; Hatsushika, Masabumi; and Komori, Shinichi, 4,231,817, Cl. 148-32.500.

Hattori, Seizi; Makino, Koichi; Nakagawa, Takehiko; and Shinohara, Masayoshi, to Fujitsu Limited. Magnetic recording medium and process for producing the same. 4,232,061, Cl. 427-130.000.

Hattori, Seizi: *See*—
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Hattori, Shuzo: *See*—
Tokudome, Katumi; Ishikawa, Michio; and Hattori, Shuzo, 4,232,274, Cl. 331-94.50S.

Hausenblas, Bernhard: *See*—
Merkle, Theodor; Hausenblas, Bernhard; Schweickert, Hermann; and Wengert, Dieter, 4,231,594, Cl. 285-3.000.

Hauser, Daniel: *See*—
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,232,039, Cl. 424-278.000.

Havlice, James F.: *See*—
Waxman, Albert S.; and Havlice, James F., 4,231,373, Cl. 128-660.000.

Hawk, Rufus L.; and Unterborn, Ralph D., to General Motors Corporation. Diaphragm pump. 4,231,721, Cl. 417-413.000.

Hawken, Henry A.: *See*—
Phelon, Russell E.; and Hawken, Henry A., 4,232,284, Cl. 336-90.000.

Hayama, Hajime: *See*—
Kanatani, Heiichi; Osumi, Masato; and Hayama, Hajime, 4,231,353, Cl. 126-443.000.

Hayashi, Masaki; Arai, Yoshinobu; Ohuchida, Shuichi; and Hashimoto, Shinsuke, to ONO Pharmaceutical Co. Ltd. ω-Halo-PGI$_2$ analogues. 4,232,009, Cl. 424-180.000.

Haydon, Charles R. Dent straightening tool. 4,231,247, Cl. 72-479.000.

Hayes, Roger A.: *See*—
Flock, Steven D.; and Hayes, Roger A., 4,231,664, Cl. 366-35.000.

Hayes, William H., Jr.: *See*—
Lyon, Warren C.; and Hayes, William H., Jr., 4,231,376, Cl. 128-748.000.

Hebble, Terry L.: *See*—
Sandberg, Richard G.; and Hebble, Terry L., 4,231,993, Cl. 423-34.000.

Hechtfischer, Gustav: *See*—
Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, 4,231,933, Cl. 260-326.5FL.

Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,231,920, Cl. 260-45.70S.

Hedstrom Co.: *See*—
Moss, Mark D., 4,231,582, Cl. 280-87.02W.

Hedtke, Robert G.; Harrom, Harley A.; Kelley, Wilfred H., Jr.; and Frederick, Sherman B., to White Farm Equipment Company. Overload warning system. 4,231,450, Cl. 187-9.00R.

Heerema, Pieter S.; Horowitz, Alexandre; and Willemsen, Henricus P., to Varitrac AG. Stabilizing system on a semi-submersible crane vessel. 4,231,313, Cl. 114-265.000.

Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of 1-(1,3-dioxolan-2-ylmethyl)-1H-imidazoles. 4,232,034, Cl. 424-269.000.

Heffner, George R.; and Casutt, Max, to Grumman Flexible Corporation. Apparatus for holding hollow wall panels while they are filled with foamed plastic. 4,231,556, Cl. 269-22.000.

Hehl, Klaus; and Sauer, Hans-Jurgen, to Riloga-Werk Joachim Schmidt. Roller-blind assembly. 4,231,411, Cl. 160-120.000.

Heikinheimo, Olli, to Plan-Sell Oy. System for transferring wane-edged boards. 4,231,460, Cl. 198-341.000.

Heiligtag, Raymond W. Gyratory aerobic aeration treatment tank. 4,231,874, Cl. 210-195.400.

Heimerman, David P.: *See*—
Hinds, Horace, Jr.; Heimerman, David P.; and Born, Billy L., 4,232,051, Cl. 426-582.000.

Heinsen, Edward A.; and Marathe, Vijay V., to Hewlett-Packard Company. Incrementing signal hold circuit for a clock/calculator. 4,232,382, Cl. 368-1.000.

Heinz Kaiser AG: *See*—
Pape, Dieter; and Woerz, Hans, 4,231,691, Cl. 408-185.000.

Heiter, George L., to Bell Telephone Laboratories, Incorporated. Continuously variable phase shift network. 4,232,399, Cl. 455-276.000.

Heitmann, Jurgen, to Robert Bosch GmbH. Method and system for separating the chrominance and luminance signals in color television signals having quadrature-modulated chrominance subcarriers. 4,232,330, Cl. 358-31.000.

Helle, Michel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Method and device for reading coded information in the form of intervals of predetermined sizes. 4,232,216, Cl. 235-449.000.

Hempelmann, Heinrich J.: *See*—
Beisch, Hans R.; and Hempelmann, Heinrich J., 4,231,619, Cl. 301-37.00P.

Henderson, Dennis. Method and apparatus for assembling a portable tower. 4,231,200, Cl. 52-111.000.

Henderson, James M.: *See*—
Campbell, Ivor E.; Henderson, James M.; Johnson, Walter; and Wetherill, William H., 4,231,995, Cl. 423-242.000.

Henke, Robert H., to Allegheny Ludlum Industries, Inc. Methods of producing silicon steel strip. 4,231,818, Cl. 148-111.000.

Henrick, Clive A.; and Garcia, Barbara A., to Zoecon Corporation. Fluoro substituted aryl esters and thiolesters of amino acids. 4,231,953, Cl. 260-465.00D.

Henry, James W., to Eastman Kodak Company. Inspection of elongated material. 4,232,336, Cl. 358-106.000.

Henry, William N., to RCA Corporation. Method of making a silicon diode array target. 4,231,820, Cl. 148-187.000.

Henry, William P., to Caterpillar Tractor Co. Fluid barrier means for parts washer apparatus. 4,231,806, Cl. 134-18.000.

Hepp, Dieter: *See*—
Kaufhold, Manfred; Hepp, Dieter; and Menzel, Gerhard, 4,231,915, Cl. 260-31.80R.

Hepworth & Grandage Limited: *See*—
Grimshaw, Rex W.; and Poole, Colin, 4,232,091, Cl. 428-472.000.

Herman Miller, Inc.: *See*—
Propst, Robert L.; and Wodka, Michael A., 4,231,630, Cl. 339-22.00R.

Hermann C. Starck Berlin: *See*—
Hahn, Reinhard; and Behrens, Dieter, 4,231,790, Cl. 75-0.5BB.

Hermine, Mair, to Ipierre Sirotex, S.p.A. Water sprinkler. 4,231,521, Cl. 239-230.000.

Herrmann, Manfred F.: *See*—
Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, 4,231,933, Cl. 260-326.5FL.

Hertell, Siegfried, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Rotary vane pump. 4,231,728, Cl. 418-79.000.

Hertzog, Russel C., to Schlumberger Technology Corporation. Background subtraction system for pulsed neutron logging of earth boreholes. 4,232,220, Cl. 250-270.000.

Herzer, Heinz, Rath, Heinz-Jorg, and Schmidt, Dietrich, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for purifying solid substances. 4,231,755, Cl. 23-293.00R.

Hesler, Dietrich: *See*—
Nicklas, Walter; Hesler, Dietrich, and Gresser, Gerhard, 4,232,064, Cl. 427-208.400.

Hessner, Hans, to Mo Och Domsjo Aktiebolag. Bandage for absorbing body fluids. 4,231,357, Cl. 128-156.000.

Hestad, Alfred M.; Synek, Jan, and Hansen, Harold O., to United Networks, Inc. Dialing system. 4,232,200, Cl. 179-90.00K.

Heusel, Richard: *See*—
Haberle, Fritz; Riechers, Daniel; and Heusel, Richard, 4,231,601, Cl. 293-136.000.

Heuser, Hans: *See*—
Oram, Roger; Heuser, Hans, Ohlenforst, Hans, and Pelzer, Rudolf, 4,232,080, Cl. 428-215.000.

Hewett, Colin L.: *See*—
Campbell, Alexander C.; Hewett, Colin L., and Zeelen, Filippus J., 4,232,042, Cl. 424-308.000.

Hewitt, James A., to F. W. Payne & Son (Bickley) Limited. Floating dredger and treatment plant. 4,231,172, Cl. 37-71.000.

Hewlett-Packard Company: *See*—
Clouser, David E.; and Engel, Steven J., 4,232,233, Cl. 307-229.000.
Heinsen, Edward A.; and Marathe, Vijay V., 4,232,382, Cl. 368-1.000.

Heybourn, Frank: *See*—
Hinchcliffe, Dennis; Heybourn, Frank; and Luddington, Eric A., 4,231,461, Cl. 198-347.000.

Hickam, William M.; Lin, Ching-Yu; and Zomp, John M., to Westinghouse Electric Corp. Combined O$_2$/combustibles solid electrolyte gas monitoring device. 4,231,733, Cl. 431-76.000.

Hida, Teisuo: *See*—
Fujiu, Masayoshi; and Hida, Teisuo, 4,231,303, Cl. 110-245.000.

Higuchi, Hobari A.; and Yee, Sammy K., to International Business Machines Corporation. AC to DC Converter with enhanced buck/boost regulation. 4,232,363, Cl. 363-75.000.

Higuchi, Noboru; Ogasawara, Takayuki, and Seike, Shoji, to NGK Insulators, Ltd. Electrical insulator with semiconductive glaze. 4,232,185, Cl. 174-140.00C.

Hill, Johnnie L. Automobile auxiliary heater. 4,232,211, Cl. 219-202.000.

Hill, Lewis J.; and Dillard, Bill J., to U-Change Lock Industries, Inc. Plug for a key operated lock. 4,231,242, Cl. 70-347.000.

Hill, William F.; and Southgate, John P., to Lucas Industries Limited. Internal combustion engine function control system. 4,232,368, Cl. 364-431.000.

Hillesland, Gene G. Combination tail-wiggling artificial bait and stabilizer plug. 4,231,179, Cl. 43-42.060.

Hinchcliffe, Dennis; Heybourn, Frank; and Luddington, Eric A., to Molins, Ltd. Reservoirs for cigarettes. 4,231,461, Cl. 198-347.000.

Hindermayr, Herman: *See*—
Winter, Werner; Hindermayr, Herman; Roesch, Egon; Roesch, Andromki; and Wilhelms, Otto-Henning, 4,232,024, Cl. 424-251.000.

Hinds, Horace, Jr.; Heimerman, David P., and Born, Billy L., to Stoelting, Inc. Method of separating liquid from soft particulate food solids. 4,232,051, Cl. 426-582.000.

Hinn, Werner, to RCA Corporation. SECAM Chroma demodulator circuit. 4,232,268, Cl. 329-103.000.

Hirai, Kentaro; Fujishita, Toshio; and Ishiba, Teruyuki, to Shionogi & Co., Ltd. 1-Substituted thiomethyltriazolobenzodiazepines. 4,231,930, Cl. 260-245.500.

Hirai, Seiichi: *See*—
Otsuka, Nobuyuki; and Hirai, Seiichi, 4,231,232, Cl. 64-21.000.

Hirose, Takao: *See*—
Kato, Osamu; Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; and Takashima, Hiroaki, 4,231,857, Cl. 208-40.000.

Hirsch, Horst E.; and Smyth, Robert W., to Cominco Ltd. Cadmium mercury telluride sputtering targets. 4,231,981, Cl. 264-102.000.

Hiruma, Teruo; and Tsuchiya, Yutaka, to Hamamatsu Terebi Kabushiki Kaisha. Streak image analyzing device. 4,232,333, Cl. 358-93.000.

Hitachi, Ltd.: *See*—
Kuwahara, Akiyasu; and Yanagisawa, Syozo, 4,231,337, Cl. 123-568.000.
Murata, Toshinori; and Matsuura, Shigeo, 4,232,397, Cl. 455-179.000.
Nishimiya, Torazo; Okumura, Masamitsu; Ito, Tomo; and Numakura, Seisaku, 4,231,340, Cl. 123-568.000.
Okuhara, Shinzi; Ohhinata, Ichiro; and Tokunaga, Michio, 4,232,234, Cl. 307-252.00G.
Saito, Akihiro; and Naoi, Keigo, 4,232,238, Cl. 310-68.00D.
Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,231,686, Cl. 406-14.000.
Sakurai, Soichi; Ando, Kunio; and Fukuzawa, Kenichi, 4,232,246, Cl. 313-414.000.
Tobita, Hideyuki; and Mori, Toshio, 4,231,130, Cl. 8-159.000.
Tooyama, Eiji, 4,232,206, Cl. 179-175.30S.
Ueda, Shinjiro; Takada, Yoshihiro; Mishina, Haruo; and Kuroda, Atsuhiko, 4,231,706, Cl. 416-186.00R.
Watanabe, Ryuji; Arakawa, Hideo; and Kuniya, Keiichi, 4,231,814, Cl. 148-11.50C.
Yamamoto, Hideaki; Tsukada, Toshihisa; Maruyama, Eiichi; and Inagaki, Hiroya, 4,232,219, Cl. 250-227.000.

Hitachi Metals, Ltd.: *See*—
Asanae, Masumi; and Yamashita, Keitaro, 4,231,320, Cl. 118-657.000.

Hittman Corporation: *See*—
Lyon, Warren C.; and Hayes, William H., Jr., 4,231,376, Cl. 128-748.000.

Hobbs, Lawrence H.: *See*—
Baraff, David R.; and Hobbs, Lawrence H., 4,232,212, Cl. 219-216.000.

Hoch, Samuel: *See*—
Ceprini, Mario Q.; Collins, John D.; Hoch, Samuel; and Wood, Donald A., 4,231,949, Cl. 260-429.700.

Hochberg, Mordecai. Plant growing assembly. 4,231,189, Cl. 47-83.000.

Hochiki Corporation: *See*—
Yasuda, Katsuya; and Adachi, Akio, 4,232,292, Cl. 340-147.0SY.

Hochrein, Ambrose A., Jr.: *See*—
Thiruvengadam, Alagu P.; and Hochrein, Ambrose A., Jr., 4,231,259, Cl. 73-584.000.

Hochstein, Peter A.: *See*—
Pringle, William L.; Hochstein, Peter A.; and Milton, Harold W., Jr., 4,231,223, Cl. 60-527.000.

Hodgdon, Russell B.; and Alexander, Samuel S., to Ionics, Incorporated. Electrodialysis membranes of high interstitial molality based upon methacrylate ester derivatives. 4,231,855, Cl. 204-301.000.

Hodgkins, Bernard E.; and Wadey, Raymond C. C., to Zimmer Orthopaedic Limited. Supporting frame for a vehicle seat. 4,231,589, Cl. 280-781.000.

Hoechst Aktiengesellschaft: *See*—
De Felice, Wilfried, 4,231,477, Cl. 206-532.000.
Feess, Erich; and Reinhardt, Friedrich, 4,231,745, Cl. 8-552.000.
Gunther, Dieter; Erckel, Rudiger; Rosch, Gunter; and Probst, Heinz, 4,231,741, Cl. 8-571.000.
Kuhne, Rudolf; and Hamal, Heinrich, 4,231,964, Cl. 564-305.000.
Michel, Wolfgang; and Kalberer, Heinz, 4,232,128, Cl. 521-134.000.
Rochlitz, Jurgen; and Schon, Gunter, 4,231,799, Cl. 430-59.000.

Hoffman, Carl H.: *See*—
Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, 4,231,938, Cl. 260-343.500.

Hoffmann, Herbert: *See*—
Ponsold, Kurt; Prousa, Richard; Oettel, Michael; Strecke, Joachim; and Hoffmann, Herbert, 4,231,946, Cl. 260-397.400.

Hoffmann-La Roche Inc.: *See*—
Chan, Ka-Kong; and Pawson, Beverly A., 4,231,944, Cl. 260-347.400.

Hofmann, Corris M.: *See*—
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,231,935, Cl. 260-326.50B.

Hofmann, Franz, to Georg Fischer Aktiengesellschaft. Process for the production of molded phosphate bonded refractory articles. 4,231,984, Cl. 264-256.000.

Hogan, Lawrence R., to Cole-Parmer Instrument Company. Peristaltic pump. 4,231,725, Cl. 417-477.000.

Hoh, Thomas L.; and Relly, Robert H. Shim. 4,232,068, Cl. 428-43.000.

Hohki, Tetsuo: *See*—
Sakamoto, Seiya; Hohki, Tetsuo; and Saito, Isao, 4,232,344, Cl. 358-298.000.

Holbek, Gert A. E., to Munch, Erik. Table having an adjustable support and locking system for the top thereof. 4,231,297, Cl. 108-10.000.

Holder, John D.: *See*—
Clark, Grady W.; Holder, John D.; and Pasto, Arvid E., 4,231,796, Cl. 75-206.000.

Holland Dental B.V.: *See*—
Groen, Johannes, 4,231,737, Cl. 433-78.000.

Hollingsworth, Charles M.: *See*—
Corris, Charles J.; Hollingsworth, Charles M.; Kosicki, Witold W.; and Potter, Robert T., 4,231,184, Cl. 46-265.000.

Holset Engineering Company Limited: *See*—
Cornish, Robert N., 4,231,457, Cl. 192-82.00T.

Holt, John P.; and Cash, Theodore P., to Valley Mineral Products Corporation. Dry heat setting refractory and methods of using same. 4,231,800, Cl. 106-58.000.

Holzermer, Guenter: *See*—
Finkenzeller, Johann; Holzermer, Guenter; and Wenzek, Gerhard, 4,232,227, Cl. 250-468.000.

Holzmann, Dieter: *See*—
Gerlach, Albrecht; Holzmann, Dieter; Lindstedt, Guenter; and Burth, Rolf-Dieter, 4,232,297, Cl. 340-168.00S.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Otsuka, Nobuyuki; and Hirai, Seiichi, 4,231,232, Cl. 64-21.000.

Honeywell Inc.: *See*—
Bibbero, Robert J., 4,232,364, Cl. 364-105.000.

Hoogovens Ijmuiden, B.V.: *See*—
Vander, Timen; Thijssen, Nicolaas J.; de Blok, Jan F.; and Middel, Jan, 4,231,845, Cl. 202-113.000.

Hope Co., Ltd.: *See*—
Kikuchi, Toshikazu, 4,231,584, Cl. 280-604.000.

Hope, Henry F.; and Hope, Stephen F. Adjustable metering pump. 4,231,724, Cl. 417-472.000.

Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,231,724, Cl. 417-472.000.

Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., to Eastman Kodak Company. Multichannel recording format for a sampled-analog color video signal. 4,232,329, Cl. 358-9.000.

Horbelt, Michael: *See*—
Drews, Ulrich; Schnurle, Hans; Horbelt, Michael; Schmidt, Bernhard; and Werner, Peter, 4,231,345, Cl. 123-510.000.

Horgan, Anthony M.; and Radler, Richard W., Jr., to Xerox Corporation. Imaging system. 4,232,102, Cl. 430-58.000.

Hori, Hideichi: *See*—
Nakane, Mototaka; and Hori, Hideichi, 4,231,456, Cl. 192-70.250.

Hori, Tatsu, to Savin Corporation. Recirculating document feeder. 4,231,562, Cl. 271-3.100.

Horiba, Ltd.: *See*—
Ohnishi, Toshikazu; Ishida, Kozo; and Saitoh, Osamu, 4,232,223, Cl. 250-343.000.

Horie, Ikutard: *See*—
Naoi, Takashi; and Horie, Ikutard, 4,232,117, Cl. 430-539.000.

Horikiri Spring Manufacturing Co., Ltd.: *See*—
Saito, Tsutomu, 4,231,555, Cl. 267-154.000.

Horowitz, Alexandre: *See*—
Heerema, Pieter S.; Horowitz, Alexandre; and Willemsen, Henricus P., 4,231,313, Cl. 114-265.000.

Horsman Dolls Inc.: *See*—
Corris, Charles J.; Hollingsworth, Charles M.; Kosicki, Witold W.; and Potter, Robert T., 4,231,184, Cl. 46-265.000.

Hoskinson, Gordon H., to Cornell-Hoskinson Manufacturing Corp. Combustion apparatus utilizing an auger having an integral air supply system. 4,231,304, Cl. 110-257.000.

Hosono, Takashi: *See*—
Toyama, Akira; Ohkoshi, Akio; Toyama, Takashi; Yukawa, Takahiro; and Hosono, Takashi, 4,232,332, Cl. 358-67.000.

Howarth, Thomas T., to Beecham Group Limited. Antibacterial agents. 4,232,005, Cl. 424-114.000.

Howmedica, Incorporated: *See*—
Kurtz, Robert J.; and Silverstein, Spencer J., 4,231,354, Cl. 128-1.00D.

Hrabal, Hans; and Wimmer, Josef, to Enfo Grundlagen Forschungs AG. Closing member for a ring valve. 4,231,394, Cl. 137-512.000.

Hsu, Sheng T., to RCA Corporation. Extended drain self-aligned silicon gate MOSFET. 4,232,327, Cl. 357-23.000.

Hsu, Yun T. Sparking plug with efficient air supplying system and a removable sitting device. 4,232,242, Cl. 313-120.000.

Hubert, Guy: *See*—
Dechenne, Roger; and Hubert, Guy, 4,231,483, Cl. 220-66.000.

Hudek, Karl; and Weigert, Kurt, to Siemens Aktiengesellschaft. Procedure and device for the detection of extraordinary events in a series of essentially periodically recurring normal events. 4,231,374, Cl. 128-702.000.

Huettner, Robert; Kuetterer, Gerhard; and Sklebitz, Hartmut, to Siemens Aktiengesellschaft. Diagnostic installation for producing tomographic images. 4,232,226, Cl. 250-445.00T.

Hughes Aircraft Company: *See*—
Forward, Robert L., 4,232,280, Cl. 333-213.000.
Kolb, William P., Jr., 4,232,275, Cl. 331-94.50D.
Lagodmos, George P., 4,231,418, Cl. 165-4.000.
Prince, Paul R., 4,232,279, Cl. 333-165.000.

Hughes, Donald W. K.; and Lauterbach, John H. F., to AMP Incorporated. Electrical connector receptacles. 4,231,628, Cl. 339-17.0LC.

Hugl, Herbert; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Azo dyestuffs. 4,231,748, Cl. 8-668.000.

Huiatt, Jerry L.; Shurtz, Melvin D.; and Potter, George M., to United States of America, Interior. Molybdenite flotation. 4,231,859, Cl. 209-11.000.

Humphrey, James S., Jr., to General Electric Company. Polycarbonate articles coated with an adherent, durable organopolysiloxane coating and process for producing same. 4,232,088, Cl. 428-412.000.

Hunninghaus, Roy E.: *See*—
Hallberg, Irving H.; Paul, Howard C.; Ralston, Ronald R.; and Hunninghaus, Roy E., 4,231,335, Cl. 123-440.000.

Hunt, Guilbert M.: *See*—
Groth, Hugh F.; Vogel, John D.; and Hunt, Guilbert M., 4,231,668, Cl. 401-146.000.

Huntington Alloys Inc.: *See*—
Tundermann, John H.; and Goodrich, Charles B., 4,231,729, Cl. 425-79.000.

Huppenthal, Frank J.: *See*—
Still, Robert C.; Huppenthal, Frank J.; Smith, Barbara J.; and Scotney, Gerald H., 4,231,389, Cl. 137-315.000.

Hurkett, Earl. Water bed wave generator. 4,231,126, Cl. 5-451.000.

Hutchins, Ferris L., Jr.: *See*—
Gebhardt, James L.; and Hutchins, Ferris L., Jr., 4,231,299, Cl. 108-91.000.

Hutchinson, John; and Whittaker, Graham, to Imperial Chemical Industries Limited. Process for the preparation of a perfluorinated cyclic ether. 4,231,849, Cl. 204-59.00F.

I.S.C. Smelting Ltd.: *See*—
Charles, James A., 4,231,791, Cl. 75-9.000.

Ichikawa, Junji; Takahashi, Yuji; and Saito, Jun, to Canon Kabushiki Kaisha. Paper feed device. 4,231,565, Cl. 271-105.000.

Ichinose, Isao: *See*—
Mori, Fumio; Ichinose, Isao; and Kunimoto, Go, 4,232,086, Cl. 428-341.000.

ICI Americas Inc.: *See*—
Ferrarini, L. James, Jr.; and Feltzin, Joseph, 4,232,133, Cl. 525-452.000.

Ideal Toy Corporation: *See*—
Lahr, Robert G., 4,231,183, Cl. 46-262.000.

Idelson, Elbert M., to Polaroid Corporation. Yellow azomethine dye developers. 4,231,950, Cl. 260-438.50R.

Ihara Chemical Industry Company, Limited: *See*—
Shinohara, Akira; Wada, Nobuhide; Tokunaga, Yukio; and Yazawa, Chihiro, 4,231,963, Cl. 564-443.000.

Iida, Haruki: *See*—
Nagahara, Yasumori; and Iida, Haruki, 4,231,653, Cl. 355-3.0FU.

Iida Kensetsu Kabushiki Kaisha: *See*—
Ijima, Takeshi, 4,231,680, Cl. 405-31.000.

Iida, Yozo, to Nippon Kogaku K.K. Camera which permits automatic focusing and manual focusing. 4,231,646, Cl. 354-195.000.

Iizuka, Haruhiko: *See*—
Sugasawa, Fukashi; and Iizuka, Haruhiko, 4,231,338, Cl. 123-568.000.

Iizuka, Yutaka: *See*—
Kimura, Makoto; and Iizuka, Yutaka, 4,231,649, Cl. 354-224.000.

Ijima, Takeshi, to Iida Kensetsu Kabushiki Kaisha. Breakwaters. 4,231,680, Cl. 405-31.000.

Ikarashi, Takeo: *See*—
Yoneoka, Mikio; Osugi, Minoru; and Ikarashi, Takeo, 4,232,171, Cl. 560-239.000.

Ikeda, Mankichi, to Kabushiki Kaisha Ikeda Seisakusho; and Sugita Sangyo Kabushiki Kaisha. Capstan. 4,231,551, Cl. 254-344.000.

Ikemi, Tadashi: *See*—
Kato, Tadanari; Ikemi, Tadashi; and Sagawa, Takatoshi, 4,231,900, Cl. 252-466.0PT.

Ikumoto, Takeshi: *See*—
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,232,159, Cl. 546-112.000.

Illinois Tool Works Inc.: *See*—
Reinwall, Ernest W., Jr., 4,231,281, Cl. 85-50.0AT.

Imai, Ryoji: *See*—
Nakano, Kinichi; Urakawa, Chikahiro; and Imai, Ryoji, 4,231,936, Cl. 260-326.240.

Imperial Chemical Industries Limited: *See*—
Barr, Dennis A.; and Rose, John B., 4,232,142, Cl. 528-125.000.
Bentley, John; and Thompson, Morice W., 4,232,135, Cl. 525-509.000.
Boyle, Francis T.; and Davies, Alan, 4,232,032, Cl. 424-269.000.
Dalton, Raymond F., 4,231,888, Cl. 252-182.000.
Hutchinson, John; and Whittaker, Graham, 4,231,849, Cl. 204-59.00F.

Imperial Screen Company, Inc.: *See*—
Wilson, Clarence P., 4,232,310, Cl. 340-550.000.

Inagaki, Hiroya: *See*—
Yamamoto, Hideaki; Tsukada, Toshihisa; Maruyama, Eiichi; and Inagaki, Hiroya, 4,232,219, Cl. 250-227.000.

Inagaki, Nobuo: *See*—
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.

Ingemarsson, Gosta, to Eur-Control Kalle AB. Pulp screen device. 4,231,881, Cl. 210-396.000.

Inland Steel Company: *See*—
Elmer, Charles W., 4,231,261, Cl. 73-716.000.

Inoue, Nobuyoshi: *See*—
Saito, Toshihisa; and Inoue, Nobuyoshi, 4,231,650, Cl. 354-246.000.

Inoue, Shigeru: *See*—
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,231,961, Cl. 564-65.000.

Inoue, Yasuo: *See*—
Iwasaki, Masayuki; Sato, Shigeru; Inoue, Yasuo; and Nagashima, Akira, 4,232,106, Cl. 430-170.000.

Inouye, George T.; Sanders, Nathaniel L.; and Moss, Winston C., to TRW Inc. Non-arcing dielectric modular array. 4,232,070, Cl. 428-49.000.

Inouye, Hiroyuki: *See*—
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,232,159, Cl. 546-112.000.

Integrated Technology Limited: *See*—
Carternock, Frederick A., 4,231,678, Cl. 404-103.000.

Intel Corporation: *See*—
Somekh, Sasson; and Ahlquist, C. Norman, 4,231,811, Cl. 148-1.500.

Inter-Ikea A/S: *See*—
Mikkelsen, Henrik; and Andersen, Bjarne B., 4,231,203, Cl. 52-284.000.

International Business Machines Corporation: *See*—
Chang, Ifay F.; and Shafer, Merrill W., 4,231,892, Cl. 252-301.60F.
Cuomo, Jerome J.; Gangulee, Amitava; and Kobliska, John, 4,231,816, Cl. 148-31.550.
Gazdik, Charles E.; and McBride, Donald G., 4,231,154, Cl. 29-840.000.
Higuchi, Hobart A.; and Yee, Sammy K., 4,232,363, Cl. 363-75.000.
Mortelmans, Joost, 4,232,253, Cl. 315-370.000.
Ray, Asit K.; and Reisman, Arnold, 4,232,057, Cl. 427-39.000.
Tsao, Sherman H., 4,232,324, Cl. 346-75.000.

International Design Systems, Ltd.: *See*—
Roming, Derek, 4,231,677, Cl. 404-89.000.

International Detection Protection: *See*—
Bernier, Raymond, 4,232,291, Cl. 340-147.0MD.

International Educational Services AG: *See*—
Schwab, Klaus M.; and Kahrbek, Detlev, 4,231,655, Cl. 355-40.000.

International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,231,940, Cl. 260-345.100.

International Harvester Company: *See*—
Jennings, Marvin D., 4,231,432, Cl. 172-7.000.
Windecker, Leo J., 4,232,069, Cl. 428-47.000.

International Telephone and Telegraph Corporation: *See*—
Cooper, William J., 4,231,824, Cl. 156-73.100.
Maklad, Mokhtar S., 4,231,774, Cl. 65-3.00A.

Inventa AG fur Forschung und Patentverwertung, Zurich: *See*—
Schmid, Eduard; and Griehl, Wolfgang, 4,232,145, Cl. 528-324.000.

Ionics, Incorporated: *See*—
Hodgdon, Russell B.; and Alexander, Samuel S., 4,231,855, Cl. 204-301.000.

Ipierre Sirotex, S.p.A: *See*—
Hermine, Mair, 4,231,521, Cl. 239-230.000.

IRECO Chemicals: *See*—
Sudweeks, Walter B.; and Lawrence, Larry D., 4,231,821, Cl. 149-21.000.

Irvin, Howard B.; Lewis, Ronnie L.; and Moczygemba, George A., to Phillips Petroleum Company. Cooling an alpha-methylstyrene polymerization mass. 4,232,137, Cl. 526-71.000.

Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Polyester which exhibits anisotropy in the melt containing p-oxybenzoyl units and 4,4'-dioxybenzophenone units or methyl and chloro derivatives thereof. 4,232,143, Cl. 528-128.000.

Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Polyester which exhibits anisotropy in the melt containing p-oxybenzoyl units and 4-oxy-3'-carbonylbenzophenone units or methyl and chloro derivatives of said units. 4,232,144, Cl. 528-128.000.

Irwin, Robert W.: *See*—
Saunders, Michael A.; and Irwin, Robert W., 4,232,356, Cl. 361-415.000.

Isaacson, Henry V., to Eastman Kodak Company. Suspension polymerization of styrene monomers in the presence of carbon black. 4,231,919, Cl. 260-42.530.

Isailovic, Jordan, to MCA Disco-Vision, Inc. Method and means for encoding and decoding digital data. 4,232,388, Cl. 375-110.000.

Isbell, Tim D.: *See*—
Dobkin, Robert C.; Isbell, Tim D.; Miller, Bernard D.; and Sample, Lawrence R., 4,232,271, Cl. 330-258.000.

Ishiba, Jintaro, to Yoshida Kogyo K. K. Indirect extrusion apparatus. 4,231,245, Cl. 72-253.00A.

Ishiba, Teruyuki: *See*—
Hirai, Kentaro; Fujishita, Toshio; and Ishiba, Teruyuki, 4,231,930, Cl. 260-245.500.

Ishida, Hiroaki: *See*—
Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, 4,231,648, Cl. 354-195.000.

Ishida, Kozo: *See*—
Ohnishi, Toshikazu; Ishida, Kozo; and Saitoh, Osamu, 4,232,223, Cl. 250-343.000.

Ishida, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for atomizing fuel in an internal combustion engine. 4,231,329, Cl. 123-52.0MB.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,231,238, Cl. 68-62.000.

Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,231,787, Cl. 71-107.000.

Ishii, Yoshikazu: *See*—
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.

Ishikawa, Michio: *See*—
Tokudome, Katumi; Ishikawa, Michio; and Hattori, Shuzo, 4,232,274, Cl. 331-94.50S.

Ishimitsu, Kichio K.; and Tinoco, Edward N., to Boeing Company, The. Airfoil for controlling refueling boom. 4,231,536, Cl. 244-135.00A.

Istvanffy, Stephen M.; and Linse, Vonne D., to Canadian Industries Limited. Method of welding metal pipe sections with explosives. 4,231,506, Cl. 228-109.000.

Ito, Tomo: *See*—
Nishimiya, Torazo; Okumura, Masamitsu; Ito, Tomo; and Numakura, Seisaku, 4,231,340, Cl. 123-568.000.

ITT Industries, Inc.: *See*—
Gerlach, Albrecht; Holzmann, Dieter; Lindstedt, Guenter; and Burth, Rolf-Dieter, 4,232,297, Cl. 340-168.00S.

ITW Fastex Italia S.p.A.: *See*—
Aimar, Michele, 4,231,485, Cl. 220-210.000.

Iudica, Robert T., to Professional Mfg. Corp. Unitary cartridge type turbine assembly. 4,231,739, Cl. 433-126.000.

Ivanov, Jury P. Dry dock for building vessels. 4,231,679, Cl. 405-4.000.

Ivanov, Vasily T.: *See*—
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Iwamatsu, Seiichi, to VLSI Technology Research Association. Light-reflection type pattern forming system. 4,231,657, Cl. 355-71.000.

Iwasaki, Masayuki; Sato, Shigeru; Inoue, Yasuo; and Nagashima, Akira, to Fuji Photo Film Co., Ltd. Photosensitive compositions containing 2-halomethyl-5-vinyl-1,3,4-oxadiazoles as free radical progenitors. 4,232,106, Cl. 430-170.000.

Iwata, Akiyoshi, to Quanta-Ray, Inc. Laser apparatus. 4,232,276, Cl. 331-94.50D.

Iwatsu Electric Co., Ltd.: *See*—
Kokaji, Norio; Kinoshita, Kunio; Urano, Toshihiro; and Saito, Katsunori, 4,232,323, Cl. 346-74.100.

J. M. Voith GmbH: *See*—
Merkle, Theodor; Hausenblas, Bernhard; Schweickert, Hermann; and Wengert, Dieter, 4,231,594, Cl. 285-3.000.
Ortner, Herbert; Bahr, Theodor; and Musselmann, Walter, 4,231,526, Cl. 241-28.000.

J. Nesbit-Evans & Co. Ltd.: *See*—
Croxton, John M., 4,231,124, Cl. 5-63.000.

Jackson, Keith L., to General Steel Industries, Inc. Three-truck high adhesion locomotive. 4,231,296, Cl. 105-136.000.

Jackson, Leland B.; and Jaron, Dov, to Regents for Education of the State of Rhode Island. Compensation of fluidic transducers. 4,232,373, Cl. 364-572.000.

Jagatich, Carl T., to Ohio Nuclear, Inc. Video speed logarithmic analog-to digital converter. 4,232,302, Cl. 340-347.0AD.

James, David L., to James, Mitchell D. Protective liner for tires resistant to displacement during use. 4,231,407, Cl. 152-351.000.

James, Donald E. Cooking utensil with integrally formed pot attaching means. 4,231,128, Cl. 7-112.000.

James, Mitchell D.: *See*—
James, David L., 4,231,407, Cl. 152-351.000.

Jamieson, Peter B., to Minnesota Mining and Manufacturing Company. Light-handleable photographic materials. 4,232,116, Cl. 430-510.000.

Janome Sewing Machine Co., Ltd.: *See*—
Takenoya, Hideaki, 4,231,307, Cl. 112-158.00E.

Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,232,034, Cl. 424-269.000.

Janssens, Wilhelmus, to AGFA-GEVAERT N.V. Photographic material suited for use in diffusion transfer photography and method of diffusion transfer photography using such material. 4,232,107, Cl. 430-223.000.

Jansson, Hans B. E., to AB Volvo. Method for the production of tools for deep drawing, moulding, extruding and the like. 4,231,982, Cl. 264-112.000.

Jantsch, Ottomar; and Tihanyi, Jeno, to Siemens Aktiengesellschaft. Process for producing bi-polar charge coupled devices by ion-implantation. 4,231,810, Cl. 148-1.500.

Japan Medical Supply Co., Ltd.: *See*—
Kurata, Motoji, 4,231,988, Cl. 422-47.000.

Jaron, Dov: *See*—
Jackson, Leland B.; and Jaron, Dov, 4,232,373, Cl. 364-572.000.

Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Timesetting arrangement for electrical timepieces. 4,232,384, Cl. 368-185.000.

Jennings, Marvin D., to International Harvester Company. Position and draft control system for plows. 4,231,432, Cl. 172-7.000.

Jensen, Elwood V.; and DeSombre, Eugene R., to University Patents, Inc. Methods and materials for detection of estrophilin. 4,232,001, Cl. 424-1.000.

Jensen, Svend O. Demountable boat ladder. 4,231,448, Cl. 182-93.000.

Jimenez, Humberto A.: *See*—
Perez, Jose L.; and Jimenez, Humberto A., 4,231,625, Cl. 312-245.000.

Jirkovsky, Ivo L.: *See*—
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,232,029, Cl. 424-263.000.

JMR Instruments, Inc.: *See*—
Loiler, Roger D., 4,232,389, Cl. 455-12.000.

Johne, Bruce. Electrically powered paint scraping tool. 4,231,155, Cl. 30-169.000.

Johns-Manville Corporation: *See*—
French, David W., 4,231,983, Cl. 264-249.000.

Johnson, Allan B., to Mark Controls Corporation. Thermostat. 4,231,512, Cl. 236-47.000.

Johnson, Allen S., Jr. Bag-type filter apparatus with internal air diffuser. 4,231,770, Cl. 55-302.000.

Johnson, Delbert C.: *See*—
Adams, Halbert E.; Cooper, Edgar R.; Ford, Lowell D.; Johnson, Delbert C.; and Warren, Gregory L., 4,232,378, Cl. 367-36.000.

Johnson, Howard K.: *See*—
Engelbrecht, Horst P.; and Johnson, Howard K., 4,231,974, Cl. 261-87.000.

Johnson & Johnson: *See*—
Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,231,903, Cl. 252-545.000.

Johnson, Michael R., to Pfizer Inc. Hexahydro-1-hydroxy-9-hydroxymethyl-3-substituted-6H-dibenzo[b,d]pyrans as analgesic agents. 4,232,018, Cl. 424-248.550.

Johnson, Roger F.; and Mitzel, Allen M., to Boeing Company, The. Apparatus and method for measuring static deflection of runway surface under aircraft loading. 4,231,160, Cl. 33-174.00P.

Johnson, Rubein V. Acoustic lens speaker cabinet. 4,231,445, Cl. 181-148.000.

Johnson, Walter: *See*—
Campbell, Ivor E.; Henderson, James M.; Johnson, Walter; and Wetherill, William H., 4,231,995, Cl. 423-242.000.

Johnston, William J., to General Motors Corporation. Diesel fuel heat recovery system and control valve therefor. 4,231,342, Cl. 123-557.000.

Jonasson, Kjell O.; and Andersson, Sven A., to AB Volvo. Child's seat cushion for motor vehicles. 4,231,613, Cl. 297-250.000.

Jones, George F., to Wheelabrator-Frye Inc. Method of treating parts by vibratory action. 4,231,196, Cl. 51-313.000.

Jonsson, Karl-Erik A. Device for treatment of the surface of round timber. 4,231,406, Cl. 144-208.00E.

Joseph, Joseph P.: *See*—
Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, 4,232,150, Cl. 536-119.000.

Jottier, Christian F., to S.A. Anarec. Apparatus for the treatment of fluids. 4,231,990, Cl. 422-100.000.

Juenemann, Werner: *See*—
Dehnert, Johannes; and Juenemann, Werner, 4,231,746, Cl. 8-680.000.

Justus, Edgar J. Hydraulic impact device. 4,231,434, Cl. 173-119.000.

Juziuk, Jurgen A.; Mack, Ronald H.; Banka, Eugene F.; and Nicol, Edward A., to Burroughs Corporation. Stepper motor drive for a mechanical camshaft. 4,232,217, Cl. 235-480.000.

K-Line Industries, Inc.: *See*—
Kammeraad, James A., 4,231,693, Cl. 408-230.000.

Kablaoui, Mahmoud S., to Texaco Inc. Motor fuel composition. 4,231,758, Cl. 44-71.000.

Kabushiki Kaisha Ikeda Seisakusho: *See*—
Ikeda, Mankichi, 4,231,551, Cl. 254-344.000.

Kabushiki Kaisha Kogen: *See*—
Mizuno, Shuzo, 4,232,306, Cl. 340-506.000.

Kabushiki Kaisha Seikosha: *See*—
Hamatani, Mitsuhiro, 4,232,241, Cl. 310-317.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Banda, Syunji, 4,231,639, Cl. 350-335.000.
Chihara, Hiroyuki, 4,232,383, Cl. 368-66.000.

Kahrbek, Detlev: *See*—
Schwab, Klaus M.; and Kahrbek, Detlev, 4,231,655, Cl. 355-40.000.

Kaieda, Nobuo; and Okano, Yoshihiro, to Yokogawa Electric Works, Ltd. Servo-system. 4,232,259, Cl. 318-615.000.

Kajihara, Motoyoshi; Hamakawa, Toshihiro; Shibata, Toshiaki; Suzue, Takashi; and Fujii, Setsuro, to Taiho Pharmaceutical Company Ltd. Oral antilipemic agents. 4,232,007, Cl. 424-177.000.

Kalberer, Heinz: *See*—
Michel, Wolfgang; and Kalberer, Heinz, 4,232,128, Cl. 521-134.000.

Kalfoglou, George, to Texaco Inc. Surfactant waterflooding oil recovery method. 4,231,427, Cl. 166-275.000.

Kamachi, Hajime: *See*—
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 4,231,928, Cl. 260-239.100.

Kamada, Isao, to Mitsubishi Rayon Company, Limited. Multi-colored synthetic resin sheet. 4,232,078, Cl. 428-195.000.

Kamezawa, Yasutoki: *See*—
Fukuda, Hideo; Morikawa, Hiroichi; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 4,232,101, Cl. 430-56.000.

Kamino, Yukishige: *See*—
Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,231,686, Cl. 406-14.000.

Kammeraad, James A., to K-Line Industries, Inc. Reamer with radial relief. 4,231,693, Cl. 408-230.000.

Kamoto, Hidetoshi, to Sony Corporation. Apparatus for indicating the amount of tape wound upon a reel. 4,232,371, Cl. 364-561.000.

Kanatani, Heiichi; Osumi, Masato; and Hayama, Hajime, to Sanyo Electric Co., Ltd. Solar heat collecting apparatus. 4,231,353, Cl. 126-443.000.

Kandachi, Takayoshi: *See*—
Okino, Seiki; Nakata, Kunio; Yanai, Tosiharu; and Kandachi, Takayoshi, 4,232,062, Cl. 427-160.000.

Kanebo, Ltd.: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Morita, Tominori; Nose, Takashi; and Okazaki, Mitsuo, 4,232,010, Cl. 424-200.000.

Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, to Ricoh Company, Ltd. Auto document feeder for use with duplex copying machine. 4,231,561, Cl. 271-3.100.

Kano, Seiji: *See*—
Kubota, Shigeru; Kano, Seiji; and Kubo, Masahiro, 4,231,152, Cl. 29-621.000.

Kansas State University Research Foundation: *See*—
Deyoe, Charles W.; and Bartley, Erle E., 4,232,046, Cl. 426-69.000.

Kao, Jar-lin; and Sheng, Ming N., to Atlantic Richfield Company. Preparation of alkylene carbonates from alkylene iodohydrins. 4,231,937, Cl. 260-340.200.

Kao Soap Co., Ltd.: *See*—
Yagi, Kouichi; and Nakagawa, Yunosuke, 4,231,890, Cl. 252-186.000.

Kariyama, Kenji: *See*—
Kubota, Kenichi; Mukai, Osamu; and Kariyama, Kenji, 4,231,716, Cl. 417-315.000.

Karl M. Reich Maschinenfabrik GmbH, Firma: *See*—
Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, 4,232,064, Cl. 427-208.400.

Kashiwa, Norio: *See*—
Minami, Syuji; and Kashiwa, Norio, 4,232,139, Cl. 526-125.000.

Kato, Hironobu, to Nissan Motor Company, Limited. Process for a cationic cathodic electrocoat. 4,231,850, Cl. 204-181.00C.

Kato, Masaru: *See*—
Shinohara, Hideaki; Kato, Masaru; and Takamatsu, Yoshiaki, 4,232,105, Cl. 430-160.000.

Kato, Osamu; Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; and Takashima, Hiroaki, to Nippon Oil Co., Ltd. Process for preparing petroleum-derived binder pitch. 4,231,857, Cl. 208-40.000.

Kato, Tadanari; Ikemi, Tadashi; and Sagawa, Takatoshi, to Nissan Motor Company, Limited. Method for forming activated alumina coating on refractory article and article thereby produced. 4,231,900, Cl. 252-466.0PT.

Kaufhold, Manfred; Hepp, Dieter; and Menzel, Gerhard, to Chemische Werke Huls Aktiengesellschaft. Use of di-(cyclohexylethylmethylol) phthalates or di-(ethylcyclohexylmethylol) phthalates as plasticizers for polyvinyl chloride. 4,231,915, Cl. 260-31.80R.

Kaufman, Robert J.: *See*—
Franz, John E.; and Kaufman, Robert J., 4,231,782, Cl. 71-87.000.

Kaufman, Vernon R., to Tecumseh Products Company. Steel connecting rod bearing liner for internal combustion engines. 4,231,623, Cl. 308-23.000.

Kawa, Hidetoshi: *See*—
Nakagawa, Hiroshi; Kawa, Hidetoshi; and Kawai, Makoto, 4,232,335, Cl. 358-101.000.

Kawaguchi, Fumikazu: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenake, Yoshimichi; and Tsutaya, Tadao, 4,231,797, Cl. 75-256.000.

Kawai, Makoto: *See*—
Nakagawa, Hiroshi; Kawa, Hidetoshi; and Kawai, Makoto, 4,232,335, Cl. 358-101.000.

Kawai, Masanobu: *See*—
Okii, Mitsuyoshi; Onitake, Tatsuya; Kawai, Masanobu; Takematsu, Tetsuo; and Konnai, Makato, 4,231,789, Cl. 71-121.000.

Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph, 4,231,278, Cl. 84-1.190.

Kawai, Syuji: *See*—
Yamauchi, Kazuhisa; Tanaka, Taku; Kawai, Syuji; and Tanii, Hirokuni, 4,231,877, Cl. 210-321.00B.

Kawakami, Susumu: *See*—
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.

Kawamata, Motoo: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,231,934, Cl. 260-326.5FM.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tachibana, Hisataro; and Ono, Hiromi, 4,231,315, Cl. 440-43.000.

Kawasumi, Yoshio; and Sato, Haruki, to Nippon Mining Co., Ltd. Method for making a raw board for use in printed circuits. 4,231,848, Cl. 204-20.000.

Kawaziri, Kazuhiro: *See*—
Tabei, Masatoshi; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,231,808, Cl. 136-260.000.

Keeling, Michael C.; and Doss, Dwight E., to Motorola, Inc. Enclosure for a solar cell array. 4,231,807, Cl. 136-251.000.

Kefalas A/S: *See*—
Poschel, Bruno P. H.; and Maxwell, Donald R., 4,232,021, Cl. 424-250.000.

Keil, Wolfgang. Device for complete desalination of water. 4,231,872, Cl. 210-93.000.

Keim, John E.: *See*—
Lee, Maw H.; and Keim, John E., 4,232,308, Cl. 340-539.000.

Kelley Manufacturing Co.: *See*—
Whitfield, Carroll J.; and Lastinger, Anthony W., 4,231,433, Cl. 172-662.000.

Kelley, Wilfred H., Jr.: *See*—
Hedtke, Robert G.; Harrom, Harley A.; Kelley, Wilfred H., Jr.; and Frederick, Sherman B., 4,231,450, Cl. 187-9.00R.

Kelly, Peter B., to General Electric Company. Bowling lane and surface. 4,231,573, Cl. 273-51.000.

Kelly, Walter J., to Goodyear Tire & Rubber Company, The. Preparation of unsymmetrical polyenes. 4,232,180, Cl. 585-645.000.

Kelsall, Jeffrey C., to McGraw-Edison Company. Adjustable light fixture. 4,232,361, Cl. 362-364.000.

Kelso, David W.: *See*—
Gantz, Jeanne A.; and Kelso, David W., 4,231,634, Cl. 350-4.200.

Kemmner, Ulrich: *See*—
Ruhl, Karl; and Kemmner, Ulrich, 4,231,718, Cl. 417-366.000.

Kempter, Fritz E.: *See*—
Boehlke, Klaus; and Kempter, Fritz E., 4,231,854, Cl. 204-294.000.

Kennedy, Matthew R.: *See*—
Weiss, Thomas R.; and Kennedy, Matthew R., 4,231,446, Cl. 181-148.000.

Kenton, Hobart E.; and Decker, Forrest W., to PPG Industries, Inc. Plate counter. 4,232,218, Cl. 250-222.0PC.

Kern, Horstmar; and Botzenhardt, Helmut, to Wieland-Werke Aktiengesellschaft. Heat-insulated structural section assembly. 4,231,207, Cl. 52-730.000.

Kern, James W.: *See*—
Grant, Andrew C.; and Kern, James W., 4,232,056, Cl. 427-37.000.

Kern, Neil C., to Motorola, Inc. Range detector. 4,232,315, Cl. 343-7.300.

Kerotest Manufacturing Corp.: *See*—
Visalli, Robert G., 4,231,549, Cl. 251-335.00A.

Kersting, Hans-Joachim: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, 4,231,844, Cl. 201-34.000.

Kessler, Theodore P., to Timron, Inc. Shipping carton for pile fabric and a machine for winding pile fabric on a reel. 4,231,475, Cl. 206-389.000.

Ketzer, Manfred, to U.S. Philips Corporation. Adjusting mechanism for a tape recorder capstan. 4,231,504, Cl. 226-180.000.

Kharkhardin, Petr P.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Baryło, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Kiejzik, Paul A. Device for inserting a microfilm into microfilm jackets in series. 4,231,214, Cl. 53-520.000.

Kikuchi, Toshikazu, to Hope Co., Ltd. Ski boot heel binding equipped with ski brake. 4,231,584, Cl. 280-604.000.

Kilevitsa, Marite K.: *See*—
Paegle, Ruta A.; Lidaka, Marger J.; Zhuk, Regina A.; Maurinsh, Juris A.; Zidermane, Aina A.; and Kilevitsa, Marite K., 4,232,149, Cl. 536-23.000.

Kimmon Electric Co., Ltd.: *See*—
Tokudome, Katumi; Ishikawa, Michio; and Hattori, Shuzo, 4,232,274, Cl. 331-94.50S.

Kimura, Makoto; and Iizuka, Yutaka, to Nippon Kogaku K.K. Viewfinder display in a single lens reflex camera. 4,231,649, Cl. 354-224.000.

Kinch, Michael A.: *See*—
Chapman, Richard A.; Buss, Dennis D.; and Kinch, Michael A., 4,231,149, Cl. 29-578.000.

King, Samuel B. Gasoline and petroleum fuel supplement. 4,231,756, Cl. 44-53.000.

Kinney, Frank N. Refuse collection device. 4,231,602, Cl. 294-1.0BA.

Kinoshita, Kunio: *See*—
Kokaji, Norio; Kinoshita, Kunio; Urano, Toshihiro; and Saito, Katsunori, 4,232,323, Cl. 346-74.100.

Kinsey, J. D.: *See*—
Erwin, Robert L., 4,231,440, Cl. 137-246.220.

Kiovsky, Joseph R.; and Goyette, William J., to Norton Company. Hydroisomerization of pentane utilizing Pd exchanged mordenite. 4,232,181, Cl. 585-739.000.

Kirby, Robert E., to Telex Computer Products, Inc. Apparatus for connection of coaxial cables to a printed circuit mother board. 4,231,629, Cl. 339-17.00M.

Kishino, Takao; and Tanaka, Gentaro, to Futaba Denshi Kogyo K.K. Multi-digit luminescent display tube. 4,232,251, Cl. 315-167.000.

Kitai, Kiyoshi; and Takazawa, Yuzuru, to Seiko Koki Kabushiki Kaisha. Automatic focusing camera. 4,231,647, Cl. 354-195.000.

Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, to Seiko Koki Kabushiki Kaisha. Automatic focusing camera. 4,231,648, Cl. 354-195.000.

Kitamura, Hajime: *See*—
Koyanagi, Shunichi; Kitamura, Hajime; and Kurimoto, Kazuhiko, 4,232,141, Cl. 526-344.200.

Kitaori, Kiyoshi: *See*—
Fujita, Masao; and Kitaori, Kiyoshi, 4,231,240, Cl. 70-173.000.

Kitayama, Seishi: *See*—
Yamamoto, Seiichi; and Kitayama, Seishi, 4,232,400, Cl. 455-305.000.

Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,231,940, Cl. 260-345.100.

Kizaki, Shigeru, to Citizen Watch Co., Ltd. Method for manufacturing subminiature quartz crystal vibrator. 4,232,109, Cl. 430-312.000.

Klas, Kenneth H., to Allis-Chalmers Corporation. Single belt drive for a three-spindle rotary mower. 4,231,215, Cl. 56-11.600.

Kleinschmitt, David: *See—*
Feinland, Seymour; and Kleinschmitt, David, 4,231,662, Cl. 356-373.000.

Kloeber, Peter: *See—*
Becker, Friedbert; Biethan, Gunter; and Kloeber, Peter, 4,232,318, Cl. 370-29.000.

Kluge, Arthur F.; and Muchowski, Joseph M., to Syntex (U.S.A.) Inc. 5-Alkylsulfinylbenzoyl- and 5-alkylsulfonylbenzoyl-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1-carboxylic acids. 4,232,038, Cl. 424-274.000.

Knappenberger, Thomas A.; and Landers, James F., Jr., to Motorola, Inc. Potting and encapsulating material for electronic circuits. 4,231,916, Cl. 260-37.0EP.

Knofel, Hartmut; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the production of monoisocyanate. 4,231,952, Cl. 260-453.00P.

Knoski, Jerry L. Easy change wheel assembly. 4,231,670, Cl. 403-11.000.

Knotek, Otto: *See—*
Kruske, Gerhard; Knotek, Otto; and Lugscheider, Erich, 4,231,793, Cl. 75-122.000.

Knutsen, Karl I. Waste dispensing device for recreational vehicles and the like. 4,231,595, Cl. 285-38.000.

Kobayashi, Minoru, to Olympus Optical Co., Ltd. Mode switching mechanism for a cassette tape recorder. 4,232,349, Cl. 360-105.000.

Kobe Steel, Limited: *See—*
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenake, Yoshimichi; and Tsutaya, Tadao, 4,231,797, Cl. 75-256.000.

Kobler, Edith: *See—*
Kobler, Richard, 4,232,346, Cl. 360-71.000.

Kobler, Richard, to Kobler, Edith; and Frey, Ernst. Apparatus for repeated reproduction of intelligence on selected portions of magnetic tape. 4,232,346, Cl. 360-71.000.

Kobliska, John: *See—*
Cuomo, Jerome J.; Gangulee, Amitava; and Kobliska, John, 4,231,816, Cl. 148-31.550.

Koch, Helmut: *See—*
Boatwright, John T.; Prince, David G.; Haskett, William F.; and Koch, Helmut, 4,232,199, Cl. 179-18.00B.

Koches, Andrew: *See—*
Ebreo, Mark A.; and Koches, Andrew, 4,231,140, Cl. 24-237.000.

Kockum Industries, Inc.: *See—*
Neilson, Jay C., 4,231,464, Cl. 198-456.000.

Koeneman, James B., to Lord Corporation. Knee joint prosthesis. 4,231,122, Cl. 3-1.911.

Koenig & Bauer Aktiengesellschaft: *See—*
Weschenfelder, Otto T.; and Michalik, Horst B., 4,231,559, Cl. 493-426.000.

Koenig, Nathan H.; and Friedman, Mendel, to United States of America, Agriculture. Shrinkproofing wool with copper salts of carboxylic acids. 4,231,747, Cl. 8-127.600.

Koga, Hideaki: *See—*
Nishikawa, Kazuyoshi; Uno, Makoto; and Koga, Hideaki, 4,231,266, Cl. 74-467.000.

Koga, Nobuhito: *See—*
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,231,934, Cl. 260-326.5FM.

Kogo, Yasuo: *See—*
Toyama, Takashi; and Kogo, Yasuo, 4,231,169, Cl. 36-43.000.

Kohama, Masayuki: *See—*
Satoh, Eiji; Kohama, Masayuki; Yokoya, Kunihiko; Yamada, Kenji; and Nemoto, Akira, 4,231,673, Cl. 403-125.000.

Kohler, Rolf-Dieter: *See—*
Hagen, Helmut; and Kohler, Rolf-Dieter, 4,232,165, Cl. 548-339.000.

Kohori, Yoshinori. Ash tray. 4,231,379, Cl. 131-235.00R.

Koitabashi, Takeo: *See—*
Okauchi, Ken; Koitabashi, Takeo; and Fujimori, Noboru, 4,232,118, Cl. 430-574.000.

Koizumi, Yutaka: *See—*
Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, 4,231,561, Cl. 271-3.100.

Kokaji, Norio; Kinoshita, Kunio; Urano, Toshihiro; and Saito, Katsunori, to Iwatsu Electric Co., Ltd. Magnetographic apparatus. 4,232,323, Cl. 346-74.100.

Kokot, Hellmut: *See—*
Romey, Ingo; and Kokot, Hellmut, 4,231,856, Cl. 208-39.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Yamamoto, Seiichi; and Kitayama, Seishi, 4,232,400, Cl. 455-305.000.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See—*
Fujita, Masao; and Kitaori, Kiyoshi, 4,231,240, Cl. 70-173.000.

Kolb, William P., Jr., to Hughes Aircraft Company. Adjustable mirror mount for a laser. 4,232,275, Cl. 331-94.50D.

Kolbeck, Rainer: *See—*
Schaffernicht, Klaus; and Kolbeck, Rainer, 4,231,627, Cl. 316-25.000.

Koller, Stefan, to Ciba-Geigy Corporation. Styryl compounds. 4,231,942, Cl. 260-346.710.

Kolpak, Miroslav M., to Standard Oil Company (Indiana). Lateral tensioning system for riser pipe. 4,231,429, Cl. 166-362.000.

Komori, Shinichi: *See—*
Takeuchi, Yo; Ohbori, Koichi; Hatsushika, Masabumi; and Komori, Shinichi, 4,231,817, Cl. 148-32.500.

Kondo, Isao: *See—*
Tsunefuji, Katsuhiko; and Kondo, Isao, 4,231,644, Cl. 354-51.000.

Kondou, Takayasu: *See—*
Ando, Shigeo; and Kondou, Takayasu, 4,231,276, Cl. 84-1.190.

Konig, Axel, to Volkswagenwerk Aktiengesellschaft. Pump for fluid media having different temperatures. 4,231,720, Cl. 417-379.000.

Konig, Klaus: *See—*
Knofel, Hartmut; and Konig, Klaus, 4,231,952, Cl. 260-453.00P.

Konishiroku Photo Industry Co., Ltd.: *See—*
Kuse, Satoru, 4,232,112, Cl. 430-393.000.
Okauchi, Ken; Koitabashi, Takeo; and Fujimori, Noboru, 4,232,118, Cl. 430-574.000.
Shinozaki, Sohji; and Takei, Yoshiaki, 4,232,104, Cl. 430-68.000.

Koniz, Leon F.; and Estes, John H., to Texaco Inc. Novel method of testing a charge calcined alumina to determine its suitability for use in hydrocarbon conversion. 4,231,751, Cl. 23-230.00R.

Konnai, Makato: *See—*
Okii, Mitsuyoshi; Onitake, Tatsuya; Kawai, Masanobu; Takematsu, Tetsuo; and Konnai, Makato, 4,231,789, Cl. 71-121.000.

Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, to Toyo Engineering Corporation; and Mitsui Toatsu Chemicals, Incorporated. Process for preparation of urea. 4,231,961, Cl. 564-65.000.

Koppers Company, Inc.: *See—*
Pennino, Charles J., 4,231,908, Cl. 260-28.5AS.

Korenko, Michael K.: *See—*
Gibson, Robert C.; and Korenko, Michael K., 4,231,795, Cl. 75-171.000.

Kosicki, Witold W.: *See—*
Corris, Charles J.; Hollingsworth, Charles M.; Kosicki, Witold W.; and Potter, Robert T., 4,231,184, Cl. 46-265.000.

Koszelak, Thaddeus D.: *See—*
Gilman, Paul B., Jr.; Belly, Robert T.; Koszelak, Thaddeus D.; and Zigman, Seymour, 4,232,121, Cl. 435-32.000.

Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, to Muanyagipari Kutato Intezet; and Finomvegyszer Szovetkezet, part interest to each. Process for the controlled hardening of unsaturated polyester resins. 4,232,136, Cl. 525-327.000.

Koval, Boris A.: *See—*
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Kovalenko, Viktor M.: *See—*
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Koyanagi, Shunichi; Kitamura, Hajime; and Kurimoto, Kazuhiko, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of vinyl chloride polymers. 4,232,141, Cl. 526-344.200.

Kraft, Joseph K., to Westinghouse Electric Corp. Spring applied, electric released drum brake. 4,231,452, Cl. 188-171.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Gugel, Georg, 4,231,419, Cl. 165-11.00A.

Kramer, Wolfgang; Buchel, Karl H.; Pflugbeil, Wolf-Dietrich; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with diastereomeric form A of 1-phenoxy-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-ols. 4,232,033, Cl. 424-269.000.

Krapcho, John: *See—*
Turk, Chester F.; and Krapcho, John, 4,232,027, Cl. 424-258.000.

Krause, David A. Combination ski lock and safety strap. 4,231,586, Cl. 280-637.000.

Krockenberger, Dieter: *See—*
Magiera, Leonhardt; Grundmann, Raban; and Krockenberger, Dieter, 4,231,968, Cl. 570-109.000.

Kroplinski, Thaddeus F.: *See—*
Brauer, Melvin; and Kroplinski, Thaddeus F., 4,231,986, Cl. 264-272.000.

Kru-Bur, Inc.: *See—*
Burke, James W.; and Cook, John N., 4,231,391, Cl. 137-343.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Rigid non-sliding homokinetic universal joint. 4,231,233, Cl. 64-21.000.

Krueger, Wallace F.; and Shaw, Anthony R., to Libbey-Owens-Ford Company. Solar energy collector. 4,231,204, Cl. 52-397.000.

Krueger, Wallace F.: *See—*
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., 4,231,505, Cl. 228-14.000.

Krugener, Rolf; and Kurth, Hermann W., to Daimler-Benz Aktiengesellschaft. Cylinder lock, especially for motor vehicles. 4,231,244, Cl. 70-422.000.

Krumnikl, Svatopluk: *See—*
Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, 4,231,669, Cl. 401-258.000.

Kruske, Gerhard; Knotek, Otto; and Lugscheider, Erich, to Metallgesellschaft Aktiengesellschaft. Nickel-base alloy. 4,231,793, Cl. 75-122.000.

Kubo, Masahiro: *See—*
Kubota, Shigeru; Kano, Seiji; and Kubo, Masahiro, 4,231,152, Cl. 29-621.000.

Kubota, Kenichi; Mukai, Osamu; and Kariyama, Kenji, to Tohoku Mikuni Kogyo Co., Ltd.; and Mikuni Kogyo Co., Ltd. Mechanical lubricating pump. 4,231,716, Cl. 417-315.000.

Kubota, Shigeru; Kano, Seiji; and Kubo, Masahiro, to Nitto Kogyo K.K. Method and apparatus for press-fitting caps on electronic parts and the like. 4,231,152, Cl. 29-621.000.

Kuetterer, Gerhard: *See—*
Huettner, Robert; Kuetterer, Gerhard; and Sklebitz, Hartmut, 4,232,226, Cl. 250-445.00T.

Kuhl, Bernhard R.; and Safranek, Edward J., to Echlin Manufacturing Company, The. Rotary switch assembly. 4,232,207, Cl. 200-11.00R.

Kuhne, Rudolf; and Hamal, Heinrich, to Hoechst Aktiengesellschaft. Nitroamines, processes for their manufacture and their use as diazo components. 4,231,964, Cl. 564-305.000.

Kuivinen, William L.: *See—*
Gopalakrishnan, Sankaraiyer; and Kuivinen, William L., 4,231,702, Cl. 415-56.000.

Kukacka, Lawrence: *See—*
Zeldin, Arkady; Carciello, Neal; Kukacka, Lawrence; and Fontana, Jack, 4,231,917, Cl. 260-37.0SB.

Kulik, Metro D., to Continental Oil Company. Method for producing ammonia and hydrogen sulfide. 4,231,996, Cl. 423-242.000.

Kumano, Hiroshi: *See—*
Murakami, Kaoru; Okahisa, Mitsugu; Arita, Tomohiko; and Kumano, Hiroshi, 4,231,889, Cl. 252-182.100.

Kumaoka, Michiaki; and Aosima, Sinzi, to Nippon Gakki Seizo Kabushiki Kaisha. Muting arrangement of a radio receiver with a phase-locked loop frequency synthesizer. 4,232,393, Cl. 455-154.000.

Kunimoto, Go: *See—*
Mori, Fumio; Ichinose, Isao; and Kunimoto, Go, 4,232,086, Cl. 428-341.000.

Kuniya, Keiichi: *See—*
Watanabe, Ryuji; Arakawa, Hideo; and Kuniya, Keiichi, 4,231,814, Cl. 148-11.50C.

Kuno, Akira: *See—*
Yoshino, Yasuhisa; Kuno, Akira; and Shinoda, Yoshio, 4,231,257, Cl. 73-432.0CR.

Kuramoto, Akio; and Onishi, Toshinari, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas flow control valve apparatus for use in an internal combustion engine. 4,231,341, Cl. 123-552.000.

Kuraray Co., Ltd.: *See—*
Yamauchi, Kazuhisa; Tanaka, Taku; Kawai, Syuji; and Tanii, Hirokuni, 4,231,877, Cl. 210-321.00B.

Kurata, Motoji, to Japan Medical Supply Co., Ltd. Artificial lung. 4,231,988, Cl. 422-47.000.

Kurath, Paul: *See—*
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,231,924, Cl. 260-112.50R.

Kurimoto, Kazuhiko: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Kurimoto, Kazuhiko, 4,232,141, Cl. 526-344.200.

Kurita, Toshiaki, to Tomy Kogyo Co., Inc. Toy vehicle having reversing mechanism. 4,231,182, Cl. 46-212.000.

Kuroda, Atsuhiko: *See—*
Ueda, Shinjiro; Takada, Yoshihiro; Mishina, Haruo; and Kuroda, Atsuhiko, 4,231,706, Cl. 416-186.00R.

Kurth, Hermann W.: *See—*
Krugener, Rolf; and Kurth, Hermann W., 4,231,244, Cl. 70-422.000.

Kurtz, Robert J.; and Silverstein, Spencer J., to Howmedica, Incorporated. Pulsatile blood pumping apparatus and method. 4,231,354, Cl. 128-1.00D.

Kurtz, Roman: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, 4,231,844, Cl. 201-34.000.

Kuse, Satoru, to Konishiroku Photo Industry Co., Ltd. Process for treating silver halide color photographic photosensitive material. 4,232,112, Cl. 430-393.000.

Kutik, Louis F.; and Cecil, Howard E., to Security Plastics Inc. Lever pump with button actuator. 4,231,493, Cl. 222-321.000.

Kutt, Mers; and Osbaldeston, Bernard, to Kutt, Mers. Racket stringing. 4,231,575, Cl. 273-73.00D.

Kuwahara, Akiyasu; and Yanagisawa, Syozo, to Hitachi, Ltd. Air intake system for diesel engine. 4,231,337, Cl. 123-568.000.

Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M. Flotation machine. 4,231,860, Cl. 209-169.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Chiba, Hideo; Sasaki, Ryuzo; Yoshikawa, Masaaki; Takahashi, Naofumi; Sugimoto, Etsuro; and Samejima, Hirotoshi, 4,232,044, Cl. 426-44.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Nakano, Kinichi; Urakawa, Chikahiro; and Imai, Ryoji, 4,231,936, Cl. 260-326.240.

Kyritsos, Joseph; and Sacco, Jean, to Rhone-Poulenc-Textile. Fluid shapable sulfuric compositions based on arylaliphatic copolymers. 4,231,913, Cl. 260-30.80R.

Lado, William J., to Pettibone Corporation. System for one-hand control of two winches during hoisting of closed clamshell, with differentiation. 4,231,698, Cl. 414-624.000.

Lagodmos, George P., to Hughes Aircraft Company. Cryogenic regenerator. 4,231,418, Cl. 165-4.000.

Lahr, Robert G., to Ideal Toy Corporation. Differential gear drive. 4,231,183, Cl. 46-262.000.

Laiacona, Michael N. Apparatus for combining phonograph signal with auxiliary audio signal. 4,232,190, Cl. 179-1.00B.

Lake, Ralph J., Jr.: *See—*
Hall, James F., Jr.; Lake, Ralph J., Jr.; and Scholder, William G., 4,231,439, Cl. 177-25.000.

Lam, Inc.: *See—*
Williams, Thomas A.; and Scholze, Alfred O., 4,232,362, Cl. 362-410.000.

Lambkin, Fred M. Universal battery charger/adapter unit. 4,232,260, Cl. 320-2.000.

Lancet, Michael S.; and Curran, George P., to Continental Oil Company. Process for gasification using a synthetic CO_2 acceptor. 4,231,760, Cl. 48-197.00R.

Landers, James F., Jr.: *See—*
Knappenberger, Thomas A.; and Landers, James F., Jr., 4,231,916, Cl. 260-37.0EP.

Landoll Corporation: *See—*
Landoll, Donald R., 4,231,710, Cl. 414-475.000.

Landoll, Donald R., to Landoll Corporation. Tiltable trailer having movable undercarriage. 4,231,710, Cl. 414-475.000.

Lang, Glenn E.; Crotzer, Milburn E.; and Fuoto, John S., to Westinghouse Electric Corp. Automatic steam generator feedwater realignment system. 4,231,328, Cl. 122-504.000.

Lang, William H.: *See—*
Chang, Clarence D.; Lang, William H.; and LaPierre, Rene B., 4,231,955, Cl. 260-465.100.

Langseth, Rollin E.: *See—*
Acampora, Anthony; and Langseth, Rollin E., 4,232,197, Cl. 370-97.000.

Lannen Tehtaat Oy: *See—*
Ruuska, Mauno, 4,231,186, Cl. 47-74.000.

LaPierre, Rene B.: *See—*
Chang, Clarence D.; Lang, William H.; and LaPierre, Rene B., 4,231,955, Cl. 260-465.100.

Lark S.p.A.: *See—*
Palladino, Gaetano; and Micciarelli, Mario, 4,232,013, Cl. 424-241.000.

Larsen, Hans-Ole: *See—*
Sorensen, Erik L.; and Larsen, Hans-Ole, 4,231,369, Cl. 128-283.000.

Larson, Olaf A.; and Matthews, Charles W., to Gulf Oil Corporation. Consolidation of in-situ retort. 4,231,617, Cl. 299-2.000.

Lastinger, Anthony W.: *See—*
Whitfield, Carroll J.; and Lastinger, Anthony W., 4,231,433, Cl. 172-662.000.

Laub, Bernard: *See—*
Rolinski, Edmund J.; and Laub, Bernard, 4,231,248, Cl. 73-15.600.

Laud, Kamlakar R.: *See—*
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,231,254, Cl. 73-362.0AR.

Laurel Bank Machine Co., Ltd.: *See—*
Miyagawa, Tuyoshi; and Arikawa, Yunichi, 4,231,564, Cl. 271-95.000.

Laurita, Joseph N. Foldable ladder. 4,231,449, Cl. 182-164.000.

Lauterbach, John H. F.: *See—*
Hughes, Donald W. K.; and Lauterbach, John H. F., 4,231,628, Cl. 339-17.0LC.

Lavin, Walter M.; McFarlane, James I.; and Rose, Dennis L., to Betz Laboratories, Inc. Stabilized alkali metal bisulfite or sulfite-catalyzed solutions. 4,231,894, Cl. 252-389.00A.

Lawless, William N., to Corning Glass Works. Cryogenic ceramic and apparatus. 4,231,231, Cl. 62-514.00R.

Lawrence, Larry D.: *See—*
Sudweeks, Walter B.; and Lawrence, Larry D., 4,231,821, Cl. 149-21.000.

Lazardwitz, Benjamin: *See—*
Weiss, Gerald; Scharf, Gerson; Guido, Anthony A.; and Lazardwitz, Benjamin, 4,232,187, Cl. 178-22.000.

Lazaroff, Gary G. Spray washer system. 4,231,239, Cl. 68-205.00R.

Le-Bo Products Co., Inc.: *See—*
Aprahamian, Vaughn, 4,231,473, Cl. 206-387.000.

Leanza, William J.: *See—*
Christensen, Burton G.; Leanza, William J.; and Wildonger, Kenneth J., 4,232,030, Cl. 424-263.000.

Learn, William H. Projectable step for vehicles. 4,231,583, Cl. 280-166.000.

Leber, Dieter, to VDO Adolf Schindling AG. Apparatus for continuous measurement of the liquid level in a container. 4,231,250, Cl. 73-290.00V.

Lechner, Robert H.: *See—*
DeLacy, James P.; and Lechner, Robert H., 4,232,232, Cl. 307-139.000.

Lecky, John H.: *See—*
Boehringer, John R.; and Lecky, John H., 4,231,375, Cl. 128-725.000.

Lectron Products, Inc.: *See—*
Slavin, Michael; and Telmet, Juhan, 4,232,287, Cl. 340-52.00E.

Lee, Maw H.; and Keim, John E., to Scott & Fetzer Company, The. Wireless alarm system. 4,232,308, Cl. 340-539.000.

Lee, Minyoung: *See—*
DeVries, Robert C.; Lee, Minyoung; Szala, Lawrence E.; and Tuft, Roy E., 4,231,195, Cl. 51-307.000.

Lee, Ross A., to Du Pont de Nemours, E. I., and Company. Bleachable photographic sensitizing dyes. 4,232,115, Cl. 430-522.000.

Leeds and Northrup Ltd.: *See—*
Bradshaw, Michael; and Edwards, Roger D., 4,232,325, Cl. 346-76.00R.

Leggett & Platt, Incorporated: *See—*
Sandham, Edwin C., 4,231,539, Cl. 248-418.000.

Leiber, Heinz, to Robert Bosch GmbH. Anti-lock apparatus for a hydraulic brake system. 4,231,620, Cl. 303-119.000.

Leidich, Arthur J., to RCA Corporation. PNP Output short circuit protection. 4,232,273, Cl. 330-298.000.

Leipelt, Rudolf: *See—*
Alf, Herbert; Ernst, Volker; Hainle, Rudi; and Leipelt, Rudolf, 4,231,343, Cl. 123-556.000.

Leitch, Clifford D., to Harris Corporation. AM Stereo receivers. 4,232,189, Cl. 179-1.00G.

Lelaidier, Daniel; and Godard, Pierre, to Saft-Societe des Accumulateurs Fixes et de Traction. System for controlling an electronic warning device. 4,232,305, Cl. 340-384.00E.

Lemercier, Pierre: *See—*
Balligand, Pierre; Corfa, Yves; Lemercier, Pierre; Marchal, Paul; and Vertut, Jean, 4,231,171, Cl. 37-54.000.

Lenaerts, George V., to Northern Telecom Limited. Integral telephone set and handset. 4,232,203, Cl. 179-103.000.

Leon, Gordon T.; and Byron, Joseph L., to Berkey-Colortran, Inc. Spotlight or other illuminator. 4,232,359, Cl. 362-268.000.

Lerner, Marshall A.: *See—*
Lipski, Frank F., 4,231,241, Cl. 70-195.000.

Lesko, Imre A.: *See—*
Gorenc, Edward J.; Fox, Ulles E.; and Lesko, Imre A., 4,231,246, Cl. 72-412.000.

Lesteva, Tatyana M.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; and Lesteva, Tatyana M., 4,232,182, Cl. 585-820.000.

Lever Brothers Company: *See—*
Machin, David, 4,231,904, Cl. 252-557.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,231,784, Cl. 71-92.000.

Levy, John V.; Rodgers, David P.; Stewart, Robert E.; and Casabona, Richard J., to Digital Equipment Corporation. Bus for a data processing system with overlapped sequences. 4,232,366, Cl. 364-200.000.

Lewellyn, Morris E.: *See—*
Wang, Samuel S.; and Lewellyn, Morris E., 4,231,868, Cl. 210-728.000.

Lewis, Frank M., to Wright Dow Corning. Metacarpal-phalangeal prosthesis. 4,231,121, Cl. 3-1.910.

Lewis, Ronnie L.: *See—*
Irvin, Howard B.; Lewis, Ronnie L.; and Moczygemba, George A., 4,232,137, Cl. 526-71.000.

Ley, Anthony J., to ENERTEC. Remotely-controllable relays and filters therefor. 4,232,298, Cl. 340-171.00R.

Liakumovich, Alexandr G.; Pantukh, Boris I.; and Lesteva, Tatyana M. Process for purifying isoprene. 4,232,182, Cl. 585-820.000.

Liakumovich, Alexandr G.: *See—*
Adigamov, Engel R.; Gurvich, Yakov A.; Liakumovich, Alexandr G.; Logutov, Igor J.; Michurov, Jury I.; Polenov, Alexei S.; and Yanshevsky, Vladimir A., 4,232,176, Cl. 568-756.000.

Libbey-Owens-Ford Company: *See—*
Krueger, Wallace F.; and Shaw, Anthony R., 4,231,204, Cl. 52-397.000.
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., 4,231,505, Cl. 228-14.000.

Licentia Patent-Verwaltungs-GmbH: *See—*
Schaffernicht, Klaus; and Kolbeck, Rainer, 4,231,627, Cl. 316-25.000.

Lidaka, Marger J.: *See—*
Paegle, Ruta A.; Lidaka, Marger J.; Zhuk, Regina A.; Maurinsh, Juris A.; Zidermane, Aina A.; and Kilevitsa, Marite K., 4,232,149, Cl. 536-23.000.

Lieberman, Aaron L. Laminated frame assembly and process. 4,231,833, Cl. 156-249.000.

Limburg, William W.; and Pai, Damodar M., to Xerox Corporation. Phenyl benzotriazole stabilized photosensitive device. 4,232,103, Cl. 430-59.000.

Limone, Mario; Russo, Giovanni; Magliuolo, Umberto; and Sardella, Salvatore. Card comprising an electronic circuit with obliterable credit elements for the distribution of goods or services. 4,231,458, Cl. 194-4.00F.

Lin, Ching-Yu: *See—*
Hickam, William M.; Lin, Ching-Yu; and Zomp, John M., 4,231,733, Cl. 431-76.000.

Linde AG: *See—*
Wagner, Norbert, 4,231,508, Cl. 228-219.000.

Lindemann, Martin K. O.; and Verdicchio, Robert J., to Johnson & Johnson. Detergent compositions. 4,231,903, Cl. 252-545.000.

Lindkvist, Folke: *See—*
Dahle, Orvar; Einarsson, Olov; Lindkvist, Folke; and Valdemarsson, Stefan, 4,231,145, Cl. 29-432.000.

Lindstedt, Guenter: *See—*
Gerlach, Albrecht; Holzmann, Dieter; Lindstedt, Guenter; and Burth, Rolf-Dieter, 4,232,297, Cl. 340-168.00S.

Ling, Alexander C.: *See—*
McDonald, John C.; Baichtal, James R.; and Ling, Alexander C., 4,232,386, Cl. 370-68.000.

Ling Systems Limited: *See—*
Arscott, John R., 4,231,469, Cl. 198-779.000.

Lingstaedt, Ernst; Moegen, Gerhard; and Wotruba, Gottfried, to Eurosil GmbH. MOS Control circuit for integrated circuits. 4,232,261, Cl. 323-22.00R.

Linneborn, Hans, to Neuhaus-Schwermann, Albert; and Zerbin, Walter Otto. Apparatus and process for burning of fuels of relatively young geological age and of any resulting gases. 4,231,302, Cl. 110-229.000.

Linse, Vonne D.: *See—*
Istvanffy, Stephen M.; and Linse, Vonne D., 4,231,506, Cl. 228-109.000.

Lintell, Robert J.; and Campbell, James D., to United States of America, Air Force. Active optical tracking system. 4,231,534, Cl. 244-3.160.

Lipp, George D., to Corning Glass Works. Electrically heated surgical cutting instrument. 4,231,371, Cl. 128-303.100.

Lipps, Bennie J.; Murphy, William P., Jr.; and Mather, Frank W., III, to Cordis Dow Corp. Artificial kidney and method for making same. 4,231,871, Cl. 210-87.000.

Lipski, Frank F., to Lerner, Marshall A., trustee of Henry Bissell, a part interest. Vehicle shifter locking device. 4,231,241, Cl. 70-195.000.

Lithgow, Keith B., to Microform Communications Limited. Clamping devices. 4,231,538, Cl. 248-226.100.

Litmanovich, Ilya M.: *See—*
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Livesay, Keith. Fireplace heat exchanger unit. 4,231,349, Cl. 126-121.000.

Ljungqvist, Stig-Ove E.; Hammarstrom, Bernth S.; and Fritjofsson, Sture F. E., to Gislaved AB. System for automatic joining and rolling up of cord strips. 4,231,836, Cl. 156-405.00P.

Loewenstern, Kenneth M.: *See—*
Wright, William S.; and Loewenstern, Kenneth M., 4,232,300, Cl. 340-840.390.

Logan, Arthur D.: *See—*
Ensley, Rufus N.; Haren, Doyle V.; Logan, Arthur D.; and McLean, Michael E., 4,231,835, Cl. 156-361.000.

Logan, David J., to Gerber Scientific Instrument Company, The. Method of making an overlay mask and a printing plate therefrom. 4,231,659, Cl. 355-132.000.

Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., to Ford Motor Company. Rare earth or yttrium, transition metal oxide thermistors. 4,231,254, Cl. 73-362.0AR.

Logutov, Igor J.: *See—*
Adigamov, Engel R.; Gurvich, Yakov A.; Liakumovich, Alexandr G.; Logutov, Igor J.; Michurov, Jury I.; Polenov, Alexei S.; and Yanshevsky, Vladimir A., 4,232,176, Cl. 568-756.000.

Loiler, Roger D., to JMR Instruments, Inc. Receiver for satellite navigational positioning system. 4,232,389, Cl. 455-12.000.

Lomard, Jean-Pierre, to Societe Anonyme dite: CM Industries. Method for the treatment of male sterility. 4,232,019, Cl. 424-248.560.

Lombard, Jean-Pierre, to C M Industries. Process for the treatment of children suffering from a hyperkinetic syndrome. 4,232,020, Cl. 424-248.560.

Lonati, Francesco. Device for advancing the main drum in a circular knitting machine. 4,231,235, Cl. 66-236.000.

Longerich, Ernest P., to United States of America, Navy. Towable pod assembly for protectively disabling incoming torpedoes. 4,231,311, Cl. 114-244.000.

Looney, Donald F.: *See—*
Derrick, Danny O.; and Looney, Donald F., 4,231,141, Cl. 24-243.00K.

Lord Corporation: *See—*
Koeneman, James B., 4,231,122, Cl. 3-1.911.

Lorenz, Kurt: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, 4,231,844, Cl. 201-34.000.

Loubier, Roger C.: *See—*
Petterson, Robert C.; and Loubier, Roger C., 4,231,804, Cl. 134-11.000.
Petterson, Robert C.; and Loubier, Roger C., 4,231,805, Cl. 134-11.000.

Louthan, Rector P., to Phillips Petroleum Company. Preparation of alkyl mercaptocarboxylate/dialkyl thiodicarboxylate mixture using sulfur and/or water cocatalyst. 4,232,167, Cl. 560-154.000.

Lubrizol Corporation, The: *See—*
Davis, Kirk E., 4,231,757, Cl. 44-63.000.

Lucas, Frank J. Lawn mower safety device. 4,231,217, Cl. 56-17.400.

Lucas Industries Limited: *See—*
Hill, William F.; and Southgate, John P., 4,232,368, Cl. 364-431.000.
Reed, Kenneth R. B., 4,232,231, Cl. 307-10.00R.

Luddington, Eric A.: *See—*
Hinchcliffe, Dennis; Heybourn, Frank; and Luddington, Eric A., 4,231,461, Cl. 198-347.000.

Lugscheider, Erich: *See—*
Kruske, Gerhard; Knotek, Otto; and Lugscheider, Erich, 4,231,793, Cl. 75-122.000.

Lui, Kenneth, to TRW Inc. Electrodeposition of nickel-iron alloys having a low temperature coefficient and articles made therefrom. 4,231,847, Cl. 204-7.000.

Luke, Roger D.; and Rhodes, John M., to Gould Inc. Neutral bar, lug and barrier assembly. 4,231,633, Cl. 339-242.000.

Lummus Company, The: *See—*
Riegel, Herbert, 4,231,969, Cl. 570-223.000.

Lund, Arvid, to Rader Companies, Inc. Rotary feeder for pneumatic conveying line. 4,231,495, Cl. 222-345.000.

Lunn, William H. W.: *See—*
Nagata, Wataru; Hamashima, Yoshio; Tsuji, Teruji; and Lunn, William H. W., 4,232,151, Cl. 544-90.000.

Lynch, Brian; and Partus, Fred P., to Western Electric Company, Inc. Methods of and apparatus for heating a glass tube. 4,231,777, Cl. 65-109.000.

Lyon, Warren C.; and Hayes, William H., Jr., to Hittman Corporation. Pressure sensor. 4,231,376, Cl. 128-748.000.

Lyons, Michael T., to Satellite Business Systems. Satellite-launch vehicle combination and method. 4,231,537, Cl. 244-160.000.

M & T Chemicals Inc.: *See—*
Dworkin, Robert D., 4,231,895, Cl. 252-400.00A.

MacDonald, David J., to United States of America, Interior. Separation of zirconium from hafnium by solvent extraction. 4,231,994, Cl. 423-70.000.

MacGregor, Daniel. Extract of energy from the sea. 4,231,711, Cl. 417-100.000.

Machin, David, to Lever Brothers Company. Detergent bars with improved properties. 4,231,904, Cl. 252-557.000.

Macias, Julian W.: *See—*
Rennick, Lyle V.; and Macias, Julian W., 4,232,381, Cl. 367-135.000.

Mack, Ronald H.: *See—*
Juziuk, Jurgen A.; Mack, Ronald H.; Banka, Eugene F.; and Nicol, Edward A., 4,232,217, Cl. 235-480.000.

Mader, William L. Releasable animal hitching apparatus. 4,231,327, Cl. 119-110.000.

Maechtle, Gary L.: *See—*
Carlstrom, William L.; and Maechtle, Gary L., 4,232,085, Cl. 428-315.000.

Magane, Shigeo; and Yamamoto, Kazuo, to NSK-Warner K.K. Safety belt system for vehicles. 4,231,590, Cl. 280-803.000.

Magdanyi, Laszlo: *See—*
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.

Magerlein, Barney J., to Upjohn Company, The. 6-Deoxyneamines. 4,232,148, Cl. 536-17.00R.

Magiera, Leonhardt; Grundmann, Raban; and Krockenberger, Dieter, to Chemische Werke Huls Aktiengesellschaft. Stabilization of 1,1,1-trichloroethane. 4,231,968, Cl. 570-109.000.

Magliuolo, Umberto: *See—*
Limone, Mario; Russo, Giovanni; Magliuolo, Umberto; and Sardella, Salvatore, 4,231,458, Cl. 194-4.00F.

Magnusson, Ulf S. G.; and Uhrbom, Lars E., to Nordiska Ackumulatorfabriker Noack AB. Electrode plate for lead accumulators. 4,232,100, Cl. 429-217.000.

Mainetti, Mario, to S.A. Mainetti. Clothes hanger. 4,231,500, Cl. 223-96.000.

Maki, Douglas W.: *See—*
Dickens, Lawrence E.; and Maki, Douglas W., 4,232,277, Cl. 331-107.0DP.

Makino, Koichi: *See—*
Hattori, Seizi; Makino, Koichi; Nakagawa, Takehiko; and Shinohara, Masayoshi, 4,232,061, Cl. 427-130.000.

Makins, James E., Jr., to United States Steel Corporation. Eccentric shaft and method of making a shaft. 4,231,671, Cl. 403-13.000.

Maklad, Mokhtar S., to International Telephone and Telegraph Corporation. Method of fabricating large optical preforms. 4,231,774, Cl. 65-3.00A.

Makowski, Lawrence A.: *See—*
Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,231,588, Cl. 280-661.000.

Maladra, Anthony: *See—*
Campanella, Matthew J.; Maladra, Anthony; and Goldberg, Bennett C., 4,231,511, Cl. 235-375.000.

Malburg, Werner, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Pulsating liquid jet gun and method of operating the same. 4,231,283, Cl. 89-8.000.

Malec, Robert E., to Ethyl Corporation. Lubricant composition. 4,231,883, Cl. 252-33.400.

Mallory, Glenn O., Jr., to Richardson Chemical Company. Method of preparing substrate surface for electroless plating and products produced thereby. 4,232,060, Cl. 427-98.000.

Malone, Carl E. Container depressurization system. 4,231,489, Cl. 220-304.000.

Malpass, Dennis B., to Texas Alkyls, Inc. Organomagnesium complexes. 4,231,896, Cl. 252-431.00R.

Manfroni, Ezio, to Carpigiani Bruto Macchine Automatiche S.p.A. Dispensing valve for liquids. 4,231,547, Cl. 251-210.000.

Mann, George F. Method of producing plasminogen activator. 4,232,124, Cl. 435-212.000.

Mann, John: *See—*
Orr, Thomas S. C.; Hall, David E.; and Mann, John, 4,232,012, Cl. 424-232.000.

Manning, Robert G.: *See—*
Rule, Charles E.; Manning, Robert G.; and Zielinski, Richard J., 4,232,050, Cl. 426-582.000.

Mansson, Staffan T.: *See—*
Brandt, Lennart H.; and Mansson, Staffan T., 4,231,317, Cl. 440-50.000.

Manufacture de Produits Chimiques Protex Societe Anonyme: *See—*
Balland, Jean, 4,231,749, Cl. 8-584.000.

Marathe, Vijay V.: *See—*
Heinsen, Edward A.; and Marathe, Vijay V., 4,232,382, Cl. 368-1.000.

Marcantonio, Arnold F.; and Dailey, Rodney E., to Ball Corporation. Aqueous metal coordination compounds as protective coatings for glass. 4,232,065, Cl. 427-226.000.

Marchal, Paul: *See—*
Balligand, Pierre; Corfa, Yves; Lemercier, Pierre; Marchal, Paul; and Vertut, Jean, 4,231,171, Cl. 37-54.000.

Marchesano, Carlo, to Minnesota Mining and Manufacturing Company. Liquid concentrated developer composition, and confection ready to mix with water including it, for use in color photography. 4,232,113, Cl. 430-450.000.

Marconi Company Limited, The: *See—*
Gerard, Roger E. J., 4,232,193, Cl. 179-1.50R.

Marey, Daniel J.: *See—*
Ayache, Michel R.; Delonge, Jean-Claude L.; and Marey, Daniel J., 4,231,704, Cl. 416-95.000.

Margolin, George D.: *See—*
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,231,593, Cl. 283-6.000.

Marion Laboratories, Inc.: *See—*
Mathison, Ian W.; and Solomons, William E., 4,232,014, Cl. 424-324.000.

Mark Controls Corporation: *See—*
Johnson, Allan B., 4,231,512, Cl. 236-47.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Transparent to translucent flame-retardant polycarbonate composition. 4,231,920, Cl. 260-45.70S.

Marky, Michael, to Ciba-Geigy Corporation. Phosphonium compounds, a process for their preparation and a process for the preparation of asymmetrically substituted stilbene fluorescent brightening agents. 4,231,957, Cl. 260-505.00C.

Marmet, Melvin L.; and Padgett, Clarence W., to Rockwell International Corporation. High gain differential amplifier with positive feedback. 4,232,270, Cl. 330-253.000.

Marquez, Joseph A.: *See—*
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,232,006, Cl. 424-177.000.

Marquis, David M.: *See—*
Paradis, Stephen G.; Marquis, David M.; and Bakshi, Kiran R., 4,231,943, Cl. 260-346.750.

Marquisee, Mark J., to Du Pont de Nemours, E. I., and Company. Nontacky shaped objects from polymer latices. 4,232,126, Cl. 521-65.000.

Mars Limited: *See—*
Compton, Peter A.; and Wood, John G., 4,231,476, Cl. 206-519.000.

Marsh, Dean E. Hot water boiler. 4,231,350, Cl. 126-133.000.

Marsocci, Angelo A., to American District Telegraph Company. Electrical test circuit for optical particle detector. 4,232,307, Cl. 340-515.000.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Phthalimidomethyl cyclopropane carboxylic acid esters. 4,231,932, Cl. 260-326.00A.

Martin, David G., to Upjohn Company, The. Purification of AT-125. 4,232,164, Cl. 548-240.000.

Martin, Frank E., to Midori Anzen Company, Ltd. Personal emergency breathing hood with nose blocking device. 4,231,359, Cl. 128-201.180.

Martin, Jerry R.: *See—*
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,231,924, Cl. 260-112.50R.
Tadanier, John S.; and Martin, Jerry R., 4,232,147, Cl. 536-4.000.

Martin, Raul: *See—*
Gomez, Nicolas Q.; and Martin, Raul, 4,231,199, Cl. 52-91.000.

Martin, Richard H.: *See—*
Cline, Warren K.; and Martin, Richard H., 4,231,377, Cl. 131-9.000.

Martin, Robert F.: *See—*
Burke, Robert G.; and Martin, Robert F., 4,232,294, Cl. 340-147.0LP.

Marty, Didier; Abadie, Albert; and Mustin, Michel. Process for preparation of a water for hemodialysis, and its application in renal hemodialysis. 4,231,864, Cl. 210-669.000.

Marui, Toshio; and Masuda, Masuo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process of transfer printing. 4,231,829, Cl. 156-230.000.

Maruyama, Eiichi: *See—*
Yamamoto, Hideaki; Tsukada, Toshihisa; Maruyama, Eiichi; and Inagaki, Hiroya, 4,232,219, Cl. 250-227.000.

Maruzen Sewing Machine Co., Ltd: *See—*
Matsumura, Nobuyoshi, 4,232,258, Cl. 318-345.00H.

Marx, Dieter: *See—*
Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Muller-Calgan; Helmut; and Dolce, Giuliano, 4,232,016, Cl. 414-244.000.

Masaki, Kenji: *See—*
Suzuki, Suzuo; Nagaishi, Hastuo; and Masaki, Kenji, 4,231,331, Cl. 123-416.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Griepentrog, Hartmut, 4,231,226, Cl. 60-648.000.
Zurner, Hansjurgen; and Fuhrmann, Wolfgang, 4,231,543, Cl. 251-57.000.

Mascioli, Rocco L.: *See—*
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,232,152, Cl. 544-119.000.

Mashimo, Norio: *See—*
Mori, Yoshihisa; Mashimo, Norio; and Eguchi, Takeo, 4,232,202, Cl. 179-100.40E.
Mason, Keith J.: *See—*
Swersky, Gerald S.; and Mason, Keith J., 4,231,437, Cl. 175-325.000.
Massachusetts Institute of Technology: *See—*
Raffel, Jack I.; and Bernacki, Stephen E., 4,231,819, Cl. 148-175.000.
Schrock, Richard R., 4,231,947, Cl. 260-429.00R.
Mastalish, Lawrence V.: *See—*
Pierson, Roger P.; Mastalish, Lawrence V.; and Zollar, Daniel J., 4,231,491, Cl. 221-48.000.
Masterman, Raymond J. Vehicle alarm. 4,232,288, Cl. 340-63.000.
Masuda, Masuo: *See—*
Marui, Toshio; and Masuda, Masuo, 4,231,829, Cl. 156-230.000.
Matchette, Gerald J. Saw guide assembly. 4,231,274, Cl. 83-820.000.
Mather, Frank W., III: *See—*
Lipps, Bennie J.; Murphy, William P., Jr.; and Mather, Frank W., III, 4,231,871, Cl. 210-87.000.
Mathiak, Hans; and Oldengott, Hans, to Ruhrkohle, AG. Plug for protecting coke-oven chamber doors from the action of the internal temperature in the oven. 4,231,846, Cl. 202-248.000.
Mathison, Ian W.; and Solomons, William E., to Marion Laboratories, Inc. Aminoalkylindans and use as hypotensive agents. 4,232,014, Cl. 424-324.000.
Mathner, Manfred; and Thomsen, Peter, to Dolmar Maschinenfabrik GmbH & Co. Exhaust silencer for exhaust systems of internal combustion engines, particularly internal combustion engine-operated manual appliances. 4,231,221, Cl. 60-319.000.
Matsuda, Teruo; and Murata, Tetsuo, to Sumitomo Chemical Company, Limited. Process for producing salicylaldehyde. 4,231,967, Cl. 568-433.000.
Matsuda, Wakatake: *See—*
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, to Yamaha Hatsukoko Kabushiki Kaisha. Control device for exhaust gas recycled internal combustion engine. 4,231,339, Cl. 123-568.000.
Matsumura, Nobuyoshi, to Maruzen Sewing Machine Co., Ltd. Speed control apparatus for electric motor. 4,232,258, Cl. 318-345.00H.
Matsuo, Koji: *See—*
Taguchi, Nobuyoshi; Matsuo, Koji; Takahashi, Hiromu; and Oda, Fujio, 4,232,213, Cl. 219-216.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Murakami, Kaoru; Okahisa, Mitsugu; Arita, Tomohiko; and Kumano, Hiroshi, 4,231,889, Cl. 252-182.100.
Nakagawa, Hiroshi; Kawa, Hidetoshi; and Kawai, Makoto, 4,232,335, Cl. 358-101.000.
Ochi, Matsuo; and Miyoshi, Keisuke, 4,232,247, Cl. 313-474.000.
Taguchi, Nobuyoshi; Matsuo, Koji; Takahashi, Hiromu; and Oda, Fujio, 4,232,213, Cl. 219-216.000.
Matsuura, Shigeo: *See—*
Murata, Toshinori; and Matsuura, Shigeo, 4,232,397, Cl. 455-179.000.
Matsuzuka, Takeshi, to Trio Kabushiki Kaisha. FM Receiving device. 4,232,191, Cl. 179-1.0GD.
Mattern, Gunter: *See—*
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,232,011, Cl. 424-200.000.
Matthews, Charles W.: *See—*
Larson, Olaf A.; and Matthews, Charles W., 4,231,617, Cl. 299-2.000.
Mattia, Manlio M. System for removing organic contaminants from air. 4,231,764, Cl. 55-28.000.
Matuska, Tibor L., to Unaform, Inc. Fabric for papermaking machines. 4,231,401, Cl. 139-383.00A.
Mauldin, Charles H.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,231,898, Cl. 252-441.000.
Mauri, Luigi: *See—*
Bordini, Fosco; and Mauri, Luigi, 4,232,089, Cl. 428-413.000.
Maurinsh, Juris A.: *See—*
Paegle, Ruta A.; Lidaka, Marger J.; Zhuk, Regina A.; Maurinsh, Juris A.; Zidermane, Aina A.; and Kilevitsa, Marite K., 4,232,149, Cl. 536-23.000.
Maurischat, Gunther: *See—*
Waibel, Gottfried; Maurischat, Gunther; and Webersik, Heinz, 4,231,319, Cl. 118-655.000.
MAXS Aktiengesellschaft: *See—*
Zimmermann, Anton; and Greutert, Albert, 4,231,876, Cl. 210-232.000.
Maxwell, Donald R.: *See—*
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Mayhew, Harry E.: *See—*
Schlegel, William R.; and Mayhew, Harry E., 4,231,535, Cl. 244-110.00C.
Mazzacano, Paul J.: *See—*
Smith, Dennis W.; and Mazzacano, Paul J., 4,231,676, Cl. 404-6.000.
MCA Disco-Vision, Inc.: *See—*
Isailovic, Jordan, 4,232,388, Cl. 375-110.000.
MCA Discovision, Inc.: *See—*
Canino, Lawrence S., 4,232,201, Cl. 179-100.10G.
Winslow, John S.; and Wilkinson, Richard L., 4,232,337, Cl. 358-128.500.
McBride, Donald G.: *See—*
Gazdik, Charles E.; and McBride, Donald G., 4,231,154, Cl. 29-840.000.
McCarter, Ed R.: *See—*
Thatcher, Arthur K.; and McCarter, Ed R., 4,231,333, Cl. 123-440.000.
McCombie, Stuart, to Schering Corporation. S-5-(Azidomethyl or aminomethyl)-2-lower-alkoxytetrahydrofurans. 4,231,945, Cl. 260-347.700.
McConnell, George B., to Data Information Systems Corporation. Jukebox polling system. 4,232,295, Cl. 340-152.00R.
McCue, Bernard B., to RCA Corporation. Internal metal stripe on conductive layer. 4,232,248, Cl. 313-479.000.
McDonald, John C.; Baichtal, James R.; and Ling, Alexander C., to TRW Inc. Subscriber switch controller for controlling connections between a plurality of telephone subscriber lines and a pair of multitime-slot digital data buses. 4,232,386, Cl. 370-68.000.
McElheny, Donald C., to American Precision Industries, Inc. Method of connecting wire leads to miniature coil assemblies. 4,231,985, Cl. 264-262.000.
McEvilly, Richard V., Jr. Mobile radio vehicle control system. 4,232,390, Cl. 455-77.000.
McFarlane, James I.: *See—*
Lavin, Walter M.; McFarlane, James I.; and Rose, Dennis L., 4,231,894, Cl. 252-389.00A.
McGee, Thomas W.: *See—*
Smith, William E.; and McGee, Thomas W., 4,232,175, Cl. 568-706.000.
McGinley, Emanuel J.; and Zuban, Joseph M., to FMC Corporation. Method of mixing difficulty dispersible material, e.g., fat or wax, in a gum-microcrystalline cellulose matrix, and powder product. 4,231,802, Cl. 106-197.00C.
McGraw-Edison Company: *See—*
Kelsall, Jeffrey C., 4,232,361, Cl. 362-364.000.
McGuire, John J.; and Auger, Edward J. Method and system for propagating of plants. 4,231,188, Cl. 47-80.000.
McLean, Michael E.: *See—*
Ensley, Rufus N.; Haren, Doyle V.; Logan, Arthur D.; and McLean, Michael E., 4,231,835, Cl. 156-361.000.
McMillan, Stephen L., to General Electric Company. Automatic control for a clothes dryer. 4,231,166, Cl. 34-48.000.
McQuillin, Brian: *See—*
Middleton, Anthony E.; and McQuillin, Brian, 4,231,701, Cl. 414-730.000.
McSwain, Edward D. Automatic ventilator. 4,231,514, Cl. 236-49.000.
Mead Corporation, The: *See—*
Gebhardt, James L.; and Hutchins, Ferris L., Jr., 4,231,299, Cl. 108-91.000.
Gebhardt, James L., 4,231,831, Cl. 156-233.000.
Meeker, Paul K., to Questor Corporation. Baby carrier and car seat. 4,231,612, Cl. 297-250.000.
Meisel, Fritz. Hot-stamping film, and process and apparatus for its manufacture. 4,232,077, Cl. 428-174.000.
Mengoli, Giuliano; Daolio, Sergio; Giulio, Ugo; and Folonari, Carlo, to Centro Ricerche Fiat S.p.A.; and Consiglio Nazionale Delle Ricerche. Method for electrochemically coating a metallic substrate with a protective film of a phenolic resin. 4,231,851, Cl. 204-181.00R.
Menju, Shinichi; Takahashi, Kunio; Haginomori, Eiichi; Murakami, Yoichi; and Zaima, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Denryoku Kabushiki Kaisha. Method and apparatus for detecting foreign matters in gas sealed electric apparatus. 4,231,258, Cl. 73-572.000.
Menju, Shinichi; Ohshima, Iwao; and Takahashi, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective gap devices for protecting circuit breakers. 4,232,352, Cl. 361-120.000.
Menocal, Gustavo A., to Gould Inc. Circuit breaker having means to facilitate assembly thereof. 4,232,282, Cl. 335-202.000.
Menzel, Gerhard: *See—*
Kaufhold, Manfred; Hepp, Dieter; and Menzel, Gerhard, 4,231,915, Cl. 260-31.80R.
Merceron, Daniel: *See—*
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Merck & Co., Inc.: *See—*
Christensen, Burton G.; Leanza, William J.; and Wildonger, Kenneth J., 4,232,030, Cl. 424-263.000.
Christensen, Burton G.; and Shih, David H., 4,232,036, Cl. 424-274.000.
Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, 4,231,938, Cl. 260-343.500.
Shepard, Kenneth L.; and Brenner, Daniel G., 4,232,158, Cl. 546-72.000.
ten Broeke, Jan, 4,232,026, Cl. 424-258.000.
Merck Patent Gesellschaft mit beschraenkter Haftung: *See—*
Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Muller-Calgan, Helmut; and Dolce, Giuliano, 4,232,016, Cl. 414-244.000.
Merisio, Alberto, to Somet Societa Meccanica Tessile, S.p.A. Drawing gripper for weaving looms. 4,231,402, Cl. 139-448.000.
Merkle, Theodor; Hausenblas, Bernhard; Schweickert, Hermann; and Wengert, Dieter, to J. M. Voith GmbH. Pipe joint structure. 4,231,594, Cl. 285-3.000.

Merten, Josef: *See—*
Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, 4,232,132, Cl. 525-222.000.
Meseguer, Jose D.: *See—*
Coll, Antonio L. P.; and Meseguer, Jose D., 4,232,162, Cl. 548-111.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Malburg, Werner, 4,231,283, Cl. 89-8.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Kruske, Gerhard; Knotek, Otto; and Lugscheider, Erich, 4,231,793, Cl. 75-122.000.
Metallurgical Processes Ltd.: *See—*
Charles, James A., 4,231,791, Cl. 75-9.000.
Meyer, Andreas: *See—*
Remy, Ernst; Meyer, Andreas; and Rieske, Ellen, 4,231,660, Cl. 356-244.000.
Meyer-Kahrweg, Helmut, to Steag A.G. Flare gas limiting apparaus for coal gasification unit. 4,231,761, Cl. 48-192.000.
Meyerson, Stanley. Watch bracelet. 4,231,502, Cl. 224-177.000.
Mezzanotte, Mario, to Societa Pneumatici Pirelli S.p.A. Radial vehicle tire. 4,231,409, Cl. 152-354.00R.
Miale, Joseph N.: *See—*
Chen, Nai Y.; Miale, Joseph N.; and Reagan, William J., 4,231,899, Cl. 252-455.00Z.
Micciarelli, Mario: *See—*
Palladino, Gaetano; and Micciarelli, Mario, 4,232,013, Cl. 424-241.000.
Michael Huber Munchen, GmbH: *See—*
Clausen, Dieter; and Uhlemayr, Albert, 4,231,742, Cl. 8-470.000.
Michalik, Horst B.: *See—*
Weschenfelder, Otto T.; and Michalik, Horst B., 4,231,559, Cl. 493-426.000.
Michel, Thomas J.: *See—*
Finger, Richard H.; and Michel, Thomas J., 4,232,355, Cl. 361-235.000.
Michel, Wolfgang; and Kalberer, Heinz, to Hoechst Aktiengesellschaft. Porous shaped cellulose hydrate article with an improved cleaning effect. 4,232,128, Cl. 521-134.000.
Michurov, Jury I.: *See—*
Adigamov, Engel R.; Gurvich, Yakov A.; Liakumovich, Alexandr G.; Logutov, Igor J.; Michurov, Jury I.; Polenov, Alexei S.; and Yanshevsky, Vladimir A., 4,232,176, Cl. 568-756.000.
Microform Communications Limited: *See—*
Lithgow, Keith B., 4,231,538, Cl. 248-226.100.
Middel, Jan: *See—*
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Middleton, Anthony E.; and McQuillin, Brian, to Davy-Loewy Ltd. Manipulator. 4,231,701, Cl. 414-730.000.
Midori Anzen Company, Ltd.: *See—*
Martin, Frank E., 4,231,359, Cl. 128-201.180.
Mikkelsen, Henrik; and Andersen, Bjarne B., to Inter-Ikea A/S. Unit joint for connecting two angularly arranged panel units. 4,231,203, Cl. 52-284.000.
Mikuni Kogyo Co., Ltd.: *See—*
Kubota, Kenichi; Mukai, Osamu; and Kariyama, Kenji, 4,231,716, Cl. 417-315.000.
Miles Laboratories, Inc.: *See—*
Hartzler, Harold E., 4,231,939, Cl. 260-343.600.
Schut, Robert N.; Snoke, Edgar O.; and Van Dyke, John W., Jr., 4,232,160, Cl. 546-146.000.
Vogelhut, Paul O., 4,231,754, Cl. 23-230.00R.
Millea, Michael F.; and Seib, David H., to United States of America, Air Force. Method and apparatus for trimming IR/CCD mosaic sensors. 4,232,221, Cl. 250-311.000.
Miller, Bernard D.: *See—*
Dobkin, Robert C.; Isbell, Tim D.; Miller, Bernard D.; and Sample, Lawrence R., 4,232,271, Cl. 330-258.000.
Miller, John D.: *See—*
Seibert, Chesterfield F.; and Miller, John D., 4,231,768, Cl. 55-179.000.
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, to Burroughs Wellcome Co. Assay method and compounds. 4,231,923, Cl. 260-112.50R.
Miller, Robert C., to Summa Corporation. High temperature skin construction. 4,232,093, Cl. 428-591.000.
Milliken Research Corporation: *See—*
Moot, Lorence M., 4,231,744, Cl. 8-495.000.
Milton, Harold W., Jr.: *See—*
Pringle, William L.; Hochstein, Peter A.; and Milton, Harold W., Jr., 4,231,223, Cl. 60-527.000.
Minami, Syuji; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for producing polymers or copolymers of olefins containing at least 3 carbon atoms. 4,232,139, Cl. 526-125.000.
Mine Safety Appliances Company: *See—*
Wise, Layton A., 4,231,361, Cl. 128-202.260.
Minnesota Mining and Manufacturing Company: *See—*
Buerkley, Donald D.; Sweeny, Norman P.; and Vivona, Daniel N., 4,232,083, Cl. 428-307.000.
Carlson, Robert C., 4,231,886, Cl. 252-117.000.
Jamieson, Peter B., 4,232,116, Cl. 430-510.000.
Marchesano, Carlo, 4,232,113, Cl. 430-450.000.
Ramey, Joseph F.; Seiler, George A.; and Thompson, Dorman N., Jr., 4,231,837, Cl. 156-522.000.
Smith, George H.; and Olofson, Peter M., 4,231,951, Cl. 260-446.000.
Minolta Camera Kabushiki Kaisha: *See—*
Abe, Haruo, 4,231,636, Cl. 350-175.0FS.
Minor, William F. Combined box, table and bench. 4,231,453, Cl. 190-11.000.
Mintz, Leonard A. Method for applying magnetic strips. 4,231,828, Cl. 156-230.000.
Mishina, Haruo: *See—*
Ueda, Shinjiro; Takada, Yoshihiro; Mishina, Haruo; and Kuroda, Atsuhiko, 4,231,706, Cl. 416-186.00R.
Mita Industrial Company Ltd.: *See—*
Fukuda, Hideo; Morikawa, Hiroichi; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 4,232,101, Cl. 430-56.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, 4,232,229, Cl. 250-541.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Yoneoka, Mikio; Osugi, Minoru; and Ikarashi, Takeo, 4,232,171, Cl. 560-239.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Takeuchi, Yo; Ohbori, Koichi; Hatsushika, Masabumi; and Komori, Shinichi, 4,231,817, Cl. 148-32.500.
Mitsubishi Rayon Company, Limited: *See—*
Kamada, Isao, 4,232,078, Cl. 428-195.000.
Mitsui, Akio: *See—*
Adachi, Keiichi; Shishido, Tadao; and Mitsui, Akio, 4,232,114, Cl. 430-504.000.
Mitsui Petrochemical Industries Ltd.: *See—*
Minami, Syuji; and Kashiwa, Norio, 4,232,139, Cl. 526-125.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,231,961, Cl. 564-65.000.
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,231,934, Cl. 260-326.5FM.
Mitzel, Allen M.: *See—*
Johnson, Roger F.; and Mitzel, Allen M., 4,231,160, Cl. 33-174.00P.
Miyagawa, Tuyoshi; and Arikawa, Junichi, to Laurel Bank Machine Co., Ltd. Paper sheet holding device for paper sheet counter. 4,231,564, Cl. 271-95.000.
Miyakawa, Seiichi: *See—*
Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, 4,231,561, Cl. 271-3.100.
Miyamoto, Taketoshi: *See—*
Nakagawa, Eishiro; Miyamoto, Taketoshi; Umino, Naozi; and Oyama, Hirosi, 4,231,146, Cl. 29-432.000.
Miyazaki, Kenichi: *See—*
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Miyazako, Takushi; and Nagatomo, Shigeru, to Fuji Photo Film Co., Ltd. Photographic photosensitive element with protective layer and image forming method using same. 4,232,111, Cl. 430-355.000.
Miyoshi, Keisuke: *See—*
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Miyoshi, Tadayoshi: *See—*
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Mizuno, Shuzo, to Kabushiki Kaisha Kogen. Supervisory control system and apparatus. 4,232,306, Cl. 340-506.000.
MKD Corporation: *See—*
Campanella, Matthew J.; Maladra, Anthony; and Goldberg, Bennett C., 4,231,511, Cl. 235-375.000.
Mo Och Domsjo Aktiebolag: *See—*
Hessner, Hans, 4,231,357, Cl. 128-156.000.
Mobil Oil Corporation: *See—*
Chang, Clarence D.; Lang, William H.; and LaPierre, Rene B., 4,231,955, Cl. 260-465.100.
Chen, Nai Y.; Miale, Joseph N.; and Reagan, William J., 4,231,899, Cl. 252-455.00Z.
Moore, Edward J.; and Sedlak, Michael, 4,231,752, Cl. 23-230.0HC.
Moczygemba, George A.: *See—*
Irvin, Howard B.; Lewis, Ronnie L.; and Moczygemba, George A., 4,232,137, Cl. 526-71.000.
Model, Ernst, to Ciba-Geigy Corporation. Tetraphenylketazines and isoindolinone pigments obtained therefrom. 4,231,931, Cl. 260-325.0PH.
Moegen, Gerhard: *See—*
Lingstaedt, Ernst; Moegen, Gerhard; and Wotruba, Gottfried, 4,232,261, Cl. 323-22.00R.
Moertel, George B., to Textron, Inc. Slide fastener. 4,231,138, Cl. 24-205.16R.
Molins, Ltd.: *See—*
Hinchcliffe, Dennis; Heybourn, Frank; and Luddington, Eric A., 4,231,461, Cl. 198-347.000.
Molson, William N.: *See—*
Caplan, Sidney W.; and Molson, William N., 4,231,197, Cl. 52-36.000.
Molvik, Arthur W.: *See—*
Fink, Joel H.; and Molvik, Arthur W., 4,232,244, Cl. 313-363.000.
Mona, Roberto; and Gnieser, Jurgen, to Sulzer Brothers Limited. Method for the preservation of an activated sludge. 4,231,862, Cl. 210-601.000.

Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, to Merck & Co., Inc. Hypocholesteremic fermentation products and process of preparation. 4,231,938, Cl. 260-343.500.

Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, to CRAF Sud. Hydrazono penicillin derivatives. 4,231,927, Cl. 260-239.100.

Monsanto Chemicals Limited: *See*—
Baxter, Samuel; and Cuangani, Pushpkumar D., 4,232,130, Cl. 521-143.000.

Monsanto Company: *See*—
Bollinger, Frederic G., 4,231,783, Cl. 71-90.000.
Czajkowski, Albert J.; and Schafer, David E., 4,231,786, Cl. 71-100.000.
Franz, John E.; and Kaufman, Robert J., 4,231,782, Cl. 71-87.000.

Monsen, Geoffrey: *See*—
Falconer, John D.; Proudlock, George T.; and Monsen, Geoffrey, 4,231,484, Cl. 220-89.00A.

Monsheimer, Rolf: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,232,123, Cl. 435-69.000.

Montedison S.p.A.: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,231,841, Cl. 162-5.000.

Moore, Edward J.; and Sedlak, Michael, to Mobil Oil Corporation. Method of determining salt water in oils. 4,231,752, Cl. 23-230.0HC.

Moore, George G. I., to Riker Laboratories, Inc. Anti-inflammatory method. 4,232,043, Cl. 424-340.000.

Moore, Thomas W., Jr.: *See*—
Graham, Paul W. L.; and Moore, Thomas W., Jr., 4,231,778, Cl. 65-117.000.

Moot, Lorence M., to Milliken Research Corporation. Process for dyeing closely constructed non-tufted textile materials and products produced thereby. 4,231,744, Cl. 8-495.000.

Moplefan S.p.A.: *See*—
Bordini, Fosco; and Mauri, Luigi, 4,232,089, Cl. 428-413.000.

Moranne, Jean-Pierre, to Societe Anonyme des Usines Chausson. Method for protecting heat exchanger tubes made of aluminum against erosion and/or corrosion. 4,231,422, Cl. 165-69.000.

Moranne, Jean-Pierre, to Societe Anonyme des Usines Chausson. Header constituting a pressurizing tank. 4,231,424, Cl. 165-107.00D.

Moranne, Jean-Pierre, to Societe Anonyme des Usines Chausson. Lead based alloy for the bonding of aluminum parts to parts comprising an alloy of a heavy metal. 4,231,794, Cl. 75-166.00C.

Mori, Fumio; Ichinose, Isao; and Kunimoto, Go, to Toyo Seikan Kaisha, Ltd. Polyolefin-metal bonded structures and process for preparing same. 4,232,086, Cl. 428-341.000.

Mori, Toshio: *See*—
Tobita, Hideyuki; and Mori, Toshio, 4,231,130, Cl. 8-159.000.

Mori, Yoshihisa; Mashimo, Norio; and Eguchi, Takeo, to Sony Corporation. Record player for a stationary record disc. 4,232,202, Cl. 179-100.40E.

Moriconi, Leonard E.; and Yoshida, Yoshitaka, to General Motors Corporation. Unitary electric motor and bi-directional controller arrangement. 4,232,256, Cl. 318-292.000.

Morikawa, Hiroichi: *See*—
Fukuda, Hideo; Morikawa, Hiroichi; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 4,232,101, Cl. 430-56.000.

Morita, Douglas R.: *See*—
Dahn, C. James; Morita, Douglas R.; and Tulis, Allen J., 4,231,293, Cl. 102-7.200.

Morita, Tominori: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Morita, Tominori; Nose, Takashi; and Okazaki, Mitsuo, 4,232,010, Cl. 424-200.000.

Moritz, Frederick G.: *See*—
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,232,353, Cl. 361-172.000.

Mortelmans, Joost, to International Business Machines Corporation. Distortion correction in electromagnetic deflection yokes. 4,232,253, Cl. 315-370.000.

Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G. Door lock security system. 4,232,353, Cl. 361-172.000.

Moser, Kenneth W.; Siemens, Richard E.; and Rhoads, Stanley C., to United States of America, Interior. Recovery of organic and aqueous phases from solvent extraction emulsions. 4,231,866, Cl. 210-660.000.

Moser, Kurt; and Wegmann, Helmut, to Develop KG Dr. Eisbein & Co. Drum for electrophotographic copier. 4,231,652, Cl. 355-3.0DR.

Moser, Paul, to Ciba-Geigy Corporation. Novel light stabilizers. 4,231,921, Cl. 260-45.75R.

Moss, Mark D., to Hedstrom Co. Foldable round bouncer/walker. 4,231,582, Cl. 280-87.02W.

Moss, Winston C.: *See*—
Inouye, George T.; Sanders, Nathaniel L.; and Moss, Winston C., 4,232,070, Cl. 428-49.000.

Mostmans, Joseph H.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,232,034, Cl. 424-269.000.

Motoren- und Turbinen-Union Muenchen GmbH: *See*—
Weiler, Wolfgang, 4,231,703, Cl. 415-159.000.

Motorola, Inc.: *See*—
Dworsky, Lawrence N.; Whalin, Jeffery A.; and Glotzbach, Warren P., 4,232,239, Cl. 310-312.000.
Gould, Larrie A.; and Reed, Kim W., 4,232,398, Cl. 455-226.000.
Keeling, Michael C.; and Doss, Dwight E., 4,231,807, Cl. 136-251.000.
Kern, Neil C., 4,232,315, Cl. 343-7.300.
Knappenberger, Thomas A.; and Landers, James F., Jr., 4,231,916, Cl. 260-37.0EP.
Wrathall, Robert S., 4,231,332, Cl. 123-416.000.

Motoyama, Koichiro; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Yokokawa, Sumio; and Miyazaki, Kenichi, to Victor Company of Japan, Ltd. Circuit for stabilizing the black level in an output signal of a camera tube in a color television camera. 4,232,331, Cl. 358-44.000.

Mount Isa Mines Limited: *See*—
Cherkson, Leonard A., 4,231,252, Cl. 73-151.000.

Mroz, Judith C.; and Thomas, Dennis A., to Procter & Gamble Company, The. Disposable diaper type garment having wetness indicator. 4,231,370, Cl. 128-287.000.

Muanyagipari Kutato Intezet: *See*—
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.

Muchowski, Joseph M.: *See*—
Kluge, Arthur F.; and Muchowski, Joseph M., 4,232,038, Cl. 424-274.000.

Mueller, Rand W.; and Stec, Daniel L. Electrically actuated lock for a door or similar access means. 4,232,354, Cl. 361-172.000.

Mukai, Osamu: *See*—
Kubota, Kenichi; Mukai, Osamu; and Kariyama, Kenji, 4,231,716, Cl. 417-315.000.

Muller-Calgan, Helmut: *See*—
Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Muller-Calgan, Helmut; and Dolce, Giuliano, 4,232,016, Cl. 414-244.000.

Muller, Dieter, to Buehler-Miag GmbH. Apparatus for crystallizing an amorphous particulate material. 4,231,991, Cl. 422-245.000.

Munch, Erik: *See*—
Holbek, Gert A. E., 4,231,297, Cl. 108-10.000.

Murakami, Kaoru; Okahisa, Mitsugu; Arita, Tomohiko; and Kumano, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Divalent silver oxide for use in primary cell and manufacturing method thereof. 4,231,889, Cl. 252-182.100.

Murakami, Yoichi: *See*—
Menju, Shinichi; Takahashi, Kunio; Haginomori, Eiichi; Murakami, Yoichi; and Zaima, Eiichi, 4,231,258, Cl. 73-572.000.

Muramatsu, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Remote control unit. 4,231,310, Cl. 114-144.0RE.

Murata, Tetsuo: *See*—
Matsuda, Teruo; and Murata, Tetsuo, 4,231,967, Cl. 568-433.000.

Murata, Toshinori; and Matsuura, Shigeo, to Hitachi, Ltd. Automatic channel selection apparatus. 4,232,397, Cl. 455-179.000.

Murphy, William P., Jr.: *See*—
Lipps, Bennie J.; Murphy, William P., Jr.; and Mather, Frank W., III, 4,231,871, Cl. 210-87.000.

Murray, Joseph E., Jr.: *See*—
Davis, Carl W.; and Murray, Joseph E., Jr., 4,231,645, Cl. 354-145.000.

Musashi Seimitsu Kogyo Kabushiki Kaisha: *See*—
Satoh, Eiji; Kohama, Masayuki; Yokoya, Kunihiko; Yamada, Kenji; and Nemoto, Akira, 4,231,673, Cl. 403-125.000.

Musselmann, Walter: *See*—
Ortner, Herbert; Bahr, Theodor; and Musselmann, Walter, 4,231,526, Cl. 241-28.000.

Mustin, Michel: *See*—
Marty, Didier; Abadie, Albert; and Mustin, Michel, 4,231,864, Cl. 210-669.000.

My-D-Han-D Manufacturing Co.: *See*—
Tieben, James, 4,231,190, Cl. 49-25.000.

Myers, Lawrence F.: *See*—
Cooper, Izates C., 4,231,156, Cl. 33-1.0LE.

Myron, Donald L.; and Berringer, Robert T., to Westinghouse Electric Corp. Guide tube flow diffuser. 4,231,843, Cl. 176-50.000.

Nagahara, Yasumori; and Iida, Haruki, to Ricoh Company, Ltd. Oil supply apparatus. 4,231,653, Cl. 355-3.0FU.

Nagaishi, Hastuo: *See*—
Suzuki, Suzuo; Nagaishi, Hastuo; and Masaki, Kenji, 4,231,331, Cl. 123-416.000.

Nagashima, Akira: *See*—
Iwasaki, Masayuki; Sato, Shigeru; Inoue, Yasuo; and Nagashima, Akira, 4,232,106, Cl. 430-170.000.

Nagata, Wataru; Hamashima, Yoshio; Tsuji, Teruji; and Lunn, William H. W., to Shionogi & Co., Ltd. Dihydrotriazinylthiooxacephalosporins. 4,232,151, Cl. 544-90.000.

Nagatomo, Shigeru: *See*—
Miyazako, Takushi; and Nagatomo, Shigeru, 4,232,111, Cl. 430-355.000.

Nagode, Gerald E. Package wrapping machine. 4,231,210, Cl. 53-397.000.

Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, to American Cyanamid Company. Oligosaccharide precursors to substituted O-α-D and O-β-D-multigalactopyranosyl and glucopyranosyl 1→4 and 1→6 galactopyranosyl 1→6α-D-glucopyranoses. 4,232,150, Cl. 536-119.000.

Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, to Bristol-Myers Company. Antibacterial agents. 4,231,928, Cl. 260-239.100.

Naito, Takayuki; Nakagawa, Susumu; Yamasaki, Tetsuro; Okita, Taka-Aki; and Yamashita, Haruhiro, to Bristol-Myers Company. Purine compounds. 4,232,155, Cl. 544-277.000.

Nakagaki, Shintaro: *See*—
Motoyama, Koichiro; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,232,331, Cl. 358-44.000.

Nakagawa, Eishiro; Miyamoto, Taketoshi; Umino, Naozi; and Oyama, Hirosi, to Pentel Kabushiki Kaisha. Method of making a tip for a ball point pen. 4,231,146, Cl. 29-432.000.

Nakagawa, Hiroshi; Kawa, Hidetoshi; and Kawai, Makoto, to Matsushita Electric Industrial Co., Ltd. Numerical control tape preparation machine. 4,232,335, Cl. 358-101.000.

Nakagawa, Susumu: *See*—
Naito, Takayuki; Nakagawa, Susumu; Yamasaki, Tetsuro; Okita, Taka-Aki; and Yamashita, Haruhiro, 4,232,155, Cl. 544-277.000.

Nakagawa, Tadashi: *See*—
Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, 4,231,648, Cl. 354-195.000.

Nakagawa, Takehiko: *See*—
Hattori, Seizi; Makino, Koichi; Nakagawa, Takehiko; and Shinohara, Masayoshi, 4,232,061, Cl. 427-130.000.

Nakagawa, Yoshimasa. Head and face protecting hood. 4,231,118, Cl. 2-7.000.

Nakagawa, Yunosuke: *See*—
Yagi, Kouichi; and Nakagawa, Yunosuke, 4,231,890, Cl. 252-186.000.

Nakajima, Yosuke: *See*—
Tabei, Masatoshi; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,231,808, Cl. 136-260.000.

Nakamura, Isao: *See*—
Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, 4,231,561, Cl. 271-3.100.

Nakane, Mototaka; and Hori, Hideichi, to Aisin Seiki Kabushiki Kaisha. Clutch releasing device. 4,231,456, Cl. 192-70.250.

Nakano, Kinichi; Urakawa, Chikahiro; and Imai, Ryoji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Mitomycin C derivatives. 4,231,936, Cl. 260-326.240.

Nakata, Kunio: *See*—
Okino, Seiki; Nakata, Kunio; Yanai, Toshiharu; and Kandachi, Takayoshi, 4,232,062, Cl. 427-160.000.

Nakayama, Masafumi, to Nissan Motor Company, Limited. Supply apparatus. 4,231,972, Cl. 261-44.00D.

Naoi, Keigo: *See*—
Saito, Akihiro; and Naoi, Keigo, 4,232,238, Cl. 310-68.00D.

Naoi, Takashi; and Horie, Ikutard, to Fuji Photo Film Co., Ltd. Photographic light-sensitive materials having improved film physical properties. 4,232,117, Cl. 430-539.000.

Nappen, Bernard H., to National Starch and Chemical Corporation. Process for powdering high fat foodstuffs. 4,232,052, Cl. 426-601.000.

Narayan, Thirumurti L.: *See*—
Cenker, Moses; and Narayan, Thirumurti L., 4,232,127, Cl. 521-106.000.

Narbaits-Jaureguy, Jean-Raymond; Billottet, Henri; and Granier, Pierre, to Thomson-CSF. Electromagnetic detector responsive to a modification of a magnetic field. 4,232,285, Cl. 340-38.00L.

Nash, Gilbert J.; and Seidel, Gerhard E., to Boeing Commercial Airplane Company. Convertible container for fluent or solid cargo. 4,231,481, Cl. 220-1.500.

Nasu, Rikuo: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,231,787, Cl. 71-107.000.

Natale, Anthony J., Jr., to Towmotor Corporation. Latch assembly. 4,231,598, Cl. 292-210.000.

National Custom Van Corp.: *See*—
Bernacchia, George, Jr., 4,231,144, Cl. 29-401.100.

National Drying Machinery Company: *See*—
Parkes, Ralph C., 4,231,470, Cl. 198-797.000.

National Research Development Corporation: *See*—
Day, William H., 4,231,120, Cl. 3-1.910.
Whitehead, Alan G.; and Tite, David J., 4,231,306, Cl. 111-86.000.

National Semiconductor Corporation: *See*—
Dobkin, Robert C.; Isbell, Tim D.; Miller, Bernard D.; and Sample, Lawrence R., 4,232,271, Cl. 330-258.000.

National Starch and Chemical Corporation: *See*—
Nappen, Bernard H., 4,232,052, Cl. 426-601.000.

NCR Corporation: *See*—
Paugstat, John F.; and Girard, Donald J., 4,232,375, Cl. 364-900.000.

Nedelec, Lucien: *See*—
Dumont, Claude; Guillaume, Jacques; and Nedelec, Lucien, 4,232,031, Cl. 424-263.000.

Nedstedt, Gert: *See*—
Palm, Lars-Erik; Nedstedt, Gert; and Nilen, Bengt, 4,232,048, Cl. 426-115.000.

Needham, Riley B.; Thomas, Charles P.; and Wier, Donald R., to Phillips Petroleum Company. Well treatment method. 4,231,428, Cl. 166-280.000.

Neefe, Charles W., to Neefe Optical Laboratory. Polymethylmethacrylate cellulosic copolymer lens material. 4,231,905, Cl. 260-17.00A.

Neefe Optical Laboratory: *See*—
Neefe, Charles W., 4,231,905, Cl. 260-17.00A.

Neidig, Arno; Popp, Gerhard; and Gilbers, Gabriele, to BBC Brown, Boveri & Company, Limited. Chemically sensitive field effect transistor having electrode connections. 4,232,326, Cl. 357-23.000.

Neier, Wilhelm: *See*—
Brandes, Gunter; Wollner, Johannes; Neier, Wilhelm; and Webers, Werner, 4,231,966, Cl. 568-396.000.

Neilsen, Hildaur L., to Rolodex Corporation, The. Locking rotary file. 4,231,624, Cl. 312-186.000.

Neilson, Jay C., to Kockum Industries, Inc. Conveyor with laterally adjustable flights. 4,231,464, Cl. 198-456.000.

Nelimarkka, Juha A. E. High pressure ball valve with tipping action. 4,231,545, Cl. 251-161.000.

Nemirovsky, Isaak Y.: *See*—
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Nemoto, Akira: *See*—
Satoh, Eiji; Kohama, Masayuki; Yokoya, Kunihiko; Yamada, Kenji; and Nemoto, Akira, 4,231,673, Cl. 403-125.000.

Netravali, Arun N.; and Robbins, John D., to Bell Telephone Laboratories, Incorporated. Method and apparatus for video signal encoding with motion compensation. 4,232,338, Cl. 358-136.000.

Neuhaus-Schwermann, Albert: *See*—
Linneborn, Hans, 4,231,302, Cl. 110-229.000.

New Concepts, Inc.: *See*—
Still, Robert C.; Huppenthal, Frank J.; Smith, Barbara J.; and Scotney, Gerald H., 4,231,389, Cl. 137-315.000.

Newman, Fred C., to Continental Group, Inc., The. Carrier assembly for multi-pack containers. 4,231,605, Cl. 294-87.200.

Newport, Harry E., Jr.; and Baysinger, Robert L., to Emerson Electric Co. Gas burner control system. 4,231,732, Cl. 431-46.000.

Newton, David W., to Valleylab, Inc. Safety monitoring circuit for electrosurgical unit. 4,231,372, Cl. 128-303.140.

NGK Insulators, Ltd.: *See*—
Higuchi, Noboru; Ogasawara, Takayuki; and Seike, Shoji, 4,232,185, Cl. 174-140.00C.

Niagara Bottle Washer Manufacturing Co.: *See*—
Vamvakas, Michael, 4,231,463, Cl. 198-446.000.

Nichols, Webb. Light frame for drafting table. 4,232,358, Cl. 362-97.000.

Nickell, Louis G.: *See*—
Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., 4,231,788, Cl. 71-113.000.

Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, to Karl M. Reich Maschinenfabrik GmbH, Firma. Method for melting and applying a fusion adhesive. 4,232,064, Cl. 427-208.400.

Nicol, Edward A.: *See*—
Juziuk, Jurgen A.; Mack, Ronald H.; Banka, Eugene F.; and Nicol, Edward A., 4,232,217, Cl. 235-480.000.

Nikolov, Ivan D.; Chorbov, Iliya G.; and Peychev, Ivan M., to NPO "Technologia Na Metalite". Apparatus for casting metals and other materials under pressure. 4,231,416, Cl. 164-318.000.

Nilen, Bengt: *See*—
Palm, Lars-Erik; Nedstedt, Gert; and Nilen, Bengt, 4,232,048, Cl. 426-115.000.

Nippel, Frank, to Deutsche Nemectron GmbH. Instrument panel teaching aid. 4,231,168, Cl. 35-39.000.

Nippon Electric Co., Ltd.: *See*—
Nomoto, Koh, 4,232,301, Cl. 340-789.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ando, Shigeo; and Kondou, Takayasu, 4,231,276, Cl. 84-1.190.
Fujishima, Masakazu, 4,232,394, Cl. 455-158.000.
Kumaoka, Michiaki; and Aosima, Sinzi, 4,232,393, Cl. 455-154.000.
Muramatsu, Shigeru, 4,231,310, Cl. 114-144.0RE.
Wachi, Masatada, 4,231,277, Cl. 84-1.190.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Marui, Toshio; and Masuda, Masuo, 4,231,829, Cl. 156-230.000.

Nippon Keori Kabushiki Kaisha: *See*—
Noritake, Hiroshi, 4,232,082, Cl. 428-225.000.

Nippon Kogaku K.K.: *See*—
Iida, Yozo, 4,231,646, Cl. 354-195.000.
Kimura, Makoto; and Iizuka, Yutaka, 4,231,649, Cl. 354-224.000.
Tsuruoka, Tomio, 4,231,651, Cl. 354-288.000.

Nippon Mining Co., Ltd.: *See*—
Kawasumi, Yoshio; and Sato, Haruki, 4,231,848, Cl. 204-20.000.

Nippon Oil Co., Ltd.: *See*—
Kato, Osamu; Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; and Takashima, Hiroaki, 4,231,857, Cl. 208-40.000.

Nippon Soken, Inc.: *See*—
Sakakibara, Yasuyuki, 4,232,303, Cl. 340-366.00R.
Yoshino, Yasuhisa; Kuno, Akira; and Shinoda, Yoshio, 4,231,257, Cl. 73-432.0CR.

Nippon Telegraph and Telephone Public Corporation: *See*—
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.
Yamamoto, Hideaki; Tsukada, Toshihisa; Maruyama, Eiichi; and Inagaki, Hiroya, 4,232,219, Cl. 250-227.000.

Nishikawa, Kazuyoshi; Uno, Makoto; and Koga, Hideaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Lubricating device for power transmission unit. 4,231,266, Cl. 74-467.000.

Nishimiya, Torazo; Okumura, Masamitsu; Ito, Tomo; and Numakura, Seisaku, to Hitachi, Ltd. Exhaust gas recirculation control system for internal combustion engine. 4,231,340, Cl. 123-568.000.

Nishioka, Yoshiki: *See*—
Yasuda, Syoichi; and Nishioka, Yoshiki, 4,232,290, Cl. 340-146.3QZ.

Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha Ltd.

Herbicidal compound, herbicidal composition containing the same, and method of use thereof. 4,231,787, Cl. 71-107.000.

Nissan Motor Company, Limited: *See—*
Kato, Hironobu, 4,231,850, Cl. 204-181.00C.
Kato, Tadanari; Ikemi, Tadashi; and Sagawa, Takatoshi, 4,231,900, Cl. 252-466.0PT.
Nakayama, Masafumi, 4,231,972, Cl. 261-44.00D.
Sugasawa, Fukashi; and Iizuka, Haruhiko, 4,231,338, Cl. 123-568.000.
Suzuki, Suzuo; Nagaishi, Hastuo; and Masaki, Kenji, 4,231,331, Cl. 123-416.000.

Nissan Shatai Kabushiki Kaisha: *See—*
Fujita, Masao; and Kitaori, Kiyoshi, 4,231,240, Cl. 70-173.000.

Nitto Kogyo K.K.: *See—*
Kubota, Shigeru; Kano, Seiji; and Kubo, Masahiro, 4,231,152, Cl. 29-621.000.

NL Industries, Inc.: *See—*
Brauer, Melvin; and Kroplinski, Thaddeus F., 4,231,986, Cl. 264-272.000.

Nobue, Michio: *See—*
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,231,961, Cl. 564-65.000.

Nogrady, Stephen G., to Welsh National School of Medicine, The. Procedures and pharmaceutical products for use in the administration of antihistamines. 4,232,002, Cl. 424-45.000.

Nohara, Akira: *See—*
Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, 4,232,071, Cl. 428-64.000.

Noll, Robert W.: *See—*
Vance, Robert L.; and Noll, Robert W., 4,231,513, Cl. 236-49.000.

Nomoto, Koh, to Nippon Electric Co., Ltd. Apparatus for automatically selectively displaying information of a plurality of kinds. 4,232,301, Cl. 340-789.000.

Nonomura, Keisaku: *See—*
Funada, Fumiaki; Nonomura, Keisaku; Uede, Hisashi; and Wada, Tomio, 4,231,640, Cl. 350-336.000.

Nordiska Ackumulatorfabriker Noack AB: *See—*
Magnusson, Ulf S. G.; and Uhrbom, Lars E., 4,232,100, Cl. 429-217.000.

Noritake, Hiroshi, to Nippon Keori Kabushiki Kaisha. Anti-electrostatically guarded worsted suiting. 4,232,082, Cl. 428-225.000.

Norman, Lewis R.: *See—*
Elphingstone, Eugene A.; and Norman, Lewis R., 4,231,882, Cl. 252-8.55C.

Norris Industries, Inc.: *See—*
Beisch, Hans R.; and Hempelmann, Heinrich J., 4,231,619, Cl. 301-37.00P.

North Shore Precision Research Corporation: *See—*
Davidson, William W., Jr., 4,231,291, Cl. 101-137.000.

Northern Telecom Limited: *See—*
Baraff, David R.; and Hobbs, Lawrence H., 4,232,212, Cl. 219-216.000.
Harris, Harold H., 4,232,293, Cl. 340-147.00R.
Lenaerts, George V., 4,232,203, Cl. 179-103.000.

Northrop Corporation: *See—*
Rennick, Lyle V.; and Macias, Julian W., 4,232,381, Cl. 367-135.000.

Norton Company: *See—*
Kiovsky, Joseph R.; and Goyette, William J., 4,232,181, Cl. 585-739.000.

Norwood Marking & Equipment Co.: *See—*
Shenoha, James L., 4,231,290, Cl. 101-93.110.

Nose, Takashi: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Morita, Tominori; Nose, Takashi; and Okazaki, Mitsuo, 4,232,010, Cl. 424-200.000.

Nowak, Eugene F. Folding garage screen door. 4,231,412, Cl. 160-213.000.

NPO "Technologia Na Metalite": *See—*
Nikolov, Ivan D.; Chorbov, Iliya G.; and Peychev, Ivan M., 4,231,416, Cl. 164-318.000.

NSK-Warner K.K.: *See—*
Magane, Shigeo; and Yamamoto, Kazuo, 4,231,590, Cl. 280-803.000.

Numakura, Seisaku: *See—*
Nishimiya, Torazo; Okumura, Masamitsu; Ito, Tomo; and Numakura, Seisaku, 4,231,340, Cl. 123-568.000.

N.V. Optische Industrie "De Oude Delft": *See—*
Deltrap, Johan H. M., 4,232,222, Cl. 250-333.000.

Oatey Co.: *See—*
Rios, Paul W., 4,231,492, Cl. 222-1.000.

Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Incorporated. Process for the production of N-(hydroxyphenyl) maleimides. 4,231,934, Cl. 260-326.5FM.

Obergfell, James J. Shovel having fulcrum device. 4,231,604, Cl. 294-59.000.

Obrecht, Robert P., to Stauffer Chemical Company. Phosgene manufacture. 4,231,959, Cl. 260-544.00K.

Occidental Research Corporation: *See—*
Di Giacomo, Peter M.; and Dines, Martin B., 4,232,146, Cl. 528-395.000.

Ocean Technology, Inc.: *See—*
Adams, Robert H., 4,232,194, Cl. 179-1.50R.

Ochi, Matsuo; and Miyoshi, Keisuke, to Matsushita Electric Industrial Co., Ltd. Projection tube with X-ray shielding means on target. 4,232,247, Cl. 313-474.000.

O'Connell, Robert M., to United States of America, Air Force. High piezoelectric coupling X-cuts of lead potassium niobate, $Pb_2KNb_5O_{15}$, for surface acoustic wave applications. 4,232,240, Cl. 310-313.00A.

Oda, Fujio: *See—*
Taguchi, Nobuyoshi; Matsuo, Koji; Takahashi, Hiromu; and Oda, Fujio, 4,232,213, Cl. 219-216.000.

O'Dell, C. Allen: *See—*
Shealy, Y. Fulmer; and O'Dell, C. Allen, 4,232,154, Cl. 544-250.000.

Odenthal, Charles: *See—*
Young, Joe W.; and Odenthal, Charles, 4,231,973, Cl. 261-78.00A.

Oestreich, Ulrich: *See—*
Zeidler, Guenter; and Oestreich, Ulrich, 4,231,635, Cl. 350-96.230.

Oettel, Michael: *See—*
Ponsold, Kurt; Prousa, Richard; Oettel, Michael; Strecke, Joachim; and Hoffmann, Herbert, 4,231,946, Cl. 260-397.400.

Officina Meccanica Pisani Luigi: *See—*
Pisani, Luigi, 4,231,142, Cl. 29-2.160.

Ogasawara, Takayuki: *See—*
Higuchi, Noboru; Ogasawara, Takayuki; and Seike, Shoji, 4,232,185, Cl. 174-140.00C.

Ogawa, Shinji: *See—*
Hatsuno, Hiroshi; Fukazawa, Jinpei; Fukushima, Mitsuo; and Ogawa, Shinji, 4,231,251, Cl. 73-119.00A.

Ogren, Sven O.: *See—*
Florvall, Gosta L.; and Ogren, Sven O., 4,232,037, Cl. 424-274.000.

Ohashi, Tadahiro: *See—*
Fukushima, Shigeki; and Ohashi, Tadahiro, 4,232,369, Cl. 364-476.000.

Ohbori, Koichi: *See—*
Takeuchi, Yo; Ohbori, Koichi; Hatsushika, Masabumi; and Komori, Shinichi, 4,231,817, Cl. 148-32.500.

Ohhinata, Ichiro: *See—*
Okuhara, Shinzi; Ohhinata, Ichiro; and Tokunaga, Michio, 4,232,234, Cl. 307-252.00G.

Ohio Nuclear, Inc.: *See—*
Jagatich, Carl T., 4,232,302, Cl. 340-347.0AD.

Ohkoshi, Akio: *See—*
Toyama, Akira; Ohkoshi, Akio; Toyama, Takashi; Yukawa, Takahiro; and Hosono, Takashi, 4,232,332, Cl. 358-67.000.

Ohlenforst, Hans: *See—*
Orain, Roger; Heuser, Hans; Ohlenforst, Hans; and Pelzer, Rudolf, 4,232,080, Cl. 428-215.000.

Ohm, Edward A., to Bell Telephone Laboratories, Incorporated. Multiple beam satellite antenna with preferred polarization distribution. 4,232,321, Cl. 343-778.000.

Ohnhaus, Buff; and Faith, James D. Air-flow capture and control device for flow measurement. 4,231,253, Cl. 73-861.620.

Ohnishi, Toshikazu; Ishida, Kozo; and Saitoh, Osamu, to Horiba, Ltd. Gas analyzer. 4,232,223, Cl. 250-343.000.

Ohshima, Iwao: *See—*
Menju, Shinichi; Ohshima, Iwao; and Takahashi, Shigeru, 4,232,352, Cl. 361-120.000.

Ohta, Teruo, to Sony Corporation. Tape cassette. 4,232,350, Cl. 360-132.000.

Ohuchida, Shuichi: *See—*
Hayashi, Masaki; Arai, Yoshinobu; Ohuchida, Shuichi; and Hashimoto, Shinsuke, 4,232,009, Cl. 424-180.000.

Ohumi, Takeharu; and Tsunekawa, Masaru, to Aisin Seiki Kabushiki Kaisha. Fuel pressure regulating valve. 4,231,347, Cl. 123-512.000.

Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, to Tokyo Shibaura Electric Co., Ltd. Output power control system for microwave ovens. 4,232,210, Cl. 219-10.55C.

Oiles Industries Co., Ltd.: *See—*
Satoh, Eiji; Kohama, Masayuki; Yokoya, Kunihiko; Yamada, Kenji; and Nemoto, Akira, 4,231,673, Cl. 403-125.000.

Ojala, Pertti, to Valmet Oy. Recovery of thermal energy from a thermomechanical pulp plant. 4,231,842, Cl. 162-47.000.

Oji Paper Co., Ltd.: *See—*
Shinohara, Hideaki; Kato, Masaru; and Takamatsu, Yoshiaki, 4,232,105, Cl. 430-160.000.

Okahisa, Mitsugu: *See—*
Murakami, Kaoru; Okahisa, Mitsugu; Arita, Tomohiko; and Kumano, Hiroshi, 4,231,889, Cl. 252-182.100.

Okamoto, Miyoshi, to Toray Industries, Inc. Fibrous sheet materials resembling a deer skin and process for preparing same. 4,232,073, Cl. 428-91.000.

Okano, Yoshihiro: *See—*
Kaieda, Nobuo; and Okano, Yoshihiro, 4,232,259, Cl. 318-615.000.

Okauchi, Ken; Koitabashi, Takeo; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 4,232,118, Cl. 430-574.000.

Okazaki, Gosei, to Shibuya Kogyo Kabushikigaisha. Box packing machine. 4,231,213, Cl. 53-497.000.

Okazaki, Mitsuo: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Morita, Tominori; Nose, Takashi; and Okazaki, Mitsuo, 4,232,010, Cl. 424-200.000.

Okii, Mitsuyoshi; Onitake, Tatsuya; Kawai, Masanobu; Takematsu, Tetsuo; and Konnai, Makato. Method for protecting crops from suffering damages. 4,231,789, Cl. 71-121.000.

Okino, Seiki; Nakata, Kunio; Yanai, Tosiharu; and Kandachi, Takayoshi, to Central Glass Company, Limited. Method of coating glass

surface with heat-reflective titanium oxide film. 4,232,062, Cl. 427-160.000.

Okita, Taka-Aki: *See—*
Naito, Takayuki; Nakagawa, Susumu; Yamasaki, Tetsuro; Okita, Taka-Aki; and Yamashita, Haruhiro, 4,232,155, Cl. 544-277.000.

Okuhara, Shinzi; Ohhinata, Ichiro; and Tokunaga, Michio, to Hitachi, Ltd. Semiconductor switch circuit. 4,232,234, Cl. 307-252.00G.

Okumura, Jun: *See—*
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 4,231,928, Cl. 260-239.100.

Okumura, Masamitsu: *See—*
Nishimiya, Torazo; Okumura, Masamitsu; Ito, Tomo; and Numakura, Seisaku, 4,231,340, Cl. 123-568.000.

Okuyama, Hidetoshi: *See—*
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,232,159, Cl. 546-112.000.

Olander, Karl E., to Alfa-Laval AB. Milking machine claw. 4,231,323, Cl. 119-14.080.

Oldengott, Hans: *See—*
Mathiak, Hans; and Oldengott, Hans, 4,231,846, Cl. 202-248.000.

Olin Corporation: *See—*
Cline, Warren K.; and Martin, Richard H., 4,231,377, Cl. 131-9.000.

Olofson, Peter M.: *See—*
Smith, George H.; and Olofson, Peter M., 4,231,951, Cl. 260-446.000.

Olson, Richard O.: *See—*
Pohto, Gerald R.; and Olson, Richard O., 4,231,143, Cl. 29-281.500.

Olympia Werke AG: *See—*
Behrendt, Wolfgang; Bohnhage, Detlef; Friedemann, Peter; Frolich, Bernhard; and Orzessek, Reinhold, 4,231,667, Cl. 400-208.000.

Olympus Optical Co., Ltd.: *See—*
Kobayashi, Minoru, 4,232,349, Cl. 360-105.000.
Osanai, Akira, 4,231,268, Cl. 74-572.000.
Satoh, Ken; and Yanagida, Tuneo, 4,232,348, Cl. 360-74.100.
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,231,403, Cl. 141-284.000.
Tsunefuji, Katsuhiko; and Kondo, Isao, 4,231,644, Cl. 354-51.000.

OMV Aktiengesellschaft: *See—*
Schmidt, Alfred, 4,231,960, Cl. 564-73.000.

Onishi, Nobuo. Cutter for thin boards. 4,231,275, Cl. 83-862.000.

Onishi, Sigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha, a part interest. Engine drive type generator blower. 4,231,717, Cl. 417-364.000.

Onishi, Toshinari: *See—*
Kuramoto, Akio; and Onishi, Toshinari, 4,231,341, Cl. 123-552.000.

Onitake, Tatsuya: *See—*
Okii, Mitsuyoshi; Onitake, Tatsuya; Kawai, Masanobu; Takematsu, Tetsuo; and Konnai, Makato, 4,231,789, Cl. 71-121.000.

Ono, Hiromi: *See—*
Tachibana, Hisataro; and Ono, Hiromi, 4,231,315, Cl. 440-43.000.

ONO Pharmaceutical Co. Ltd.: *See—*
Hayashi, Masaki; Arai, Yoshinobu; Ohuchida, Shuichi; and Hashimoto, Shinsuke, 4,232,009, Cl. 424-180.000.

Onoda, Mamoru: *See—*
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenake, Yoshimichi; and Tsutaya, Tadao, 4,231,797, Cl. 75-256.000.

Oppenlander, Harry; and Wilde, Ulrich, to Thyssen Industrie AG. Shield type support for use in underground mining with lemniscate guide rods. 4,231,684, Cl. 405-291.000.

Orain, Roger; Heuser, Hans; Ohlenforst, Hans; and Pelzer, Rudolf, to Saint-Gobain Industries. Safety window comprising self-healing polymeric layer. 4,232,080, Cl. 428-215.000.

Orr, Thomas S. C.; Hall, David E.; and Mann, John, to Fisons Limited. Composition. 4,232,012, Cl. 424-232.000.

Ort, Morris R., to Cities Service Company. Process for polymerizing olefins. 4,232,140, Cl. 526-129.000.

Ortho Pharmaceutical Corporation: *See—*
Goldstein, Gideon, 4,232,008, Cl. 424-177.000.

Ortner, Herbert; Bahr, Theodor; and Musselmann, Walter, to J. M. Voith GmbH. Process and apparatus for treating waste paper. 4,231,526, Cl. 241-28.000.

Orzessek, Reinhold: *See—*
Behrendt, Wolfgang; Bohnhage, Detlef; Friedemann, Peter; Frolich, Bernhard; and Orzessek, Reinhold, 4,231,667, Cl. 400-208.000.

Osanai, Akira, to Olympus Optical Co., Ltd. Flywheel for small size tape recorder. 4,231,268, Cl. 74-572.000.

Osawa, Masayuki; and Sekine, Masaoki, to TDK Electronics Company Limited. Method of stripping a molded article. 4,231,987, Cl. 264-328.100.

Osbaldeston, Bernard: *See—*
Kutt, Mers; and Osbaldeston, Bernard, 4,231,575, Cl. 273-73.00D.

Osugi, Minoru: *See—*
Yoneoka, Mikio; Osugi, Minoru; and Ikarashi, Takeo, 4,232,171, Cl. 560-239.000.

Osumi, Masato: *See—*
Kanatani, Heiichi; Osumi, Masato; and Hayama, Hajime, 4,231,353, Cl. 126-443.000.

Otsuka, Nobuyuki; and Hirai, Seiichi, to Honda Giken Kogyo Kabushiki Kaisha. Constant velocity universal joint. 4,231,232, Cl. 64-21.000.

Outboard Marine Corporation: *See—*
Bland, Gerald F.; and Payne, Guy D., 4,231,316, Cl. 440-86.000.

Owens-Corning Fiberglas Corporation: *See—*
Carter, Neil A., 4,231,825, Cl. 156-78.000.
Erickson, Thomas D., 4,231,773, Cl. 65-1.000.

Owens-Illinois, Inc.: *See—*
Berg, Charles A., 4,231,772, Cl. 62-2.000.
Graham, Paul W. L.; and Moore, Thomas W., Jr., 4,231,778, Cl. 65-117.000.
Santiago, Edgardo, 4,231,911, Cl. 260-29.6NR.

Oyama, Hirosi: *See—*
Nakagawa, Eishiro; Miyamoto, Taketoshi; Umino, Naozi; and Oyama, Hirosi, 4,231,146, Cl. 29-432.000.

Ozeki, Takeshi: *See—*
Hara, Elmer H.; and Ozeki, Takeshi, 4,232,385, Cl. 370-3.000.

Padgett, Clarence W.: *See—*
Marmet, Melvin L.; and Padgett, Clarence W., 4,232,270, Cl. 330-253.000.

Paegle, Ruta A.; Lidaka, Marger J.; Zhuk, Regina A.; Maurinsh, Juris A.; Zidermane, Aina A.; and Kilevitsa, Marite K. 1-(5-Fluoruracil-1)-2,5-di-O-acetyl-β-D-glucofuranurono-6,3-lactone. 4,232,149, Cl. 536-23.000.

Pagana, Enrico: *See—*
De Padova, Salvatore; Pagana, Enrico; and Rosenga, Giorgio, 4,232,322, Cl. 343-781.00P.

Pai, Damodar M.: *See—*
Limburg, William W.; and Pai, Damodar M., 4,232,103, Cl. 430-59.000.

Painter, Mark C., to Boeing Company, The. Combined shoulder harness and lap belt restraint apparatus having single fasten/release point at lap buckle. 4,231,616, Cl. 297-481.000.

Pall Corporation: *See—*
Seibert, Chesterfield F.; and Miller, John D., 4,231,768, Cl. 55-179.000.

Palladino, Gaetano; and Micciarelli, Mario, to Lark S.p.A. 16,17-Pyrazolino- and 16,17-isopyrazolino-1,4-pregnadiene derivatives. 4,232,013, Cl. 424-241.000.

Palm, Lars-Erik; Nedstedt, Gert; and Nilen, Bengt, to AB Zirristor. Package containing pressured liquid. 4,232,048, Cl. 426-115.000.

Palma, James D., to General Motors Corporation. Electromagnetic fuel injector with selectively hardened armature. 4,231,525, Cl. 239-585.000.

Pantukh, Boris I.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; and Lesteva, Tatyana M., 4,232,182, Cl. 585-820.000.

Pape, Dieter; and Woerz, Hans, to Heinz Kaiser AG. Dual cutter boring head. 4,231,691, Cl. 408-185.000.

Papp, Alfred; and Harms, Hauke, to Siemens Aktiengesellschaft. Arrangement for the magneto-optical measurement of currents. 4,232,264, Cl. 324-96.000.

Paradis, Stephen G.; Marquis, David M.; and Bakshi, Kiran R., to Chevron Research Company. Maleic anhydride production. 4,231,943, Cl. 260-346.750.

Pardee, Robert P., to Ball Corporation. Protective compositions for recording. 4,232,072, Cl. 428-65.000.

Park, Dong-Sil; Chatterji, Debajyoti; and Breiter, Manfred W., to Electric Power Research Institute, Inc. Sodium-sulfur cell component protected by a high chromium alloy and method for forming. 4,232,098, Cl. 429-104.000.

Park, John K.: *See—*
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,231,254, Cl. 73-362.0AR.

Parker-Hannifin Corporation: *See—*
Scannell, John B., 4,231,579, Cl. 277-205.000.

Parkes, Ralph C., to National Drying Machinery Company. Conveyor system. 4,231,470, Cl. 198-797.000.

Parkhomchuk, Alexei T.: *See—*
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Parks, Donald M. Modular, waste collecting and draining floor apparatus. 4,231,325, Cl. 119-28.000.

Parsons Manufacturing, Incorporated: *See—*
Hannie, Steven G.; and Tucker, Terry D., 4,231,861, Cl. 209-240.000.

Partus, Fred P.: *See—*
Lynch, Brian; and Partus, Fred P., 4,231,777, Cl. 65-109.000.

Pasto, Arvid E.: *See—*
Clark, Grady W.; Holder, John D.; and Pasto, Arvid E., 4,231,796, Cl. 75-206.000.

Patel, Mahesh G.: *See—*
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,232,006, Cl. 424-177.000.

Paugstat, John F.; and Girard, Donald J., to NCR Corporation. Data compression system and apparatus. 4,232,375, Cl. 364-900.000.

Paul, Howard C.: *See—*
Hallberg, Irving H.; Paul, Howard C.; Ralston, Ronald R.; and Hunninghaus, Roy E., 4,231,335, Cl. 123-440.000.

Paul, Jeffrey A.: *See—*
Chang, Yu-Wen; and Paul, Jeffrey A., 4,232,401, Cl. 455-328.000.

Pauliukonis, Richard S. Momentary contact reversing diverter. 4,231,399, Cl. 137-625.400.

Paullin, Grover G. Tapered bearing kit for intermediate gear. 4,231,622, Cl. 308-22.000.

Paulus, Philippe; and Hancart, Jules, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Surface treatment of metal strip. 4,231,812, Cl. 148-6.15R.

Paurat, Friedrich W. Tunnel-excavating machine. 4,231,618, Cl. 299-31.000.

Pawson, Beverly A.: *See*—
Chan, Ka-Kong; and Pawson, Beverly A., 4,231,944, Cl. 260-347.400.

Payne, Guy D.: *See*—
Bland, Gerald F.; and Payne, Guy D., 4,231,316, Cl. 440-86.000.

Pearson, Robert M.; and Weninger, A. Edwin, to Pearson, Robert M. Anesthesia ventilation system. 4,231,562, Cl. 128-205.150.

Peck, Norman J.; Rowland, Thomas J.; and Ashes, John R., to Commonwealth Scientific and Industrial Research Organization. Impact decorticator. 4,231,529, Cl. 241-189.00R.

Peck, Theodore H., to Bausch & Lomb Incorporated. Microscope objective. 4,231,638, Cl. 350-255.000.

Pedersen, Einar, to Pedersen, Einar. Apparatus for welding of stiffeners or the like on a plate. 4,232,209, Cl. 219-137.410.

Peil, William, to General Electric Company. Lighting network including a gas discharge lamp and standby lamp. 4,232,252, Cl. 315-92.000.

Pelcin, Albert L., to Eastern Company, The. Flush-type door lock. 4,231,597, Cl. 292-164.000.

Pelletier, Jean, to Coast Catamaran France S.A. Rudders for boats, particularly for pleasure boats. 4,231,309, Cl. 114-162.000.

Peltier, John W. Evaporative cooler and liquid-gas contact pad therefor. 4,231,975, Cl. 261-99.000.

Pelzer, Rudolf: *See*—
Orain, Roger; Heuser, Hans; Ohlenforst, Hans; and Pelzer, Rudolf, 4,232,080, Cl. 428-215.000.

Pennino, Charles J., to Koppers Company, Inc. Composition for use between polymeric tie plates and cross ties. 4,231,908, Cl. 260-28.5AS.

Pentel Kabushiki Kaisha: *See*—
Nakagawa, Eishiro; Miyamoto, Taketoshi; Umino, Naozi; and Oyama, Hirosi, 4,231,146, Cl. 29-432.000.

Perez, Jose L.; and Jimenez, Humberto A. Tape storage cabinet. 4,231,625, Cl. 312-245.000.

Perfecta Rolladen Karl & Co.: *See*—
Dillitzer, Manfred, 4,232,309, Cl. 340-547.000.

Perkins, Sonnie J. Golf club head alignment apparatus. 4,231,576, Cl. 273-183.00D.

Person, Abraham, to Global Marine, Inc. Flexible ocean upwelling pipe. 4,231,312, Cl. 114-264.000.

Person, Nelson H. Electrical connection system for panel structures. 4,232,183, Cl. 174-48.000.

Persons-Majestic Manufacturing Company: *See*—
Bird, Martin J., 4,231,611, Cl. 297-195.000.

Peter, Cornelius, to Robert Bosch GmbH. Method and apparatus for determining the proportions of the constituents of the air-fuel mixture supplied to an internal combustion engine. 4,231,334, Cl. 123-440.000.

Peter, Dietmar: *See*—
Braun, Walter; Burst, Hermann; and Peter, Dietmar, 4,231,600, Cl. 293-128.000.

Peters, Michael. Hydroplane boat. 4,231,314, Cl. 114-291.000.

Peterson, Larry W., to Shell Oil Company. Herbicide antidotes. 4,231,785, Cl. 71-93.000.

Petersson, Bengt A.: *See*—
Franzen, Olof K.; Hallstrom, Ulf; and Petersson, Bengt A., 4,232,096, Cl. 428-683.000.

Petroleo Brasileiro S.A.-Petrobras: *See*—
Valladares Barrocas, Helcio V; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, 4,232,179, Cl. 585-640.000.

Petterson, Robert C.; and Loubier, Roger C. Vapor stripping method. 4,231,804, Cl. 134-11.000.

Petterson, Robert C.; and Loubier, Roger C. Vapor stripping process. 4,231,805, Cl. 134-11.000.

Pettibone Corporation: *See*—
Lado, William J., 4,231,698, Cl. 414-624.000.

Peychev, Ivan M.: *See*—
Nikolov, Ivan D.; Chorbov, Iliya G.; and Peychev, Ivan M., 4,231,416, Cl. 164-318.000.

Pez, Guido P., to Allied Chemical Corporation. Lithium dicyclopentadienyl titanium hydride compositions. 4,231,948, Cl. 260-429.500.

Pez, Guido P.: *See*—
Grey, Roger A.; and Pez, Guido P., 4,232,170, Cl. 560-179.000.

Pfizer Inc.: *See*—
Crawford, Thomas C., 4,232,168, Cl. 560-174.000.
Johnson, Michael R., 4,232,018, Cl. 424-248.550.
Schaaf, Thomas K.; and Eggler, James F., 4,232,173, Cl. 562-430.000.

Pfleiderer, Ernst: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,232,123, Cl. 435-69.000.

Pflugbeil, Wolf-Dietrich: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Pflugbeil, Wolf-Dietrich; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,232,033, Cl. 424-269.000.

Pharmacia Diagnostics AB: *See*—
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; and Drevin, Hakan N. Y., 4,231,999, Cl. 424-1.000.
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Pheils, David R., Jr. Method and apparatus for solar heating a building. 4,231,351, Cl. 126-419.000.

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Phillippi, Conrad M. Device for calibrating the photometric linearity of optical instruments. 4,231,663, Cl. 356-432.000.

Phillips Petroleum Company: *See*—
Irvin, Howard B.; Lewis, Ronnie L.; and Moczygemba, George A., 4,232,137, Cl. 526-71.000.
Louthan, Rector P., 4,232,167, Cl. 560-154.000.
Needham, Riley B.; Thomas, Charles P.; and Wier, Donald R., 4,231,428, Cl. 166-280.000.
Stewart, William S., 4,231,753, Cl. 23-230.00A.

Physics International Company: *See*—
Smiley, Parker C., 4,231,287, Cl. 92-94.000.

Pierson, Roger P.; Mastalish, Lawrence V.; and Zollar, Daniel J., to Procter & Gamble Company, The. Bundle support for compact dispensing package. 4,231,491, Cl. 221-48.000.

Pifferi, Giorgio: *See*—
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,231,927, Cl. 260-239.100.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Tokorozawa, Sadao; Shimizu, Toyoji; and Yoshizawa, Naomi, 4,231,707, Cl. 417-12.000.

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Pioneer Electronic Corporation: *See*—
Yokogawa, Tomohisa, 4,232,395, Cl. 455-173.000.

Pirner, Miroslav; Zoller, Heinrich; and Bichsel, Heinz, to Swiss Aluminium Ltd. Filler metal in a welded assembly. 4,232,095, Cl. 428-654.000.

Pisani, Luigi, to Officina Meccanica Pisani Luigi. Stop motion for band cutting device. 4,231,142, Cl. 29-2.160.

Pitney Bowes Inc.: *See*—
Feinland, Seymour; and Kleinschmitt, David, 4,231,662, Cl. 356-373.000.

Pitts, Frank, to Engelhard Minerals & Chemicals Corporation. Preparation of rare earth nitrates. 4,231,997, Cl. 423-263.000.

Plan-Sell Oy: *See*—
Heikinheimo, Olli, 4,231,460, Cl. 198-341.000.

Plastovets, Ivan K.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

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Rosenberg, Harry; and Plevak, Lubomir, 4,231,685, Cl. 405-296.000.

Plueddemann, Edwin P., to Dow Corning Corporation. Primer composition. 4,231,910, Cl. 260-29.40R.

Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Muller-Calgan, Helmut; and Dolce, Giuliano, to Merck Patent Gesellschaft mit beschraenkter Haftung. 3-Fluorobenzodiazepines. 4,232,016, Cl. 414-244.000.

Pohle, Werner P.: *See*—
Aprea, George F.; and Pohle, Werner P., 4,231,524, Cl. 239-468.000.

Pohto, Gerald R.; and Olson, Richard O., to Diamond Shamrock Corporation. Electrode and apparatus for forming the same. 4,231,143, Cl. 29-281.500.

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Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,231,929, Cl. 260-243.300.
Davis, Carl W.; and Murray, Joseph E., Jr., 4,231,645, Cl. 354-145.000.
Idelson, Elbert M., 4,231,950, Cl. 260-438.50R.
Raphael, Thomas; and Shulman, Joseph, 4,232,079, Cl. 428-195.000.
Sullivan, Charles I., 4,232,099, Cl. 429-152.000.

Polenov, Alexei S.: *See*—
Adigamov, Engel R.; Gurvich, Yakov A.; Liakumovich, Alexandr G.; Logutov, Igor J.; Michurov, Jury I.; Polenov, Alexei S.; and Yanshevsky, Vladimir A., 4,232,176, Cl. 568-756.000.

Poletto, John F.: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,231,958, Cl. 260-507.00R.

Pollack, Hyman. Shelving system. 4,231,298, Cl. 108-64.000.

Pomper, Seymour; and Akerman, Emanuel, to Standard Brands Incorporated. Preparation of free-flowing particulate yeast. 4,232,045, Cl. 426-62.000.

Ponsford, Roger J., to Beecham Group Limited. Heterocyclic compounds. 4,232,022, Cl. 424-251.000.

Ponsold, Kurt; Prousa, Richard; Oettel, Michael; Strecke, Joachim; and Hoffmann, Herbert, to VEB Jenapharm. 14,15-Methylene derivatives of the estrane series and methods for preparing same. 4,231,946, Cl. 260-397.400.

Poole, Colin: *See*—
Grimshaw, Rex W.; and Poole, Colin, 4,232,091, Cl. 428-472.000.

Popov, Alexandr D.; and Solomin, Vladimir A. Asynchronous line-fed motor. 4,232,237, Cl. 310-13.000.

Popov, George D.; and Robinson, Howard W., to Verbatim Corporation. Tape cassette with improved tape guiding. 4,231,532, Cl. 242-199.000.

Popp, Gerhard: *See*—
Neidig, Arno; Popp, Gerhard; and Gilbers, Gabriele, 4,232,326, Cl. 357-23.000.

Poschel, Bruno P. H.; and Maxwell, Donald R., to Kefalas A/S. Antidepressant methods. 4,232,021, Cl. 424-250.000.

Possati, Mario, to Finike Italiana Marposs S.p.A. Electronic apparatus for checking the linear dimensions of mechanical workpieces. 4,231,158, Cl. 33-149.00J.

Posthuma, Albert E.; and Woodhouse, Robert C. Synthetic physiological mucus. 4,232,003, Cl. 424-81.000.

Potter, George M.: *See*—
Huiatt, Jerry L.; Shurtz, Melvin D.; and Potter, George M., 4,231,859, Cl. 209-11.000.

Potter, Robert T.: *See*—
Corris, Charles J.; Hollingsworth, Charles M.; Kosicki, Witold W.; and Potter, Robert T., 4,231,184, Cl. 46-265.000.

Power Parts, Inc.: *See*—
Phelon, Russell E.; and Hawken, Henry A., 4,232,284, Cl. 336-90.000.

PPG Industries Canada Ltd.: *See*—
Geesen, Donald H., 4,231,840, Cl. 159-47.00R.

PPG Industries, Inc.: *See*—
Carlin, William W., 4,231,813, Cl. 148-6.300.
Kenton, Hobart E.; and Decker, Forrest W., 4,232,218, Cl. 250-222.0PC.
Rahn, Henry W., 4,231,853, Cl. 204-243.00R.
Simon, Martin J., 4,232,090, Cl. 428-424.400.
Wilson, James F.; and Craig, James C., 4,231,827, Cl. 156-214.000.

Preobrazhensky, Boris P.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Price, Anthony G.: *See*—
Edwards, Roy E.; Price, Anthony G.; and Rees, John R., 4,231,224, Cl. 60-581.000.

Prickett, William H., to Gorski, Michael E. Controller for photographic enlarger or the like. 4,231,654, Cl. 355-38.000.

Prince, David G.: *See*—
Boatwright, John T.; Prince, David G.; Haskett, William F.; and Koch, Helmut, 4,232,199, Cl. 179-18.00B.

Prince, Paul R., to Hughes Aircraft Company. Low noise charge coupled device transversal filter. 4,232,279, Cl. 333-165.000.

Pringle, William L.; Hochstein, Peter A.; and Milton, Harold W., Jr. Thermal energy scavenger (rotating wire modules). 4,231,223, Cl. 60-527.000.

Probost, Miroslav, to Deep Steam Extraction (1974) Ltd. Wet vacuum machine. 4,231,133, Cl. 15-300.00A.

Probst, Heinz: *See*—
Gunther, Dieter; Erckel, Rudiger; Rosch, Gunter; and Probst, Heinz, 4,231,741, Cl. 8-571.000.

Process Evaluation & Development Corporation: *See*—
Villavicencio, Eduardo J., 4,231,136, Cl. 19-7.000.

Procter & Gamble Company, The: *See*—
Fawzi, Mahdi B., 4,232,000, Cl. 424-1.000.
Mroz, Judith C.; and Thomas, Dennis A., 4,231,370, Cl. 128-287.000.
Pierson, Roger P.; Mastalish, Lawrence V.; and Zollar, Daniel J., 4,231,491, Cl. 221-48.000.

Professional Mfg. Corp.: *See*—
Iudica, Robert T., 4,231,739, Cl. 433-126.000.

Proffitt, William G., to E-Systems, Inc. Process of defining film patterns on microelectronic substrates by air abrading. 4,232,059, Cl. 427-96.000.

Propst, Robert L.; and Wodka, Michael A., to Herman Miller, Inc. Under the wall energy supply system for a space divider system. 4,231,630, Cl. 339-22.00R.

Proudlock, George T.: *See*—
Falconer, John D.; Proudlock, George T.; and Monsen, Geoffrey, 4,231,484, Cl. 220-89.00A.

Prousa, Richard: *See*—
Ponsold, Kurt; Prousa, Richard; Oettel, Michael; Strecke, Joachim; and Hoffmann, Herbert, 4,231,946, Cl. 260-397.400.

Pullan, Ronald E., to Schlegel (U.K.) Limited. Edge protector trim strip. 4,232,081, Cl. 428-217.000.

Quanta Chemical Ltd.: *See*—
Reilly, Frank, 4,231,736, Cl. 433-6.000.

Quanta-Ray, Inc.: *See*—
Iwata, Akiyoshi, 4,232,276, Cl. 331-94.50D.

Questor Corporation: *See*—
Meeker, Paul K., 4,231,612, Cl. 297-250.000.

Quinan, James R., to Albany International Corp. Corrosion-resistant crucible with graphite parts. 4,231,498, Cl. 222-602.000.

Quinby, Thomas C., to United States of America, Energy. High-temperature, high-pressure bonding of nested tubular metallic components. 4,231,507, Cl. 228-131.000.

Quinn, Daniel P. Adjustable apron of vinyl laminate. 4,231,119, Cl. 2-48.000.

R/m GmbH: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,232,123, Cl. 435-69.000.

R. W. Hartnett Company: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,231,462, Cl. 198-380.000.

Rader Companies, Inc.: *See*—
Lund, Arvid, 4,231,495, Cl. 222-345.000.

Radler, Richard W., Jr.: *See*—
Horgan, Anthony M.; and Radler, Richard W., Jr., 4,232,102, Cl. 430-58.000.

Rae, Scott M. Exercising device. 4,231,569, Cl. 272-122.000.

Raffel, Jack I.; and Bernacki, Stephen E., to Massachusetts Institute of Technology. Dielectric isolation method using shallow oxide and polycrystalline silicon utilizing a preliminary etching step. 4,231,819, Cl. 148-175.000.

Rahdener Maschinenfabrik August Kolbus: *See*—
Rathert, Horst, 4,231,466, Cl. 198-479.000.

Rahn, Henry W., to PPG Industries, Inc. Cathodic current conducting elements for use in aluminum reduction cells. 4,231,853, Cl. 204-243.00R.

Raiteri, Angelo, to UNICEM-Unione Cementerie Marchino, Emiliane di Augusta S.p.A.; and Andrea Doria, part interest to each. Valve bag feeding method and machine for powder material packaging apparatus. 4,231,212, Cl. 53-459.000.

Ralston, Ronald R.: *See*—
Hallberg, Irving H.; Paul, Howard C.; Ralston, Ronald R.; and Hunninghaus, Roy E., 4,231,335, Cl. 123-440.000.

Ramey, Joseph F.; Seiler, George A.; and Thompson, Dorman N., Jr., to Minnesota Mining and Manufacturing Company. Notepaper dispenser and tape tabber. 4,231,837, Cl. 156-522.000.

Randhawa, Jagir S., to United States of America, Army. Chemiluminescent method and apparatus for the detection of ozone. 4,232,225, Cl. 250-361.00C.

Randin, Jean-Paul, to Ebauches S.A. Electro-optic device. 4,231,641, Cl. 350-357.000.

Raphael, Thomas; and Shulman, Joseph, to Polaroid Corporation. Novel I.D. cards. 4,232,079, Cl. 428-195.000.

Rasberger, Michael: *See*—
Rody, Jean; and Rasberger, Michael, 4,232,131, Cl. 525-184.000.

Rash, Douglas L., to Viggo AB. Infusion catheter assembly. 4,231,367, Cl. 128-214.400.

Rath, Heinz-Jorg: *See*—
Herzer, Heinz; Rath, Heinz-Jorg; and Schmidt, Dietrich, 4,231,755, Cl. 23-293.00R.

Rathert, Horst, to Rahdener Maschinenfabrik August Kolbus. Book block transport system. 4,231,466, Cl. 198-479.000.

Ray, Asit K.; and Reisman, Arnold, to International Business Machines Corporation. Semiconductor plasma oxidation. 4,232,057, Cl. 427-39.000.

Ray, Leonard N., Jr.: *See*—
Buckwalter, Mervin R.; Bulson, Walter T.; and Ray, Leonard N., Jr., 4,231,743, Cl. 8-471.000.

Raymond Engineering Inc.: *See*—
Bickford, John H.; and Snyder, Robert F., 4,231,454, Cl. 192-4.00R.

Razdan, Raj K.; and Ghosh, Anil C., to Sisa, Incorporated. 17-Cyclobutylmethyl-4,5α-epoxy-3-hydroxy-14-methoxy-8α-methylmorphinan-6-one, and method of treating pain with it. 4,232,028, Cl. 424-260.000.

RCA Corporation: *See*—
Bedford, Alda V., 4,232,186, Cl. 178-22.000.
Dion, Donald F.; and Wojcik, David R., 4,232,376, Cl. 365-222.000.
Fuhrer, Jack S., 4,232,340, Cl. 358-167.000.
Haferl, Peter E., 4,232,254, Cl. 315-408.000.
Henry, William N., 4,231,820, Cl. 148-187.000.
Hinn, Werner, 4,232,268, Cl. 329-103.000.
Hsu, Sheng T., 4,232,327, Cl. 357-23.000.
Leidich, Arthur J., 4,232,273, Cl. 330-298.000.
McCue, Bernard B., 4,232,248, Cl. 313-479.000.
Savoye, Eugene D.; Edwards, Thomas W.; and Wallace, Lloyd F., 4,232,245, Cl. 313-367.000.
Werst, Joseph L., 4,232,283, Cl. 335-212.000.

Re, Luciano; Brandt, Alberto; and Bassignani, Luciano, to Snamprogetti S.p.A. Process for preparing alpha-oxo-esters. 4,232,169, Cl. 560-174.000.

Reagan, William J.: *See*—
Chen, Nai Y.; Miale, Joseph N.; and Reagan, William J., 4,231,899, Cl. 252-455.00Z.

Reed, Kenneth R. B., to Lucas Industries Limited. Road vehicle electrical systems. 4,232,231, Cl. 307-10.00R.

Reed, Kim W.: *See*—
Gould, Larrie A.; and Reed, Kim W., 4,232,398, Cl. 455-226.000.

Rees, John R.: *See*—
Edwards, Roy E.; Price, Anthony G.; and Rees, John R., 4,231,224, Cl. 60-581.000.

Regents for Education of the State of Rhode Island: *See*—
Jackson, Leland B.; and Jaron, Dov, 4,232,373, Cl. 364-572.000.

Regie Nationale des Usines Renault: *See*—
Allibert, Jean-Pierre, 4,231,392, Cl. 137-454.200.

Reich, Frederich R.; and Schwankoff, Albert R., to United States of America, Energy. Method of lightening radiation darkened optical elements. 4,232,228, Cl. 250-492.00R.

Reilly, Frank, to Quanta Chemical Ltd. Orthodontic screw-type device and method of making same. 4,231,736, Cl. 433-6.000.

Reinehr, Dieter; and Gsell, Laurenz, to Ciba-Geigy Corporation. 3-Phenoxybenzylideneamines and 3-benzylbenzylideneamines. 4,231,962, Cl. 564-272.000.

Reineke, Charles E.: *See*—
Burk, George A.; Reineke, Charles E.; and Wilson, Charles A., 4,232,041, Cl. 424-304.000.

Reinhardt, Friedrich: *See*—
Feess, Erich; and Reinhardt, Friedrich, 4,231,745, Cl. 8-552.000.

Reinwall, Ernest W., Jr., to Illinois Tool Works Inc. Adjustable spacer-cam assembly. 4,231,281, Cl. 85-50.0AT.

Reis, Robert V. Safetied exercising board apparatus, and method of safetying exercising board apparatus. 4,231,570, Cl. 272-123.000.

Reisman, Arnold: *See—*
Ray, Asit K.; and Reisman, Arnold, 4,232,057, Cl. 427-39.000.

Relly, Robert H.: *See—*
Hoh, Thomas L.; and Relly, Robert H., 4,232,068, Cl. 428-43.000.

Remia B.V.: *See—*
te Riele, Johannes H., 4,231,397, Cl. 137-614.110.

Remy, Ernst; Meyer, Andreas; and Rieske, Ellen. Microscope slide with electrode arrangement for cell study, and method for its construction. 4,231,660, Cl. 356-244.000.

Rennick, Lyle V.; and Macias, Julian W., to Northrop Corporation. Noise cancellation using tracking filter. 4,232,381, Cl. 367-135.000.

Replin, Henry. Tire structure. 4,231,408, Cl. 152-353.00R.

Republic Steel Corporation: *See—*
Adelsperger, Frederic J., 4,231,792, Cl. 75-53.000.

Research Corporation: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,231,979, Cl. 264-81.000.

Retrum, Rowland. Method and apparatus for hydrolyzing keratinaceous material. 4,231,926, Cl. 260-123.700.

Revlon, Inc.: *See—*
Dyson, Evelyna C., 4,232,334, Cl. 358-93.000.

Rheinische Braunkohlwerke AG: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, 4,231,644, Cl. 201-34.000.

Rhoads, Stanley C.: *See—*
Moser, Kenneth W.; Siemens, Richard E.; and Rhoads, Stanley C., 4,231,866, Cl. 210-660.000.

Rhodes, Cyril E.; and Verburgh, Martin B., to SKF Industrial Trading and Development Company B.V. Sprayed coatings on metal surfaces. 4,232,094, Cl. 428-614.000.

Rhodes, John M.: *See—*
Luke, Roger D.; and Rhodes, John M., 4,231,633, Cl. 339-242.000.

Rhone-Poulenc-Textile: *See—*
Kyritsos, Joseph; and Sacco, Jean, 4,231,913, Cl. 260-30.80R.

Ribeyre, Rene, to Thomson-Brandt. Microphone mount. 4,232,205, Cl. 179-146.00R.

Richards, Mark A., to Tektronix, Inc. No-flash erase of direct viewing bistable storage CRT. 4,232,250, Cl. 315-13.0ST.

Richardson Chemical Company: *See—*
Mallory, Glenn O., Jr., 4,232,060, Cl. 427-98.000.

Ricoh Company, Ltd.: *See—*
Hatsuno, Hiroshi; Fukazawa, Jinpei; Fukushima, Mitsuo; and Ogawa, Shinji, 4,231,251, Cl. 73-119.00A.
Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, 4,231,561, Cl. 271-3.100.
Nagahara, Yasumori; and Iida, Haruki, 4,231,653, Cl. 355-3.0FU.
Suzuki, Minoru, 4,231,566, Cl. 271-117.000.

Ridenour, Ralph G. Tubing joint assembly. 4,231,596, Cl. 285-382.200.

Rieben, Stuart L., to Westinghouse Electric Corp. Multi-function end effector. 4,231,696, Cl. 414-5.000.

Riechers, Daniel: *See—*
Haberle, Fritz; Riechers, Daniel; and Heusel, Richard, 4,231,601, Cl. 293-136.000.

Riegel, Herbert, to Lummus Company, The. Production of hexachlorocyclopentadiene. 4,231,969, Cl. 570-223.000.

Rieske, Ellen: *See—*
Remy, Ernst; Meyer, Andreas; and Rieske, Ellen, 4,231,660, Cl. 356-244.000.

Rigden, Sydney A. R., to General Electric Company Limited, The. High pressure electric discharge lamp. 4,232,243, Cl. 313-217.000.

Riikonen, Pentti. Ski fastening. 4,231,585, Cl. 280-615.000.

Riitano, Francesco; and Spina, Vincenzo. Canal instrument for eliminating interference, widening the opening and the contemporaneous flared reaming of the first two-thirds of the dental radicular canals. 4,231,738, Cl. 433-102.000.

Riker Laboratories, Inc.: *See—*
Moore, George G. I., 4,232,043, Cl. 424-340.000.
Scherrer, Robert A.; and Stern, Richard M., 4,231,965, Cl. 568-327.000.

Riley, Robert Q.; and Carey, David L. Exercise machine with spring-cam arrangement for equalizing the force required through the exercise stroke. 4,231,568, Cl. 272-136.000.

Riley, Terence J.: *See—*
Hartman, Adrian R.; Riley, Terence J.; and Shackle, Peter W., 4,232,328, Cl. 357-49.000.

Riloga-Werk Joachim Schmidt: *See—*
Hehl, Klaus; and Sauer, Hans-Jurgen, 4,231,411, Cl. 160-120.000.

Ring, H. Kenneth, Jr., to Trane Company, The. Pressurized control signal apparatus. 4,231,515, Cl. 236-87.000.

Ringwald, Peter; Rose, Klaus; and Ruhl, Karl, to Robert Bosch GmbH. Procedure and apparatus for degassing fuel supply pump. 4,231,719, Cl. 417-366.000.

Rios, Paul W., to Oatey Co. Apparatus and method for dispensing putty-like material. 4,231,492, Cl. 222-1.000.

Ripka, Chester D., to Carrier Corporation. Method and apparatus for reducing corrosion in a heat exchanger. 4,231,417, Cl. 165-3.000.

Robbins, John D.: *See—*
Netravali, Arun N.; and Robbins, John D., 4,232,338, Cl. 358-136.000.

Robert Bosch GmbH: *See—*
Drews, Ulrich; Schnurle, Hans; Horbelt, Michael; Schmidt, Bernhard; and Werner, Peter, 4,231,345, Cl. 123-510.000.
Heitmann, Jurgen, 4,232,330, Cl. 358-31.000.
Leiber, Heinz, 4,231,620, Cl. 303-119.000.
Peter, Cornelius, 4,231,334, Cl. 123-440.000.
Ringwald, Peter; Rose, Klaus; and Ruhl, Karl, 4,231,719, Cl. 417-366.000.
Ruhl, Karl; and Kemmner, Ulrich, 4,231,718, Cl. 417-366.000.
Schiele, Werner; and Schleupen, Richard, 4,231,348, Cl. 123-644.000.
Strampfer, Armin; and Voegele, Guenther, 4,231,211, Cl. 53-452.000.

Robertson, Charles S.: *See—*
Youden, Robert H.; and Robertson, Charles S., 4,232,367, Cl. 364-408.000.

Robeson, Lloyd M., to Union Carbide Corporation. Impact modified polyarylate blends. 4,231,922, Cl. 260-45.95G.

Robinson, Howard W.: *See—*
Popov, George D.; and Robinson, Howard W., 4,231,532, Cl. 242-199.000.

Rochlitz, Jurgen; and Schon, Gunter, to Hoechst Aktiengesellschaft. Electrophotographic recording material. 4,231,799, Cl. 430-59.000.

Rockwell International Corporation: *See—*
Marmet, Melvin L.; and Padgett, Clarence W., 4,232,270, Cl. 330-253.000.

Rodgers, David P.: *See—*
Levy, John V.; Rodgers, David P.; Stewart, Robert E.; and Casabona, Richard J., 4,232,366, Cl. 364-200.000.

Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,232,131, Cl. 525-184.000.

Roesch, Androniki: *See—*
Winter, Werner; Hindermayr, Herman; Roesch, Egon; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,232,024, Cl. 424-251.000.

Roesch, Egon: *See—*
Winter, Werner; Hindermayr, Herman; Roesch, Egon; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,232,024, Cl. 424-251.000.

Rojas, Hernan H., to Comercial e Industrial Sound-Tronic Ltd. High fidelity loudspeaker. 4,232,204, Cl. 179-115.50R.

Rolinski, Edmund J.; and Laub, Bernard, to United States of America, Air Force. Laser tensile test sample holder. 4,231,248, Cl. 73-15.600.

Rolls-Royce Limited: *See—*
Chapman, John F., 4,231,447, Cl. 181-213.000.

Rolodex Corporation, The: *See—*
Neilsen, Hildaur L., 4,231,624, Cl. 312-186.000.

Rombi, Max: *See—*
Dick, Pierre R.; and Rombi, Max, 4,232,023, Cl. 424-251.000.

Romey, Ingo; and Kokot, Hellmut, to Bergwerksverband GmbH. Purifying filter-clogging coal tar formed from low-temperature coal carbonization. 4,231,856, Cl. 208-39.000.

Roming, Derek, to International Design Systems, Ltd. Process and apparatus for forming concrete. 4,231,677, Cl. 404-89.000.

Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, to A.W. Faber-Castell. Device for receiving a writing implement. 4,231,669, Cl. 401-258.000.

Rosch, Gunter: *See—*
Gunther, Dieter; Erckel, Rudiger; Rosch, Gunter; and Probst, Heinz, 4,231,741, Cl. 8-571.000.

Rose, Dennis L.: *See—*
Lavin, Walter M.; McFarlane, James I.; and Rose, Dennis L., 4,231,894, Cl. 252-389.00A.

Rose, John B.: *See—*
Barr, Dennis A.; and Rose, John B., 4,232,142, Cl. 528-125.000.

Rose, Klaus: *See—*
Ringwald, Peter; Rose, Klaus; and Ruhl, Karl, 4,231,719, Cl. 417-366.000.

Rosenberg, Harry; and Plevak, Lubomir, to Gewerkschaft Eisenhutte Westfalia. Roof support unit. 4,231,685, Cl. 405-296.000.

Rosenga, Giorgio: *See—*
De Padova, Salvatore; Pagana, Enrico; and Rosenga, Giorgio, 4,232,322, Cl. 343-781.00P.

Rosler, Richard S.; and East, Robert W., to Applied Materials, Inc. Chemical vapor deposition reactor and process. 4,232,063, Cl. 427-94.000.

Rotenfeld, Veniamin S.: *See—*
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Roth, Gunther; to Sunvic Regler GmbH. Pneumatic controller. 4,231,385, Cl. 137-86.000.

Roth, Milton, to United States of America, Army. Non-polluting process for desensitizing explosives. 4,231,822, Cl. 149-109.600.

Roussel Uclaf: *See—*
Dumont, Claude; Guillaume, Jacques; and Nedelec, Lucien, 4,232,031, Cl. 424-263.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,231,932, Cl. 260-326.00A.
Teutsch, Jean G.; and Deraedt, Roger, 4,232,015, Cl. 424-243.000.

Rowland, Thomas J.: *See—*
Peck, Norman J.; Rowland, Thomas J.; and Ashes, John R., 4,231,529, Cl. 241-189.00R.

Royal Crown Cola Company: *See—*
Walker, Maurice; Wheeley, Buren R.; and Glass, Charles A., 4,231,209, Cl. 53-48.000.

Rozhnov, Valentin E.: *See—*
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Ruckert, Hans, to Vereinigte Elektrizitatswerke Westfalen AG. Device for cathodic corrosion protection employing an external current anode. 4,231,852, Cl. 204-196.000.

Rueffel, Philip G., to Saskatchewan Minerals. Thermal energy storage composition comprising peat moss. 4,231,885, Cl. 252-70.000.

Ruhl, Karl; and Kemmner, Ulrich, to Robert Bosch GmbH. Fluid pump, particularly a fuel supply pump. 4,231,718, Cl. 417-366.000.

Ruhl, Karl: *See—*
Ringwald, Peter; Rose, Klaus; and Ruhl, Karl, 4,231,719, Cl. 417-366.000.

Ruhrkohle, AG.: *See—*
Mathiak, Hans; and Oldengott, Hans, 4,231,846, Cl. 202-248.000.

Rule, Charles E.; Manning, Robert G.; and Zielinski, Richard J., to SCM Corporation. Imitation acid-set cheese. 4,232,050, Cl. 426-582.000.

Rulevsky, Evgeny V.: *See—*
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Rumianca S.p.A.: *See—*
Baldi, Luciano; Francese, Renato; and Collecchia, Franco, 4,232,153, Cl. 544-204.000.

Runkel, Manfred A.: *See—*
Smith, Alan C.; and Runkel, Manfred A., 4,231,284, Cl. 91-171.000.

Russo, Giovanni: *See—*
Limone, Mario; Russo, Giovanni; Magliuolo, Umberto; and Sardella, Salvatore, 4,231,458, Cl. 194-4.00F.

Ruuska, Mauno, to Lannen Tehtaat Oy. Group of pots for nursing and replanting plants. 4,231,186, Cl. 47-74.000.

Ryan, John R.; and Shalita, Paul, to Ferro Corporation. Process for preparing reflecting sheeting having wide angle response. 4,231,830, Cl. 156-232.000.

Ryan, Keith. Visible indexes. 4,231,176, Cl. 40-395.000.

Sacco, Jean: *See—*
Kyritsos, Joseph; and Sacco, Jean, 4,231,913, Cl. 260-30.80R.

Safir, Sidney R.: *See—*
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,231,935, Cl. 260-326.50B.

Safranek, Edward J.: *See—*
Kuhl, Bernhard R.; and Safranek, Edward J., 4,232,207, Cl. 200-11.00R.

Safi-Societe des Accumulateurs Fixes et de Traction: *See—*
Guerinault, Jean-Marc; and Barber, Jacques, 4,231,631, Cl. 339-94.00A.
Lelaidier, Daniel; and Godard, Pierre, 4,232,305, Cl. 340-384.00E.

Sagawa, Takatoshi: *See—*
Kato, Tadanari; Ikemi, Tadashi; and Sagawa, Takatoshi, 4,231,900, Cl. 252-466.0PT.

Saint-Gobain Industries: *See—*
Orain, Roger; Heuser, Hans; Ohlenforst, Hans; and Pelzer, Rudolf, 4,232,080, Cl. 428-215.000.

Sair, Louis; and Sair, Ralph A., to Griffith Laboratories U.S.A., Inc. Food supplement concentrate in a dense glasseous extrudate. 4,232,047, Cl. 426-96.000.

Sair, Ralph A.: *See—*
Sair, Louis; and Sair, Ralph A., 4,232,047, Cl. 426-96.000.

Saito, Akihiro; and Naoi, Keigo, to Hitachi, Ltd. Rectifier assembly for AC generators for use with vehicles. 4,232,238, Cl. 310-68.00D.

Saito, Isao: *See—*
Sakamoto, Seiya; Hohki, Tetsuo; and Saito, Isao, 4,232,344, Cl. 358-298.000.

Saito, Jun: *See—*
Ichikawa, Junji; Takahashi, Yuji; and Saito, Jun, 4,231,565, Cl. 271-105.000.

Saito, Katsunori: *See—*
Kokaji, Norio; Kinoshita, Kunio; Urano, Toshihiro; and Saito, Katsunori, 4,232,323, Cl. 346-74.100.

Saito, Toshihisa; and Inoue, Nobuyoshi, to Copal Company Limited. Blade type focal plane shutter. 4,231,650, Cl. 354-246.000.

Saito, Tsutomu, to Horikiri Spring Manufacturing Co., Ltd. Bar-shaped torsion spring. 4,231,555, Cl. 267-154.000.

Saitoh, Osamu: *See—*
Ohnishi, Toshikazu; Ishida, Kozo; and Saitoh, Osamu, 4,232,223, Cl. 250-343.000.

Sakakibara, Yasuyuki, to Nippon Soken, Inc. Multiitem indicating device. 4,232,303, Cl. 340-366.00R.

Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, to Hitachi, Ltd. Control system of apparatus for transporting slurry. 4,231,686, Cl. 406-14.000.

Sakamoto, Seiya; Hohki, Tetsuo; and Saito, Isao, to Dainippon Screen Seizo Kabushiki Kaisha. Device for reproducing a halftone picture by scanning. 4,232,344, Cl. 358-298.000.

Sakashita, Nobuyuki: *See—*
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,231,787, Cl. 71-107.000.

Sakurai, Soichi; Ando, Kunio; and Fukuzawa, Kenichi, to Hitachi, Ltd. Electron gun assembly for a color picture tube. 4,232,246, Cl. 313-414.000.

Samejima, Hirotoshi: *See—*
Chiba, Hideo; Sasaki, Ryuzo; Yoshikawa, Masaaki; Takahashi, Naofumi; Sugimoto, Etsuro; and Samejima, Hirotoshi, 4,232,044, Cl. 426-44.000.

Sample, Lawrence R.: *See—*
Dobkin, Robert C.; Isbell, Tim D.; Miller, Bernard D.; and Sample, Lawrence R., 4,232,271, Cl. 330-258.000.

Sanborn, James R.; and Tieman, Charles H., to Shell Oil Company. Polymeric insecticidal compositions of matter. 4,232,025, Cl. 424-256.000.

Sandberg, Richard G.; and Hebble, Terry L., to United States of America, Interior. Recovery of metal values from lead smelter matte. 4,231,993, Cl. 423-34.000.

Sanders, Nathaniel L.: *See—*
Inouye, George T.; Sanders, Nathaniel L.; and Moss, Winston C., 4,232,070, Cl. 428-49.000.

Sandham, Edwin C., to Leggett & Platt, Incorporated. Pedestal seat base. 4,231,539, Cl. 248-418.000.

Sando Iron Works Co.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,231,238, Cl. 68-62.000.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co. Apparatus for the liquid treatment of a cloth. 4,231,238, Cl. 68-62.000.

Sandoz Ltd.: *See—*
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,232,039, Cl. 424-278.000.

Santek, Inc.: *See—*
Finger, Richard H.; and Michel, Thomas J., 4,232,355, Cl. 361-235.000.

Santiago, Edgardo, to Owens-Illinois, Inc. Abrasion resistant coating for foamed plastic substrates. 4,231,911, Cl. 260-29.6NR.

Sanyo Electric Co., Ltd.: *See—*
Kanatani, Heiichi; Osumi, Masato; and Hayama, Hajime, 4,231,353, Cl. 126-443.000.

Sapa, Fedor I.: *See—*
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Sardella, Salvatore: *See—*
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Sasaki, Masayuki: *See—*
Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, 4,232,210, Cl. 219-10.55C.

Sasaki, Ryuzo: *See—*
Chiba, Hideo; Sasaki, Ryuzo; Yoshikawa, Masaaki; Takahashi, Naofumi; Sugimoto, Etsuro; and Samejima, Hirotoshi, 4,232,044, Cl. 426-44.000.

Saskatchewan Minerals: *See—*
Rueffel, Philip G., 4,231,885, Cl. 252-70.000.

Satellite Business Systems: *See—*
Lyons, Michael T., 4,231,537, Cl. 244-160.000.

Sato, Haruki: *See—*
Kawasumi, Yoshio; and Sato, Haruki, 4,231,848, Cl. 204-20.000.

Sato, Shigeru: *See—*
Iwasaki, Masayuki; Sato, Shigeru; Inoue, Yasuo; and Nagashima, Akira, 4,232,106, Cl. 430-170.000.

Sato, Tetsuo: *See—*
Chaki, Eiichi; Chiba, Taneaki; and Sato, Tetsuo, 4,232,316, Cl. 343-108.00R.

Satoh, Eiji; Kohama, Masayuki; Yokoya, Kunihiko; Yamada, Kenji; and Nemoto, Akira, to Oiles Industries Co., Ltd.; and Musashi Seimitsu Kogyo Kabushiki Kaisha. Ball joint and a method for manufacturing the ball joint. 4,231,673, Cl. 403-125.000.

Satoh, Ken; and Yanagida, Tuneo, to Olympus Optical Co., Ltd. Tape end warning apparatus. 4,232,348, Cl. 360-74.100.

Satomi, Toyokazu: *See—*
Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, 4,231,561, Cl. 271-3.100.

Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, to Warner-Lambert Company. Novel 3-hydroxy-pyrrolin-2-one derivatives. 4,231,933, Cl. 260-326.5FL.

Sauer, Hans-Jurgen: *See—*
Hehl, Klaus; and Sauer, Hans-Jurgen, 4,231,411, Cl. 160-120.000.

Saunders, Michael A.; and Irwin, Robert W., to Burroughs Corporation. Logic card frame. 4,232,356, Cl. 361-415.000.

Savalle, Rene, Jr., to Andrew Corporation. Mount for earth station antenna. 4,232,320, Cl. 343-765.000.

Savin Corporation: *See—*
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Savoye, Eugene D.; Edwards, Thomas W.; and Wallace, Lloyd F., to RCA Corporation. Reduced blooming devices. 4,232,245, Cl. 313-367.000.

Scannell, John B., to Parker-Hannifin Corporation. Sealing ring. 4,231,579, Cl. 277-205.000.

Scarberry, Eugene N. Emergency resuscitation apparatus. 4,231,365, Cl. 128-207.150.

Schaaf, Thomas K.; and Eggler, James F., to Pfizer Inc. 15-Sulfonamidoprostaglandin derivatives. 4,232,173, Cl. 562-430.000.
Schaeffer, Bernard J., to Amax Inc. Grinding mill shell liner elements. 4,231,528, Cl. 241-182.000.
Schael, Wilfried, to Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG Apparatebau KG. Blood flow monitoring and control apparatus. 4,231,366, Cl. 128-214.00E.
Schafer, David E.: *See—*
Czajkowski, Albert J.; and Schafer, David E., 4,231,786, Cl. 71-100.000.
Schaffernicht, Klaus; and Kolbeck, Rainer, to Licentia Patent-Verwaltungs-GmbH. Electron beam tube. 4,231,627, Cl. 316-25.000.
Schaper, Lambert; and Sie, Swan T., to Shell Oil Company. Process for the preparation of an aromatic hydrocarbon mixture using iron crystalline silicates. 4,232,178, Cl. 585-408.000.
Scharf, Gerson: *See—*
Weiss, Gerald; Scharf, Gerson; Guido, Anthony A.; and Lazardwitz, Benjamin, 4,232,187, Cl. 178-22.000.
Schechter, Michael M., to Ford Motor Company. Variable rate aneroid capsule. 4,231,285, Cl. 92-34.000.
Scheidegger, Albert. Closure caps adapted for distribution in a channel. 4,231,479, Cl. 215-250.000.
Scherenberg, Hans O.; and Andres, Rudolf, to Daimler-Benz Aktiengesellschaft. Arrangement of a three-point automatic belt. 4,231,592, Cl. 280-808.000.
Schering Corporation: *See—*
McCombie, Stuart, 4,231,945, Cl. 260-347.700.
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,232,006, Cl. 424-177.000.
Scherrer, Robert A.; and Stern, Richard M., to Riker Laboratories, Inc. Phenoxy phenyl ethanones. 4,231,965, Cl. 568-327.000.
Schiele, Werner; and Schleupen, Richard, to Robert Bosch GmbH. Ignition system with ignition current and minimum spark duration controls. 4,231,348, Cl. 123-644.000.
Schlanzke, Claus G.: *See—*
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Schlegel (U.K.) Limited: *See—*
Pullan, Ronald E., 4,232,081, Cl. 428-217.000.
Schlegel, William R.; and Mayhew, Harry E., to All American Industries, Inc. Composite tape for arresting landing aircraft. 4,231,535, Cl. 244-110.00C.
Schletter, Peter, to DEC GmbH. Milk quantity meter. 4,231,324, Cl. 119-14.170.
Schleupen, Richard: *See—*
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Schloemann-Siemag Aktiengesellschaft: *See—*
Beerens, Hugo, 4,231,382, Cl. 134-64.00R.
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Schmeisser, Helmut: *See—*
Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, 4,231,669, Cl. 401-258.000.
Schmid, Eduard; and Griehl, Wolfgang, to Inventa AG fur Forschung und Patentverwertung, Zurich. Injection moldable glass clear transparent polyamide. 4,232,145, Cl. 528-324.000.
Schmid, Manfred; Elsaber, Martin; and Weik, Manfred, to Sulzer Morat GmbH. Assembly plate for assembling cam parts of a knitting machine. 4,231,234, Cl. 66-27.000.
Schmidt, Alfred, to OMV Aktiengesellschaft. Process for the purification of urea solutions containing biuret and the like. 4,231,960, Cl. 564-73.000.
Schmidt, Bernhard: *See—*
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Schmidt, Dietrich: *See—*
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Schmidt, Manfred; Bandtel, Eberhard; Traudisch, Walter; Spott, Georg; and Freitag, Dieter, to Bayer Aktiengesellschaft. Process for isolating boron-containing phenol/formaldehyde resins. 4,232,134, Cl. 525-506.000.
Schmidt, Paul F., to Bell Telephone Laboratories, Incorporated. Method of removing impurity metals from semiconductor devices. 4,231,809, Cl. 148-1.500.
Schmitt, Frederick L.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,231,940, Cl. 260-345.100.
Schneider, Abraham: *See—*
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Schnurle, Hans: *See—*
Drews, Ulrich; Schnurle, Hans; Horbelt, Michael; Schmidt, Bernhard; and Werner, Peter, 4,231,345, Cl. 123-510.000.
Schoker, Hans, to Casma Di V. Mannoni & Figli. Automatic door closing arrangement. 4,231,134, Cl. 16-49.000.
Scholder, William G.: *See—*
Hall, James F., Jr.; Lake, Ralph J., Jr.; and Scholder, William G., 4,231,439, Cl. 177-25.000.
Scholze, Alfred O.: *See—*
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Schon, Gunter: *See—*
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Rosbiegalle, Rudolf; Farber, Karl; Grimm, Herbert; Schmeisser, Helmut; Schonhut, Hermann; Krumnikl, Svatopluk; and Edel, Gunter, 4,231,669, Cl. 401-258.000.
Schramm, Hans; and Schramm, Klaus, to Frank & Schulte GmbH. Alloy carrier for charging cupola furnaces. 4,231,798, Cl. 75-256.000.
Schramm, Klaus: *See—*
Schramm, Hans; and Schramm, Klaus, 4,231,798, Cl. 75-256.000.
Schreck, Philipp; and Buck, Gerold A. Method and apparatus for in-situ production of concrete slabs. 4,231,977, Cl. 264-33.000.
Schrock, Richard R., to Massachusetts Institute of Technology. Tantalum and niobium catalysts or catalyst precursors. 4,231,947, Cl. 260-429.00R.
Schuierer, Manfred: *See—*
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Schut, Robert N.; Snoke, Edgar O.; and Van Dyke, John W., Jr., to Miles Laboratories, Inc. Isoquinoline propionamides exhibiting analgesic properties. 4,232,160, Cl. 546-146.000.
Schwab, Klaus M.; and Kahrbek, Detlev, to International Educational Services AG. Method of dynamic representation and apparatus therefor. 4,231,655, Cl. 355-40.000.
Schwankoff, Albert R.: *See—*
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Schwartz, Robert W.: *See—*
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Merkle, Theodor; Hausenblas, Bernhard; Schweickert, Hermann; and Wengert, Dieter, 4,231,594, Cl. 285-3.000.
Schwierz, Theodor, to Siemens Aktiengesellschaft. Measuring installation for frequency analysis of signal levels within a large amplitude range. 4,232,263, Cl. 324-77.00B.
SCM Corporation: *See—*
Rule, Charles E.; Manning, Robert G.; and Zielinski, Richard J., 4,232,050, Cl. 426-582.000.
Scotney, Gerald H.: *See—*
Still, Robert C.; Huppenthal, Frank J.; Smith, Barbara J.; and Scotney, Gerald H., 4,231,389, Cl. 137-315.000.
Scott & Fetzer Company, The: *See—*
Lee, Maw H.; and Keim, John E., 4,232,308, Cl. 340-539.000.
Scott, Morton J. Air cleaning apparatus and method. 4,231,765, Cl. 55-90.000.
Scozzafava, Milton V. Mounting device. 4,231,675, Cl. 403-252.000.
Sea Solar Power: *See—*
Anderson, J. Hilbert, 4,231,420, Cl. 165-40.000.
Security Plastics Inc.: *See—*
Kutik, Louis F.; and Cecil, Howard E., 4,231,493, Cl. 222-321.000.
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Sehring, Richard: *See—*
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Seib, David H.: *See—*
Millea, Michael F.; and Seib, David H., 4,232,221, Cl. 250-311.000.
Seibert, Chesterfield F.; and Miller, John D., to Pall Corporation. Air purification system and process. 4,231,768, Cl. 55-179.000.
Seidel, Gerhard E.: *See—*
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Seike, Shoji: *See—*
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Seiko Koki Kabushiki Kaisha: *See—*
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Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, 4,231,648, Cl. 354-195.000.
Seiler, George A.: *See—*
Ramey, Joseph F.; Seiler, George A.; and Thompson, Dorman N., Jr., 4,231,837, Cl. 156-522.000.
Seiller, Pierre F. X. Clasp fastener. 4,231,380, Cl. 132-47.000.
Seitzer, Walter H.; and Schneider, Abraham, to Suntech, Inc. Processing shale oil to jet fuel. 4,231,858, Cl. 208-89.000.
Sekine, Masaoki: *See—*
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Semi, Hidetoshi: *See—*
Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, 4,232,210, Cl. 219-10.55C.
Sequeira, Avilino, Jr.; and Barger, Frank L., to Texaco Inc. Control system for an N-methyl-2-pyrrolidone refining unit receiving light sweet charge oil. 4,231,459, Cl. 196-46.000.
Shackle, Peter W.: *See—*
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Shafer, Merrill W.: *See—*
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Shaffer, Donald O., to Champion Spark Plug Company. Automatic color change electrostatic paint spray system. 4,232,055, Cl. 427-33.000.
Shaffer, Gene P. Wheelchair. 4,231,614, Cl. 297-330.000.

Shalita, Paul: *See—*
Ryan, John R.; and Shalita, Paul, 4,231,830, Cl. 156-232.000.
Shanks, Howard R.; Bevolo, Albert J.; Danielson, Gordon C.; and Weber, Michael F., to United States of America, Energy. Fuel cell oxygen electrode. 4,232,097, Cl. 429-44.000.
Sharp, Joseph. Multifuel self-regulating burner. 4,231,731, Cl. 431-38.000.
Sharp Kabushiki Kaisha: *See—*
Funada, Fumiaki; Nonomura, Keisaku; Uede, Hisashi; and Wada, Tomio, 4,231,640, Cl. 350-336.000.
Yasuda, Syoichi; and Nishioka, Yoshiki, 4,232,290, Cl. 340-146.30Z.
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., to Libbey-Owens-Ford Company. Method and apparatus for producing solar collector panels. 4,231,505, Cl. 228-14.000.
Shaw, Anthony R.: *See—*
Krueger, Wallace F.; and Shaw, Anthony R., 4,231,204, Cl. 52-397.000.
Shealy, Y. Fulmer; and O'Dell, C. Allen, to United States of America, America. Carbocyclic analogs of cytosine nucleosides exhibiting antiviral and antineoplasticactivity. 4,232,154, Cl. 544-250.000.
Shedd, Francis A.: *See—*
Wrast, Richard E.; Gardiner, William J.; and Shedd, Francis A., 4,231,826, Cl. 156-138.000.
Shell Oil Company: *See—*
Ensing, Lukas, 4,232,379, Cl. 367-43.000.
Peterson, Larry W., 4,231,785, Cl. 71-93.000.
Sanborn, James R.; and Tieman, Charles H., 4,232,025, Cl. 424-256.000.
Schaper, Lambert; and Sie, Swan T., 4,232,178, Cl. 585-408.000.
Shelton, Winston L. Filter aid dispensing arrangement. 4,231,665, Cl. 366-165.000.
Sheng, Ming N.: *See—*
Kao, Jar-lin; and Sheng, Ming N., 4,231,937, Cl. 260-340.200.
Shenoha, James L., to Norwood Marking & Equipment Co. Multiple head marking device. 4,231,290, Cl. 101-93.110.
Shepard, John S. Shelf bracket assembly. 4,231,300, Cl. 108-111.000.
Shepard, Kenneth L.; and Brenner, Daniel G., to Merck & Co., Inc. 10,11-Dihydro-5H-dibenzo[a,d]cyclohepten-5,10-imines. 4,232,158, Cl. 546-72.000.
Sherman, John D.: *See—*
Denny, Arthur F.; and Sherman, John D., 4,231,887, Cl. 252-174.190.
Sherwin-Williams Company, The: *See—*
Groth, Hugh F.; Vogel, John D.; and Hunt, Guilbert M., 4,231,668, Cl. 401-146.000.
Shibata, Toshiaki: *See—*
Kajihara, Motoyoshi; Hamakawa, Toshihiro; Shibata, Toshiaki; Suzue, Takashi; and Fujii, Setsuro, 4,232,007, Cl. 424-177.000.
Shibuya Kogyo Kabushikigaisha: *See—*
Okazaki, Gosei, 4,231,213, Cl. 53-497.000.
Shigeta, Yasuo: *See—*
Hanajima, Hidemitsu; and Shigeta, Yasuo, 4,232,267, Cl. 328-138.000.
Shih, David H.: *See—*
Christensen, Burton G.; and Shih, David H., 4,232,036, Cl. 424-274.000.
Shimano Industrial Company, Limited: *See—*
Fujii, Yuji, 4,231,451, Cl. 188-73.100.
Shimizu, Toyoji: *See—*
Tokorozawa, Sadao; Shimizu, Toyoji; and Yoshizawa, Naomi, 4,231,707, Cl. 417-12.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Kurimoto, Kazuhiko, 4,232,141, Cl. 526-344.200.
Shing-Hsiung, Wu. Sea water lifting device. 4,231,712, Cl. 417-100.000.
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Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,232,159, Cl. 546-112.000.
Shinoda, Yoshio: *See—*
Yoshino, Yasuhisa; Kuno, Akira; and Shinoda, Yoshio, 4,231,257, Cl. 73-432.0CR.
Shinohara, Akira; Wada, Nobuhide; Tokunaga, Yukio; and Yazawa, Chihiro, to Ihara Chemical Industry Company, Limited. Process for producing aminophenol ether. 4,231,963, Cl. 564-443.000.
Shinohara, Hideaki; Kato, Masaru; and Takamatsu, Yoshiaki, to Oji Paper Co., Ltd. Photosensitive lithographic printing plate with hydrophilic sublayer. 4,232,105, Cl. 430-160.000.
Shinohara, Masayoshi: *See—*
Hattori, Seizi; Makino, Koichi; Nakagawa, Takehiko; and Shinohara, Masayoshi, 4,232,061, Cl. 427-130.000.
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Shinozaki, Sohji; and Takei, Yoshiaki, to Konishiroku Photo Industry Co., Ltd. Substrates for use in screen photosensitive element. 4,232,104, Cl. 430-68.000.
Shioi, Ryoichi; and Yamauchi, Tamotu, to TDK Electronics Company Limited. PTC Honeycomb heating element with multiple electrode layers. 4,232,214, Cl. 219-541.000.
Shionogi & Co., Ltd.: *See—*
Hirai, Kentaro; Fujishita, Toshio; and Ishiba, Teruyuki, 4,231,930, Cl. 260-245.500.
Nagata, Wataru; Hamashima, Yoshio; Tsuji, Teruji; and Lunn, William H. W., 4,232,151, Cl. 544-90.000.
Shishido, Tadao: *See—*
Adachi, Keiichi; Shishido, Tadao; and Mitsui, Akio, 4,232,114, Cl. 430-504.000.
Shoher, Itzhak; and Whiteman, Aharon E. Dental restorative structures. 4,231,740, Cl. 433-208.000.
Showa Denki K.K.: *See—*
Fujiu, Masayoshi; and Hida, Tetsuo, 4,231,303, Cl. 110-245.000.
Shulman, Joseph: *See—*
Raphael, Thomas; and Shulman, Joseph, 4,232,079, Cl. 428-195.000.
Shurtz, Melvin D.: *See—*
Huiatt, Jerry L.; Shurtz, Melvin D.; and Potter, George M., 4,231,859, Cl. 209-11.000.
Sides, Jerry L.: *See—*
Carter, Walter H.; and Sides, Jerry L., 4,231,426, Cl. 166-252.000.
Sie, Swan T.: *See—*
Schaper, Lambert; and Sie, Swan T., 4,232,178, Cl. 585-408.000.
Siegel, John R. Vertical belt sanding apparatus. 4,231,193, Cl. 51-141.000.
Siegmund, Walter P., to American Optical Corporation. Method of making ommateal lenses and plates. 4,231,775, Cl. 65-30.00E.
Siemens Aktiengesellschaft: *See—*
Becker, Friedbert; Biethan, Gunter; and Kloeber, Peter, 4,232,318, Cl. 370-29.000.
Brabetz, Bernhard; and Hackl, Helmut, 4,231,692, Cl. 408-230.000.
Finkenzeller, Johann; Holzermer, Guenter; and Wenzek, Gerhard, 4,232,227, Cl. 250-468.000.
Giersberg, Dieter, 4,232,188, Cl. 370-24.000.
Hudek, Karl; and Weigert, Kurt, 4,231,374, Cl. 128-702.000.
Huettner, Robert; Kuetterer, Gerhard; and Sklebitz, Hartmut, 4,232,226, Cl. 250-445.00T.
Jantsch, Ottomar; and Tihanyi, Jeno, 4,231,810, Cl. 148-1.500.
Papp, Alfred; and Harms, Hauke, 4,232,264, Cl. 324-96.000.
Schwierz, Theodor, 4,232,263, Cl. 324-77.00B.
Zeidler, Guenter; and Oestreich, Ulrich, 4,231,635, Cl. 350-96.230.
Zoeke, Siegfried, 4,231,658, Cl. 355-110.000.
Siemens, Richard E.: *See—*
Moser, Kenneth W.; Siemens, Richard E.; and Rhoads, Stanley C., 4,231,866, Cl. 210-660.000.
Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., to W. R Grace & Co. Ripening of grapes. 4,231,788, Cl. 71-113.000.
Sierra Labs, Inc.: *See—*
Zuckerman, Matthew M., 4,231,249, Cl. 73-23.000.
Silverstein, Seth D.: *See—*
Vakil, Himanshu B.; and Silverstein, Seth D., 4,232,360, Cl 362-294.000.
Silverstein, Spencer J.: *See—*
Kurtz, Robert J.; and Silverstein, Spencer J., 4,231,354, Cl. 128-1.00D.
Simon, Martin J., to PPG Industries, Inc. Sealerless primers. 4,232,090, Cl. 428-424.400.
Simonov, Nikolai F.: *See—*
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.
Singer Company, The: *See—*
Eisenberg, Robert M., 4,232,299, Cl. 340-171.00R.
Sisa, Incorporated: *See—*
Razdan, Raj K.; and Ghosh, Anil C., 4,232,028, Cl. 424-260.000.
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene phenylene anionic naphthalenesulfonic acids. 4,231,958, Cl. 260-507.00R.
Skala, Stephen F. Multiplexing for facsimile systems. 4,232,342, Cl. 358-296.000.
SKF Industrial Trading and Development Company B.V.: *See—*
Rhodes, Cyril E.; and Verburgh, Martin B., 4,232,094, Cl. 428-614.000.
Sklebitz, Hartmut: *See—*
Huettner, Robert; Kuetterer, Gerhard, and Sklebitz, Hartmut, 4,232,226, Cl. 250-445.00T.
Slavin, Michael; and Telmet, Juhan, to Lectron Products, Inc. Tone generator. 4,232,287, Cl. 340-52.00E.
SMC Corporation: *See—*
Snyder, John L., 4,231,815, Cl. 148-24.000.
Smelter Control Research Association, Inc.: *See—*
Campbell, Ivor E.; Henderson, James M.; Johnson, Walter; and Wetherill, William H., 4,231,995, Cl. 423-242.000.
Smiley, Charles F.; and Zachum, Billy G., to Harris Corporation. Television signal horizontal interval timing reconstruction system. 4,232,339, Cl. 358-150.000.
Smiley, Parker C., to Physics International Company. Spring diaphragm. 4,231,287, Cl. 92-94.000.
Smirnov, Vladimir A. Device for measuring intensity of magnetic or electromagnetic fields using strain gauges mounted on ferromagnetic plates. 4,232,265, Cl. 324-260.000.
Smith, Alan C.; and Runkel, Manfred A., to Textron, Inc. Load equilization feedback for parallel channel servo actuators. 4,231,284, Cl. 91-171.000.
Smith, Barbara J.: *See—*
Still, Robert C.; Huppenthal, Frank J.; Smith, Barbara J.; and Scotney, Gerald H., 4,231,389, Cl. 137-315.000.
Smith, Dennis W.; and Mazzacano, Paul J., to F F Fabricators, Inc Collapsible traffic barricade. 4,231,676, Cl. 404-6.000.

Smith, George H.; and Olofson, Peter M., to Minnesota Mining and Manufacturing Company. Complex salt photoinitiator. 4,231,951, Cl. 260-446.000.

Smith, Henry E., to Xerox Corporation. Clip for attaching guide rails to a frame. 4,231,674, Cl. 403-233.000.

Smith International, Inc.: *See—*
Garner, Lloyd L.; and Harris, Charles R., 4,231,438, Cl. 175-353.000.

Smith, Lawrence A., Jr., to Chemical Research & Licensing Company. Catalytic distillation process. 4,232,177, Cl. 585-324.000.

Smith, Peter. Hanger with collapsible arms provided with a release and locking mechanism. 4,231,499, Cl. 223-94.000.

Smith, Philip N., to Standex International Corporation. In-line package relay. 4,232,281, Cl. 335-152.000.

Smith, William E.; and McGee, Thomas W., to Dow Chemical Company, The. Nitrosation of aromatic compounds. 4,232,175, Cl. 568-706.000.

Smiths Industries Limited: *See—*
Eccles, Edward S.; and Gibson, Harry, 4,232,312, Cl. 340-753.000.

Smyth, Robert W.: *See—*
Hirsch, Horst E.; and Smyth, Robert W., 4,231,981, Cl. 264-102.000.

Snamprogetti S.p.A.: *See—*
Re, Luciano; Brandt, Alberto; and Bassignani, Luciano, 4,232,169, Cl. 560-174.000.

Snoke, Edgar O.: *See—*
Schut, Robert N.; Snoke, Edgar O.; and Van Dyke, John W., Jr., 4,232,160, Cl. 546-146.000.

Snyder, John L., to SMC Corporation. Copper alloy brazing paste. 4,231,815, Cl. 148-24.000.

Snyder, Robert F.: *See—*
Bickford, John H.; and Snyder, Robert F., 4,231,454, Cl. 192-4.00R.

Socapex: *See—*
Badoz, Jean-Marie; and Merceron, Daniel, 4,231,632, Cl. 339-97.00R.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Cottatellucci, Ezio, 4,232,387, Cl. 371-47.000.

Societa Pneumatici Pirelli S.p.A.: *See—*
Mezzanotte, Mario, 4,231,409, Cl. 152-354.00R.

Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Duris, Jean, 4,231,167, Cl. 34-66.000.

S.A. Anarec: *See—*
Jottier, Christian F., 4,231,990, Cl. 422-100.000.

Societe Anonyme de Recherche et d'Etudes Techniques: *See—*
Augier, Robert; Carbonari, Jean P.; and Eliche, Jean, 4,231,198, Cl. 52-91.000.

Societe Anonyme des Usines Chausson: *See—*
Moranne, Jean-Pierre, 4,231,422, Cl. 165-69.000.
Moranne, Jean-Pierre, 4,231,424, Cl. 165-107.00D.
Moranne, Jean-Pierre, 4,231,794, Cl. 75-166.00C.

Societe Anonyme dite: CM Industries: *See—*
Lomard, Jean-Pierre, 4,232,019, Cl. 424-248.560.

S.A. Mainetti: *See—*
Mainetti, Mario, 4,231,500, Cl. 223-96.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Ayache, Michel R.; Delonge, Jean-Claude L.; and Marey, Daniel J., 4,231,704, Cl. 416-95.000.

Societe Samibem, S.A.: *See—*
Weber, Marcel, 4,231,216, Cl. 56-13.600.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Jaunin, Jean-Pierre, 4,232,384, Cl. 368-185.000.

Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Co., Ltd. Liquid feeder for automatic culture apparatus. 4,231,403, Cl. 141-284.000.

Solar Unlimited, Inc.: *See—*
Bowden, Donald R.; and Sparks, Robert O., 4,231,352, Cl. 126-422.000.

Solomin, Vladimir A.: *See—*
Popov, Alexandr D.; and Solomin, Vladimir A., 4,232,237, Cl. 310-13.000.

Solomons, William E.: *See—*
Mathison, Ian W.; and Solomons, William E., 4,232,014, Cl. 424-324.000.

Solvay & Cie.: *See—*
Dechenne, Roger; and Hubert, Guy, 4,231,483, Cl. 220-66.000.

Somekh, Sasson; and Ahlquist, C. Norman, to Intel Corporation. Variable thickness self-aligned photoresist process. 4,231,811, Cl. 148-1.500.

Somet Societa Meccanica Tessile, S.p.A.: *See—*
Merisio, Alberto, 4,231,402, Cl. 139-448.000.

Sommer, Ruediger, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for recording graphic or image information by means of punctiform recording spots. 4,232,343, Cl. 358-296.000.

Sony Corporation: *See—*
Hanajima, Hidemitsu; and Shigeta, Yasuo, 4,232,267, Cl. 328-138.000.
Kamoto, Hidetoshi, 4,232,371, Cl. 364-561.000.
Mori, Yoshihisa; Mashimo, Norio; and Eguchi, Takeo, 4,232,202, Cl. 179-100.40E.
Ohta, Teruo, 4,232,350, Cl. 360-132.000.
Tachi, Katsuichi, 4,232,347, Cl. 360-73.000.
Takahashi, Kenji, 4,231,474, Cl. 206-387.000.
Toyama, Akira; Ohkoshi, Akio; Toyama, Takashi; Yukawa, Takahiro; and Hosono, Takashi, 4,232,332, Cl. 358-67.000.
Watanabe, Toshiro; and Suzuki, Koji, 4,232,341, Cl. 358-250.000.

Sorensen, Erik L.; and Larsen, Hans-Ole, to Coloplast International A/S. Sealing material for ostomy devices. 4,231,369, Cl. 128-283.000.

Sorensen, Norman L., to Wisco Corporation. Sunroof structure. 4,231,608, Cl. 296-216.000.

Sorensen, Norman L., to Wisco Corporation. Vehicle sunroof frame. 4,231,609, Cl. 296-218.000.

Souriau et Cie: *See—*
Badoz, Jean-Marie; and Merceron, Daniel, 4,231,632, Cl. 339-97.00R.

Southgate, John P.: *See—*
Hill, William F.; and Southgate, John P., 4,232,368, Cl. 364-431.000.

Sparks, Robert O.: *See—*
Bowden, Donald R.; and Sparks, Robert O., 4,231,352, Cl. 126-422.000.

Spectra-Physics, Inc.: *See—*
Studebaker, Robert H., 4,231,700, Cl. 414-700.000.

Sperry Corporation: *See—*
Englund, Robert M., 4,232,365, Cl. 364-200.000.

Speshyock, Fred R. Respiratory control. 4,231,364, Cl. 128-206.150.

Sphere Investments Limited: *See—*
Stone, Alan M., 4,231,478, Cl. 209-576.000.

Spiegler, Kurt S., to United States of America, Interior. Backwashing reverse-osmosis and ultrafiltration membranes by electro-osmosis. 4,231,865, Cl. 210-636.000.

Spina, Vincenzo: *See—*
Riitano, Francesco; and Spina, Vincenzo, 4,231,738, Cl. 433-102.000.

Spott, Georg: *See—*
Schmidt, Manfred; Bandtel, Eberhard; Traudisch, Walter; Spott, Georg; and Freitag, Dieter, 4,232,134, Cl. 525-506.000.

Spranger, Kurt, to Gambro Dialysatoren GmbH & Co. KG. Apparatus for selective separation of matter through semi-permeable membranes. 4,231,879, Cl. 210-321.00B.

Spransy, George B., to Anspack, Inc. Threaded bottle lid. 4,231,480, Cl. 215-329.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivatives. 4,231,940, Cl. 260-345.100.

Spuhl AG: *See—*
Spuhl, Walter, 4,231,723, Cl. 417-429.000.

Spuhl, Walter, to Spuhl AG. Metering and conveyor arrangement. 4,231,723, Cl. 417-429.000.

Spurgin, Wendell P., to United Air Specialists, Inc. Two stage electrostatic precipitator with electric field induced airflow. 4,231,766, Cl. 55-138.000.

Standard Brands Incorporated: *See—*
Pomper, Seymour; and Akerman, Emanuel, 4,232,045, Cl. 426-62.000.

Standard Oil Company (Indiana): *See—*
Adams, Halbert E.; Cooper, Edgar R.; Ford, Lowell D.; Johnson, Delbert C.; and Warren, Gregory L., 4,232,378, Cl. 367-36.000.
Boone, David E., 4,232,138, Cl. 526-122.000.
Kolpak, Miroslav M., 4,231,429, Cl. 166-362.000.
Udelhofen, John H.; and Watson, Roger W., 4,231,759, Cl. 44-75.000.
Waller, Michael R., 4,231,436, Cl. 175-7.000.

Standex International Corporation: *See—*
Smith, Philip N., 4,232,281, Cl. 335-152.000.

Stanley Works, The: *See—*
Amtmann, James S.; and Bobrowski, Louis G., 4,231,626, Cl. 312-350.000.

Starkey Labs, Inc.: *See—*
Beex, Aloysius A., 4,232,192, Cl. 179-1.0FS.

Statz, Robert J.; and Doty, James K., to Du Pont de Nemours, E. I., and Company. Catalyst and dehydrogenation process. 4,232,174, Cl. 562-599.000.

Stauffer Chemical Company: *See—*
Obrecht, Robert P., 4,231,959, Cl. 260-544.00K.
Uhing, Eugene H., 4,231,970, Cl. 260-931.000.

Steag A.G.: *See—*
Meyer-Kahrweg, Helmut, 4,231,761, Cl. 48-192.000.

Stec, Daniel L.: *See—*
Mueller, Rand W.; and Stec, Daniel L., 4,232,354, Cl. 361-172.000.

Stenberg, Kaj O.: *See—*
Carlsson, Per-Olov A. V.; and Stenberg, Kaj O., 4,231,875, Cl. 210-232.000.
Carlsson, Per-Olov A. V.; and Stenberg, Kaj O., 4,231,880, Cl. 210-321.00B.

Stepanov, Jury V.: *See—*
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Sterling Drug Inc.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,232,161, Cl. 546-279.000.

Stern, Richard M.: *See—*
Scherrer, Robert A.; and Stern, Richard M., 4,231,965, Cl. 568-327.000.

Stetson, John R.; Graham, Alan A.; and Frisch, Rudolf, to Congoleum Corporation. Methods of obtaining deep through penetration of colorants into polyvinyl chloride compositions, and the resulting products. 4,232,076, Cl. 428-158.000.

Stevens, Joel B.; and Wirfs, Mark C., to Cascade Steel Rolling Mills, Inc. Method and apparatus for dipping metal fence posts. 4,232,066, Cl. 427-430.100.

Stevens, Pierre M. Device for perforating packaged cigarettes. 4,231,378, Cl. 131-170.00R.

Stewart, Robert E.: *See—*
Levy, John V.; Rodgers, David P.; Stewart, Robert E.; and Casabona, Richard J., 4,232,366, Cl. 364-200.000.

Stewart, Robert M.; and Schwartz, Robert W., to W. R. Grace & Co. Prill tower rake. 4,231,227, Cl. 62-57.000.

Stewart, William S., to Phillips Petroleum Company. Control of a cracking furnace. 4,231,753, Cl. 23-230.00A.

Sticht, Walter. Apparatus for separating individual assembly parts from a coherent mass and for orienting the individual parts. 4,231,687, Cl. 406-52.000.

Still, Robert C.; Huppenthal, Frank J.; Smith, Barbara J.; and Scotney, Gerald H., to New Concepts, Inc. Removable operator for gate valves. 4,231,389, Cl. 137-315.000.

Stoelting, Inc.: *See—*
Hinds, Horace, Jr.; Heimerman, David P.; and Born, Billy L., 4,232,051, Cl. 426-582.000.

Stohlquist, Roger H.; and Strombeck, Leo, to Anderson Bros. Mfg. Co. Tension controlled apparatus for feeding web material. 4,231,560, Cl. 493-29.000.

Stoll, Christopher A. Camper anchoring and locking structure. 4,231,610, Cl. 296-167.000.

Stolle, James R., to White Consolidated Industries, Inc. Safety interlock for offset printing press. 4,231,292, Cl. 101-137.000.

Stone, Alan M., to Sphere Investments Limited. Bulk sorting of particulate material. 4,231,478, Cl. 209-576.000.

Strampfer, Armin; and Voegele, Guenther, to Robert Bosch GmbH. Method and apparatus for sealing the fill openings of hard gelatine capsules filled with liquid. 4,231,211, Cl. 53-452.000.

Stratton, Richard W.: *See—*
Bischoff, Klaus; and Stratton, Richard W., 4,231,976, Cl. 264-0.500.

Strecke, Joachim: *See—*
Ponsold, Kurt; Prousa, Richard; Oettel, Michael; Strecke, Joachim; and Hoffmann, Herbert, 4,231,946, Cl. 260-397.400.

Strehlow, Wighard: *See—*
Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Mullèr-Calgan, Helmut; and Dolce, Giuliano, 4,232,016, Cl. 414-244.000.

Strickland, James K., to Strickland Systems, Inc. Concrete form panel tying apparatus. 4,231,541, Cl. 249-216.000.

Strickland Systems, Inc.: *See—*
Strickland, James K., 4,231,541, Cl. 249-216.000.

Strombeck, Leo: *See—*
Stohlquist, Roger H.; and Strombeck, Leo, 4,231,560, Cl. 493-29.000.

Studebaker, Robert H., to Spectra-Physics, Inc. Method and apparatus for laser beam control of backhoe digging depth. 4,231,700, Cl. 414-700.000.

Sudweeks, Walter B.; and Lawrence, Larry D., to IRECO Chemicals. Emulsion blasting agent sensitized with perlite. 4,231,821, Cl. 149-21.000.

Sugasawa, Fukashi; and Iizuka, Haruhiko, to Nissan Motor Company, Limited. Internal combustion engine. 4,231,338, Cl. 123-568.000.

Sugimoto, Etsuro: *See—*
Chiba, Hideo; Sasaki, Ryuzo; Yoshikawa, Masaaki; Takahashi, Naofumi; Sugimoto, Etsuro; and Samejima, Hirotoshi, 4,232,044, Cl. 426-44.000.

Sugita Sangyo Kabushiki Kaisha: *See—*
Ikeda, Mankichi, 4,231,551, Cl. 254-344.000.

Sugiyama, Keiichi: *See—*
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,231,339, Cl. 123-568.000.

Sullivan, Charles I., to Polaroid Corporation. Novel battery assembly. 4,232,099, Cl. 429-152.000.

Sullivan, Daniel S., III; and Bridges, Wilbur L., to Exxon Research & Engineering Co. Process for preparation of thioethers. 4,231,956, Cl. 260-465.80R.

Sulzer Brothers Limited: *See—*
Mona, Roberto; and Gnieser, Jurgen, 4,231,862, Cl. 210-601.000.

Sulzer Morat GmbH: *See—*
Schmid, Manfred; Elsaber, Martin; and Weik, Manfred, 4,231,234, Cl. 66-27.000.

Sumitomo Chemical Company, Limited: *See—*
Matsuda, Teruo; and Murata, Tetsuo, 4,231,967, Cl. 568-433.000.

Sumitomo Electric Industries, Ltd.: *See—*
Hara, Akio; and Yazu, Shuji, 4,231,762, Cl. 51-309.000.

Summa Corporation: *See—*
Miller, Robert C., 4,232,093, Cl. 428-591.000.

Summa Four, Inc.: *See—*
Boatwright, John T.; Prince, David G.; Haskett, William F.; and Koch, Helmut, 4,232,199, Cl. 179-18.00B.

Suntech, Inc.: *See—*
Seitzer, Walter H.; and Schneider, Abraham, 4,231,858, Cl. 208-89.000.

Sunvic Regler GmbH: *See—*
Roth, Gunther;, 4,231,385, Cl. 137-86.000.

Superfos Emballage: *See—*
Bock, Erik, 4,231,486, Cl. 220-266.000.

Sussman, Milton H., to American Optical Corporation. Seven-component microscope objective. 4,231,637, Cl. 350-175.0ML.

Sutphin, Eldon M. Method and apparatus for treating water. 4,231,863, Cl. 210-615.000.

Sutphin, Eldon M. Method and apparatus for treating heterogeneous fluid systems. 4,231,867, Cl. 210-703.000.

Suzue, Takashi: *See—*
Kajihara, Motoyoshi; Hamakawa, Toshihiro; Shibata, Toshiaki; Suzue, Takashi; and Fujii, Setsuro, 4,232,007, Cl. 424-177.000.

Suzuki, Koji: *See—*
Watanabe, Toshiro; and Suzuki, Koji, 4,232,341, Cl. 358-250.000.

Suzuki, Minoru, to Ricoh Company, Ltd. Sheet feed apparatus. 4,231,566, Cl. 271-117.000.

Suzuki, Suzuo; Nagaishi, Hastuo; and Masaki, Kenji, to Nissan Motor Company, Limited. Pulse generator of the corona discharge type for sensing engine crankshaft angle on an engine control system. 4,231,331, Cl. 123-416.000.

Suzuki, Yasuo: *See—*
Yomogida, Toshihiko; and Suzuki, Yasuo, 4,232,236, Cl. 307-297.000.

Sweeny, Norman P.: *See—*
Buerkley, Donald D.; Sweeny, Norman P.; and Vivona, Daniel N., 4,232,083, Cl. 428-307.000.

Swersky, Gerald S.; and Mason, Keith J., to Christensen, Inc. Combined stabilizer and reamer for drilling well bores. 4,231,437, Cl. 175-325.000.

Swigger, Michael P. Underwater liquid containment system. 4,231,873, Cl. 210-170.000.

Swiss Aluminium Ltd.: *See—*
Pirner, Miroslav; Zoller, Heinrich; and Bichsel, Heinz, 4,232,095, Cl. 428-654.000.

Synek, Jan: *See—*
Hestad, Alfred M.; Synek, Jan; and Hansen, Harold O., 4,232,200, Cl. 179-90.00K.

Syntex (U.S.A.) Inc.: *See—*
Kluge, Arthur F.; and Muchowski, Joseph M., 4,232,038, Cl. 424-274.000.
Waterbury, L. David, 4,232,040, Cl. 424-283.000.

Szailer, Ferenc: *See—*
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.

Szajko nee Lorinczi, Maria: *See—*
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.

Szala, Lawrence E.: *See—*
DeVries, Robert C.; Lee, Minyoung; Szala, Lawrence E.; and Tuft, Roy E., 4,231,195, Cl. 51-307.000.

Szatmari, Ede: *See—*
Kovacsay, Istvan; Szajko nee Lorinczi, Maria; Dubovszky, Istvan; Magdanyi, Laszlo; Szailer, Ferenc; and Szatmari, Ede, 4,232,136, Cl. 525-327.000.

Tabata, Norikazu: *See—*
Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, 4,232,229, Cl. 250-541.000.

Tabata, Yasuhiro: *See—*
Kaneko, Tamaki; Miyakawa, Seiichi; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Tabata, Yasuhiro, 4,231,561, Cl. 271-3.100.

Tabei, Masatoshi; Kawaziri, Kazuhiro; and Nakajima, Yosuke, to Fuji Photo Film Co., Ltd. Thin film photovoltaic cell and a method of manufacturing the same. 4,231,808, Cl. 136-260.000.

Tachi, Katsuichi, to Sony Corporation. Video tape control time code reading. 4,232,347, Cl. 360-73.000.

Tachibana, Hisataro; and Ono, Hiromi, to Kawasaki Jukogyo Kabushiki Kaisha. Water-jet propulsion unit for vessels. 4,231,315, Cl. 440-43.000.

Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, to Abbott Laboratories. 4-N-Acylfortimicin B derivatives and the chemical conversion of fortimicin B to fortimicin A. 4,231,924, Cl. 260-112.50R.

Tadanier, John S.; and Martin, Jerry R., to Abbott Laboratories. 4-N-Acylfortimicin B-1,5-carbamates. 4,232,147, Cl. 536-4.000.

Tagliaferri, Ermanno: *See—*
Tratta, Bruno G.; and Tagliaferri, Ermanno, 4,231,236, Cl. 68-15.000.

Taguchi, Nobuyoshi; Matsuo, Koji; Takahashi, Hiromu; and Oda, Fujio, to Matsushita Electric Industrial Co., Ltd. Thermal head. 4,232,213, Cl. 219-216.000.

Taiho Pharmaceutical Company Ltd.: *See—*
Kajihara, Motoyoshi; Hamakawa, Toshihiro; Shibata, Toshiaki; Suzue, Takashi; and Fujii, Setsuro, 4,232,007, Cl. 424-177.000.

Taito Co., Ltd.: *See—*
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,232,159, Cl. 546-112.000.

Takada, Yoshihiro: *See—*
Ueda, Shinjiro; Takada, Yoshihiro; Mishina, Haruo; and Kuroda, Atsuhiko, 4,231,706, Cl. 416-186.00R.

Takahashi, Hiromu: *See—*
Taguchi, Nobuyoshi; Matsuo, Koji; Takahashi, Hiromu; and Oda, Fujio, 4,232,213, Cl. 219-216.000.

Takahashi, Kenji, to Sony Corporation. Storage case. 4,231,474, Cl. 206-387.000.

Takahashi, Kunio: *See—*
Menju, Shinichi; Takahashi, Kunio; Haginomori, Eiichi; Murakami, Yoichi; and Zaima, Eiichi, 4,231,258, Cl. 73-572.000.

Takahashi, Naofumi: *See*—
Chiba, Hideo; Sasaki, Ryuzo; Yoshikawa, Masaaki; Takahashi, Naofumi; Sugimoto, Etsuro; and Samejima, Hirotoshi, 4,232,044, Cl. 426-44.000.

Takahashi, Ryohei: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,231,787, Cl. 71-107.000.

Takahashi, Shigeru: *See*—
Menju, Shinichi; Ohshima, Iwao; and Takahashi, Shigeru, 4,232,352, Cl. 361-120.000.

Takahashi, Yuji: *See*—
Ichikawa, Junji; Takahashi, Yuji; and Saito, Jun, 4,231,565, Cl. 271-105.000.

Takamatsu, Yoshiaki: *See*—
Shinohara, Hideaki; Kato, Masaru; and Takamatsu, Yoshiaki, 4,232,105, Cl. 430-160.000.

Takanashi, Itsuo: *See*—
Motoyama, Koichiro; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,232,331, Cl. 358-44.000.

Takashima, Hiroaki: *See*—
Kato, Osamu; Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; and Takashima, Hiroaki, 4,231,857, Cl. 208-40.000.

Takazawa, Yuzuru: *See*—
Kitai, Kiyoshi; and Takazawa, Yuzuru, 4,231,647, Cl. 354-195.000.

Takeda, Keiso, to Toyota Kidosha Kogyo Kabushiki Kaisha. Secondary air control system for an internal combustion engine. 4,231,220, Cl. 60-276.000.

Takeda, Yoshio: *See*—
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,232,159, Cl. 546-112.000.

Takei, Yoshiaki: *See*—
Shinozaki, Sohji; and Takei, Yoshiaki, 4,232,104, Cl. 430-68.000.

Takematsu, Tetsuo: *See*—
Okii, Mitsuyoshi; Onitake, Tatsuya; Kawai, Masanobu; Takematsu, Tetsuo; and Konnai, Makato, 4,231,789, Cl. 71-121.000.

Takenake, Yoshimichi: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenake, Yoshimichi; and Tsutaya, Tadao, 4,231,797, Cl. 75-256.000.

Takenoya, Hideaki, to Janome Sewing Machine Co., Ltd. Pulse generator for sewing machines. 4,231,307, Cl. 112-158.00E.

Takeuchi, Yo; Ohbori, Koichi; Hatsushika, Masabumi; and Komori, Shinichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Extruded corrosion resistant structural aluminum alloy. 4,231,817, Cl. 148-32.500.

Tallman, James L., to Tektronix, Inc. Memory preservation and verification system. 4,232,377, Cl. 365-229.000.

Tanaka, Gentaro: *See*—
Kishino, Takao; and Tanaka, Gentaro, 4,232,251, Cl. 315-167.000.

Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, to Mitsubishi Denki Kabushiki Kaisha. Ozonizer. 4,232,229, Cl. 250-541.000.

Tanaka, Taku: *See*—
Yamauchi, Kazuhisa; Tanaka, Taku; Kawai, Syuji; and Tanii, Hirokuni, 4,231,877, Cl. 210-321.00B.

Tanii, Hirokuni: *See*—
Yamauchi, Kazuhisa; Tanaka, Taku; Kawai, Syuji; and Tanii, Hirokuni, 4,231,877, Cl. 210-321.00B.

Tapley, David R., to Clark Equipment Company. Control system for a storage/retrieval machine in an automated material handling system. 4,232,370, Cl. 364-478.000.

Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., to Schering Corporation. Antibiotic W-10 complex, antibiotic 20561 and antibiotic 20562 as antifungal agents. 4,232,006, Cl. 424-177.000.

Tate, Clarence R., to Thalatta, Inc. Sheets containing microencapsulated color-coded micromagnets. 4,232,084, Cl. 428-309.000.

Tawara, Ikuo: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,231,403, Cl. 141-284.000.

Taylor, Eugene R., Jr.: *See*—
Eggleston, Philip W.; and Taylor, Eugene R., Jr., 4,231,546, Cl. 251-173.000.

Taylor, Gary N., to Bell Telephone Laboratories, Incorporated. Solid state devices formed by differential plasma etching of resists. 4,232,110, Cl. 430-313.000.

TDK Electronics Company Limited: *See*—
Osawa, Masayuki; and Sekine, Masaoki, 4,231,987, Cl. 264-328.100.
Shioi, Ryoichi; and Yamauchi, Tamotu, 4,232,214, Cl. 219-541.000.

Teague, Kenneth W., to Chrysler Corporation. Pressure regulator system. 4,231,390, Cl. 137-315.000.

Tecumseh Products Company: *See*—
Kaufman, Vernon R., 4,231,623, Cl. 308-23.000.

Teichmann, Joachim. Magnetic reciprocating pump for pumping fluids. 4,231,722, Cl. 417-418.000.

Tektronix, Inc.: *See*—
Richards, Mark A., 4,232,250, Cl. 315-13.0ST.
Tallman, James L., 4,232,377, Cl. 365-229.000.

Telesio, George O. Mechanical interfaces for control linkages in a removable vehicle engine module. 4,231,444, Cl. 180-294.000.

Telesio, George O. Transfer of quick-disconnect engine modules from vehicles. 4,231,708, Cl. 414-343.000.

Telex Computer Products, Inc.: *See*—
Brooks, Forrest E., 4,231,150, Cl. 29-593.000.
Kirby, Robert E., 4,231,629, Cl. 339-17.00M.

Telmet, Juhan: *See*—
Slavin, Michael; and Telmet, Juhan, 4,232,287, Cl. 340-52.00E.

ten Broeke, Jan, to Merck & Co., Inc. Diazaditwistanes, and pharmaceutical compositions for treating pain in warm blooded animals containing them. 4,232,026, Cl. 424-258.000.

Terada, Akira; Hattori, Seizi; Ishii, Yoshikazu; Nohara, Akira; Inagaki, Nobuo; Matsuda, Wakatake; and Kawakami, Susumu, to Nippon Telegraph and Telephone Public Corporation; and Fujitsu Limited. Method of producing magnetic thin film. 4,232,071, Cl. 428-64.000.

Teramachi, Hiroshi. Sliding roller bearing with height adjustor. 4,231,621, Cl. 308-6.00C.

te Riele, Johannes H., to Remia B.V. Method of, and apparatus for, regulating the pressure in a deformable conduit conducting a flowing fluid. 4,231,397, Cl. 137-614.110.

Terpstra, Daniel A.: *See*—
Blachly, Donald L.; and Terpstra, Daniel A., 4,231,557, Cl. 269-139.000.

Tesserax Inc.: *See*—
Weiss, Thomas R.; and Kennedy, Matthew R., 4,231,446, Cl. 181-148.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,231,932, Cl. 260-326.00A.

Testa, Raymond T.: *See*—
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,232,006, Cl. 424-177.000.

Teutsch, Jean G.; and Deraedt, Roger, to Roussel Uclaf. Novel Δ^4-androstenes. 4,232,015, Cl. 424-243.000.

Texaco Inc.: *See*—
Carter, Walter H.; and Sides, Jerry L., 4,231,426, Cl. 166-252.000.
Kablaoui, Mahmoud S., 4,231,758, Cl. 44-71.000.
Kalfoglou, George, 4,231,427, Cl. 166-275.000.
Koniz, Leon F.; and Estes, John H., 4,231,751, Cl. 23-230.00R.
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,231,459, Cl. 196-46.000.

Texas Alkyls, Inc.: *See*—
Malpass, Dennis B., 4,231,896, Cl. 252-431.00R.

Texas Instruments Incorporated: *See*—
Chapman, Richard A.; Buss, Dennis D.; and Kinch, Michael A., 4,231,149, Cl. 29-578.000.

Textron, Inc.: *See*—
Moertel, George B., 4,231,138, Cl. 24-205.16R.
Smith, Alan C.; and Runkel, Manfred A., 4,231,284, Cl. 91-171.000.

Thalatta, Inc.: *See*—
Tate, Clarence R., 4,232,084, Cl. 428-309.000.

Thatcher, Arthur K.; and McCarter, Ed R., to Thatcher, Arthur K. Single point fuel dispersion system using a low profile carburetor. 4,231,333, Cl. 123-440.000.

Theriot, Joseph E. Adaptive washer and bolt assembly. 4,231,279, Cl. 85-9.00R.

Thijssen, Nicolaas J.: *See*—
Vander, Timen; Thijssen, Nicolaas J.; de Blok, Jan F.; and Middel, Jan, 4,231,845, Cl. 202-113.000.

Thirion, Andre, to Antivols Simplex. Pin tumbler locks and their assembly. 4,231,243, Cl. 70-364.00A.

Thiruvengadam, Alagu P.; and Hochrein, Ambrose A., Jr. Method and apparatus for non-destructive evaluation utilizing the internal friction damping (IFD) technique. 4,231,259, Cl. 73-584.000.

Thoma, Hans A., to Chandon Investment Planning Ltd. Multichannel system for the handling of immobilized biologically active substances. 4,231,989, Cl. 422-63.000.

Thomas, Charles P.: *See*—
Needham, Riley B.; Thomas, Charles P.; and Wier, Donald R., 4,231,428, Cl. 166-280.000.

Thomas, Clifford F. Residential fence. 4,231,552, Cl. 256-24.000.

Thomas, Dennis A.: *See*—
Mroz, Judith C.; and Thomas, Dennis A., 4,231,370, Cl. 128-287.000.

Thomas, Wendl; Doyle, Holly T.; and Doyle, Robert O. Electrical game apparatus using fold switch matrices. 4,231,577, Cl. 273-238.000.

Thompson, Dorman N., Jr.: *See*—
Ramey, Joseph F.; Seiler, George A.; and Thompson, Dorman N., Jr., 4,231,837, Cl. 156-522.000.

Thompson, Earl C. Protective holder for sheet material. 4,231,174, Cl. 40-10.00A.

Thompson, George J., to Dresser Industries, Inc. Lower and crawler frame construction for crawler propelled machines. 4,231,699, Cl. 414-687.000.

Thompson, Morice W.: *See*—
Bentley, John; and Thompson, Morice W., 4,232,135, Cl. 525-509.000.

Thomsen, Peter: *See*—
Mathner, Manfred; and Thomsen, Peter, 4,231,221, Cl. 60-319.000.

Thomson-Brandt: *See*—
Ribeyre, Rene, 4,232,205, Cl. 179-146.00R.

Thomson-CSF: *See*—
Narbaits-Jaureguy, Jean-Raymond; Billottet, Henri; and Granier, Pierre, 4,232,285, Cl. 340-38.00L.

Thornton, William S. Tennis ball target. 4,231,572, Cl. 273-29.00A.

Thyssen Industrie AG: *See*—
Oppenlander, Harry; and Wilde, Ulrich, 4,231,684, Cl. 405-291.000.

Tidue S.r.l.: *See*—
Tratta, Bruno G.; and Tagliaferri, Ermanno, 4,231,236, Cl. 68-15.000.

Tieben, James, to My-D-Han-D Manufacturing Co. Remotely controlled gate opener. 4,231,190, Cl. 49-25.000.

Tieman, Charles H.: *See*—
Sanborn, James R.; and Tieman, Charles H., 4,232,025, Cl. 424-256.000.

Tihanyi, Jeno: *See*—
Jantsch, Ottomar; and Tihanyi, Jeno, 4,231,810, Cl. 148-1.500.

Timron, Inc.: *See*—
Kessler, Theodore P., 4,231,475, Cl. 206-389.000.

Tinoco, Edward N.: *See*—
Ishimitsu, Kichio K.; and Tinoco, Edward N., 4,231,536, Cl. 244-135.00A.

Tite, David J.: *See*—
Whitehead, Alan G.; and Tite, David J., 4,231,306, Cl. 111-86.000.

Tittl, Joseph F. Beach towel for use with a pillow. 4,231,125, Cl. 5-419.000.

Tobita, Hideyuki; and Mori, Toshio, to Hitachi, Ltd. Automatic washing machine and method for operating the same. 4,231,130, Cl. 8-159.000.

Toho Beslon Co., Ltd.: *See*—
Toyama, Takashi; and Kogo, Yasuo, 4,231,169, Cl. 36-43.000.

Tohoku Mikuni Kogyo Co., Ltd.: *See*—
Kubota, Kenichi; Mukai, Osamu; and Kariyama, Kenji, 4,231,716, Cl. 417-315.000.

Tokar, Grigory A.: *See*—
Kuznetsov, Vyacheslav D.; Preobrazhensky, Boris P.; Rozhnov, Valentin E.; Stepanov, Jury V.; Belitsky, Anatoly N.; Beizer, Viktor N.; Tokar, Grigory A.; Plastovets, Ivan K.; Barylo, Ivan I.; Koval, Boris A.; Chepurnykh, Sergei F.; Chumachenko, Petr N.; Simonov, Nikolai F.; Kharkhardin, Petr P.; and Litmanovich, Ilya M., 4,231,860, Cl. 209-169.000.

Tokorozawa, Sadao; Shimizu, Toyoji; and Yoshizawa, Naomi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Fluid supplying device. 4,231,707, Cl. 417-12.000.

Tokudome, Katumi; Ishikawa, Michio; and Hattori, Shuzo, to Kimmon Electric Co., Ltd. Metal vapor laser system. 4,232,274, Cl. 331-94.50S.

Tokunaga, Michio: *See*—
Okuhara, Shinzi; Ohhinata, Ichiro; and Tokunaga, Michio, 4,232,234, Cl. 307-252.00G.

Tokunaga, Yukio: *See*—
Shinohara, Akira; Wada, Nobuhide; Tokunaga, Yukio; and Yazawa, Chihiro, 4,231,963, Cl. 564-443.000.

Tokyo Denryoku Kabushiki Kaisha: *See*—
Menju, Shinichi; Takahashi, Kunio; Haginomori, Eiichi; Murakami, Yoichi; and Zaima, Eiichi, 4,231,258, Cl. 73-572.000.

Tokyo Eizai Lab. Co., Ltd.: *See*—
Usukura, Koji, 4,231,356, Cl. 128-90.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Chaki, Eiichi; Chiba, Taneaki; and Sato, Tetsuo, 4,232,316, Cl. 343-108.00R.
Fukushima, Shigeki; and Ohashi, Tadahiro, 4,232,369, Cl. 364-476.000.
Menju, Shinichi; Takahashi, Kunio; Haginomori, Eiichi; Murakami, Yoichi; and Zaima, Eiichi, 4,231,258, Cl. 73-572.000.
Menju, Shinichi; Ohshima, Iwao; and Takahashi, Shigeru, 4,232,352, Cl. 361-120.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, 4,232,210, Cl. 219-10.55C.

Tomy Kogyo Co., Inc.: *See*—
Kurita, Toshiaki, 4,231,182, Cl. 46-212.000.
Watanabe, Hiroyuki, 4,231,571, Cl. 273-1.00E.

Tooyama, Eiji, to Hitachi, Ltd. Signal transmission control system. 4,232,206, Cl. 179-175.30S.

Toray Industries, Inc.: *See*—
Okamoto, Miyoshi, 4,232,073, Cl. 428-91.000.

Tosco Corporation: *See*—
Gutierrez, Manuel M., 4,231,998, Cl. 423-449.000.

Totsu, Katsuyuki. Electrically driven fastening appliance. 4,231,270, Cl. 81-474.000.

Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, to Taito Co., Ltd. Nitrogen-containing monoterpene derivatives. 4,232,159, Cl. 546-112.000.

Towmotor Corporation: *See*—
Natale, Anthony J., Jr., 4,231,598, Cl. 292-210.000.

Toyama, Akira; Ohkoshi, Akio; Toyama, Takashi; Yukawa, Takahiro; and Hosono, Takashi, to Sony Corporation. Color television receiver. 4,232,332, Cl. 358-67.000.

Toyama, Takashi; and Kogo, Yasuo, to Toho Beslon Co., Ltd. Insole and method of producing the same. 4,231,169, Cl. 36-43.000.

Toyama, Takashi: *See*—
Toyama, Akira; Ohkoshi, Akio; Toyama, Takashi; Yukawa, Takahiro; and Hosono, Takashi, 4,232,332, Cl. 358-67.000.

Toyo Engineering Corporation: *See*—
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,231,961, Cl. 564-65.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Mori, Fumio; Ichinose, Isao; and Kunimoto, Go, 4,232,086, Cl. 428-341.000.

Toyoda-Koki Kabushiki-Kaisha: *See*—
Yomogida, Toshihiko; and Suzuki, Yasuo, 4,232,236, Cl. 307-297.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ishida, Yasuhiko, 4,231,329, Cl. 123-52.0MB.
Kuramoto, Akio; and Onishi, Toshinari, 4,231,341, Cl. 123-552.000.
Nishikawa, Kazuyoshi; Uno, Makoto; and Koga, Hideaki, 4,231,266, Cl. 74-467.000.
Onishi, Sigeru, 4,231,717, Cl. 417-364.000.
Yuuki, Kiyoshi, 4,231,336, Cl. 123-568.000.

Toyota Kidosha Kogyo Kabushiki Kaisha: *See*—
Takeda, Keiso, 4,231,220, Cl. 60-276.000.

Traber, Walter: *See*—
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,232,011, Cl. 424-200.000.

Trane Company, The: *See*—
Ring, H. Kenneth, Jr., 4,231,515, Cl. 236-87.000.

Trask, Elwood G., to Albany International Corp. Method of coating organic fibers with polytetrafluoroethylene. 4,232,087, Cl. 428-389.000.

Tratta, Bruno G.; and Tagliaferri, Ermanno, to Tidue S.r.l. Dyeing machine, particularly for dyeing and drying stocking articles and like garments. 4,231,236, Cl. 68-15.000.

Traub, Henry A., to W. S. Shamban & Co. Seal assembly. 4,231,578, Cl. 277-121.000.

Traudisch, Walter: *See*—
Schmidt, Manfred; Bandtel, Eberhard; Traudisch, Walter; Spott, Georg; and Freitag, Dieter, 4,232,134, Cl. 525-506.000.

Trejo Gonzalez, Humberto. Process to manufacture tubular articles resembling wood, cane, bamboo, reed, wicker, rattan, rush, and the like. 4,231,834, Cl. 156-294.000.

Trio Kabushiki Kaisha: *See*—
Matsuzuka, Takeshi, 4,232,191, Cl. 179-1.0GD.

Trojer, Felix; and Briggs, John, to Battelle Memorial Institute. Method for manufacturing a panel of anisotropic ceramic glass. 4,231,776, Cl. 65-33.000.

Troy, J. Harold: *See*—
Haderer, Norman G.; and Troy, J. Harold, 4,231,151, Cl. 29-605.000.

TRW Inc.: *See*—
Acker, Roy M., 4,231,767, Cl. 55-186.000.
Inouye, George T.; Sanders, Nathaniel L.; and Moss, Winston C., 4,232,070, Cl. 428-49.000.
Lui, Kenneth, 4,231,847, Cl. 204-7.000.
McDonald, John C.; Baichtal, James R.; and Ling, Alexander C., 4,232,386, Cl. 370-68.000.

Tsao, Sherman H., to International Business Machines Corporation. Apparatus for arranging scanning heads for interlacing. 4,232,324, Cl. 346-75.000.

Tsou, Ivan H., to Grow Group Inc. Cathodic electrodeposition compositions employing fatty acid derivatives. 4,231,907, Cl. 260-23.0AR.

Tsubata, Noritaka, to Yoshida Kogyo K.K. Woven stringer for slide fasteners. 4,231,139, Cl. 24-205.16R.

Tsuboi, Hikotada: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,231,934, Cl. 260-326.5FM.

Tsuchiya, Yutaka: *See*—
Hiruma, Teruo; and Tsuchiya, Yutaka, 4,232,333, Cl. 358-93.000.

Tsuji, Teruji: *See*—
Nagata, Wataru; Hamashima, Yoshio; Tsuji, Teruji; and Lunn, William H. W., 4,232,151, Cl. 544-90.000.

Tsukada, Toshihisa: *See*—
Yamamoto, Hideaki; Tsukada, Toshihisa; Maruyama, Eiichi; and Inagaki, Hiroya, 4,232,219, Cl. 250-227.000.

Tsukamoto, Goro; Yoshino, Koichiro; Morita, Tominori; Nose, Takashi; and Okazaki, Mitsuo, to Kanebo, Ltd. Calcium-antagonistic composition. 4,232,010, Cl. 424-200.000.

Tsunefuji, Katsuhiko; and Kondo, Isao, to Olympus Optical Co., Ltd. Electrical shutter for camera. 4,231,644, Cl. 354-51.000.

Tsunekawa, Masaru: *See*—
Ohumi, Takeharu; and Tsunekawa, Masaru, 4,231,347, Cl. 123-512.000.

Tsuruoka, Tomio, to Nippon Kogaku K.K. Camera body. 4,231,651, Cl. 354-288.000.

Tsutaya, Tadao: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenake, Yoshimichi; and Tsutaya, Tadao, 4,231,797, Cl. 75-256.000.

Tucker, Dempsey G. Coal-gathering assembly for a continuous miner. 4,231,468, Cl. 198-515.000.

Tucker, Terry D.: *See*—
Hannie, Steven G.; and Tucker, Terry D., 4,231,861, Cl. 209-240.000.

Tuerk, Robert P. Pickup truck stake arrangement. 4,231,606, Cl. 296-43.000.

Tuft, Roy E.: *See*—
DeVries, Robert C.; Lee, Minyoung; Szala, Lawrence E.; and Tuft, Roy E., 4,231,195, Cl. 51-307.000.

Tulis, Allen J.: *See*—
Dahn, C. James; Morita, Douglas R.; and Tulis, Allen J., 4,231,293, Cl. 102-7.200.

Tundermann, John H.; and Goodrich, Charles B., to Huntington Alloys Inc. Powder rolling apparatus. 4,231,729, Cl. 425-79.000.

Turk, Chester F.; and Krapcho, John, to E. R. Squibb & Sons, Inc. 1,2-Dihydro-2-oxo-4-phenyl-3-quinolinecarbonitrile derivatives. 4,232,027, Cl. 424-258.000.

Turloff, Harry E. Level indicating and elevation indicating device. 4,231,163, Cl. 33-367.000.

Tuskos, Michael E. Drapery clamping device. 4,231,157, Cl. 33-18.00R.

Tuson, Samuel, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Structure for sea-bed exploitation allowing the various functions inherent in such exploitation to be performed. 4,231,681, Cl. 405-195.000.

Tuson, Samuel, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Device for handling appliances on a sea bed. 4,231,682, Cl. 405-202.000.

U-Change Lock Industries, Inc.: *See—*
Hill, Lewis J.; and Dillard, Bill J., 4,231,242, Cl. 70-347.000.

Uchida, Kenji: *See—*
Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,231,686, Cl. 406-14.000.

Uddeholms Aktiebolag: *See—*
Franzen, Olof K.; Hallstrom, Ulf; and Petersson, Bengt A., 4,232,096, Cl. 428-683.000.

Udelhofen, John H.; and Watson, Roger W., to Standard Oil Company (Indiana). Liquid hydrocarbon fuels containing high molecular weight Mannich bases. 4,231,759, Cl. 44-75.000.

Ueda, Shinjiro; Takada, Yoshihiro; Mishina, Haruo; and Kuroda, Atsuhiko, to Hitachi, Ltd. Impeller of a centrifugal blower. 4,231,706, Cl. 416-186.00R.

Uede, Hisashi: *See—*
Funada, Fumiaki; Nonomura, Keisaku; Uede, Hisashi; and Wada, Tomio, 4,231,640, Cl. 350-336.000.

Uemura, Seiichi: *See—*
Kato, Osamu; Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; and Takashima, Hiroaki, 4,231,857, Cl. 208-40.000.

Ueno, Takanori: *See—*
Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, 4,232,229, Cl. 250-541.000.

Uhing, Eugene H., to Stauffer Chemical Company. Reaction products of unsaturated hydrocarbons with P_4S_{10} and PSX_3. 4,231,970, Cl. 260-931.000.

Uhl, Jurgen: *See—*
Poetsch, Eike; Uhl, Jurgen; Marx, Dieter; Strehlow, Wighard; Muller-Calgan, Helmut; and Dolce, Giuliano, 4,232,016, Cl. 414-244.000.

Uhlemayr, Albert: *See—*
Clausen, Dieter; and Uhlemayr, Albert, 4,231,742, Cl. 8-470.000.

Uhrbom, Lars E.: *See—*
Magnusson, Ulf S. G.; and Uhrbom, Lars E., 4,232,100, Cl. 429-217.000.

Umino, Naozi: *See—*
Nakagawa, Eishiro; Miyamoto, Taketoshi; Umino, Naozi; and Oyama, Hirosi, 4,231,146, Cl. 29-432.000.

Umtech, Inc.: *See—*
Chung, David H.; and Cosley, John V., 4,232,374, Cl. 364-900.000.

Unaform, Inc.: *See—*
Matuska, Tibor L., 4,231,401, Cl. 139-383.00A.

Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner, 4,231,233, Cl. 64-21.000.

UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta S.p.A.: *See—*
Raiteri, Angelo, 4,231,212, Cl. 53-459.000.

Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S. Apparatus for removing a welding bulge from pipes. 4,231,694, Cl. 409-179.000.

Union Carbide Corporation: *See—*
Denny, Arthur F.; and Sherman, John D., 4,231,887, Cl. 252-174.190.
D'Silva, Themistocles D. J., 4,232,035, Cl. 424-270.000.
Grant, Andrew C.; and Kern, James W., 4,232,056, Cl. 427-37.000.
Robeson, Lloyd M., 4,231,922, Cl. 260-45.95G.

United Air Specialists, Inc.: *See—*
Spurgin, Wendell P., 4,231,766, Cl. 55-138.000.

United Kingdom Atomic Energy Authority: *See—*
Woodhead, James L., 4,231,893, Cl. 252-313.00R.

United National Bank & Trust Co., executor: *See—*
Boll, Richard H., deceased; and Ghering, Walter L., 4,231,262, Cl. 73-861.040.

United Networks, Inc.: *See—*
Hestad, Alfred M.; Synek, Jan; and Hansen, Harold O., 4,232,200, Cl. 179-90.00K.

U.S. Armament Corporation: *See—*
Foote, John P., 4,231,177, Cl. 42-16.000.

United States Gypsum Company: *See—*
Wendt, Alan C., 4,231,205, Cl. 52-481.000.

United States of America
Agriculture: *See—*
Koenig, Nathan H.; and Friedman, Mendel, 4,231,747, Cl. 8-127.600.
Air Force: *See—*
Dahn, C. James; Morita, Douglas R.; and Tulis, Allen J., 4,231,293, Cl. 102-7.200.
Durig, Richard F., 4,231,533, Cl. 244-3.160.
Gawronski, Michael J.; and Goldie, Harry, 4,232,278, Cl. 333-13.000.
Lintell, Robert J.; and Campbell, James D., 4,231,534, Cl. 244-3.160.
Millea, Michael F.; and Seib, David H., 4,232,221, Cl. 250-311.000.
O'Connell, Robert M., 4,232,240, Cl. 310-313.00A.
Rolinski, Edmund J.; and Laub, Bernard, 4,231,248, Cl. 73-15.600.
America: *See—*
Shealy, Y. Fulmer; and O'Dell, C. Allen, 4,232,154, Cl. 544-250.000.
Army: *See—*
Chang, Yu-Wen; and Paul, Jeffrey A., 4,232,401, Cl. 455-328.000.
Dickens, Lawrence E.; and Maki, Douglas W., 4,232,277, Cl. 331-107.0DP.
Randhawa, Jagir S., 4,232,225, Cl. 250-361.00C.
Roth, Milton, 4,231,822, Cl. 149-109.600.
Weiss, Gerald; Scharf, Gerson; Guido, Anthony A.; and Lazardwitz, Benjamin, 4,232,187, Cl. 178-22.000.
Energy: *See—*
Baker, William R., 4,232,351, Cl. 361-56.000.
Clark, Grady W.; Holder, John D.; and Pasto, Arvid E., 4,231,796, Cl. 75-206.000.
Fink, Joel H.; and Molvik, Arthur W., 4,232,244, Cl. 313-363.000.
Gibson, Robert C.; and Korenko, Michael K., 4,231,795, Cl. 75-171.000.
Quinby, Thomas C., 4,231,507, Cl. 228-131.000.
Reich, Frederich R.; and Schwankoff, Albert R., 4,232,228, Cl. 250-492.00R.
Shanks, Howard R.; Bevolo, Albert J.; Danielson, Gordon C.; and Weber, Michael F., 4,232,097, Cl. 429-44.000.
Winsche, Warren E., 4,231,771, Cl. 55-408.000.
Zeldin, Arkady; Carciello, Neal; Kukacka, Lawrence; and Fontana, Jack, 4,231,917, Cl. 260-37.0SB.
Interior: *See—*
Huiatt, Jerry L.; Shurtz, Melvin D.; and Potter, George M., 4,231,859, Cl. 209-11.000.
MacDonald, David J., 4,231,994, Cl. 423-70.000.
Moser, Kenneth W.; Siemens, Richard E.; and Rhoads, Stanley C., 4,231,866, Cl. 210-660.000.
Sandberg, Richard G.; and Hebble, Terry L., 4,231,993, Cl. 423-34.000.
Spiegler, Kurt S., 4,231,865, Cl. 210-636.000.
Navy: *See—*
Adrian, Donald J., 4,232,314, Cl. 343-7.0PF.
Beckert, Werner F.; Barber, William H.; and Dengel, Ottmar H., 4,231,891, Cl. 252-188.000.
Fleishman, Herman B., 4,232,313, Cl. 343-6.00R.
Longerich, Ernest P., 4,231,311, Cl. 114-244.000.

U.S. Philips Corporation: *See—*
Filipovic, Dominik, 4,232,296, Cl. 340-167.00R.
French, Richard C., 4,232,392, Cl. 455-105.000.
Ketzer, Manfred, 4,231,504, Cl. 226-180.000.

United States Steel Corporation: *See—*
Makins, James E., Jr., 4,231,671, Cl. 403-13.000.

University Patents, Inc.: *See—*
Jensen, Elwood V.; and DeSombre, Eugene R., 4,232,001, Cl. 424-1.000.

Uno, Makoto: *See—*
Nishikawa, Kazuyoshi; Uno, Makoto; and Koga, Hideaki, 4,231,266, Cl. 74-467.000.

Unterborn, Ralph D.: *See—*
Hawk, Rufus L.; and Unterborn, Ralph D., 4,231,721, Cl. 417-413.000.

UOP Inc.: *See—*
Antos, George J., 4,231,897, Cl. 252-441.000.

Upjohn Company, The: *See—*
Magerlein, Barney J., 4,232,148, Cl. 536-17.00R.
Martin, David G., 4,232,164, Cl. 548-240.000.

Urakawa, Chikahiro: *See—*
Nakano, Kinichi; Urakawa, Chikahiro; and Imai, Ryoji, 4,231,936, Cl. 260-326.240.

Urano, Toshihiro: *See—*
Kokaji, Norio; Kinoshita, Kunio; Urano, Toshihiro; and Saito, Katsunori, 4,232,323, Cl. 346-74.100.

Urbain, Jean-Luc: *See—*
Cowx, Henry; and Urbain, Jean-Luc, 4,231,912, Cl. 260-29.7SQ.

Urbinati, Mario; and Conti, Luigi, to Centro Ricerche Fiat S.p.A. Air induction systems for diesel engines. 4,231,344, Cl. 123-518.000.

Usukura, Koji, to Tokyo Eizai Lab. Co., Ltd. Surgical immobilizing bandage and the like. 4,231,356, Cl. 128-90.000.

Vakil, Himanshu B.; and Silverstein, Seth D., to General Electric Company. Heat recovery high intensity discharge lamp constructions. 4,232,360, Cl. 362-294.000.

Valdemarsson, Stefan: *See—*
Dahle, Orvar; Einarsson, Olov; Lindkvist, Folke; and Valdemarsson, Stefan, 4,231,145, Cl. 29-432.000.

Vall, Seymour, to Falcon Safety Products, Inc. Sailing vessel self steerer. 4,231,308, Cl. 114-144.00R.

Valladares Barrocas, Helcio V; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, to Petroleo Brasileiro S.A.-Petrobras. Process for preparing ethene. 4,232,179, Cl. 585-640.000.

Valley Mineral Products Corporation: *See—*
Holt, John P.; and Cash, Theodore P., 4,231,800, Cl. 106-58.000.

Valleylab, Inc.: *See—*
Newton, David W., 4,231,372, Cl. 128-303.140.

Valmet Oy: *See—*
Ojala, Pertti, 4,231,842, Cl. 162-47.000.

Valton S.A.: *See—*
Boucraut, Frantz M., 4,231,563, Cl. 271-18.300.

Vamvakas, Michael, to Niagara Bottle Washer Manufacturing Co. Bottle stream combiner and divider. 4,231,463, Cl. 198-446.000.

Vance, Robert L.; and Noll, Robert W., to Acutherm, Inc. Thermally actuated diffuser. 4,231,513, Cl. 236-49.000.

Vander, Timen; Thijssen, Nicolaas J.; de Blok, Jan F.; and Middel, Jan, to Hoogovens Ijmuiden, B.V. Equipment for emission-free operation of a coking plant. 4,231,845, Cl. 202-113.000.

van der Lely, Cornelis. Soil cultivating machine. 4,231,305, Cl. 111-7.000.

van der Lely, Cornelis. Overload couplings. 4,231,443, Cl. 180-53.00D.

Vanderline, Walpy. Process and a device for making anchorages in soils and rocks. 4,231,683, Cl. 405-260.000.

Van Doren, Bernard M.; and Frank, Jacques G., to Etablissements VanDoren. Device for trimming the reeds of wind instruments. 4,231,404, Cl. 144-2.00R.

Van Dyke, John W., Jr.: *See—*
Schut, Robert N.; Snoke, Edgar O.; and Van Dyke, John W., Jr., 4,232,160, Cl. 546-146.000.

Van Haasteren, Adrian J., Jr.: *See—*
Demick, Eugene; and Van Haasteren, Adrian J., Jr., 4,231,643, Cl. 353-86.000.

Van Moorsel, William H.: *See—*
Barron, John W.; and Van Moorsel, William H., 4,231,839, Cl. 159-47.0UA.

Vannan, Frederick F., Jr., to Goodyear Tire & Rubber Company, The. Pre-shaped plastic reinforcing member and a tire encapsulating said member. 4,231,410, Cl. 152-356.00R.

Van Slooten, Louis J., to General Motors Corporation. Roller hydraulic valve lifter. 4,231,267, Cl. 74-569.000.

van Zelm, Willem D. Gripping device for handicapped persons. 4,231,603, Cl. 294-19.00R.

Vapor Corporation: *See—*
Daugiras, Kristupas; and Elguindy, Samir M., 4,231,192, Cl. 49-363.000.

Varitrac AG: *See—*
Heerema, Pieter S.; Horowitz, Alexandre; and Willemsen, Henricus P., 4,231,313, Cl. 114-265.000.

VDO Adolf Schindling AG: *See—*
Leber, Dieter, 4,231,250, Cl. 73-290.00V.

VEB Jenapharm: *See—*
Ponsold, Kurt; Prousa, Richard; Oettel, Michael; Strecke, Joachim; and Hoffmann, Herbert, 4,231,946, Cl. 260-397.400.

Verbatim Corporation: *See—*
Popov, George D.; and Robinson, Howard W., 4,231,532, Cl. 242-199.000.

Verburgh, Martin B.: *See—*
Rhodes, Cyril E.; and Verburgh, Martin B., 4,232,094, Cl. 428-614.000.

Verdicchio, Robert J.: *See—*
Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,231,903, Cl. 252-545.000.

Vereinigte Elektrizitatswerke Westfalen AG: *See—*
Ruckert, Hans, 4,231,852, Cl. 204-196.000.

Versluis, Ronald, to B.V. Neratoom. Non-return valve. 4,231,395, Cl. 137-514.700.

Vertut, Jean: *See—*
Balligand, Pierre; Corfa, Yves; Lemercier, Pierre; Marchal, Paul; and Vertut, Jean, 4,231,171, Cl. 37-54.000.

Vicon Espana S.A.: *See—*
Delgado, Luis D., 4,231,218, Cl. 56-377.000.

Victor Company of Japan, Ltd.: *See—*
Motoyama, Koichiro; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,232,331, Cl. 358-44.000.

Viggo AB: *See—*
Rash, Douglas L., 4,231,367, Cl. 128-214.400.

Vikre, Merle A. Irrigation system and volume control valve therefor. 4,231,523, Cl. 239-454.000.

Vila, Jose F. Pencil driven mechanical pencil sharpener. 4,231,405, Cl. 144-28.400.

Villavicencio, Eduardo J., to Process Evaluation & Development Corporation. Bagasse depithing. 4,231,136, Cl. 19-7.000.

Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,231,940, Cl. 260-345.100.

Vincent, Gary A.: *See—*
Fearon, Frederick W. G.; and Vincent, Gary A., 4,231,909, Cl. 260-29.1SB.

Visalli, Robert G., to Kerotest Manufacturing Corp. Valve stem and valve disc connection for a diaphragm valve. 4,231,549, Cl. 251-335.00A.

Vivona, Daniel N.: *See—*
Buerkley, Donald D.; Sweeny, Norman P.; and Vivona, Daniel N., 4,232,083, Cl. 428-307.000.

VLSI Technology Research Association: *See—*
Iwamatsu, Seiichi, 4,231,657, Cl. 355-71.000.

Vnuchenko, Nikolai S.: *See—*
Unigovsky, Mikhail R.; Rulevsky, Evgeny V.; Sapa, Fedor I.; Parkhomchuk, Alexei T.; Yampolsky, Arnold S.; Rotenfeld, Veniamin S.; Ivanov, Vasily T.; Nemirovsky, Isaak Y.; Kovalenko, Viktor M.; and Vnuchenko, Nikolai S., 4,231,694, Cl. 409-179.000.

Vock, Manfred H.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,231,940, Cl. 260-345.100.

Voegele, Guenther: *See—*
Strampfer, Armin; and Voegele, Guenther, 4,231,211, Cl. 53-452.000.

Vogel, John D.: *See—*
Groth, Hugh F.; Vogel, John D.; and Hunt, Guilbert M., 4,231,668, Cl. 401-146.000.

Vogelhut, Paul O., to Miles Laboratories, Inc. Chemiluminescent analytical device. 4,231,754, Cl. 23-230.00R.

Volkswagenwerk Aktiengesellschaft: *See—*
Buchholz, Peter; Warnecke, Rolf; and Beier, Alfred, 4,231,727, Cl. 418-76.000.
Konig, Axel, 4,231,720, Cl. 417-379.000.

Voll, Walter. Apparatus to indicate the spacing between a vehicle and a metal article. 4,232,286, Cl. 340-51.000.

Vurpillat, Victor V.: *See—*
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,231,593, Cl. 283-6.000.

W. R. Grace & Co.: *See—*
Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., 4,231,788, Cl. 71-113.000.
Stewart, Robert M.; and Schwartz, Robert W., 4,231,227, Cl. 62-57.000.

W. S. Shamban & Co.: *See—*
Traub, Henry A., 4,231,578, Cl. 277-121.000.

Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Process for forming musical tones. 4,231,277, Cl. 84-1.190.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Herzer, Heinz; Rath, Heinz-Jorg; and Schmidt, Dietrich, 4,231,755, Cl. 23-293.00R.

Wada, Nobuhide: *See—*
Shinohara, Akira; Wada, Nobuhide; Tokunaga, Yukio; and Yazawa, Chihiro, 4,231,963, Cl. 564-443.000.

Wada, Tomio: *See—*
Funada, Fumiaki; Nonomura, Keisaku; Uede, Hisashi; and Wada, Tomio, 4,231,640, Cl. 350-336.000.

Wadey, Raymond C. C.: *See—*
Hodgkins, Bernard E.; and Wadey, Raymond C. C., 4,231,589, Cl. 280-781.000.

Wagner, Norbert, to Linde AG. Method of making a plate-type heat exchanger. 4,231,508, Cl. 228-219.000.

Waibel, Gottfried; Maurischat, Gunther; and Webersik, Heinz, to AG-FA-Gevaert, A.G. Electrostatic copying apparatus. 4,231,319, Cl. 118-655.000.

Waldrum, John E. Liquid sprayer. 4,231,520, Cl. 239-171.000.

Walker, Maurice; Wheeley, Buren R.; and Glass, Charles A., to Royal Crown Cola Company. Self-synchronizing bottle carrier applicator. 4,231,209, Cl. 53-48.000.

Wallace, Charles C. Gate for use in a gate valve. 4,231,388, Cl. 137-242.000.

Wallace, Lloyd F.: *See—*
Savoye, Eugene D.; Edwards, Thomas W.; and Wallace, Lloyd F., 4,232,245, Cl. 313-367.000.

Waller, Michael R., to Standard Oil Company (Indiana). Marine riser insert sleeves. 4,231,436, Cl. 175-7.000.

Wallwork, Charles M. G. Handling foundry materials. 4,231,414, Cl. 164-154.000.

Walsh, J. William; and Bietry, Raymond E., Jr., to Becton, Dickinson & Company. Radial scanner. 4,231,661, Cl. 356-340.000.

Walter, Alfred, to Alfred Walter AG. Apparatus for perforating a paper sample. 4,231,273, Cl. 83-510.000.

Wang, Samuel S.; and Lewellyn, Morris E., to American Cyanamid Company. Process for dewatering mineral and coal concentrates. 4,231,868, Cl. 210-728.000.

Ward, William H.; and Ward, William H., Jr. Container closure spout construction and method of forming same. 4,231,488, Cl. 220-288.000.

Ward, William H., Jr.: *See—*
Ward, William H.; and Ward, William H., Jr., 4,231,488, Cl. 220-288.000.

Warman, Bloomfield J. Device for establishing conference calls via at least one telephone exchange switching system. 4,232,198, Cl. 179-18.0BC.

Warnecke, Rolf: *See—*
Buchholz, Peter; Warnecke, Rolf; and Beier, Alfred, 4,231,727, Cl. 418-76.000.

Warner-Lambert Company: *See—*
Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, 4,231,933, Cl. 260-326.5FL.

Warren, Gregory L.: *See—*
Adams, Halbert E.; Cooper, Edgar R.; Ford, Lowell D.; Johnson, Delbert C.; and Warren, Gregory L., 4,232,378, Cl. 367-36.000.

Watanabe, Hiroyuki, to Tomy Kogyo Co., Inc. Portable obstacle toy. 4,231,571, Cl. 273-1.00E.

Watanabe, Makoto. Apparatus for cleaning inner surfaces of hollow cylindrical container. 4,231,132, Cl. 15-56.000.

Watanabe, Ryuji; Arakawa, Hideo; and Kuniya, Keiichi, to Hitachi, Ltd. Method of producing a vacuum circuit breaker. 4,231,814, Cl. 148-11.50C.

Watanabe, Toshiro; and Suzuki, Koji, to Sony Corporation. Image display apparatus. 4,232,341, Cl. 358-250.000.

Waterbury, L. David, to Syntex (U.S.A.) Inc. Compositions for and a method of preventing diabetic complications. 4,232,040, Cl. 424-283.000.

Watson, Kenneth, to Westland Aircraft Limited. Helicopter rotor. 4,231,705, Cl. 416-108.00R.

Watson, Roger W.: *See—*
Udelhofen, John H.; and Watson, Roger W., 4,231,759, Cl. 44-75.000.

Waxman, Albert S.; and Havlice, James F., to Diasonics. Ultrasonic imaging apparatus. 4,231,373, Cl. 128-660.000.

Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Kurtz, Roman; and Kersting, Hans-Joachim, to Carl Still GmbH & Co. KG, Firma; and

Rheinische Braunkohlwerke AG. Method and apparatus for producing abrasion resistant coke from brown coal briquets. 4,231,844, Cl. 201-34.000.
Weber, Marcel, to Societe Samibem, S.A. Mower with bottom-driven cutter discs. 4,231,216, Cl. 56-13.600.
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Weingartner, Charles E. Heat control systems. 4,231,516, Cl. 237-51.000.
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Weiss, Gerald; Scharf, Gerson; Guido, Anthony A.; and Lazardwitz, Benjamin, to United States of America, Army. Teletype character modification unit. 4,232,187, Cl. 178-22.000.
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Nogrady, Stephen G., 4,232,002, Cl. 424-45.000.
Wendt, Alan C., to United States Gypsum Company. Steel edge gypsum wall panel. 4,231,205, Cl. 52-481.000.
Wengert, Dieter: *See*—
Merkle, Theodor; Hausenblas, Bernhard; Schweickert, Hermann; and Wengert, Dieter, 4,231,594, Cl. 285-3.000.
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Pearson, Robert M.; and Weninger, A. Edwin, 4,231,362, Cl. 128-205.150.
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Werst, Joseph L., to RCA Corporation. Electron beam moving apparatus for a color cathode ray tube. 4,232,283, Cl. 335-212.000.
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Lynch, Brian; and Partus, Fred P., 4,231,777, Cl. 65-109.000.
Westinghouse Electric Corp.: *See*—
Burns, David C., 4,231,690, Cl. 408-80.000.
Graham, Kingsley F.; and Gopal, Raj, 4,232,224, Cl. 250-356.000.
Haderer, Norman G.; and Troy, J. Harold, 4,231,151, Cl. 29-605.000.
Hickam, William M.; Lin, Ching-Yu; and Zomp, John M., 4,231,733, Cl. 431-76.000.
Kraft, Joseph K., 4,231,452, Cl. 188-171.000.
Lang, Glenn E.; Crotzer, Milburn E.; and Fuoto, John S., 4,231,328, Cl. 122-504.000.
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Rieben, Stuart L., 4,231,696, Cl. 414-5.000.
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Watson, Kenneth, 4,231,705, Cl. 416-108.00R.
Weston, Robert M., Sr. Cargo loading and unloading apparatus for trucks. 4,231,695, Cl. 410-69.000.
Wetherill, William H.: *See*—
Campbell, Ivor E.; Henderson, James M.; Johnson, Walter; and Wetherill, William H., 4,231,995, Cl. 423-242.000.
Whalin, Jeffery A.: *See*—
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Jones, George F., 4,231,196, Cl. 51-313.000.
Wheeley, Buren R.: *See*—
Walker, Maurice; Wheeley, Buren R.; and Glass, Charles A., 4,231,209, Cl. 53-48.000.
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Stolle, James R., 4,231,292, Cl. 101-137.000.
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., to Research Corporation. High surface area permeable material. 4,231,979, Cl. 264-81.000.
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Hedtke, Robert G.; Harrom, Harley A.; Kelley, Wilfred H., Jr.; and Frederick, Sherman B., 4,231,450, Cl. 187-9.00R.
White, Jerry R.: *See*—
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Whitehead, Alan G.; and Tite, David J., to National Research Development Corporation. Apparatus for injecting granular material in soil. 4,231,306, Cl. 111-86.000.
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Shoher, Itzhak; and Whiteman, Aharon E., 4,231,740, Cl. 433-208.000.
Whitfield, Carroll J.; and Lastinger, Anthony W., to Kelley Manufacturing Co. Cultivator with tool support arm and latch for holding same in raised non-working position. 4,231,433, Cl. 172-662.000.
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Hutchinson, John; and Whittaker, Graham, 4,231,849, Cl. 204-59.00F.
Whitwell, Robert J.: *See*—
Galvin, Michael E.; and Whitwell, Robert J., 4,231,228, Cl. 62-77.000.
Widdowson, Richard E.; and Atkinson, Ward J., to General Motors Corporation. Compressor modulation delay valve for variable capacity compressor. 4,231,713, Cl. 417-222.000.
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Kern, Horstmar; and Botzenhardt, Helmut, 4,231,207, Cl. 52-730.000.
Wier, Donald R.: *See*—
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Wilde, Ulrich: *See*—
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Wildonger, Kenneth J.: *See*—
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Wilhelms, Otto-Henning: *See*—
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Wilkinson, Richard L.: *See*—
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Heerema, Pieter S.; Horowitz, Alexandre; and Willemsen, Henricus P., 4,231,313, Cl. 114-265.000.
William Prym, Inc.: *See*—
Ebreo, Mark A.; and Koches, Andrew, 4,231,140, Cl. 24-237.000.
Wm. Steinen Mfg. Co.: *See*—
Aprea, George F.; and Pohle, Werner P., 4,231,524, Cl. 239-468.000.
Williams, Thomas A.; and Scholze, Alfred O., to Lam, Inc. Family of modular lamps for indirect lighting. 4,232,362, Cl. 362-410.000.
Williams, William J. Billiard cue having a quick connector for the handle portion thereof. 4,231,574, Cl. 273-68.000.
Willitts, Benjamin R., to Emhart Industries, Inc. Energy conservation system having improved means for controlling receiver pressure. 4,231,229, Cl. 62-196.00A.
Willoner, Gideon, to GTE Lenkurt Electric (Canada) Ltd. Digitally programmable active RC bandpass filter with constant absolute bandwidth. 4,232,269, Cl. 330-85.000.
Willox, J. Hebden. Guy guard and method of installing same. 4,231,208, Cl. 52-741.000.
Wilson, Charles A.: *See*—
Burk, George A.; Reineke, Charles E.; and Wilson, Charles A., 4,232,041, Cl. 424-304.000.
Wilson, Clarence P., to Imperial Screen Company, Inc. Protective window screen assembly. 4,232,310, Cl. 340-550.000.
Wilson, James F.; and Craig, James C., to PPG Industries, Inc. Press polishing and laminating plastic transparencies using polycarbonate pressing plates. 4,231,827, Cl. 156-214.000.
Wimmer, Josef: *See*—
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Winch, Allen R., to Cotton, Incorporated. Apparatus and method for impregnating a dry fiber batt. 4,231,129, Cl. 8-149.100.
Windecker, Leo J., to International Harvester Company. Impact resistant composite structure. 4,232,069, Cl. 428-47.000.
Winkelmann, Heinrich: *See*—
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Winkelmann and Pannhoff and Bayerische Motoren Werke Aktiengesellschaft: *See*—
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Winsche, Warren E., to United States of America, Energy. Dispersoid separation method and apparatus. 4,231,771, Cl. 55-408.000.
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Wirfs, Mark C.: *See*—
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Wisco Corporation: *See*—
Sorensen, Norman L., 4,231,608, Cl. 296-216.000.
Sorensen, Norman L., 4,231,609, Cl. 296-218.000.
Wise, Layton A., to Mine Safety Appliances Company. Breathing apparatus flow device. 4,231,361, Cl. 128-202.260.
Wissner, Allan, to American Cyanamid Company. 15-Deoxy-16-hydroxy-17-methylene prostaglandins of the E and F series. 4,232,166, Cl. 560-121.000.
Witt, David. Methods and apparatus for installing clutches in automatic transmissions. 4,231,147, Cl. 29-433.000.
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Woerz, Hans: *See*—
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Wolf, Johann. Apparatus for clearing silage or similar material. 4,231,688, Cl. 406-76.000.
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Wood, Donald A.: *See*—
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Woodhead, James L., to United Kingdom Atomic Energy Authority. Process for preparing aqueous dispersion of ceria and resulting product. 4,231,893, Cl. 252-313.00R.
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Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., to Ford Motor Company. Adjusting sleeve assembly. 4,231,588, Cl. 280-661.000.
Wrast, Richard E.; Gardiner, William J.; and Shedd, Francis A., to Gates Rubber Company, The. Process for forming V-belts and belt sleeves. 4,231,826, Cl. 156-138.000.
Wrathall, Robert S., to Motorola, Inc. Spark and dwell ignition control system using digital circuitry. 4,231,332, Cl. 123-416.000.
Wright Dow Corning: *See*—
Lewis, Frank M., 4,231,121, Cl. 3-1.910.
Wright, William: *See*—
Eaton, Burrows P.; and Wright, William, 4,231,421, Cl. 165-68.000.
Wright, William E.: *See*—
Gratzer, Nelson R.; and Wright, William E., 4,231,230, Cl. 62-503.000.
Wright, William S.; and Loewenstern, Kenneth M., to Drexelbrook Controls, Inc. Level measuring system using admittance sensing. 4,232,300, Cl. 340-840.390.
Xerox Corporation: *See*—
Horgan, Anthony M.; and Radler, Richard W., Jr., 4,232,102, Cl. 430-58.000.
Limburg, William W.; and Pai, Damodar M., 4,232,103, Cl. 430-59.000.
Smith, Henry E., 4,231,674, Cl. 403-233.000.
Ziehm, Richard T., 4,231,567, Cl. 271-259.000.
Yagi, Kouichi; and Nakagawa, Yunosuke, to Kao Soap Co., Ltd. Bleaching composition causing no color change or fading of colored and figured cloths. 4,231,890, Cl. 252-186.000.
Yamada, Keiichi. Attachment for bolt tightening and removing device. 4,231,271, Cl. 81-57.300.
Yamada, Kenji: *See*—
Satoh, Eiji; Kohama, Masayuki; Yokoya, Kunihiko; Yamada, Kenji; and Nemoto, Akira, 4,231,673, Cl. 403-125.000.
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Yamamoto, Hideaki; Tsukada, Toshihisa; Maruyama, Eiichi; and Inagaki, Hiroya, to Nippon Telegraph and Telephone Public Corporation; and Hitachi, Ltd. Photosensor. 4,232,219, Cl. 250-227.000.
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Yamamoto, Syunichi: *See*—
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Yamauchi, Kazuhisa; Tanaka, Taku; Kawai, Syuji; and Tanii, Hirokuni, to Kuraray Co., Ltd. Blood dialyzer. 4,231,877, Cl. 210-321.00B.
Yamauchi, Tamotu: *See*—
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Yasuda, Katsuya; and Adachi, Akio, to Hochiki Corporation. Data transmitter device. 4,232,292, Cl. 340-147.0SY.
Yasuda, Syoichi; and Nishioka, Yoshiki, to Sharp Kabushiki Kaisha. Handwritten character identification. 4,232,290, Cl. 340-146.30Z.
Yazawa, Chihiro: *See*—
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Yokogawa, Tomohisa, to Pioneer Electronic Corporation. Multiband radio receiver with electronic preset tuning system. 4,232,395, Cl. 455-173.000.
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Yomogida, Toshihiko; and Suzuki, Yasuo, to Toyoda-Koki Kabushiki-Kaisha. Output converting circuit for a programmable sequence controller. 4,232,236, Cl. 307-297.000.
Yoneoka, Mikio; Osugi, Minoru; and Ikarashi, Takeo, to Mitsubishi Gas Chemical Company, Inc. Process for producing methyl formate. 4,232,171, Cl. 560-239.000.
Yoshida Kogyo K. K.: *See*—
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Yoshida, Yoshitaka: *See*—
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Yoshino, Yasuhisa; Kuno, Akira; and Shinoda, Yoshio, to Nippon Soken, Inc. Slope sensor for a vehicle. 4,231,257, Cl. 73-432.0CR.
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Youden, Robert H.; and Robertson, Charles S. Apparatus for maximizing intersect earnings and providing payments from principal without interest penalty. 4,232,367, Cl. 364-408.000.
Young, Eldon L. Inflatable high speed boat. 4,231,131, Cl. 9-2.00C.
Young, Joe W.; and Odenthal, Charles, to C. R. Bard, Inc. Nebulizer with variable flow rate control and associated method. 4,231,973, Cl. 261-78.00A.
Young, Maurice E.: *See*—
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Youngflex S.A.: *See*—
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Yu, Ruey J., to General Motors Corporation. Thermistor with more stable beta. 4,231,902, Cl. 252-519.000.
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Toyama, Akira; Ohkoshi, Akio; Toyama, Takashi; Yukawa, Takahiro; and Hosono, Takashi, 4,232,332, Cl. 358-67.000.
Yuuki, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for an internal combustion engine. 4,231,336, Cl. 123-568.000.
Z-L Limited Partnership: *See*—
Zilliken, Fritz W., 4,232,122, Cl. 435-52.000.
Zachum, Billy G.: *See*—
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Zahnradfabrik Friedrichshafen AG.: *See*—
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Zanutti, Hugo A. Vessel location system. 4,232,391, Cl. 455-96.000.
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Zeelen, Filippus J.: *See*—
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Zeidler, Guenter; and Oestreich, Ulrich, to Siemens Aktiengesellschaft. Communication cable with glass fiber light waveguides. 4,231,635, Cl. 350-96.230.
Zeldin, Arkady; Carciello, Neal; Kukacka, Lawrence; and Fontana, Jack, to United States of America, Energy. High temperature concrete composites containing organosiloxane crosslinked copolymers. 4,231,917, Cl. 260-37.0SB.
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Ziehm, Richard T., to Xerox Corporation. Method and apparatus for clearing jams in copiers. 4,231,567, Cl. 271-259.000.
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Zigman, Seymour: *See*—
Gilman, Paul B., Jr.; Belly, Robert T.; Koszelak, Thaddeus D.; and Zigman, Seymour, 4,232,121, Cl. 435-32.000.
Zilliken, Fritz W., to Z-L Limited Partnership. Antioxidants, antioxidant compositions and methods of preparing and using same. 4,232,122, Cl. 435-52.000.
Zimmer Orthopaedic Limited: *See*—
Hodgkins, Bernard E.; and Wadey, Raymond C. C., 4,231,589, Cl. 280-781.000.
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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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396 4,231,881
601 4,231,862
615 4,231,863
636 4,231,865
660 4,231,866
669 4,231,864
703 4,231,867
728 4,231,868
763 4,231,869
797 4,231,870

CLASS 215

250 4,231,479
329 4,231,480

CLASS 219

10.55 C 4,232,210
69 W 4,232,208
137.41 4,232,209
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4,232,213
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CLASS 222

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CLASS 223

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CLASS 224

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CLASS 225

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CLASS 226

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CLASS 228

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109 4,231,506
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219 4,231,508

CLASS 229

22 4,231,509
39 B 4,231,510

CLASS 235

78 RC 4,232,215
375 4,231,511
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CLASS 236

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87 4,231,515

CLASS 237

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CLASS 238

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171 4,231,520
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468 4,231,524
585 4,231,525

CLASS 241

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182 4,231,528
189 R 4,231,529
223 4,231,530

CLASS 242

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199 4,231,532

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227 4,232,219
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557 4,231,904

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CLASS 256

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19 N 4,231,906
23 AR 4,231,907
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572 4,232,373
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CLASS 408

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 11, 1980

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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

November 11, 1980 Volume 1000 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

June 17, 1980.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,521,588, Re. S.N. 178,774, Filed Aug. 18, 1980, Cl. 114/263, MOVABLE FLOATING BOAT ANCHORAGE, Gerald D. Atlas, Owner of Record: *Paragon Pool Enterprises, Wheeling, Ill.*, Attorney or Agent: Allen H. Gerstein, Ex. Gp.: 315

3,772,589, Re. S.N. 177,560, Filed Aug. 13, 1980, Cl. 324/10, APPARATUS FOR DETERMINING THE RESISTIVITY OF A SUBSURFACE EARTH FORMATION AT DIFFERENT LATERAL DISTANCES FROM A BORE HOLE WALL, Andre Scholberg, Owner of Record: *Schlumberger Technology Corporation, New York, N.Y.*, Attorney or Agent: Stephen L. Borst, et al., Ex. Gp.: 252

3,902,898, Re. S.N. 162,122, Filed Jun. 23, 1980, Cl. 75/128 P, FREE-MACHINING AUSTENITIC STAINLESS STEEL, Elbert E. Denhard, Jr., et al., Owner of Record: *Armco Inc., Middletown, Ohio*, Attorney or Agent: Albert E. Strasser, et al., Ex. Gp.: 111

3,924,653, Re. S.N. 167,045, Filed Jul. 9, 1980, Cl. 137/236, DEVICE FOR TEMPORARY STORAGE OF WASTE AND STORM WATER, Stein Bendixen, Owner of Record: *Inventor*, Attorney or Agent: Charles E. Brown, et al., Ex. Gp.: 341

3,987,784, Re. S.N. 177,619, Filed Aug. 13, 1980, Cl. 126/447, SOLAR ENERGY ABSORBER PANEL, Joseph A. Godrick, Owner of Record: *Kennecott Copper Corporation, New York, N.Y.*, Attorney or Agent: Harold D. Jones, et al., Ex. Gp.: 345

4,018,944, Re. S.N. 182,031, Filed Aug. 28, 1980, Cl. 427/140, METHOD OF APPLYING A WEARING SURFACE, James R. Hallstrom, et al., Owner of Record: *Rexnord Inc., Milwaukee, Wis.*, Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 162

4,105,391, Re. S.N. 176,260, Filed Aug. 7, 1980, Cl. 425/526, INJECTION BLOW MOLDING MACHINE, Katashi Aoki, Owner of Record: *Nissei ASB Machine Co., Ltd., Tokyo, Japan*, Attorney or Agent: Carl Kustin, et al., Ex. Gp.: 147

4,107,715, Re. S.N. 177,614, Filed Aug. 13, 1980, Cl. 354/206, FILMSTRIP METERING DEVICE FOR A CAMERA, Harumi Tanaka, Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: Lawrence R. Radanovic, Ex. Gp.: 211

4,109,829, Re. S.N. 182,783, Filed Aug. 29, 1980, Cl. 222/81, CONTAINER FOR METERED DISPENSING OF LIQUID, Alexander Kuckens, et al., Owner of Record: *Dagma Deutsche Automaten- und Getrankemaschinen-Gesellschaft mit Beschrankter Haftung & Co., Reinfeld, Germany*, Attorney or Agent: Dale R. Small, Ex. Gp.: 311

4,110,795, Re. S.N. 181,610, Filed Aug. 27, 1980, Cl. 358/260, METHOD OF GRAPHIC DATA REDUNDANCY REDUCTION IN AN OPTICAL FACSIMILE SYSTEM, David R. Spencer, Owner of Record: *Litton Systems, Inc., Melville, N.Y.*, Attorney or Agent: Robert F. Rotella, et al., Ex. Gp.: 233

4,117,405, Re. S.N. 180,501, Filed Aug. 22, 1980, Cl. 455/51, NARROW-BAND RADIO COMMUNICATION SYSTEM, Louis Martinez, Owner of Record: *Inventor*, Attorney or Agent: Roger W. Blakely, et al., Ex. Gp.: 233

4,140,900, Re. S.N. 182,694, Filed Aug. 29, 1980, Cl. 250/213 VT, PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE AND RADIOGRAPHIC CAMERA SYSTEM, Shih-Ping Wang, Owner of Record: *Diagnostic Information, Inc., Sunnyvale, Calif.*, Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 252

4,157,173, Re. S.N. 178,835, Filed Aug. 18, 1980, Cl. 267/110, SEAT BASE RAIL CONNECTOR AND ASSEMBLY, Lawton H. Crosby, Owner of Record: *Morley Furniture Spring Corporation, Chicago, Ill.*, Attorney or Agent: James P. Hume, et al., Ex. Gp.: 311

4,166,290, Re. S.N. 177,555, Filed Aug. 13, 1980, Cl. 364/200, COMPUTER MONITORING SYSTEM, Eugene L. Furtman, et al., Owner of Record: *Tesdata Systems Corporation, McLean, Va.*, Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 237

4,166,547, Re. S.N. 177,718, Filed Aug. 11, 1980, Cl. 220/339, TIDY BOX MADE ENTIRELY OF POLYPROPYLENE, Renato Castelli, Owner of Record: *Inventor*, Attorney or Agent: George J. Netter, Ex. Gp.: 241

4,198,398, Re. S.N. 178,345, Filed Aug. 14, 1980, Cl. 424/177, ENKEPHALIN ANALOGUES, Derek Hudson, Owner of Record: *Derek Hudson, et al.*, Attorney or Agent: Thomas P. Sarro, Ex. Gp.: 125

PATENT NOTICES

Certificates of Correction for the Week of Nov. 11, 1980

D. 253,296	4,186,350	4,209,431	4,214,246
D. 255,024	4,186,610	4,209,583	4,214,249
D. 256,403	4,187,705	4,209,598	4,214,337
3,947,810	4,188,743	4,210,220	4,214,481
3,981,283	4,189,222	4,210,238	4,214,509
3,983,027	4,190,598	4,210,288	4,214,559
4,003,023	4,192,921	4,210,360	4,214,570
4,005,077	4,194,704	4,210,423	4,215,071
4,032,543	4,195,850	4,210,702	4,215,077
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4,047,804	4,198,431	4,211,097	4,215,607
4,048,058	4,198,496	4,211,277	4,215,668
4,049,248	4,200,443	4,211,431	4,215,780
4,067,067	4,201,712	4,211,711	4,216,378
4,072,396	4,201,788	4,211,736	4,216,398
4,075,059	4,201,843	4,211,759	4,216,435
4,104,438	4,202,064	4,212,111	4,216,494
4,111,869	4,203,706	4,212,119	4,216,554
4,122,304	4,204,062	4,212,307	4,216,561
4,134,740	4,204,208	4,212,317	4,216,714
4,138,268	4,204,264	4,212,333	4,216,764
4,138,854	4,204,664	4,212,420	4,216,772
4,141,886	4,204,894	4,212,564	4,217,078
4,156,088	4,206,101	4,212,789	4,217,176
4,161,031	4,206,267	4,212,896	4,217,202
4,161,812	4,206,490	4,212,952	4,217,440
4,162,130	4,206,541	4,212,960	4,217,679
4,162,492	4,207,137	4,212,990	4,217,748
4,165,371	4,207,142	4,213,036	4,218,452
4,169,011	4,207,529	4,213,187	4,218,751
4,172,802	4,208,215	4,213,403	4,218,813
4,173,417	4,208,290	4,213,518	4,219,449
4,180,931	4,208,295	4,213,613	4,219,532
4,181,403	4,208,679	4,213,650	4,220,174
4,184,042	4,209,157	4,213,710	4,220,200
4,184,203	4,209,306	4,213,912	4,221,365
4,185,806	4,209,391	4,213,984	4,221,865
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Disclaimer and Dedication

4,155,453.—*Dan D. Ono*, San Francisco, Calif. INFLATABLE GRIP CONTAINER. Patent dated May 22, 1979. Disclaimer and Dedication filed Aug. 11, 1980, by the inventor.

Hereby disclaims and dedicates all claims of said patent.

Disclaimer

4,089,930.—*James R. Kittrell*, Amherst, Mass. and *Donald L. Herman*, Yardley, Pa. PROCESS FOR THE CATALYTIC REDUCTION OF NITRIC OXIDE. Patent dated May 16, 1978. Disclaimer filed Feb. 29, 1980, by the assignee, *New England Power Service Company*.

The term of this patent subsequent to Mar. 21, 1995, has been disclaimed.

National Technical Information Service

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U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6-124,011. Protection of Insect Pheromones From Degradation by Ultraviolet Radiation. Filed Feb. 25, 1980.

Patent application 6-124,012. Protection of Insect Pheromones From Degradation by Ultraviolet Radiation. Filed Feb. 25, 1980.

Patent application 6-128,440. Process for the Preparation of Tris(aminomethyl)phosphine Oxide and its Ternary Salts. Filed Mar. 10, 1980.

Patent application 6-132,594. Method of Imparting Smolder Resistance to Cotton-Containing Textiles. Filed Mar. 21, 1980.

Patent application 6-134,014. Compositions and Processes for Producing Flame Retardant Textile Materials Based on Methylolaminotrimatopropyl Triazines and Antimony Oxides. Filed Mar. 26, 1980.

Patent 4,194,032. Transfer Techniques for Producing Flame Retardant Cotton Fabrics. Filed Mar. 5, 1975. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,196,302. Quaternary Phosphonium Salts Bearing Carbamate Groups. Filed Mar. 6, 1979. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,199,460. Fatty Acid-Derived Lubricants and Additives. Filed Sept. 26, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,201,709. Process for Producing a Low Gossypol Protein Product From Glanded Cottonseed. Filed May 26, 1978. Patented May 6, 1980. Not available NTIS.

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	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Hearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers, Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-23-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-1-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents ..... Numbers 2,277 to 2,286, inclusive

REISSUES

NOVEMBER 11, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,432

STRUCTURAL ASSEMBLIES

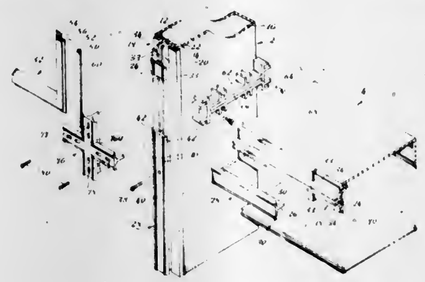
Richard L. Stoakes, "Clouds", Northdown Rd., Woldingham, Surrey, England

Original No. 3,940,897, dated Mar. 2, 1976, Ser. No. 430,036, Jan. 2, 1974. Application for reissue Feb. 21, 1978, Ser. No. 879,797

Claims priority, application United Kingdom, Jan. 10, 1973, 1285/73

Int. Cl.[2] **E04B** *2/88, 1/00*

U.S. Cl. 52—395 **14 Claims**



13. A glazing structure comprising an elongated structural member having two spaced apart surfaces to abut against, with or without the interposition of gaskets, the one faces of two panel edge portions respectively, a glazing bead of open channel section whereof the channel base is arranged to engage the structural member between the said surfaces with the side walls of the channel extending outwardly away from the structural member, the side walls being turned outwardly from one another at their end portions to provide abutments facing towards the surfaces to lie opposite the other faces of the edge portions of the panels respectively, means accessible from the outer side of the channel section of the glazing bead to secure the base of the channel of the bead to the structural member and two gaskets of elastomeric material each having a first portion to lie between the abutment and the other faces and second portions to enter within the channel of the glazing bead, the arrangement being such that the glazing bead can first be secured to the structural member with the first portions of the gaskets secured between the bead and the panels to hold the panels in position and the second portions can then be pressed side by side in the channel to form a weatherproof seal for the channel.

Re. 30,433

HEAT EXCHANGER

Rudy C. Bussjager, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Original No. 4,057,976, dated Nov. 15, 1977, Ser. No. 720,722, Sep. 7, 1976. Application for reissue Jan. 5, 1979, Ser. No. 1,324

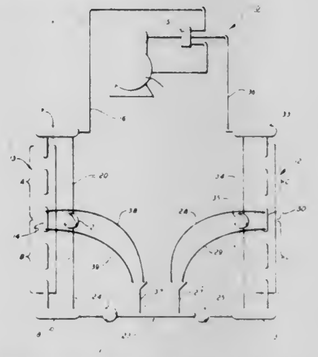
Int. Cl.[2] **F25B** *1/00, 13/00;* **F28F** *27/02*

U.S. Cl. 62—115 **3 Claims**

10. A method of routing refrigerant through a heat exchanger arranged to serve as a condenser when the flow of refrigerant to the exchanger is in one direction and as an evaporator when the flow to the exchanger is in the opposite direction, the steps including

dividing the heat exchanger into a plurality of heat transfer zones arranged so that when air flows through the heat exchanger, the air flows through the zones in parallel paths,

directing refrigerant in a series flow progression through each of the heat transfer zones when the flow to the exchanger is in one direction, and



rerouting the refrigerant through each of the heat transfer zones simultaneously when the flow to the exchanger is in the opposite direction.

Re. 30,434

ELECTROLESS TIN AND TIN-LEAD ALLOY PLATING BATHS

Thomas F. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original No. 4,093,466, dated Jun. 6, 1978, Ser. No. 574,979, May 6, 1975. Application for reissue Dec. 21, 1978, Ser. No. 972,088

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[3] **C23C** *3/02*

U.S. Cl. 106—1.22 **9 Claims**

1. A salt composition, when diluted with 1 liter of water and sufficient hydrochloric acid to provide a solution having a pH of 0.5 to 1, is suitable for immersion plating [tin-lead alloys] *essentially tin* at increased rates, the salt composition [comprising] *consisting essentially of* the proportions of:

a.	hydrous stannous chloride ($SnCl_2 . 2H_2O$)	from about 10 to about 150 g.
b.	lead chloride ($PbCl_2$)	from about 1 to about 12 g.
c.	sodium hypophosphite ($NaH_2PO_2 . H_2O$)	from about 10 to about 100 g. and
d.	thiourea ($NH_2 . CS . NH_2$)	from about [15] *40* about 100 g.

Re. 30,435

KEYBOARD SWITCH ARRANGEMENT AND KEY SWITCH USEABLE THEREIN

Satoshi Fukao, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Original No. 3,900,712, dated Aug. 19, 1975, Ser. No. 434,591, Jan. 18, 1974. Application for reissue Aug. 15, 1977, Ser. No. 825,540

Claims priority, application Japan, Feb. 23, 1973, 48-22564

Int. Cl.[2] **H01H** *13/04;* **B41J** *5/08;* **H01H** *9/02*

U.S. Cl. 200—159 R **8 Claims**

9. A key switch unit, for use in a keyboard arrangement, comprising:

a base plate having a pair of fixed electrodes which are separated by a non-conductive area;

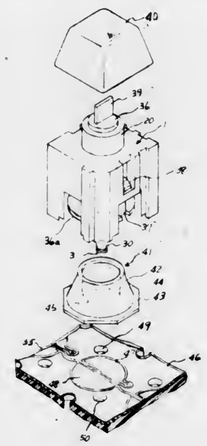
a key unit dismountably retained on said base plate, said unit including a key stem with a push button on top thereof and a key stem holder in slidable engagement with said key stem;

a movable electrode mechanism, disposed between said key unit and said base plate, comprising, assembled into one body, (a) an inverted cup-like resilient cone having a restoring force against deformation by manual depressing of said push button, said cone being provided with an outwardly directed flange extending around the opening thereof, (b) a resilient member, made of an insulating material, fixed to an upper end of said resilient cone and positioned below said upper end, and (c) a movable electrode layer fixed to a lower end of said resilient member; and

an electrically insulating layer disposed between said pair of fixed electrodes and said movable electrode layer so as to form a capacitor switch in combination with said fixed and movable electrodes,

wherein said movable electrode layer is movable downwardly to switch ON when said push button is manually depressed and upwardly to switch OFF by the restoring force of said resilient cone, and

wherein said outwardly directed flange of said cup-like resilient cone is held stably in position between abutting portions of said key stem holder and an upper surface of said plate,



thereby causing said cone to envelop said capacitor switch, with the opening thereof contacting the surface of said base plate, and causing said movable electrode mechanism to be retained stably on said base plate while remaining easily removable by means of dismounting said key stem holder from said base plate.

PATENTS

GRANTED NOV. 11, 1980

ERRATA

For CLASS	See PATENT NO.
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493-010	4,232,592
493-224	4,232,593
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405-263	4,233,015
430-535	4,233,074
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208-112	4,233,139
208-180	4,233,140
208-236	4,233,141
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250-214 AL	4,233,545

PATENTS

GRANTED NOVEMBER 11, 1980

GENERAL AND MECHANICAL

4,232,402

MULTI-FUNCTIONAL CONVERTIBLE GARMENT

Elizabeth M. Roche, Post and Rail Farms Rd., Palos Park, Ill. 60464

Filed Oct. 3, 1978, Ser. No. 948,161
Int. Cl.[2] A41D 1/00
U.S. Cl. 2—93 **8 Claims**



1. A multi-functional convertible human garment comprising

(A) a sleeve equipped jacket for overlying upper portions of a torso having

(1) generally vertically extending, front opening, mating flaps, and

(2) one side of a first zipper-type slide fastener member means depending about bottom circumferential portions of said jacket including means mounting said first fastener member to said jacket,

(B) a first extension for overlying lower portions of such torso having

(1) generally vertically extending, front opening, mating flaps,

(2) upper circumferential portions thereof which are locatable in circumferentially adjacent relationship to said jacket bottom circumferential portions, said upper circumferential portions thereof being about equal to said jacket bottom circumferential portions, said first extension flaps being generally aligned with said jacket flaps,

(3) bottom circumferential portions thereof in transversely spaced, generally parallel relationship to said upper circumferential portions thereof, and

(4) one side of each of a second and a third zipper-type slide fastener member means depending about a different one of each of said upper circumferential portions thereof and said bottom circumferential portions thereof respectively, including respective means mounting said second and said third fastener members to said first extension,

(C) a second extension for overlying upper leg portions depending from such torso or, alternatively, for overlying upper shoulder portions of such torso, said second extension having

(1) generally vertically extending, front opening, mating flaps,

(2) upper circumferential portions thereof which are locatable in circumferentially adjacent relationship to said first extension bottom circumferential portions, said upper circumferential portions thereof being about equal to said first extension bottom circumferential portions, said second extension flaps being generally aligned with said first extension flaps, and

(3) one side of a fourth zipper-type slide fastener member means depending about said upper circumferential portions thereof including means mounting said fourth fastener member to said second extension,

(D) a separate and independent belt means for tightening about waist regions of such torso, or alternatively, for extending over shoulder portions of such torso, said belt means having

(1) upper and lower circumferential portions, said lower circumferential portions being locatable in circumferentially adjacent relationship to said second extension upper circumferential portions, said belt means being about equal in length to the distance about said second extension upper circumferential portions and being generally coextensible therewith, and

(2) a single zipper means being one side of a fifth zipper-type slide fastener member means depending about said lower circumferential portions thereof, including means mounting said fifth fastener member to said belt means,

(E) said first fastener member being disengagably interconnectable with said second fastener member, including reversable connecting means therefor, for engaging said jacket to said first extension, if desired,

(F) said third fastener member being disengagably interconnectable with said fourth fastener member, including reversable connecting means therefor, for engaging said first extension to said second extension, if desired,

(G) said fifth fastener member being disengagably interconnectable with said fourth fastener member for engaging said belt means with said second extension, if desired.

4,232,403

TRANSFORMABLE CHRISTENING BONNET AND BRIDE'S HANDKERCHIEF

Kathryn S. Burtis, 74116 De Anza Way, Palm Desert, Calif. 92660

Filed Apr. 2, 1979, Ser. No. 26,025
Int. Cl.[2] A42B 1/20, 15/04
U.S. Cl. 2—204 **7 Claims**





1. In combination with a protective folder, a substantially square handkerchief of woven material and first and second ribbons of substantially equal length, said handkerchief capable of being carried as such by a bride at a wedding and subsequently said handkerchief and first and second ribbons when

removably combined cooperating to define a baby's christening bonnet, said handkerchief after use at said wedding and a christening being stored in said protective folder, said handkerchief formed from a foldable cloth and being substantially square and having first and second side edges and first and second end edges, said handkerchief prior to defining said christening cap having first, second and third fold lines formed therein, said first fold line intermediately disposed between said first and second edges and parallel thereto to divide said handkerchief into first and second rectangular panels, said second panel overlying said first panel, said second and third fold lines dividing said first and second panels into first and second generally triangular shaped segments that are separated by a generally trapezoidal intermediate segment, said first and second triangular segments each having first and second segments overlying a major portion of said intermediate segment, with portions of said first and second segments adjacent said intermediate segment overlapping one another; first means for removably securing said portions of said first and second segments together to define said bonnet, said bonnet having the top and sides thereof defined by said first panel and the rear thereof by said second panel, with the forward edge of said bonnet defined by said first end edge of said first panel, and the lower side edges and rear edge of said bonnet by said first and second side edges of said first panel; and second means for removably securing said first and second ribbons to the lower forward extremities of the sides of said bonnet, said first and second ribbons capable of being extended under the chin of a baby and tied to retain the bonnet in place on the baby's head, with the first and second means capable of being removed to permit the bonnet to be returned to the initial hankerchief configuration to again be used for the same purpose by subsequent generations.

4,232,404

ENDOPROSTHETIC ANKLE JOINT

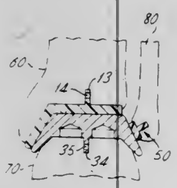
Kent M. Samuelson, Salt Lake City, Utah, and Michael A. Tuke, Morden, England, assignors to National Research Development Corporation, London, England

Filed Jul. 11, 1978, Ser. No. 923,687

Claims priority, application United Kingdom, Jul. 18, 1977, 30073/77

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.91 **4 Claims**



1. An endoprosthetic ankle joint device, comprising:

a talar component defining, relative to an axis, a convex articulatory surface of revolution of which the generator has a rectilinear intermediate portion parallel to said axis and two rectilinear end portions extending in equally inclined divergent manner towards said axis, so that said convex surface is formed by a part-circular-cylindrical area flanked at each end by a coaxial part-conical area;

a tibial component defining, relative to said axis, an assymmetrical concave surface of revolution substantially complementary with and in articulatory engagement with said cylindrical area and only one of said conical areas; and

a fibular component having an articulatory surface engaged with the other of said conical areas;

said components being adapted remotely from said surfaces for respective securement to the talus, tibia, and fibula;

said talar component being, as a whole, symmetrical about the medial axial radial plane and the medial transverse radial plane of said cylindrical area; and

said tibial component being, as a whole, symmetrical about said axial plane.

4,232,405

PROSTHESIS JOINT

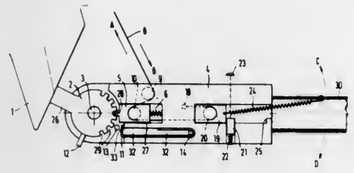
Franz Janovsky, Vienna, Austria, assignor to Viennatone Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 13, 1978, Ser. No. 959,894

Claims priority, application Austria, Nov. 11, 1977, 8101/77

Int. Cl.³ A61F *1/04, 1/06*

U.S. Cl. 3—12.3 **4 Claims**



1. A prosthesis joint for the rotatable connection of two prosthesis parts pivotal in relation to each other, which comprises

(a) a detent body rotatably mounted on one of the prosthesis parts and fixedly connected to the other prosthesis part, the detent body having a periphery defining a series of detent notches and a lug affixed thereto and projecting from the periphery,

(b) a latch having a tip, the latch being mounted slidably in relation to the detent body,

(c) a spring biasing the latch against the detent body into a first position wherein the tip of the latch engages a respective one of the detent notches to lock the joint,

(d) a cable line attached to the latch and operable to move the latch against the spring bias into a second position wherein the tip of the latch is disengaged from the one detent notch to unlock the joint, operation of the cable line pivoting the one prosthesis part in relation to the other prosthesis part, and

(e) a stop part including a leaf spring having an angularly bent end displaceable between the notched periphery of the detent body and the latch by the lug to retain the latch in the second position.

4,232,406

WATER CLOSET VENTILATING SYSTEM WITH VACUUM BREAKER VALVE

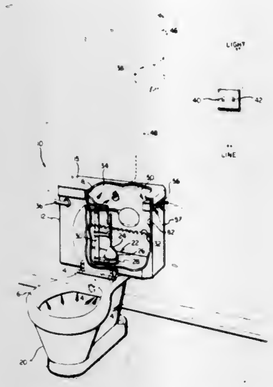
Lester R. Beeghly, and George E. Gilchrist, both of 4400 N. Paulina Ave., Chicago, Ill. 60640

Filed May 18, 1979, Ser. No. 40,432

Int. Cl.³ E03D *9/04;* **A47K** *13/00*

U.S. Cl. 4—213 **8 Claims**

1. In a system for ventilating water closets of the type having a flush tank for storing water at a storage level, said flush tank having a cover adapted to fit thereon, a bowl having a flush ring with a plurality of apertures formed around the periphery of said bowl, conduit means connecting said flush tank with said bowl, a standpipe mounted within said flush tank and having its lower end communicating with said flush ring and its upper end communicating with the space above the normal level of the water in said flush tank, and means for effecting the withdrawal of gases from said space and consequently from said bowl, the improvement of which comprises the inclusion of means responsive to lowering of the water level in said flush tank for venting the space above the level of the water in said tank to the atmosphere during flushing so as to eliminate any vacuum in said space and thereby prevent any restriction of the flow of water from said flush tank into said bowl.



4,232,407

BASKET STRAINER AND STOPPER ASSEMBLY FOR SINKS

Frank N. Williams, Sandwich, Ill., assignor to Bradley Corporation, Menomonee Falls, Wis.

Filed Mar. 19, 1979, Ser. No. 21,581

Int. Cl.³ A47K *1/14;* **E03C** *1/26*

U.S. Cl. 4—287 **3 Claims**



1. In a basket strainer-stopper assembly for closing the drain opening of a sink having a drain plate with a central opening extending across the drain opening, which basket strainer-stopper assembly comprises a cup-shaped basket strainer, a stopper for closing the drain opening positioned below the basket strainer and the means which hold the assembly in an open drain position and cooperate with the opening in the drain plate to retain the assembly in a closed drain position, the improved means which comprise a stem extending axially through the basket strainer and the stopper, said stem having an upper portion projecting into the basket strainer to provide a handle and a lower forked portion having a plurality of individual arcuate legs which are connected at one end to the stem and have tips at the other end that support the assembly in a stable position upon the drain plate about the central opening when the assembly is in an open drain position, said arcuate legs being sufficiently resilient so that when a downward force is exerted on the upper portion of the stem the legs will flex inwardly sufficiently to pass through the central opening in the drain plate so that the assembly can assume a closed drain position and so that the legs also will flex inwardly when the upper portion of the stem is pulled upwardly so that the assembly can be moved from the closed drain position to an open drain position.

4,232,408

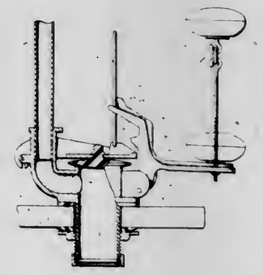
TWO VARIABLE FLUSH GATE FOR LAVATORY RESERVOIR

Lee Chen-Yuan, No. 14 Alley 6 Lane 251 Fu-Te Street, Taipei, Taiwan

Filed Mar. 30, 1979, Ser. No. 25,547

Int. Cl.³ E03D *1/14, 1/34*

U.S. Cl. 4—325 **5 Claims**



1. A flush gate for a toilet flush tank having two modes of actuation for permitting two different water volumes to be selectively flushed, comprising, in combination:

a pivot area,

a first control piece pivoted at said pivot area to a flush gate housing having first and second extremities on opposed sides of said pivot area,

a flush gate seal pivotably mounted on said flush gate housing,

means on said first extremity to engage and retain said flush gate seal overlying said flush gate for one time interval

first float means on said second extremity to disengage said seal from said first extremity when the water volume falls to a selected level;

a second control piece pivoted at said pivot area and laterally spaced from said first control piece, and substantially parallel thereto having first and second extremities on opposed sides of said pivot area with means on said first extremity to engage and retain said seal for a second time interval, and second float means on said second extremity to disengage said seal when the water volume falls to another selected level, said first and second control pieces being pivoted in said pivot area about a single pivot axis.

4,232,409

PNEUMATIC ASSISTED FLUSHING APPARATUS FOR TOILETS

Minh Van Pham, 3200 Ridgewood Rd., Willits, Calif. 95490

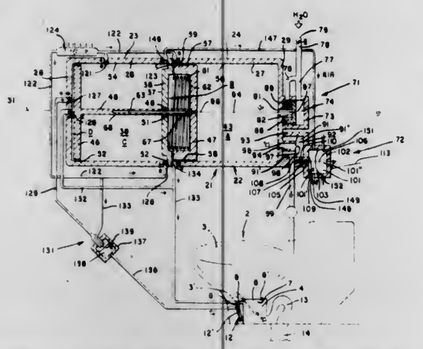
Filed Aug. 21, 1978, Ser. No. 935,382

Int. Cl.³ E03D *3/10, 11/00, 5/012*

U.S. Cl. 4—362 **33 Claims**

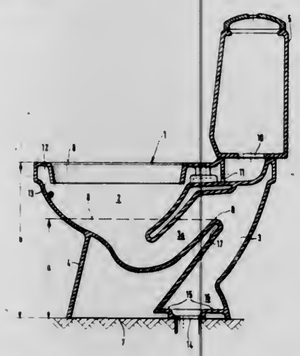
1. An apparatus for compressing a predetermined volume of air without the use of an independent motor-driven air compressor and for delivering said compressed air under pressure to the evacuation chamber of a pneumatic assisted water flush toilet bowl to discharge waste products from the evacuation chamber, comprising:

(a) a fluid-tight housing having walls defining a hollow interior;
(b) at least one piston reciprocable within said housing and constituting a displaceable wall defining with said housing walls a pair of chambers variable in volume in response to displacement of said piston, one of said chambers of said pair containing air at a predetermined pressure;



(c) means controlling admission of water under pressure to the other chamber of the pair to effect displacement of the piston to reduce the volume of the first mentioned chamber of the pair to pressurize the air therewithin above said predetermined pressure; and
(d) means controlling delivery to said evacuation chamber of pressurized air from said other chamber of the pair to thereby effect discharge of waste products from said evacuation chamber.

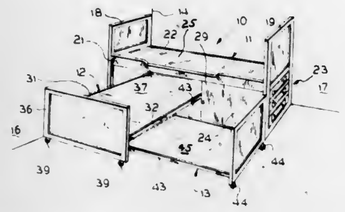
4,232,410
WATER CLOSET
Torbjörn Forsbäck, Ekenäs, and Arvo Förbom, Vantaa, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland
Filed Dec. 15, 1978, Ser. No. 969,860
Int. Cl.³ E03D *11/18*
U.S. Cl. 4—415 **15 Claims**



1. A water closet including a body portion with an upper level and a lower level, and integral with said body portion, a closet bowl and an outlet conduit forming an odor seal at the bottom of said bowl, said odor seal having an outlet crest determining the highest water level of said odor seal, further a flush water container adjacent to said body portion and means for flushing said closet bowl by means of water passing by gravity from said flush water container through said bowl and said outlet conduit, wherein the improvement consists in the combination of the following features:
(a) that said odor seal outlet crest is at a height level of at least 50 percent of the height of said upper level measured from said lower level;
(b) that close to said upper level there is an annular flush duct of substantially bottomless configuration opening into said bowl at a level above said odor seal outlet crest;
(c) that said outlet conduit has a constriction at its outlet end below said odor seal, said constriction being downstream of said odor seal

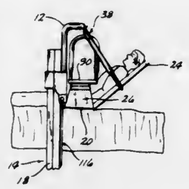
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4,232,411
COMBINATION BED AND LOUNGE ASSEMBLY
Henning J. Speyer, Melrose Park, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed May 24, 1979, Ser. No. 42,168
Int. Cl.³ A47B *83/00, 87/00*
U.S. Cl. 5—8 **4 Claims**



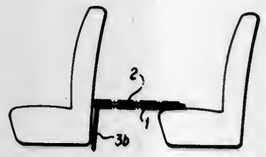
1. A combination bed and lounge assembly comprising first, second and third bed units, each having an occupant supporting member, the supporting member of the first bed unit being highermost, the supporting member of the second bed unit being below the supporting member of the first bed unit and the supporting member of the third bed unit being below the supporting member of the second bed unit, whereby in a lounge mode an end portion of said second bed unit is received in the space under the supporting member of said first bed unit and an end portion of said third bed unit is received in the space under the supporting member of said second bed unit which is remote from the first bed unit, with said second bed unit being disposed at a right angle to said first bed unit and the third bed unit being disposed at a right angle to said second bed unit and parallel to said first bed unit and forming a three tiered lounge assembly, said bed units being independently manually separable for sleeping purposes.

4,232,412
PATIENT TRANSFER DEVICE
Bartholomew Petrini, 7517 N. Ridge Dr., Omaha, Nebr. 68112
Filed Nov. 30, 1978, Ser. No. 964,831
Int. Cl.² A61G *1/02*
U.S. Cl. 5—86 **10 Claims**



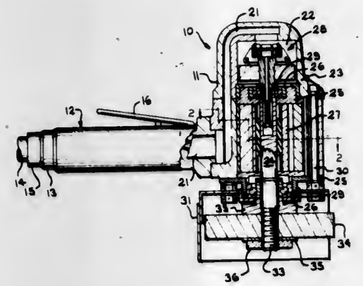
1. A device for supporting a patient on a lift apparatus comprising,
a generally rigid back portion,
a generally rigid seat portion foldably connected to a lower end of said back portion,
a main support yoke including an upper cross bar, and a pair of yoke arms extended downwardly from opposite ends of said cross bar,
means for supporting said cross bar on said lift apparatus,
means for pivotally connecting lower ends of said yoke arms to said back portion at a medial position thereon,
a pair of dual arm hangers pivotally connected to said cross bar and extended downwardly therefrom, and
means for securing lower ends of said dual arm hangers to opposite sides of said seat portion.

4,232,413
DEVICE FOR USE AS A COT ON THE REAR SEAT OF A VEHICLE
Jacques H. C. Mongault, 82 rue Dutot, 75015 Paris, France
Filed Sep. 29, 1978, Ser. No. 947,098
Claims priority, application France, Oct. 3, 1977, 77 29626
Int. Cl.³ A47C *27/08*; A47F *1/00*
U.S. Cl. 5—94 **22 Claims**



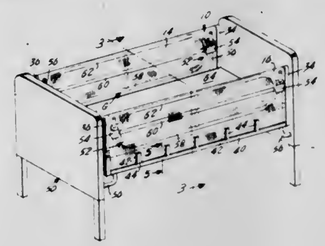
1. Apparatus for forming a cot adapted for use for the rear seat of a vehicle comprising
a having three sides only formed by a front element and a lateral element extending from each end of said front element,
a web of flexible cloth stretched between said three frame elements, the portion of the web extending from the unstructured rear of the frame adapted to rest directly on the vehicle rear seat, and
means connected to said frame adapted for supporting the frame from a fixed point of the body of the vehicle.

4,232,414
FREE-WHEELING OVERSPEED GRINDER DEVICE
George R. Curtiss, Chardon, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.
Filed Jul. 10, 1978, Ser. No. 923,163
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—134.5 F **5 Claims**



1. A vertical grinder comprising, in combination, a motor having a rotor and stator, a grinding wheel, a drive shaft operably connected to said grinding wheel and means for coupling said motor rotor to said drive shaft, said means including mechanically parallel slip clutch means for frictionally engaging said rotor and said shaft and overrunning clutch means for achieving power transfer from said motor rotor to said drive shaft and inhibiting power transfer from said shaft to said rotor, said slip clutch means including at least one clutch annulus disposed between said shaft and said rotor.

4,232,415
MATTRESS SLING
Gloria C. Webber, 44 Gail Dr., New Rochelle, N.Y. 10805
Filed Mar. 19, 1979, Ser. No. 21,913
Int. Cl.³ A47C *21/08*
U.S. Cl. 5—427 **8 Claims**

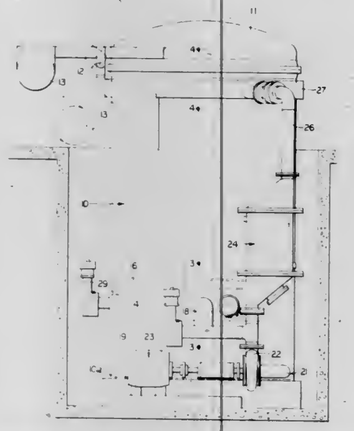


1. A mattress sling for use with a bed having head and foot ends, a mattress support, and substantially horizontal side rails which reciprocate on posts, comprised of:
a base portion adapted to be positioned under a mattress between the mattress and the mattress support, and
two spaced, opposed side portions each (i) having longitudinal proximate edges connected to the base portion, (ii) having head and foot edges and a longitudinal remote edge, (iii) being of a longitudinal length greater than the distance between the posts on which the side rails are mounted such that the head and foot edges are positionable between the posts and the head and foot ends of the bed, and being of a vertical length such that the longitudinal remote edge is positionable below the lowermost side rail, and (iv) having attached thereto releasable securing means in the form of a strip of adhesive material along each head and foot edge, and pieces of pairs of adhesive material positioned adjacent its longitudinal proximate edge and its longitudinal remote edge, for releasably securing each side portion to itself about the side rails so that when a mattress is on the base portion, each secured side portion extends substantially tautly and substantially vertically upward from adjacent the side of the mattress to and over a side rail most vertically removed from the mattress, and downward such that the pairs of pieces of adhesive material are releasably secured to each other vertically below the lowermost side rail, adjacent the side wall and bottom of the mattress, and the strips of adhesive material are secured to each other along the head and foot edges between the posts and the head and foot ends of the bed, to thereby prevent the mattress from shifting out of its proper position of the mattress support, and prevent the bed occupant or his or her appendage from becoming lodged between the lowermost side rail and the mattress or mattress support.

4,232,416
PROCESS FOR WETTING FIBER
Charles W. Burgin, Columbus, Ga., assignor to Morton Machine Works, Incorporated, Columbus, Ga.
Filed Apr. 13, 1979, Ser. No. 29,774
Int. Cl.³ D06B *5/12*
U.S. Cl. 8—156 **1 Claim**

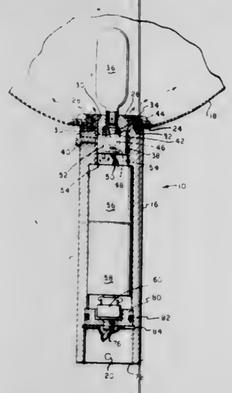
1. The process of wetting masses of fiber comprising:
(a) supporting a mass of fiber to be wetted on a generally horizontally disposed, air and liquid permeable member located intermediate the upper end and closed bottom of a vessel,
(b) supplying liquid to the upper surface of the fiber mass

whereby it flows downwardly, displacing entrapped air in the fiber mass and discharging it from the bottom of the fiber mass,
(c) collecting in the bottom of the vessel liquid which flows



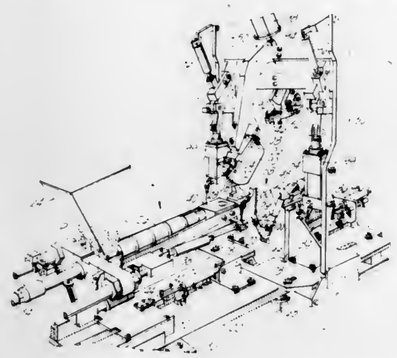
through the mass and recirculating at least a portion of the same through the fiber mass, and
(d) venting from the vessel air displaced from the fiber mass at a point below the fiber mass and above the level of the liquid which collects in the bottom of the vessel.

4,232,417
MARINE MAMMAL RETRIEVAL APPARATUS
Donald Miller, Del Mar, and Robert W. Skipton, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 24, 1979, Ser. No. 6,055
Int. Cl.[3] B63B *21/52*; B63C *9/16*
U.S. Cl. 9—8 R **9 Claims**



1. A retrieval apparatus comprising:
a flotation bag;
gas pressure bottle means;
explosive means connected to the pressure bottle means for puncturing the bottle means;
electronically operated timing means connected to the puncturing means for activating the puncturing means so as to puncture the bottle means after a predetermined time;
a power source;
an on-off switch adapted to be connected to the power source for applying power to the timing means when the switch is turned on;
an elongated pressure housing which has a top opening at one end;
the puncturing means, timing means, power source, and on-off switch being mounted within the housing;
the flotation bag being sealably mounted to the pressure housing opening so that the interior of the bag is in communication with the interior of the housing;
the pressure bottle means extending from the top opening into the flotation bag; and
the switch being mounted through the housing and having a manual actuator located exteriorly thereof.

4,232,418
MACHINE FOR STIFFENING AND FORMING SHEET MATERIAL
John G. Hollick, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.
Continuation-in-part of Ser. No. 806,559, Jun. 14, 1977, Pat. No. 4,127,910. This application Jul. 5, 1978, Ser. No. 921,944
Int. Cl.[2] A43D *7/00*; A43B *13/42*
U.S. Cl. 12—61 A **26 Claims**

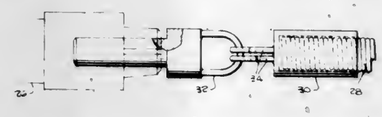


13. In a machine for preforming and stiffening the backpart of a shoe upper preparatory to a lasting operation thereon, movable gripper means for transferring the upper from a position wherein it is suspended and disposed to receive a deposit or series of deposits of thick, hot, molten resin on the inside at the back portion of the upper to a backpart shaping position, and a pair of cooperative V-shaped backpart formers mounted for relative movement of approach with respect to said position and each other, the work engaging surfaces of said formers respectively defining a dihedral angle of from about 30° to about 60° to distribute the resin while still hot and molten as a generally thinner, coating continuously extending substantially throughout the backpart, and the dihedral angle of one of the formers being only slightly greater than that of the other to cause said coating to taper in thickness from the backpart extremity.

4,232,419
ARTICULATED PLUMBERS SNAKE
Winston D. Sanger, 12600 Cuddy Valley Rd., Frazier Park, Calif. 93225
Filed Mar. 26, 1979, Ser. No. 23,587
Int. Cl.[3] B08B *9/02*
U.S. Cl. 15—104.3 SN **2 Claims**

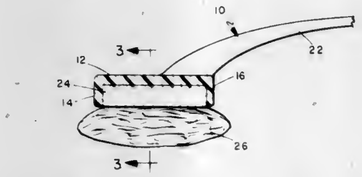
1. A powered plumbers snake comprising:
an elongated flexible water pipe cleaning element having a driven end section,
a power hand tool having a rotary chuck and having a given direction of work rotation,

the driven end section of said flexible water pipe cleaning element having an end portion comprising a shank removably clamped in said chuck,
said flexible element, excepting said driven end section, comprising a plurality of additional sections having complementary detachable connections,
said additional sections each having at one end, a closed loop,



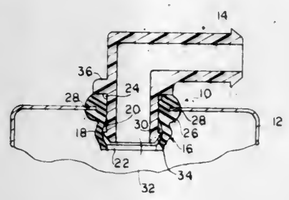
the other end of each such section having split spring ring means within which said closed loop is removably received,
and said driven end section having its end opposite from the shank end, means for detachable connection selectively with one of said detachable connections.

4,232,420
SCOURING PAD HANDLE
Sam Schuster, and Lilian E. Schuster, both of 2625 Pirineos Way, Apt. #124, La Costa, Calif. 92008
Filed Apr. 23, 1979, Ser. No. 32,529
Int. Cl.[3] A47K *7/02*; A47L *13/46*
U.S. Cl. 15—209 D **5 Claims**



1. A detachable handle for scouring pads of the type constructed at least in part of magnetically attracting material the improvement in said handle comprising:
a generally box like body portion having a downwardly opening cavity adapted to receive and mount a magnet;
a water immersible permanent magnet mounted in said cavity of said body portion; and
a handle member adapted to be grasped by the hand of an individual secured to said body portion and extending upward and outward therefrom.

4,232,421
ALTERNATIVE DIAMETER GASKET
James I. Tucker, Manhattan Beach, Calif., assignor to Orion Industries, Inc., Compton, Calif.
Filed Mar. 16, 1979, Ser. No. 21,212
Int. Cl.[2] B65D *7/48*
U.S. Cl. 16—2 **5 Claims**



1. A dual diameter gasket formed as a flexible cylindrical annular sleeve having inner and outer surfaces with a uniform wall thickness therebetween and opposing ends, and said inner surface is of a uniform first diameter throughout its length, between said opposing ends, and an annular lip protrudes radially inwardly from said inner surface at one of said ends and an externally directed collar is integrally formed with said sleeve at the opposite end thereof and an annular recess configured to receive said lip is formed in said interior surface of said sleeve at said opposite end, whereby said sleeve is axially collapsible upon itself throughout its entire length into a toroidal shape and said lip is engageable in said recess and said sleeve has a uniform inner second diameter throughout its length in its collapsed state, and said second diameter is equal to said first diameter reduced by twice the wall thickness of said sleeve.

4,232,422
HAND TOOL WITH REMOVABLE EXTENSION HANDLE
Ruedi Fellmann, Dietlikon, Switzerland, assignor to Max Langenstein Feld- und Gartengeräte, Illertissen, Fed. Rep. of Germany
Filed Sep. 21, 1978, Ser. No. 944,311
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 7729610[U]
Int. Cl.[1] A01B *1/14*; F16D *1/00*
U.S. Cl. 16—110 R **9 Claims**



1. A tool comprising:
an implement;
a relatively short elongated handle having a front end connected to said implement and a rear end formed with a longitudinally backwardly open recess and having a longitudinally backwardly directed rim surrounding this recess;
a relatively long extension handle having a front end formed as a longitudinal projection snugly engageable forwardly in said recess and longitudinally slidable and rotatable therein;
a connecting ring surrounding and fixed longitudinally and rotationally to said extension handle adjacent said front end thereof, said ring having a forwardly directed end face engageable longitudinally flatly against said rim and having a forwardly extending collar extending from said end face toward said front end of said extension handle and engageable inside said recess with said rear end of said short handle; and
means including interengaging generally helical formations on said collar and in said recess of said short handle for locking said handles together screwthread-fashion with said end face bearing longitudinally on said rim.

4,232,423
FURNITURE HINGE
Manfred Schnelle, D-4901 Hiddenhausen 2, Am Reesberg 22, Fed. Rep. of Germany
Filed Aug. 7, 1978, Ser. No. 931,553
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735825
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—130 **15 Claims**

1. A hinge member for attachment into at least one bore in a

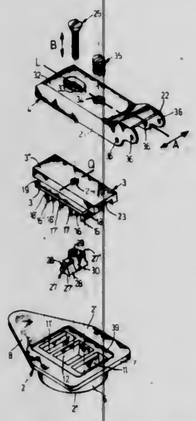
panel, said hinge member having at least one axis pivot comprising:

(a) an anchoring part for insertion into said at least one bore and having means for holding said anchoring part in said at least one bore;

(b) an intermediate support;

(c) at least one flexible ratchet member on one of said intermediate support and said anchoring part and engageable with the other thereof for cooperatively connecting said anchoring part and said intermediate support together;

(d) a hinge arm;



(e) fastening means for connecting said hinge arm and said intermediate support to said anchoring part;

(f) first adjustment means for permitting displacement adjustment of said hinge arm with respect to said panel in a first direction parallel to said panel; and

(g) said fastening means including walls in said anchoring part defining at least one opening therein, said fastening means further including at least two opposed flexible wall sections on said intermediate support fitting into said at least one opening, and clamping means for expanding said opposed flexible wall sections against said walls.

4,232,424

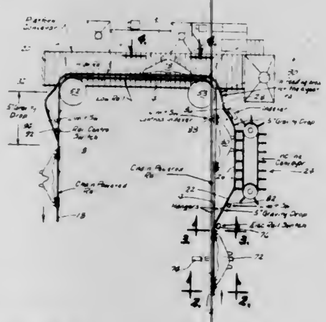
TWO RAIL OVERHEAD CONVEYOR DEVICE

John C. Denefe, 10832 Stone Canyond Rd., Apt. 2402, Dallas, Tex. 75230

Division of Ser. No. 869,006, Jan. 12, 1978. This application Apr. 16, 1979, Ser. No. 30,222

Int. Cl.³ A22B 5/00

U.S. Cl. 17—24 **11 Claims**



1. In combination,

a revolving eviscerating platform conveyor apparatus adapted to support a workman, said platform adapted to revolve at a constant speed,

and a two rail overhead conveyor device for meat processing comprising,

a first rail means adapted to guide and support a conveyor trolley frame having a carcass attached thereto, said first rail means having a first end portion, a middle portion transversing over said platform conveyor at a first predetermined height therefrom and a second end portion,

a second rail means adapted to guide and support a conveyor trolley frame having a carcass attached thereto, said second rail means having a first end portion, a middle portion transversing over said platform conveyor at a second predetermined height therefrom and a second end portion,

first connection means for selectively detachably connecting said first end portion of said second rail means to said first rail means at a point before said middle portion,

first means for propelling a conveyor trolley frame having a carcass attached thereto at said constant speed along said middle portion of said first rail means and along said middle portion of said second rail means,

second means for propelling a conveyor trolley frame having a carcass attached thereto along said first end portion and said second end portion of said first rail means,

third means for propelling a conveyor trolley frame having a carcass attached thereto along said first end portion and said second end portion of said second rail means, and

a detection means operationally attached to said first end portion of said first rail means to detect a carcass of a predetermined size, attached to a conveyor trolley frame on said first end portion,

said detection means being connected to said first connection means so that the detection of a carcass of said predetermined size activates said first connection means thereby guiding said trolley frame and carcass attached thereto onto said first end portion of said second rail means from said first end portion of said first rail means.

4,232,425

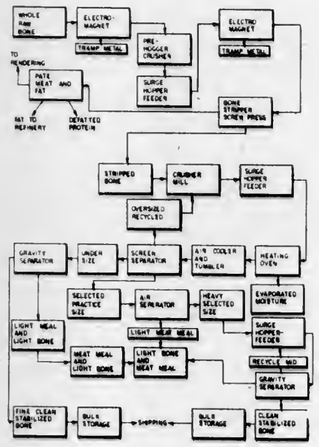
METHOD OF PRODUCING STABILIZED BONE

Herbert W. Wojcik, Palos Heights, Ill., assignor to Darling & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 966,078, Dec. 4, 1978, abandoned. This application Jan. 15, 1980, Ser. No. 112,204

Int. Cl.³ A22C 25/16

U.S. Cl. 17—46 **14 Claims**



1. Process for cleaning and stabilizing raw bone consisting essentially of:

(a) reducing raw bone from its natural state to a size suitable for passing the raw bone into a press with a screw-type conveyor and feeding said raw bone having soft non-bone material including moisture, fat and meat tissue associated therewith into said press with said screw-type conveyor mounted within a cage having at least one wall provided with apertures smaller than the minimum size desired in the bone product,

(b) applying pressure by means of said screw-type conveyor to said raw bone within said cage to force fat and meat tissue through said apertures in the cage and discharging from said cage separately from said fat and meat tissue pressed raw bone material having a particle size ranging between about ¼ inch and about 1½ inches stripped of a substantial portion of said fat and meat tissue associated with said raw bone,

(c) feeding pressed raw bone material having a particle size between about ¼ inch and about 1½ inches and having moisture and residual fat and meat tissue associated therewith into an oven dryer and heating said pressed raw bone material therein without scorching said raw bone material to reduce the moisture content of said bone material and effect crisping said residual fat and meat tissue remaining on said pressed raw bone material whereby said crisped fat and meat tissue are adapted to be separated from the pressed bone material by fracturing the crisped fat and meat tissue during screening and gravity separation treatment of said bone material,

(d) passing said bone material from said dryer through a screen separator means which removes all but a selected range of particle size from said bone material, and

(e) feeding said bone material having the selected range of particle size to a gravity separator means from which high density clean stabilized bone product suitable for making high quality gelatin is recovered separately from low density material.

4,232,426

WEB GUIDING DEVICE

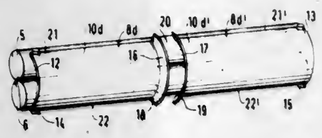
Wolfgang Beneke; Paul G. Teichmann, and Wilfried Weber, all of Mönchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,215

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711619

Int. Cl.² D01G 15/46

U.S. Cl. 19—106 R **21 Claims**



1. In a carding machine including a cylinder; a web delivering assembly arranged downstream of the cylinder and including a pair of cooperating rolls for delivering a running fiber web; a device arranged downstream of the web delivering assembly for gathering the running fiber web; the device including at least one operationally substantially stationary guide element having a hollow guiding face, the improvement wherein said guide element is supported downstream of and immediately adjacent to said rolls; said hollow guiding face extending transversely to the direction of web discharge by said rolls and shrouding at least one part of both said rolls; and said hollow guiding face having upper and lower longitudinal bounding edges extending immediately adjacent and parallel to the one and the other of said rolls, whereby air is substantially prevented from impinging on the running web from the outside.

4,232,427

UNITARY BUTTON FASTENER

Gladys F. Mawhinney, 6202 S. Euclid, Tucson, Ariz. 85734, and George H. McFerron, 2700 N. Sunrock La., Tucson, Ariz. 85705

Filed Apr. 13, 1979, Ser. No. 29,639

Int. Cl.³ A44B 1/18, 1/26

U.S. Cl. 24—90 R **6 Claims**



1. A button attaching system for attaching a button having a hole or eyelet therein to a fabric, said button attaching system comprising in combination:

a. a base element having opposed first and second surfaces, said base element having a retaining aperture extending through said base element from said first surface to said second surface, said base element having a thickness which is substantially less than the lateral dimensions of said first and second surfaces;

b. a shaft having a first end attached to said first surface extending approximately perpendicularly from an attachment point of said first surface, said shaft including a sharp second end for penetrating the fabric, said attachment point being spaced from said retaining aperture, said flexible shaft being sufficiently flexible to permit said shaft to be bent to pass said second end through said hole, the portion of said shaft remaining on the first surface side of said base element forming a U-shaped path; and

c. retaining means attached to said shaft between said first and second ends for allowing said shaft to be easily passed through said retaining hole in the direction from said first side to said second side and preventing said shaft from being moved through said retaining hole in the direction from said second surface to said first surface, the portion of said second end of said shaft being removable after said passing of said shaft through said retaining hole;

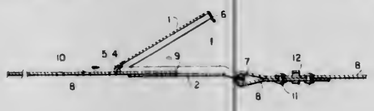
said retaining means including a tapered element extending outwardly from said shaft, said tapered element having a first surface slightly inclined outwardly from the surface of said shaft and a second surface steeply inclined outwardly from the surface of said shaft,

a plurality of flange means disposed around the periphery of said retaining aperture for flexing toward said second surface of said base element in response to pressing of said first slightly inclined surface against said flange means as said tapered element is forced through said retaining aperture by a first force applied in a first direction to said shaft, said flange means also resisting flexing toward said first surface of said base element in response to pressing of said second steeply inclined surface against said flange means as a second force is applied to said shaft in a direction opposite to said first direction, said second force being substantially greater than said first force, said base element and said shaft being composed of plastic material, said base element being sufficiently thick that it is substantially unflexible,

whereby said second end of said shaft can be passed through the fabric, one or more holes or eyelets of the button, back

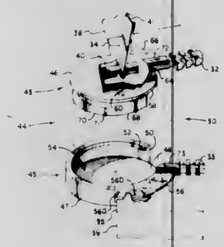
through the fabric, and through said retaining aperture fasten the button to the fabric.

4,232,428
BELT BUCKLE
Lars Johansson, 631 Hicksville Rd., Far Rockaway, N.Y. 11691
Filed Feb. 2, 1978, Ser. No. 874,411
Int. Cl.³ A44B *11/20*
U.S. Cl. 24—188 **12 Claims**



1. A belt buckle formed of a front face piece and rear face piece parallel thereto when said buckle is closed, each of said face pieces being a single piece, said front face piece and rear face piece being the only face pieces present in said belt buckle, each face piece having opposed depending sides extending at substantially right angles thereto, and said rear face piece further having means for bracing said front face piece in the open position, there being at each of the sides of adjacent ends of each face piece opening holes with connectors therein which connectors are flush on the insides which face a belt and which connect the faces in a manner such at the two faces can open to a maximum angle of about 30° apart from each other, at which 30° angle the front face piece is braced by contact with said means on the rear face piece, each of said face pieces extending rearwardly substantially no further than the ends of their sides; and said front face piece includes an integral frictional wedged prong perpendicularly connected to the far end of said front face piece forwardly from said holes and said connectors, which prong can engage said rear face piece in a positive locking manner when the buckle is closed.

4,232,429
SLIDING FASTENER
Martin F. Friedberg, 7233 Aberdeen, Dallas, Tex. 75230
Continuation-in-part of Ser. No. 895,935, Apr. 13, 1978, abandoned. This application Sep. 7, 1978, Ser. No. 940,255
Int. Cl.³ A44B *19/36*
U.S. Cl. 24—205.11 R **11 Claims**



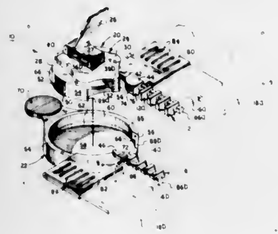
1. In a sliding fastener of the type used for joining sections of a garment and having first and second elongated interlocking elements each attached to one of said sections by a stringer, with said elememts being brought together into side by side interlocking relationship by a slider moving longitudinally along the elements, the improvement comprising:

an insert fastener including two complementary parts;

first means at one end of said first interlocking element for holding the slider in a position to be moved longitudinally to engage the first interlocking element, said first means including one of the insert fastener parts therewith; and

second means, at a corresponding end of said second interlocking element and including the other of the insert fastener parts therewith, for permitting said insert fastener to be closed by moving said parts together in a direction substantially non-parallel with said stringers, including while said elongated elements are positioned side by side, and for guiding the engagement of the slider with the second interlocking element when the insert fastener is closed.

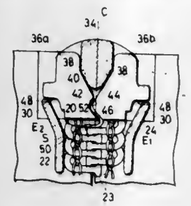
4,232,430
DEVICE FOR CONNECTING THE ENDS OF A SEPARABLE ZIPPER
Martin F. Friedberg, 7233 Aberdeen, Dallas, Tex. 75230
Continuation-in-part of Ser. No. 940,255, Sep. 7, 1978, which is a continuation-in-part of Ser. No. 895,935, Apr. 13, 1978, abandoned. This application Mar. 15, 1979, Ser. No. 20,318
Int. Cl.³ A44B *19/36*
U.S. Cl. 24—205.11 R **51 Claims**



1. A device for connecting the ends of a separable zipper of the type having the first (**12**) and second (**14**) opposed rows of teeth and a slider (**24**) for engaging and disengaging the rows of teeth, each row of teeth being disposed along the edge of a supporting sheet (**16***a*, **16***b*), the slider having first (**39***a*) and second (**39***b*) adjacent ports at the front thereof which lead to a common passageway within the slider, the ports being adapted to receive the respective first and second rows of teeth as the slider is moved forward whereby the teeth in the opposed rows are progressively brought into interlocking engagement within the passageway, the device having first (**20**) and second (**22**) terminals disposed at the respective rearward ends of the first and second rows of teeth, the first terminal including means (**28**) for carrying the slider when the rows of teeth are fully disengaged, one of the terminals having portions (**60**, **64**) defining an aperture (**65**) for receiving cooperating portions (**52**,**54**) of the other terminal such that insertion of the cooperating portions into the receiving aperture couples the terminals in operative engagement, characterized in that the area defined by the receiving aperture (**65**) is at least twice as large as the area defined by one of the slider ports (**39***b*).

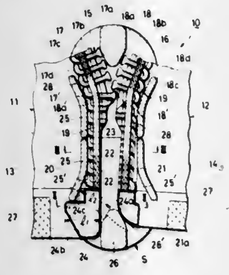
4,232,431
SLIDE FASTENER
Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Apr. 4, 1979, Ser. No. 27,097
Claims priority, application Japan, Apr. 20, 1978, 53/52455[U]
Int. Cl.³ A44B *19/36*
U.S. Cl. 24—205.11 R **5 Claims**

1. An open end slide fastener comprising a pair of stringer tapes each carrying a row of coupling elements along one longitudinal edge, each of said coupling elements including a pair of spaced legs supported on one of said tapes and a coupling head extending between said legs, said coupling head having a pair of lateral projections extending longitudinally of the row of coupling elements beyond the width of the legs so that the rows of coupling elements can be interlocked together by interengagement of said lateral projections of the opposed coupling heads, a slider having a diamond and adapted to open and close the fastener, and a top end stop including a pair of lugs secured to the longitudinal edges of the respective stringer tapes, said lugs having oblique opposed edges extending divergently with respect to the longitudinal axis of the fastener and



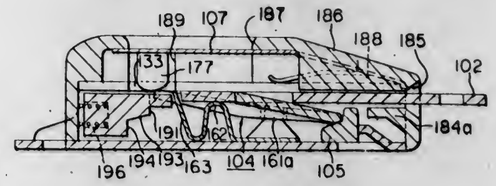
jointly defining therebetween a substantially V-shaped opening complementary in shape with the diamond of the slider, said interengaged lateral projections of the coupling heads of the opposed endmost coupling elements located next to said top end stop lugs being cut off to permit said endmost coupling elements to be desengaged from each other when the slide fastener is closed.

4,232,432
SEPARABLE SLIDE FASTENER
Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Sep. 26, 1979, Ser. No. 78,931
Claims priority, application Japan, Oct. 9, 1978, 53-138698[U]; Oct. 9, 1978, 53-138699[U]
Int. Cl.³ A44B *19/40*
U.S. Cl. 24—205.11 R **5 Claims**



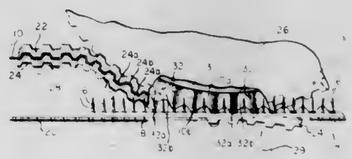
1. A separable slide fastener comprising a pair of oppositely disposed stringers each having a support tape and a fastener element formed from a plastic monofilament into a continuous structure secured by sewn seams to a longitudinal inner edge of the respective tape; the fastener element consisting of a succession of elongated loops each having a coupling head portion at one end thereof, an upper leg, a lower leg and a connecting heel portion at the opposite end remote from the coupling head connected to a next adjacent one of the successive loops; a reinforcing core extending through said succession of loops; and a slider having a pair of branched guide channels defined between its flanges and its diamond; a group of said successive loops being fused together over a predetermined length of the two coupled stringers at one end of the fastener and cut closely along the sewn seams to provide a pair of integrated pin members on the respective stringers, the group of fused loops on one stringer having a plurality of coupling head portions transferred from the other stringer.

4,232,433
SEAT BELT BUCKLE DEVICE
Takeo Ueda; Shinichi Fujita; Hideo Tachiki, all of Fujisawa, and Shuichi Asano, Maebashi, all of Japan, assignors to NSK-Warner K. K., Tokyo, Japan
Division of Ser. No. 811,386, Jun. 29, 1977. This application Mar. 27, 1979, Ser. No. 24,377
Int. Cl.³ A44G *11/26*
U.S. Cl. 24—230 A **10 Claims**



1. A latch device in a seat belt buckle, comprising: a load member, means supported on said load member for latching a tongue, means for biasing said latching means toward a tongue locking position, releasing means adapted, when operated, to bring the latching means into a tongue unlocking position, and false latching preventing means having selectively a first position where said latching means is held thereby in the tongue unlocking position and a second position where said latching means is freed therefrom, said preventing means being biased toward the first position and engages the tongue when the tongue is inserted, whereby when the tongue is inserted to displace the preventing means from the first position to the second position, the latching means latches the tongue, the preventing means is held in said second position by the latched tongue, and when the releasing means is operated to bring said latching means into the tongue unlocking position to free the tongue, the preventing means is brought from said second position to said first position.

4,232,434
APPARATUS AND METHOD FOR ATTACHING STIFF CRIMPABLE MATERIAL TO A TENTER FRAME
Friedrich V. Pfister, Geneva, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 25, 1978, Ser. No. 909,554
Int. Cl.² D06C *3/02*
U.S. Cl. 26—86 **1 Claim**



1. In an overfeed system for supplying and attaching stiff crimpable material at its selvedges to the pin chains of a pin tentering machine that includes means for forwarding the material from a source to an overfeed means for squeezing the material at its selvedges into a wavy shape having crests and valleys and forwarding the material to the plane of the pin chains, comprising upper and lower endless toothed belts pressed together through which the material passes, the im-

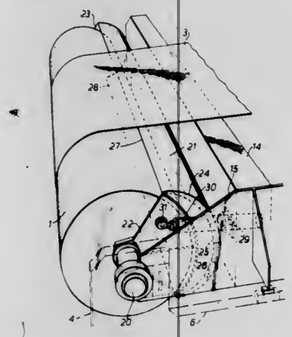
provement comprising a rotatable cylindrical brush formed of spaced groups of bristles located adjacent said overfeed means at each selvedge of the material and above said pin chain with said bristles projecting below the points of the pins, in which said brush has a peripheral surface with crests and valleys corresponding to crests and valleys imparted to the material by the overfeed means, said crests of said brush engage the valleys of said material, and said valleys of said brush are clear of the crests of said material, and means for rotating the brush synchronously with the movement of the wavy shaped selvedge edge of the material so that the crests and valleys on the peripheral surface of the brush are maintained in alignment with the valleys and crests, respectively, on said material.

4,232,435

STRETCHING MACHINE FOR TREATING REMOVABLE BELTS SUPPORTED ON ROLLERS

Gunnar Eriksen, Asker, Norway, assignor to Thune-Eureka A/S, Tranby, Norway

Filed Sep. 6, 1978, Ser. No. 940,101
Int. Cl.[2] D06C 3/06
U.S. Cl. 26—106 **2 Claims**



1. In a stretching machine for treating removable belts supported on rollers, such as felts and wires in papermaking machines, the stretching machine comprising two rollers over which the belt is suspended, means to heat at least one of said rollers, and means to move one of the rollers toward the other to slacken the belt for removal from the rollers; the improvement comprising lifting means adapted to be inserted between the heated roller and the belt, such that the belt can be held raised up from the roller, the lifting means being pivotable about the axis of rotation of the heated roller and being formed as a shield running along the length of the roller and, seen in cross section, spanning at least a main portion of the roller circumference that is not covered by the belt, cooling ducts in the shield and means for pivoting the shield from a rest position between the two rollers into a protective working position in which the belt is held raised from the heated roller.

4,232,436

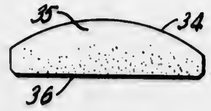
POWDER METALLURGY PRODUCTION OF SPHERICAL ARTICLES, SUCH AS BEARING ELEMENTS

William J. Chmura, Southington, Conn., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 774,024, Mar. 3, 1977, Pat. No. 4,118,009, which is a division of Ser. No. 503,279, Sep. 5, 1974, Pat. No. 4,026,657. This application Mar. 31, 1978, Ser. No. 892,027
Int. Cl.[3] B21H 1/14
U.S. Cl. 29—148.4 B **4 Claims**

1. A method for producing a powder metallurgy article of manufacture characterized by a convex surface of revolution which comprises,

forming a sintered porous powder metal blank having said surface of revolution formed about a fixed axis passing through said blank having an average density ranging from about 70% to 90% of the theoretical density of the metal, and then mechanically working by roll forming substantially said entire convex surface of revolution of said article sufficient to produce a highly dense mechanically worked zone at and adjacent said convex surface of



average density of at least about 95% of theoretical density of the metal with the pores at the surface thereof substantially closed,

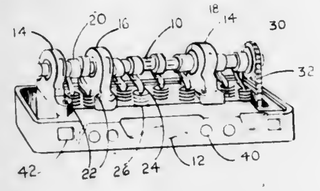
while maintaining the remaining portion of the sintered metal inwardly of the dense zone and extending towards said axis substantially porous and having an average density ranging from about 70% to less than 95% of the theoretical density of the metal.

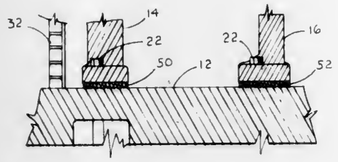
4,232,437

METHOD FOR RECONDITIONING AN ENGINE HEAD

James V. Fair, Tucson, Ariz., assignor to V & W Parts & Machine Shops, Inc., Tucson, Ariz.

Filed Jun. 30, 1978, Ser. No. 920,964
Int. Cl.[3] B23P 15/00, 13/00; F01L 1/04
U.S. Cl. 29—156.4 R **2 Claims**





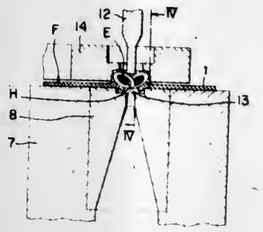
1. A method of reconditioning engines where the engine head has become warped and distorted, the engine of the type having an overhead cam shaft supported by a plurality of cam towers atop the engine head, the cam shaft having a cam shaft sprocket at one end attached to a crank shaft sprocket in the body of the engine block by a timing chain having a fixed length, a chain tensioner interposed the cam shaft sprocket and the crank shaft sprocket to engage the chain and take up slackness therein within a certain limit, and the distance between the cam shaft sprocket and the crank shaft sprocket being a predetermined fixed length, the method comprising machining the engine head upper and lower surface to coplanar parallel surfaces to remove distortion in the head, selecting a thickness of shim to correspond to the thickness of the metal removed from the engine head upper and lower surfaces, and installing the shim between each of the cam towers and the head whereby the same predetermined fixed distance is maintained between the cam shaft sprocket and the crank shaft sprocket as existed before the head had been planed and the head warped.

4,232,438

METHOD AND APPARATUS FOR PROVIDING SPACE SECTIONS IN A CONTINUOUS SLIDE FASTENER CHAIN

Kihei Takahashi, Uozu, and Toyoo Morita, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Japan

Filed Nov. 29, 1978, Ser. No. 964,461
Claims priority, application Japan, Dec. 7, 1977, 52-146903
Int. Cl.[3] B23P 19/00
U.S. Cl. 29—408 **4 Claims**



1. A method for providing a space section in a slide fastener chain of the coiled plastic filament type in which the chain is stitched to a fastener tape with head portions at the edge of the tape and leg portions remote from the edge of the tape, which method comprises the steps of:

(a) supporting the slide fastener chain on the tape side thereof and adjacent the leg portions,

(b) lowering a punch having a cutter blade towards the head portions of the supported slide fastener chain, whereby the chain becomes inclined with the head portions exposed,

(c) cutting off the head portions of the chain by the cutter blade while the chain is kept in the inclined position, and

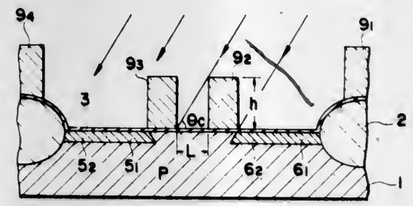
(d) removing the leg portions of the interlocking elements.

4,232,439

MASKING TECHNIQUE USABLE IN MANUFACTURING SEMICONDUCTOR DEVICES

Hiroshi Shibata, Kawasaki, Japan, assignor to VLSI Technology Research Association, Kawasaki, Japan

Filed Nov. 29, 1977, Ser. No. 855,639
Claims priority, application Japan, Nov. 30, 1976, 51-142918; Nov. 30, 1976, 51-142919; Dec. 31, 1976, 51-158060
Int. Cl.[3] B01J 17/00
U.S. Cl. 29—579 **4 Claims**



1. A method of manufacturing a planar type semiconductor device having a monocrystalline semiconductor substrate of one conductivity type and having at least one intermediate region different in properties from side regions on both sides thereof, comprising the steps of:

(a) forming a base, said base forming step including at least the forming of an oxide layer on one surface of said substrate;

(b) forming a resist layer on said base, said resist layer having a thickness t;

(c) selectively removing said resist layer to form a desired pattern including at least a pair of pattern portions spaced apart by a distance L substantially corresponding to the width of said intermediate region to form a window;

(d) introducing impurities of the other conductivity into said side regions of said substrate by irradiating said substrate with impurity ion beams obliquely at an angle equal to or less than $\tan^{-1}(t/L)$ with respect to said substrate surface;

(e) removing said oxide layer on said side regions by irradiating said substrate with etching ion beams at the same angle as in step (d) to form contact holes on said side regions;

(f) depositing ohmic electrode material over said substrate surface;

(g) removing said resist pattern portions; and

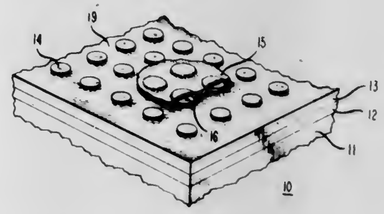
(h) said method further comprising the step of irradiating said substrate with vertical impurity ion beams of the other conductivity type.

4,232,440

CONTACT STRUCTURE FOR LIGHT EMITTING DEVICE

John J. Bastek, Reading, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 27, 1979, Ser. No. 15,717
Int. Cl.[1] B01J 17/00
U.S. Cl. 29—590 **7 Claims**



1. The method of making a substantially ohmic low resistance contact to the light emitting surface **19** of a light emitting semiconductor device **10** comprising the steps of;

(1) forming on said light emitting surface an array of small metallic contacts **14**,

(2) heating said device to alloy a portion of each said contact to said light emitting surface,

(3) selectively depositing a large area metal bonding pad **15** on said light emitting surface and over a plurality of said small contacts,

(4) subjecting the light emitting contact surface to sputter etching for a period of time sufficient to entirely remove the small contacts not covered by the bonding pad, and

(5) attaching a wire lead to the surface of said bonding pad.

4,232,441

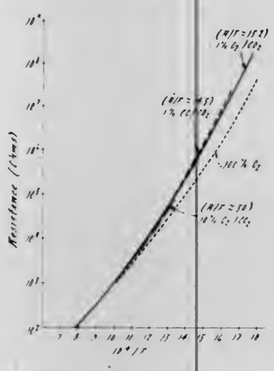
METHOD FOR PREPARING RARE EARTH OR YTTRIUM, TRANSITION METAL OXIDE THERMISTORS

Eleftherios M. Logothetis, Birmingham; Kamlakar R. Laud, and John K. Park, both of Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 857,498, Dec. 5, 1977, Pat. No. 4,162,631. This application Jun. 29, 1978, Ser. No. 920,572
Int. Cl.[3] H01C 7/00
U.S. Cl. 29—612 **2 Claims**

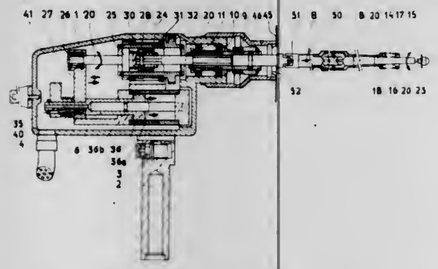
1. A method for preparing a thermistor comprising a thermistor composition having iron, praesodynium and oxygen in a respective molar ratio of about 1:1:3, which comprises:

(a) admixing Pr_6O_{11} and Fe_2O_3 in a molar ratio of Fe to Pr of about 1:1;
(b) heating at a temperature above about 1000° C.; and



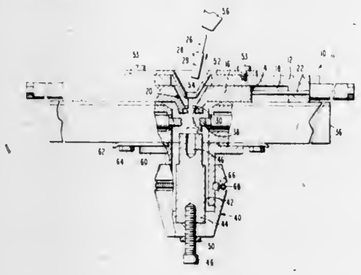
(c) incorporating at least two spaced apart conducting leads into the thermistor composition.

4,232,442
REMOVAL OF RESIDUAL STRESSES IN A TUBE SEATED IN A TUBE PLATE
Daniel Brunaud, Saint-Germain-du Plain, France, assignor to Framatome, Courbevoie, France
Filed Feb. 1, 1979, Ser. No. 8,400
Claims priority, application France, Feb. 3, 1978, 78 03131
Int. Cl.[3] B21D *39/06*; B23P *15/26*
U.S. Cl. 29—727 **3 Claims**



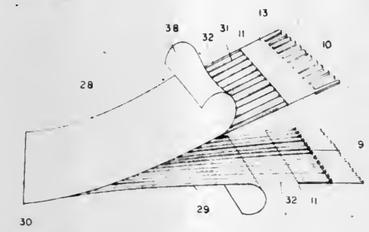
1. Apparatus for removing residual stresses produced in a tube by an operation of seating the tube in a bore passing completely through a plate of high thickness, the tube being arranged relative to the plate with one of its ends flush with one of the faces of the plate and extending from the other face of the plate, the seating of the tube being carried out by expanding and rolling the tube at the level of the plate up to a transition zone in the region of emergence of the tube from the other face of the plate, said device comprising: a support adapted to permit handling thereof; an elongate tubular element defining a longitudinal axis; means mounting one end of said tubular element in said support for rotation about said longitudinal axis; a generally tubular cage provided in the other end portion of said tubular element and defining a plurality of longitudinally extending recesses therethrough; a wheel in each said recess which serves as a housing therefor; means mounting each said wheel in said respective recess such that said wheel is radially movable therein between an operative position projecting partially from said cage and a retracted position within said cage, said wheels having axes of rotation which make a small angle with said longitudinal axis; a rod for controlling said wheels, said rod extending coaxially within said tubular element and comprising at one end a terminal part of generally conical shape which penetrates into the interior bore of said cage and contacts said wheels; a motor for causing rotation; a jack for causing linear movement; means connecting said motor to said rod for rotating said rod about said longitudinal axis to cause rotation of said wheels by frictional contact with said wheels; means connecting said jack to said rod for moving said rod in the direction of said longitudinal axis relative to said tubular element to cause radial movement of said wheels; an adjustable stop for contacting the one face of said plate for precisely positioning said wheel cage in a tube at the level of the transition zone thereof; means mounting said stop on said support; control means for controlling rotational and linear movement of said rod relative to said tubular element to permit an exactly controlled expansion of the tube in the transition zone, and comprising means for actuating said jack to cause movement of said rod in a direction to move said wheels from said retracted position towards said operative position, means for actuating said motor when said rod comes to rest against said wheels, means for counting the revolutions performed by said rod and for deactuating said motor and said jack after a preset number of revolutions have been performed by said rod, said means for actuating said motor being defined by a carriage connected to said control rod for linear movement thereof and connected to the rod of said jack by direct contact for movement of said control rod in a direction causing retraction of said wheels, and by means of an actuating element bearing on said carriage via an axially elastically deformable member for movement of said rod in a direction causing radially outward movement of said wheels; and an electrical contact carried by said carriage for controlling actuation of said motor and operable by said actuating element which moves relative to said carriage when said rod comes to rest against said wheels.

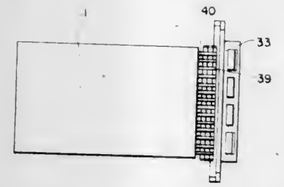
4,232,443
WIRE INSERTION GUIDE
Bernard Lichtenstein, and Edward Nemeth, both of Fair Lawn, N.J., assignors to VIP Industries, Inc., Paterson, N.J.
Filed Mar. 26, 1979, Ser. No. 23,669
Int. Cl.[3] H01R *43/04*
U.S. Cl. 29—753 **6 Claims**



1. A wire insertion guide for use with a closed barrel electrical contact having a barrel axially aligned with an end, said barrel having a first diameter and said end having a second diameter, said wire insertion guide comprising:
a housing;
a movable funnel located within said housing, said movable funnel having a neck adjustable from a first size substantially equal to said first diameter to a second size larger than the larger of said first and second diameters;
a fixed funnel nested within said movable funnel, said fixed funnel having a neck of diameter larger than the larger of said first and second diameters;
a contact holder mounted in spaced relation with said movable funnel, said contact holder including a sleeve in axial alignment with the necks of said fixed and said movable funnels, said sleeve being of a height greater than that of said end, and having a diameter slightly larger than that of said end.

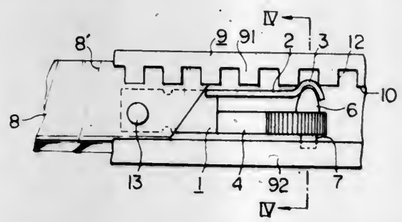
4,232,444
FLAT CABLE STRIPPING AND TERMINATING TECHNIQUE
Virgil T. Bolick, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.
Filed May 19, 1978, Ser. No. 907,447
Int. Cl.[3] H01R *43/04*
U.S. Cl. 29—863 **11 Claims**





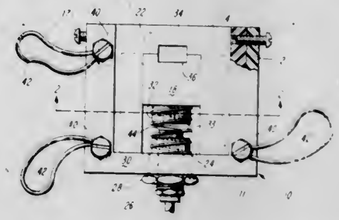
1. A method for preparing a flat cable having a plurality of substantially parallel wires for gang termination in a connector with opposite rows of contacts on its respective sides comprising: cutting through the jacket of the cable at an end thereof and forming portions of every other wire of the cable down and the remaining ones up, grasping the downturned wire ends and separately grasping the upturned ones, and pulling said wire ends in opposite directions separating one side of the cable jacket from the other side leaving two spaced parallel groups of wires ready for termination in a connector.

4,232,445
KNIFE APPARATUS
Daizaburo Ito, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan
Filed Mar. 30, 1979, Ser. No. 25,749
Claims priority, application Japan, Mar. 31, 1978, 53-41890[U]
Int. Cl.[3] B26B *1/08*
U.S. Cl. 30—162 **5 Claims**



1. A knife apparatus including a knife handle having a substantially C-shaped cross-section with a bottom wall and opposed side walls defining a groove or a channel extending longitudinally of said knife handle, said groove or channel having penthouse-like web portions extending toward each other from the top ends of said side walls and defining therebetween a gap through which said groove or channel is in communication with the outside of said knife handle, one of said web portions being provided with a series of notches formed in its inner edge confronting the other web portion; a cutting blade formed with a number of lines of breakage spaced in the longitudinal direction of said cutting blade; and a slider having opposite ends to one of which said cutting blade is detachably secured, said slider being received by said groove or channel for sliding movement along the length of said groove or channel;
said slider being characterized by comprising a depressable resilient tab and a resilient clicking tab both secured to the slider and extending generally codirectionally from the end of said slider opposite to said one end thereof, said depressable resilient tab being provided with a pawl, said resilient clicking tab being adapted to be swung in the direction transverse to the direction of depression of said depressable resilient tab and having a curved end portion, said curved end portion of said resilient clicking tab being located opposite said pawl and being concave at one side to enable it to receive said pawl and convex at the other side so as to be engageable with a selected one of said notches formed in said one of said penthouse-like web portions, said depressable resilient tab when not depressed positioning said pawl at the level of said curved end portion of said resilient clicking tab and in engagement with said one side of said curved end portion so that the latter is interposed between said pawl and the selected notch receiving said other side of said curved end portion, said pawl being adapted to be disengaged from said curved portion of said resilient clicking tab when said depressable resilient tab is resiliently depressed, thereby to allow said curved end portion of said resilient clicking tab to disengage from said selected notch and to allow said slider to be slid along the length of said groove or channel.

4,232,446
GAGE FOR MEASURING DECREASE IN DIMENSION OF TEST SPECIMEN IN TENSILE TEST
Don F. Woods, North Ogden, and Ronald F. Larsen, Willard, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Mar. 30, 1979, Ser. No. 25,412
Int. Cl.[3] G01B *3/20, 7/06*
U.S. Cl. 33—143 L **1 Claim**



1. A device for measuring the decrease in one dimension of a compression sensitive test specimen in a direction perpendicular to the applied stress in a tensile test machine, comprising:
a polytetrafluoroethylene frame member;
a polytetrafluoroethylene slidable member positioned in said frame member;
a means for providing a low friction bearing between said slidable member and said frame member;
notches in said slidable and frame members, for receiving a test specimen therebetween;
a spring positioned between the frame member and the

slidable member, on the side of said slidable member remote from said notches; and

a proximity measuring device secured to said frame member and a metallic target secured to the slidable member.

4,232,447

METHOD AND AN APPARATUS FOR CONTINUOUSLY MONITORING THE CROSS-SECTION OF SLIVERS

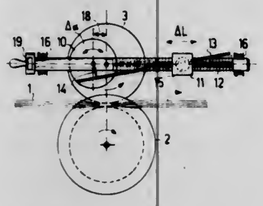
Werner Grunder, Monchaltorf, and Erwin Murbach, Werrikon-Uster, both of Switzerland, assignors to Zellweger Uster Limited, Switzerland

Filed Jan. 19, 1979, Ser. No. 4,879

Claims priority, application Switzerland, Feb. 2, 1978, 1130/78

Int. Cl.³ G01B 7/04

U.S. Cl. 33—147 L **11 Claims**



1. An apparatus for continuously monitoring and controlling the deviations in the cross-section of slivers, comprising a grooved roller, a feeler roller which cooperates with the grooved roller, and which is displaceable against a resistance force under the influence of a sliver located between the grooved roller and the feeler roller, a lever shaft on one end of which the feeler roller is eccentrically mounted, an eccentric measuring tab connected to the lever shaft and arranged to reproduce on a larger scale the rotational movements of the shaft, and sensor means including a sensor which lies in a plane determined by the axis of lever shaft and the axis of the feeler roller when no sliver is present for detecting the position of the measuring tab with respect to said plane without contact with said measuring tab.

4,232,448

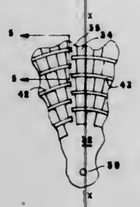
BROKEN LINE DRAFTING TEMPLATES

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048

Filed Apr. 9, 1979, Ser. No. 28,077

Int. Cl.³ B43L 13/20

U.S. Cl. 33—174 B **1 Claim**



1. Apparatus for drawing a broken line consisting of dashes with spaces therebetween, with a compass carrying a marking end, such as a pencil or pen, on a surface, such as a sheet of paper, comprising:

(a) a support member adapted to be fixedly disposed on said surface,

(b) concentric circular rows of relatively thin lands projecting from the support member forming spaces therebetween for exposing the surface therebelow,

(c) each land having an entry edge at one side thereof over which the end of the implement may freely move into contact with the exposed surface disposed in a space between lands and an exit edge at its other side for camming said end out of said space onto the adjacent land, and

(d) the construction being such that as the implement is moved along its guided path, its marking end oscillates toward and from the surface, producing the spaced marks thereon only in the spaces between lands,

(e) the circular rows being formed as two angularly spaced sets, each set extending substantially 180° about a center and having dividing rims between rows which preclude drawing beneath same, the rims being staggered so that a line which cannot be drawn in one set may be drawn in the other set and the remaining 180° of the line may be drawn after rotating the support member 180°, whereby broken lines of all radii within the range of the rows may be drawn in complete circles,

(f) the dividing rims of one set are staggered in radial positions substantially mid-way between those of the other set.

4,232,449

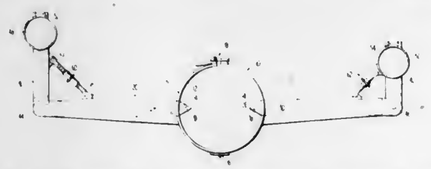
BORE SIGHTING APPARATUS

Darrell Linenberger, 512 Rigewood Dr., P.O. Box 177, Ulysses, Kans. 67880

Filed Oct. 15, 1979, Ser. No. 84,710

Int. Cl.³ F41G 3/32

U.S. Cl. 33—235 **5 Claims**



1. A bore sighting apparatus comprising clamping ring means adapted to be clamped adjacent the muzzle end of a tube, a pair of horizontally disposed arms secured to said ring means and extending outwardly therefrom in opposite directions, a pair of witness sight means hingedly secured to said arms adjacent said ring for alignment with witness marks on said tube, a pair of vertically disposed arms pivotally secured to the ends of said horizontally disposed arms respectively and target means mounted on each of said vertically disposed arms for use with the sights adjacent the breach end of said tube.

4,232,450

FOOTBALL YARDLINE LOCATING DEVICE

William E. Lynn, 209-A Millbrook Rd., Raleigh, N.C. 27609

Filed Nov. 14, 1978, Ser. No. 960,554

Int. Cl.³ G01B 11/26

U.S. Cl. 33—289 **9 Claims**



1. Apparatus for locating a point on a remote surface having a perimeter, comprising a substantially stationary platform, optical sighting means mounted by the platform for viewing said said point on the remote surface through a measuring plane, framing means mounted on the platform for adjustment to an outline corresponding to said remote surface perimeter viewed substantially in said measuring plane, extensible scale means movably mounted by the framing means for displacement substantially in said measuring plane, and actuating means connected to the scale means for displacement thereof to a measuring position indicating the location of said point on the remote surface relative to said perimeter as outlined in the measuring plane.

4,232,451

DETECTOR FOR SENSING THE ANGULAR POSITION OF A ROTATABLE MAGNET

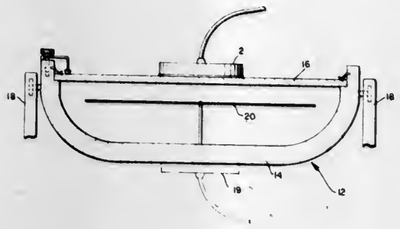
Ib Thomsen, Livadiavej 50, DK-6960 Hvide Sande, Denmark

Continuation of Ser. No. 764,017, Jan. 31, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,621

Claims priority, application Denmark, Feb. 19, 1976, 679/76

Int. Cl.² G05F 1/00

U.S. Cl. 33—361 **5 Claims**



1. Detector means for the detection and electronic reading of the angular position of a magnetic compass, using flux-sensitive means, comprising: a carrying body having a substantially flat and circular surface, said body adapted to be mounted on the exterior top or bottom of a compass, perpendicular to the axis of the compass magnet, the flux sensitive means comprising at least one pair of Hall-elements mounted on said body parallel to said flat surface and symmetrically positioned on a diameter perpendicular to an axis of symmetry of the flat surface, and at least a second pair of Hall-elements substantially are mounted in the same manner as said one pair on the flat surface but at 90 degrees to the line connecting the Hall-elements in the first pair.

4,232,452

APPARATUS FOR USE IN CONNECTION WITH DRY TRANSFER LETTERING AND ANALOGOUS SHEETS

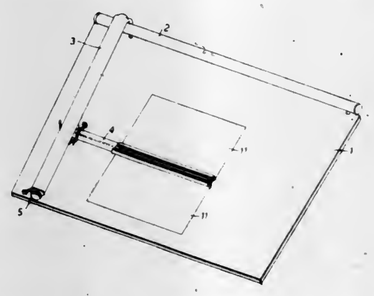
Martin E. Dowzall, Wyckoff, and Vazgen J. Houssian, Union City, N.J., assignors to Letraset International Limited, London, England

Filed Jan. 31, 1979, Ser. No. 8,086

Claims priority, application United Kingdom, Jan. 31, 1978, 3882/78

Int. Cl.³ B43L 7/00

U.S. Cl. 33—430 **9 Claims**



1. Apparatus for use in conjunction with a sheet of dry transfer symbols which comprises a baseboard, a horizontal rule mounted thereon and capable of moving both horizontally and vertically, register pins on the rule for registration with predetermined positions on the sheet of dry transfer material, and an upper magnetic clamp adapted to clasp one edge of the sheet of dry transfer material and hold it engaged on the pins, said sheet extending upwardly over the baseboard, and,

a lower magnetic clamp for engaging a second sheet of dry transfer material, said second sheet extending downwardly over the baseboard on the opposite side of the rule, wherein the register pins are pointed and adapted to perforate the sheet of dry transfer material, and said clamps are movable from a first open position to a second closed position and include recesses for engaging said pins in said closed position.

4,232,453

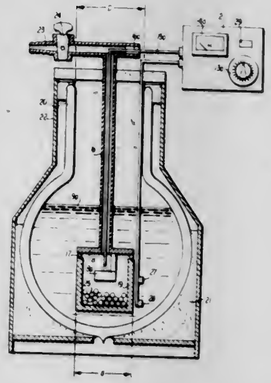
DEVICE FOR FREEZE DRYING AND SYNTHETIC RESIN IMPREGNATION WHEN NECESSARY OF SMALL BIOLOGICAL OBJECTS FOR ELECTRON MICROSCOPIC EXAMINATION

Ludwig Edelmann, Homburg, Fed. Rep. of Germany, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Sep. 25, 1978, Ser. No. 945,372

Int. Cl.³ F26B 13/30

U.S. Cl. 34—92 **13 Claims**



1. A device for freeze drying and synthetic resin impregnation of biological specimens which comprises a Dewar flask for holding a cooling liquid, a sealable container, support means for supporting said container in said Dewar flask below the liquid for cooling said container, valve means for connecting said container to a source of reduced pressure for evacuating said container, a sample tray having at least one recess for receiving a biological specimen, means for supporting said tray within said container spaced from the container interior and heating means for warming said tray.

4,232,454

VARIABLE AIRFLOW HAIR TREATMENT DEVICE

William E. Springer, Bridgeport, Conn., assignor to Clairol Incorporated, New York, N.Y.

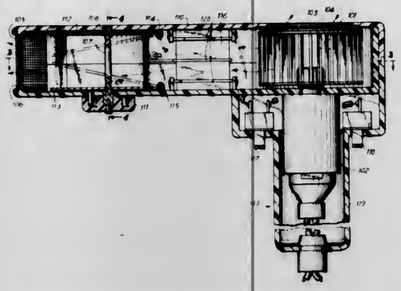
Filed Jun. 14, 1979, Ser. No. 48,323

Int. Cl.³ A45D 20/12

U.S. Cl. 34—97 **3 Claims**

1. A hair treatment device having a housing defining a handle, an air conduit, an air inlet and an air outlet and having disposed in the housing a fan for blowing air out of the air outlet and against a person's hair; a heater for heating the air before it is blown out of the device; a pair of trap doors positioned in the air conduit intermediate the heater and the air outlet for controlling the airflow velocity; and means for adjusting the opening between the front ends of the trap doors by controlling the trap doors' movement comprising a knob

which rotates a screw connected to each trap door through holes therein containing female threads, said screw having



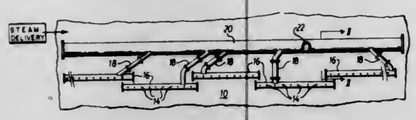
left-hand threads on one end portion and right-hand threads on the other end portion.

4,232,455

DRYER DRUM CONDENSATE REMOVAL APPARATUS

Frank Burton, Baldingstone, England, assignor to Beloit Corporation, Beloit, Wis.

Filed May 2, 1978, Ser. No. 902,169
Claims priority, application United Kingdom, Dec. 3, 1977, 50440/77
Int. Cl.[1] F28F 5/02
U.S. Cl. 34—124 1 Claim



1. A dryer drum for a paper making machine comprising in combination:

a rotary mounted hollow cylindrical drum shell with supporting end heads;

means for delivering steam into the interior of the shell for heating the shell and with condensate forming on the inner surface of the shell;

a plurality of relatively short length headers extending generally axially within the drum and uniformly spaced from each other around the circumference of the drum overlapping at their ends;

a row of dipper straws projecting radially outwardly from each of the headers and relatively uniformly spaced therealong with open ends positioned adjacent the inner surface of the shell for withdrawing condensate through the straws up into the headers;

means rigidly mounting the headers in their respective positions to the inner surface of the shell;

means for adjusting the position of the open end of the straws so as to position them uniformly spaced from the inner surface of the shell to maintain a uniform thickness in the layer of condensate rimming the shell surface;

a conduit means extending from within the shell to the exterior thereof for removal of condensate;

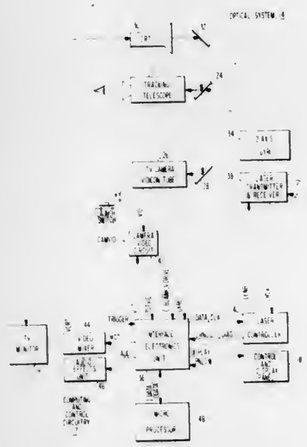
and flexible tubes connecting each of the headers to the conduit means for conducting the condensate from the headers to the conduit.

4,232,456

WEAPONS SYSTEM SIMULATOR AND METHOD INCLUDING RANGING SYSTEM

George L. Harmon; Ronald D. Monroe, both of Winter Park; Thomas M. Munday; Clarence E. Jones, both of Orlando, and Edward B. Baker, Maitland, all of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 30, 1977, Ser. No. 811,713
Int. Cl.[3] F41J 5/08
U.S. Cl. 35—25 22 Claims



1. A weapons simulator for training an operator in the use of a weapons system comprising:

operator positionable optical means for viewing a predetermined field of view;

first and second optically detectable markers positioned on a target remote from said optical means and having a predetermined spacing therebetween;

means in optical communication with said optical means for scanning the field of view in accordance with a predetermined scanning pattern and generating a first video signal representing an image within the field of view including the target and the first and second markers;

means responsive to the video signal from said scanning means for detecting said markers and generating a target signal representing the position of the target in relation to the predetermined scanning pattern;

means for generating a range signal representing the range between the simulator and the target in the field of view;

means for generating a missile guidance signal; operator actuated means for initiating simulated flight;

means responsive to operator initiation of simulated flight for generating a missile signal electronically simultating the flight of a missile from the simulator to the target and varying in value in accordance with the guidance signal and time from initiation of flight to thereby represent the size and location of the missile within the field of view;

means in optical communication with said optical means for projecting an image of the missile onto the image presented to the operator in the optical field of view in response to said missile signal;

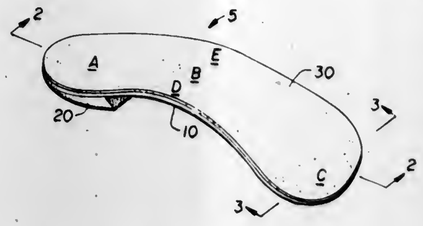
means responsive to said target, range and missile signals for generating a kill signal related to the proximity of the target and the simulated missile in the field of view a predetermined time after initiation of the simulated flight.

4,232,457

ORTHOTIC INSERT

Mitchell R. Mosher, 120 Ascot Dr. #D, Roseville, Calif. 95678

Filed Jan. 31, 1979, Ser. No. 8,025
Int. Cl.[2] A43B 13/40, 7/22
U.S. Cl. 36—44 4 Claims



1. An orthotic insert comprised of a plastic support member adapted to extend beneath the heel and arch of a user's foot, terminating at points proximal to the user's metatarsal heads; and,

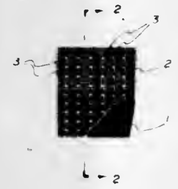
a heel post mounted on the lower surface of said support member at the heel region; wherein said support member is formed of incompressible, flexible, resilient plastic sheet; said heel post is formed of a compressible, resilient material; said plastic sheet is molded to provide a rise of about 1/8" in the matatarsal arch and, when assembled with said heel post, to provide a rise of about 1" at the flange of the medial longitudinal arch, a rise of about 7/16" at the lateral longitudinal arch, and a 4°-5° varus at the heel; and said heel post is approximately 3/16" at its thinnest point.

4,232,458

SHOE

Bruce E. Bartels, Cambridge, Canada, assignor to Wheelabrator Corp. of Canada, Ontario, Canada

Filed Mar. 13, 1978, Ser. No. 886,042
Int. Cl.[2] A43B 23/00
U.S. Cl. 36—45 15 Claims



1. A shoe including an upper in which the upper is fabricated at least substantially from a breathable fabric comprising a woven fabric face layer having bulky warp and weft threads interlaced to define cross-over points, and a woven fabric back layer having fine warp and weft threads interlaced to define cross-over points, said face layer at spaced cross-over points thereof being interwoven with said back layer to provide discrete tie-in points of said face layer to said back layer, said spaced cross-over points being separated both longitudinally and laterally by intermediate cross-over points at which no interweaving between the fabric layers occurs, the interweaving at said tie-in points being by means of a single weft thread from one layer and a single warp thread from the other layers, the spacing between adjacent discrete tie-in points being at least 2/16" and not greater than 9/16" and sufficiently close to provide that the layers always remain in contact with each other over the whole area of their adjacent surfaces and have substantially no relative movement in use, and whereby said layers retain their separate identities and said fabric, when viewed from said face layer side, generally not having an interwoven appearance.

4,232,459

SKI BOOTS

Franco Vaccari, Via Paleoveneti 3/3, Montebelluna, Treviso, Italy

Filed Oct. 30, 1978, Ser. No. 956,294
Claims priority, application Italy, Nov. 2, 1977, 22634/77[U]
Int. Cl.[3] A43B 19/00, 7/06
U.S. Cl. 36—71 3 Claims



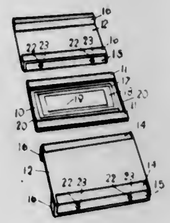
1. A ski boot comprising a shell, an inshoe within said shell, a bladder member between said shell and said inshoe, pumping means incorporated within said shell, a delivery valve between said pumping means and said bladder member for delivering air from said pumping means to said bladder member, and means for discharging air from said bladder member, wherein said bladder member is connected with said pumping means and said discharge means through conduits developing between said inshoe and said shell.

4,232,460

MAGNETIC PRESS AND REFRESHER FOR CLOTHES

Lester S. Krulwich, 241 Central Park West, New York, N.Y. 10024

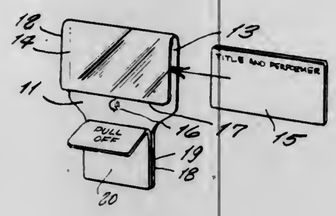
Filed Sep. 11, 1978, Ser. No. 940,906
Int. Cl.[3] D06F 69/00
U.S. Cl. 38—1 R 5 Claims



1. A magnetic press and refresher for clothes apparatus comprising a flat, thin rectangular member, partially pliable, containing thin, flat flexible magnetic tape attached adjacent to each of the longitudinal edges of its surface, the base of said tapes being lowered so that their surfaces are even with the surface of said rectangular member, and a flat, thin backing of the same size as said rectangular member, provided with magnetically attractable strips movably set on each of the longitudinal sides of said backing on a base lowered from its surface, with said strips adjustably engaging extensions fastened to the other side of said backing enabling said strips to be raised and lowered from the surface of said backing, and capable of magnetically adhering on said magnetic tapes, thereby holding

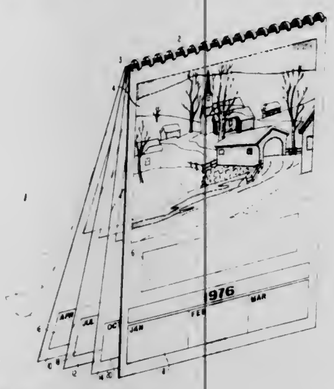
clothes placed between said backing and rectangular member and allowing said clothes to extend out on all sides.

4,232,461
PHONOGRAPH RECORD ALBUM INDEX TABS
Larry B. Crawford, 5959 S. Van Ness Ave., Los Angeles, Calif. 90047
Filed Mar. 19, 1979, Ser. No. 21,841
Int. Cl.³ G09F *3/16*
U.S. Cl. 40—23 A **5 Claims**



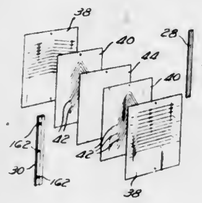
1. A record index tab for a phonograph record album, comprising, in combination, an upper part folded over, so as to form a flat pocket, receiving a card serving as a label, and a lower part coated with adhesive, on one side, for adhering to said album, and said tab being made of transparent, relatively stiff plastic sheeting material; said parts being pivotally connected together by said lower part having a rolledover upper end inserted in a slot near a lower edge of said upper part; a dimple pressed on one side of said upper part intercepting an entrance of said pocket; and stop and snap means, whereby said upper part is pivotably snapped between an upwardly vertical and an angularly upwardly inclined positions.

4,232,462
CALENDARS
Lineaus W. Longenecker, R.D. 5, Manheim, Pa. 17545
Division of Ser. No. 614,817, Sep. 18, 1975, Pat. No. 4,055,011. This application Dec. 3, 1976, Ser. No. 747,156
Int. Cl.³ G09D *3/04*
U.S. Cl. 40—119 **5 Claims**



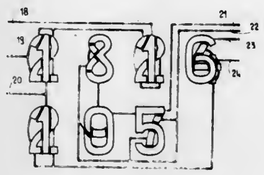
1. A calendar, comprising,
a base sheet having a picture thereon in the form of a landscape scene, said base sheet having thereon opaque calendar data areas which bear calendar data,
an overlay sheet having a transparent area movable to overlie the picture on the base sheet, overlay picture portions in said transparent area which register with and obscure portions of said picture on said base sheet, said overlay picture portions depicting vegetation associated with the season of the calendar data area of the respective overlay sheet,
opaque calendar data areas carried by said overlay sheet and located in register with corresponding said opaque calendar data areas; whereby the placement of a transparent overlay sheet over the calendar serves to add overlay picture portions to the picture, and to obscure a calendar data area therebeneath while presenting its own calendar data area.

4,232,463
PANEL FILE
Arthur T. Spees, Tustin, Calif., assignor to Visu-Flex Corporation, Pico Rivera, Calif.
Filed May 16, 1978, Ser. No. 906,917
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—373 **27 Claims**



1. A device for the storage of flat, flexible data elements, comprising:
a plurality of horizontal strips of resilient material arranged to form a layered panel, at least some of said strips each having an upper margin which overlaps a portion of an adjacent strip in said panel; and
a flexible sheet underlying and attached to said panel and having a plurality of inverted "V"-shaped cuts forming a plurality of inverted "V"-shaped straps, at least some of said straps each having a vertex attached to one of said strips below said overlapping upper margin, each of said straps which is attached to an adjacent strip being attached at an attachment point, each of said strips which is attached to one of said straps including means for guiding said data element over said attachment point.

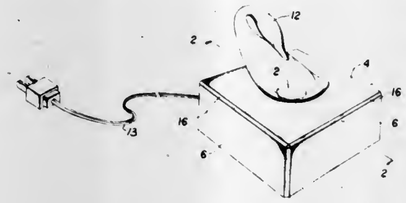
4,232,464
METHOD FOR THE DISPLAY OF INFORMATION
Rene Besson, Neuchatel, and Jean-Luc Breguet, La Chaux-de-Fonds, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland
Filed Feb. 15, 1978, Ser. No. 877,854
Claims priority, application Switzerland, Feb. 18, 1977, 2039/77
Int. Cl.³ G09F *9/35*
U.S. Cl. 40—451 **4 Claims**



1. A method for the display of information, especially for watches, using a display device of the type comprising several

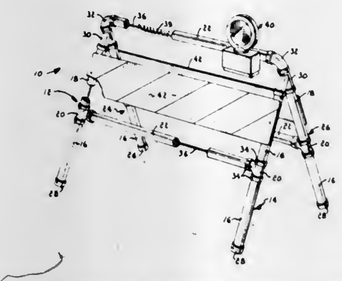
elements arranged in a rectangular formation, said elements being separately activatable, at least a group of at least two of said elements being required to be activated to effect the said display, said method comprising the steps of: activating a first element; and activating at least one selected element to said first element in one of three directions of reading namely left to right, top to bottom and top to bottom and left to right in a diagonal direction.

4,232,465
ILLUMINATED DISPLAY STAND
Ione Stoddard, 1501 S. Flagler Dr., Suite 8-F, West Palm Beach, Fla. 33401
Filed Nov. 9, 1978, Ser. No. 959,403
Int. Cl.³ G09F *13/18*
U.S. Cl. 40—546 **9 Claims**



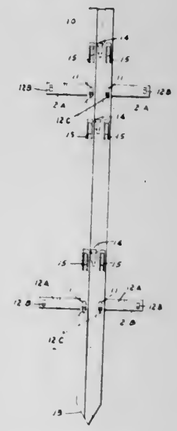
1. An illumiated stand for displaying transparent objects which are placed thereon, comprising,
a light source,
an enclosure for said light sorce, said enclosure having a top wall located in a substantially horizontal plane spaced above said light source, said enclosure including side walls laterally enclosing said light sorce, said top wall having an opening in the path of light from the light source so that a transparent object placed over said opening will be internally illuminated,
at least one of said walls including a piece of light-conducting material which has a light-receiving edge in the path of light from the light source and a light-emitting edge which is visible from the exterior of the enclosure to provide the stand with an illuminated edge, whereby said light source produces the illumination of both said illuminated edge and an object placed on said top wall over said opening.

4,232,466
COLLAPSIBLE DISPLAY FRAME
Terry S. Mathis, R.R. 2, Box 332A, Galena, Kans. 66739
Filed Dec. 13, 1978, Ser. No. 969,290
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—606 **4 Claims**



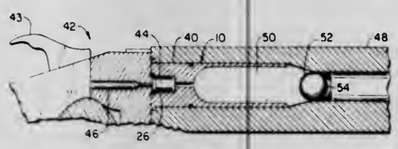
1. Apparatus for holding a display panel comprising:
first and second spaced apart leg supports,
each of said supports comprising first and second tubular members and a T-coupling joining said members;
third and fourth spaced apart leg supports;
first and second Y-couplings for coupling said first leg support with said third leg support and said second leg support with said fourth leg support;
a line extending through said first and second leg supports and having a segment passing through said member couplings and between said first and second leg supports; and
tensioning means coupled with the ends of said line for holding said line under tension,
said first and second leg supports being removable from said Y-couplings whereby they may be positioned in folded relationship next to said third and fourth leg supports and held in said folded position by said line.

4,232,467
SIGN SUPPORT STAKE
Robert Stewart, 12360 Riverside Dr., North Hollywood, Calif. 91607
Filed May 26, 1978, Ser. No. 909,939
Int. Cl.² G09F *07/20*
U.S. Cl. 40—607 **2 Claims**



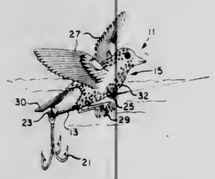
1. A sign support stake comprising:
an elongated member having a substantially hat-shaped configuration in cross-section forming a U-shaped center section with a depending flange extending laterally from each side of said center section, said U-shaped center section having an irregularly shaped opening, each said depending flange having an upright projection;
a longitudinal brace member being secured to said elongated member in a crossed configuration, said brace member having substantially equal length sections extending from said elongated member, each said section having a hook projecting therefrom, whereby a separate sheet sign structure is to be capable of being supported by said hook projections on one side of said elongated member with another sheet sign structure to be capable of being supported by said upright projections on the opposite side of said elongated member; a fastener to connect with said irregularly shaped opening, said fastener to extend through an opening in said another sheet sign structure and secure such to said elongated member, said fastener having a plurality of matching sets of apposing notches, a particular said matched set of apposing notches is to interconnect with said irregularly shaped opening for a particular thickness of said another sheet sign structure.

4,232,468
COMBINATION BREECH-LOADING TO MUZZLE-LOADING FIREARM CONVERTING DEVICE AND PROJECTILE CASING
Paul D. Chapin, 1936 Fifth St., Ceres, Calif. 95307
Filed Apr. 12, 1979, Ser. No. 29,184
Int. Cl.³ F41C *21/10*
U.S. Cl. 42—77 **6 Claims**



1. A device for removable insertion into a breech of a standard, unmodified. breech-loading firearm, the device being alternately usable as a preloaded, projectile-containing casing or for converting said firearm to one of a muzzle-loading variety, the device comprising:
a cylindrically shaped body member having opposed ends and an outer surface configured for mating engagement with the interior of the breech of said firearm, the body member being formed with a primer-receiving chamber at one of said opposed ends and a powder charge chamber at the opposite end, said primer-receiving and powder charge chambers being interconnected by a fluid communicating passage having an effective section generally equal to the area of a circle having a diameter in the range of 0.061 inches–0.080 inches.

4,232,469
FISH LURE
Howard P. Shiverdecker, Park City South, Lot 132, Bloomfield, Ill. 61701
Continuation-in-part of Ser. No. 855,898, Nov. 30, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,798
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.27 **1 Claim**



1. An artificial bait for use in fishing comprising a bouyant plug and a body, said body being secured to said plug to simulate the appearance and movement of a non-aquatic bird in the water, said body including an upper body portion having wings formed of a resilient flexible material cantilevered outwardly therefrom, and a lower body portion having feet and tail feathers formed of said resilient flexible material cantilevered-outwardly therefrom, said plug having a bottom plug surface having a generally flat section for floating in the water, and a recessed plug section at its rearward end, a hook being attached to said recessed plug section to orient said plug at a slight angle relative to the surface of the water to submerge at least a part of said lower body portion including said feet and tail feathers, and to place said upper body portion including said wings at least partially above the water's surface, a line-receiving eyelet attaching to said bottom plug surface approximately mid-way therealong adjacent said flat section for retrieving said artificial bait through said water at said slight angle relative to the water's surface, whereby said resilient feet and tail feathers flex and move beneath the surface of the water with the movement of said artificial bait while floating or being retrieved through the water, and said flexible wings disposed on the water's surface intermittently contacting the surface in a fluttering and flapping motion in response to movement of said artificial bait while floating or being retrieved through the water to simulate the movement and appearance of a non-aquatic bird in the water.

4,232,470
FISH HOOK
Joe A. Steffick, Jr., 2 Millbrook Rd., Bridgeport, W. Va. 26330
Filed Jan. 17, 1979, Ser. No. 4,212
Int. Cl.³ A01K *83/00*
U.S. Cl. 43—43.16 **3 Claims**

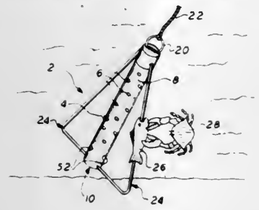


1. A fish hook, comprising:
an elongated shank,
a first generally U-shaped loop portion having one end thereof connected to the lower end of said shank, the other end of said loop portion extending upwardly toward said shank,
a second generally U-shaped portion connected at one end thereof to the other end of said loop portion and being spaced from said shank a distance less than the thickness of said shank, said second U-shaped portion being curved in a reverse manner to that of said loop portion, the other end of said second U-shaped portion extending downwardly in generally parallel relation to said other end of said loop portion and being spaced therefrom a distance greater than the thickness of said shank,
a generally U-shaped hook portion connected to the other end of said second U-shaped portion,
whereby the eye portion of a second hook or lure may be fitted over said hook portion, passed through said second U-shaped portion, and snap-fitted between said second U-shaped portion and said shank into said loop portion so as to be removably connected to said fish hook.

4,232,471
CRABBING CHUM LURE
Glenn R. Kolk, 7 Claverack Rd., and Wayne Haraka, 338 Grove St., both of Clifton, N.J. 07013
Filed Mar. 1, 1979, Ser. No. 16,663
Int. Cl.³ A01K *97/02*
U.S. Cl. 43—44.99 **10 Claims**

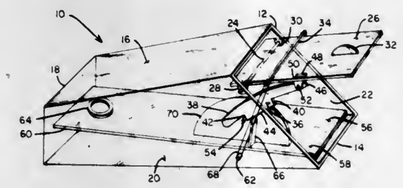
1. A chumming lure for fish, shellfish and the like which comprises:
a central, elongated tubular body to hold a quantity of chumming material, said body comprising a cylindrical side wall, a first closed end and a second open end, said side wall defining a plurality of perforations for the release of said chumming material;
at least one non-linear bait rod attached to said closed end and extending radially therefrom to define a distal free end, said at least one bait rod adapted to impale and retain whole bait thereon;

a removable cap provided to sealingly engage said open end, said cap including an upstanding eye projecting away from said body, said eye providing attachment means for said lure to a control line or the like; and



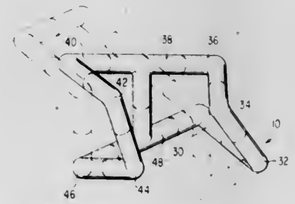
means for securing said cap and the free end of said at least one bait rod to said body to prevent the premature escape of both said whole bait and said chumming material.

4,232,472
ANIMAL TRAP
Earl L. Muelling, Fairmont, Minn., assignor to The Earl Enterprises, Inc., Fairmont, Minn.
Continuation-in-part of Ser. No. 879,258, Feb. 21, 1978, abandoned. This application Mar. 30, 1979, Ser. No. 25,470
Int. Cl.³ A01M *23/02*
U.S. Cl. 43—61 **4 Claims**



1. An animal trap, comprising:
(a) a housing having a generally rectangular bottom member of a first predetermined length, a generally rectangular top member of a second predetermined length less than said first predetermined length, a rectangular end member extending perpendicularly from one end edge of said bottom member and joining said top member at a corresponding end edge thereof and first and second parallel and spaced apart irregularly shaped, four sided, polygonal, side members joining said bottom, top and end member along opposed edges thereof so that said top member slopes toward said bottom member, said housing having a door opening extending obliquely between the other end edges of said bottom and top members and conforming to an open edge of said polygonal side members;
(b) a door member pivotally secured between said side members of said housing to completely seal said door opening in a substantially air-tight fashion when in a first orientation and to permit entry of an animal into said housing when in a second orientation;
(c) resilient means coupled between said door member and said side members of said housing for normally urging said door member to said first orientation;
(d) an abutment extending inwardly of said housing from one of said side members;
(e) a latch member pivotally secured to said door and having first and second abutment engaging notches located at spaced apart locations along its length such that when said first notch engages said abutment, said door is held in said second orientation and when said second notch engages said abutment, said door is positively held in said first orientation;
(f) an elongated platform having first and second ends disposed within said housing with said first end proximate said door opening near said bottom member, the platform being removably attached to a pivot member located intermediate said first and second ends of said platform and having a bait receiving area proximate said second end; and
(g) a generally rectangular trip member having a first end edge attached to said platform between said pivot and said first end of said platform and extending generally perpendicularly therefrom and having a second end edge adapted to engage said latch member when said second end of said platform member is rotated toward said bottom member for releasing said first notch from engagement with said abutment and allowing said resilient means to urge said door member into said first orientation with said second notch engaging said abutment, said second end edge of said trip member preventing engagement between said first notch of said latch member and said abutment when said second end of said platform is in its rotated position toward said bottom member.

4,232,473
RECONFIGURABLE LOOP OF TUBULAR ELEMENTS
Sherman Jenkins, 1401 Columbus Ave., Livermore, Calif. 94550
Filed Apr. 10, 1978, Ser. No. 895,007
Int. Cl.³ A63H *33/00, 33/08, 33/06*
U.S. Cl. 46—1 R **4 Claims**



1. A twistable novelty device consisting of:
six rigid tubular elbows each having a generally L-shaped configuration rotatably connected end to end forming a single closed loop structure, each abutting pair of elbows being mutually rotatable about the axis common to the abutting ends of said pair without axial displacement therebetween, said elbows being joined together to form a structure in which each leg of the elbows lie in one of two generally perpendicular intersecting planes.

4,232,474
TOY SAFE WITH ALARM
Robert F. Dyer, Rancho Palos Verdes, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 16, 1979, Ser. No. 12,921
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—2 **4 Claims**

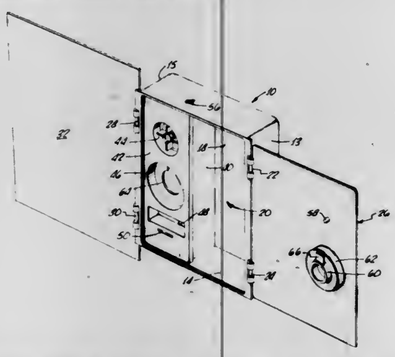
1. In a toy safe, the combination comprising:
a generally box-like housing forming a compartment with a rear wall and a plurality of sidewalls;
an aperture extending through one of said sidewalls;
a clapper member pivotally mounted within said compartment adjacent said aperture, said clapper member having a portion in aligned spaced proximate relation with said aperture, said clapper member having an enlarged main body portion with an opening extending therethrough;
a boss formed on the rear wall of said housing extending through the opening of said main body portion;
a spring member encircling said boss portion and having one end thereof fixed relative to said housing;
an actuating member rotatably mounted on said boss portion and having means for fixing the other end of said spring member thereto, rotation of said actuating member in a first direction storing energy in said spring member;
coacting means on said actuating member and said main

body portion for intermittently pivoting said clapper member in response to rotation of said actuating member in and opposite direction under force of said spring member;

a bell member mounted on said boss portion in proximate relation to said clapper member;

means on said clapper member for contacting said bell member in response to said intermittent pivoting;

a handle member coupled to said actuating member for concurrent rotation therewith;



a closure member hingedly coupled to said housing for closing the opening of said compartment, said closure member having means coacting with said handle member for restraining rotation thereof with said closure member closed; and

another member insertable through said aperture in said sidewall for coacting with a portion of said clapper member for restraining said clapper member from pivoting with said closure member open.

4,232,475

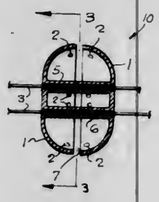
TETHERED TOP USABLE IN TWO WAYS

Harvey E. Bauer, 9124 Thilow Dr., Sacramento, Calif. 95826

Filed Jan. 4, 1978, Ser. No. 866,845

Int. Cl.³ A63H *1/30, 1/32*

U.S. Cl. 46—61 **2 Claims**



1. A whistling toy comprising a central body element having a substantially oval configuration in cross section and planar vertical faces, a central recess area which defines two symmetrical body portions, edges of said vertical faces sloping towards said recess area due to said oval configuration, said two portions being connected by only two shafts which together form connecting means oblong in transverse section, each shaft disposed on a diametrical line offset from a center of rotation of said toy, and strings inserted within and shafts connected to handle means, and orifices disposed on the sloping edges to provide said whistle by air passing through said orifice whereby said strings are adapted to be removed from within said shafts, a string secured externally to at least one of said shafts and wrapped around said shafts in said central recess area to provide a yo-yo.

4,232,476

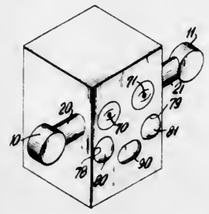
CHILDREN'S MASK

Arthur M. Lieberman, 60 E. 42nd St., New York, N.Y. 10017

Filed Sep. 8, 1978, Ser. No. 940,859

Int. Cl.³ A63H *3/06*

U.S. Cl. 46—88 **1 Claim**



1. In a children's mask the combination comprising a plurality of bladders mounted on said mask for changing the size of the accompanying portions of said mask; a mouthpiece having a plurality of apertures mounted on said mask, and a plurality of flexible tubes coupling said apertures to said bladders whereby the tongue may act as a gate to seal predetermined of said apertures and activate the remaining thereof to expand the associated bladders.

4,232,477

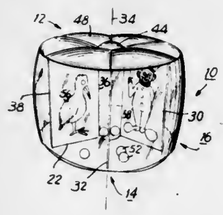
INFLATABLE HASSOCK-SHAPED TOY

Charles C. C. Lin, Taipei, Taiwan, assignor to Shelcore, Inc., New York, N.Y.

Filed May 11, 1979, Ser. No. 37,652

Int. Cl.³ A63H *3/06*; A47C *9/00, 25/00*

U.S. Cl. 46—88 **13 Claims**



1. An inflatable toy, which when inflated has the contour of a hassock, which comprises an envelope, said envelope when inflated being substantially cylindrical with substantially circular and flat top and bottom walls and a substantially cylindrical side wall, said envelope being composed of soft limp flexibe non-resilient sheet material, said envelope having an opening in a wall thereof to enable the envelope to have air under mild pressure introduced into the interior thereof so as to inflate the same, means to selectively close said opening in the wall of the envelope in order to selectively retain air in the envelope and thereby keep the envelope inflated, a plurality of soft limp flexible planar vertical baffles mutually angularly spaced within said envelope, each of said baffles extending radially from near the central axis of said envelope and terminating short of the periphery of said envelope, rectilinear means attaching the top and bottom edges of each of said baffles to the circular top and bottom walls of said envelope, so that the top and bottom walls of said envelope, when said envelope is inflated, have a contour with a central outward bulge and discrete radial outward bulges between adjacent rectilinear attachment means, said baffles being tautened by outward force exerted on the top and bottom walls between the baffles by the pressure of the inflating air, said baffles being spaced from and free of attachment to the substantially cylindrical side wall of said envelope, so that the side wall of said envelope, when said envelope is inflated, has a horizontally outwardly bulging barrel-shaped contour, and at least one discrete solid object within said envelope, the inner edges of adjacent baffles being spaced apart when the envelope is inflated, said object being sized to pass between the inner edges of adjacent baffles to the central axis of said envelope.

4,232,478

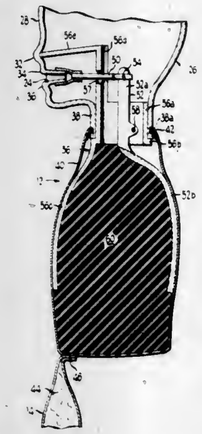
ANIMATED DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1979, Ser. No. 10,835

Int. Cl.³ A63H *13/02, 11/00*

U.S. Cl. 46—141 **8 Claims**



1. An animated doll capable of suckling a member telescoped within said doll comprising:

a body having a head with a face including a mouth defined by spaced apart lips formed of flexible material and a tubular mouth sleeve extending from said lips inwardly into the interior of said head;

manually operable means connected to said lips and said mouth sleeve behind said face, said manually operable means being reciprocally movable to move said lips inwardly and outwardly with respect to said face in a suckling type action and to move said mouth sleeve generally in a direction parallel to its axis, said operator means including a reciprocal actuator, engaging said sleeve;

said head including an outer facial wall of thin flexible plastic material, said head being a hollow enclosure having stiffening means internally of said head engaging said facial wall in a position spaced apart from said mouth for preventing retractive movement of said facial wall away from said mouth when said actuator is operatively moving said tubular mouth sleeve inwardly and outwardly; and

means connected to said body for defining a member for insertion within said tubular mouth sleeve of said doll during the reciprocal movement of said lips.

4,232,479

TOY RACING CAR

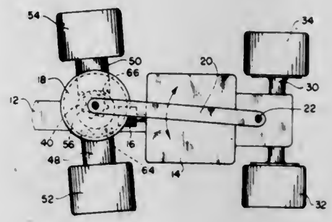
Emil H. von Winckelmann, 7731 Amestoy St., Van Nuys, Calif. 91406

Filed Oct. 5, 1978, Ser. No. 948,688

Int. Cl.³ A63H *17/36*

U.S. Cl. 46—262 **5 Claims**

1. A toy car including: a chassis; an electrically energized drive motor mounted on the chassis and having a drive shaft; a plurality of wheels for the car mounted on the chassis; an axle for supporting two of the wheels at the respective ends thereof, each of said wheels including a hub clamped to the axle and each of the hubs having a gear affixed thereto; means for mounting the axle on the chassis for angular movement thereof about a vertical axis for steering purposes; and means including a gear train coupling the drive shaft of the motor to the axle for transmitting forward motion to the car and for causing the axle to turn angularly in one direction of the other about the vertical axis depending upon the direction of rotation of the motor,



said gear train including a drive gear, a pivotally mounted arm supporting the drive gear on its distal end and angularly movable about a pivot axis to cause the drive gear selectively to engage the gears affixed to the hubs of the two wheels, a further gear coaxial with said drive gear and affixed thereto, and gear means coupling the further gear to the drive shaft of the motor.

4,232,480

METHOD AND DEVICE FOR COLORING BULK HYDRO MULCH FIBERS

Otis R. Videen, Roseville, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed May 14, 1979, Ser. No. 38,500

Int. Cl.³ A01G *7/00*

U.S. Cl. 47—9 **9 Claims**

1. In the process for preparing a hydraulic mulch wherein defibrated vegetable materials are packaged in a shipping container with a dye, the improvement comprising addition of the dye to the defibrated vegetable material after the defibrated vegetable material is in its shipping container.

4,232,481

CARPET OF VEGETABLE MATTER

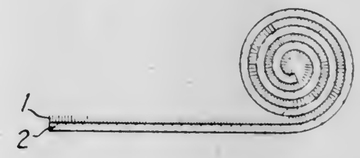
Michel C. Chamoulaud, Pont de l'Eyre, 33770 Salles, France

Continuation of Ser. No. 856,569, Dec. 2, 1977, abandoned. This application Jul. 31, 1979, Ser. No. 62,378

Claims priority, application France, Dec. 3, 1976, 76 36574

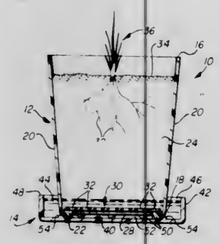
Int. Cl.³ A01C *1/04*

U.S. Cl. 47—56 **15 Claims**



1. A transportable carpet sheet of grass, said carpet sheet comprising a thin layer of compost consisting essentially of finely crushed and gauged conifer bark the particles of which have a section of not more than 100 sq mm and a diameter of at least 1 mm, and grass having whole roots embedded into the compost to form a supporting fabric therein for the sheet, the sheet thickness being approximately 2 cm.

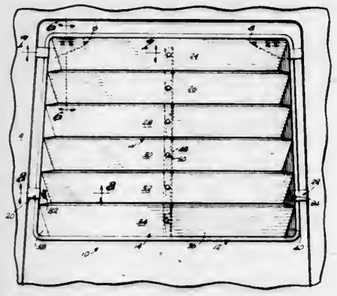
4,232,482
FLOWER POT
Neill H. Watt, and Lynda L. Watt, both of 1815 Valcourt, Richardson, Tex. 75081
Filed Jan. 2, 1979, Ser. No. 74
Int. Cl.³ A01G *23/02*
U.S. Cl. 47—71 **1 Claim**



1. A container assembly for growing and transplanting plants comprising, in combination, a pot having an open top end, an open bottom end, an upwardly flaring conical sidewall disposed between the top and bottom ends, and an annular flange projecting into the interior of said pot from the sidewall near the bottom end defining the open bottom end, said flange being inwardly, radially spaced from said sidewall; bottom disc removably supported on the annular flange within the interior of said pot and covering the open bottom end, said bottom disc having at least one drainage opening overlying the open bottom end for permitting water to drain from soil enclosed within said pot through the open bottom end, and said bottom disc being upwardly movable through said pot for displacing a volume of soil and a rooted plant through the top opening without disturbing the soil surrounding the roots of the plant; a tray for supporting said pot in an upright position, said tray having a closed bottom panel and an upturned sidewall projecting from the closed bottom panel, said tray bottom panel, tray sidewall and pot sidewall defining an open annular reservoir space between the sidewall of the tray and the sidewall of the pot when the pot is received within the tray; and, interlocking support means mounted on said pot and on said tray for centering and removably supporting the open bottom end of said pot above the bottom panel of said tray and below the top of the tray sidewall and for providing fluid communication between the open reservoir space and the intermediate opening, said interlocking support means including a circular array of axially projecting feet depending from said flange, said feet being spaced relative to each other thereby defining a flow passage between adjacent feet, and a circular array of elongated, curved ridge segments projecting upright from the tray bottom panel, said curved ridge segments being spaced relative to each other thereby defining a flow passage between adjacent ridge segments, the circular array of axially projecting feet being concentrically aligned with the circular array of ridge segments, said axially projecting feet and ridge segments being engageable to define a male and female connection for securing said pot into engagement with said tray.

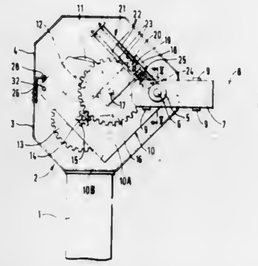
4,232,483
HINGED LOUVERED WINDOW SHADE DEVICE
Robert Lockshin, 2025 NE. 154 St., North Miami Beach, Fla. 33162
Continuation of Ser. No. 754,558, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 659,599, Feb. 20, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,337
Int. Cl.² E05C *7/02*
U.S. Cl. 49—67 **7 Claims**

1. A louvered window shade device for mounting relative to the window in the rear door of an automobile comprising:
a main body assembly having a top edge portion and a lower portion and being comprised of a plurality of interconnected horizontally disposed louvers, each louver including an elongated transverse top wall and a pair of opposed end walls,
mounting means including a pair of top mounting assemblies and a pair of lower mounting assemblies,
each of said pair of top mounting assemblies including hinge means connecting to said top edge portion and clamp means for fixed engagement relative to the existing peripheral door flange, and
each of said pair of lower mounting means including clamp



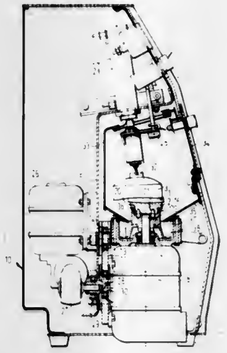
means for fixed engagement relative to the door flange and latch means for selective engagement and disengagement relative to said lower portion, each of said latch means comprising a latch pin connecting a lower mounting means and an end wall of one of said louvers, said latch pin being rotatable between a latched position at which the latch pin extends between the associated mounting means and louver end wall and an unlatched position at which the latch pin is removable from between the associated mounting means and louver end wall.

4,232,484
APPARATUS FOR MOVING TOLL BARS OR THE LIKE
Hans Buchmann, Oetwil, Switzerland, assignor to Zuhlke Engineering AG, Schlieren, Switzerland
Filed Dec. 20, 1978, Ser. No. 971,356
Claims priority, application Switzerland, Dec. 21, 1977, 015788/77
Int. Cl.³ E05F *15/02, 15/10*; E01F *23/00*
U.S. Cl. 49—334 **11 Claims**



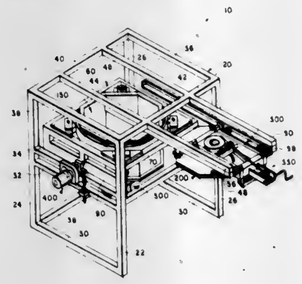
1. In a tollgate or the like, the combination of a support; a bar mounted on said support and movable between a first and second end position; and means for moving said bar between said end positions, including a prime mover and a swinging crank guide transmission having an input element connected with said prime mover and an output element connected with said bar, one of said elements including a pivotable crank guide and the other including an orbiting crank portion guided by said crank guide.

4,232,485
APPARATUS FOR POLISHING CURVED SURFACES
Stuart Eadon-Allen, Birmingham, England, assignor to Dollond & Aitschison (Services) Limited, Birmingham, England
Filed Aug. 11, 1978, Ser. No. 933,453
Claims priority, application United Kingdom, Aug. 13, 1977, 34083/77
Int. Cl.³ B24B *13/02*
U.S. Cl. 51—55 **6 Claims**



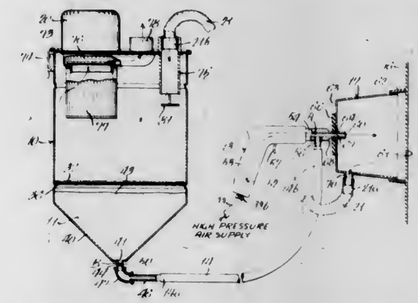
1. A combination for polishing curved surfaces comprising a workpiece and a polishing tool having complementary part-spherical surfaces and apparatus for rubbing said surfaces together, wherein the apparatus comprises first carrying means for carrying one of the workpiece and tool for rotation about a first axis, a support which is movable relative to the first axis, second carrying means for carrying the other of the workpiece and tool for rotation about a second axis, the second carrying means being mounted on the support, fluid biasing means for urging the workpiece and the tool into mutual engagement, driving means for rotating one of the workpiece and tool about its axis and for moving the support whereby the workpiece and the tool are rubbed together, and guide means co-operable with the support for guiding the support and second carrying means for movement such that the second axis moves in a plane, the first axis being inclined at an acute angle to said plane.

4,232,486
TUMBLER-TYPE FINISHING MACHINE
John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio
Filed Nov. 14, 1978, Ser. No. 960,630
Int. Cl.³ B24B *31/02*
U.S. Cl. 51—164.1 **24 Claims**



1. A tumbler apparatus, comprising:
(a) a drum defining a chamber adapted to receive finishing media and workpieces to be finished, the drum being rotatable about a rotation axis;
(b) a framework supporting the drum for rotation about the rotation axis;
(c) an upstanding frame supporting the framework for movement about a pivot axis for positioning the drum rotation axis in selected orientations;
(d) drum rotation drive means interposed between the framework and the drum for rotating the drum about the rotation axis; and,
(e) the drive means including a hydraulic motor and shock absorbing means for minimizing the transmission through the drive means of transient loads and shocks from the drum to the framework.

4,232,487
ABRADING DEVICE
Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.
Filed May 25, 1978, Ser. No. 909,537
Int. Cl.³ B24C *3/06, 7/00*
U.S. Cl. 51—425 **47 Claims**



1. A surface treating apparatus comprising a housing containing a supply of abrasive material and having an outlet at the bottom thereof, a gun for directing abrasive material in the direction of a surface area to be abraded and having a passageway defined therethrough, a source of positive pressure air connected to one end of said gun passageway, a conduit having a first end portion connected to said outlet and a second end portion connected to said gun passageway downstream of the connection of said source of positive pressure to said gun, abrasive material from the housing occupying said first end portion under the influence of gravity when the apparatus is inoperative, an aperture formed in said first end portion of the conduit adjacent the abrasive material therein and the housing outlet, the aperture permitting ambient atmospheric pressure to communicate with said conduit downstream to the gun and upstream through said first end portion to the housing only through said outlet, whereby positive pressure air flowing through said gun passageway across the end of said conduit creates a negative pressure in said conduit, the negative pressure in said conduit causing ambient air to flow in through said aperture toward the gun and to draw abrasive material from said first end portion and from said housing through said outlet and to propel said abrasive material to the gun passageway so that positive pressure in said passageway propels the abrasive material onto the surface area.

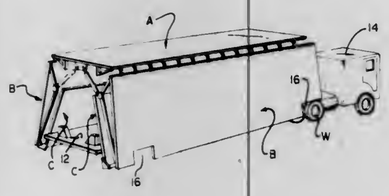
4,232,488
PORTABLE STAGE
William F. Hanley, c/o Magic Stage, 430 Salem St., Medford, Mass. 02155
Filed Mar. 30, 1979, Ser. No. 25,329
Int. Cl.² E04H *3/10*; A47B *3/00*
U.S. Cl. 52—7 **17 Claims**

1. Portable extendable, wide area apparatus, usable for stages

and the like, mountable on and compressible to an over-the-road truck cross section frame and expandable to a flat staging width on at least one side of the truck of two or more times truck height and comprising,

means forming a B panel arranged to hang vertically and pivot 0°–90° about a first pivotal axis running parallel to the truck length and located at elevation above the truck body and within the said cross section frame thereof and high enough so that the lower free end of the said B panel clears the ground when the panel is vertically arranged (at 0°),

means for driving the B panel about its pivotal axis,



means forming a C panel pivotally mounted to be movable 0° to 180° about a second axis running parallel to the truck length located substantially at and mounted on, but offset from said free end of the B panel and,

means mounted on said B panel for driving the C panel about its pivot and comprising separate means, alternatively engageable, for driving the panel through extreme acute and obtuse angles and for driving the C panel in between said extreme angle ranges of motion,

the B-C panels when at their respective 90° and 180° pivotal extensions forming a stage raised above the ground,

means for supporting such raised stage,

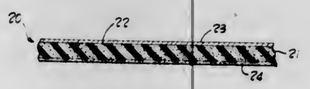
the 0° position of the C and B panels comprising a folded up panel array constituting a side wall of the truck.

4,232,489

SKELETAL FRAME STRUCTURE WITH SHEET MATERIAL COVER

Edward J. Corvington, Cuyahoga Falls, and Elmer J. Sitter, Northfield, both of Ohio, assignors to Royal Mark Laminates, Macedonia, Ohio

Filed Jun. 28, 1979, Ser. No. 53,103
Int. Cl.[2] E04B 1/347; B32B 5/18, 23/00
U.S. Cl. 52—63 **6 Claims**



1. In a skeletal frame structure including a framework and a flexible cover, the improvement characterized by a protective tape applied to the framework beneath the cover, said tape comprising a laminate of plastic foam and a facing layer of silicone-coated kraft paper, said facing layer being exposed for contact by the cover.

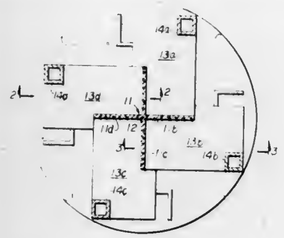
4,232,490

BUILDING CONSTRUCTION FOR MULTIPLE UNITS HAVING COMMON WALLS

Cyril M. Doane, 500 Font Blvd., San Francisco, Calif. 94132

Filed Feb. 5, 1979, Ser. No. 9,442
Int. Cl.[3] E04B 1/98
U.S. Cl. 52—167 **3 Claims**

1. A multi-unit building comprising a free-standing central wall having a plurality of arms extending radially from a central vertical axis, said central wall comprising the principal support for the entire building and affording seismic protection, sound proofing, heat and sound insulation and fire hazard shielding for said entire building, a plurality of units, each unit extending perpendicularly from one said arm, a concrete slab for each said unit, a concrete-reinforced foundation around the perimeter of said slab including one stretch parallel to each said arm and the front exterior wall on each said one stretch, exterior walls around the perimeter of said slabs supported by said



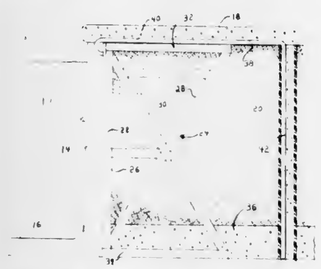
foundations, said central wall and said slabs being tied together with first reinforcing rods, said foundations and said slabs and said exterior walls being tied together by second reinforcements, a roof for each said unit supported by one said arm and by at least some of said exterior walls, said central wall being of masonry construction and being substantially fire, sound and earthquake proof, the exterior walls of individual units being separated from each other by arms of said central wall to reduce likelihood of fire spreading from one unit to another.

4,232,491

SWIMMING POOL DECK

John C. Bumgarner, Sr., 514 N. Crain Hwy., Glen Burnie, Md. 21061

Filed Oct. 10, 1978, Ser. No. 949,537
Int. Cl.[3] E04B 1/35; E04H 3/16, 3/18
U.S. Cl. 52—169.7 **3 Claims**



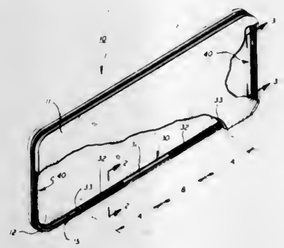
1. In combination in apparatus for fabricating a swimming pool deck comprising; a concrete footing, a plurality of spaced vertically disposed hollow tubular support molds filled with concrete, embedded in the concrete footings, a plurality of spaced supports abutting the exterior surface of a side wall of an existing swimming pool and embedded in the concrete footings, and a plurality of vertical plates positioned next to the exterior surface of the side walls of the existing swimming pool and the spaced supports have a vertical leg to hold said vertical plates in place, a plurality of horizontal reinforcing rods extending from the side wall of the existing swimming pool to the vertically disposed hollow tubular support molds to support a poured concrete deck, said hollow tubular support means are speced from one another and from the side wall of the existing swimming pool, each of the horizontal reinforcing rods having a hook portion on one end to engage the top portion of the vertical plates, and an elongated vertically disposed downwardly extending L-shaped portion on the other end, said downwardly extending portion embedded in the concrete in the hollow tubular support molds.

4,232,492

DRYING APPARATUS FOR MULTI-GLAZED WINDOW UNIT

David W. Remick, Camillus, and David T. Ahlgren, Syracuse, both of N.Y., assignors to O. M. Edwards Co., Syracuse, N.Y.

Filed Jan. 18, 1979, Ser. No. 4,459
Int. Cl.[3] E06B 7/12
U.S. Cl. 52—172 **4 Claims**



1. In a multi-glazed window of the type wherein at least two light transmitting panels are mounted in a frame in a spaced-apart relationship and the window is sealed to prevent moisture from entering the atmosphere within the space between the panels, the improvement comprising

an elongated housing extending along one of the margins of the window within the sealed space between the panels, said housing having a bottom wall, side walls and end walls,

a desiccant material evenly dispersed throughout said housing in sufficient quantity to initially dry the atmosphere within the sealed space between the panels upon sealing of the window and to maintain said atmosphere in a dry condition thereafter,

a cover mounted upon the top of said housing having a first open zone containing a plurality of closely spaced holes for exposing the desiccant in this region of the housing to said atmosphere and a second closed zone having an unbroken surface for shielding the desiccant in this region from direct exposure to the atmosphere in the sealed space, and

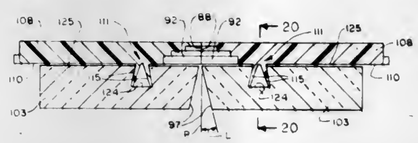
said open zone of the cover containing at least twice the area of the closed zone.

4,232,493

FIRE-RESISTANT ELECTRICAL WIRING DISTRIBUTING FLOOR STRUCTURE AND METHOD

Charles R. Gray, Coraopolis; John O. Hazen, Monaca, and Charles J. Kelly, Pittsburgh, all of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 901,063
Int. Cl.[3] E04C 3/10
U.S. Cl. 52—221 **12 Claims**



1. In a floor structure of the type comprising a metal subfloor providing generally parallel enclosed cells separated by lengthwise troughs; a covering layer of monolithic concrete supported by said metal subfloor; a housing disposed between said metal subfloor and said concrete, providing a chamber which includes a trough space and which communicates with one of said cells; and a layer of fireproofing material covering the lower surface of said metal subfloor; the improvement comprising:

said layer of fireproofing material having a thickness which is less than that required to provide said floor structure with a desired fire endurance when the housing is activated;

activating means for gaining access to said chamber and for reinstating said desired fire endurance of said floor structure without increasing said thickness of said layer of fireproofing material, said activating means including:

a passageway in said concrete extending between said upper surface of said concrete and said housing, providing access to said chamber,

a removable cover supported in capping relation with said passageway,

a rigid insulation block secured to said cover at a lower face thereof, said rigid insulation block being removably connected to said cover by a dovetail connection, and

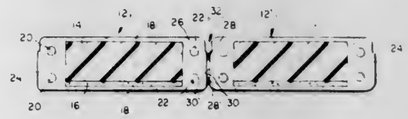
a heat shield positioned within said trough space.

4,232,494

COMPOSITE CONSTRUCTION PANEL

Tamil D. Bauch, Box 394 B, R.F.D. 1, Kingston, N.Y. 12401, and Hank Starr, Kingston, N.Y., assignors to Tamil D. Bauch, Kingston, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,892
Int. Cl.[3] E04B 2/02; E04C 2/24; B32B 5/18
U.S. Cl. 52—221 **10 Claims**



1. A molded composite construction panel formed in a continuous molding procedure and suitable for casting curvilinear structural components comprising a lightweight cellular core of rigid foam material, said core having a cementaceous fireproofing layer interfacially bonded to one side of said core, a relatively thin skin of sprayed glass fiber reinforced concrete encasing said core and fireproofing layer, said panel further including at least one integrally formed lateral rib section of said fiber reinforced concrete, said rib section being coextensive with at least one side of the panel and including connection means for securing adjacently placed panels.

4,232,495

PRECAST UNITS FOR CONSTRUCTING COOLING TOWERS AND THE LIKE

Tung-Yen Lin, El Cerrito, and Yue-Chyou Yang, San Francisco, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Division of Ser. No. 768,175, Feb. 14, 1977, Pat. No. 4,092,811. This application Nov. 3, 1977, Ser. No. 848,025
Int. Cl.[2] E04C 3/26
U.S. Cl. 52—224 **4 Claims**

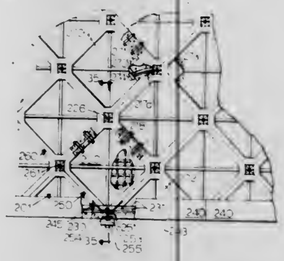
1. A precast unit for constructing cooling towers and the like, comprising:

a quadrilateral reinforced thin skin of concrete, having integral therewith

an edge rib along each edge thereof, each having openings therethrough to enable securement, as by bolting, of a like precast unit thereto, and

a pair of cross ribs crossing diagonally, each having a ten-

don-receiving passage running therethrough at each corner of said unit, the two edge ribs converging there being



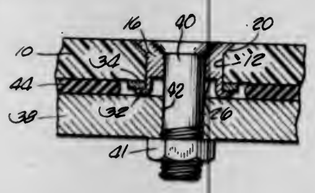
splayed across the corner, leaving the unit only the thickness of said skin outside the splay.

4,232,496

GROMMET ASSEMBLY FOR COMPOSITE PANELS

Roy Warkentin, Lomita, Calif., assignor to Tridair Industries, Milwaukee, Wis.

Filed Apr. 30, 1979, Ser. No. 34,105
Int. Cl.³ E04B *1/66*; F16B *5/02*
U.S. Cl. 52—403 **4 Claims**



1. An assembly for attaching a panel of relatively brittle composite material to a substructure, separated therefrom with a layer of gasket material compressible to a maximum limit, comprising:

(1) aligned circular holes in the panel and the substructure;

(2) the gasket material defining a space radially around the holes and axially between the panel and the substructure;

(3) a structural grommet disposed in the panel hole and having a radially flared end extending into the space for securing the grommet in the panel;

(4) fastening means disposed in the grommet and the hole in the substructure for drawing the panel and substructure together and compressing the gasket material;

(5) spacer means interposed between the panel inner face and the flared grommet end; and,

(6) the spacer means and grommet end having a combined thickness in the axial direction of the space between the panel and substructure greater than the thickness of the gasket material at its limit of maximum compressibility.

4,232,497

DEVICE FOR SECURING PLATELIKE ELEMENTS TO A CARRYING STRUCTURE AT A DISTANCE THEREFROM

Albin Meschnig, Müllnern 72 (Kärnten), A-9585 G dersdorf, Austria

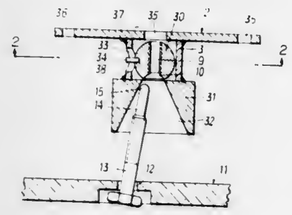
Filed Feb. 21, 1979, Ser. No. 13,654
Int. Cl.³ E04B *1/38*; F16B *39/00*
U.S. Cl. 52—506 **7 Claims**

1. An assembly for securing a panel to a carrying structure, particularly for securing suspended ceilings to an overlying structure, comprising

a carrier means for attachment to a carrying structure, said carrier means being formed with a plurality of apertures,

a nut member pivotally mounted in the carrier means, said nut member being formed with a threaded tapped bore,

a bolt adapted to be passed through an opening in the panel and screwed into the tapped bore of the nut member, the bolt having a cylindrical extension of a diameter smaller than the threaded tapped bore of the nut member and the carrier means having a flared guide means for leading said cylindrical extension into the nut member,



a plurality of pins extending from the nut member constituting means for restricting rotation of the nut member about the axis of said threaded tapped bore,

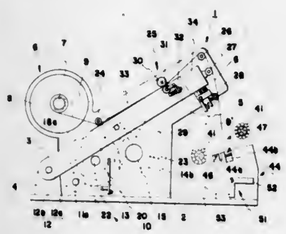
the pins having a clearance fit in said apertures, respectively, in the carrier means are regularly spaced around the nut member, said apertures in said carrier means correspond to the number of said pins.

4,232,498

DEVICE FOR BINDING A THERMALLY ADHESIVE TAPE TO ARTICLES

Hiromichi Uchida, c/o Shin Nihon Seiki Co., Ltd., Hoshino Bldg., 7-3, Ueno 5-chome, Taito-ku, Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,901
Claims priority, application Japan, Jul. 25, 1977, 52-89081
Int. Cl.³ B65B *13/32*, *27/10*, *57/16*
U.S. Cl. 53—76 **7 Claims**



1. A device for binding thermally adhesive tape around articles to be bundled, said device comprising:

a base frame;

an arm pivoted to said base frame and pivotably movable between a working position and a non-working position, said arm having a free end;

a working head provided on said free end of said arm;

a tape supply mounted on said base frame for supplying a leading end of tape over said free end of said arm;

a working stand mounted on said base frame at a position to be faced with said working head when said arm is pivoted to said working position;

tape holding means, mounted on said working stand, for releasably holding said tape leading end;

whereby, when said arm is in said non-working position, articles to be bundled may be placed in a tape portion extending between said working head and said tape holding means;

said working head including tape bundling means for, upon movement of said arm to said working position, wrapping said tape portion around said articles to be bundled, holding the thus wrapped tape portion against said working stand, and for releasing said tape holding means from said tape leading end;

heater means, provided on one of said working head and said working stand, for bonding said wrapped tape portion;

cutter means on said working head for cutting the thus bonded and wrapped tape portion from a succeeding portion of said tape, thereby forming a released bundle of said articles;

said working head including tape leading means for leading a new tape leading end from said succeeding tape portion to said tape holding means;

a transmission system for moving said arm from said non-working position to said working position, said transmission system comprising a motor, a first gear group driven by said motor, a second gear group, a clutch between said first and second gear groups, said clutch having an engaged position causing said first gear group to drive said second gear group and a non-engaged position interrupting driving between said first and second gear groups, and arm drive means connected to said second gear group and to said arm for pivoting said arm between said working and non-working positions upon said clutch being in said engaged position and upon driving of said second gear group; and

clutch engaging means for moving said clutch from said non-engaged position thereof to said engaged position thereof and for thereby moving said arm from said non-working position thereof to said working position thereof, said clutch engaging means comprising an article receiving table positioned to receive and entirely support thereon said tape portion and said articles to be bundled, said table being mounted to be depressed upon receipt of said tape portion and articles to be bundled, and lever-linkage means, mounted between said table and said clutch, and operable upon depression of said table, for moving said clutch from said non-engaged position thereof to said engaged position thereof, said lever-linkage means comprising a clutch releasing member mounted for movement between a first position in contact with said clutch and thereby maintaining said clutch in said non-engaged position out of contact with said clutch and thereby and a second position allowing said clutch to move to said engaged position, spring means for urging said clutch to said engaged position, and linkage means connected to said clutch releasing member for moving said clutch releasing member to said second position thereof upon depression of said table.

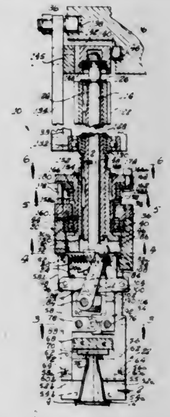
4,232,499

CAPPER CHUCK

John H. Holstein, 5304 N. Colonial - No. 102, Fresno, Calif. 93704, assignor to John H. Holstein, Fresno, Calif.

Filed Aug. 1, 1978, Ser. No. 930,053
Int. Cl.³ B65B *7/28*; B67B *3/20*
U.S. Cl. 53—331.5 **17 Claims**

1. In a capper chuck for applying a closure to a container by effecting relative rotation between the closure and the container, the capper chuck including housing means, gripper jaw means supported by said housing means for movement between an open condition adapted to receive a closure therein and a closed condition adapted to firmly retain the closure, linkage means interconnecting said gripper jaw means and operable to effect movement of said jaw means between said open and closed conditions, and control means mounted on said housing means and operatively associated with said linkage means to release said gripper jaw means from a closure in response to a predetermined rotational torque effected between the closure and an associated container upon relative rotation between the capper chuck and container, the improvement wherein said control means includes control plate means rotatably mounted on said housing means, coaxial with said capper chuck, spring means coaxial with said control plate and connected between said control plate means and said housing means and operative to transmit a predetermined rotational torque to said housing means upon rotation of said control plate means, and an actuating lever mounted on said housing



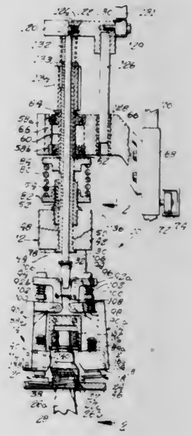
means for cooperation with said control plate means and said linkage means, said control plate means and actuating lever being operative to effect release of said jaw means from a closure when said predetermined torque is effected between said closure and associated container.

4,232,500

ROLL-ON CAPPER CHUCK

John H. Holstein, 5304 N. Colonial - No. 102, Fresno, Calif. 93704, assignor to John H. Holstein, Fresno, Calif.

Filed Aug. 1, 1978, Ser. No. 930,054
Int. Cl.³ B65B *7/28*; B67B *3/18*
U.S. Cl. 53—334 **3 Claims**



1. In a capper chuck apparatus having housing means, at least two support arms pivotally mounted on said housing means, operating means carried by said support arms and adapted to engage a closure disposed between said operating arms, and means operatively associated with said housing means and said support arms and operative to effect pivotal movement of said support arms between first positions wherein said operating means engage a closure disposed therebetween and second positions wherein said operating means are spaced from the closure.

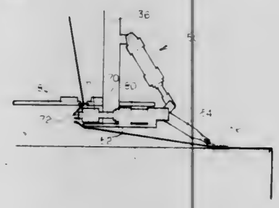
the improvement wherein each of said support arms has a bifurcated end thereon opposite its pivotal connection to said housing means, each of said support arms having a pair of laterally aligned open ended slots formed in its bifurcated end and a pair of axially aligned openings spaced from said slots, each of said operating means including a mounting block adapted to be received within the bifurcated end of the associated support arm, each of said mounting blocks having a first pin therein adapted for registration with the open ended slots in the associated support arm and having a second pin therein adapted to be inserted through said axially aligned openings in the associated support arm so as to releasably retain the operating arm in assembled relation with its associated support arm.

4,232,501

ECONOMY AUTOMATIC WRAPPING APPARATUS

William H. Stackhouse, Pamyra, Ind., assignor to Lantech Inc., Louisville, Ky.

Filed May 1, 1978, Ser. No. 901,634
Int. Cl.[1] B65B *11/04*
U.S. Cl. 53—399 **16 Claims**



1. The process of making a unitary package from a load comprising a plurality of units comprising:

(a) placing a leading edge of a roll of stretchable film from a dispensing means adjacent a load in a clamp to hold it in a fixed position;

(b) applying tension to the roll of stretchable film so that the film web is stretched at least 20% as it is removed from the roll;

(c) wrapping the load with a plurality of layers of stretched film web by rotating the load while removing the clamp so that the leading edge of the roll of stretched film is released and held against said load by an overwrap of said stretched film;

(d) stopping the wrapping of said load;

(e) moving a web extending means into the path of said stretched film web to engage the stretched film web and distort the film web out of the flow path it initially occupied when the wrap was stopped;

(f) clamping at least a portion of the distorted stretched film web in said clamp between the extruding means and the dispensing means;

(g) extending a cutting means mounted to the web extending means into the film web from the same side of the film web that the web extending means engages the film web thereby severing the web without any opposing force on the other side of the film web after the film has been distorted from its initial flow path; and

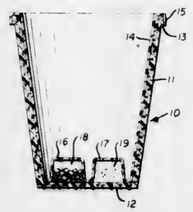
(h) pressing the trailing edge of the film web against an underlying film wrap layer.

4,232,502

METHOD OF MAKING A DRINKING CUP AND CONTAINER

Paul A. Lucas, 2605 St. Clair Ave., East Liverpool, Ohio 43920

Continuation-in-part of Ser. No. 811,432, Jun. 29, 1977, Pat. No. 4,134,492. This application Oct. 5, 1978, Ser. No. 948,893
Int. Cl.[1] A23L *29/02;* **B65D** *77/00;* **B29C** *17/08;* **B65B** *47/00*
U.S. Cl. 53—453 **7 Claims**



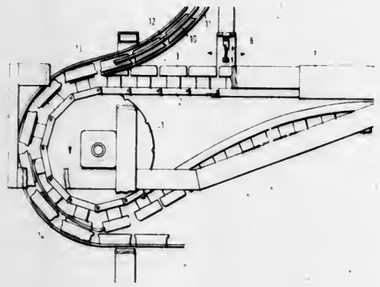
1. The method of making a drinking cup and container comprising positioning a piece of thin flexible plastic film over a shaping form of a predetermined shape incorporating at least one depression in the outer surfaces thereof, moving the film into close engagemment with said outer surfaces of said shaping form, positioning a beverage concentrate or the like in at least one of the depressions defined in said film by said depressions in said shaping form, positioning an expendible cup thereover in sealing relation thereto and removing the excess film around the outside of said cup so that said film forms a liner in said cup with said depressions and said beverage concentrate in the normal bottom of said cup when the same is in upright position.

4,232,503

MACHINE FOR AUTOMATICALLY FILLING CANS

Niels J. Andersen, Broby, Denmark, assignor to Cabinplant A/S, Haarby, Denmark

Filed Mar. 8, 1979, Ser. No. 18,740
Claims priority, application Denmark, Mar. 16, 1978, 1184/78
Int. Cl.[1] B65B *37/16, 63/00*
U.S. Cl. 53—517 **6 Claims**



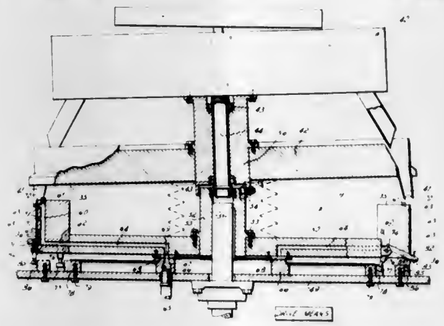
1. A machine for automatically filling elongated pieces of food-ware in cans, comprising a substantially horizontal endless conveyor chain rotating about a sprocketwheel, each link of said chain carrying a receptacle, each said receptacle being open at its top and at its opposite ends, the outer dimensions of each said receptacle substantially corresponding to the inside dimension of said cans, successive receptacles being lengthwise aligned to form a groove at least through a filling station through which said chain passes; a cutting device arranged to be moved between the adjacent ends of the receptacles; and guiding means for supplying a continuous row of cans having openings facing downward to a location where said conveyor chain initiates a downward movement as it rotates around said sprocketwheel, said conveyor chain and guiding means approaching one another at said sprocketwheel so that cans from said guiding means are successively caught by respective receptacles and forced down to surround the same and be retained in this position to the lower part of said sprocketwheel.

4,232,504

POUCH FORMING AND FILLING MECHANISM WITH PROVISION FOR INCREASING THE CAPACITY OF THE POUCHES

Paul E. Dieterlen, Covington, Ky., and Harold T. Benner, Jr., Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jun. 12, 1978, Ser. No. 914,426
Int. Cl.[1] B65B *43/30, 43/32*
U.S. Cl. 53—570 **12 Claims**



1. In pouching apparatus, a filling mechanism comprising,

a filler wheel assembly,

means for continuously rotating said assembly,

said filler wheel having a filling zone at one arcuate portion of its rotary excursion,

a vacuum transfer wheel mounted below said filler wheel assembly and rotatable therewith,

a plurality of substantially vertical lands circumferentially spaced around said transfer wheel to receive a web of pouches,

means for holding the web on said lands,

a plurality of tuck fingers movably mounted on said transfer wheel between said lands,

a stationary circumferential cam mounted adjacent said transfer wheel,

said tuck fingers being connected to said cam to cause said fingers to move upwardly into contact with the pouches in said web to tuck the bottom of each pouch during at least a portion of the movement of said tuck fingers through said filling zone, thereby increasing the capacity of each pouch.

4,232,505

DUAL ELEMENT FILAMENT MOWER

Joseph J. Walto, Chaska, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Aug. 9, 1978, Ser. No. 932,353
Int. Cl.[1] A01D *35/264*
U.S. Cl. 56—12.7 **8 Claims**

6. A dual element filament mower of the type wherein a plurality of rotating filament mounting elements carrying flexible nonmetallic filament cutting elements which pass through overlapping paths during rotations are affixed to a mower housing having ground-engaging wheels for movement over a ground surface in a preferred direction, wherein the improvement comprises:

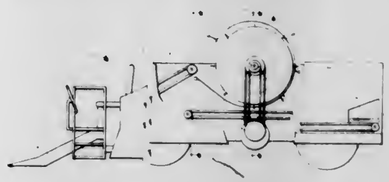
means mounting said filament mounting elements with axis of rotation of one element ahead of the other with respect to said preferred direction, and the axes of rotation of both of said elements tipped substantially with respect to the vertical, so that the cutting planes defined by the filaments of each of said mounting elements do not intersect.

4,232,506

METHOD AND APPARATUS FOR RECOVERING TOMATOES FROM SEVERED VINES, EMPLOYING A ROTATED AND OSCILLATED SHAKER

Henry E. Studer, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 25, 1979, Ser. No. 51,846
Int. Cl.[1] A01D *45/00*
U.S. Cl. 56—327 R **37 Claims**



1. A method for mechanically harvesting a crop from a vine or like plant after the vines have been severed from their roots and lifted aboveground, comprising

shaking the vines by subjecting them to angular acceleration and deceleration while transporting said vines around an arcuate path about an horizontal axis and while holding said vines in said arcuate path,

collecting the crop shaken from the vines, and

disposing of the stripped vines.

4,232,507

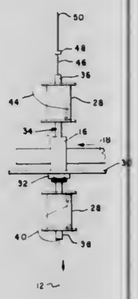
APPARATUS AND METHOD FOR WRAPPING CORE YARNS

Francis B. Northup, and Donald R. Hart, both of Sanford, N.C., assignors to Carlo Menegatto, Milan, Italy

Filed Feb. 22, 1973, Ser. No. 334,704
Int. Cl.[2] D02G *3/38*
U.S. Cl. 57—16 **15 Claims**

1. A method of wrapping a core yarn with a plurality of wrap yarns comprising directing a core yarn in a substantially vertical path of travel and into and through first and second rotating hollow spindles each rotatably carrying a spool of

wrap yarn on its opposite ends for wrapping the core yarn passing through the hollow spindles whereby the core yarn



will be successively wrapped by the wrap yarns carried by the hollow spindles.

4,232,508

KNOTTING MECHANISM PROVIDED WITH A DRIVING MECHANISM

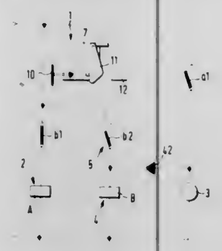
Gerd Husges, and Rupert Karl, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,504

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802886

Int. Cl.³ D01H *15/02, 15/00*

U.S. Cl. 57—22 **11 Claims**



1. A knotting mechanism for use on an open end spinning machine for performing a knotting process on yarn being produced on said spinning machine, mounting means for supporting said knotting mechanism so as to permit said knotting mechanism to be moved along said spinning machine and transversely to said spinning machine to a knotting position, said knotting mechanism comprising:

a switching-on mechanism (**1**);

means for activating said switch-on (**1**) mechanism responsive to said knotting mechanism being moved transversely to said knotting position;

driving means (**3**) for initiating said knotting process on said yarn upon being activated;

a release means (**2**) operably connected to said driving means (**3**) for activating said driving means responsive to said switch-on mechanism (**1**) being activated;

timing means (**4**) for de-activating said driving means after a predetermined period of time sufficient to carry out said knotting process and for preventing said driving means from initiating another knotting process without first de-activating and re-activating said switch-on (**1**) mechanism.

4,232,509

METHOD AND DEVICE FOR JOINING AN UPPER THREAD TO A LOWER THREAD

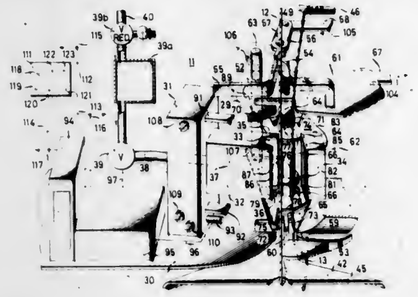
Joachim Rohner; Reinhard Mauries, and Heinz Zumfeld, all of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,099

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810741; Apr. 13, 1978, 2815999; Oct. 10, 1978, 2845031; Nov. 27, 1978, 2851252

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—261 **18 Claims**



1. Method for joining together an upper and a lower thread, which comprises moving at least one first thread feeder from a thread pick-up position to a thread transfer position, inserting the upper and the lower threads into a longitudinal slot formed in a chamber, holding the threads in the slot until compressed air is admitted to the chamber, and at given positions during the movement of the first thread feeder: closing the chamber with a lid, automatically severing the ends of the upper and lower thread and blowing compressed air into the chamber.

4,232,510

TIMEPIECE

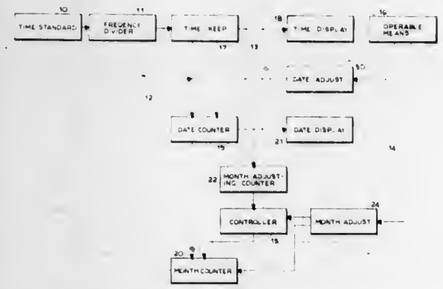
Munetaka Tamaru, Tokyo; Akira Tsuzuki, Ooizumigakuen; Shigeru Morokawa, Higashiyamato; Minoru Watanabe; Kazunari Kume, both of Tokorozawa, and Hideshi Oono, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 616,053, Sep. 23, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,934

Claims priority, application Japan, Sep. 25, 1974, 49-110202

Int. Cl.² G04B *19/24*; G04C *3/00*; G04B *27/00*

U.S. Cl. 368—28 **6 Claims**



1. A timepiece comprising:

time measuring means including an oscillator as a time base and a timekeeping means synchronized with said oscillator for keeping time information,

driving means, partially mechanical time display means rotated by said driving means for displaying at least part of the time information kept by said time keeping means when said time keeping means is in a time keeping mode, said time display means including an input data display part including at least an hour display, a minute display and a calendar display, said input data display part having a display which is changeable by a display changing means to display a data to be delivered to the time measuring means when the time measuring means is in an input mode and to display the time information when the time measuring means is in the time keeping mode,

information means included in said time measuring means for providing additional time-related information,

inserting means for inserting the data into the information means, said inserting means including an actuating member for selectively actuating the time keeping mode and the input mode, a discriminating means for determining whether the timepiece is in the time keeping mode or input mode in accordance with the actuating member, and control means for controlling the transmission of the data to the information means, said controlling means transmitting during the input mode the data corresponding to the display of the input data display part, and

said timekeeping means keeping the time information independentaly of the display of the input data display part when said time measuring means is in the input mode and including a compensating means for providing the display of the input data display part with information corresponding to the time information of the time keeping means when the mode of said time measuring means is changed from the data input mode to the time keeping mode.

4,232,511

TIME DETECTING DEVICE FOR A CLOCK

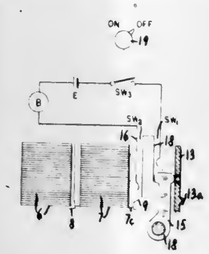
Kiyoshi Kitai, and Masuo Ogihara, both of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1978, Ser. No. 935,763

Claims priority, application Japan, Aug. 29, 1977, 52/103314; Sep. 7, 1977, 52/107528

Int. Cl.³ G04C *21/00*

U.S. Cl. 368—73 **6 Claims**



1. In a clock of the type which includes a rotating hour wheel having an angular position representative of the hour, a second rotating time wheel which rotates at a higher speed than the hour wheel and which has an angular position representative of a time interval less than one hour, time indicating leaves retained on said second time wheel and indicating time digitally, the improvement comprising a time signaling device for signaling when a predetermined time occurs, said time signaling device comprising: first detecting means for detecting when the hour wheel is at an angular position corresponding to the predetermined time; second detecting means for detecting when the second time wheel is at an angular position corresponding to the predetermined time and for thereafter successively detecting when predetermined time intervals occur during the hour following the detection of the predetermined time; said time indicating leaves having projections; and said second detecting means detecting one of said projections to determine the angular position of said second time wheel.

2. In a digital leaf clock having a plurality of hour leaves for indicating hours, and a plurality of minute leaves for indicating minutes, wherein ones of said minute leaves have projections for engaging and controlling exposure of the hour leaves as time advances, the improvement comprising: second projections on selected ones of said minute leaves spaced at regular intervals and independent of the first mentioned projections, and detecting means cooperative with said second projections for detecting at regular time intervals when the selected ones of said minute leaves are exposed for viewing.

4,232,512

SOLID STATE WATCH MODULE CONSTRUCTION

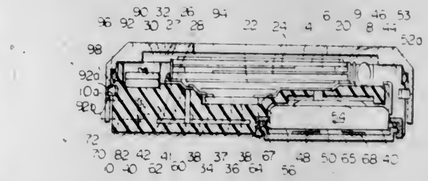
Kenichi Yoshikawa, Tokyo; Makoto Koshikawa, Higashimurayama; Toshio Umemoto, Koganei; Tetsuo Satoh, Higashiyamato; Singo Ichikawa, Sayama, and Yoshiaki Kato, Higashimurayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,536

Claims priority, application Japan, Dec. 27, 1976, 51/157787; Dec. 27, 1976, 51/157795

Int. Cl.² G04C *3/00*; G04B *19/30, 37/00*

U.S. Cl. 368—82 **12 Claims**



1. A watch module construction comprising:

a single body of plastic material serving as a substrate and a baseplate, said single plastic body having formed on a first side thereof, a first cavity having a bottom and a second smaller cavity formed in the bottom of said first cavity with a stepped wall formed by said cavities on said first side of said single plastic body;

a plurality of printed circuit leads directly formed on said stepped wall by a printing technique, and an integrated circuit chip directly mounted in said second cavity on said first side of said single plastic body, said integrated circuit chip having electrical terminals connected to said printed circuit leads and adapted to provide drive signals; and

an electro-optical display means mounted in said first cavity in said first side of said single plastic body and having electrode patterns adapted to provide a display of characters on a viewing surface thereof, said display means having a plurality of electrical terminals connected to said electrode patterns, said electrical terminals of said display means being electrically connected to said printed circuit leads to provide an electrical connection therebetween whereby said display means receives said drive signals from said chip to provide a time indication by means of said electrode patterns;

said single plastic body having a cutout formed on the opposite second side thereof for receiving a battery, and serving as a back cover of a watch.

4,232,513

PRESSURE RELIEF PANEL FOR AIRCRAFT POWERPLANT

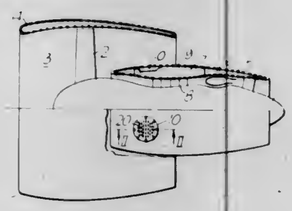
Kenneth A. Pearson, Henleaze, and Major D. Moorhouse, Stapleton, both of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 29, 1978, Ser. No. 947,153

Claims priority, application United Kingdom, Oct. 19, 1977, 43456/77

Int. Cl.³ F02G 3/00; F16K 17/14

U.S. Cl. 60—39.09 R **4 Claims**



1. A pressure relief panel for an aircraft powerplant comprising a frangible diaphragm within an enclosure defined by walls, the first one of the walls including an apertured area which is overlaid by the frangible diaphragm so that in operation the diaphragm is exposed to pressures on both sides of the wall but no flow passes through the wall, the diaphragm being adapted to break up when the pressure difference across the wall exceeds a predetermined minimum, a second one of the walls forming a cover over the diaphragm and adapted to form a smooth continuation of the powerplant outer surface, said second wall being apertured to allow exposure of the interior of the enclosure to the external pressure, the apertures in the second wall being sized so that the total area thereof is sufficient to allow escape of the excess fluid therethrough after break up of the diaphragm, but the individual areas thereof are such as to prevent escape from the enclosure of parts of the diaphragm of such size as to be a potential danger to the aircraft or other powerplants.

4,232,514

DUMP CONTROL FOR TURBINE ENGINE GATE VALVE ACTUATOR

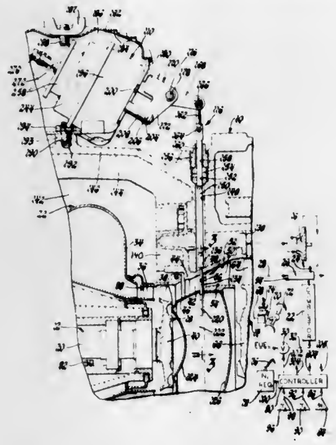
James H. Flatt, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1979, Ser. No. 50,152

Int. Cl.³ F02C 9/02

U.S. Cl. 60—39.25 **3 Claims**

1. A gas turbine engine gate valve control system for positioning a partial admission gate into and out of an inlet flow path to a turbine nozzle downstream of a source of motive fluid including air flow from a compressor comprising: a pneumatic operator including a pressurizable power chamber therein and having a movable power diaphragm forming part of the pressurizable power chamber, a mounting base for the operator including an opening therein, an operator shaft connected at one end thereof to said power diaphragm and extending through said opening for reciprocal movement in response to movement of said diaphragm to position said partial admission gate, an end wall on said pneumatic operator having a dump opening therein, means including a control diaphragm forming a control chamber, said control chamber having a smaller diameter than said power diaphragm with a disc valve element thereon located in overlying relationship to said dump opening, said valve disc having a flow restriction orifice therein, means for directing a regulated source of pressure against said control diaphragm and through said orifice for pressure biasing said valve element against said end wall to close the dump opening therein during a first mode of gas turbine engine operation and to cause a controlled buildup of pressure within said pressurizable power chamber and a slow rate extension of said operator shaft to gradually shift said partial admission gate into the flow path to said power turbine nozzle, and means for terminating pressurization of said control diaphragm by said regulated source of pressure and to remove the biasing pressure acting on said control diaphragm, pressure on the opposite side of said control diaphragm continuously operative following termination of the regulated pressure source on said control diaphragm to cause a quick opening of said valve element, and means including said dump hole to dump pressurized fluid from said pressurizable power chamber and operative to cause a quick return movement of said shaft and the gate valve from a partial admission position to a fully open position thereby to prevent compressor surge.



4,232,515

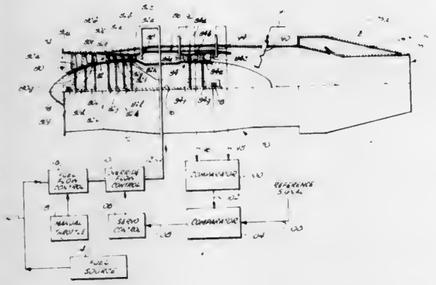
SUPERSONIC CRUISE AIRPLANE AND ENGINE

Robert B. Brown, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 6, 1978, Ser. No. 883,596

Int. Cl.³ F02K 3/00

U.S. Cl. 60—204 **26 Claims**



1. In a turbine engine designed to provide a predetermined amount of thrust at a given throttle setting when propelling an airplane at a predetermined supersonic Mach number, the improvement comprising:

control means for maintaining the corrected airflow in said engine substantially at a constant value at flight Mach numbers below said predetermined supersonic Mach number.

4,232,516

FLOW DEFLECTING DEVICES

William J. Lewis, Winscombe; Leslie R. Harper, Bristol; Malcolm J. Davis, Bristol, and Richard G. Gardiner, Bristol, all of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 25, 1978, Ser. No. 945,505

Claims priority, application United Kingdom, Oct. 5, 1977, 41522/77

Int. Cl.³ F02K 3/02

U.S. Cl. 60—226 A **3 Claims**



1. A translating cowl thrust reverser for a ducted fan gas turbine engine comprising radially inner and outer walls defining a fan duct, means for translating a portion of the radially outer wall axially to open up in the radially outer wall an aperture which has an inlet communicating with the fan duct and an outlet communicating with atmosphere, means for simultaneously blocking the fan duct as the aperture is opened and for directing flow from the fan duct into the inlet of the aperture, the aperture having upstream and downstream sidewalls which are shaped to give the flow through the aperture a forward component of velocity from the outlet thereof, and a substantially axially extending at least part-annular plate extending in a downstream direction from the upstream sidewall of the aperture only into a turbulent region of the flow and terminating upstream of the downstream extent of the upstream side-wall and defining with the upstream side-wall an annular recess open to the flow and in which, in operation, the flow causes a reduced pressure to delay the onset of separation from the upstream side-wall.

4,232,517

EXHAUST GAS CONTROL ACTUATOR

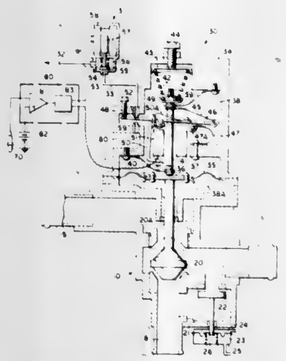
Masaharu Sumiyoshi, and Katsuhiko Motosugi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 7, 1978, Ser. No. 940,445

Claims priority, application Japan, Mar. 13, 1978, 53-29096

Int. Cl.³ F01N 3/10

U.S. Cl. 60—276 **8 Claims**



1. An exhaust gas control actuator wherein the feed of secondary air fed to an exhaust piping is controlled by a signal-emitting oxygen concentration detector disposed in the stream of exhaust gas of an internal combustion engine whereby an air-fuel ratio of the exhaust gas entering a catalyst disposed down-stream of the exhaust piping is maintained within a given range, said actuator comprising:

a flow control valve having a housing provided with a valve chamber, a flow-in port communicating said chamber with an air pump, a flow-out port communicating said chamber with an exhaust piping, a bypass port communicating said chamber with an air cleaner, and a movable valve body in said chamber controlling flow out of said flow-out port and said bypass port;

a flow control device for controlling said flow control valve comprising a housing partitioned by a diaphragm connected to said valve body into an actuating chamber and an atmospheric chamber, said actuating chamber having a vacuum introducing port communicating through a conduit with an intake manifold and an atmosphere introducing port constantly communicating with the atmosphere;

a solenoid valve in said conduit having ON-OFF positions;

an electronic circuit for controlling said solenoid valve in accordance with the signal from the detector;

and a nozzle flapper mechanism in said actuating chamber for varying resistance to flow through said vacuum introducing port and said atmosphere introducing port in accordance with the position of said valve body in such a manner that the signal of the oxygen concentration detector is negatively fed back to control the feed of secondary air.

4,232,518

SEALED TYPE FLUID RESERVOIR

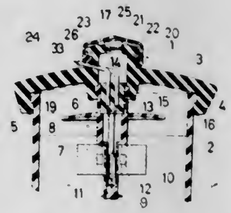
Mitsuyuki Suzuki, Okazaki, and Atsushi Ohmi, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 21, 1978, Ser. No. 962,660

Claims priority, application Japan, Nov. 30, 1977, 52-143724

Int. Cl.³ F15B 7/00

U.S. Cl. 60—535 **2 Claims**



1. A sealed type fluid reservoir mounted on a brake master cylinder comprising:

a casing which comprises transparent plastic material;

a main cap which comprises a rubber material disposed on the casing and which includes an upper portion extending therefrom having a comparatively thin portion, said thin portion of said upper portion of the cap including a slit formed therein;

a secondary cap mounted on the main cap;

a plurality of projections formed on the secondary cap;

air passage means formed between the secondary cap and said main cap by said projection;

groove means formed on said secondary cap for communicating said air passage means to atmospheric air, said casing including a brake fluid containing interior, and

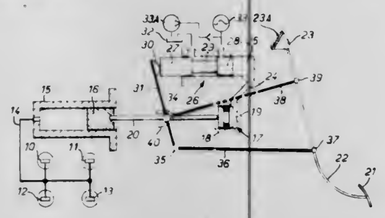
a chamber formed between said thin portion and said main cap in open communication with the casing interior, said slit of said thin portion comprising a radial slit such that said thin portion comprises a normally closed valve member for controlling flow of air from said air passage means to said casing interior and vice versa when differential pressure therebetween exceeds a set limit.

4,232,519

ASSISTED BRAKING DEVICE

Jean L. R. Dauvergne, Fosses, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Nov. 21, 1978, Ser. No. 963,919
Claims priority, application France, Nov. 28, 1977, 77 35691
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—550 **9 Claims**



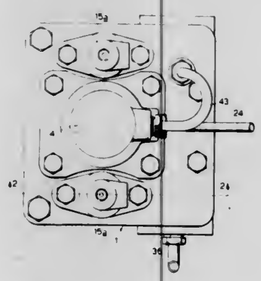
1. An assisted braking device comprising a master cylinder, a common body fixed to said member cylinder and incorporating a motor and a distributor, a master piston mounted slidably in said master cylinder, pilot means including a pedal mounted on a pivoted pedal lever, assisting means comprising said motor, one movable element of which is adapted to cooperate with the master piston via interconnecting means, an assistance energy source, said distributor being adapted to supply the motor with assistance energy from the said source, control means adapted to control the distributor in response to the actuation of the pilot means and comprising an arm and a connecting rod, the arm acting on a movable element of the distributor and being articulated on the said interconnecting means, the connecting rod connecting the pedal lever to the arm via two articulation points, and safety means which are actuated if the assisting means break down, so as to displace the master piston under the effect of the action exerted on the pedal, the safety means comprising a safety rod which is independent of the distributor control means, one end of the safety rod being articulated on the pedal lever at an articulation point which is different from that of the connecting rod, and the other end of the safety rod being connected to the master piston independently of the motor.

4,232,520

ACTUATOR ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

David A. Harries, Solihull, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 793,891, May 4, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 13,200
Claims priority, application United Kingdom, May 6, 1976, 18516/76
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—550 **6 Claims**



1. A power-operated actuator assembly for a vehicle hydraulic braking system comprising a housing having a pressure space and a power chamber, a reservoir for fluid, an outlet port in said housing through which said pressure space can be connected to a wheel brake, a piston for controlling generation of pressure in said pressure space, means supplying booster fluid to said power chamber to operate said piston, booster valve means for controlling said supply of booster fluid to said power chamber, said booster valve means including a pedal-operated valve actuating member comprising means for applying an applying force manually to said piston in the event of a failure in said supply of booster fluid, pressure responsive stop means in said housing for preventing said valve actuating member from being advanced through a distance sufficient to transmit a force to said piston at least when said supply of booster fluid is operative, said housing further including a pair of first and second sealingly isolated chambers, connecting means for connecting said first chamber to a supply of fluid under pressure, said booster valve means including exhaust valve means which is normally open for connecting said second chamber to said reservoir and inlet valve means which is normally closed for providing a connection between said pair of chambers, said stop means including means closing said exhaust valve means to isolate said second chamber from said reservoir and means opening said inlet valve means to supply a metered proportion of fluid under pressure to said second chamber to oppose movement of said actuating member in said operating direction, wherein a member which is separate from said housing and movable in said housing divides said housing into two portions and includes means allowing communication between said portions on movement of said member to relieve any pressure which may be trapped in either of said pair of chambers upon failure of said supply of fluid under pressure, and said member comprises a stepped piston having a first portion of smaller area and a second portion of greater area, said housing having a stepped bore in which said stepped piston is located and said bore having an end wall through which said actuating member projects, a first bore portion of smaller area in which said first piston portion works and a second bore portion of greater area in which said second piston portion is movable with a clearance fit, said second piston portion normally having a sealing engagement with said end wall, said stepped piston having a blind axial bore in which said projecting part of said actuating member is in a working fit, said first chamber comprising a first compartment between said stepped piston and said second bore portion in permanent fluid communication with a second compartment defined between the inner end of said blind bore and said inlet valve means, and said second chamber comprising a third compartment defined in said blind bore between said inlet valve means and said exhaust valve means and in a permanent fluid communication with a fourth compartment defined between said stepped piston and a closed inner end of said stepped bore.

4,232,521

SYSTEM FOR STARTING INTERNAL COMBUSTION ENGINES

Salvador Gali Mallofre, C/Londres, 29 - 1º - 2ª, Barcelona, Spain

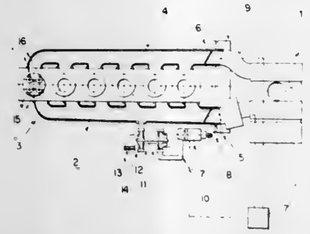
Filed Mar. 28, 1978, Ser. No. 891,117
Claims priority, application Spain, Nov. 1, 1977, 464.585
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—612 **4 Claims**

1. A process for starting an internal combustion engine of the type having a flywheel which is turned during starting of said engine, said flywheel being attached to a shaft which is attached to pistons which are located within cylinders in said engine for causing said pistons to reciprocatingly move within said cylinders thereby initiating starting of said engine, an air intake manifold and an exhaust manifold being connected to said cylinders and communicating with said cylinders via intake and exhaust valves for respectively admitting a fuel-air mixture into said cylinders for combustion and for exhausting burned gases which result from combustion, and a turbocharger connected to and communicating with both said exhaust and intake manifolds whereby during normal operation of said engine said burned gases, which are exhausted through said exhaust manifold, drive said turbocharger, said turbocharger compressing said fuel-air mixture entering said cylinders by injecting air from the exterior said process comprising the steps of:

turning said engine flywheel by means of a pneumatic starting motor which has a toothed wheel for turning said engine flywheel during starting and an exhaust conduit for exhausting air which is used to drive said pneumatic starting motor, said pneumatic starting motor adapted for being positioned in relation to said engine for turning said flywheel during starting;

injecting compressed air into said intake manifold for enriching said fuel-air mixture entering said cylinders during starting by means of an auxiliary turbocharging unit including a turbine and a compressor, said auxiliary turbocharging unit being connected to said exhaust conduit of said pneumatic starting motor, said stop of injecting comprising driving said turbine by said air being exhausted from said pneumatic starting motor through said exhaust conduit, thereby driving said compressor connected to said turbine, said compressor communicating with said exterior, drawing air from said exterior into said compressor and compressing said air, and passing the thus compressed air from said compressor into said intake manifold; and

closing off communication between said intake and exhaust manifolds and said turbocharger during starting by means of valves positioned at respective ends of said intake and exhaust adjacent said turbocharger, said valves located within said ends of said manifolds and being in a closed position.



4,232,522

METHOD AND APPARATUS FOR UTILIZING WASTE HEAT FROM A FLOWING HEAT VEHICLE MEDIUM

Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

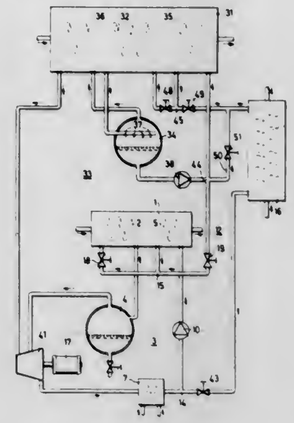
Filed Jan. 19, 1979, Ser. No. 4,883
Claims priority, application Switzerland, Jan. 3, 1978, 2196/78
Int. Cl.³ F01K *23/08, 23/10*
U.S. Cl. 60—618 **7 Claims**

1. A method of utilizing waste heat of a diesel engine, said method comprising the steps of

passing a flow of a heat vehicle medium utilized in a diesel engine into heat exchange relation with a flow of a working medium of at least one power circuit;

circulating the working medium through the power circuit to effect pre-heating, at least partial evaporation, expansion and condensation thereof;

introducing an additional quantity of a liquid working medium from a heating circuit into the power circuit prior to said pre-heating; and



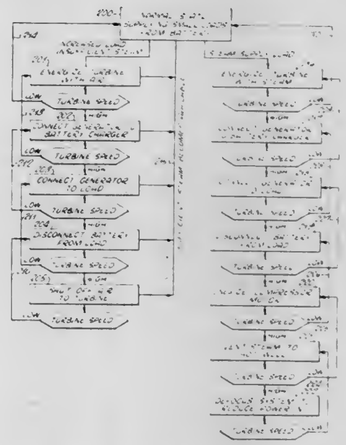
discharging the liquid working medium from the power circuit after said pre-heating to at least one heat consuming means.

4,232,523

SOLAR POWER PLANT

Ronald C. Derby, 11162 Wickford Dr., Santa Ana, Calif. 92705; Stanley H. Zelinger, 14411 Heights Dr., Tustin, Calif. 92680; William P. Dampier, 525 Comanche Dr., Placentia, Calif. 92670, and Samuel P. Lazzara, 12002 Cherry St., Los Alamitos, Calif. 90720

Division of Ser. No. 710,569, Aug. 2, 1976, Pat. No. 4,079,591. This application Mar. 16, 1978, Ser. No. 887,064
Int. Cl.³ F03G *7/02*
U.S. Cl. 60—641 **4 Claims**



1. An Energy Management System for a solar power plant of the type which includes a solar collector for focusing the suns energy on a vaporizing converter, a prime mover operatively connected to operate from compressed air storage or thermally vaporized fluid, a hot well for storing excess solar energy, and a generator operatively connected to the output of the prime mover for driving a compressor and/or charging a storage battery, said energy management system coprising:

energy sensing means for sensing the rate at which energy is being outputted from said vaporizing converter;

load sensing means for sensing the rate at which energy is being demanded by a user load;

first command generating means responsive to said energy sensing means and said load sensing means for generating a command to connect said battery to the user load when the parameter sensed by said energy sensing means and said load sensing means are both less than a predetermined value;

second command generating means responsive to said energy sensing means and said load sensing means for generating a command to operate the prime mover from stored compressed air when the parameter sensed by said energy sensing means is less than a predetermined value and the parameter sensed by said load sensing means is greater than a predetermined value;

velocity sensing means for sensing the angular velocity of the prime mover;

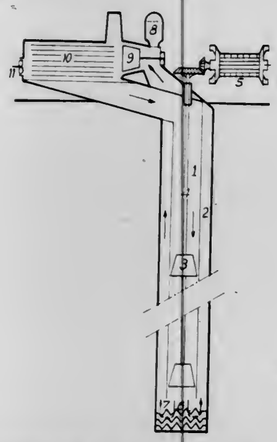
third command generating means responsive to said velocity sensing means for generating a command to connect the generator so as to charge the battery in addition to supplying power to the user load.

4,232,524

PRODUCTION OF INDUSTRIAL ELECTRICAL ENERGY FROM HYDRAULIC ENERGY

Eugene Goyat, Belley, France, assignor to Raymond Goyat, Cuzieu-Belley, France, a part interest

Filed Mar. 20, 1978, Ser. No. 888,031
Claims priority, application France, Mar. 24, 1977, 77 08757
Int. Cl.³ F01K *7/32*
U.S. Cl. 60—647 **6 Claims**



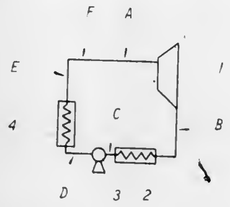
1. A process for the production of electrical energy from a fluid circulating in a closed circuit and comprising the steps of bringing said fluid to its saturating vapour phase in a substantially vertical column, returning said fluid to its liquid phase at the upper portion of said column, directing the liquid phase fluid downward through a fall column to return said fluid to the lower portion of said vertical column, vaporizing said fluid at said lower portion of said vertical column, and actuating at least one energy-producing member with said fluid in said fall column, said at least one energy-producing member being disposed in said fall column between said upper and lower portions, said process being characterized by maintaining the temperature in said vertical column such that the vapour phase of said fluid is close to its critical point.

4,232,525

WORKING FLUID FOR RANKINE CYCLE

Naonori Enjo, Suita, and Hideki Aomi, Osaka, both of Japan, assignors to Daikin Kogyo Co. Ltd., Osaka, Japan

Filed Jan. 23, 1979, Ser. No. 5,801
Claims priority, application Japan, Feb. 7, 1978, 53-13123
Int. Cl.³ F01K *25/00*
U.S. Cl. 60—671 **3 Claims**



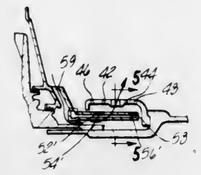
1. A working fluid for a Rankine cycle in which the working fluid is vaporized, the vapor is expanded to give a mechanical energy and the vapor is then condensed, which comprises a mixture of 2,2,3,3-tetrafluoropropanol and water.

4,232,526

HIGH INTENSITY SLINGER TYPE COMBUSTOR FOR TURBINE ENGINES

Dennis E. Barbeau, Liberty Center, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 26, 1978, Ser. No. 972,678
Int. Cl.³ F02C *7/22*
U.S. Cl. 60—745 **6 Claims**



1. A turbine engine having a support housing, a shaft rotatably secured within said support housing, an air compressor rotatably mounted in said housing and having an inlet and an outlet, a combustor in said housing, said combustor having a chamber fluidly connected with the outlet of the compressor, means for supplying fuel to the combustor chamber, said last-mentioned means comprising a slinger type fuel injector secured to said shaft having an annular housing and a plurality of radial bores adapted to provide a plurality of axially spaced planes of fuel and air introduction into said combustor chamber, a stationary fuel manifold spaced radially inwardly from said injector housing and in fluid communication with a first portion of said radial bores, and air passage means for fluidly connecting the outlet of the compressor to a second portion of said radial bores.

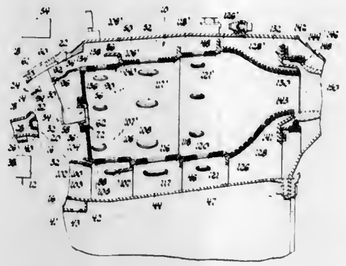
4,232,527

COMBUSTOR LINER JOINTS

Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 923,811, Jul. 12, 1978. This application Apr. 13, 1979, Ser. No. 29,781
Int. Cl.³ F02C *7/18*
U.S. Cl. 60—754 **5 Claims**

1. In a combustor for a gas turbine engine including a compressor discharging into a combustor diffuser directing discharge flow from the compressor for uniform distribution to a dome plenum the improvement comprising: an annular porous liner wall segment, said liner wall segment defining a combustion zone downstream of said dome, said porous liner wall segment directing compressed air radially inwardly of the combustor at a point downstream of the dome plenum to cool the inner surfaces thereof by transpiration cooling, said wall segment having an inlet end thereon and an outlet end thereon, a solid metal joint ring welded to said inlet end to define a



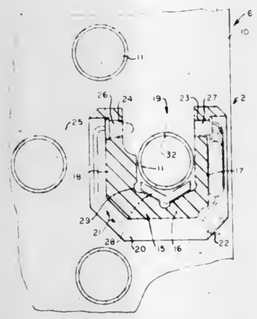
sealed joint, said solid metal joint ring including a plurality of small diameter effusion holes sized to direct cooling air from the plenum through said solid metal joint ring at a rate to cool the mass of said ring without producing a tangential wall stream on the inner surface of said porous liner wall segment thereby to direct heat from the sealed joint and said porous liner wall segment to maintain structural integrity therebetween without excessive diversion of total engine airflow from the plenum.

4,232,528

FROST DETECTOR

Joseph L. Behr, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 16, 1978, Ser. No. 887,380
Int. Cl.³ G08B *19/02*; F25D *21/02*
U.S. Cl. 62—140 **14 Claims**
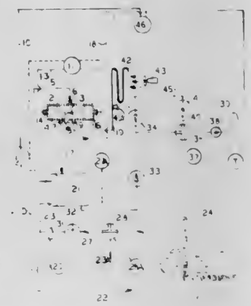


1. In a refrigeration system including a compressor having a high pressure outlet side, a low pressure inlet side, a first coil operatively connected to said compressor, a second coil operatively connected to said compressor and to said first coil, each of said coils including a tubular member having a predetermined length for carrying a refrigerant fluid, the improvement which comprises frost detector means directly mounted to said tubular member, said frost detector having a structure for mounting said detector to said tubular member, said structure including a channel for receiving the outer diameter of said tubular member, electromagnetic energy source means mounted to said structure and positioned to direct a beam of electromagnetic energy across the periphery of said tubular structure, an electromagnetic energy sensor mounted to said structure and separated from said source on a diametrically opposite side of said tube, and means for varying the beam path with respect to a tangent along the outer diameter of said tube between said energy source and said energy sensor.

4,232,529

ENERGY CONSERVATION REFRIGERATION UNIT

Frederick J. Babbitt, 564 Eastern Blvd., Clarksville, and Daniel K. Carnine, 1004 Hazelwood, Jeffersonville, both of Ind. 47130

Filed Aug. 1, 1978, Ser. No. 929,902
Int. Cl.³ F25B *13/00, 27/02*
U.S. Cl. 62—160 **5 Claims**



1. A refrigeration system to selectively supply cooling to a space to be cooled and to heat a fluid including:

a. refrigerant compressor means having an expanded refrigerant inlet and a compressed refrigerant outlet;

b. reversing valve means including body means having an inlet communicating with said compressed refrigerant outlet and first, second and third outlet means and valve member means to selectively move from first position to permit communication between said first and second outlets where said valve inlet communicates with said third outlet to second position to permit communication between said second and third outlets where said inlet communicates with said first outlet;

c. reversing valve control means to move said reversing valve member between said first and second positions;

d. first heat exchange means having refrigerant inlet means communicating with said first outlet means of said reversing valve, first exchange fluid inlet means to introduce said fluid to be heated to said first heat exchange means to receive heat from said refrigerant in said first heat exchange means and first exchange fluid outlet means to emit fluid to be heated from said first heat exchanger and first heat exchanger refrigerant outlet means to emit refrigerant from said first heat exchanger;

e. refrigerant heat exchange means having a first fluid flow aperture communicating with said third outlet of said reversing valve means and second fluid flow aperture means;

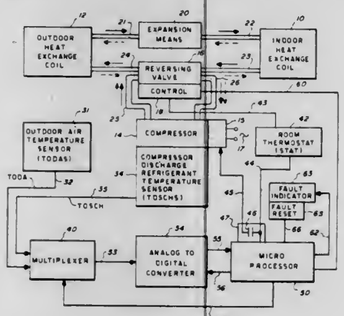
f. bypass valve means inlcuding valve body means having first refrigerant inlet means communicating with said first heat exchange refrigerant outlet means and said refrigerant heat exchange means, second fluid flow aperture means and first outlet means communicating with said third reversing valve outlet and second outlet means connected to refrigerant evaporator means located in a space to be cooled and valve member means operable from a first position where said bypass valve inlet means communicates with said bypass conduit means to a second position wherein said bypass valve inlet means communicates with said second outlet means;

g. conduit means communicating with the outlet of said evaporator means and said inlet to said compressor means;

h. system control means including first temperature sensing means located in said first exchange fluid inlet means to activate said reversing valve means to said second position at preselected temperature and second temperature sensing means located in said space to be cooled and adpated to move said bypass valve member from said first position to said second position at preselected temperature in said space to be served

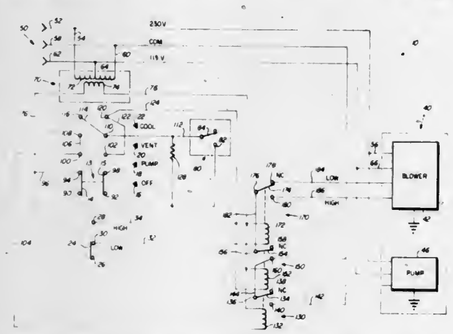
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4,232,530
HEAT PUMP SYSTEM COMPRESSOR START FAULT DETECTOR
Dale A. Mueller, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jul. 12, 1979, Ser. No. 57,135
Int. Cl.[3] F25B *13/00, 49/00*
U.S. Cl. 62—160 **8 Claims**



1. A compressor start fault detection and control system (hereinafter "fault detection system") for a reverse cycle refrigeration system (hereinafter "system") for heating and cooling a building wherein said system comprises refrigerant compression means, refrigerant compression control means, an indoor coil, an outdoor coil, and refrigerant conduit means connecting said compression means and said coils, said fault detection system comprising:
compressor discharge temperature sensing means (hereinafter "TDSCHS") having an output indicative of the temperature (hereinafter "TDSCH") of the refrigerant discharged from said refrigerant discharge means; and
building temperature sensing means (hereinafter "STAT") having an output indicative of a demand for heating or cooling of the building; and
controller means having operative connections to said TDSCHS and STAT so as to receive the outputs thereof, said controller means including circuit connect-disconnect means selectively interconnecting said STAT output to said refrigerant compression control means whereby when said STAT output is connected thereto said compression means is enabled to operate and when said STAT output is disconnected therefrom said compression means is inhibited from operating, said controller means also including timing means and means for comparing the initial value of TDSCH (hereinafter "TD_1") measured at or near the start-up of the compressor and the value of TDSCH (hereinafter "TD_2.") after a predetermined time interval measured from the measurement of TD_1, and said controller means further being characterized by being adapted to inhibit said compression means from operating if, after a said preselected time interval as measured by said timing means, the value of TD_2 is less than the value of TD_1 plus said predetermined constant.

4,232,531
THERMOSTATIC CONTROL APPARATUS FOR EVAPORATIVE COOLING SYSTEM
William M. Mangam, Jr.; John J. Willis, Jr., and Myron Jones, Jr., all of Phoenix, Ariz., assignors to Dial Manufacturing, Inc., Phoenix, Ariz.
Filed Jun. 29, 1979, Ser. No. 53,243
Int. Cl.[3] F28D *3/00*; F25D *17/00*
U.S. Cl. 62—171 **9 Claims**

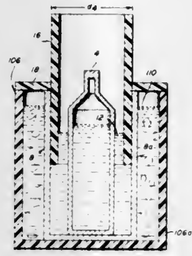


1. Control apparatus for controlling electrical current flow including signal voltage and line voltage in an evaporative cooling system having a blower and a pump operated by the line voltage, comprising, in combination:
first switch means selectively connected to the thermostat, to the blower, and to the pump, for selecting one of a plurality of modes of operation of the blower and pump, including
a first plurality of terminals,
a first switch element movable between some of the first plurality of terminals representing the modes of operation of the pump,
a second plurality of terminals, and
a second switch element movable with the first switch element between some of the second plurality of terminals representing the modes of operation of the blower;
a thermostat connected to one terminal of the second plurality of terminals, including
a pair of contacts, and
a temperature responsive element connected to one contact of the pair of contacts and adapted to make contact with the other contact of the pair of contacts upon a temperature rise;
second switch means connected to the pump and to the first switch means and selectively actuable for controlling line voltage for operating the pump in response to the selected mode of operation of the first switch means; and
third switch means connected to the blower and to the first switch means and selectively actuable for controlling line voltage for operating the blower in response to the selected mode of operation of the first switch means and of the thermostat.

4,232,532
APPARATUS FOR CONTROLLING THE TEMPERATURE OF A BOTTLE
Lawrence B. Marsh, 12842 Littleton St., Silver Spring, Md. 20906
Filed Jun. 27, 1979, Ser. No. 52,468
Int. Cl.[3] F25D *3/08*
U.S. Cl. 62—457 **9 Claims**

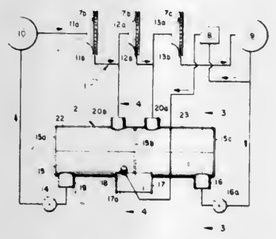
1. Apparatus for controlling the temperature of a bottle or the like, comprising
(a) an outer container having a vertically arranged tubular wall portion open at its upper end, said tubular wall portion having an inner first diameter;

(b) an impermeable inner container having a vertically arranged tubular wall portion open at its upper end, the outer diameter of the inner container tubular wall portion being less than said first diameter, said inner container being formed of heat-conducting material and being arranged in concentrically spaced relation within said outer container, the inner diameter of said inner container tubular wall portion being greater than the outer diameter of the bottle;



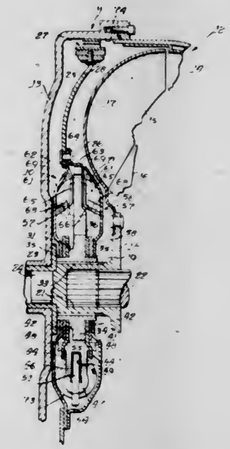
(c) a first fluid medium arranged in the space between said inner and outer containers, said first fluid medium having a given initial temperature; and
(d) heat energy transfer control means arranged within said inner container, whereby when the bottle is placed in said inner container, said control means controls the transfer of heat energy between the bottle and said first fluid medium through said inner container to control the temperature of the bottle.

4,232,533
MULTI-STAGE ECONOMIZER
James T. Lundblad, Onalaska, and Chester D. Ware, La Crosse, both of Wis., assignors to The Trane Company, La Crosse, Wis.
Filed Jun. 29, 1979, Ser. No. 53,578
Int. Cl.[3] F25B *39/04*
U.S. Cl. 62—509 **15 Claims**



1. An economizer having a pluraity of stages for flash cooling refrigerant liquid for use in a refrigeration system comprising
a. housing means defining a plurality of chambers of successively lower pressure, a first chamber being at the highest pressure, and a last chamber at the lowest pressure;
b. first inlet means for conveying refrigerant liquid into said first chamber which is at the highest pressure;
c. first outlet means for conveying the cooled refrigerant liquid out of said last chamber which is at the lowest pressure;
d. second inlet means for conveying refrigerant into each of the chambers except said first chamber;
e. second outlet means for conveying cooled refrigerant predominantly in the liquid stage, out from each of the chambers except said last chamber;
f. connecting means for connecting the second outlet means of a chamber of relatively higher pressure together in fluid communication with the second inlet means of a chamber of successively lower pressure, said connecting means including sump means for collecting the cooled refrigerant liquid which flows through said connecting means;
g. throttling means for restricting the flow of refrigerant into each chamber and thereby reducing its pressure such that a portion of the refrigerant liquid flashes or evaporates as it flows through said throttling means, and thereby cools the liquid refrigerant remaining; and
h. flash gas outlet means disposed near the top of each chamber, and operative to convey flash gas away from that chamber.

4,232,534
EXTENDED TRAVEL VIBRATION DAMPER ASSEMBLY
Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 14, 1978, Ser. No. 933,392
Int. Cl.[3] F16D *3/14*
U.S. Cl. 64—27 C **22 Claims**



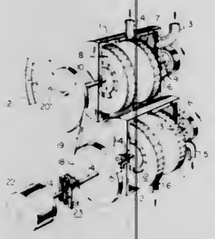
1. A vibration damper assembly to transmit torque between driving and driven members, comprising an input member adapted to engage torque input means, a hub operatively connected to torque output means and having a pair of diametrically opposed radial arms, a pair of equalizers journalled on and floating independently of said hub, each equalizer including a pair of equalizer plates located on opposite sides of said hub, each plate having a pair of oppositely disposed peripheral tabs, a wedge-shaped separator mounted between each pair of axially aligned tabs of a pair of equalizer plates, resilient means interposed between said hub arms and separators, and a pair of cover plates substantially enclosing said hub, equalizers and resilient means and operatively connected to said input member, each cover plate having integral drive means therein interposed in the path of said resilient means.

4,232,535
SELF-ALIGNING-AXIAL SHAFTS-MAGNETIC COUPLING
Walter C. Caldwell, Irving, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.
Filed Mar. 5, 1979, Ser. No. 17,505
Int. Cl.[3] F16D *3/56, 7/00*
U.S. Cl. 64—28 M **2 Claims**

1. A mechanism for flexibly coupling first and second substantially axially aligned shafts comprising:
(A) a yoke structure connected to one end of the first shaft,

said yoke structure having inwardly facing first and second opposing surfaces disposed generally parallel to the axis of the first shaft;

(B) first and second bar magnets affixed, respectively, on said first and second facing surfaces with a space therebetween, said first and second bar magnets being oriented with like poles thereof facing one another across said space;



(C) a third bar magnet connected to one end of the second shaft, said third bar magnet being disposed in said space between said first and second bar magnets and oriented with the north and south poles thereof situated, respectively, between the facing north poles and the facing south poles of said first and second bar magnets; and

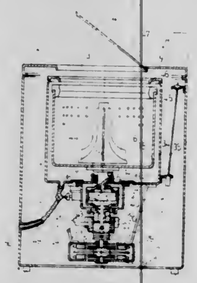
(D) first and second means for rotatably supporting, respectively, the first and second shafts.

4,232,536

AGITATOR-TYPE WASHING MACHINE

Wasuke Koseki, Moriguchi; Kunihito Mori, Toyonaka; Hideo Obata, Ibaraki, and Yoshikazu Shinchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 1, 1979, Ser. No. 35,268
Claims priority, application Japan, May 16, 1978, 53-058422
Int. Cl.[3] D06F *13/02*
U.S. Cl. 68—12 R **7 Claims**



1. An agitator-type washing machine comprising a washing tub,

a spin basket rotatably disposed in said washing tub,

a reciprocal agitator rotatably disposed in said spin basket,

a spin basket shaft rotatably journalled to said washing tub and on which said spin basket is mounted,

an agitator shaft rotatably journalled in and held coaxially to said spin basket shaft,

an axial-airgap motor having a motor shaft,

a reduction gear having an input shaft and an output shaft, said input shaft being connected to said motor shaft and said output shaft being connected to said agitator shaft,

a clutch having an input shaft and an output shaft, said input shaft being connected to said motor shaft and said output shaft connected to said spin basket shaft,

motor control circuit means for changing motor operation between a washing mode, to drive said axial-airgap motor reciprocatingly, and a spinning mode to drive said axial-airgap motor continuously in one direction, and

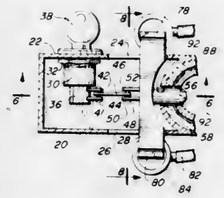
interlocking means for interlocking said motor control circuit means with said clutch in a manner that, when said clutch is disconnected, said motor control circuit means is changed to said washing mode.

4,232,537

WHEELED VEHICLE LOCK

Charles E. Plaiss, 7058 North Olcott Ave., Chicago, Ill. 60631

Filed Aug. 3, 1978, Ser. No. 930,719
Int. Cl.[3] B62H *5/00;* **E05B** *71/00*
U.S. Cl. 70—233 **2 Claims**



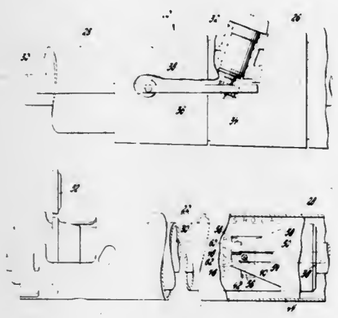
1. A wheel vehicle lock for permanent securement to the head of a wheeled vehicle having a fork stem seated therein and each having an aligned perforation, a closed hollow housing, having side, bottom and end walls, an aligned slot in each side wall, a perforation in one of said end walls, a keyed cylinder lock having a plug, said cylinder lock mounted on one of said side walls adjacent said slots, the cylinder and plug extending interiorally into said housing, a latch bolt, a transverse elongated bar anchored medially to said bolt positioned in and through said slots in said side walls and shiftable by said bolt, yokes on said plug and bolt extending towards each other, a link arm pivotally secured in and between said yokes whereby to shift said bolt horizontally into and out of said aligned perforations in said yoke and head by rotation of said cylinder lock.

4,232,538

CONTROL MECHANISM FOR A VEHICLE IGNITION LOCK

John C. Detloff, Jr., Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1979, Ser. No. 24,169
Int. Cl.[3] B60K *20/00;* **B60R** *25/00;* **G05G** *9/00, 9/12*
U.S. Cl. 70—239 **2 Claims**



1. A position control mechanism for use in a vehicle having

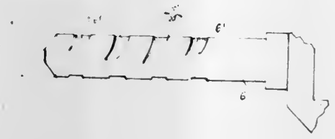
a steering column, a steering column mounted ignition lock mechanism movable by the operator to "Start", "Run", "Off" and "Lock" positions, and a floor mounted transmission control mechanism, said position control mechanism comprising; a tubular member concentric with the axis of the steering column and being rotatable about the axis by the transmission control mechanism; an opening in said tubular member having circumferentially extending axially spaced parallel control surfaces, axially aligned end slots extending axially from one end of said control surfaces, and another slot extending axially from only one of said control surfaces intermediate the ends of the one said control surface; and pin means operatively connected with the ignition lock mechanism and limited in axial movement by said opening, whereby said ignition lock mechanism is movable to all of its positions only when said pin means is axially aligned with said end slots, is movable to said "Start", "Run" and "Off" positions when said pin means is axially aligned with said another slot, and is freely movable between said control surfaces to said "Off" and "Run" positions regardless of the axial relationship of said opening relative to said pin means.

4,232,539

LOCK BODY WITH LOCK PLATES OPENED OR CLOSED BY A CYLINDRICAL KEY BAR

Jiuan P. Lo, 30-1, La. 325, St. Tong Ho, Taipei, Taiwan

Filed Feb. 8, 1978, Ser. No. 876,042
Int. Cl.[3] E05B *19/08, 29/06*
U.S. Cl. 70—364 R **9 Claims**



1. A cylindrical lock comprising:

a housing;

a cylindrical plug mounted for rotation in said housing;

a roll-back mounted for rotation with said plug;

tumbler means disposed in said plug for opening and closing said lock, said tumbler means including a plurality of plate-shaped tumblers disposed in said plug;

cylindrical key bar means for aligning said plurality of tumblers at the periphery of said plug;

said bar means including a cylindrical bar having angled grooves in the periphery thereof each of said tumblers corresponding to one of said plurality of grooves;

each of said plurality of tumblers being responsive to pressure applied by one of the sides of said corresponding groove when said key bar means are rotated in said plug, to rotate said plug and said roll-back.

4,232,540

CONTROLLED VARIABLE RADIUS ROLL FORMING APPARATUS

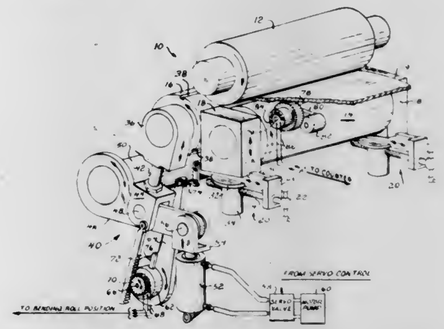
Jack C. Cain, 536 S. Waterman Ave., Arlington Heights, Ill. 60004, and Maynard E. Carlson, Rte. 1, Carlson Rd., Box 289, West Salem, Wis. 54669

Filed Mar. 19, 1979, Ser. No. 21,798
Int. Cl.[3] B21D *5/14;* **G01B** *5/20*
U.S. Cl. 72—11 **16 Claims**

1. A roll forming apparatus for curling a sheet of metal into a curved configuration having a plurality of sheet contours each in a respective segment of said sheet, the apparatus including a pair of pinch rolls and a bending roll for curving the sheet into predetermined arcs dependent upon the relative positions of the bending and pinch rolls, and power means for varying the relative positions of the bending and pinch rolls, said apparatus being characterized by:

measuring means responsive to the movement of the sheet through the roll forming apparatus and to generate progressive signals indicative of the extent of that movement; and

control means connected to said measuring means and to said power means for determining from said progressive signals which segment of the sheet is in the appropriate position for bending between the pinch and bending rolls and for causing said power means to establish said relative positions of the pinch and bending rolls to produce the desired contour for that segment, said control means comprising



command value generator means to produce command value signals related to the distances of travel for the segments respectively,

comparator means connected to receive the signals from the measuring means and the command value generator means for comparing said signals and for producing a further signal when a distance corresponding to the end of the segment being rolled and the beginning of the next successive segment is reached, and

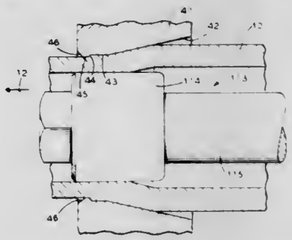
radius control and modification means connected to receive said further signal for producing a signal to the power means indicative of the relative positions of the pinch and bending rolls for said next successive segment.

4,232,541

DRAWING TECHNIQUE

Paul E. Stump, Beaver Falls, Pa., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 879,288, Feb. 21, 1978, Pat. No. 4,148,207.
This application Jan. 23, 1979, Ser. No. 6,065
Int. Cl.[3] B21C *3/06*
U.S. Cl. 72—283 **2 Claims**



1. An improved method of cold drawing a tube shell to be worked through an apparatus having a die with generally constant diameter cylindrical mandrel plug means fixed within

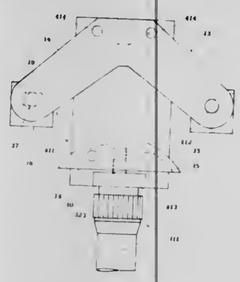
the tube shell and within the die opening for improving outside smoothness of said tube shell which comprises: positioning the tube shell within a die opening having an approach zone, a die land including a first cylindrical section, a second smaller diameter cylindrical section, a tapered section connecting the first section to the second section, and a countersunk exit section, the second smaller diameter cylindrical section being adjacent to the exit section of the die opening; contacting the interior of the tube shell with the mandrel plug when said contacting surface is adjacent said approach zone to prevent reduction of the inside diameter of said tube shell; contacting the exterior of the tube shell with the surface of the die opening; and axially drawing the tube shell so that the exterior surface contacts in order at least part of the surface of the approach zone to first reduce the outside diameter of said tube shell, the first cylindrical section, the tapered section, and the second cylindrical section to produce a heavy and rapid wall reduction in said tube shell.

4,232,542

PORTABLE MANUALLY CONTROLLED PIPE-BENDING APPARATUS PROVIDED WITH REVERSIBLE BENDING MEMBERS

Alessandro Caporusso, and Mario Caporusso, both of Piedimonte S. Germano, Italy, assignors to C.M.L. Costruzioni Meccaniche Lirl S.r.l., Piedimonte S. Germano, Italy

Filed Mar. 29, 1979, Ser. No. 25,453
Claims priority, application Italy, Apr. 6, 1978, 48765 A/78
Int. Cl.³ B21D 7/06
U.S. Cl. 72—389 **5 Claims**



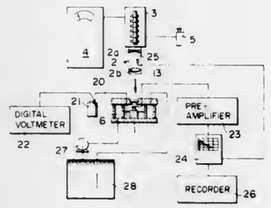
1. A portable, manually controlled, hydraulic pipe-bending apparatus provided with a coupling head and reversible bending members to reverse the bending direction of a pipe relative to the apparatus, comprising the coupling head being (311) integral with a supporting member (411) made up of a plate (412) extending longitudinally of the apparatus, said plate having two parallel pins (414) which, in turn, support the bending member having the function of a fixed bending member, said pins (414) protruding from the surface of said supporting plate which is the sliding surface of a movable bending member, a piston stem actuated by a lever, said bending member being connected to the free end of said piston stem (30) of said apparatus and consequently moved therewith when operated by the operator by repeatedly actuating said lever (12), said fixed and movable bending members having the possibility of a reversible assembling on said pins (414) which are protruding from the plate (412) or on the end of said piston stem (30), respectively, in accordance with the desired bending direction of a pipe (T).

4,232,543

DEVICE FOR MEASURING THERMAL CONDUCTIVITY OF LIQUIDS

Wataru Eguchi, Kyoto; Makoto Harada, Otsu; Masataka Tanigaki, and Yutaka Tada, both of Kyoto, all of Japan, assignors to The President of Kyoto University, Kyoto, Japan

Filed Aug. 22, 1979, Ser. No. 68,525
Claims priority, application Japan, Feb. 28, 1979, 54-023050
Int. Cl.³ G01N 25/18
U.S. Cl. 73—15 A **7 Claims**



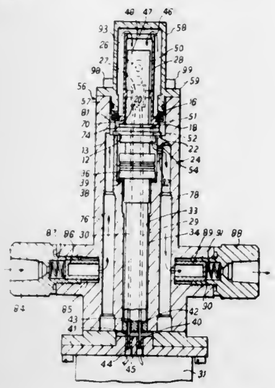
1. A device for measuring thermal conductivity of liquids, comprising:
a thin and small metal disc to be heated by a laser flash;
a sample holding block located beneath said metal disc; and
a pair of thermocouple wires connected to said metal disc to measure the thermal conductivity of a sample liquid on the basis of thermal diffusion from said metal disc to a cylindrical layer of said sample liquid inserted between said metal disc and said sample holding block;
said metal disc being supported in a horizontal position by said pair of thermocouple wires and at least one auxiliary support filament.

4,232,544

TRANSDUCER FOR SENSING A PARAMETER OF A FLUID

James W. Stansfeld, Beech, Near Alton, England, assignor to Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 2, 1979, Ser. No. 63,300
Claims priority, application United Kingdom, Aug. 14, 1978, 33229/78
Int. Cl.³ G01N 9/00; G01L 9/00
U.S. Cl. 73—32 A **10 Claims**



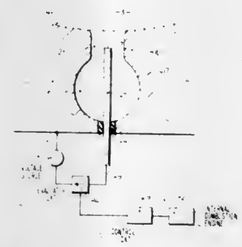
1. A transducer for measuring a characteristic of a fluid, comprising:
means forming a substantially rigid cylindrical base, said means having two annular shoulder surfaces;
a cylindrical hollow body of which a wall is relatively resilient and resonantly vibratable, said hollow body including a mounting mass structure with two annular clamping surfaces, the first of the clamping surfaces being applied against the first shoulder surface; and
a cylindrical cover including an annular spring defined between two further annular surfaces, one of the two said further surfaces being applied against the second annular shoulder surface, and the other of the two further surfaces being applied against the second clamping surface.

4,232,545

APPARATUS FOR DETECTING PRESSURE FLUCTUATIONS IN THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Klaus Dobler, Gerlingen; Christian Zrenner, Stuttgart; Günter Schirmer, Ingersheim, and Alfred Kizler, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,478
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802202
Int. Cl.³ G01M 15/00
U.S. Cl. 73—35 **8 Claims**



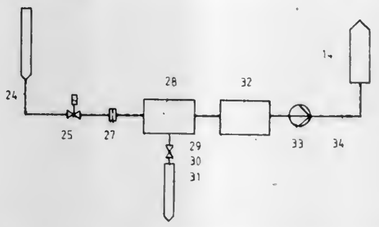
1. In an apparatus for detecting pressure fluctuations in the combustion chamber of an internal combustion engine, comprising:
an ionic current sensor mounted to the engine for exposure to the gas in a combustion chamber, said ionic current sensor including: means defining a dead space and a connecting channel which extends between the dead space and the combustion chamber; a first electrode; and a second electrode spaced from the first electrode, between which electrodes a measurement voltage is applied, wherein said connecting channel also defines the spacing between the first and second electrodes.

4,232,546

METHOD AND APPARATUS FOR TUBE LEAKAGE TESTING

Willy Dumont, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 21, 1979, Ser. No. 22,633
Claims priority, application Sweden, Mar. 21, 1978, 3060/78
Int. Cl.³ G01M 3/20
U.S. Cl. 73—40.7 **17 Claims**



1. An apparatus for measuring leakage, in a heat exchanger, especially in a moisture-separator, reheat superheater, wherein a heat transmission takes place between a first and a second flowing media separated from one another by a dividing wall, comprising:
first means for selectively supplying a test gas into the first flowing medium;
means for obtaining a sample of the second flowing medium;
means for removing non-gaseous components from the sample of the second flowing medium; and
means for detecting the test gas in the sample of the second flowing medium.

4,232,547

FORCE MEASURING DEVICE FOR A CHUCK OR COLLET

Daniel K. Kasper, Richfield, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 9, 1979, Ser. No. 19,051
Int. Cl.³ G01L 1/22
U.S. Cl. 73—141 A **10 Claims**



6. A force transducer for measuring the force exerted by a gripping device having gripping elements such as the jaws of a chuck or segment of a collet comprising:
elongated shaped members each having at least two flat parallel surfaces formed intermediate its ends;
four strain gages associated with each of said elongated shaped members with two of the strain gages disposed on one of the two flat parallel surfaces and the other two strain gages disposed on the opposite flat surface;
a housing;
aligning means for aligning the elongated shaped members to extend radially outward from the housing into engagement with the gripping elements;
support means for engaging and solidly supporting the inner end of each elongated shaped member against radially inward movement;
instrumentation for monitoring the four strain gages; and
electric connecting means for connecting the four strain gages to said instrumentation.

4,232,548

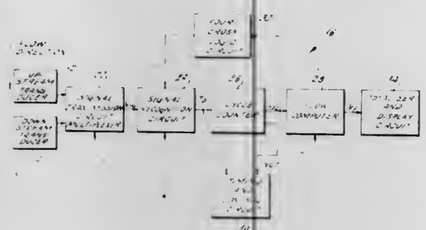
LIQUID FLOW METER

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Filed Mar. 1, 1979, Ser. No. 16,525
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.28 **13 Claims**

13. Apparatus including means responsive to the receipt of a repetitive sinusoidal pulse signal; said apparatus including means for measuring the arrival time of repetitive sinusoidal waveform pulses which are accompanied by noise, means for detecting the zero cross-over point of each of a plurality of loops in said sinusoidal waveform pulse, means averaging the time of arrival of each of the corresponding zero cross-over

points in each repetitively received signal, and means connecting a signal related to the averaged time of arrival of at least a



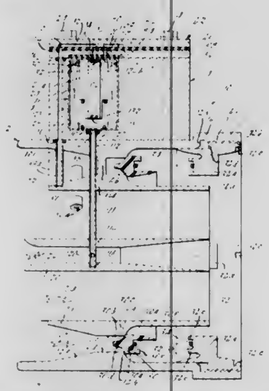
selected one of said zero cross-over points to said means responsive to said signal.

4,232,549

TWO STAGE FLOWMETER

Robert S. Migrin, and Jerry A. Olson, both of Dearborn, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 6, 1978, Ser. No. 966,844
Int. Cl.[3] G01F 5/00
U.S. Cl. 73—202 **18 Claims**



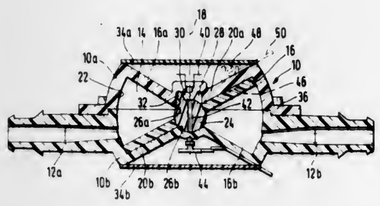
1. A fluid flowmeter comprising: a main passage for the flow of fluid therethrough;
- swirl means disposed within said main passage and operative to form a low static pressure region immediately downstream thereof;
- a secondary passage disposed within said main passage for communicating a portion of the fluid upstream of said swirl means to a point downstream of said swirl means adjacent said low static pressure region;
- means for sensing the pressure of the fluid in said low static pressure region and the pressure of the fluid before said swirl means; and
- a bypass passage operative to selectively interconnect a point upstream of said swirl means with a second point downstream of said swirl means radially outwardly adjacent the low pressure region.

4,232,550

FLOWMETER FOR LIQUIDS

Georg Aigner, Leonberg, Fed. Rep. of Germany, assignor to KDM Elecktronik GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 416
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759176
Int. Cl.[3] G01F 3/12
U.S. Cl. 73—258 **4 Claims**



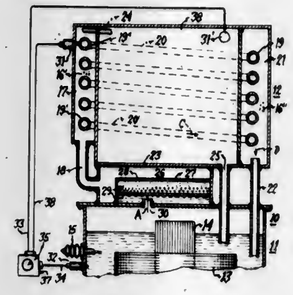
1. A flowmeter for liquids, comprising:
- a hollow housing having two opposed, axially-aligned, inwardly-tapered, and spaced-apart truncated cone-shaped walls, each of which has an outer peripheral edge and a generally spherical segment-shaped annular wall which interconnects the outer peripheral edges of said truncated cone-shaped walls and defines therewith an internal metering chamber which is positioned in a rotationally symmetric manner with respect to a central axis coaxial with the axes of said cone-shaped walls and which is symmetrically configured with respect to a plane passing through said central axis, said truncated, cone-shaped walls each having a centrally-shaped coaxially-aligned ball socket formed therein, one of which has an annular groove formed therein;
- at least two liquid connections coupled to said housing and communicating with said metering chamber for establishsing a liquid flow therethrough;
- a generally disc-shaped wobble plate having a centrally-disposed spherical wobble center mounted within said metering chamber with said spherical wobble center thereof rotatably retained between said ball sockets, said wobble plate dividing said chamber into two subchambers, defined by a plane extending through said central axis, said spherical center having a radially outwardly extending shoulder which is disposed generally normally relative to said wobble plate and which is slidably received within said annular groove formed in one of said ball sockets, said shoulder being disposed at an angle to said central axis which complements the conical angle of said cone-shaped walls to form a combined angle of about 180°, said wobble plate having a circumferential edge which is in resilient sealing engagement with said annular wall, said circumferential edge of said plate being provided with a circumferentially-extending groove which opens outwardly and wherein a resilient sealing ring is received within said radial groove which comprises a slotted ring having a radially inner side from which extends, in a radially inward direction, a plurality of resilient protrusions which can be radially deformed in a radially outward direction; and
- non-contacting coacting signal transmitter elements associated with said housing and wobbler plate for generating signals proportionally corresponding to the wobble frequency of said wobble plate.

4,232,551

LEAK DETECTOR FOR VAPORIZATION COOLED TRANSFORMERS

Linden W. Pierce, Rome, Ga., assignor to General Electric Company, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,543
Int. Cl.[3] G01M 3/32; G01K 1/08; H01F 27/10
U.S. Cl. 73—350 **23 Claims**



1. A method for determining leaks in vaporization cooled transformers of the type consisting of a transformer tank containing a transformer core and winding assembly, a condensable coolant, and a heat exchanger, comprising the steps of:
- sensing the temperature of the condensable coolant within said transformer tank;
- sensing the temperature within a portion of said heat exchanger;
- determining the temperature differential between said heat exchanger and said coolant; and
- providing an indication when a predetermined temperature differential is exceeded, said excess temperature differential thereby indicating the presence of ambient air within said transformer.

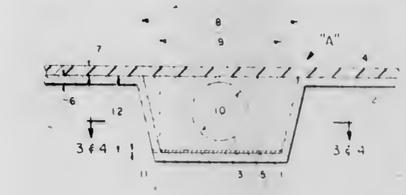
4,232,552

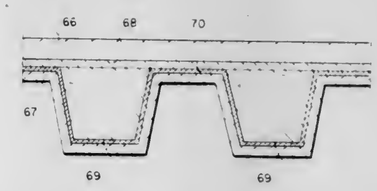
TEMPERATURE INDICATING COMPOSITIONS OF MATTER

Craig R. Hof, Hopatcong, and Roy A. Ulin, Wyckoff, both of N.J., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 895,422, Apr. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 844,334, Oct. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 796,492, May 12, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,935
Int. Cl.[3] G01K 11/06, 11/08, 11/12, 11/16; C09K 3/00
U.S. Cl. 73—356 **89 Claims**

1. A composition of matter exhibiting a sharp color change upon transition from a liquid state to a solid state of from a solid state to a liquid state capable of being supercooled for at least several minutes, and substantially free of impurities, consisting essentially of:
- (a) a solvent adapted to change from a solid state at substantially a predetermined temperature to a liquid state; and
- (b) an effective amount of one or more suitable organic moieties dissolved in and inert towards said solvent to form a solid solution when the composition is in the solid state, and adapted to change the color of the composition visible to the naked eye upon the change in state at substantially the predetermined temperature when so dissolved, and selected from one of the groups consisting of:
  - (1) one or more of a Group III body of compounds consisting of pinacyanol iodide, 1,1'-diethyl-2,2'-cyanine iodide, quinaldine red, pinacyanol chloride, thionin, methylene blue, cresol red, chlorophenol red, neutral red iodide, neutral red chloride, crystal violet, acridin orange, Orasol Orange RLN TM, Orasol Navy Blue TM, Irgalith Red PR TM, Fat Red BS TM, Xylene Cyanol FF TM, Rhodamine B TM, Rhodamine 6G TM, Irgalith Magneta TCB TM, Irgalith Pink TYNC TM, Toluidine Blue O TM, Savinyl Green B TM, Savinyl Blue RS TM, purpurin, 3,3'-diethylthiadicarbocyanine iodide, cryptocyanine, Dicyanine A TM, Merocyanine 540 TM, 4-(p-ethoxyphenylazo)-m-phenylene diamine monohydrochloride, Yellow Orange S TM, Chrysoidan G TM, fuchsin, aurintricarboxylic acid (ammonium salt), Victoria Blue R TM, Pyronin G TM, gallein, Erythrosin Yellow Blend TM, chlorophenol blue, bromophenol blue, bromocresol purple, Coriphosphine O TM, acriflavine, acridine orange, rhoduline violet, Alizarin cyanin 2R TM, Alizarin Red S TM, alcannin, Aurantia, Direct Green G TM, Fast Red Salt 3GL TM, Fast Blue Salt BB TM, Fast Garnet Salt GBC TM, Carta Yellow G 180 o/o TM, Murexide, Savinyl Blue GLS TM, Irgalith Blue GLSM TM, phthalocyanine, Di Amingreen B TM, Alizarin Blue S, Celliton Blue Extra TM, neocyanine, Janus Green TM, dimethyl yellow, Fast Yellow TM, methyl red sodium salt, Alizarin Yellow R TM, Eriochrome Black T TM, Chromotrope 2R TM, Ponceau 6R TM, Brilliant Ponceau G/R/2R TM, chromolan yellow, Sudan Red B TM, Bismarck brown G TM, Fat Black TM, Resorcin Brown TM, Benzofast Pink 2BL TM, Oil Red EGN TM, Euroglaucine, Fuchsin NB TM, parafuchsin, Patent Blue TM, Irgalith Blue TNC TM, Phloxin B TM, fluorescein sodium salt, Rhodamine B base TM, Eosin Scarlet, Eosin Yellowish TM, Erythrosin extra bluish, 4,5-dibromofluorescein, ethyleosin, Phloxine TM, Cyanovin B TM, chlorocresol green, pinacyanol bromide, 2-(p-dimethylaminostyryl)-1-ethyl pyridinium iodide, ethyl red, nigrosine, Savinyl Blue B TM, Orasol Blue BLN TM, Safranin O TM, Azocarnum G TM, Phenosafranine TM, Azocarmine BX TM, Solophenyl Brilliant Blue BL TM, Nile Blue A TM, gallocyanine, gallamine blue, celestine blue, methylene green, Azure A/B/C TM, Blue VIF Organol TM, Alizarin, Nitrofast Green GSB TM, quinalizarine, Oil Blue N TM, Solvay purple, Ciba Blue TM, Indigo synthetic TM, Chromophtal Bordeaux RS TM, Acid Alizarin Red B TM, 5-





aminoflourescein, Rose Bengal TM, Martius Yellow TM, Chicago Blue 6B TM, Alcian Blue 8GX TM, cresyl violet, 4,4'Bis(dimethylamino)benzylhdrol, zinc Pthalocyanine, Sudan III TM, Pyronin Y TM, Toluylene Blue TM, cresyl violet perchlorate, Mendola's Blue TM, Phosphine Dye, Nitron TM, cresyl violet acetate, Ceres Orange R TM, 4-phenylazo-1-naphtylamine, 4-(4-Dimethylamino-1-napthylazo)-3-methoxybenzene sulfonic acid, Bindschedler's Green TM, and p-(p-dimethylaminophenylazo)benzoic acid;

(2) a binary mixture of:

(A) one or more of a Group I body of compounds soluble in said solvent consisting of the halogenated sulfonphthaleins and the organic acids having a pK_1 less than about four; and

(B) one or more of a Group II body of compounds consisting of the aminotriphenylmethanes and their soluble salts, 8-hydroxyquinoline, and the cyanines;

wherein the weight ratio of the Group I body of compounds to the Group II body of compounds is more than or about 3 to 1 and with the proviso that if the Group II compounds consist solely of one or more aminotriphenylmethanes or their soluble salts, then the Group I compound must be selected from one or more of the group consisting of oxalic acid, suitable soluble sulfonic acids, and the tetrahalogenated sulfonphthaleins, and the other organic acids having a pK_1 of less than or about 2; and

(3) one or more of the aforesaid Group III body of compounds with one or more of the Group I or Group II bodies of compounds.

42. A temperature-indicating device comprising a heat conducting carrier having one or more spaced regions defined therein to determine a like number of predetermined temperatures in a predetermined temperature range, said spaced regions containing a like number of different compositions of matter therein, each a solid solution, said carrier having a transparent cover sheet means in sealing engagement therewith, and with a single solid solution being deposited in each of said regions and being associated with a single one of said predetermined temperatures, each composition of matter exhibiting a sharp color change upon transition from a solid state to a liquid state, capable of being supercooled for at least several minutes, and substantially free of impurities, consisting essentially of:

(a) a solvent adapted to change from a solid at substantially the predetermined temperature to a liquid state; and

(b) an effective amount of one or more suitable moieties dissolved in and inert towards said solvent to form a solid solution when the composition is in the solid state, and adapted to change the color of the composition visible to the naked eye upon the change in state at substantially the predetermined temperature when so dissolved, and selected from one of the groups consisting of:

(1) one or more of a Group III body of compounds consisting of pinacyanol iodide, quinaldine red, 1,1'-diethyl-2,2'-cyanine iodide, pinacyanol chloride, thionin, methylene blue, cresol red, chlorophenol red, neutral red iodide, neutral red chloride, crystal violet, acridin orange, Toluidin Blue O TM, Orasol Orange RLN TM, Orasol Navy Blue TM, Irgalith Red PR TM, Fat Red BS TM, Xylene Cyanol FF TM, Rhodamine 6G TM, Rhodanine B TM, Irgalith Magenta TCB TM, Irgalite pink TYNC TM, Toluidine Blue O, Savinyl Green B TM, Savinyl Blue RS TM, purpurin, 3,3'-diethylthiadicarbocyanine iodide, cryptocyanine, Dicyanine A TM, Merocyanine 540 TM, 4-(p-ethoxyphenylazo)-m-phenylene diamine monohydrochloride, Yellow Orange S TM, Chrysoidin G TM, fuchsin, aurintricarboxylic acid (ammonium salt), Victoria Blue R TM, Pyronin G TM, gallein, Erythrosin Yellow Blend TM, chlorophenol blue, bromophenol blue, bromocresol purple, Coriphosphine O TM, acriflavine, acridine orange, rhoduline violet, Alizarin Cyanin 2R TM, Alizarin Red S TM, alcannin, Aurantia, Direct Green G TM, Fast Red Salt 3GL TM, Fast Blue Salt BB TM, Fast Garnet Salt GBC TM, Carta Yellow G 180 o/o TM, murexide, Savinyl Blue GLS TM, Irgalith Blue GLSM TM, phthalocyanine, Di Amingreen B TM, Alizarin Blue S, Celliton Blue Extra TM, neocyanine, Janus Green, dimethyl yellow, Fast Yellow, Methyl red sodium salt, Alizarin yellow R TM, Eriochrome Black T TM, Chromotrope 2R TM, Ponceau 6R TM, Brilliant Ponceau G/R/2R TM, chromolan yellow, Sudan Red B TM, Bismarck brown G TM, Fat Black TM, Resorcin Brown TM, Benzofast pink 2BL TM, Oil Red EGN TM, Euroglaucine, Fuchsin NB TM, parafuchsin, Patent Blue TM, Irgalith Blue TNC TM, Phloxin B TM, fluorescein sodium salt, Rhodamine B base TM, Eosin Scarlet, Esoin Yellowish TM, Erythrosin extra bluish 4,5-dibromofluorescein, ethyleosin, Phloxine TM, Cyanovin B TM, chlorocresol green, pinacyanol bromide, 2-(p-dimethylaminostyryl)-1-1-ethyl pryidinium iodide, ethyl red, neutral red iodide, nigrosine, savinyl blue B TM, Orasol Blue BLN TM, Safranin O TM, Azocarnun G TM, Phenosafranine, Azocarmine BX TM, Solophenyl Brilliant Blue BL TM, Nile Blue A TM, gallocyanine, gallamine blue, celestine blue, methylene green, Azure A/B/C TM, Blue VIF Organol TM, Alizarin, Nitrofast Green GSB TM, quinalizarine, Oil Blue N TM, Solvay purple, Ciba Blue TM, Indigo synthetic TM, Chromophtal Bordeaux RS TM, Acid Alizarin Red B TM, 5-Aminoflourescein, Rose Bengal TM, Martius Yellow TM, Chicago Blue 6B TM, Alcian Blue 8GX TM, Cresyl violet, 4,4'Bis(dimethylamino)benzylhdrol, Zinc Pthalocyanine, Sudan III TM, Pyronin Y TM, Toluylene Blue TM, cresyl violet perchlorate, Mendola's Blue TM, Phosphine Dye, Nitron TM, cresyl violet acetate, Ceres Orange R TM, 4-phenylazo-1-naphtyl-amine, 4-(4-Dimethylamino-1-napthylazo)-3-methoxybenzene sulfonic acid, Bindschedler's Green TM, p-(p-dimethylaminophenylazo) benzoic acid;

(2) a binary mixture of:

(A) one or more of a Group I body of compounds soluble in said solvent consisting of the halogenated sulfonphthaleins and the organic acids having a pK_1 of less than or about four; and

(B) one or more of a Group II body of compounds consisting of the aminotriphenylmethane and their soluble salts, 8-hydroxyquinoline, and the cyanines;

with the proviso that if the Group II compounds consist solely of one or more aminotriphenylmethanes or their soluble salts, then the Group I compound must be selected from one or more of the group consisting of oxalic acid, suitable soluble sulfonic acids and the tetrahalogenated sulfonphthaleins, and the other soluble organic acids having a pK_1 of less than or about 2, and wherein the weight ratio of the Group I body of compounds to the Group II body of compounds is more than or about 3 to 1; and

(3) one or more of the aforesaid Group III body of compounds with one or more of the Group I or Group II bodies of compounds.

4,232,553

ANGULAR ACCELERATION SENSING APPARATUS

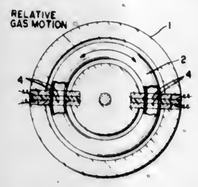
Kenneth R. Benedetto, Medway, and Larry J. Linder, Dayton, both of Ohio, assignors to KBG Corporation, Medway, Ohio

Filed Jan. 12, 1979, Ser. No. 3,489

Int. Cl.³ G01P *15/08*

U.S. Cl. 73—516 LM **10 Claims**

1. An angular acceleration sensing apparatus free of any moving mechanical parts, mechanical linkages, servo mechanisms and the like and operative on a principle whereby relative motion of a volume of fluid contained within a hollow torroid is sensed when a container securable to an object under study is subjected to an angular acceleration about an axis perpendicular to a plane of the torroid, comprising: an enclosed circular fluid-filled channel in the form of a torroid rigidly mounted in the container, pairs of thermally sensitive resistive elements suspended within said channel in fixed position, means for maintaining said elements at a constant temperature including an electrical circuit which forces said elements



to operate at a preselected resistance corresponding to desired operating temperatue, and means electrically connected with respect to said circuit and said elements to yield signals respresentative of angular acceleration.

4,232,554

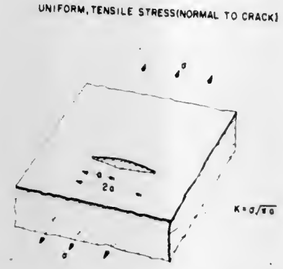
THERMAL EMISSION FLAW DETECTION METHOD

Benjamin J. Aleck, Jackson Heights, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,912

Int. Cl.³ G01N *3/32*

U.S. Cl. 73—577 **9 Claims**



1. A nondestructive method for detecting flaws in a structure comprising a material having a characteristic threshold stress intensity factor, including the steps of:

(a) loading the structure at a level corresponding to a stress intensity factor below the characteristic threshold stress intensity factor of the material; and

(b) positioning detection means in thermal proximity to the structure for detecting thermal emission signals indicative of plastic deformation.

4,232,555

ULTRASONOGRAPHIC EXPOSURE APPARATUS

Robert B. Rosenfeld, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1979, Ser. No. 30,972

Int. Cl.³ G01N *29/00*

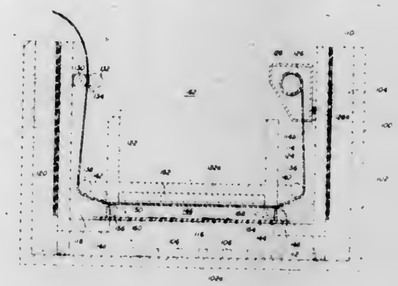
U.S. Cl. 73—606 **20 Claims**

1. An ultrasonographic exposure apparatus comprising

a reservoir for an ultrasonic transport liquid,

an ultrasound transducer positioned to be immersed in the transport liquid,

means for supporting an ultrasonographic element within the transport liquid, and



a damper located adjacent the ultrasonographic element remote from the ultrasound transducer to form an interface with the transport liquid within said reservoir.

4,232,556

MOVING TRANSDUCER SYSTEMS

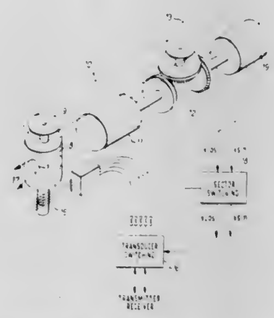
Allan Cole, Lasswade, Scotland, assignor to E M I Limited, Hayes, England

Filed Mar. 1, 1979, Ser. No. 16,496

Claims priority, application United Kingdom, Mar. 7, 1978, 8915/78

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—626 **20 Claims**



1. An arrangement for operating on sine and cosine components of a rotating vector signal, representing at different times the positions of different ones of two or more investigative transducers, rotating about an axis with constant relative phase, for control of a display on which the transducer outputs are displayed in alternation, the arrangement including means for varying the relative phase of the vector signal when representing at least one of said transducers to the vector signal when representing a first transducer, to correct display errors resulting from misalignment of said at least one transducer relative to said first transducer.

4,232,557

PERIODIC MAGNET UNIDIRECTIONAL TRANSDUCER

Carmine F. Vasile, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 23, 1979, Ser. No. 32,057

Int. Cl.³ G01N *29/04*

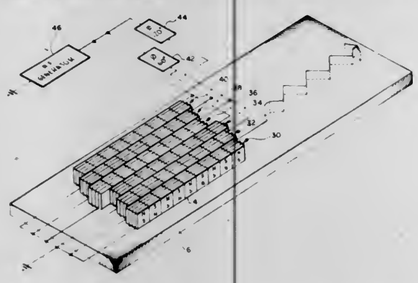
U.S. Cl. 73—629 **10 Claims**

1. A periodic magnet, unidirectional transducer comprising:

a first row of permanent magnets, the N-S axes of said magnets being substantially parallel, adjacent magnets in said

first row having differently oriented polarity so that a first periodic magnetic field is created;

a second row of permanent magnets, the N-S axes of said magnets being substantially parallel, adjacent magnets in said first row having differently oriented polarity so that a second periodic magnetic field of the same periodicity as



said first field is created, said second row being positioned adjacent and parallel to said first row and being offset along its length by one-quarter period from said second row; and

separate coils around said first and said second rows of magnets.

4,232,558

METHODS FOR DETERMINING BOND FAILURE MODES USING STRESS WAVE EMISSION TECHNIQUES

Min-Chung Jon, and Vito Palazzo, both of East Windsor Township, Mercer County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 12, 1979, Ser. No. 29,174
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—801 **8 Claims**



1. A method for determining the failure mode of a bonded article during destructive testing, comprising the steps of:

monitoring the stress wave emissions emanating from the bonded article during the destructive test;

developing a signal that is proportional to the number of excursions of the stress wave emissions above a predetermined threshold; and

comparing the developed signal to empirically determined ranges of signals associated with known failure modes to determine the bond failure mode.

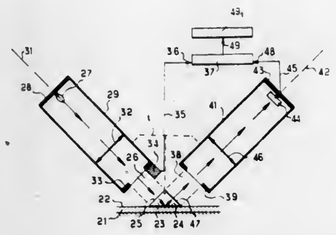
4,232,559

METHOD AND AN APPARATUS FOR MEASURING THE BONDING POWER OF AN ADHESIVE MATERIAL

Jean-Paul Favre, Bourg la Reine; Joseph Perrin, Clamart; Michel Philbert, Paris, and Jean Surget, Joinville le Pont, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (ONERA), France

Filed Jun. 13, 1979, Ser. No. 48,255
Claims priority, application France, Jun. 15, 1978, 78 17965
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—827 **10 Claims**

1. A method for measuring the bonding power of an adhesive material, particularly a sheet material comprising fibres impregnated with a glue, wherein, after having applied against the material the face of a totally reflecting prism the index of refraction of which is lower than that of the glue, a force is exerted which tends to bring apart from each other the prism



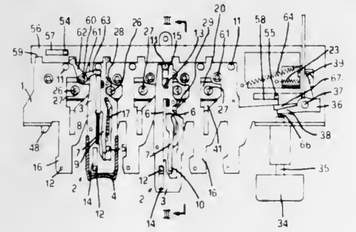
and said material, the value of the force corresponding to the separation is determined and the quotient is made of said force by the value of the contact area measured at the moment of the separation from the light totally reflected by said face.

4,232,560

KEYBOARD FOR THE PRESELECTION OF ELECTROMAGNETIC SIGNALS

Ezio F. Dellantonio, Rome, Italy, assignor to Autovox, SpA, Rome, Italy

Filed Nov. 9, 1977, Ser. No. 849,739
Claims priority, application Italy, Nov. 11, 1976, 52129 A/76
Int. Cl.³ F16H *35/18*
U.S. Cl. 74—10.33 **26 Claims**



1. A pushbutton keyboard tuning system for the tuning preselection of electromagnetic signals comprising:

a frame with means adapted to guide a number of keys for preselecting signals,

a tuning memorization latch whose position determines the selection of electromagnetic signals,

a key positioning bar for selectively maintaining each of said keys in at least an operative inserted position and a non-operative extracted position,

a slider for controlling clutch disengagement of said latch to a rotary knob tuning mechanism,

and in which each key comprises end of stroke stop means adapted to position the key at a predetermined position with respect to the frame in said operative position of said key,

a plunger linearly slidable on each key adapted to selectively position the tuning memorization latch,

means to lock the plunger in a predetermined slidable position on each key which determines the position of said tuning memorization latch when said key is in its operative inserted position, and means moveable with each key for acting on the slider controlling clutch-disengagement, and an improvement wherein,

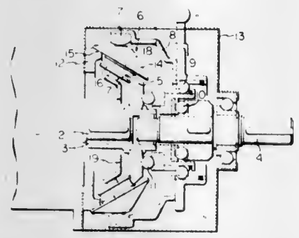
each key comprises a flat slider portion provided with guide means for slidably guiding said plunger and provided with a resilient appendage forming part of said guide means and operable to selectively lock the slidable position of said plunger.

4,232,561

STEPLESS SPEED CHANGE GEAR

Manabu Kashihara, Kyoto; Kikuo Okamura, Koto; Yoshikata Muguruma, Koyto; Shizuo Yamano, and Shigeo Mizusawa, both of Kyoto, all of Japan, assignors to Shinpo Kogyo Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 12, 1978, Ser. No. 914,762
Claims priority, application Japan, Jun. 14, 1977, 52-70079
Int. Cl.² F16H *15/16*
U.S. Cl. 74—191 **5 Claims**



1. A stepless speed change gear comprising:

an input member;

an output member coaxial with said input member;

a plurality of conical rollers;

a first member, a second member and a third member frictionally engaging said conical rollers;

a means for generating contact pressures between said conical rollers and said three members;

said first member comprising means for changing the speed of said output member and is moved in the common axial direction of said input member and said output member;

first annular power transmitting surface means comprising a substantially flat surface on the bottom of said conical roller and a second annular power transmitting surface of arcuate cross-sectional contour extending beneath said flat surface;

said flat and arcuate surfaces of said first annular power transmitting surface means being frictionally engaged with said second member and said third member, respectively;

said conical rollers being frictionally wedged between said first member and said second member by a force which is generated by said contact pressure generating means and which is transmitted through said third member.

4,232,562

LEAD SCREW LINEAR ACTUATOR

Gerald S. Perkins, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Nov. 16, 1978, Ser. No. 961,294
Int. Cl.² F16H *1/20*
U.S. Cl. 74—424.8 R **10 Claims**

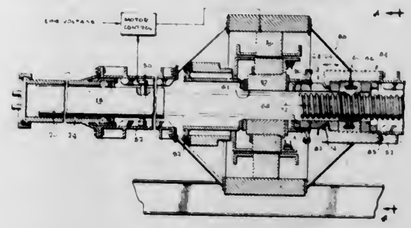
1. A linear actuator, comprising:

a rod having a threaded portion;

a motor having a stator and a rotor;

a threaded nut means threadably engaging said threaded rod portion; and

a coupling which connects said rotor to said nut means, said coupling constructed to transmit torque about the axis of



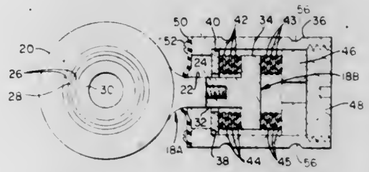
rotation of the rotor while permitting at least slight shifting of position of the nut means relative to the rotor.

4,232,563

LAMINATED ELASTOMERIC END BEARINGS FOR ARTICULATING LINKS

Robert R. Peterson, Hudson; Daniel S. Ventura, Malden, and Richard S. Gureghian, Burlington, all of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Mar. 16, 1978, Ser. No. 887,204
Int. Cl.² G05G *25/00*; F16C *11/08*
U.S. Cl. 74—470 **52 Claims**



1. A rod end bearing assembly for coupling a connecting rod to a mechanical element comprising:

a first laminated elastomeric bearing unit comprising alternating elastomer and non-elastomer layers of cylindrical shape;

a second laminated elastomeric bearing unit comprising alternating elastomer and non-elastomer layers of non-cylindrical shape; and

a load transmitting member extending between and connected to said first and second elastomeric bearing units;

said first bearing unit being adapted to accommodate motion about the first of three predetermined axes and to react loading along the second or third of said three axes, said second bearing unit being adapted to react loading along said second axis and to accommodate motion about said second axis, and said load transmitting member having a longitudinal axis extending radially of the elastomer and non-elastomer layer of said first bearing unit and at an angle to the elastomer and non-elastomer layers of said second bearing unit.

4,232,564

BICYCLE SPEED CHANGE LEVER DEVICE

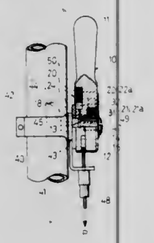
Kazuto Yamasaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 951,017
Claims priority, application Japan, Oct. 14, 1977, 52-123828
Int. Cl.² G05G *5/06, 5/16, 5/18*
U.S. Cl. 74—475 **6 Claims**

1. A bicycle speed change lever device comprising;

a lever body pivotally mounted on a support shaft and having a handle portion and a base portion which is formed with internal hollow spaces,

a step positioning mechanism disposed at one side of said base portion and including a resiliently urged engaging piece and a plurality of engaging recesses arranged so as to cooperate for retainging said lever body in a selected speed gear position,



a one-way clutch mechanism disposed within said internal hollow spaces and including means for permitting said lever body to pivotally move in one direction with reduced frictional resistance, and

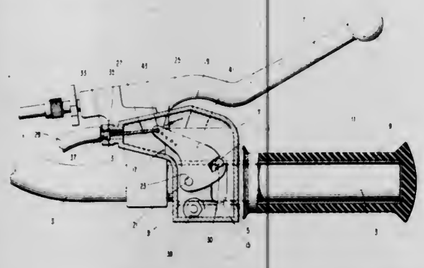
means for imparting frictional resistance to rotation of said lever body.

4,232,565

THROTTLE TWIST-GRIP CONTROL DEVICE

William H. Leonheart, San Carlos, Calif., assignor to McMinnville Tool & Die, Inc., McMinnville, Tenn.

Filed Aug. 17, 1978, Ser. No. 934,623
Int. Cl.[2] B62K *23/04*
U.S. Cl. 74—489 **10 Claims**



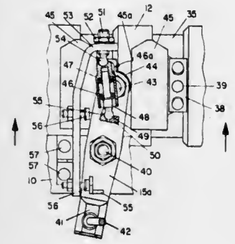
1. A remote control actuator for translating rotational angular movement into linear movement comprising: a housing; support partition means within said housing having a slot therethrough; a rotatable member arranged for rotational movement about an axis; projecting means rigidly mounted on said rotatable member and extending through said slot in said partition whereby the degree of rotation of the rotatable member is determined by the limits of said slot; a lever arm pivotally mounted on said support partition; means on said lever arm for movably engaging said projecting means whereby rotation of the rotatable member will cause said lever arm to move in a plane substantially parallel to the axis of rotation of the rotatable member; control actuator cable means including an inner cable member slidably movable with respect to a co-axially arranged outer cable member, said inner cable member being anchored upon and movable with said lever arm operative to oppose the movement of the outer cable member when said inner cable member is moved by said lever arm permitting relative movement between said cable members as said inner cable member is shifted in response to movement of said lever arm.

4,232,566

SWITCHING LEVER MECHANISM

Otto Lemke, Recklinghausen, and Manfred Krause, Herten-Langebochum, both of Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Division of Ser. No. 824,697, Aug. 15, 1977, Pat. No. 4,159,924. This application Apr. 4, 1978, Ser. No. 893,421
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637314
Int. Cl.[3] F16H *53/06, 21/44*
U.S. Cl. 74—569 **1 Claim**



1. A switching lever mechanism for operating a switching lever between two end positions, comprising first and second laterally spaced apart cams, a follower lever pivotally mounted between its ends and including one end with a roller follower disposed between said cams, and an opposite end connectable to a member for shifting the member, a socket formed on said follower lever between the roller follower and the pivotal mounting thereof, a bolt having a spherical head pivotally mounted in said socket, a bracket mounted in a stationary position alongside said follower lever and having a set screw with a head portion, a sleeve pivotally mounted on said head portion and carrying said bolt, and spring means in said sleeve biasing said bolt outwardly, said sleeve being pivoted centrally between said cams so that when said follower lever is engaged in one end position, it will be biased by said spring into that end position, and when it moves beyond dead center or the pivotal location of the mounting of said sleeve, it will switch over and bias the lever into an opposite end position against the other of the cams.

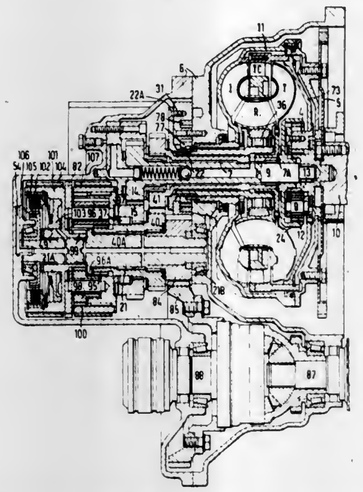
4,232,567

POWER TRANSMISSION APPARATUS

Howard F. Hobbs, Napton, England, assignor to Variable Kinetic Drives Limited, England

Filed May 20, 1977, Ser. No. 799,087
Int. Cl.[3] F16H *47/04, 47/08, 37/06*
U.S. Cl. 74—677 **3 Claims**

1. A power transmission apparatus comprising a torque converter having an input shaft, an impeller connected to the input shaft, an output sleeve, a layshaft parallel to said input shaft, an output member, an output turbine connected to said output sleeve, a reactor and a circulatory turbine, a first gearing connecting the circulatory turbine (TC) to the input shaft to transmit driving torque thereto, a unidirectional freewheel, a second gearing connecting the first gearing to the converter output sleeve through said unidirectional freewheel and a third gearing connecting the second gearing to said layshaft; a coupling shaft, said second gearing comprising first and second gearwheels the first of which is carried by said output sleeve and the second is carried by said coupling shaft which is coaxial with said output sleeve; third and fourth gearwheels carried by said layshaft, said first and second gearwheels meshing with said third and fourth gearwheels the third gearwheel being connected with said third gearing and the fourth gearwheel is connected with the third gearwheel by said freewheel; and



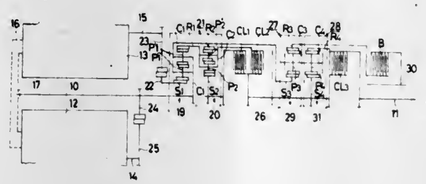
means drivably connecting the layshaft with said output member.

4,232,568

OUTPUT SPLIT-TYPE MECHANICAL AND HYDRAULIC TRANSMISSION

Hiroaki Maeda, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 28, 1977, Ser. No. 810,790
Claims priority, application Japan, Jul. 6, 1976, 51/80619
Int. Cl.[2] F16H *47/04*
U.S. Cl. 74—687 **25 Claims**



1. The output split-type mechanical and hydraulic transmission comprising:

(a) an input shaft;

(b) an output shaft;

(c) an intermediate shaft;

(d) first and second hydraulic pump motors hydraulically connected to each other, and at least said first pump motor having a variable hydraulic capacity and being mechanically connected to said input shaft;

(e) a first differential gear mechanism having first and second planetary gears, each of said planetary gears comprising a sun gear, a ring gear, a pinion meshed with said sun gear and said ring gear thereof, and a carrier rotatably supporting said pinion thereof, and wherein said carrier of said second planetary gear is integrally connected to said input shaft and to said ring gear of said first planetary gear, said sun gears of said first and second planetary gears are integrally connected to each other and mechanically connected to said second hydraulic pump motor, and said carrier of said first planetary gear and said ring gear of said second planetary gear are selectively connected to said intermediate shaft;

(f) a second differential gear mechanism having third planetary gear with a sun gear, a ring gear, a pinion meshed with said ring gear and said sun gear thereof, and a carrier rotatably supporting said pinion thereof, and wherein said carrier of said third planetary gear is mechanically connected to said first hydraulic pump motor, said sun gear of said third planetary gear is integrally connected to said intermediate shaft, and said ring gear is selectively connected to said output shaft; and

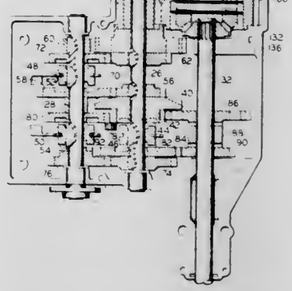
(g) clutch means for selectively connecting and disconnecting said ring gear of said second planetary gear to said intermediate shaft, said carrier of said first planetary gear to said intermediate shaft, said intermediate shaft to said output shaft, and said ring gear of said third planetary gear to said output shaft.

4,232,569

TRANSAXLE

Hans Hauser, Fredericktown, and William J. Clayborne, Mount Vernon, both of Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Nov. 7, 1977, Ser. No. 849,011
Int. Cl.[2] F16H *37/08*
U.S. Cl. 74—701 **6 Claims**



1. A transaxle comprising a housing, an input shaft rotatably carried by said housing, a shifting shaft rotatably carried by said housing, output shaft means carried by said housing, a driven gear on said input shaft, a first power-transmitting gear on said input shaft, two power-transmitting gears on said output shaft means meshing with said driven gear and said first power-transmitting gear, additional gear means for transmitting power from said driven gear to said output shaft means at a first range of speeds and from said first power-transmitting gear to said output shaft means at a second range of speeds, and shift means operable outside said housing for mechanically connecting said driven gear and said first power-transmitting gear to said input shaft, one at a time, said housing being in two parts with said input shaft, said shifting shaft, and said output shaft means carried by said parts at the meeting line, said input shaft, said shifting shaft, and said output shaft means being in a common plane with said output shaft means and said shifting shaft being on opposite sides of said input shaft.

4,232,570

VARIABLE RATIO TRANSMISSION SYSTEMS

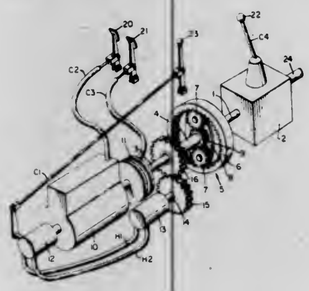
Peter J. Gibson, Guildford, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 22, 1977, Ser. No. 863,103

Claims priority, application United Kingdom, Dec. 22, 1976, 53641/76

Int. Cl.[2] B60K *41/16*

U.S. Cl. 74—866 **3 Claims**



1. A variable ratio transmission system for coupling a drive shaft of a prime mover to a load, including

a clutch;

an epicyclic gear train having first and second input elements and an output element, said first input element being coupled to said drive shaft via said clutch;

a stepped-ratio gear box having an input shaft coupled to said output element of the epicyclic gear train, and an output shaft coupled to said load;

a smoothly adjustable-ratio hydrostatic transmission subsystem having a ratio range substantially equal to the greatest ratio step of said gear box and comprising

a variable capacity pump mechanically coupled with said drive shaft, and

a fixed capacity motor hydraulically coupled with said pump and mechanically coupled to said second input element of the epicyclic gear train; and

an electrical control system including:

an operator-controlled load demand means,

a plurality of actuators for varying each of the following variable parameters of said transmission system: the speed of said drive shaft, the engaged/disengaged condition of said clutch, the ratio of said gear box, and the ratio of said hydrostatic sub-system,

a plurality of sensing means operative to produce signals representative of each of the said variable parameters, and

logic means responsive to input signals received from said sensing means and from said load demand means, and generating actuator command signals in an actuator drive circuit respective to each of said actuators.

4,232,571

FLOOR MOUNTED SHIFT CONTROL MECHANISM WITH DRIVE TRANSMITTING CABLES

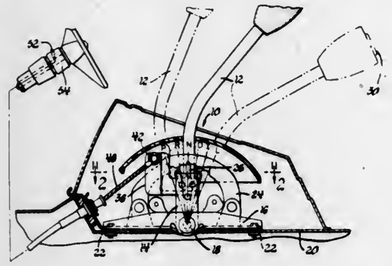
Dan R. Kimberlin, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1979, Ser. No. 11,396

Int. Cl.[3] B60K *41/04*

U.S. Cl. 74—878 **1 Claim**

1. A floor mounted manual transmission shift control mechanism for a vehicle having a steering column with a multiposition lock mechanism and a multiposition transmission mode control mechanism, said shift control mechanism comprising; a manual control lever; longitudinally movable first cable means operatively connected with the lock mechanism and being held from longitudinal movement when the lock mechanism is in a predetermined position; longitudinally movable second cable means operatively connected to a transmission mode control mechanism; a bracket pivotally mounted for movement with said manual control lever; spring means secured to said bracket, pin means secured to said spring means and drivingly connected to said first cable means for resiliently connecting said bracket and said first cable means through said spring means to move said first cable means longitudinally in response



to pivoting of said bracket, said spring means permitting relative motion between said bracket and said first cable means when said first cable means is held from longitudinal movement; and an extension integral with said bracket, said pin means also being operatively connected to said second cable means, and supported in said extension for transmitting motion from said bracket through said spring means and said pin means to said second cable means when said first cable means is free to move longitudinally.

4,232,572

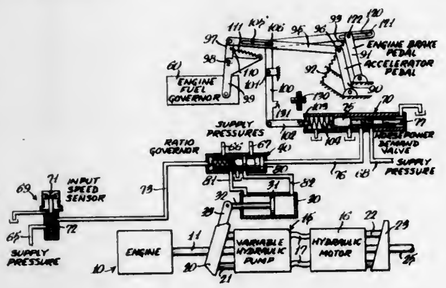
ENGINE-TRANSMISSION CONTROL SYSTEM

William A. Ross, and Frederic W. Pollman, both of Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 17, 1978, Ser. No. 925,362

Int. Cl.[2] B60K *41/16*; F16D *31/02*

U.S. Cl. 74—859 **17 Claims**



1. An engine-transmission control system for an engine utilizing no fuel control other than a fuel governor comprising, a variable hydrostatic transmission, a variable speed engine connected to said transmission, a fuel governor for said engine which provides an engine operating curve conforming to the locus of minimum fuel consumption of the engine and which establishes a particular engine horsepower at any particular engine speed, a horsepower demand signal valve, an engine speed signal valve, and means including a ratio governor valve responsive to horsepower demand and engine speed signals to set the transmission ratio of the hydrostatic transmission and control engine power delivery by action of the fuel governor resulting from the transmission ratio establishing an engine speed.

4,232,573

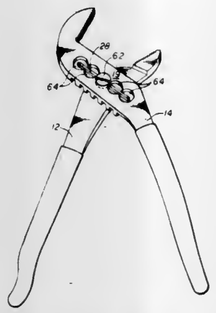
SLIP PLIERS WITH LOCK

Marvin H. Dace, Jr., Rte. 3, Box 665, Friendswood, Tex. 77511

Filed Jan. 8, 1979, Ser. No. 1,382

Int. Cl.[3] B25B *7/04*

U.S. Cl. 81—405 **2 Claims**



1. A new and improved set of slip type pliers, comprising:

two pivotally connected plier members, each member having an opposing gripping jaw and an elongated handle at the opposite end thereof;

a pivot pin mounted to the first plier member about which the second plier member rotates;

the second plier member having a slot therein for receiving the pivot pin to thereby permit the second plier member to slide relative to the first plier member therein enabling the second plier member to be manually adjusted about the pivot pin for rotation and positioning of such second plier member jaws relative to the jaws of said first plier member;

means for locking said pivot pin relative to said slot wherein said jaws may be moved relative to each other to enable gripping of a desired object only in one fixed position and wherein said pivot pin is prevented from sliding in said slot to enable said jaws to be maintained in said one fixed position,

means for unlocking said pivot pin relative to said slot, said pivot pin being free to slide within said slot to enable said gripping jaws to be readjusted to maintain said jaws in a different position;

said locking means being a dowel slidably positioned within the first plier member, said dowel being slidable between a first position for preventing said pivot pin from sliding within said slot to enable said jaws to be maintained in one fixed position, and a second position for releasing the plier members to enable said gripping jaws to be readjusted to maintain said jaws in a different position, said locking means including a resilient means mounted to said dowel for urging said dowel into its first position for retaining the plier members in a preset functional adjustment.

4,232,574

APPARATUS AND METHOD FOR PROVIDING A CIGARETTE FILTER WITH AN AERATION GROOVE

Floyd V. Hall, Durham, N.C., assignor to Liggett Group Inc., Montvale, N.J.

Filed Aug. 19, 1977, Ser. No. 826,136

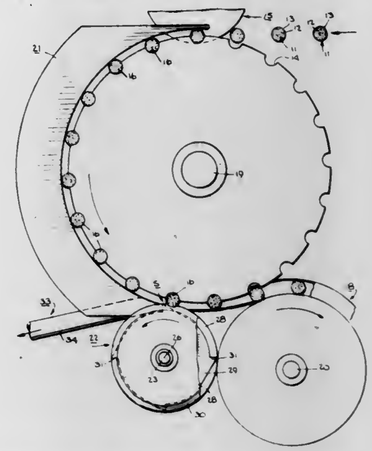
Int. Cl.[3] B23B *3/04, 5/14*

U.S. Cl. 82—84 **18 Claims**

1. In an apparatus for providing an aeration groove in a filter plug having a layer of plug wrap paper circumferentially about a body of entrainment-type fibrous filter material, the combination comprising

a rotatable filter plug alignment drum having a plurality of peripherally disposed grooves for sequentially receiving and aligning a plurality of filter plugs,

a storage drum for sequentially receiving the filter plugs from said alignment drum, and



means adjacent said drums for forming at least one peripheral groove in each filter plug to extend through said plug wrap paper and being at least the depth of said plug wrap paper to communicate the exterior of the filter plug with the body of filter material.

4,232,575

ARRANGEMENT FOR PUNCHING OUT CIRCULAR BLANKS

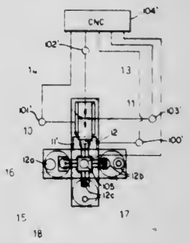
Franz Schneider; Helmut Braitinger, both of Göppingen; Ewald Bergmann, Rechberghausen, and Otto Kurz, Hattenhofen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,246

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751123

Int. Cl.[3] B21D *28/22*

U.S. Cl. 83—71 **17 Claims**



1. An arrangement for notching circular blanks, the arrangement comprising at least one notching machine, a rotatably mounted table means for supporting the blanks at the notching machine, a feeding and removing means, and an adjusting drive means for adjusting the notching machine in a first direction of movement radially with respect to a spatially fixed axis of rotation of the supporting table means, characterized in that an additional adjusting means is provided for selectively driving the supporting table means, in that means are provided for enabling a relative movement between the supporting table means and the at least one notching machine in a second direction of movement at a right angle to the first direction of

movement, and in that further means are provided for operating said feeding and removing device.

4,232,576

DEVICE FOR SEVERING A CONTINUOUS AXIALLY MOVING ROD-LIKE MEMBER INTO SEPARATE ELEMENTS

Roger A. Allen, Prestwood, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Filed Dec. 26, 1978, Ser. No. 972,897

Claims priority, application United Kingdom, Dec. 28, 1977, 54024/77

Int. Cl.³ A24C *5/28*

U.S. Cl. 83—309 **7 Claims**



1. A device for severing a continuous rod-like member into separate elements during axial movement of the rod-like member along a predetermined path through a severance zone, comprising:

a ledger disc having a radially facing annular peripheral groove and a radial knife guide slot extending inwardly from the periphery of said ledger disc so as to intersect said groove, said ledger disc being rotatably mounted in a substantially vertical plane beneath said path for supporting said rod-like member substantially tangentially in said annular groove during passage through the severance zone;

a flexible cutting knife slidable cooperable with said knife guide slot in said ledger disc;

knife support means including a universal joint mounted adjacent to the severance zone and movable for causing said knife to follow an endless course intersecting said path at said annular groove with a component of motion along said path in the direction of movement of said rod-like member;

means for rotating said ledger disc at a predetermined speed; and,

means for driving said knife support means in synchronism with said ledger disc to cause said knife to pass thorugh said knife guide slot when in the severance zone and at a greater speed than the speed maintained during the remainder of its movement.

4,232,577

APPARATUS FOR LONGITUDINALLY CUTTING WEBS OF MATERIAL

Wilfried Wallmann, Lengerich of Westphalia; Manfred Menzel, Lengerich-Hohne, and Dieter Peschel, Lienen-Holzhausen, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

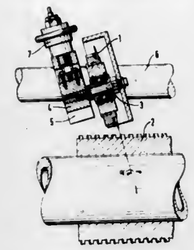
Filed Feb. 2, 1979, Ser. No. 9,175

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805211

Int. Cl.³ B23D *19/06*; B26D *1/24*

U.S. Cl. 83—496 **6 Claims**

1. Apparatus for longitudinally cutting webs of material, especially paper webs, comprising a freely rotatably mounted circular knife which can be applied to cutting edges of a grooved backing roller defining the counter-knife, characterised in that in the cutting position the circular knife (1) is inclined to the axis of the counter-knife (2) by an angle of incidence (α), and characterised in that the circular knife is



disengageable from the counter-knife by movement in the direction of the angle of incidence (α) so that the width of cut is changeable during movement of a web to be cut.

4,232,578

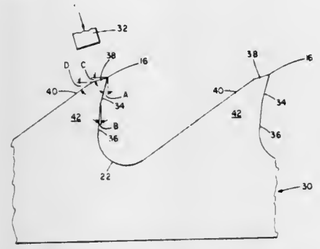
SAW BLADE AND METHOD OF MAKING

Thomas S. Stellinger, Weston, and Stephen R. Crosby, Sterling, both of Mass., assignors to Wallace Murray Corporation, Fitchburg, Mass.

Filed Jul. 9, 1979, Ser. No. 56,138

Int. Cl.³ B27B *33/06*

U.S. Cl. 83—661 **9 Claims**



1. A saw blade in which each tooth comprises

a primary rake face extending from the tooth tip for a distance of 0.007 to 0.020 inch and having a positive rake angle of 12° to 25°,

a secondary rake face extending from the primary rake face to the gullet of the tooth and having a positive rake angle of less than 12°,

a primary end relief surface extending from the tooth tip for a distance of 0.007 to 0.030 inch and forming a relief angle of 10° to 25°, and

a secondary end relief surface extending from said primary end relief surface to the gullet of the next succeeding tooth of said blade and forming a relief angle greater than that of said primary end relief surface.

4,232,579

SWITCH ACTUATING ASSEMBLY FOR POWER TOOLS

Peter J. Craddock, Oldham; Brian R. Law, Leicester, and Albert J. Smith, Nuneaton, all of England, assignors to Burgess Power Tools Limited, Great Britain

Filed Jan. 31, 1979, Ser. No. 8,109

Int. Cl.³ B26D *5/00*; B27B *13/00*; B27G *19/06*

U.S. Cl. 83—788 **7 Claims**

1. Power tool having an electric motor, a component mounting the motor and a drive mechanism for a tool implement characterised in that a box-shaped moulding of synthetic material mounts, apart from a motor and a drive mechanism for an implement, also a switch actuating assembly flush in a side of the moulding, said assembly comprising an OFF actuating

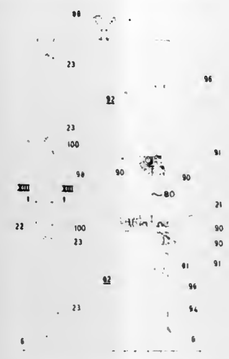


plate pivotably mounted in a recess in the side and covering an ON actuating plate to which access can be gained by pivoting the OFF actuating plate upwards.

4,232,580

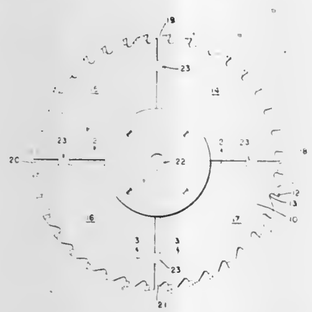
CIRCULAR SAW BLADE

John S. Stewart, P.O. Box 5670, Greensboro, N.C. 27403

Filed Nov. 6, 1978, Ser. No. 957,859

Int. Cl.³ B27B *33/08*

U.S. Cl. 83—835 **7 Claims**



1. A circular saw blade comprising a circular disk having opposite flat faces and a plurality of circumferentially spaced cutting teeth, said blade having a plurality of circumferentially-spaced and radial slots extending in said blade to a depth at least half the radius of said blade forming blade segments, and collar means for central clamping against at least one flat face of said disk and partially overlapping said slot whereby vibrational energy is damped.

4,232,581

AUTOMATIC ACCOMPANIMENT APPARATUS

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 659,070, Feb. 18, 1976, abandoned. This application Apr. 12, 1978, Ser. No. 895,697

Claims priority, application Japan, Feb. 21, 1975, 50-21668; Feb. 28, 1975, 50-24524; Feb. 28, 1975, 50-24525; Feb. 28, 1975, 50-24526

Int. Cl.³ G10H *1/38, 1/42*

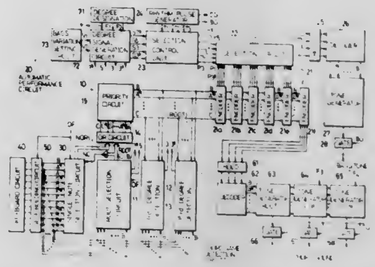
U.S. Cl. 84—1.03 **8 Claims**

1. An automatic accompaniment apparatus comprising:

a circuit for producing signals representing the root and subordinate notes of a chord;

a circuit for designating a predetermined bass degree change pattern;

a circuit for detecting, in accordance with the designated degree change pattern, which one of a plurality of octave ranges the root and subordinate notes belong to; and



a circuit for producing a bass tone corresponding to frequencies of the root and subordinate notes in the detected octave range.

4,232,582

ACOUSTICAL STRINGED MUSICAL INSTRUMENT PICK-UP

Marc Diamond, Wildcat Hill Rd., Harwinton, Conn. 06791

Filed Apr. 4, 1979, Ser. No. 26,873

Int. Cl.³ G10D *1/08*; A61B *7/02*

U.S. Cl. 84—267 **23 Claims**



1. In combination with a stringed instrument having a bridge and a string anchor, apparatus for transmitting acoustical energy to a listener comprising a flexible energy pick-up chamber having at least one opening, said chamber being located in said bridge, so that one wall of said chamber provides support for the strings and there being substantially no soft, sound damping material between said wall and the strings; at least one elongated, hollow energy transmission member having a first end connected to the interior of said chamber through said opening; and listening means for transmitting said energy to a listener, said means being mounted on a second end of said hollow member.

4,232,583

FIREARM WITH RECOIL MOVEMENT DELAYING MECHANISM

Donald G. Harrison, 5927 W. Rose La. #C, Glendale, Ariz. 85301

Filed Dec. 14, 1978, Ser. No. 969,382

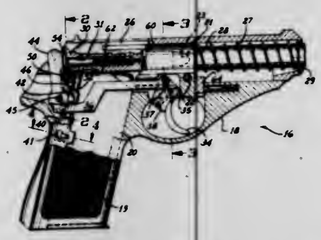
Int. Cl.³ F41D *5/02, 5/04, 11/06*

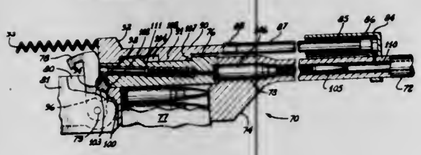
U.S. Cl. 89—153 **12 Claims**

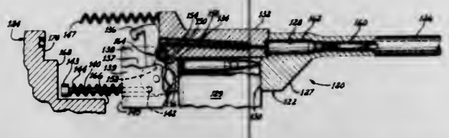
1. An automatic or semiautomatic firearm comprising in combination:

(a) a frame;

(b) a recoiling breechlock on said frame and longitudinally reciprocally movable relative to said frame between a breech opening position and a breech closing position;
(c) roller means mounted in said frame and reciprocally movable into and out of the movement path of said recoiling breechblock;
(d) means in said frame for reciprocally mounting said roller means therein; and







(e) a hammer pivotably mounted in said frame for movement from a cocked position to a fallen position, said hammer having a cam surface formed on its leading edge which is disposed to engage said roller means upon movement of said hammer to its fallen position to drive said roller means into the movement path of said recoiling breechblock to delay movement thereof to its breech opening position.

4,232,584

CONTROL ELEMENT FOR AUXILIARY POWER STEERINGS

Rolf Fassbender, Mutlangen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichschafen, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 13,908

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807464

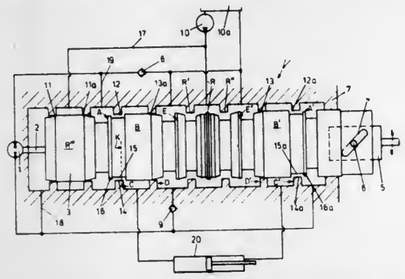
Int. Cl.³ F15B *11/08*

U.S. Cl. 91—418 **5 Claims**

1. In a control valve for a power steering system, said control valve being of the kind having a valve sleeve (7) and a valve piston (3) shiftable therein by rotation of a steering spindle (5) and including flow control rings and grooves of said valve piston coacting with flow control rings grooves and flow passages of said valve sleeve to control pressure flow from a metering pump (1) actuated by said steering spindle to a power cyilinder (20) and exhaust therefrom:

the improvement which comprises:

at least one throttling ring (A) on said valve piston and at least one throttling ring (C) on said valve sleeve effecting a throttling flow passage therebetween for pressure flow to a power cylinder wherein said pressure flow has initial low throttling in the shifting of said valve piston starting from a netural position with initial low pressure in said power cylinder to high throttling upon pressure increasing in said cylinder as said valve piston is shifted; said valve piston having a groove (15) adjacent the throttling ring (A) thereof radially spaced from and axially wider than the throttling ring (C) of said valve sleeve to effect



low throttling in initial steering control shifting of said valve piston from said neutral piston; said throttling rings being mutually dimensioned to effect maximum throttling during high pressure flow when the throttling ring (A) of said valve piston is adjacent the throttling ring (C) of said valve sleeve.

4,232,585

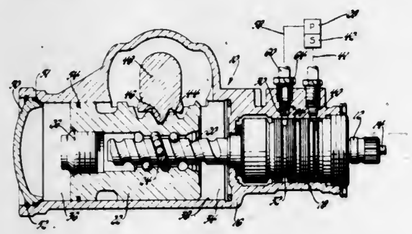
POWER STEERING GEAR WITH FLOW CHECK VALVE

James M. Shea; Michael F. Tobin, and Stanley E. Anderson, all of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1978, Ser. No. 951,964

Int. Cl.³ F15B *13/042*; F16K *15/06*

U.S. Cl. 91—432 **4 Claims**



1. A hydraulic power unit comprising a housing, a piston mounted for sliding movement in said housing and cooperating therewith to form a pair of expansible and contractible fluid chambers, output means operatively connected to said piston and extending from said housing, a source of fluid pressure, a pressure port and an exhaust in said housing, a fluid passage tube operatively connecting said source to said pressure port, said tube having one end seated in said pressure port, said tube extending externally of said housing and having its other end connected to said source, manual input means extending into said housing, valve means connected to said input means hydraulically connected to said pressure port and said exhaust, said value means being operatively mounted in said housing to feed and exhaust fluid from said fluid chambers, a one-way check valve in said pressure port, said one-way check valve comprising a valve element and a spring for biasing said valve element in one direction and a retainer for said spring and valve element, said valve element being operatively connected to said spring and retainer to form a unitized assembly, said valve element having a head portion, and valve seat means formed directly in said one end of said fluid passage tube to

cooperate with said head portion to block the fluid flow fromm said chamber to said source of pressure to prevent external loads imposed on said output means from being fed through said gear to said input.

4,232,586

STEERING CONTROL VALVE FOR POWER BOOSTER STEERING MECHANISMS

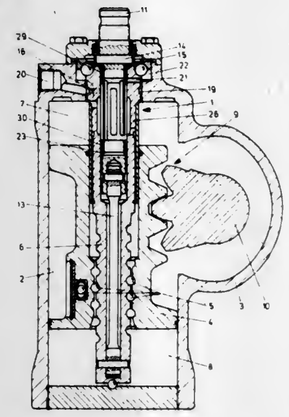
Dieter Elser, Essingen-Lauterburg, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 825,477, Aug. 17, 1977, abandoned. This application May 8, 1979, Ser. No. 37,031

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637458

Int. Cl.³ F15B *13/04*; F16K *11/00*

U.S. Cl. 91—467 **1 Claim**



1. In a booster steering mechanism system including a boost cylinder and piston of the kind described, a rotary valve plug having dead end grooves and a worm shaft effecting a valve sleeve having interior dead end grooves to coact with said rotary valve plug dead end grooves for oil pressure flow control;

said rotary valve plug being rotative within a bore through said valve sleeve for flow control and being disposed to be subjected to sidewise forces of oil pressure and steering mechanism stresses;

an anti-friction roller bearing adjacent each end of the rotary valve plug proximate the ends of the dead end grooves therein and rotatively and fixedly supporting said rotary valve plug in said valve sleeve bore with a predetermined fixed radial clearance to permit smooth and uniform low resistance to rotation while minimizing oil leakage between the rotary valve plug and valve sleeve bore, whereby said sidewise forces acting on said rotary valve plug are resisted to preclude eccentricity thereof in said valve sleeve bore to thereby prevent frictional engagement of said rotary valve plug with said valve sleeve;

wherein said bearings comprise needle rollers in slotted cages arrayed in a circle which has an outer diameter predeterminedly larger than the outer diameter of the rotary valve plug to effect said predetermined clearance between said rotary valve plug and said valve sleeve bore; said needle rollers being radially supported continuously between the walls of said valve sleeve bore and said valve plug and providing the sole means of radial support for said valve plug.

4,232,587

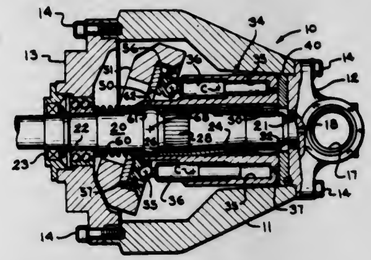
FLUID PUMP

William L. Kline, Galena, Ohio, assignor to Kline Manufacturing Co., Galena, Ohio

Filed Apr. 25, 1979, Ser. No. 33,191

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—499 **5 Claims**



1. In a hydraulic fluid pressure transducing device comprising a housing having two ends a port cap seated on one end of said housing and having inlet and discharge ports, an end bell seated on the end of said housing opposite said port cap, a drive shaft disposed within said housing and extending therefrom, bearing means for said shaft disposed in said port cap, a second bearing means for said shaft disposed in said end bell, a rotatable barrel disposed generally concentrically about said shaft and defining a plurality of uniformly spaced parallel cylinders in communication with both ends of said barrel, a plurality of pistons with one positioned in each of said cylinders, a swash plate disposed adjacent one end of said barrel and inclined about an axis skewed to the barrel axis, ball and socket means disposed intermediate said pistons and said swash plate for reciprocating said pistons, a valve plate adjacent the end of said barrel opposite said swash plate having arcuate inlet and outlet fluid passages in independent communication with said inlet and outlet ports, and drive means disposed between said shaft and said barrel for transferring rotary motion therebetween, the improvement comprising a splined interconnection between said shaft and said drive means and a second splined interconnection between said drive means and said barrel, at least one of said splined interconnections having generally a spherically profiled male spline.

4,232,588

ELECTRICALLY CONTROLLED PIPE FRACTURE SAFETY DEVICE

Herbert Ziplies, Kamen, and Werner Pyschik, Dortmund, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,915

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707630

Int. Cl.³ F15B *11/00*

U.S. Cl. 91—518 **4 Claims**

1. An electronically controlled pipe fracture safety device for operating devices which are fed by a hydraulic pump and which are actuated by a control slide valve by means of hydraulic cylinders, comprising

a hydraulic system comprising,

a hydraulic pump,

hydraulic cylinders being operatively connected to the operating devices,

first lines leading from said hydraulic pump to a first chamber of each of said hydraulic cylinders, respectively,

a first control slide valve operatively connected to said first lines between said hydraulic pump and said hydraulic cylinders,

control lines branching off from said first lines, respectively, means comprising a differential pressure monitor connected

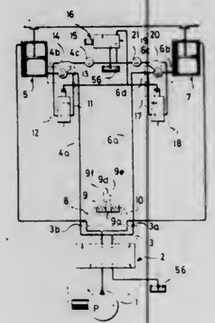
to said control lines and having a slidable differential pressure actuated piston, said means for monitoring the entire hydraulic system,

a permanent magnet secured to said piston,

a control slide valve means operatively fed with and operatively controlled by a current flow and operatively connected to said hydraulic cylinders, said control slide valve means for being in a locking position thereof without current flow thereto, said locking position preventing escape of hydraulic fluid from said first chamber of each of said hydraulic cylinders,

a logic circuit means including,

an input thereto comprising a NOR gate, and NAND gates forming a flip-flop operatively connected to said NOR



gate, a relay operatively connected to said flip-flop and to said control slide valve means,

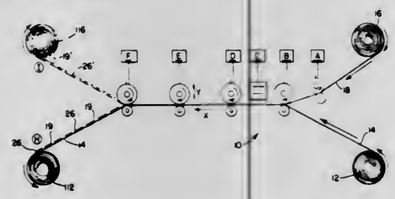
said logic circuit means including a reed contact switch means operatively connected to said NOR gate and cooperatively disposed adjacent said permanent magnet, such that upon a pressure difference between said control lines upon leakage in one of said first lines, said piston is displaced by the pressure difference and said magnet actuates said reed contact switch means so that a signal is produced in said NOR gate, whereupon said signal retransmitting a self-locking signal to said NAND gates causing a locking position of said NAND gates, in turn causing a drop-out of said relay and an interruption of the current flow to said control slide valve means and effecting the locking position of the latter.

4,232,589

METHOD OF MAKING PLASTIC BAG CONSTRUCTION IN SERIAL ROLL FORM

Edwin F. Ernst, 3722 Buckingham Dr., Roanoke, Va. 24018

Division of Ser. No. 841,441, Oct. 12, 1977, Pat. No. 4,171,048.
This application Jan. 24, 1979, Ser. No. 6,239
Int. Cl.³ B31B *27/00*
U.S. Cl. 493—223 **10 Claims**



1. A method of making a plurality of serially connected bag structures in package roll form having the following steps:

supplying a first strip of indeterminate length,

attaching short determinate length strips from a second supply of strip material at spaced points along said first strip,

forming a Z-fold expansion gusset closely adjacent to each point of attachment, and

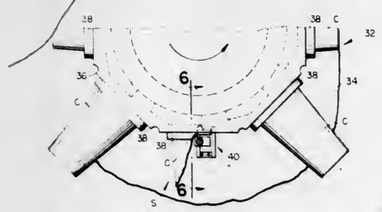
sealing the side edges together of the first member of indeterminate length and the spaced second members of determinate length to form individual bag structures, together with the additional step of tack sealing the side edges of the formed gusset prior to the edge sealing of the individual bag structures.

4,232,590

CUP MAKING MACHINE HAVING APPLICATOR MECHANISM

Warren E. Johnson, Bristol, Conn., assignor to Sherwood Tool, Incorporated, Kensington, Conn.

Filed Dec. 13, 1978, Ser. No. 968,986
Int. Cl.³ B31B *1/62*
U.S. Cl. 493—10 **10 Claims**



1. An applicator mechanism for a container making machine having a frame, a rotary turret supported on said frame for indexing movement about an axis to a plurality of successive container forming stations, and a container forming mandrel mounted in cantilever position on said turret with the axis of said mandrel extending radially outwardly from said turret, said applicator mechanism comprising applicator means for applying fluent material to an associated surface of a container blank carried by the moving mandrel as said mandrel indexes from one to another of said forming stations, said associated surface being disposed generally within a radial plane relative to the axis of said turret, means supporting said applicator means for movement relative to said turret, and means for moving said applicator means in material applying relation to a moving container blank carried by said moving mandrel in response to the indexing movement of said turret relative to said frame to apply a rectilinear strip of the fluent material to said associated surface of said moving container blank.

4,232,591

CARTON ERECTING APPARATUS

William J. Karpinsky, Audubon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 22, 1979, Ser. No. 5,303
Int. Cl.³ B31B *1/80*
U.S. Cl. 493—314 **2 Claims**

1. An apparatus for erecting carton tubes formed from foldably connected panel elements, said apparatus comprising:

(a) a hopper for holding a plurality of carton tubes in flattened condition;

(b) a conveyor adapted to receive an erected carton tube and having means for retaining said tube in an erected condition;

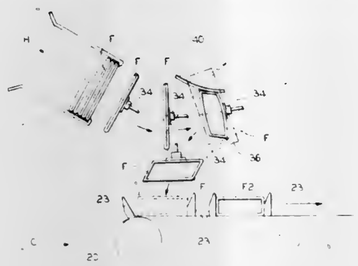
(c) a carton tube erecting and transfer structure mounted for movement in a path between said hopper and said conveyor for delivering an erected carton tube to said conveyor;

(d) said last named structure including:

(i) vacuum pick-off and transfer means movable in timed relationship to said conveyor for engaging a panel element of said tube disposed at said hopper;

(ii) said vacumm pick-off and transfer means moving in an arcuate path between said hopper and said conveyor;

(iii) stationary plenum means positioned along the path of travel of said carton tubes and located remote from and free from attachment to said hopper and acting at least



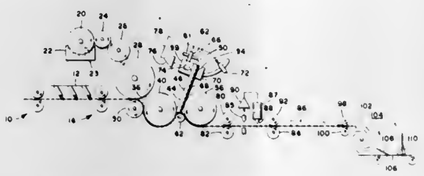
during a portion of said movement of said vacuum pick-off and transfer means for applying air pressure upon at least one end of said carton tube to erect the same as said tube is transferred from said hopper to said conveyor.

4,232,592

ENVELOPE FORMING MACHINE AND METHOD

David L. Gingerich, Farmington, Mich., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 12, 1978, Ser. No. 950,626
Int. Cl.³ B31B *1/20*
U.S. Cl. 493—10 **3 Claims**



1. A machine for serially handling, gluing and shaping envelope blanks comprising:

a. a scoring roller for receiving said blanks and adding score lines thereto,

b. means for receiving said blanks from said scoring roller and applying glue to selected first locations on said blanks, said last named means including

(i) a drive roller and a glue application roller in operative association therewith to apply glue to selected areas of an envelope blank passing between said rollers,

(ii) a first photo cell for detecting the presence of said blank and producing a first output signal when said blank is present,

(iii) means coupled to said first and second photo cells for moving said drive roller out of contact with said application roller when only said second output signal is present,

c. means receiving said blanks with applied glue and folding said blanks to cause a seal at said glue locations,

d. means for receiving said folded blanks and inverting said blanks whereby a first portion of said blanks is stationary while said blanks are being inverted,

e. means located at said inverting means for forming a desired shape in said stationary portion of each of said blanks while said blanks are being inverted, and

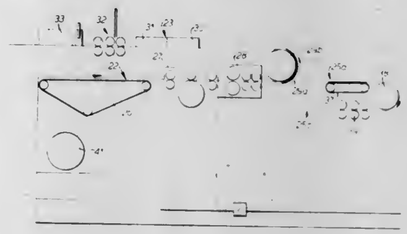
f. means for receiving said shaped blanks and folding said blanks to form completed envelopes.

4,232,593

IMPROVEMENTS IN AND RELATING TO THE MANUFACTURE OF RECORD SLEEVES

Norman J. Garrod, Great Common, Bletchingley, Surrey, England

Filed Dec. 11, 1978, Ser. No. 968,213
Int. Cl.³ B31B *1/08*
U.S. Cl. 493—224 **5 Claims**



1. A machine for making single and double record sleeves made respectively from one and two sheet material blanks, said machine comprising:

two input lines each comprising blank registering means, blank cutting means and blank creasing means;

two first output lines each comprising means for producing a single record sleeve from a cut and creased blank;

a second output line including means for producing a double record sleeve from two cut and creased blanks,

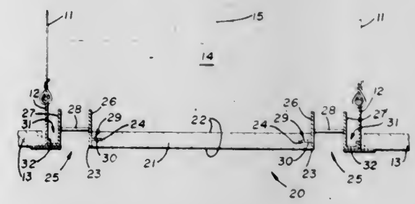
conditioning means having a first and a second condition, in the first condition of which each said input line is connected to a respective one of said two first output lines and in the second condition of which both said input lines are connected to said second output line, wherein each said input line and said respective first output lines are arranged one above the other and said conditioning means comprises, in respect of each said input line, a diverter which in said first condition is arranged to divert a blank from said respective input line to said respective first output line.

4,232,594

MODULAR CEILING PANEL UNIT USABLE WITH AIR DISTRIBUTION SYSTEMS

Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 27, 1978, Ser. No. 928,770
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—40 D **3 Claims**



1. A ceiling panel unit adapted for use with conventional air distribution mechanisms in suspended ceiling grid systems utilizing inverted-T runners suspended from upper support structures forming a plenum between the upper support structure and ceiling grid system, said ceiling panel unit having a body portion having a generally rectangular configuration with opposite parallel panel faces, said body portion having four marginal edges, wherein at least two opposite edges have

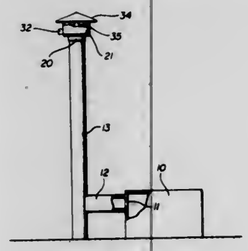
generally H-shaped integral air distribution strips having an inner leg, an outer leg, and a cross-web portion therebetween, fixedly engaged thereto for substantially the full length of the edge, said air distribution strips comprising means along the inner leg of the H-shape engaging the panel body portion edge and means at the outer leg of the H-shape for supportively associating with the arm of an inverted-T runner, at least one air distribution strip panel edge engaging means comprises a flange projecting inwardly from the inner leg of the H-shape and extending the full length of the strip wherein said flange projects into a kerf provided along substantially the full length of the panel edge thereby providing a fixed attachment, the air distribution strip means for supportively associating with an arm of an inverted-T runner comprises a flange extending outwardly from a lower end of the outer leg of the H-shape and resting atop the arm of the inverted-T to thereby support the panel unit and provide an exposed inverted-T runner configuration when viewed from below, wherein the cross-web of the H-shaped air distribution strip is adapted to supportively associate with a mounting portion of conventional air distribution mechanisms positioned in the plenum between the upper support structure and ceiling grid system.

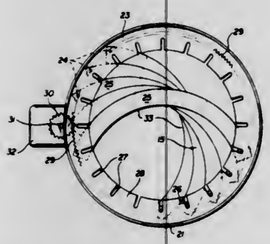
4,232,595

EXHAUST SYSTEM FOR SMOKESTACK

Norman D. Cox, Lansing, Ill., assignor to Jefco Laboratories, Incorporated, Chicago, Ill.

Filed Jun. 15, 1978, Ser. No. 915,941
Int. Cl.³ F23J *13/00*; F23L *17/02*
U.S. Cl. 98—59 **3 Claims**





1. An exhaust system for removing gaseous combustion products from a combustion chamber having an exhaust port, said exhaust system comprising:

a vertically disposed smokestack having a lower portion communicating with the exhaust port of said combustion chamber and a top opening communicating with the atmosphere;

an exhaust control device overlying said top opening of the smokestack;

said exhaust control device being substantially flat and lying in a substantially horizontal plane and having a sharp-edged circular orifice overlying the interior of said smokestack;

said exhaust control device comprising means for forming an annular insulating blanket of exhaust gases around the periphery of the smokestack interior and a uniformly flowing stream of exhaust gases passing steadily up the center of the annulus;

said substantially flat exhaust control device comprising adjustable means actuable to adjust the size of said orifice while maintaining said annular insulating blanket and said uniformly flowing stream of exhaust gases, said adjustable means comprising movable closure means defining said sharp-edged circular orifice and lying substantially entirely in said substantially horizontal plane;

and means for actuating said adjustable means in response to a change in conditions within said smokestack, reflecting a change in the number of boilers connected to said smokestack or a change in the operating conditions in a given boiler, to change the orifice size to one which will return the conditions existing before said change, said orifice adjusting means comprises:

closure means;

and means mounting said closure means for movement between a first position in which said orifice has a first cross-sectional area less than the cross-sectional area of said smokestack and a second position in which said orifice is partially open and has a second cross-sectional area less than said first cross-sectional area thereof,

said closure means comprises means for adjusting the cross-sectional area of said orifice uniformly around the periphery of the aperture,

said closure means comprises an iris-type structure,

said actuating means comprises means responsive to a change in pressure within said smokestack, said pressure-responsive actuating means comprises:

driving means operable in a first direction to close said closure means and operable in a second direction to open said closure:

controller means, responsive to a sensed pressure which is below a predetermined pressure setting, for operating said driving means in said first direction and, responsive to a sensed pressure which is above said predetermined pressure setting, for operating said driving means in said second direction;

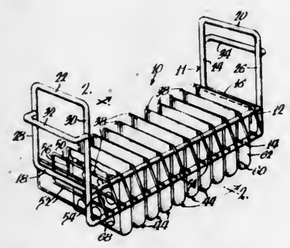
and means for communicating to said control means the pressure with said smokestack.

4,232,596

LOW HEAT CAPACITY FRY BASKET ASSEMBLY

Steve Kroll, Schaumburg, and James C. Schindler, Naperville, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Nov. 29, 1978, Ser. No. 964,789
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—410 **9 Claims**



1. A low heat capacity fry basket assembly for holding a plurality of comestible articles in a spaced apart relationship when immersed in a bath of cooking liquid, said assembly comprising:

a rigid frame having spaced-apart transverse support members;

a non-metallic, flexible sheet forming pouches hanging from said support members for receiving and holding said comestible articles, each said pouch having at least a pair of opposed sidewalls and a bottom portion together defining said pouch with open ends and an open top, said sidewalls having a plurality of apertures therein to admit said cooking liquid into said pouch; and

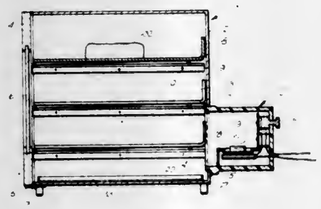
means maintaining the opposed side walls of at least two adjacent pouches in closely spaced relationship.

4,232,597

APPARATUS FOR SMOKING FOODS AND SMOKE PRODUCING MATERIAL THEREFOR

Paul M. Perrine, P.O. Box 270, Aurora, Ind. 47001, and James A. Cassera, P.O. Box 290, Prescott, Ariz. 86302

Filed May 11, 1978, Ser. No. 904,881
Int. Cl.³ A23B *4/04*
U.S. Cl. 99—468 **12 Claims**



1. A smoker for quickly imparting a smoked flavor to comistibles and the like comprising:

(a) a receptacle including means for introducing the comistible into the interior of the smoker and an opening in said receptacle for attaching a smoker unit thereto;

(b) means within said receptacle for supporting the comistible;

(c) a pan-like support positioned within said smoker for holding a small quantity of smoke producing material, said support means being positioned in non-overlying relationship with said pan-like support to prevent any part of the comistible, including fluids discharged therefrom, from contacting said pan-like support;

(d) means adjacent said pan-like support for heating the smoke producing material to a temperature sufficient to produce a desired quantity of smoke, but resulting in a relatively small temperature rise within said receptacle; and

(e) a smoker unit comprising an enclosure having an opening therein and means for removably attaching said smoker unit to the exterior of said receptacle with said smoker unit opening coextensive with said receptacle opening such that the interior of said enclosure communicates with the interior of said receptacle, said pan-like support and said heating means being located within said enclosure, and attaching means comprising a first outwardly directed flange-like lip extending partly around the periphery of said smoker unit opening and the secondly outwardly directed flange-like lip extending around the remaining periphery of said smoker unit opening, the surface of said first lip facing away in the opposite direction to said smoker unit opening and being adapted to abut the interior wall of said receptacle adjacent said receptacle opening, said second lip facing in the same direction as said smoker unit opening and being adapted to abut the exterior wall of said receptacle adjacent said receptacle opening, said enclosure being attachable to said receptacle by inserting said first lip within said receptacle opening such that a portion of said wall abutting surface of said first lip abuts said interior wall and pivoting said enclosure to move said second lip towards said receptacle opening, the weight of said smoker unit pivoting about said interior wall holding and substantially sealing said wall abutting surface of said second lip against said exterior wall adjacent said receptacle opening,

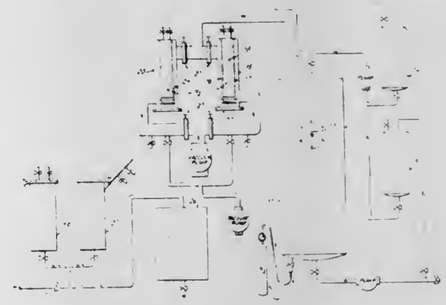
said smoker being substantially airtight to prevent escape of smoke therefrom for rapidly imparting the smoked flavor to the comistible.

4,232,598

APPARATUS FOR THE DEAROMATIZATION OF COFFEE OIL

Gerald S. Hurlow, Toronto; Jean R. Blain, Montreal; Michael Coombes, Pointe Claire; Jean-Claude Richard, Chateauquay, and Patrick W. Hitchinson, Dorval, all of Canada, assignors to General Foods Limited, Toronto, Canada

Division of Ser. No. 757,167, Jan. 6, 1977, Pat. No. 4,101,681.
This application May 1, 1978, Ser. No. 901,383
Int. Cl.³ A23F *5/50*; B01D *3/10, 7/02*
U.S. Cl. 99—483 **11 Claims**



1. A condenser which comprises:

a heat-conductive sleeve removably and snugly surrounding a heat-conductive container, the container having a coolant therein, and

a condensing chamber enclosing said heat-conductive sleeve, said condensing chamber having ports for the passage of a gas stream within the space between the sleeve and the condensing chamber, and said condensing chamber having a removable cover which seals an opening through which the sleeve is passed when removed from the container.

3. An apparatus for the separation and recovery of gas stream constituents comprising:

a distillation chamber wherein a coffee oil is subject to distillation at sub-atmospheric pressures and mild temperatures to obtain a gas stream of aroma constituents therefrom; and

the condenser of claim 1, the aroma constituents being condensed onto the outer surface of the heat-conductive sleeve of the condenser.

4,232,599

WASTE PAPER COMPACTER WITH FRONT ACCESS FEATURES

James A. Ulrich, Springdale, Ark., assignor to J. V. Manufacturing & Welding, Inc., Springdale, Ark.

Filed Oct. 19, 1978, Ser. No. 952,638
Int. Cl.³ B65B *13/06*; B30B *15/32*
U.S. Cl. 100—25 **14 Claims**

1. In a compactor apparatus comprising a cage with a door and a compacting ram for forming bales of waste material, the improvement of a bale ejector comprising,

a tiltable floor element in the bottom of said cage pivotable about an axis near the vertical plane of said door and parallel thereto,

a vertical link engaging the rear of said floor element with its

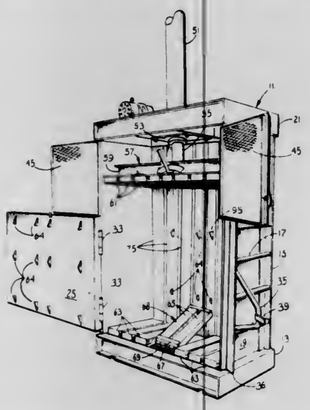
bottom and extending upwardly to a height at least slightly greater than the bale height,

said link having a hook on the upper portion thereof,

a latch member connected to move with said compacting ram and adapted to engage the hook of said link when the compacting ram is moved from its lower position to its upper position,

said latch member being movable between an operative position and an inoperative position at which it does not engage the hook of said link,

said latch member including a shaft extending along the top center of said ram from the door side thereof to the opposite side thereof, a handle on the door end of said shaft and an arm on the opposite end of said shaft, said arm being



positioned to be movable into and out of an engagement position with the hook of said link, and

a toggle element fixed relative to said cage adapted to move said latch member to the inoperative position upon downward movement of said ram,

said toggle element being provided with a ramp shaped lower portion and an approximately horizontal upper portion and said shaft of said latch member being spring loaded away from said door and towards said toggle element and said toggle element being positioned to strike said arm causing it to rotate to an inoperative position when the motion of said arm is downward and causing it to slide over said ramp portion without rotation when said ram motion is upward.

4,232,600

PROCESS AND APPARATUS FOR TREATING MATTER COMPRISING A SOLID PHASE AND A LIQUID OR PASTY PHASE

Gwenole Le Jeune, Montreuil, France, assignor to Societe Civile Hydromer, Paris, France

Filed Nov. 28, 1977, Ser. No. 855,299

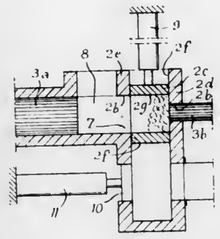
Claims priority, application France, Dec. 6, 1976, 73 36700; May 4, 1977, 77 13587

Int. Cl.[2] B30B *9/02, 9/06*

U.S. Cl. 100—37 **24 Claims**

1. An apparatus for carrying out a process for the treatment of matter comprising a solid phase and a liquid or pasty phase and of the type according to which said pasty phase is crushed and the resulting crushed matter is sifted under pressure, said apparatus comprising:

a pressure chamber defined by a wall, supply means for introducing the matter to be treated into the pressure chamber, means defining calibrated passages connecting the inside of the pressure chamber to at least one chamber for recovering the sifted matter, at least one sectioned crushing member, axially mobile and engaged in at least one bore located in said wall of said pressure chamber and which bore opens outwardly from said chamber, said crushing member being adapted to penetrate in the pressure chamber and having means for driving said member in axial translation in two directions said member having a cross section smaller than said pressure chamber with respect to any plane perpendicular to the axis of said crushing member, whereby penetration of said member in the pressure chamber containing the matter to be treated procures both a crushing and compression of said matter,



the withdrawal of the crushing member forming a recess in said mass of matter, compensation means distinct from said crushing member for reducing the volume of the pressure chamber in order to reabsorb the recess remaining in the mass of matter in the pressure chamber after each penetration and withdrawal of said crushing member and means for evacuating the dry residue remaining the pressure chamber after the sifted matter has been extracted.

4,232,601

SQUEEGEE ARRANGEMENT

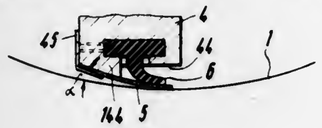
Mathias Mitter, Schloss Holte, Fed. Rep. of Germany, assignor to Mitter & Co., Schloss Holte, Fed. Rep. of Germany

Continuation of Ser. No. 817,106, Jul. 19, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,403

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632522

Int. Cl.[3] B41F *15/46, 15/42*

U.S. Cl. 101—120 **4 Claims**



1. In a screen printing machine having a printing screen which rotates in a predetermined direction and has an inner surface, a squeegee arrangement comprising a holder spaced from said inner surface and including a face directed towards the same and composed of a substantially horizontal face portion and an inclined face portion which slopes from the level of said horizontal face portion towards said inner surface in said predetermined direction; a squeegee blade of elastically deformable material having a center portion flanked by one longitudinal edge portion which lies on said inclined face portion, and another longitudinal edge portion a margin of which is in sliding engagement with said inner surface of the screen; means fixedly connecting said one longitudinal edge portion to said holder; a solid cross-section spring element of resiliently yieldable material extending along said squeegee blade and having a mounting part secured in said holder and a tongue part projecting outwardly from said horizontal face portion above said center portion of said squeegee blade and having a free edge region engaging said squeegee blade along and in direct contact with said other longitudinal edge portion,

said tongue part being resiliently stressed between said holder and said squeegee blade and deflected in direction away from said inner surface and generally in said predetermined direction towards said holder so that yielding of said squeegee blade in direction away from said inner surface of the screen is a function of the combined resistance offered to such yielding by the deflection of said squeegee blade and the deflection of said tongue part; and variable fluid-pressure means directly above said holder and operative for urging the same towards said inner surface with a variable pressure, so as to permit varying of the combined yielding resistance offered by said squeegee blade and tongue part.

4,232,602

PLATE LOADER FOR OFFSET PRINTING MACHINES

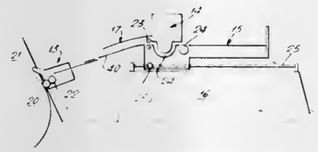
Thomas G. Selman, London, England, assignor to Gestetner Limited, London, England

Filed Jan. 4, 1978, Ser. No. 866,826

Claims priority, application United Kingdom, Jan. 7, 1977, 601/77; Sep. 9, 1977, 37810/77

Int. Cl.[3] B41L *11/08*

U.S. Cl. 101—132 **10 Claims**



1. In an offset printing machine including a plate cylinder, and a plate loader which plate loader comprises a plate support; a plate forwarding means for driving said plates from said support along a feed direction; means mounting said support on an offset printing machine; and a drive mechanism for said forwarding means; the improvement wherein said plate loader mounting means include pivot means defining an axis of pivoting of said plate loader with respect to said offset printing machine, said axis being parallel to said plate cylinder, and said drive mechanism includes means automatically engageable to transmit drive upon pivoting of said plate loader into an operative position and automatically disengageable to interrupt drive when said plate support is pivoted from its operative position.

10. In an offset printing machine including a frame; a plate cylinder; a plate loader having stop means to be engaged by the leading edge of a plate to be fed from said loader to said plate cylinder; applicator means for applying plate priming liquid to plates to be printed, said applicator means having a trough for a plate priming solution and a pair of rolls defining a nip through which the wet plate is drawn on its removal from the trough; and first guide means guiding a primed plate from said nip-defining rolls to said stop means; the improvement comprising second guide means slidably supporting said applicator means movably on said frame for movement towards and away from said plate loader, whereby the distance between said nip-defining rolls of the applicator means and said stop means for the leading edge of the plate in the plate loader can be adjusted to be equal to different values of plate length; and means for locking said applicator means in a desired position on said second guide means.

4,232,603

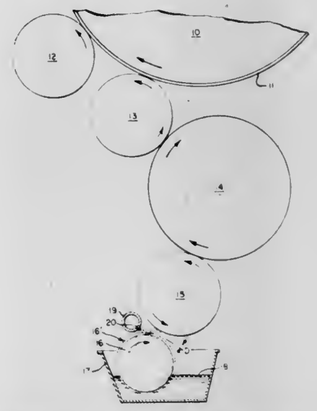
DAMPENING DEVICE FOR OFFSET PRINTING MACHINE

Fahrettin Suvak, New Hyde Park, N.Y., and Robert Snyder, Gilette, N.J., assignors to Wood Industries, Inc., Middlesex, N.J.

Continuation of Ser. No. 752,267, Dec. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 611,262, Sep. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 407,440, Oct. 18, 1973, abandoned. This application Feb. 16, 1979, Ser. No. 12,709

Int. Cl.[3] B41F *7/26, 7/30;* **B41L** *25/06*

U.S. Cl. 101—148 **9 Claims**



1. A dampening device for an offset lithographic printing machine of the type having a fluid fountain for containing a bath of dampening fluid, a pickup roll in said fountain adapted to extend into said bath, a plate cylinder carrying a printing plate, a rotatable fluid distribution means spaced from said pickup roll by a gap and disposed between said pickup roll and said printing cylinder and rotation means for rotating said pickup roll and said distribution means; the improvement comprising in that said pickup roll has a fluid retaining means thereon in the form of a fine wire mesh smooth cylindrical screen on the surface thereof with the wires of the screen comprising thread-like portions forming circumferentially evenly spaced openings where said openings are spaced uniformly radially outwardly from the peripheral surface of the pickup roll for picking up and retaining a thin film of fluid when said pickup roll is rotated in said bath, and in having gaseous blow means the center line of which is directed inwardly toward the peripheral surface of the pickup roll near said gap for breaking up said thin film into droplets and blowing said droplets onto the peripheral surface of the pickup roll where said droplets are atomized into smaller droplets and where said smaller droplets rebound from said surface to pass through said screen to be further atomized to form a fine mist and to move across said gap to the fluid distribution means.

4,232,604

RUBBER BLANKET CLEANING DEVICE

Franz Waizmann, Steppach, Fed. Rep. of Germany, assignor to Firma Baldwin-Gegenheimer GmbH, Augsburg, Fed. Rep. of Germany

Filed Jan. 15, 1979, Ser. No. 3,231

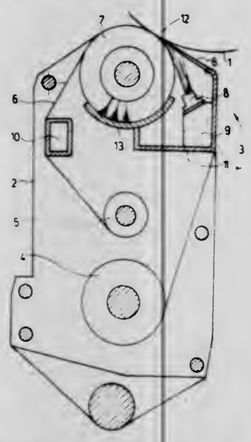
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804786

Int. Cl.[1] B41F *35/00*

U.S. Cl. 101—425 **4 Claims**

1. Rubber blanket cleaning device for offset printing machines, where a cleaning blanket is passed over a pressing roller and said blanket is brought into contact with the rubber

cylinder to be cleaned by means of said pressing roller, characterized by a pressing roller support (13) at the periphery of the pressing roller (7), whose outer contour can, in non-loaded state, pass by the roller-side surface of said pressing roller



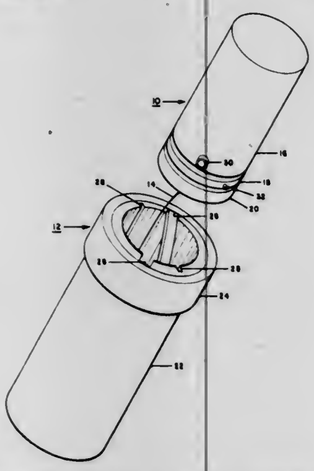
support (13) free from pressure and play, the pressing roller support (13) being positioned parallel to the axis of said pressing roller and approximately diametrically opposite to the arc region (12), coming into contact with the pressing roller, of rubber cylinder (1).

4,232,605

WARHEAD ORIENTATION DEVICE

Clair K. Lair, Upland, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Jul. 22, 1971, Ser. No. 168,507
Int. Cl.³ F42B 23/24
U.S. Cl. 102—8 **10 Claims**



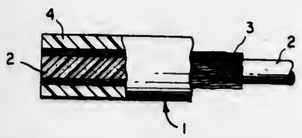
1. A directional warhead capable of ejection from a launch tube comprising;
- a generally cylindrical body containing an explosive charge in one end thereof;
- at least one first guide pin extending outwardly from the cylindrical wall of said body adapted to engage at least one first groove in a warhead launch tube;
- a base plate mounted adjacent said body at the end opposite said explosive charge in said body, said base plate provided with an upper face having at least one thrust bearing;
- a shaft attached to said base plate;
- a stable mass revolubly coupled to said shaft by means permitting free relative rotation between said body and said mass around the axis of said body, said stable mass located adjacent said base plate against the upper face and said at least one thrust bearing of which said mass is forced by acceleration forces during warhead ejection;
- at least one second guide pin extending outwardly from said mass adapted to engage at least one second groove in said warhead launch tube;
- an electrical power source contained within said body;
- arming switch means connected to said power source for arming said warhead, said arming switch means arming detonating means for detonating said explosive charge in said warhead when the warhead has reached a predetermined height above a launch tube after ejection therefrom; and
- position sensing means connected to said power source for sensing a direction in which to detonate said explosive charge in said ejected warhead.

4,232,606

EXPLOSIVE CONNECTING CORD

Malak E. Yunan, Boonton Township, Morris County, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 762,824, Jan. 26, 1977, abandoned. This application Oct. 17, 1977, Ser. No. 842,096
Int. Cl.³ F42B 3/10
U.S. Cl. 102—27 R **24 Claims**



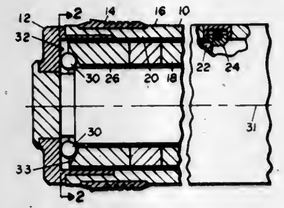
1. A low-energy detonating cord adapted for use as a trunkline and/or a downline cord in a non-electric blasting assembly and comprising
- (a) an axial continuous solid core of a deformable bonded detonating explosive composition comprising at least about 55 percent by weight of a cap-sensitive crystalline high explosive compound selected from the group consisting of organic polynitrates and polynitramines admixed with a binding agent, the particles of crystalline high explosive compound in said composition having their maximum dimension in the range of about from 0.1 to 50 microns, and the diameter and the explosive content of said core being such as to provide about from 0.1 to 2 grams of crystalline high explosive compound per meter of length of said cord;
- (b) surrounding said axial explosive core, protective sheathing consisting solely of one or more layers of plastic material, the plastic material being one which is capable of flowing at a temperature not exceeding the melting point of said crystalline high explosive compound by more than about 75° C.; and
- (c) core-reinforcement means outside said core adapted to provide said cord with a tensile strength of at least about 9 kilograms comprising at least one continuous strand of yarn running substantially parallel to said core's longitudinal axis.

4,232,607

CENTRIFUGAL BALL CAM LOCKING DEVICE

Willard R. Benson, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1978, Ser. No. 930,083
Int. Cl.³ F42B 11/22
U.S. Cl. 102—56 R **7 Claims**



1. A centrifugal cam locking apparatus for a spin stabilized projectile comprises:
- a cylindrically shaped housing having a longitudinal spin axis and a coaxial housing cavity;
- a stack of circularly shaped cargo members contiguously disposed in said housing cavity;
- stop means operatively disposed in said housing adapted to engage one end of said stack of cargo members for preventing longitudinal movement of said cargo members in a first longitudinal direction;
- base member means fixedly attached to said housing for restraining the other end of said stack of cargo members for moving in a second longitudinal direction;
- cam means, slidably disposed in said housing cavity having an inclined cam surface positioned at a critical angle θ with respect to a normal to said longitudinal spin axis, for restraining said stack of cargo members in fore and aft longitudinal movement by acting as a self-locking taper;
- spin responsive means which moves radially outward in response to projectile spin, operatively positioned in abutment with said inclined cam surface for exerting a longitudinal force against one end of said stack of cargo members in response to projectile spin and for providing a holding force for substantially eliminating looseness of said stack of cargo members within said housing cavity which causes eratic projectile flight, and, said critical angle of incline θ for said cam means and coefficient of friction "η" for said base member means and said spin responsive means are selected to provide cam back force which increases exponetially with increasing values of coefficient of friction and cam forward forces which decrease exponentially with increasing coefficient of friction.

4,232,608

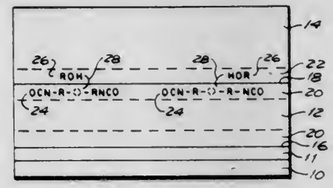
DIMER ISOCYANATE LINER COMPOSITIONS

John M. Wrightson, Carmichael, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Division of Ser. No. 292,196, Sep. 25, 1972, abandoned. This application Dec. 4, 1978, Ser. No. 965,775
Int. Cl.² F02K 9/04; C06B 45/10; F42B 1/00; B32B 27/40
U.S. Cl. 102—103 **26 Claims**

1. A method of improving the adherence of a layer of a first composition containing organic active hydrogen compounds to a surface comprising the steps of:
- applying to said surface a film of a composition comprising polyurethane forming components having dispersed therein a stable, solid polyisocyanate precursor additive in an amount in excess of the amount necessary to form the polyurethane and which is reactive after cure of the composition with said compounds;
- curing said composition to form a polyurethane film containing excess stable, solid polyisocyanate precursor additive;
- applying said layer to said film; and
- curing said layer and reacting said active hydrogen compounds with said excess additive to form bonds binding said film to said layer.

14. An assembly having improved bonding between layers comprising in combination:
- a first layer comprising polyurethane formed by cure of a first composition comprising polyurethane forming components in which is dispersed a stable, solid polyisocyanate precursor additive in excess of the amount necessary to form said polyurethane and which excess additive is reactive after cure of the composition with organic active hydrogen compounds; and
- a second layer adhered to said first layer, said second layer being formed by applying a second composition containing organic active hydrogen compounds to said first layer and curing said second composition, said active hydrogen compounds being reacted with said excess additive to form interfacial bonds between said layers.

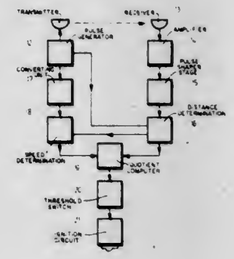


4,232,609

PROXIMITY FUSE

Manfred Held, Kühbach, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1974, Ser. No. 506,328
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1973, 2347374
Int. Cl.³ F42C 13/04
U.S. Cl. 102—214 **6 Claims**



1. A missile to be directed toward a target, comprising a warhead to release target destroying bodies into the path of the target, a proximity fuse coupled to the warhead and including transmitting-receiving means for transmitting electromagnetic waves toward a target and for receiving reflected electromagnetic waves from the target, said fuse including a circuit coupled to said transmitting-receiving means and responsive to said electromagnetic waves for producing an ignition signal to start the decomposition of the warhead when a distance is reached between the warhead and a target, said circuit having means for determining the time t_A which will elapse before the warhead encounters the target, said circuit having means for storing a constant reference time t_B so that when the warhead decomposes the bodies are released within a certain space
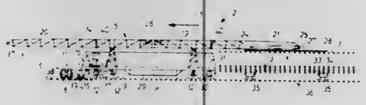
sector and cover a given space in front of the target within the reference time and for comparing the determined time t_A with the constant reference time t_B, said means for storing and comparing including a threshold device set to have a threshold corresponding to the time t_B, and means responsive to said means for storing and comparing for generating the ignition signal for starting the decomposition of the warhead on the strength of this comparison as soon as the determined time becomes shorter than the reference time.

4,232,610

MOBILE APPARATUS FOR LAYING RAILWAY TRACK

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 5, 1978, Ser. No. 912,299
Claims priority, application Austria, Jun. 16, 1977, 4282/77
Int. Cl.[3] E01B 29/02
U.S. Cl. 104—3 **5 Claims**



1. A mobile apparatus for laying railway track including rails fastened to ties defining cribs therebetween, which comprises

(a) a car mounted for mobility on the rails of the railway track in an operating direction, the car having a forward end,

(b) a carrier frame having

(1) a track and

(2) a power-driven trolley mounted on the carrier frame track, the trolley including a beam for carrying and laying an assembled section of the railway track including rails fastened to ties,

(c) a vertically and transversely adjustable flash butt welding device below the carrier frame and in the region of the forward end of the car for welding the rails of the assembled railway track section laid by the beam to the rails of the railway track whereon the car is mounted,

(d) means associated with the flash butt welding device for removing the welding bead resulting from the flash butt welding of the rails to each other,

(e) an overhang beam mounted on the forward end of the car and projecting forwardly therefrom,

(f) power drive means for moving the beam vertically, transversely and in the direction of the railway track,

(1) the flash butt welding device being mounted on the overhang beam for selective operation in the range of one of the rails of the railway track upon movement of the beam, and

(g) additional power drive means for positioning the welding bead removing means relative to the flash butt welding device and independently thereof,

(1) the welding bead removing means including a bead removing device associated with each of the rails.

4,232,611

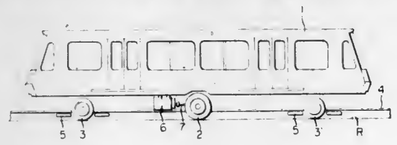
GUIDED VEHICLE FOR GUIDE-WAY TRANSPORTATION SYSTEM

Yukio Uozumi, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hygo, Japan

Filed May 19, 1977, Ser. No. 798,669
Claims priority, application Japan, May 21, 1976, 51-58672
Int. Cl.[2] B61B 13/04; B61F 9/00; B62D 11/00
U.S. Cl. 105—215 R **7 Claims**

1. A guide way vehicle adapted for running on guide way means having running surface means and guide rail means disposed on the running surface means, wherein the vehicle comprises a rigid unitary car body having three axle assemblies mounted respectively at the front, rear, and intermediate portions thereof, each axle assembly having wheels with rubber tires attached to the opposite ends thereof; the axle assemblies at the front and rear portions of the car body being pivotally mounted to swivel about a substantially vertical axis and respectively having guide wheels mounted for running along said guide rail means whereby the axle assemblies are steered along the guide rail means; the intermediate driving axle assembly being secured to the car body to prevent its swivel motion in a horizontal plane relative thereto and having oppositely and coaxially mounted drive axles with a rubber tire at the outer end of each axle; separate power means drivingly connected to said drive axles to drive them independently from each other; the tires on the intermediate driving axle assembly having a diameter greater than that of the tires on the front and rear axle assemblies; a cut-away configuration on the car body for partially accommodating the tire on the intermediate driving axle assembly to effectively lower the overall height of the vehicle.

7. A guide way vehicle adapted for running on a guide way



having a horizontal running surface and a central vertically extending guide rail, said vehicle comprising:

(a) a car body of rigid unitary construction having front, rear and intermediate axle assemblies, each assembly having wheels with attached rubber tires at the distal ends thereof to contact said horizontal running surface on opposite sides of said car body;

(b) the front and rear axle assemblies being mounted to swivel in a horizontal plane relative to the car body, each assembly having guide wheels mounted to contact said guide rail to steer the assembly along the guide rail;

(c) the intermediate axle assembly being secured to the car body to prevent its swivel motion in a horizontal plane, said intermediate assembly having driving power means coupled thereto for rotating the tires thereof independently of each other to propel the vehicle along the guide way; and

(d) said car body having a cut-away configuration over the central driving axle for partially accommodating the tires thereof.

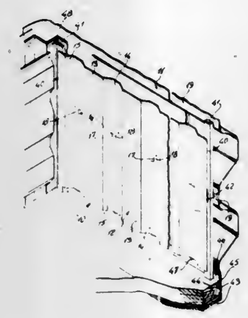
4,232,612

WALL LINING WITH ATTACHMENT MEANS

Robert B. Winsor, Beaconsfield, Canada, assignor to IEC-Holden Ltd., Montreal, Canada

Filed Feb. 22, 1978, Ser. No. 880,126
Int. Cl.[3] B61D 17/18
U.S. Cl. 105—423 **9 Claims**

1. A wall lining sheet comprising a rigid sheet having a plurality of spaced-apart bendable attachment tabs disposed in the plane of said sheet and each defined by a configured slot extending through said sheet, said sheet being free of support adjacent said tabs and each said tabs having a bendable free end portion and transverse opposed side edges free of said sheet whereby said bendable free end portion may be displaced outwardly from the plane of said sheet without deforming said sheet for securement of said sheet to a backing structure having an irregular outer plane, said securement being effected by a weld formed between said tabs and said outer plane through an



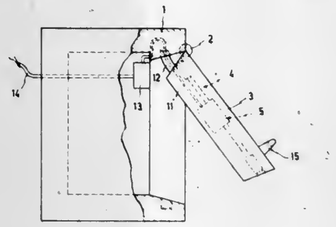
opening formed by said configured slot after deformation of said tabs to an adjacent portion of said irregular plane.

4,232,613

ARMOR PLATED SAFE

Alfons Kempf, Nikolsburger Strasse, D-8950 Kaufbeuren, Fed. Rep. of Germany, assignor to Adolf Frentrup, Kleve-Bedburg and Alfons Kempf, Kaufbeuren, both of, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 9,836
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805668
Int. Cl.[3] E05G 1/04, 1/10
U.S. Cl. 109—40 **10 Claims**



1. A safe comprising an armor plated housing, a hinged armor plate door for closing said housing, a locking mechanism arranged within said door and electric driving means for operating the locking mechanism, said driving means being arranged within said door, a program controlled time switch arrangement within said housing, an adjustment device for programming said time switch; said program controlled time switch and said adjustment device being not accessible from outside of the safe, an electric connection between said time switch and said driving means and a power supply electrically connected with said time switch and said driving means.

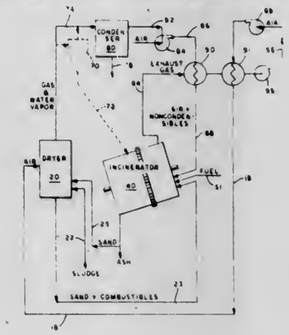
4,232,614

PROCESS OF INCINERATION WITH PREDRYING OF MOIST FEED USING HOT INERT PARTICULATES

Elliot B. Fitch, Auburn, Ala., and Orris E. Albertson, Salt Lake City, Utah, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 856,379, Dec. 1, 1977, Pat. No. 4,159,682. This application Jun. 6, 1979, Ser. No. 46,392
Int. Cl.[3] F23G 5/04
U.S. Cl. 110—235 **4 Claims**

1. A process for combustion of moist combustible feed wherein said moist feed is first dried and then introduced into a combustion zone containing inert, particulate material comprising, withdrawing a quantity of hot, inert, particulate material from said combustion zone, intimately contacting said moist feed with said hot particulate material in a drying zone to evaporate the water in the feed at a relatively low temperature, removing water vapor and non-condensible gas from said drying zone in a gas stream, removing the dried solids from



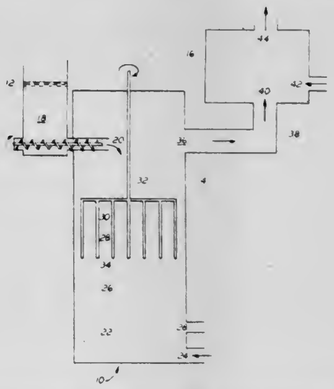
said drying zone and charging said dried solids into said combustion zone for combustion, treating said gas stream to remove and dispose of the water vapor therein, forwarding the balance of the gas stream to the combustion zone for deodorizing by heating to elevated temperature and exhausting the gases from said combustion zone to the atmosphere with or without further treatment.

4,232,615

COAL BURNING METHOD TO REDUCE PARTICULATE AND SULFUR EMISSIONS

Melvin H. Brown, Freeport, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 11, 1979, Ser. No. 47,004
Int. Cl.[3] F23K 1/02; F23N 3/00
U.S. Cl. 110—342 **13 Claims**



1. A method for burning a pulverized carbonaceous material containing sulfur and ash, comprising forming a slurry containing the carbonaceous material, water and a reagent adapted to react with the sulfur, burning the slurry in a first stage with less than 100% theoretical air, removing the combustible gases from the first stage to a second stage, and burning the gases in the second stage with additional air.

4,232,616

DEVICE FOR SELECTIVELY APPLYING LIQUID MANURE ONTO OR INTO THE GROUND

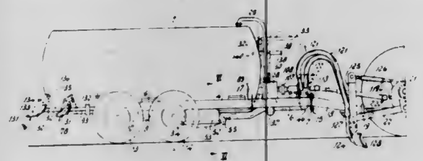
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 752,864, Dec. 21, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,481

Claims priority, application Netherlands, Dec. 22, 1975, 7514909

Int. Cl.³ A01C *23/00*; F04D *1/04*

U.S. Cl. 111—7 **84 Claims**



1. An implement for spreading liquid and semi-liquid materials comprising a tank for such materials supported on frame means, said frame means connected to a prime mover, said tank being in communication with material delivery means, said delivery means comprising at least one outlet port and means comprising at least one flexible delivery hose at each opposite side of said tank and driven means in communication with the interior of said tank to deliver material to each said hose, a corresponding pipe extending from the front to the rear of said tank with respect to the normal direction of forward travel of the implement, the rear ends of said pipes having outlet ports with spreading members including means for spreading material outwardly and rearwardly relative to said tank, a soil cultivator being positioned in front of said tank and interconnected to said prime mover, said cultivator having material injectors that extend into the ground, said hoses being alternatively connectable to said injectors and to said pipes, whereby material is adapted to be delivered into and onto the ground respectively.

4,232,617

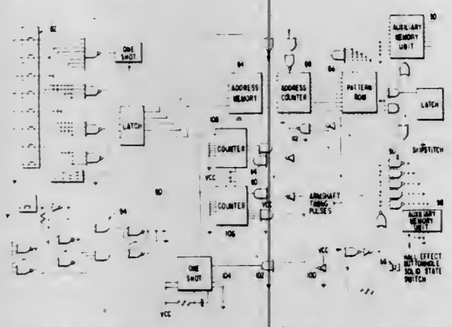
ONE-STEP BUTTONHOLER WITH HALL EFFECT SENSOR

Stephen A. Garron, Elizabeth, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,503

Int. Cl.³ D05B *3/06, 3/02*

U.S. Cl. 112—158 B **4 Claims**



1. In a zigzag sewing machine having stitch forming instrumentalitites including a reversible incremental feed mechanism and a reciprocatory needle bar arranged for lateral jogging motion, electro-magnetic actuation means for controlling various of the stitch forming instrumentalities and electronic logic circuitry for the activation of said actuation means and for the storing of various stitch patterns inclusive of a buttonhole pattern, means for determining the size of a buttonhole being sewn comprising:

a downwardly biased presser bar;

a buttonhole gauging presser foot pivotally mounted to the end of said presser bar, said presser foot including a shoe shiftably mounted thereto for movement in the direction of material feed; and

magnetic indicating means cooperating with said presser foot for indicating to said electronic logic circuitry the size of the desired buttonhole.

4,232,618

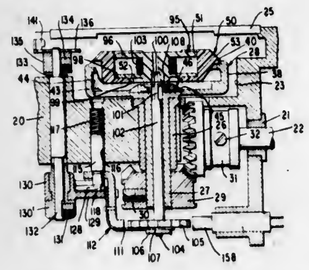
BOBBIN WINDER ARRANGEMENT FOR SEWING MACHINE LOOPTAKER

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 16, 1979, Ser. No. 58,232

Int. Cl.³ D05B *57/08, 59/00*

U.S. Cl. 112—184 **3 Claims**



1. In a lockstitch forming sewing machine having a looptaker comprising a circularly moving looptaker body formed with an annular raceway for accommodating a bobbin case constrained against motion with said looptaker, a bobbin winding mechanism for winding thereon the bobbin from the needle comprising a slip clutch carried by the looptaker body and means for rotating the bobbin for winding needle thread thereon comprising an elevatable spindle passable through said slip clutch and engageable with the bobbin for rotating the bobbin for rotation with said looptaker body while said slip clutch enables cessation of bobbin rotation when the bobbin is full and bobbin thread winding is no longer required.

4,232,619

LIFTING LOOP

Bengt E. Lindahl, Gothenburg, Sweden, assignor to Svensk Lasthantering, Bengt Lindahl AB, Torslanda, Sweden

Filed Apr. 25, 1978, Ser. No. 899,734

Int. Cl.³ D05B *93/00*

U.S. Cl. 112—417 **2 Claims**

1. An improved flexible lifting loop of sufficient length to encircle and support a large lifting load comprising a core of parallel threads, a protecting covering enclosing said core and retained about said core by a seam extending in the longitudinal direction of the loop, the improvement comprising said seam being a side seam, said threads and said covering having sufficient flexibility to conform to the shape of a lifting hook or the like and the engaged portion of the lifted load, said seam

when stitching together said protecting covering making said covering enclose said core snugly and retain said threads in



their parallel relationship when said loop is engaged with a load.

4,232,620

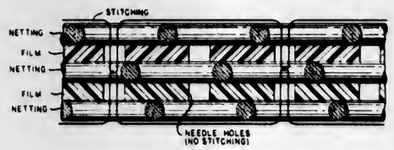
THERMAL INSULATING MATERIAL

Milton Kurz, Pond Crossing, Lawrence, N.Y. 11559

Filed Oct. 16, 1978, Ser. No. 951,371

Int. Cl.³ B32B *3/10, 7/08*

U.S. Cl. 112—420 **1 Claim**



1. A thermal insulating material comprising at least two sheets of polymeric film, a mesh sandwiched between each adjacent pair of film sheets, an outer mesh on each outside face of the film-mesh sandwich, rows of stitching joining the outer meshes and film-mesh sandwich and needle perforations through the film sheets to make the material vapor permeable including both perforations made by the needles which stitch the outer meshes and film-mesh sandwich together which are of a size of from about four to about seven diameters of the stitching thread and additional perforations made by non-threaded needles.

4,232,621

METAL-WORKING HAND TOOL

John H. Keeton, P.O. Box 278, Campbellsville, Ky. 42718

Filed Feb. 6, 1978, Ser. No. 875,544

Int. Cl.² B21D *19/00*

U.S. Cl. 113—54 R **10 Claims**

1. A metal-working hand tool for folding over sheet metal flanges, comprising

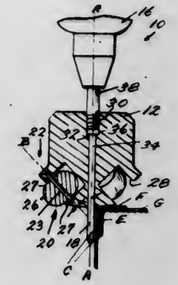
a body adapted to rotate about a first axis of rotation,

means for attaching said body to a power source for rotating said body about the first axis of rotation,

a guide component extending outwardly from one end of said body generally along the first axis of rotation,

a plurality of hardened metal roller means, and

means for mounting said roller means to said body for free rotation about second axes, fixed with respect to said body, so that said roller means will impact upon and roll with respect to a sheet metal flange or the like,



said roller means mounting means comprising a shaft for each roller means disposed so that each said second axis makes a positive angle between 0° and 90° with respect to said first axis of rotation.

4,232,622

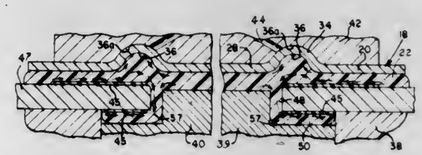
METHOD OF MAKING A CONTAINER CLOSURE

Robert J. Weierman, Lockport; Joseph J. Merle, Oak Lawn; Gerald A. Gordon, Skokie; Peter N. Y. Pan, Country Club Hills, and Rafael J. Hernandez, Chicago, all of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 950,483, Oct. 11, 1978, Pat. No. 4,170,314. This application Jan. 23, 1979, Ser. No. 5,755

Int. Cl.³ B21D *51/46*

U.S. Cl. 113—121 C **7 Claims**



1. A method of forming a closure on a container wall having an external side and having a pour opening comprising:

applying a peelable adhesive to the external side of said wall about the opening,

placing a tape having a thermoplastic portion against the adhesive in covering relation to the opening,

heating either the tape or wall or both before, during or after application of the tape to the wall to plasticize the thermoplastic portion of the tape, and

pressing the wall and tape together to squeeze excess plasticized thermoplastic material from therebetween, by a tool having a rib-forming groove and directing the excess material into a confined area defined by the groove circumscribing the opening to form a reinforcing rib projecting outwardly from said external side, into which said excess thermoplastic material is caused to flow and thereby sealing the tape to the wall.

4,232,623

APPARATUS TO REDUCE VESSEL MOTIONS

Frank S. F. Chou; David P. Tuturea, and Graham J. Blight, all of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

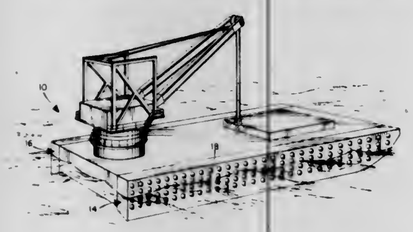
Filed Nov. 25, 1977, Ser. No. 854,652

Int. Cl.¹ B63B *39/03*

U.S. Cl. 114—125 **14 Claims**

1. Apparatus for reducing the relative motions of a floating vessel comprising

at least a pair of open tanks, one tank on the starboard side of said vessel and one tank on the port side of said vessel,
each tank having a portion which extends above a means water line of the vessel and a portion which extends below the means water line of said vessel,
each tank extending at least a portion of the longitudinal length of said vessel,
each tank having
a bottom plate extending substantially laterally outward from the bottom of the vessel for substantially the entire length of the tank,
a deck portion extending laterally outward from the deck of said vessel for substantially the entire length of the tank, having substantially the same width as said bottom plate, and having an upper surface substantially flush with the deck surface;
a first plurality of transversely extending, substantially vertically aligned perforate plates, each transverse plate structurally connected between said vessel, said bottom



plate, and said deck portion, and said transverse plates being spaced apart along the length of said tank,
a perforate, longitudinally extending, vertically oriented plate extending substantially the length of the tank, said longitudinally extending plate being adjacent to said transverse plates and secured between said bottom plate and said deck portion,
a second plurality of transversely extending, substantially vertically aligned, outwardly directed perforate plates, each second plate structurally connected between said longitudinally extending plate, said bottom plate, and said deck portion, and said plates being spaced apart along the length of said tank, and
a second perforate, longitudinally extending vertically oriented plate extending substantially the length of the tank and connected between outward edge portions of said bottom plate and said deck portion,
whereby an array of longitudinally and laterally spaced, wave energy dissipating cells are formed, each cell having at least two perforate side walls.

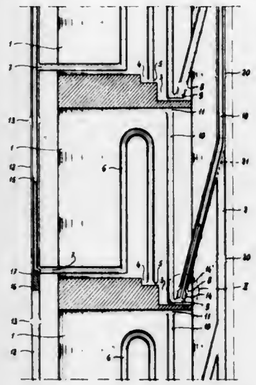
4,232,624

RESERVOIR STRUCTURE

Johannes Wipkink, Sassenheim, Netherlands, assignor to Ingenieursbureau Marcon (Marine Consultants) B.V., Leiden, Netherlands

Filed May 25, 1978, Ser. No. 909,430
Claims priority, application Netherlands, May 26, 1977, 7705823
Int. Cl.[1] B65D *88/54*
U.S. Cl. 114—257 **9 Claims**

1. A fluid storage structure having a reservoir for containing a liquid, including means for introducing a pressurized gas into the reservoir to drive liquid from the reservoir, characterized by: the means for introducing gas into the reservoir including a gas supply duct having two openings, one near the bottom of the reservoir and one near the top, and selectively displaceable switching means for controlling the flow of gas through the openings of the supply duct, said switching means having a



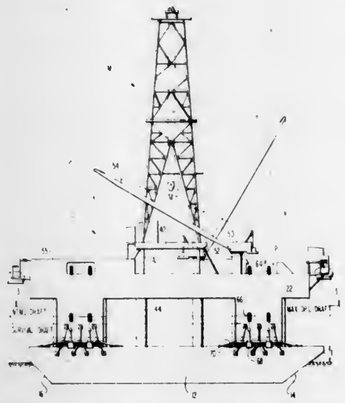
first position in which both openings are open and a second position in which only the top opening is open.

4,232,625

COLUMN STABILIZED SEMISUBMERGED DRILLING VESSEL

Yoram Goren, Los Angeles, and Charles Springett, Irvine, both of Calif., assignors to Sante Fe International Corporation, Orange, Calif.

Continuation of Ser. No. 868,485, Jan. 11, 1978, abandoned, which is a continuation of Ser. No. 699,789, Jun. 25, 1976, abandoned, which is a continuation of Ser. No. 596,256, Jul. 16, 1975, abandoned. This application Mar. 7, 1979, Ser. No. 18,253
Int. Cl.[3] B63B *35/44*
U.S. Cl. 114—264 **14 Claims**



1. A column stabilized semisubmersible vessel consisting of a pair of elongated hulls disposed in substantiallyparallel spaced side-by-side relation with each of said hulls spaced from and lying on an opposite side of the longitudinal centerline of said vessel, said vessel further comprising:
a working platform spaced above said hulls a predetermined height;
means for supporting said platform in fixed spaced relation above said hulls, including four stabilizing columns connecting said hulls with said platform;
the ratio of the length of said vessel along its longitudinal centerline to the width of said vessel along its transverse centerline being greater than 1.0;

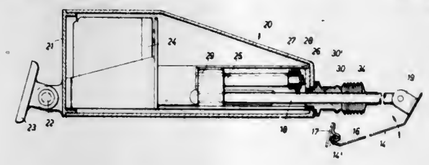
one pair only of said stabilizing columns being connected with each of said hulls on opposite sides of the vessel roll axis, with one column of each said pair being located near respective opposite ends of each hull on opposite sides of the pitch axis of the vessel;
means for ballasting said vessel including ballast compartments in said hulls, to alter the vessel's draft between a low draft hull-supported floating condition with the hulls having freeboard and a high draft semisubmerged column stabilized floating and operating condition with mean water-line located intermediate the height of said columns;
said columns being of cross-sectional areas and location so as to provide a ratio of righting moment about the vessel's transverse pitch axis to righting moment about the vessel's longitudinal roll axis within a range of 1.0 to 1.3 when said vessel is in high draft semisubmerged operating condition;
each of said hulls for at least substantially the major portion of its length being of substantially oblong cross-section and having top and bottom substantially parallel substantially planar surfaces, with breadth of each hull cross-section in direction of the vessel's transverse axis being greater than vertical height of each hull section;
the width of the vessel at the hulls in relation to the transverse spacing between the hulls being within a range of 1.5:1 to 2:1;
a plurality of longitudinally spaced structural means reinforcing the structural relationship of the hulls, platform and columns; and
said vessel comprising means including said columns of predetermined cross-sectional area, said transverse spacing of the hulls one from the other, vessel displacement, and geometry of the submerged portions of the vessel in high draft column stabilized semisubmerged operating condition being such as to provide a vessel heave response curve having a "low wave period section", a "first hump", and a "third section" with an "RAO" in relation to wave period "T" according to the following mathematical relationships:
(i) the RAO value of the curve's "first hump" is not greater than 0.6 for values of T between about 10 to 14 seconds;
(ii) the "third section" of the curve has a natural period value of between about 16 to 18 seconds.

4,232,626

DEVICE FOR CONTROLLING THE ORIENTATION OF A BOAT IN WATER

Klaus Kern, Ennepetal, Fed. Rep. of Germany, assignor to Firma K & S Baubeschlage Hugo Kruger KG, Gevelsberg, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,623
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743154
Int. Cl.[3] B63B *1/22*
U.S. Cl. 114—285 **8 Claims**



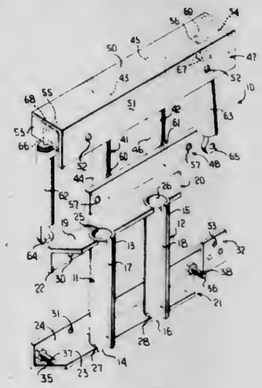
8. For use on a boat, a trimming flap moving means comprising a watertight housing, a remotely controllable low voltage drive motor fixed to said housing on the inside thereof, a drive screw rotatably mounted in said housing and operatively connected to the motor a nut non-rotatably mounted on said drive screw for movement longitudinally of said screw on rotation thereof, and an adjusting rod extending parallel to said screw in a watertight manner through a wall of said housing and having the end thereof within said housing connected to said nut.

4,232,627

BRACKET FOR ELEVATING AND LOWERING AN OUTBOARD MOTOR

Ronnie D. Glenn, and Claude V. Myers, both of Eldorado, Ark., assignors to G & M Enterprises, Inc., El Dorado, Ark.

Filed Mar. 2, 1979, Ser. No. 17,058
Int. Cl.[3] B63H *5/12*
U.S. Cl. 440—61 **10 Claims**



1. A bracket for elevating and lowering an outboard motor relative to the transom of an associated boat comprising a first pair of generally elongated tubular elements disposed with their axes in generally parallel relationship, an elongated slot in each of said tubular elements likewise disposed in generally parallel relationship, a first pair of spaced generally parallel transom mounting members secured at axially opposite end portions of said tubular elements, means for facilitating the securing of said mounting members to a boat transom, a second pair of elongated elements disposed with their axes in generally parallel relationship, said second pair of elongated elements being disposed in internal telescopic sliding relationship relative to said first pair of tubular elements, a second pair of spaced generally parallel motor mounting members secured at axially opposite end portions of said second pair of elements, means for facilitating the securing of said second pair of mounting members to an outboard motor, power means between said first and second pair of mounting members for imparting relative telescopic motion between said first and second pair of elements, and means between at least one of said second pair of elements and the slot associated therewith for guiding the relative sliding movement of said first and second pair of elements.

4,232,628

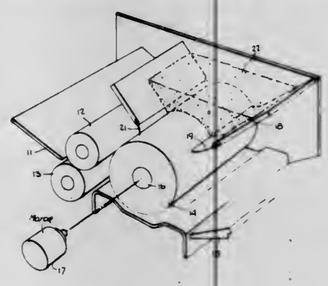
TONER APPLICATOR FOR ELECTROSTATIC COPIER

Loren E. Shelffo, South Orange, N.J., assignor to Eskofot Research A/S, Copenhagen, Denmark

Continuation of Ser. No. 595,896, Jul. 15, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,662
Int. Cl.[3] G03G *15/08*
U.S. Cl. 118—653 **5 Claims**

1. An applicator adapted to deposit triboelectrically-charged toner particles on an electrostatically charged latent image formed on a photo-conductive insulating moving medium in a xerographic system, said applicator comprising:
A. a rotatable roll formed of conductive elastomeric material and mounted on electrically-insulated bearings so that a bias may be applied thereto;
B. a trough for retaining a supply of non-magnetic toner

particles, said trough being defined by two spaced plates associated with the surface of the roll, one plate having a deflectable blade extending therefrom formed of dielectric material, the edge of the blade being pressed tangentically against the moving roll surface and being somewhat deflected thereby against the roll surface to form a tight nip therewith which only admits a thin layer of said particles drawn from the bottom of the trough, the particles admitted through said nip rubbing against said edge and being triboelectrically charged thereby, whereby the layer carried on the roll surface departing from the nip is constituted by charged toner particles which adhere to the roll, said toner particles having sizes lying within a relatively



narrow range to insure frictional engagement between substantially all of the particles in the thin layer thereof and said blade edge;

C. means bringing about engagement between the charged layer of toner particles on the roll surface and said moving medium at a position displaced from the nip to effect a transfer of particles to said latent image on said medium to produce a developed image thereon;

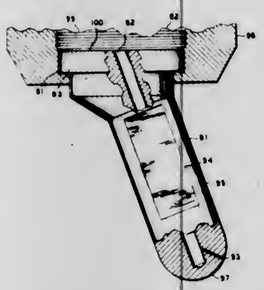
D. means to rotate said roll at a speed producing relative motion between the surface thereof and the medium to develop shear forces therebetween to enhance the deposition of charged toner particles on the latent image to produce an improved developed image.

4,232,629

DISPENSING NOZZLE

William R. Eddy, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 13, 1978, Ser. No. 924,427
Int. Cl.³ B05C 5/02, 7/02
U.S. Cl. 118—669 **16 Claims**



1. A nozzle for dispensing a ribbon of viscous liquid, said nozzle including:

a body having a first portion adapted for being secured to a source of liquid and a second portion extending from said first portion with said second portion having an exterior surface and a free end;

first means defining a first passage extending at least partially through said second portion; and

second means defining a second passage opening onto said second portion exterior surface, said second passage being in flow communication with the first passage, said second means including a pair of spaced apart generally parallel first surfaces partially defining the second passage with a width greater than the spacing between the pair of first surfaces, said second passage being generally rectangularly shaped in transverse section.

9. An apparatus for applying sealant to a seam in a container sidewall formed by overlapping portions of the sidewall, said apparatus including:

conveying means operable for moving a container to and away from a first sealing station;

first detecting means positioned adjacent to a portion of said conveying means and being operable for detecting the rotational position of a container sidewall;

first drive means positioned adjacent said first detecting means and being operable for selectively rotating a container to a predetermined rotational position; and

first sealant dispensing means positioned adjacent said conveying means at the first sealing station and being operable for dispensing sealant onto at least a portion of said seam, said first sealant dispensing means cooperating with means for providing relative movement between a portion of the first sealant dispensing means and the container, said first sealant dispensing means including a nozzle for dispensing a ribbon of viscous liquid said nozzle including

a body having a first portion adapted for being secured to a source of liquid and a second portion extending from said first portion with said second portion having an exterior surface and a free end;

first means defining a first passage extending at least partially through said second portion; and

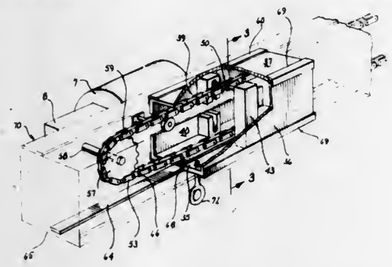
second means defining a second passage opening onto said second portion exterior surface, said second passage being in flow communication with the first passage, said second means including a pair of spaced apart generally parallel first surfaces partially defining the second passage with a width greater than the spacing between the pair of first surfaces said second passage being generally rectangularly shaped in transverse section.

4,232,630

ANIMAL EXERCISER

Gerald J. Orlowski, Scottsdale, Ariz., and Thomas E. Dugle, Cincinnati, Ohio, assignors to Fun-Tech Products Company, Phoenix, Ariz.

Filed Feb. 2, 1979, Ser. No. 9,375
Int. Cl.³ A01K 15/00
U.S. Cl. 119—29 **9 Claims**



1. Apparatus for exercising and training animals comprising:

(a) a carriage;

(b) means for attaching an animal to said carriage;

(c) transportation means for supporting and reciprocally moving said carriage along a substantially straight line of travel comprising:

(1) an endless belt having first and second courses travelling in opposite directions;

(2) means for moving said belt along the line of travel;

(3) means for moving and reversing the direction of travel of said carriage responsive to the movement of said belt comprising a connecting member having a first part engaging said carriage and a second part engaging an anchor point on said endless belt, said first part adapted to move from a first carriage engaging position to a second carriage engaging position responsive to the movement of said anchor point between said first and second courses; and

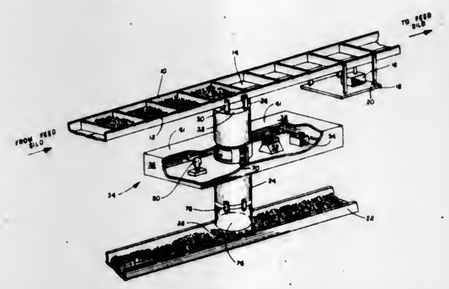
(d) means for supporting said transportation means and carriage.

4,232,631

FEEDER DEVICE

Edward F. Smith, Sr., R.R. #2, and Lloyd N. Treesh, P.O. Box 546, Avilla, both of Ind. 46710

Filed Jan. 5, 1978, Ser. No. 867,106
Int. Cl.³ A01K 5/02
U.S. Cl. 119—52 AF **8 Claims**



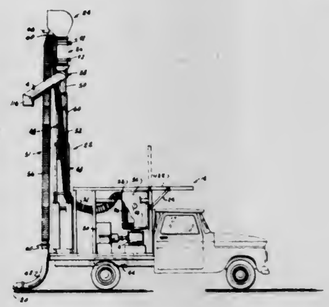
1. An apparatus for distributing measured amounts of particulate material comprising a conveyor, said conveyor having a material-moving mechanism and a discharge outlet, a material receptacle positioned below said conveyor discharge outlet, said material receptacle having a bottom, a conduit being mounted between said conveyor outlet and said receptacle bottom, said conduit having opposite open ends, one of said conduit ends being in communication with said conveyor outlet, the other of said conduit ends being in communication with said receptacle, said conveyor having means for driving said mechanism with an on condition in which said particulate material is caused to flow into said one conduit end and through said conduit and into said receptable, said other conduit end being spaced from said receptacle bottom a distance by which said particulate material flow first fills said receptacle to a desired level and then fills said conduit, a material monitor including a signal sender and a signal receiver, said signal sender and signal receiver being selectively mounted on opposite sides of said conduit at a predetermined height, said signal sender directing a signal toward said signal receiver and through said conduit and said particulate material flow when said driving means is in said on condition, said conduit being of a material which allows said signal to pass through said conduit, said signal being uninterrupted by said particulate material flowing through said conduit, whereby said signal sender and signal receiver are in signal communication, said signal being blocked when said conduit is filled with said particulate material above said predetermined height, said driving means having an off condition in which no particulate material is caused to flow into said one conduit end, said signal receiver being operatively connected to said driving means, said driving means being in said on condition when said signal sender and signal receiver are in signal communication, said driving means being in said off condition when said signal is blocked.

4,232,632

LIVE FOWL CONVEYING SYSTEM

Jack W. Kice, Wichita, Kans., assignor to K-B Engineering Co., Wichita, Kans.

Continuation of Ser. No. 645,527, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 70,011, Sep. 8, 1970, abandoned. This application Oct. 4, 1976, Ser. No. 729,380
Int. Cl.³ A01K 29/00
U.S. Cl. 119—82 **18 Claims**



1. A conveying system for the transport of live fowl comprising:

(a) a receiver chamber mounted on a frame, said receiver chamber including a housing having a fowl inlet and a fowl outlet for live fowl, a pressure differential outlet for air generally positioned laterally with respect to said fowl inlet for inhibiting additional forward progression of said live fowl from said fowl inlet, and a partition for cushioning and directing said live fowl towards said fowl outlet comprising a plurality of resilient cylindrical bumper members transversely attached within said housing to allow the passage of said air therebetween and to essentially enclose said fowl inlet and said fowl outlet and separate same from said pressure differential outlet while said air is being passed thereto;

(b) an airlock connected to said receiver outlet, said airlock comprising a housing including a fowl discharge outlet and at least two door members opening sequentially during conveyance of said live fowl through said airlock;

(c) a fowl conduit having an inlet for said live fowl and an outlet attached to said fowl inlet of said receiver chamber; and

(d) means connected to said receiver chamber for creating a pressure differential between said fowl conduit inlet and said receiver chamber in order to move said live fowl to said receiver chamber for discharge through said door members of said airlock.

10. A conveying system for the transport of live fowl comprising:

(a) a receiver chamber mounted on a frame, said receiver chamber including a housing having a fowl inlet and a fowl outlet for live fowl, means situated within said receiver chamber for cushioning and directing said live fowl towards said fowl outlet;

(b) an airlock connected to said receiver outlet, said airlock comprising a housing including a fowl discharge outlet and at least two door members opening sequentially during conveyance of said live fowl through said airlock;

(c) a fowl conduit having an inlet for said live fowl and an outlet attached to said fowl inlet of said receiver chamber;

(d) means connected to said receiver chamber for creating a pressure differential between said fowl conduit inlet and said receiver chamber in order to move said live fowl to said receiver chamber for discharge through said door members of said airlock; and

(e) means for discharging said live fowl from said airlock comprising a discharge conduit having an upper portion

and a lower portion, said upper portion including a structure defining a venturi, an upper swivel joint rotatably connected to said airlock, an auxiliary air inlet connected to said means for creating a pressure differential and situated between said venturi and said upper swivel joint, said lower portion including a structure defining a lower swivel joint connected to the lower end portion of said venturi, a flexible conduit member connected to said lower swivel joint, and a lengthwise adjustable discharge spout attached to said flexible conduit, said spout having an outer conduit member slidably mounted on an inner conduit member operable to change the length of said discharge spout.

4,232,633

PROCESS AND REACTOR FOR CONDUCTING EXOTHERMAL REACTIONS IN A CIRCULATING FLUIDIZED BED

Lars A. A. Chambert, Vikingavägen 16, S-230 50 Bjärred, Sweden

Filed May 3, 1978, Ser. No. 902,533
Claims priority, application Sweden, May 9, 1977, 7705352
Int. Cl.³ F22B 1/02
U.S. Cl. 122—4 D **13 Claims**



1. A reactor for conducting exothermal reactions such as combustion, said reactor having lower supply means for supplying relatively heavy phase and a further supply means for supplying relatively light fluidization phase, upper separarting means for separating said phases from one another, return passages for separated heavy phase to the bottom section of the reactor or a region immediately above said bottom section, outlets from the reactor for the relatively heavy and relatively light phases, and cooling surfaces in said reactor, wherein the supply means for said relatively light phase include outlet openings located in the reactor spaced from and facing the reactor side walls and said outlet openings are adjustable in the height direction of the reactor.

4,232,634

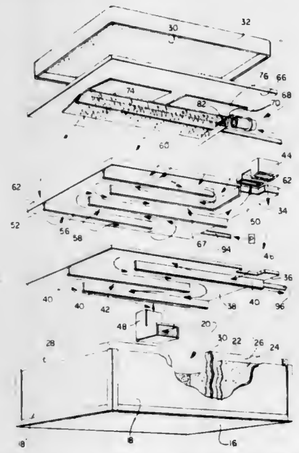
HIGH EFFICIENCY HOT WATER BOILER

George C. Terrell, Foxboro, and Andrew Konnerth, III, Swansea, both of Mass., assignors to Conservation Technologies, Inc., Bristol, R.I.

Filed Oct. 16, 1978, Ser. No. 952,549
Int. Cl.³ F22B 27/00
U.S. Cl. 122—41 **21 Claims**

1. A high efficiency heat exchange device comprising a housing, a first heat exchange manifold disposed within said housing and forming a lower floor of a combustion chamber disposed directly thereabove, a second heat exchange manifold disposed within said housing and positioned below said first manifold, said manifolds spaced apart from each other by baffles forming first labyrinth passages, said manifolds including conduit means, means causing a fluid working medium to flow through said conduit means so as to heat said medium, means for introducing and burning a hydrocarbon fuel in said combustion chamber and for directing the resultant flame downwardly towards said first heat exchange manifold, means for exhausting the combustion gases of said burning outside of said housing, means for introducing a pressure gradient from top to bottom in said housing whereby said combustion gases are downwardly directed over and under said manifolds prior to their exhaust from said housing.

18. A high efficiency method of heating a working fluid in a heat exchange device including a housing, a first heat exchange manifold disposed within said housing and forming the lower floor of a combustion chamber disposed directly thereabove,



said manifold including conduit means having a flame shield provided thereon and in direct contact therewith, comprising, introducing a hydrocarbon fuel and oxygen into said combustion chamber and igniting the same, directing the resultant flame downwardly against said conduit means with the hottest part of said flame generally directly impinging thereon so as to establish a high temperature gradient between said flame and said conduit means such that the working fluid rapidly absorbs heat from said flame, maintaining a pressure gradient in said housing so that the lower part thereof is at a lower pressure and thereby directing the combustion gas from said burning over said manifold and directing working fluid through said conduit so that heat from said flame is transferred through said conduit means to said working fluid.

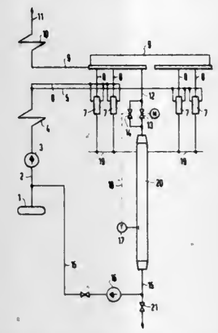
4,232,635

METHOD OF IMPROVING THE PERMISSIBLE LOAD-VARYING SPEED OF A ONCE-THROUGH STEAM GENERATOR AND DEVICE FOR PERFORMING THE METHOD

Georg Lösel, Uttenreuth, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,564
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758278
Int. Cl.³ F22D 7/00
U.S. Cl. 122—406 ST **3 Claims**

1. Method of improving the permissible load-varying speed of a once-through steam generator having a water separating vessel connected between a heating surface of the once-through steam generator and a heating surface of a superheater with a valve connected into a steam delivery line extending from the water separating device to the superheater heating surface, the valve being openable during start-up and shutdown of the once-through steam generator, which comprises closing the valve to such a limited extent, depending upon the temperature of the water separating vessel, that the temperature of the water separating vessel corresponds to boiling temperature of feedwater supplied to the once-through steam generator at a pressure at which a transition occurs with respect to pure once-through operation.

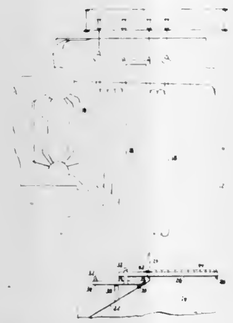


4,232,636

MAINTENANCE PLATFORM BUILT UPON RETRACTABLE SUPPORT BEAMS

George J. Prohazka, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 9, 1979, Ser. No. 28,036
Int. Cl.³ F22G 5/00
U.S. Cl. 122—479 R **7 Claims**



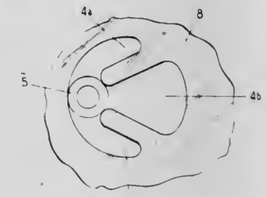
1. A vapor generating unit having waterwalls that enclose an upright combustion chamber, a nose projection in one of said waterwalls inclined to extend obliquely into said chamber to form a restriction between upper and lower parts thereof, a superheater in the upper part of the combustion chamber, an opening in said waterwall forming the nose projection, a platform adapted to traverse the opening and extend across the restricted portion of the combustion chamber, said platform including an elongate beam, and support means on the inclined waterwall adapted to support said beam for lateral movement through said opening from a position outside the combustion chamber to a position that bridges the restricted portion thereof.

4,232,637

SURFACES FOR COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE HAVING CONTROLLED FUEL INJECTION

Jacques Pichard, Meudon, France, assignor to Le Moteur Moderne, Boulogne Billancourt, France

Continuation of Ser. No. 815,023, Jul. 12, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,494
Claims priority, application France, Jul. 20, 1976, 76 22142; May 3, 1977, 77 13313
Int. Cl.³ F02B 3/00, 23/00
U.S. Cl. 123—263 **11 Claims**



1. In an internal combustion engine with controlled ignition, including at least a cylinder closed by a cylinder head, a piston reciprocating in the cylinder in a cycle between a top dead centre and a bottom dead centre, a main chamber and a prechamber forming a high turbulence combustion chamber, a fuel injector and a controlled ignition device, and means for controlling injection of the fuel so as to greatly increase the advance with the load on the engine, wherein the prechamber is formed in the cylinder head and the fuel injector and the controlled ignition device emerge into the prechamber, the improvement wherein the main chamber includes adjacent elementary chambers formed at least in the cylinder head, the lower face of the cylinder head extending between said elementary chambers and the upper face of the piston forming an impelling surface surrounding the prechamber, the inlets of the chamber and prechamber opening into the impelling surface without throttle between the prechamber, the elementary chambers, and the main chamber during the complete cycle of the piston, whereby due to the absence of throttle between the prechamber and the main chamber and between the prechamber and the elementary chambers, and the cooperation of the fuel controlled injection means, the combustion on low load is confined within the prechamber by a free circulation of air from the elementary chambers into the prechamber under the action of the piston arriving at top dead centre, and the combustion on high load spreads out freely from the prechamber into the elementary chambers as the piston goes down from top dead centre.

4,232,638

INTERNAL COMBUSTION ENGINE EQUIPPED WITH AN AUXILIARY COMBUSTION CHAMBER

Takeshi Takahashi, Susono, and Hiromichi Yanagihara, Gotenba, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

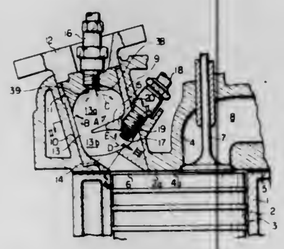
Filed Feb. 22, 1979, Ser. No. 14,163
Claims priority, application Japan, May 11, 1978, 53/54963
Int. Cl.³ F02B 19/10
U.S. Cl. 123—260 **12 Claims**

1. An internal combustion engine comprising:
a cylinder block having a cyliner bore therein;
a piston reciprocally movable in said cyliner bore;
a cyliner head fixed onto said cyliner block and forming therein an auxiliary chamber having an axis, said cyliner head and said piston defining a main chamber therebetween;
a raised portion formed on one side of an inner wall of said

auxiliary chamber and dividing said auxiliary chamber into a first auxiliary chamber and a second auxiliary chamber;

a connecting passage communicating sadi main chamber with said auxiliary chamber and tangentially connected to an inner wall of said second auxiliary chamber, which is located at a position opposite to said raised portion with respect to the axis of said auxiliary chamber;

a spark plug arranged in a recess formed beneath said raised portion in said second auxiliary chamber, and;



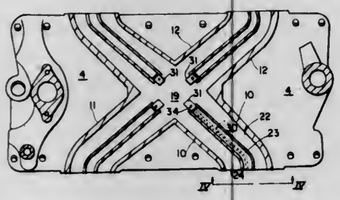
a fuel injector arranged in said first auxiliary chamber and having a first injection nozzle and a second injection nozzle, said first injection nozzle being directed to a tip of said raised portion and always injecting fuel independently of operating condition of the engine for forming a rich air-fuel mixture in said recess, said second injection nozzle injecting fuel when the load of the engine is increased beyond a predetermined level and being directed to the inner wall of said auxiliary chamber, which is located at a position opposite to said raised portion with respect to the axis of said auxiliary chamber.

4,232,639

ENGINE WITH ADDITIONAL SHARED FLOW CONTROL RUNNER FOR TWO CYLINDERS

Donald J. Shaffer, P.O. Box 88, Upper Strasburg, Pa. 17265

Filed Mar. 26, 1979, Ser. No. 24,049
Int. Cl.³ F02B 75/18
U.S. Cl. 123—52 MV **9 Claims**



1. A head for an internal combustion engine having an air intake manifold and engine block with plural cylinders, comprising:

a first surface for engagement with the corresponding surface of an engine block having in it the engine cylinders;

a plurality of intake ports opening through said first surface so as to be in communication with respective cylinders when said head is assembled on the block;

a plurality of exhaust ports extending through said first surface so as to be in communication respectively with the cylinders when said head is assembled on the block;

a valve seat in each of said intake ports and exhaust ports;

a plurality of intake and exhaust valves movable between opened and closed positions with respective ones of said intake and exhaust valve seats;

a second surface on said head for mating engagement with an intake manifold;

an intake opening in said second surface;

an intake passage extending from said intake opening to two adjacent intake valve seats that respectively lead to two adjacent intake ports that are respectively in communication with adjacent cylinders when said head is assembled on the block;

said intake passage having at least two partitions dividing said passage into at least three parallel non-communicating conduits having entrance ends at said intake opening of said second surface and exit ends at said two adjacent intake valve seats; and

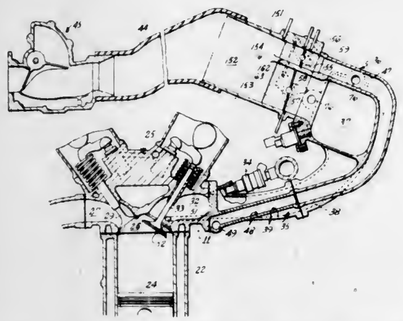
said passage and partitions being so constructed as to form means for conducting a working fluid from said one intake opening in said second surface through a first one of said conduits and a second one of said conduits to one intake valve seat when its associated valve is open exclusive of the third one of said conduits, and for conducting a working fluid through said one intake opening in said second surface through said second and third conduits to the other of said intake valve seats when its associated valve is open exclusive of said first conduit, so that two out of the three conduits may be used for each of the cylinders to provide a large flow passage with good flow characteristics provided by a partition at high engine speed.

4,232,640

INDUCTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hiromitsu Matsumoto, Hamamatsu, and Keiichi Sugiyama, Shizuoka, both of Japan, assignors to Yamaha Hatsukoko Kabushiki Kaisha, Iwata, Japan

Filed Nov. 13, 1978, Ser. No. 959,442
Claims priority, application Japan, Nov. 22, 1977, 52/140364
Int. Cl.³ F02B 17/00, 3/00
U.S. Cl. 123—308 **9 Claims**



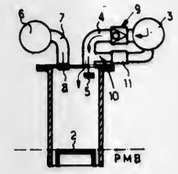
1. In an internal combustion engine having a variable volume chamber in which combustion occurs and a main intake passage communicating with said chamber through a main intake port for delivering a charge thereto, an auxiliary intake passage communicating with said chamber through an auxiliary intake port, said auxiliary intake passage having an effective cross-sectional area substantially less than the effective cross-sectional area of said main intake passage for causing a given mass flow of charge through said auxiliary intake port to enter said chamber at a significantly greater velocity, valve means including at least one valve for controlling the ratio of the communication of said ports with said chamber during a given cycle of operation of said engine, and positioning means including an operator controlled element for positioning said valve means in response to the load on the engine for causing substantially all of the idle and partial load charge requirements of the engine to be supplied by said auxiliary intake passage and substantially all of the high load charge requirements by said main intake passage, the improvement comprising said positioning means providing linear movement of the one valve in response to movement of the operator controlled element from idle to off idle operation and non-linear movement of said one valve in response to movement of the operator controlled element during the transition of flow from said auxiliary intake passage to said main intake passage.

4,232,641

METHOD AND DEVICE FOR IMPROVING THE EFFICIENCY OF INTERNAL COMBUSTION ENGINES

Remi Curtil, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France

Filed Mar. 2, 1978, Ser. No. 882,758
Claims priority, application France, Mar. 7, 1977, 77 06614; Feb. 14, 1978, 78 04140
Int. Cl.³ F02D 13/00; F02B 25/00
U.S. Cl. 123—76 **12 Claims**



1. A method for improving the efficiency of a four-stroke cycle internal combustion engine having an intake manifold, at least one cylinder, and for each cylinder a piston, an exhaust valve, an intake valve, and an intake passageway between the intake manifold and the intake valve, the method comprising for each engine cycle in each cylinder:

opening the intake valve before the piston reaches top dead center at the end of the exhaust stroke and shutting the exhaust valve after top dead center during the intake stroke to define a period when both valves are open simultaneously;

retarding the shutting of the intake valve until after the start of the compression stroke;

selectively blocking the intake passageway at a location spaced from the intake valve to permit one-way flow of gas from the intake manifold through the intake passageway past said location but to prevent, at least for light engine loads, reverse flow through the intake passageway past said location to the intake manifold, said blocking location being selected to create a reserve chamber of predetermined volume in the intake passageway between the intake valve and said location, a reserve of gas being compressed in said chamber while the intake valve is open during the compression stroke and then being expanded through the intake and exhaust valves during the next period of simultaneous opening thereof to provide improved scavenging of the cylinder at the start of each intake stroke; and

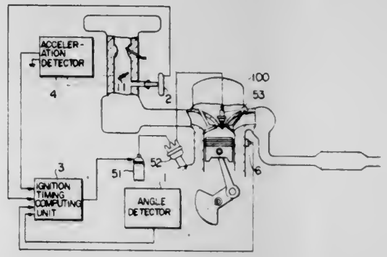
opening a path between the intake valve and the intake manifold at high engine loads for permitting the escape of at least part of said compressed gas reserve back into said manifold, thereby reducing the effective compression ratio at high load.

4,232,642

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroaki Yamaguchi, Anjo; Tadashi Hattori; Minoru Nishida, both of Okazaki; Kenji Goto, Susono; Daisaku Sawada, Susono, and Takashi Shigematu, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippon Soken, Inc., Nishio, both of, Japan

Filed Nov. 28, 1978, Ser. No. 964,153
Claims priority, application Japan, Dec. 9, 1977, 52-148524
Int. Cl.³ F02P 5/14
U.S. Cl. 123—416 **5 Claims**



1. An ignition timing control system for an internal combustion engine comprising:

first detecting means, responsive to an intake condition of said engine, for producing a first detection output indicative of the detected intake condition;

second detecting means, responsive to the rotation of said engine, for producing a second detection output indicative of the detected rotational speed;

third detecting means for producing a third detection output indicative of a rate of change in an operator induced demand for acceleration of said engine in excess of a predetermined rate of change in demand;

fourth detecting means, responsive to the temperature of said engine, for producing a fourth detection output indicative of the detected temperature;

fifth detecting means, responsive to an operating condition of said engine for producing a fifth detection output related to the acceleration of said engine between a first selected instant in time and a second selected instant in time;

first setting means, responsive to said first and second detection outputs, for producing a first setting output indicative of the first ignition advance corresponding to the detected intake condition and rotational speed;

second setting means for producing a second setting output in response to said third detection output, said second output being indicative of the second ignition advance which gradually changes from a reference value determined in dependence on said fourth and fifth detection outputs;

correcting means responsive to said first and second setting outputs, for correcting said first setting output in accordance with said second setting output and producing an output indicative of the corrected ignition advance, said output being equal to said first setting output when said second setting output is absent; and

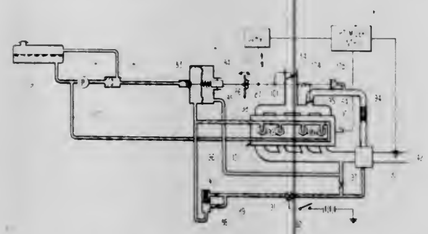
igniting means responsive to said output of said correcting means and effective to produce an ignition spark at said corrected ignition advance.

4,232,643

CHARGE FORMING SYSTEM FOR MAINTAINING OPERATION OF AN INTERNAL COMBUSTION ENGINE AT ITS LEAN LIMIT

Ervin Leshner, and Michael D. Leshner, both of Cherry Hill, N.J., assignors to Fuel Injection Development Corporation, Bellmawr, N.J.

Filed Nov. 22, 1976, Ser. No. 743,764
Int. Cl.[3] F02B *3/00*; F02M *17/18*; F02B *33/00*
U.S. Cl. 123—440 **14 Claims**



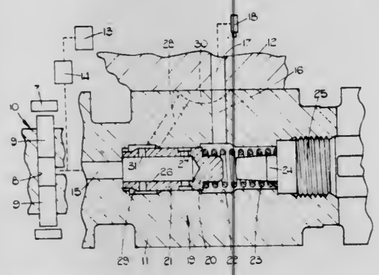
1. A charge forming system for automatically and continually optimizing the fuel/air ratio of charge supplied to an internal combustion engine comprising:
- transducer means adapted to be coupled to the engine for outputting a first signal representing the instantaneous combustion efficiency of the engine, said transducer means including means for producing signals representing the rate of fuel flow and the engine power output;
- means for combining said signals to produce an output signal representing instantaneous combustion efficiency of the engine; and
- a charge control for changing the fuel/air ratio of the charge, including a servomechanism coupled to said transducer means and responsive to changes in the level of said first signal to decrease the fuel/air ratio of the charge when instantaneous combustion efficiency of the engine is increasing, and to increase the fuel/air ratio of the charge when the instantaneous combustion efficiency of the engine is decreasing.

4,232,644

FUEL PUMPING APPARATUS

James C. Potter, and Stanislaw J. A. Sosnowski, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 20, 1978, Ser. No. 971,495
Claims priority, application United Kingdom, Jan. 19, 1978, 2178/78
Int. Cl.[3] F02M *39/00*; F04B *29/00*
U.S. Cl. 123—450 **3 Claims**



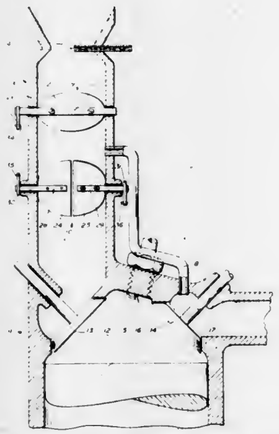
1. A liquid fuel injection pumping apparatus for supplying fuel to internal combustion engines and of the kind comprising an injection pump, a rotary distributor member housed in a body, the injection pump and distributor member being driven in use, in timed relationship with an associated engine having injection nozzles, the distributor member including a delivery passage through which fuel delivered by the injection pump flows and which registers in turn with a plurality of outlet ports which in use are connected to the injection nozzles of the associated engine respectively during successive delivery strokes of the injection pump, a spring loaded delivery valve mounted within the distributor member and positioned in said passage, said delivery valve being opened during the delivery of fuel by the injection pump and when the delivery of fuel by the injection pump has ceased, closing to allow a limited volume of fuel to return to the injection pump from the outlet ports, a branch passage formed in the distributor member, the branch passage communicating with the injection pump, said branch passage extending to the periphery of the distributor member for communication with an outlet port in advance of the communication of the same outlet port with the aforesaid passage, the size of the outlet ports and the spacing of the passages about the periphery of the distributor member being such that the initial volume of fuel delivered by the injection pump flows to the outlet ports by way of said branch passage, the fuel flow then being gradually diverted to the aforesaid passage to achieve gradual opening of the delivery valve.

4,232,645

VARIABLE GEOMETRY WHIRLER

Samuel Shiber, P.O. Box 371, Mundelein, Ill. 60060

Filed Mar. 9, 1979, Ser. No. 19,132
Int. Cl.[3] F02M *29/06*
U.S. Cl. 123—590 **7 Claims**



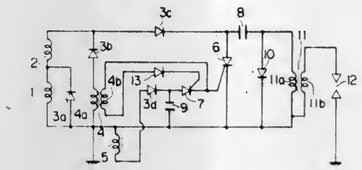
1. In an internal combustion engine having a combustion chamber, an induction manifold for delivering an explosive charge into said chamber and a throttle means disposed in said manifold for selectively and variably closing and restricting flow through said manifold,
- the improvement wherein a variable geometry whirling creating apparatus is disposed in said manifold for mixing and homogenizing said explosive charge when said throttle is partially open, said apparatus adapted to vary its geometry and to minimize its whirling creating action when said throttle is fully open.

4,232,646

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH A MAGNETO GENERATOR

Masahiro Asai, Hekinan, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 22, 1979, Ser. No. 41,302
Claims priority, application Japan, May 24, 1978, 53-62108
Int. Cl.[3] F02P *3/08*
U.S. Cl. 123—600 **3 Claims**



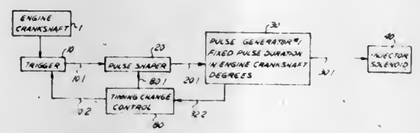
1. An ignition system for internal combustion engines comprising:
- a magneto generator having a coil for inducing therein an output in synchronism with the rotation of a crank shaft of an internal combustion engine,
- a capacitor connected to said coil of said magneto generator through a diode and being charged by the output produced in said coil,
- an ignition coil having a primary coil connected to said capacitor and having a secondary coil connected to an ignition plug,
- a thyristor connected in series with said capacitor and said primary coil of said ignition coil to form a discharging path of said capacitor,
- an auxiliary semiconductor switching element connected to a gate of said thyristor,
- means for converting an output of said coil of said magneto generator into an ignition signal and for applying said ignition signal to a gate of said auxiliary semiconductor switching element,
- a timing generator for generating an output in synchronism with the rotation of the crank shaft of said internal combustion engine advanced in phase with respect to a predetermined ignition signal, said auxiliary semiconductor switching element being turned on upon occurence of said predetermined ignition signal, and
- an auxiliary capacitor connected to said timing generator to store an output thereof and having a discharging path including said auxiliary semiconductor switching element and a gate-cathode circuit of said thyristor thereby to apply a discharging current of said auxiliary capacitor to said gate-cathode circuit of said thyristor only when said auxiliary capacitor has been charged and said auxiliary semiconductor switching element is turned on by a successive ignition signal.

4,232,647

CONTROL CIRCUIT FOR DIESEL INJECTION SYSTEM

Howard E. Van Siclen, Jr., Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 13, 1978, Ser. No. 960,513
Int. Cl.[3] F02D *5/02*
U.S. Cl. 123—478 **21 Claims**



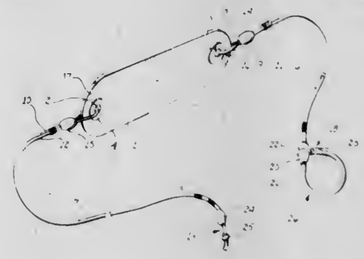
1. A system for controlling a solenoid operated fuel injector of an internal combustion engine of the type having a crankshaft which rotates during the operating cycle of the engine, said circuit comprising:
- first means for generating a trigger pulse for each operating cycle of said engine; and
- second means, responsive to each trigger pulse, for generating an energizing pulse to energize the injector solenoid for each operating cycle of the engine, said second means including:
- means for limiting the duration of said energizing pulse to a fixed number of degrees of engine crankshaft rotation over a preselected range of rotational speeds of said engine crankshaft, said limiting means consisting of electronic circuitry.

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THROWING SLING

Douglas P. Brown, 18 Loba Dr. Groom Creek Rt., Prescott, Ariz. 86301

Filed Dec. 18, 1978, Ser. No. 970,290
Int. Cl.[3] F41B *3/04*
U.S. Cl. 124—5 **5 Claims**



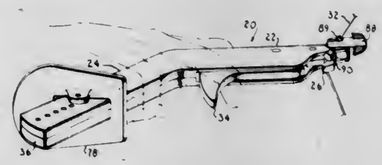
1. A projectile throwing sling comprising a supple pocket, thongs engaging opposite ends of said pocket, and weight means comprising a perforated bead that also serves to tie the release thong to the release end of the pocket, said weight means being carried at the release end of said pocket whereby the release of a projectile is aided by the weight means causing said release end of the pocket to snap open crisply upon the throw of a projectile.

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BOW STRING TRIGGER RELEASE

Holless W. Allen, and Douglas T. Allen, both of Billings, Mo. 65610

Filed May 16, 1978, Ser. No. 906,944
Int. Cl.[3] F41B *5/00*
U.S. Cl. 124—35 A **20 Claims**



1. A trigger-operated bowstring release comprising:
- an elongated, relatively narrow, rigid body of dogleg configuration having an elongated front firing portion merging with an elongated rear handle portion provided with a configuration adapting said handle portion to be gripped in the palm of an archer's hand, said portions being angularly disposed with respect to each other to present said dogleg configuration,

stop means on said handle portion spaced from said firing portion for receiving the heel of an archer's hand when the handle portion is gripped,

said firing portion having opposed, inner and outer longitudinally extending sides facing laterally toward an archer and laterally away from the archer respectively when the handle portion is gripped by the archer and the release is held in a shooting position adjacent the archer's head with said firing portion extending forwardly from said handle portion and pointing generally in the direction of a target,

said outer side of the firing portion and said handle portion defining an obtuse angle thereby providing the dogleg configuration,

a holding member associated with said firing portion and provided with an open hook for engaging and holding a bowstring, and said member having a normal, bowstring-holding position in which the hook is spaced from said body forwardly from said handle portion and projects laterally from said outer side clear of said body to hold the bowstring, permitting the release when held by the archer to be moved to a disposition of unobstructed engagement with the bowstring merely by the archer manipulating the entire body,

means on said firing portion mounting said member for movement between said normal position and an operated, bowstring-releasing position,

a trigger provided with a sear, and

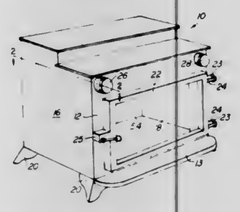
means on said firing portion mounting said trigger rearwardly of said member for movement between a normal position where the sear engages said member to retain it in its normal, bowstring-holding position and the trigger projects laterally from said outer side, and an operated position assumed upon depressing the trigger and in which the sear is disengaged from the member to permit the same to move to its bowstring-releasing position under the force of a bowstring received in said hook.

4,232,650

BAFFLED STOVE

Bruce A. Frank, Salt Lake City, Utah, assignor to Baffle Stove Company Inc., Salt Lake City, Utah

Filed Aug. 30, 1977, Ser. No. 937,966
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 **10 Claims**



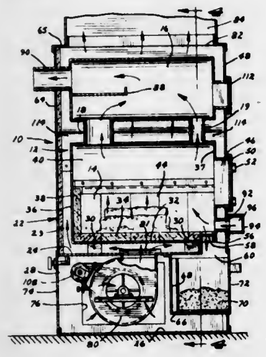
1. A generally rectangular heating structure having two sides walls, a front wall, a back wall a top wall and a bottom wall wherein said bottom wall is adapted to form a firebox for receiving fuel, a primary air passageway for introducing air into said heating structure at a level near said firebox, a secondary air inlet vertical passageway wherein said passageway includes a vertical wall spaced from said back wall and fixed to said bottom wall and to said side walls and a horizontal passageway includes a pair of spaced apart horizontally positioned baffle plates sealed at their side ends to said side walls, and a flue outlet for carrying gases of combustion to the atmosphere, said vertical and horizontal passageways forming a continuous conduit whereby secondary air enters near the bottom of the vertical passageway for preheating and exits through an outlet in said horizontal passageway where said secondary air is combined with gases of combustion for secondary burning and circuitously flows outwardly through said flue outlet.

4,232,651

WOOD BURNING FURNACE

Eugene L. Lind, Aitkin, Minn., assignor to Lind's Manufacturing Inc., Aitkin, Minn.

Filed Jul. 9, 1979, Ser. No. 56,026
Int. Cl.³ F24H 3/02
U.S. Cl. 126—110 E **7 Claims**



1. A solid fuel burning furnace including:

A. a combustion enclosure made up of:

(1) a closed, generally rectilinear, lower fire box being defined at an upper portion thereof by a semicylindrical roof dome,

(2) a closed, cylindrical, upper smoke chamber spaced above and parallel to said fire box roof dome,

(3) a rearward upright smoke conduit open between said fire box roof dome and said smoke chamber at a rearward portion of each, and

(4) a forward upright smoke conduit open between said fire box roof dome and said smoke chamber at a forward portion of each;

B. an outer, generally rectilinear, furnace shell encompassing said combustion enclosure, said shell also providing a closed fan compartment below said combustion enclosure;

C. a fire box loading collar open to said fire box through a forward wall of said shell for loading fuel inside said fire box;

D. a normally closed fire door mounted with respect to said collar to be openable to permit access to said fire box;

E. a stack open to a rear portion of said smoke chamber and extending out through said shell;

F. a blower in said fan compartment;

G. heating air passage baffles integral with the interior of said shell;

H. said baffles and the interior of said shell being in generally parallel spaced relation to the flat and cylindrical surfaces of said fire box and smoke chamber so as to provide a heating air passage of generally uniform cross sectional area when measured along progressively higher horizontal planes from the bottom of the fire box to halfway up the smoke chamber;

I. a plenum opening being provided in an upper wall of the furnace shell, said plenum opening being of at least the cross sectional area of the smallest area of a horizontal section taken through the heating air passage;

J. said fan compartment being open to said heating air passage in said shell and to unheated air outside said shell;

K. means to activate said blower to cause it to force air from outside said shell, through said heating air passage and out said plenum opening; and

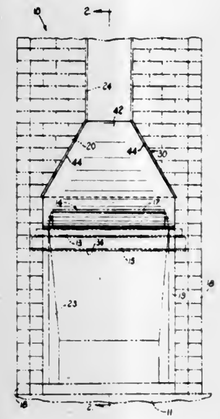
L. draft means to introduce primary combustion air into a lower portion of said fire box through said shell.

4,232,652

FIREPLACES OF THE TYPE HAVING FIREBOXES CONSTRUCTED OF FIREBRICK

Frank J. Serwatowski, 12155 Spencer Rd., Milford, Mich. 48042

Filed Dec. 20, 1977, Ser. No. 862,370
Int. Cl.³ F24B 1/18
U.S. Cl. 126—120 **1 Claim**



1. Improvement in a fireplace of the type having a firebox constructed of firebrick, said fireplace having a chimney and a flue liner therefor and a metal damper mechanism on top of the firebox, said improvement comprising a prefabricated smoke chamber liner having front and side walls made of flat sheets of fire resistant material which are capable of being assembled and fastened together at the job site where the fireplace is being constructed, said fireplace having a downdraft cavity behind said firebox, said smoke chamber liner constructed to be disposed inside of the fireplace during building thereof above both the firebox and the downdraft cavity and below the chimney flue liner, said smoke chamber liner constructed to be supported in the fireplace on its side walls on brickwork so that its front and side walls extend upwardly and inwardly so that the top of said smoke chamber liner corresponds with the opening for the flue liner and the bottom thereof corresponds with that for the firebox, the front wall of said smoke chamber liner having an extension at the lower end thereof which projects downwardly and outwardly below the side walls thereof, said damper mechanism being of the type having a flat base which is horizontally disposed in said fireplace, said damper mechanism being disposed in the vertical space between the lower edges of said side walls and the lower edge of said extension, said lower edge of said extension being straight and engaging the flat base of the damper mechanism, and the opposite side edges of the extension being disposed in a vertical plane.

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WOOD-BURNING FURNACE

James H. Otterpohl, Rte. 3 Box 35B, Clinton, Ark. 72031

Filed Mar. 8, 1979, Ser. No. 18,645
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 **9 Claims**

1. A wood-burning furnace comprising:

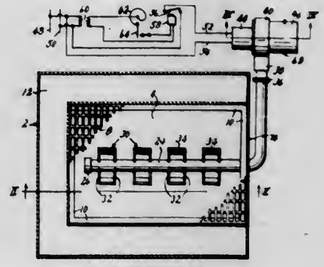
a. a furnace body providing a combustion chamber for receiving wood to be burned,

b. an open-work grate forming the floor of said combustion chamber for supporting said wood,

c. an ash pit disposed beneath said combustion chamber and communicating therewith through said grate,

d. air supply means operable to supply combustion air to said ash pit, beneath said grate, said combustion chamber and ash pit being otherwise sealed against the entry of air, and

e. thermostatically actuated control means, responsive to the air temperature in a comfort zone to be heated by said furnace, to regulate said air supply means to supply air at



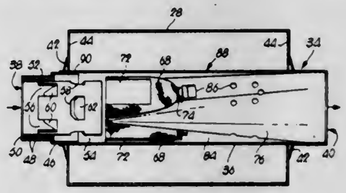
a rate sufficient to support full combustion of said wood when said control means calls for heat, and to regulate said air supply means to supply air at a rate sufficient only to maintain combustion of said wood at a minimum rate when said control means does not call for heat.

4,232,654

HEAT RECOVERY DEVICE FOR USE IN RETURN AIR DUCT OF FORCED AIR FURNACE FOR RECOVERING HEAT FROM THE FLUE OF SUCH FURNACE

Fred J. Gary, R.F.D. #1, Box 164, Glasco, Kans. 67445

Division of Ser. No. 891,171, Mar. 29, 1978, Pat. No. 4,176,787.
This application Mar. 23, 1979, Ser. No. 22,973
Int. Cl.³ F24H 7/00
U.S. Cl. 126—400 **2 Claims**



1. Apparatus for transferring heat from a first gas flowing through a heat conductive tubular member to a second gas in contact with the exterior surface areas of said member, including:

a heat trap disposed within said member adjacent said exterior surface areas of the latter,

said heat trap including a heat conductive mesh-like material through which said first gas may pass,

portions of said material being in heat conducting contact with interior surface portions of said member,

said material functioning to extract and store heat from said first gas, and further functioning to transfer said extracted heat by conduction and radiation thereof to said interior surface portions of said member for subsequent conduction to said exterior surface areas of said member,

said mesh-like material comprising a plurality of separate, elongate, tubularly-shaped structures,

each of said structures having one extremity thereof downstream in the flow of said first gas essentially closed to prevent free flow of said first gas therethrough,

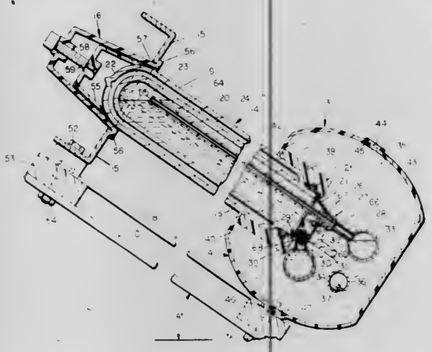
the opposite extremity of said structure upstream in said flow from said one extremity presenting an opening to said flow allowing said first gas to freely enter said structure.

4,232,655

SOLAR ENERGY COLLECTION

Joseph R. Frissora, and Michael H. Platt, both of Corning, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 26, 1978, Ser. No. 919,029
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—420 21 Claims



1. A solar energy conversion apparatus of the type wherein a heat transport liquid is circulated between a solar energy collection area and a thermal energy storage and exchange device which comprises in a combination:

a plurality of solar collectors receptive of solar radiation, each said collector comprising a double-wall tubular collector with a sealed, annular evacuated space between the walls, the collector being closed at one axial end and open at the other, an energy absorbing surface on the inner wall, the outer wall being transparent, and a cup element providing a mouth opening sealingly connected about the open end of said collector to define a closed chamber for circulation of liquid to and from said chamber to be heated by absorbed solar radiation at said inner wall, each said chamber having top and bottom regions,

a storage tank for said liquid disposed at a substantially lower elevation from said collectors,

a first liquid line connected between said storage tank and the bottom region of each of said chambers the latter being connected in parallel, for conducting liquid therebetween,

a restricted flow passage in the first liquid line connection to said bottom region of each of said parallel connected chambers extending through the cup element,

a pump in the first liquid line operable for pumping liquid in said line from said tank to said collector chambers,

a second line including plural end openings, means to dispose said plural end openings such that one end opening is in the top region of each of said chambers, and said second line is also connected to the top space in the storage tank for (a) venting air in the upper region of the chambers to the storage tank, and (b) conducting liquid entering said plural end openings by gravity flow to the tank, and

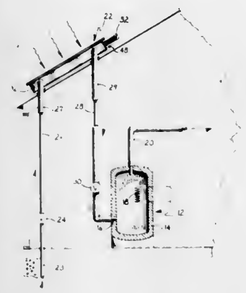
control means responsive to preselected temperature condition existing in one or more of said chambers for operating the pump and thereby pumping liquid from the storage tank to the solar collector chambers, the flow of liquid into each of said chambers being at a rate less than full flow in said end opening of the second line therein, whereby the overflow liquid from the chambers and air return to the storage tank are each through said second line, said pumping being discontinued whenever such preselected temperature condition in said chambers no longer exists.

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INTEGRAL STORAGE COLLECTOR SOLAR HEATING SYSTEM

W. Peter Teagan, Acton, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 12, 1979, Ser. No. 19,905
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—420 33 Claims



1. A solar heating system for heating water comprising:

an integral storage collector exposed to solar illumination, the storage collector including absorber means for absorbing solar energy, a heat storage medium of large heat capacity and high thermal conductivity directly heated by said absorber means, and a water flow path in heat exchange relationship with the heat storage medium;

a water outlet from said water flow path connected as a pressurized, heated water supply; and

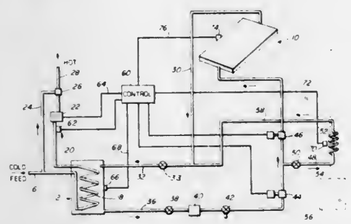
a water inlet to said water flow path connected to a primary pressurized water supply line such that line pressure forces fresh water through the water flow path of the integral storage collector as heated water is taken from the water outlet.

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SYSTEM FOR USE WITH SOLAR COLLECTOR

Francis H. Killorin, P.O. Box 353, Snug Harbor, Duxbury, Mass. 02332

Filed Apr. 19, 1979, Ser. No. 31,534
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—427 7 Claims



1. A system for use with a solar collector, comprising

(a) a combination storage tank and a heat exchanger,

(b) first conduit means connected between said tank and said collector and defining a primary circulating loop,

(c) second conduit means connected between said primary loop and a waste heat source, and defining a secondary circulating loop,

(d) a liquid heat exchange medium in said loops,

(e) a pair of pumps operatively connected to said primary loop for circulating said medium selectively through said primary and secondary loops,

(f) pump control means connected to said pumps for selective operation thereof,

(g) one of said pumps being located ahead of said secondary loop and having a pumping capacity when operated alone to circulate said medium only through said secondary loop, and,

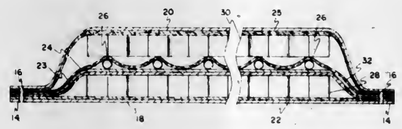
(h) third conduit means connected to said heat exchanger and defining a separate flow path for feed water therethrough to be heated thereby to provide hot water service.

4,232,658

SOLAR COLLECTOR PANEL

James D. Gessford, 20 S. First East, P.O. Box 87, Bancroft, Id. 83217

Filed Dec. 8, 1977, Ser. No. 858,584
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—441 7 Claims



1. A solar collector panel comprising:

a first fiberglass matrix saturated with a catalyzed liquiform resin;

a second fiberglass matrix saturated with a catalyzed liquiform resin;

a layer of honeycomb material bonded between said first and second fiberglass matrices, said layer comprising a plurality of individual cell structures that are substantially perpendicular to the surface of one of said matrices;

a layer of gel coat type material bonded to the surface of one of said first or second fiberglass matrices; and

a plurality of tubes bonded in heat-transfer relation to said layer of gel coat type material.

7. A method of manufacturing solar collector panels, comprising the steps of:

saturating a first layer of fiberglass mat with a catalyzed liquiform resin;

placing a first layer of unimpregnated, porous material having a honeycomb structure onto said saturated first layer of fiberglass mat;

sealing said first honeycomb layer by placing a gas-impervious layer of material on top of said first honeycomb layer;

liberating styrene gas in response to said sealing step, thereby causing said resin to be at least partially drawn up into said first honeycomb layer;

removing said gas-impervious layer after said resin has at least partially cured;

saturating a second layer of fiberglass mat with catalyzed liquiform resin and placing said second layer on top of said first honeycomb layer;

bonding a plurality of tubes to the second fiberglass layer as the resin of the second fiberglass layer is cured;

saturating a third layer of fiberglass mat with catalyzed liquiform resin and draping said third layer over said tubes;

placing a second layer of honeycomb structure material on top of said third fiberglass layer; and

saturating a fourth fiberglass mat layer with catalyzed liquiform resin and placing said fourth layer on top of said second honeycomb layer, so as to form an enclosed solar collector panel.

4,232,659

VEIN HOLDER ASSEMBLY

William A. Dale, Nashville, Tenn., assignor to Codman and Shurtleff, Inc., Randolph, Mass.

Filed Jan. 8, 1979, Ser. No. 1,799
Int. Cl.[3] A61B *19/00*
U.S. Cl. 128—1 R 4 Claims



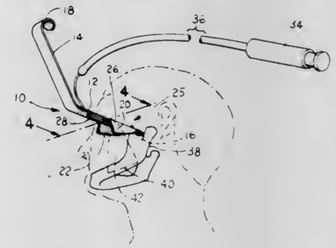
1. A vein holder assembly for use in the preparation of a vein segment during surgery comprising: an elongate base having a groove in its elongate direction; first slide means connected to said base and adapted to slide in said groove; first adjustable tightening means associated with said first slide means for tightening the same in a selected position on said base; a vein clamp mounted on said first slide means for closing off one end of a vein segment; second slide means connected to said base and adapted to slide in said groove; second adjustable tightening means associated with said second sliding means for tightening the same in a selected position on said base; a vein support mounted on said second slide means adapted to allow fluid to pass into said vein segment while supporting the same and while the other end of said vein segment is closed off by said vein clamp whereby said vein segment may be maintained in a fluid distended condition.

4,232,660

WINGED IRRIGATING SURGICAL RETRACTOR

Robert L. Coles, 13 New Haven Dr., Greenville, S.C. 29615

Continuation of Ser. No. 779,362, Mar. 21, 1977, abandoned.
This application Mar. 26, 1979, Ser. No. 24,047
Int. Cl.[3] A61B *17/02*
U.S. Cl. 128—20 5 Claims



1. A retractor device for use in surgical procedures in a surgical working area involving the jaw and oral areas comprising:

an elongated generally straight blade member having a distal end and a proximal end;

a curved element connected to said distal end of said blade member, said curved element being inclined downwardly from said blade member and being adapted for fitting over a bone process to form a fulcrum therewith;

a pair of opposed wing projections extending laterally in an inclined manner from said blade member providing an enlarged retracting surface for retracting tissue and muscle to provide access to said surgical working area and avoiding damage of adjacent tissue and muscle;

an elongated, generally flat, generally straight handle portion having a first and a second end, said first end of said handle portion being connected to said proximal end of said blade member;

said elongated blade member including a generally flat portion extending from said proximal end of said blade member to said distal end of said blade member and intermediately connecting said flat portion of said handle portion and said wing projections for providing an unrestricted side view of and access to said surgical working area;

said handle portion being substantially inclined and extending away from said flat portion of said elongated blade member in a direction opposite to the inclination of said curved element; and

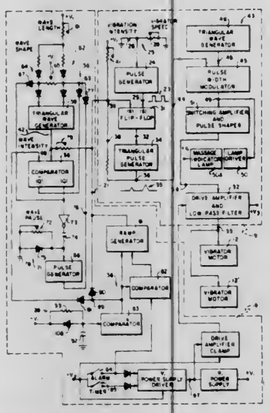
conduit means carried by said elongated blade member having at least one outlet for delivering a flush of water to said working area, said outlet of said conduit means being disposed at a spaced distance from said curved element and said distal end of said elongated blade and generally above said surgical working area when inserted therein so as to cause downward delivery of said water to said surgical working area in a flushing stream pattern and facilitate unrestricted viewing and working in said working area, and a remote end of said conduit means being adapted for connection to a syringe member for delivering said flush of water.

4,232,661

BODY MASSAGE APPARATUS

Earl A. Christensen, 107 Wilshire Ct., San Carlos, Calif. 94070

Filed Feb. 8, 1978, Ser. No. 875,984
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—33 **18 Claims**



1. Apparatus for administering massage actions to a person in intimate contact with a structure comprising:

at least one vibrator motor adapted to be operatively connected to said structure to vibrate said structure in accordance with the waveform of a signal energizing said motor;

a pulse train generator controllable to generate a train of pulses of continually varying amplitude versus time relationship;

a function generator controllable to generate a modulating signal of varying amplitude versus time relationship different than that of said train of pulses and selected relative to said train of pulses to simulate therewith a traveling wave pattern, the frequency of said modulating signal being significantly lower than the frequency of said train of pulses;

a first coupling means for combining the modulating signal with the train of pulses to effect modulation of the amplitude versus time relationship of said pulses and thereby produce a modulated output signal simulative of a traveling wave pattern; and

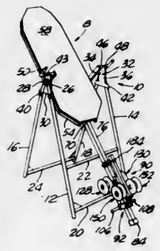
a second coupling means for operatively connecting said first coupling means directly to the vibrator motor to energize said vibrator motor with a signal having substantially the same shape as said modulated output signal.

4,232,662

THERAPEUTIC DEVICE FOR A HUMAN BODY

S. Morgan Barber, P.O. Box 223, Yerington, Nev. 89447

Filed Nov. 6, 1978, Ser. No. 958,013
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—71 **18 Claims**



1. In a therapeutic device for the human body in which a main frame pivotally mounts a body supporting structure for longitudinal tilting movements, said structure having an upper body supporting portion and a lower body supporting portion, the lower body supporting portion being connected with the upper body supporting portion by an elongated central frame member, the improvement comprising:

first means carried by the lower body supporting portion positioned to extend under each foot and form a support to limit endwise movement of the body in a downward direction, when the body supporting structure is tilted so as to elevate the head of a body thereon above a horizontal position;

second means carried by the lower body supporting portion positioned and operative to embrace each ankle area and adjacent foot instep area, and form a support to limit endwise movement of the body in an opposite downward direction, when the body supporting structure is tilted so as to lower the head of a body thereon below a horizontal position; said second means carried by the lower body supporting portion for embracing the adjacent foot instep area including an elongated lever having a lower and an outer end, the lower end of said lever being adapted for detachably engaging and pivotally supporting said elongated lever with respect to the lower body supporting portion; and

means adapted for intercoupling said lever near its outer end with the lower body supporting portion for retaining said lever in an engaged and locked position.

4,232,663

CERVICAL SUPPORT COLLAR

John E. Newton, P.O. Box 892, Burgaw, N.C. 28425

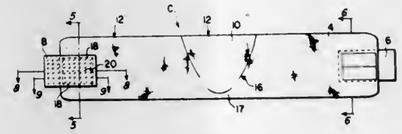
Filed Dec. 12, 1978, Ser. No. 968,796
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **5 Claims**

1. A cervical collar for placement around a user's neck, comprising:

an elongated pad of resilient foam material generally rectangular in cross-sectional configuration having two end portions, an inner surface for placement adjacent a user's neck, an outer surface, a top edge surface and a bottom edge surface, the distance between said top and bottom edge surfaces being substantially constant along the length of said pad;

means at said end portions for detachably fastening said end portions together with said pad about the user's neck;

said pad having a depressed area in said inner surface at the longitudinal mid-portion of said pad extending from and including said top edge surface toward said bottom edge surface for the greater portion of the distance between said top and bottom edge surfaces, said depressed area being generally parabolic in outline with its apex toward said bottom edge surface; and,



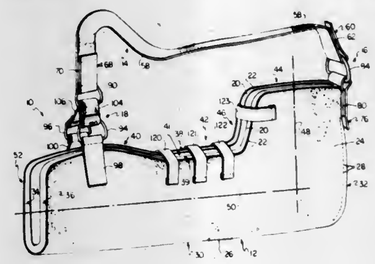
said inner surface within said depressed area being generally concave in form with the deepest portion of said depressed area being at said top edge surface generally at the longitudinal mid-point of said depressed area and with said depressed area decreasing in depth in either longitudinal direction from the longitudinal mid-point of said depressed area and decreasing in depth toward said bottom edge surface whereby, with the mid-portion of said top edge surface located underneath the user's chin, said depressed area acts to lessen pressure in the user's throat area.

4,232,664

ARM ELEVATOR AND SLING

Gerald Blatt, Ste. 440, 2840 Long Beach Blvd., Long Beach, Calif. 90806

Filed Jan. 11, 1979, Ser. No. 2,755
Int. Cl.³ A61F *5/40*
U.S. Cl. 128—94 **16 Claims**



1. An arm elevator and sling, comprising the combination of

a substantially L-shaped, flexible envelope for receiving a portion of the arm of a patient including at least the elbow and the lower portion of the arm, said envelope being closed along the bottom and open at the top;

shoulder strap means for supporting said envelope;

first means for coupling the rear end of said strap means to said envelope adjacent the rear end thereof; and

second means for coupling the forward end of said strap means to said envelope in a variable position extending from the forward end thereof rearwards toward the rear end thereof, said second means including

a yoke assembly having two short pads, each of said pads having looped-fabric engaging hooks thereon,

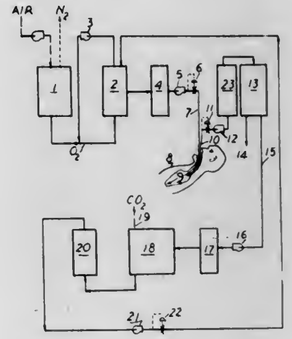
at least a portion of the outside surface of said envelope having looped-fabric thereon for releasably engaging said hooks.

4,232,665

PORTABLE LUNG APPARATUS

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Continuation-in-part of Ser. No. 808,286, Jun. 20, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,459
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.24 **1 Claim**



1. A composite mechanical lung machine, consisting of:

medical oxygen supply means;

isotonic, breathable liquid oxygen saturator means connected to said oxygen supply means for saturating isotonic, breathable liquid with oxygen from said supply means;

first heat exchanger means connected to said oxygen saturator means for temperature adjustment of the breathable liquid;

means for introducing said oxygen saturated isotonic liquid into animal lung(s) cavity;

means for removing said isotonic liquid from the animal lung(s) cavity;

first transfer pump means for transferring said isotonic, breathable liquid from said first heat exchanger means to said introducing means;

first flow and pressure control means connected between said first transfer pump means and said introducing means for controlling flow and pressure of said isotonic, breathable liquid to said introducing means;

separator means for separating said isotonic, breathable liquid from aqueous liquids accumulated from said lung(s) cavity;

second transfer pump means connected for transferring said isotonic, breathable liquid from said removing means to said separator means;

second flow and pressure control means connected between said second transfer pump means and said removing means for controlling flow and pressure of said isotonic, breathable liquid from said removing means;

filter means connected to said separator means for separation and removal of particulate solids from the isotonic, breathable liquid accumulated from the lunt(s) cavity;

heat exchange sterilizer means connected to said filter means for heat stripping absorbed carbon dioxide from the breathable liquid accumulated in the lung(s) cavity and sterilizing said breathable liquid;

second heat exchanger means connected to said sterilizer means for temperature adjustment of the breathable liquid from said sterilizer means to a selected body use temperature;

third transfer pump means for transferring said isotonic, breathable liquid from said second heat exchanger means to said oxygen saturator; and

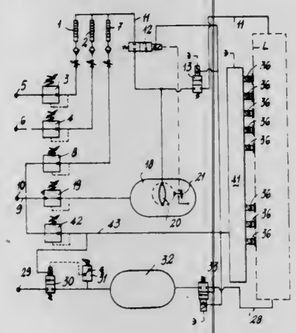
third flow and pressure control means connected between said third transfer pump means and said oxygen saturator means for controlling flow and pressure of said isotonic, breathable liquid from said third transfer pump means.

4,232,666

MEDICAL BREATHING APPARATUS

Aulo Savelli; Francesco Grianti; Giovanni Arcozzi, and Leonardo Di Bari, all of Pesaro, Italy, assignors to D G T S.r.l., Pesaro, Italy

Filed Mar. 15, 1979, Ser. No. 20,718
Claims priority, application Italy, Mar. 16, 1978, 21273 A/78
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—203.25 **6 Claims**



1. A rate of flow controlled automatic medical breathing apparatus comprising:

means for supplying a respiratory gas mixture including first conduit means wherein said mixture flows;

valve means in said first conduit means for controlling the flow of said respiratory gas mixture into the apparatus;

a first inspiration manifold downstream of said valve means;

a pressure stabilizer and governor means interposed in said first conduit means between said valve means and said first inspiration manifold;

second conduit means downstream of said first inspiration manifold, comprising at least two parallel conduits and having first flow regulating means in each of said parallel conduits;

a second inspiration manifold downstream of said first inspiration manifold, wherein said parallel conduits of said second conduit means are joined;

inspiration means connectable to a patient and including an inspiration conduit connected to said second inspiration manifold;

expiration means connectable to a patient and including an expiration conduit; and

second flow regulating means in said expiration conduit;

controlling means for controlling said first and second flow regulating means in said second conduit means and said expiration conduit so as to change the inspiration flow and expiration flow for a respiration cycle according to necessities imposed by the various pathological conditions of a patient;

and wherein said pressure stabilizer and governor means further comprises:

a constant volume reservoir;

supply means for supplying a fluid at a preselected pressure into said constant volume reservoir;

a variable volume member inside said reservoir, the interior of said variable volume member being isolated from said constant volume reservoir and connected to said first conduit means downstream of said valve means; and

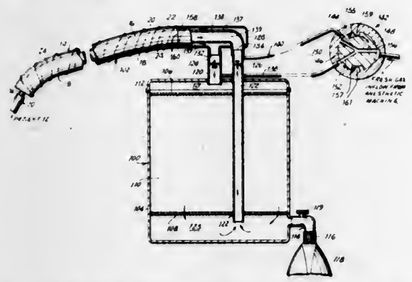
detecting and control means for detecting the volume of said variable volume member and controlling said valve means to prevent flow therethrough when a predetermined increased volume is detected and permit flow therethrough when a predetermined decreased volume is detected.

4,232,667

SINGLE LIMB BREATHING CIRCUIT ASSEMBLY AND ABSORBER

Jack Chalon, 9 Tarry Hill Rd., Tarrytown, N.Y. 10591; Sivam Ramanathan, 7100 Blvd. East, Guttenberg, N.J. 07093, and Herman Turndorf, 37 Hyatt Rd., Briar Cliff Manor, N.Y. 10510

Continuation of Ser. No. 747,910, Dec. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 568,279, Apr. 15, 1975, abandoned. This application Sep. 5, 1978, Ser. No. 939,213
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—203.26 **7 Claims**



1. A circle absorber anesthetic system for operation in conjunction with an anesthetic machine to anesthetize a patient comprising, in combination:

an absorber including a cannister having an inlet end and an outlet end, means for holding a charge of exothermic water generating reacting carbon dioxide absorbent in said cannister in spaced relation with said two cannister ends whereby to define an open space at each cannister end, an inlet conduit for conveying gases exhaled by a patient extending from outside said cannister into said open space at said inlet end, an outlet conduit for conveying gases from said cannister to said patient for inhalation by said patient and extending from said open space at said outlet end through said cannister including said inlet end to outside of said cannister, said inlet and outlet conduits being disposed in said cannister for conveying exhaled gases flowing into said cannister through said inlet conduit through said carbon dioxide absorbent to the open space at the outlet end of said cannister, and therefrom through said outlet conduit to without said absorber whereby said exhaled gases are stripped in an exothermic water generating reaction with said absorbent, one way valve means in said inlet conduit permitting fluid flow therethrough only into said cannister, and one way valve means in said outlet conduit external of said cannister in heat transfer relationship with the ambient atmosphere for permitting fluid flow therethrough only out of said cannister; and

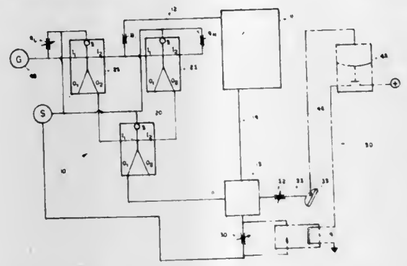
a breathing circuit assembly including a valveless inspiratory breathing tube through which the patient can inhale, a valveless expiratory tube through which the patient can exhale, said inspiratory breathing tube being connectable to said anesthetic machine and the absorber outlet conduit, said expiratory tube being connected to the inlet conduit of said absorber for absorption of exhaled carbon dioxide and reduction of anesthetic pollution of the ambient air, said inspiratory breathing tube being disposed within said expiratory tube and surrounded thereby throughout at least the respective portions of the longitudinal extents of said limbs adjacent the patient for facilitating heat retention of inhaled gases in said surrounded inspiratory breathing tube, said inspiratory and expiratory breathing tubes each comprising an end remote from said absorber, means connected to said remote ends of said inspiratory and expiratory breathing tubes for placing said tube ends in fluid flow communication with a breathing passage of the patient, said inspiratory breathing tube remote end being disposed in close proximity to the said expiratory tube remote end to minimize dead space between said limb ends in which the exhaled gases can collect for direct rebreathing by the patient, whereby the gases exhaled by the patient into said expiratory tube will surround and heat the gases being inhaled by the patient through said inspiratory breathing tube to enable said inhaled gases to hold additional moisture and thereby reduce both the drying effects of said inhaled gases on the breathing passages of the patient and the cooling effects thereof on the patient, and whereby inhalation by the patient through said expiratory tube and exhalation by the patient into said inspiratory breathing tube will be substantially prevented to substantially prevent the rebreathing by the patient of exhaled carbon dioxide through said inspiratory breathing tube, said outlet conduit comprising means for directly and readily picking up heat from said reaction for warming said stripped gases conveyed to said inspiratory breathing tube connected to said outlet conduit open end, said warmed stripped gases being capable of holding a large amount of water vapor for return to said patient through said connected inspiratory breathing tube, whereby said exhaled gases passing through said absorber and exiting said outlet conduit for return to said patient are warmed and humidified; said one way valve means in said outlet conduit being disposed therein for enabling sufficient cooling of said warmed humidified stripped gases to permit formation of a water reservoir in said outlet conduit for maintaining a relatively constant absolute humidity for said gases to be conveyed to said connected inspiratory breathing tube; whereby both heat and moisture loss in said inhaled gases passing through said absorber for conveyance to said patient are minimized.

4,232,668

GAS VENTILATING DEVICE

John P. Strupat, #127-1560 Adelaide St., N., London, Ontario, Canada (N5X 2C1)

Filed Feb. 28, 1979, Ser. No. 15,886
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.24 **7 Claims**



1. An apparatus for filling a fixed hollow enclosure with fluid of given volume and for evacuating the same to deliver a fixed volume of gas in successive cycles including:

(a) means for delivery of a first phase of fluid to the enclosure until the pressure therein reaches a predetermined high pressure point; and,

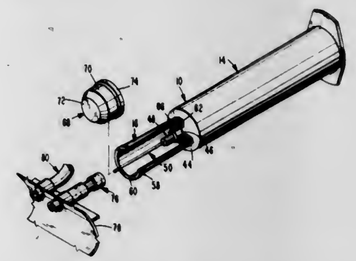
(b) means for delivery as a second phase a fixed volume of the fluid in the enclosure to a patient until the pressure in the enclosure reaches a predetermined low pressure point; including conveying means for conveying the fluid from the enclosure to the patient.

4,232,669

PROTECTIVE SHEATH FOR SYRINGE NEEDLE

Norman L. Nitshke, Central Square, N.Y., assignor to Bristol Myers Co., New York, N.Y.

Filed Feb. 15, 1979, Ser. No. 12,416
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 N **5 Claims**



1. A syringe assembly including a syringe housing having a front wall substantially closing one end of the housing and hub means one said front wall for receiving and holding a syringe needle, said hub extending forwardly of said front wall and said needle having a cannula portion extending out of said hub and forwardly of said syringe housing, and a protective sheath mounted on said housing coaxially with and spaced radially outwardly from said needle for protecting said cannula portion and extending along at least a portion of the cannula portion, said sheath including:

a substantially cylindrical side wall having a longitudinal axis;

a rear wall located at and substantially closing a first rearward end of said sheath, said rear wall extending generally radially inwardly from said side wall and defining an angle with respect to said axis that corresponds to the angle of said front wall with respect to said syringe needle, whereby when said sheath is mounted on said housing said rear wall of said sheath abuts said front wall of said syringe housing throughout its corresponding radial extent;

annular flange means extending forwardly from said rear wall into said sheath, said flange means being coaxial with said side wall and defining a central aperture, said flange forming a support and alignment collar adapted to receive said hub and cannula portion and to engage said forwardly extending hub to mount said sheath on said housing so that said rear wall abuts said front wall of said housing, said collar being substantially coextensive with said hub within said sheath to provide an axial mounting that resists lateral motion of said sheath with respect to said cannula portion, said sheath being welded to said syringe housing to provide a rigid protective structure; and

removable cap means adapted to close the second, forward end of said sheath and enclose said cannula portion.

4,232,670

TUBE TYPE SUPPLY CONTAINER FOR MEDICAL SYRINGE

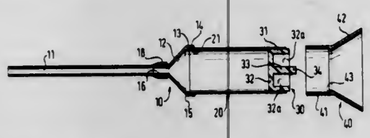
Karl M. Richter, Wendtorf; Hans E. Harder, Probsteierhagen, and Klaus Behrens, Rickling, all of Fed. Rep. of Germany, assignors to Howmedica International, Inc. Zweigniederlassung, Kiel, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,035
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1978, 7819584[U]
Int. Cl.³ A61M *3/00*
U.S. Cl. 128—224 **6 Claims**

1. A tube-type supply container for viscous media, in particular bone cement, that is adapted to be inserted in an appliance provided with a manually actuable push rod, said supply container comprising:

a cylindrical tube, both ends of said tube being open, one of said ends having first thread means adjacent thereto;

injection pipe means including a relatively elongated pipe portion of relatively small diameter and a conically flared portion, said pipe portion being formed of a shearable, elastic material, said conically flared portion having second thread means by which the conically flared portion can be connected to one of the ends of said cylindrical tube by coaction with said first thread means;



a plug-like piston that is sealingly displaceable within said cylindrical tube and adapted to be actuated by said push rod; and

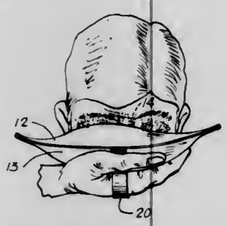
a funnel member having a cylindrical portion adapted to be slid on the outer side of either end of said cylindrical tube and having an abutment in its interior cooperating with either end face of said cylindrical tube.

4,232,671

SAFETY EYEWASH PACKAGE AND CONTAINER THEREFOR

Charles L. Crump, 151 Fuller La., Winnetka, Ill. 60093

Filed Jun. 23, 1978, Ser. No. 918,364
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—249 **6 Claims**



1. A container useful for a sealed emergency safety eyewash package in which liquid, that is essentially water, is in the container, said container having a volumetric capacity of about one pint and consisting essentially of:

a front wall and a flexible rear wall constituting at least a major portion of the walls of the container; and

a removable aqueous-impervious strip of material overlying only and secured only on a central longitudinal band of the outer surface of said front wall,

said front wall being flexible to conform, when said container is sealed with water in it and after said strip has been removed, generally to the contour of an upper part of the human face, that includes the nose and both eyes,

said front wall having holes only underlying and covered only by said strip, said holes being present as two sets, each of said sets having dimensions corresponding generally to an area overlying a human eye and said sets being spaced from each other a distance such that the distance between the center of each set is about the interpupillary distance for a human,

said container when sealed and containing water and with said strip removed, being: impervious to water except at said holes; and constructed to permit movement of said rear wall toward said front wall restrained against further forward movement by the upper part of the human face,

said holes in said two sets of holes in said front wall having dimensions that, for the sealed emergency eyewash package with said strip removed, are:

sufficiently small to preclude any substantial passage of water through said holes in said front wall; and sufficiently large to provide rapid streams of water flow from said holes during the period of time that, while said holes are overlying the eyes and other portions of said front wall are being flexed by pressing said front wall against the upper part of the human face, said rear wall is moved toward said front wall,

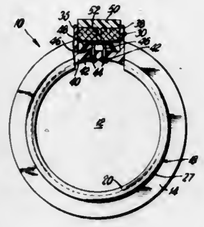
said container further including a strap mounted on said rear wall of said container with said strap having a length so that fingers of a hand can be placed between the rear wall and the intermediate portion of said strap for manual support of said container and movement of it toward the face of the individual using the eyewash package after removal of said strip, said strap extending in a direction transverse to the direction of said strip at a plane passing through said strip between and generally equidistant from said sets of holes.

4,232,672

OSTOMY COUPLING INCLUDING A VENTING VALVE

Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Kingsdown Medical Consultants Limited, London, England

Filed Aug. 2, 1978, Ser. No. 930,277
Int. Cl.³ A61F *5/44*
U.S. Cl. 128—283 **6 Claims**



1. An ostomy appliance comprising a pad of polymeric material having an adhesive layer on one side and a radially extending flange permanently bonded to the other side, said adhesive layer and said flange having an aperture permitting the appliance to fit around the stoma, said flange having an upwardly extending annular wall to which an ostomy bag can be readily attached, a filter compartment affixed to a portion of the outer periphery of said annular wall, said annular wall having one or more openings leading into said filter compartment, said openings being controlled by valves which are connected by a resilient member to a push button located at the outer periphery of said filter compartment so that in the normal state said valves seal said openings but by pushing down on said button said valves will permit gas to pass through said openings into said filter compartment and finally exit from said filter compartment.

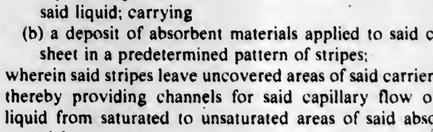
4,232,673

METHOD FOR COLLECTING AND PROCESSING BODY FLUIDS

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Filed Aug. 11, 1975, Ser. No. 603,432
Int. Cl.² A61B *10/00*
U.S. Cl. 128—769 **25 Claims**

1. In a method for obtaining information pertaining to human beings or other animals having body cavities wherein fluids from which the desired information can be derived are at least temporarily present, the steps of situating at a body cavity a means responding to presence of a fluid at the body cavity for collecting the fluid, leaving the latter means at the body cavity for a length of time sufficient to provide for collection of a quantity of fluids suitable for subsequent analysis, enclosing the collected fluid while said means remains in the body cavity in



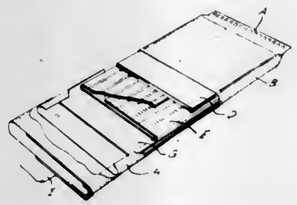
an enclosure suitable for transmittal to a laboratory or the like where the collected fluid is to be analyzed, while preventing the collected fluid in said enclosure from flowing out of said enclosure, and then analyzing the body fluid to obtain the desired information.

4,232,674

LIQUID ABSORPTION DEVICES

Nigel J. T. Melican, Goldington, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 714,466, Aug. 16, 1976, abandoned.
This application Dec. 5, 1978, Ser. No. 966,692
Claims priority, application United Kingdom, Aug. 22, 1975, 34974/75
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—287 **17 Claims**



1. A liquid absorbent device comprising: an absorbent layer, said absorbent layer consisting of:

(a) at least one carrier sheet of substantially non-absorbent material, wherein said material causes capillary flow of a liquid along said sheet when said sheet is contacted with said liquid; carrying

(b) a deposit of absorbent materials applied to said carrier sheet in a predetermined pattern of stripes;

wherein said stripes leave uncovered areas of said carrier sheet thereby providing channels for said capillary flow of said liquid from saturated to unsaturated areas of said absorbent material.

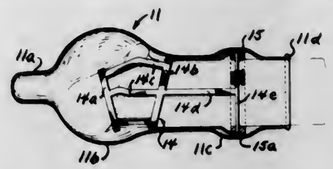
4,232,675

MALE CONTRACEPTIVE ARRANGEMENT

Edward N. Meldahl, 230 W. 55th St., Apt. 11D, New York, N.Y. 10019

Filed Mar. 29, 1979, Ser. No. 24,782
Int. Cl.³ A61F *5/42*
U.S. Cl. 128—294 **14 Claims**

1. A male contraceptive arrangement received by a penis comprising a condom having a rim surrounding an entry end and an enlargement proximate said entry end, a resilient retaining cover overlying said rim, and a spermicide receiving member disposed within said condom beneath said enlargement



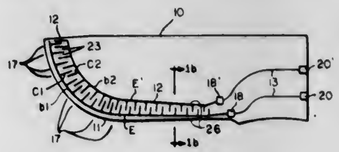
serving both operative spermicidal extruding and positioning purposes.

4,232,676

SURGICAL CUTTING INSTRUMENT

Andrew Herczog, Hammondsport, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,192
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.14 **7 Claims**



1. A surgical instrument adapted to be coupled to a source of electrical power for cauterizing tissue which is moist and electrically conductive due to the presence of physiological fluid and for simultaneous hemostasis thereof, the instrument comprising:

a blade, a cutting edge formed integrally with said blade along an edge thereof for incising tissue, and at least one pair of electrically-conductive electrodes disposed in the vicinity of the cutting edge in spaced relation to each other and adapted to be electrically coupled to the source of power, each electrode formed as an electrically conductive film surface on the blade surface including a common current carrying member evenly spaced from the cutting edge and integral transverse elongated narrow fingers extending therefrom being relatively closely interdigitated with fingers of another of said electrodes, a distal end of each of said fingers for an electrode being located on the same blade surface as the common current carrying member for the other electrode to conduct electrical power along a plurality of electrical current paths transversely from one finger to an immediately adjacent interdigitated finger for directly heating the tissue along the cutting edge in response to the electrical power applied thereto; and

connection means on said instrument providing electrical connections to said electrodes for supplying the electrical power thereto.

4,232,677

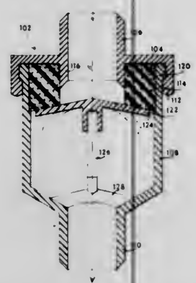
MICROBE-BARRIER DRAINAGE DEVICE

Saul Leibinsohn, 11 Oley Hagardom, Rishon Lezion, Israel

Filed May 22, 1978, Ser. No. 908,279
Claims priority, application Israel, Jun. 7, 1977, 52266
Int. Cl.³ A61F *5/44*; A61M *27/00*
U.S. Cl. 128—350 R **5 Claims**

1. A microbe barrier device particularly useful for draining body liquids while avoiding retrograde infection, comprising: a housing including an inlet connectable to a liquid line and an outlet through which the liquid from the line is drained; a one-way valve within the housing between its inlet and outlet

and permitting the one-way flow of the liquid only from the inlet to the outlet; and a barrier within the housing between its inlet and the one-way valve and including an antiseptic substance in contact with all surfaces of the inlet side of the valve through which the liquid flows, said one-way valve comprising an elastomeric membrane secured within the housing and



partitioning its interior into an upper inlet chamber communicating with the housing inlet, and a lower outlet chamber communicating with the housing outlet; said membrane being formed with a central pocket at its lower end which pocket is slitted to permit liquid flow only from the inlet chamber to the outlet chamber; said barrier being disposed within said pocket in contact with all the slit edges of the membrane.

4,232,678

DEVICE FOR THE LOCAL TREATMENT OF A PATIENT, AND MORE PARTICULARLY APPLICABLE IN ACUPUNCTURE AND AURICULOTHERAPHY

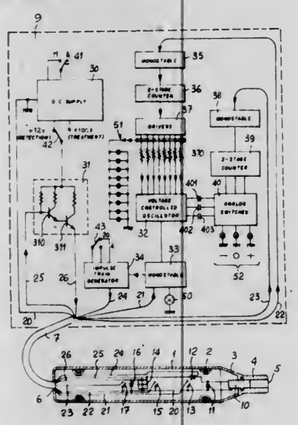
Joseph Skovajsa, 19, Avenue Vauquelin, 93 Coubron, France

Filed May 15, 1978, Ser. No. 905,938

Claims priority, application France, May 16, 1977, 77 14907; Aug. 1, 1977, 77 23616

Int. Cl.³ A61N 5/00

U.S. Cl. 128—395 **3 Claims**



1. A device for point-treatment of a patient, comprising a treatment head, a power supply unit, and a flexible connection therebetween, at least one laser diode carried by said treatment head, said treatment head comprising a body of generally cylindrical form, which terminates in a truncated portion, said truncated portion carrying a short cylindrical portion of smaller diameter than the diameter of said cylindrical body, said short cylindrical portion having an interior surface for defining a treatment orifice for selectively receiving said laser diode and an exterior surface for defining a mounting surface for mounting a separate end piece for selectively receiving said laser diode, and laser control energizing means located within said treatment head for controlling the laser diode, so that said diode emits laser pulses of light, said supply unit including means for applying trains of electric pulses to said laser control energizing means recurrently and in a controlled manner, said energizing means comprising a capacitor and a thyristor arranged in series circuit relationship with said laser diode, said supply unit including means connected across the capacitor and capable of charging the same, while electric pulses are applied to the control gate of said thyristor, the power supply unit including means for furnishing the laser diode with two different D.C. voltages, the lower voltage serving for detection purposes without considerable laser stimulation, the stronger voltage serving for the treatment with laser pulses, the power supply unit including means for switching a frequency parameter of said electric pulses, cyclically among a predetermined plurality of frequency values, and wherein the treatment head carries a first manual switch means for controlling energization of said laser diode, said treatment head also carrying a second manual switch means for controlling said cyclic switching of the frequency parameter, said means for switching a frequency parameter including a first generator in the supply unit, the basic recurrence frequency of the first generator being switchable among a plurality of selected frequencies, including means for adjusting the frequency parameter, step by step correction control means in said supply unit for effecting said adjustment of the frequency parameter, and wherein said treatment head includes a third manual switch means for actuating said step by step correction control means.

4,232,679

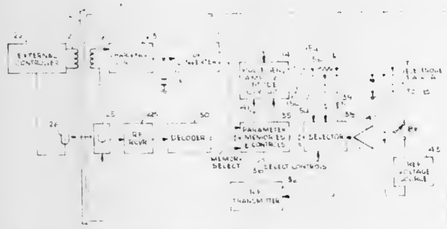
PROGRAMMABLE HUMAN TISSUE STIMULATOR

Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Jan. 26, 1977, Ser. No. 762,626

Int. Cl.³ A61N 1/36

U.S. Cl. 128—419 PG **35 Claims**



1. A programmable human tissue stimulator system comprising:

an implanted stimulating signal generator for generating body tissue stimulating pulses responsive to control signals,

an implanted memory means for storing control signals for controlling said stimulating signal generator,

external control means for generating a plurality of sets of signals, each set including control signals, and signals which represent a memory address in said memory means,

external means for transmitting said generated sets of signals;

an implanted receiver for receiving said sets of transmitted signals,

implanted means for verifying that the received signals in each set are accurate and for producing an accurate signal when each signal in a set has substantially either a first waveform or a second waveform,

an implanted memory address means for storing the memory address which is represented by the memory address representing signal in the set;

implanted means responsive to said accurate signal for entering selected ones of the received control signals in each set in the memory means at the memory address stored in said memory address means, and

implanted means for controlling said implanted stimulating signal generator with control signals from said memory.

4,232,680

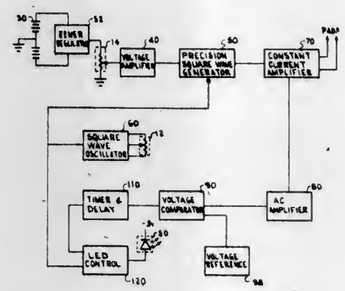
APPARATUS AND METHOD FOR TRANSCUTANEOUS ELECTROTHERAPY NERVE STIMULATOR

Bruce D. Hudleson, 2920 Ivy St., Titusville, Fla. 32780, and Joachim F. Mahnke, 75 Alhambra Dr., Merritt Island, Fla. 32952

Filed May 16, 1978, Ser. No. 906,696

Int. Cl.² A61N 1/36

U.S. Cl. 128—422 **22 Claims**



1. An electrotherapy apparatus for electrically treating a section of the patient's body, said electrotherapy apparatus comprising in combination:

first circuit means operatively coupled to a source of electrical energy for generating a squarewave output signal;

at least two pad means for being placed in operative electrical communication with the skin adjacent the body section to be treated; and second circuit means having an input operatively coupled to said first circuit means and having an output operatively coupled to said pad means, said second circuit means for amplifying said squarewave signal so as to deliver at said output thereof a constant current squarewave output signal representative of said squarewave signal at the input thereof, with said second circuit means further including current regulator means for holding constant the current level of said constant current squarewave output signal independent of the operative resistance of the body section between said pad means, whereby the area of the body operatively interposed between said pad means will be treated by said constant current squarewave output signal having a predetermined constant current level.

4,232,681

LEG POSITIONING DEVICE FOR X-RAY FILMING

Olaf Tulaszewski, Friedrich-Ebert-Str. 25, 6103 Griesheim near Darmstadt, Fed. Rep. of Germany

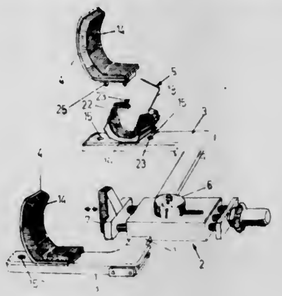
Filed Oct. 30, 1978, Ser. No. 955,962

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821251

Int. Cl.³ A61B 6/00

U.S. Cl. 128—653 **13 Claims**

1. A leg positioning device for X-ray filming, comprising supporting means, including an elongated guide member, a pair of laterally projecting outriggers mounted on respective end portions of said guide member for sliding movement lengthwise thereof, and a plurality of leg-engaging and retaining elements on the respective outriggers, so that a leg engaged by said elements extends lengthwise of said guide member from one to the other of said outriggers, said elements comprising one member for engaging and retaining a foot of the leg, and a pair of members for engaging and retaining the leg above the foot, any two of said members being jointly usable at one time; and pressure means for applying to the engaged leg intermediate said elements reproducible pressure acting in direction transversely of the elongation of said guide member and hence



of the leg, said pressure means comprising a pressure-exerting pusher component, mounting means mounting said pusher component on said guide member for movement lengthwise of the elongation of the same as well as transverse to said elongation toward and away from an engaged leg, and means for measuring and visually indicating the pressure which is being exerted by said pusher component upon the leg.

4,232,682

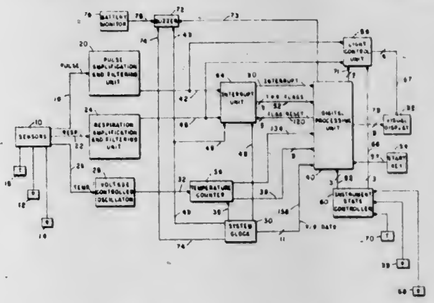
PHYSIOLOGICAL PARAMETER MEASURING SYSTEM

George J. Veth, Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 769,887, Feb. 18, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,642

Int. Cl.³ A61B 5/02

U.S. Cl. 128—671 **9 Claims**



1. A portable electronic apparatus capable of being transported to, and successively and rapidly servicing, individually a plurality of patients by simultaneously measuring temperature, pulse rate, and respiration rate for each successive patient, comprising:

a plurality of sensing means for measuring said temperature, pulse and respiration, respectively, and each simultaneously providing a signal corresponding to said temperature, pulse, and respiration, respectively;

converting means for receiving and converting said signals corresponding to said temperature, pulse and respiration, respectively, to produce corresponding digital data signals, said corresponding digital data signals including a series of measurement values leading to a single measurement value;

processing means for receiving and processing said corresponding digital data signals so as to calculate said single measurement value for temperature before said single measurement value for temperature is reached, and so as to calculate a pulse rate and a respiration rate, and for determining, by analysis of said corresponding digital data signals, invalidity of at least one of the temperature, pulse and respiration calculations, said processing means generating indication signals indicating said invalidity of said at least one of the temperature, pulse and respiration calculations;

indicator means responsive to said indication signals for alerting an operator of said portable electronic apparatus each time said invalidity of said at least one of the temperature, pulse and respiration calculations is indicated; and

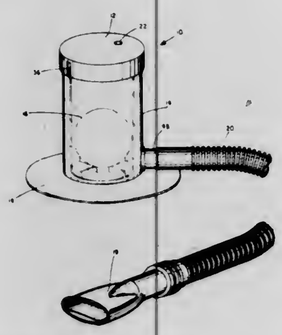
display means connected to said processing means for displaying said single measurement value for temperature, said calculated pulse rate, and said calculated respiration rate.

4,232,683

THERAPEUTIC INCENTIVE SPIROMETER

Victor L. Bartholomew, Hemet, Calif., and Harold R. Havstad, Eagle Point, Oreg., assignors to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Jul. 17, 1978, Ser. No. 924,919
Int. Cl.³ A61B 5/08; A63B 23/00
U.S. Cl. 128—725 **21 Claims**



1. An incentive spirometer comprising

a spirometer body having a lower wall, an outer wall and an inner wall concentrically oriented with respect to each other and separated by a passageway, said inner and outer walls extending generally normal to said lower wall,

an interior chamber defined by said inner wall, and cover means overlying said passageway and interior chamber,

gas inlet means for directing gas downwardly into said chamber,

passage means for directing gas out of said chamber, across said inner wall and into said passageway,

gas outlet means for directing gas out of said passageway, through said outer wall to the exterior thereof,

by-pass control means movably secured on said body and cooperating with said outer wall,

a closable by-pass gas opening defined by said by-pass control means cooperating with said outer wall through which gas from the exterior enters said passageway, and wherein the size of said opening is varied as said by-pass control means is moved on said body, and

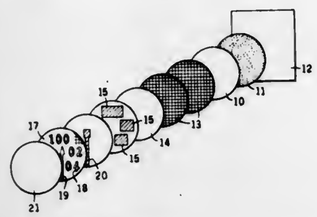
visual means associated with said interior chamber for indicating the rate of gas flow through said chamber.

4,232,684

FEVER THERMOMETER

Melvin Chervitz, c/o E. Z. Temp, Inc., P.O. Box 27505, St. Louis, Mo. 63141

Filed Jul. 14, 1978, Ser. No. 924,507
Int. Cl.³ A61B 10/00
U.S. Cl. 128—736 **1 Claim**



1. A fever thermometer comprising:

(a) a flexible backing web provided with a background color,

(b) an adhesive on one side of the web for securing the web to the skin of the human body,

(c) a plurality of numerical display areas in a predetermined attitude on the opposite side of the web, each numerical display area including an encapsulated liquid crystal indicator being responsive to a different specific temperature range, and the liquid crystal indicators being initially of a color to compliment the background color so as to be substantially invisible at temperatures below a minimum threshold temperature of the indicator having the lowest temperature range which is above the usual ambient temperature at which the thermometer is applied to the skin,

(d) a directional indicator on the said opposite side of the web for enabling adherence of the web with the numerical display areas in the predetermined attitude when the numerical display areas are substantially invisible at the usual ambient temperatures below the minimum threshold temperature when the thermometer is applied to the skin so that the numerical display areas can be easily read when made visible at temperatures within the responsive temperature ranges of the liquid crystal indicators after the thermometer is applied to the skin,

(e) a mask overlying the liquid crystal indicators, the mask having substantially the same color as the background color, and the mask being provided with windows disposed over and exposing the liquid crystal indicators to provide the numerical display areas, and

(f) the directional indicator is provided by:

(1) a window in the mask, and

(2) means providing a color contrasting with the background color located behind and visible through the directional indicator window.

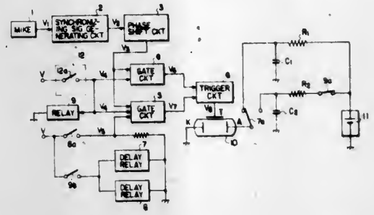
4,232,685

LARYNX STROBOSCOPE FOR PHOTOGRAPHY

Hironobu Nagashima, Tokyo; Koji Tuda, and Masatoshi Marui, both of Kami Fukuoka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,543
Claims priority, application Japan, Nov. 14, 1977, 52-136435
Int. Cl.³ A61B 1/04, 1/06
U.S. Cl. 128—773 **11 Claims**

1. In a larynx stroboscope adaptable for use with a camera for photographing a larynx the improvement comprising, means to generate a larynx vibration signal, a flash discharge tube having an anode and a cathode and selectively connected to a photographing charge discharge capacitor by the release operation of a camera, circuit means connected to said capacitor for precharging said capacitor during observation, means responsive to said release operation for disconnecting said capacitor from said circuit means, and for reconnecting said capacitor to said circuit means after the light emission of said flash discharge tube, whereby said capacitor is immediately ready for photographic operation upon said release operation, means to apply a trigger pulse to a trigger terminal of said flash discharge tube in synchronization with a vocal cord vibration



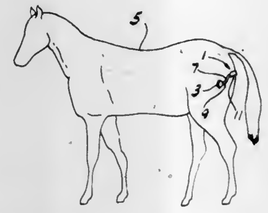
signal, wherein said flash discharge tube emits light while the shutter of said camera is open, and after a photographing operation is complete, the functions of said flash discharge tube are automatically restored to a state of light emission for observation before the shutter release operation.

4,232,686

METHOD AND APPARATUS FOR INDICATING THE ONSET OF PARTURITION

William G. Kammlade, Jr., 703 Taylor Dr., Carbondale, Ill. 62901

Filed Feb. 2, 1978, Ser. No. 874,464
Int. Cl.³ A61B 5/10
U.S. Cl. 128—775 **8 Claims**



1. Apparatus for indicating at a distance the onset of parturition in animals comprising:

a radio transmitter and a source of electrical power adapted to be secured to the pre-parturient animal at a position some distance from the vaginal orifice of said animal;

a rupturable assembly adapted to be mounted across the vaginal orifice of the pre-parturient animal and having a preferred rupture line so that when the vaginal orifice distends during the onset of parturition the assembly ruptures along the preferred rupture line; connecting means for connecting the transmitter to the source of electrical power, said means including a switch disposed intermediate the transmitter and the source of electrical power which switch when closed completes a circuit therebetween, thereby causing power to be supplied to the transmitter, said switch being secured to the rupturable assembly on one side of the preferred rupture line;

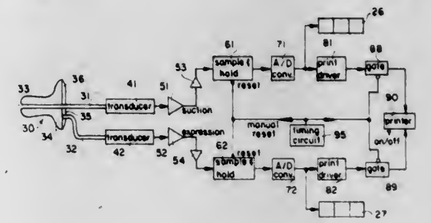
means for preventing the switch from completing a circuit between the transmitter and the source of electrical power while the rupturable assembly is unruptured, said preventing means being secured to the rupturable assembly adjacent the switch but on the opposite side of the preferred rupture line from the switch, the state of said switch except when it is proximate said preventing means being such as to complete the circuit between the transmitter and the source of electrical power, whereby at the onset of parturition the rupturable assembly ruptures, separating the switch from the preventing means, thereby completing a circuit between the transmitter and the source of electrical power, causing the transmitter to transmit a radio signal indicative of the onset of parturition.

4,232,687

APPARATUS AND METHOD FOR DETERMINING NEWBORN INFANT FEEDING CAPABILITY

Gene C. Anderson-Shanklin, Oak Park, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Sep. 1, 1977, Ser. No. 829,623
Int. Cl.³ A61B 5/00, 5/10
U.S. Cl. 128—777 **5 Claims**



1. Apparatus for recording parameters which are determinative of an infant's capability of taking oral nourishment safely, comprising:

a test nipple;

first and second transducer means adapted for coupling to said nipple, said first transducer means being operative to generate a suction-indicative electrical signal and said second transducer means being operative to generate an expression-indicative electrical signal;

timing means for defining successive time intervals of predetermined duration;

means coupled to said first transducer means and to said timing means for detecting and storing the peak value of said suction-indicative signal which occurs during each of said successive time intervals;

means coupled to said second transducer means and to said timing means for detecting and storing the peak value of said expression-indicative signal which occurs during each of said successive time intervals; and

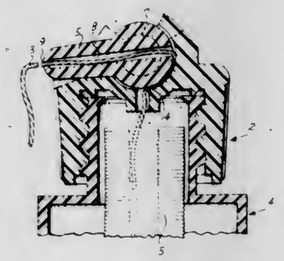
means for displaying the stored peak suction-indicative and expression-indicative signal values.

4,232,688

DENTAL GINGIVAL RETRACTION CORD DISPENSER

Reed H. Day, Bothell, Wash., assignor to Pascal Company, Inc., Bellevue, Wash.

Filed Sep. 26, 1978, Ser. No. 945,830
Int. Cl.³ A61C 15/00
U.S. Cl. 132—91 **10 Claims**



1. A cord dispensing device comprising:

a first cord dispensing means defining a first cord passage passing completely therethrough, said first cord dispensing means having a curved surface portion;

a second cord dispensing means defining a second cord passage passing completely therethrough, wherein said first and second cord dispensing means are held in a movable relation with respect to each other; and

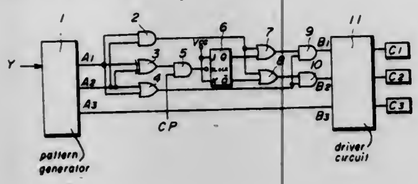
a cord threaded through said first and second cord passages; wherein said second cord dispensing means includes ridge means for pinching said cord against said curved surface portion of the first cord dispensing means when said first and second cord passages are nonaligned, to prevent inadvertant retraction of said cord through said second cord passage and to hold said cord so that it may be conveniently cut after being dispensed from said cord dispensing device; said ridge means also being for preventing said cord from moving substantially in an axial direction relative to said second cord passage when said first and second cord passages are moved towards alignment to thereby automatically dispense a length of said cord from said first cord passage as said passages are moved towards alignment.

4,232,689

COIN DISPENSER

Takakazu Nagasaka, Nara, and Yasuhide Nakamura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1978, Ser. No. 957,104
Claims priority, application Japan, Nov. 5, 1977, 52-150065
Int. Cl.³ G07D *1/00*; B65H *3/44*
U.S. Cl. 133—4 A **7 Claims**



1. A control system for a coin dispenser including a plurality of containers, at least two of said containers containing coins of a same kind; a pattern generator for developing container selection signals in response to a coin dispensation amount signal applied thereto; and a drive means for selecting desired containers in accordance with the container selection signals derived from said pattern generator, said control system comprising:

digital logic switching means operatively connected between said pattern generator and said drive means for sequentially selecting one of said at least two containers in response to said container selection signals derived from said pattern generator, said logic switching means uniformly dispensing said coins of the same kind from said at least two containers.

4,232,690

COIN KIND AND NUMBER SETTING AND ADJUSTING DEVICE FOR COIN PACKAGING MACHINE

Kenkichi Watanabe, and Katusuke Furuya, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,787
Claims priority, application Japan, Aug. 31, 1977, 52-105360
Int. Cl.³ G07D *09/04*
U.S. Cl. 133—8 R **1 Claim**

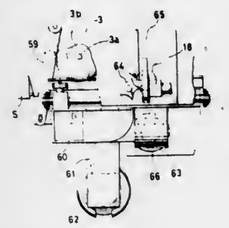
1. A coin packaging machine having a packaging mode, wherein a specific kind of coins is selected, a relatively small packaging number of coins being determined in accordance with the specific kind of coins and the determined number of coins being packaged, said machine having a counting mode, wherein a relatively large number of coins is counted, comprising:

coin kind setting dial means for setting a kind of coins in the packaging mode,

coin kind setting switches actuated by said coin kind setting dial means,

first means operatively connected to said coin kind setting switches for determining the packaging number of the coins of the set kind,

coin number setting dial means for setting the counting number of coins in the counting mode,



coin number setting switches actuated by said coin number setting dial means,

second means operatively connected to said coin number setting switches for determining the counting number of coins,

a cam provided on said coin number setting dial,

switch means actuated by said cam for selectively supplying electric power to either said coin kind setting switches or said coin number setting switches so as to select either the packaging mode or the counting mode,

packaging chute means driven by said cam for receiving coins to be packaged, and

counting chute means driven by said cam for receiving coins to be counted.

4,232,691

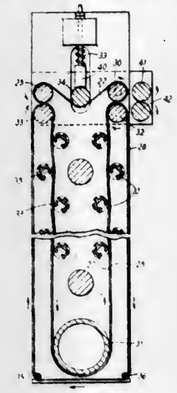
PROCESSING OF SHEET MATERIAL IN A LIQUID BATH

Sidney Grant, 46 Salmon St., Kingsbury, London N.W.9, England

Filed Feb. 5, 1979, Ser. No. 9,353
Claims priority, application United Kingdom, Feb. 7, 1978, 4916/78
Int. Cl.³ G03D *3/12*
U.S. Cl. 134—104 **10 Claims**

1. Apparatus for processing sheet material in a bath of liquid comprising a container for the liquid, a pair of drivable endless bands, means driving said bands and means mounting the bands to receive the sheet material between the bands, hold the material between the bands to transport the material through the container, and deliver the material from between the bands after immersion in the liquid, wherein at least one of the bands is composed of permeable material to allow access of liquid to the side of the sheet material in contact with the permeable band and guide members are mounted in the container to extend transverse to the bands and engage the outer faces of the bands, said bands passing between said guide members, wherein the permeable band is composed of a synthetic fabric

and the guide members are scraper bars positioned for defining a sinuous path for the bands, said scraper bars having edges



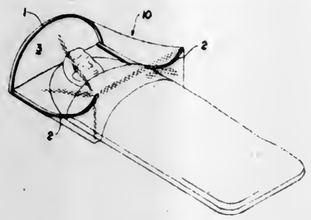
which engage the outer faces of the bands and serve to move liquid through the permeable band and scrape dirt therefrom.

4,232,692

CANOPY FRAME

Philip A. Atkins, Rte. 2, Box 801, Chico, Calif. 95926

Filed Dec. 22, 1978, Ser. No. 972,401
Int. Cl.³ A47C *29/00*
U.S. Cl. 135—5.1 **5 Claims**



1. A canopy frame for supporting a netting or the like comprising in combination:

a substantially "U" shaped frame member in which terminal portions of legs of said "U" shaped frame member are spaced apart and said "U" shaped element lies totally in one plane,

a pair of spaced parallel elements having substantially flat portions connected orthogonally to said terminal portions of said "U" shaped frame, thereby adapted to serve as a support base,

said spaced parallel coextensive elements each terminating in an arcuate portion, curved so as to extend in a same direction as said U shaped member, whereby end areas of said arcuate portions never are interbraced and each end area is equidistant from an axis of symmetry of said U shaped frame member.

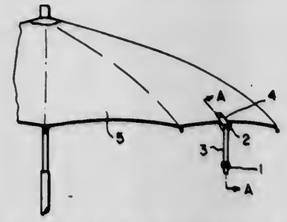
4,232,693

FOLDING UMBRELLA

Toshio Matsuda, 4-7 Miyamaecho Sanjo, Nara-shi, Nara-ken, Japan

Filed Oct. 27, 1978, Ser. No. 955,484
Claims priority, application Japan, Oct. 28, 1977, 52-129958
Int. Cl.³ A45B *25/18*
U.S. Cl. 135—36 F **2 Claims**

1. A folding umbrella comprising a collapsible central shaft, a movable frame consisting of foldable ribs coupled to one end of the shaft, an unfurlable material coupled to the foldable ribs, a guide mounted on the edge of said material such that said guide loops around an edge of the material and a belt swing-



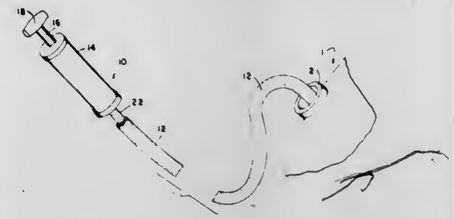
ingly coupled at one end to said guide whereby the umbrella may be furled not only when the umbrella is folded up but also when the umbrella is not folded up.

4,232,694

SIPHON

Francis R. Williams, 500 Lunalilo Home Rd., Apt. 16F, Honolulu, HI. 96825

Filed Jan. 19, 1979, Ser. No. 4,772
Int. Cl.³ F04F *10/00*
U.S. Cl. 137—1 **9 Claims**



9. A siphoning method comprising inserting a distal end of an elongated main tube in a tank containing fluid to be siphoned, positioning a connector tube in a proximal end of the main tube, the connector tube having a distal end within the main tube and having a proximal end extending from the proximal end of the main tube connecting to the connector tube, connecting to the connector tube an evacuating pump having a cylinder with an inlet end by inserting a nipple connected to the inlet end of the cylinder into the proximal end of the connector tube, positioning a piston within the cylinder near the inlet end and connecting a plunger to the piston and extending the plunger out of a second end of the cylinder remote from the inlet end, pulling outward on a handle on an end of the plunger remote from the piston and creating a reduced pressure within the cylinder and thereby within the nipple, within the connection tube and within the main tube, contacting a second end of the cylinder with the plunger and continuing pulling outward on the handle and pulling on the cylinder, nipple and connector tube, and thereby pulling the connector tube from the main tube, permitting free unobstructed flow of a siphoned fluid from the main tube.

4,232,695

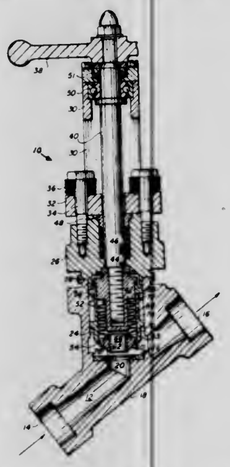
FLUID CONTROL VALVE AND METHOD

Frank L. Roberge, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 18, 1978, Ser. No. 970,714
Int. Cl.² F16K *1/44*
U.S. Cl. 137—1 **31 Claims**

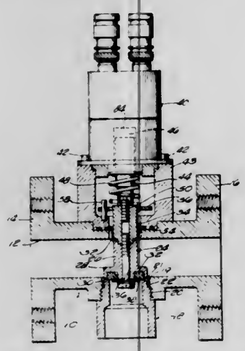
1. A method of redundantly interrupting pressurized fluid flow through a duct, comprising the following steps occurring sequentially in response to movement of a single actuator:

driving a first poppet into fluid sealing engagement with a first seat, said first poppet being driven by the actuator through a compressible, impermeable bellows;
generating a fluid pressure differential on said compressible



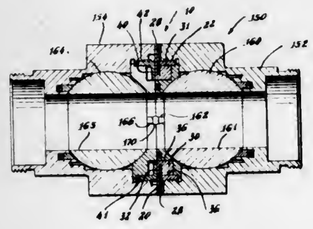
impermeable bellows urging said first poppet toward said first seat;
compressing the compressible impermeable bellows; and
driving a second poppet into fluid sealing engagement with a second seat located downstream of said first seat.

4,232,696
DRAIN VALVE ASSEMBLY
Robert E. Burris, New Berlin, and Robert J. Budyak, Greendale, both of Wis., assignors to Prime Manufacturing Corporation, Oak Creek, Wis.
Filed Oct. 3, 1977, Ser. No. 838,754
Int. Cl.³ E03B 7/10; F16K 31/04
U.S. Cl. 137—62 **3 Claims**



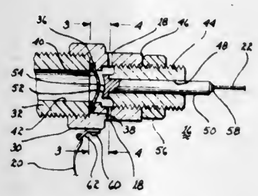
1. A drain valve assembly for a fluid system comprising:
a valve body having a flow passageway therein and fluid connector means for establishing fluid connection between said flow passageway and a fluid system, said flow passageway of said valve body having a thermally conductive wall portion, said valve body further having a thermostat mounting cavity therein located opposite said thermally conductive wall portion;
a drain assembly means including a drain port mounted in the lower portion of said valve body, said drain assembly means including a stationary valve seat surrounding said drain port;
a valve assembly means mounted for reciprocal movement in said valve body passageway towards and away from said stationary valve seat, said valve assembly means including a valve closure member adapted to move into and out of sealing engagement with said stationary valve seat when said valve assembly means is reciprocated, said valve closure member being removably mounted in a valve closure mounting member;
a solenoid operator means mounted on said valve body, said solenoid operator means operatively connected to said valve assembly means to impart a reciprocating movement thereto when said solenoid operator means is energized;
a thermostat assembly means removably mounted in said thermostat mounting cavity of said valve body, said thermostat assembly means including a temperature sensing thermostat element positioned closely adjacent said thermally conductive wall portion of said valve body, said thermostat element being responsive to the temperature of the fluid in said valve body;
electrical control circuit means including a source of electrical energy and electrical conductor means connecting said source of energy with said solenoid operator means and said thermostat assembly means, said electrical control circuit means operative so that when the temperature of said temperature sensing element of said thermostat assembly means reaches a predetermined minimum, said solenoid operator means will be energized to move said valve assembly means from its closed position to its open position; and
said valve assembly further including an actuator member extending through an opening in the upper portion of said valve body, said actuator member interconnecting said valve closure mounting member with said solenoid operator means, said actuator member being sealed in said opening by a rolling diaphragm sealing member, said rolling diaphragm sealing member being captured between said valve closure mounting member and said actuator member.

4,232,697
FRANGIBLE CONNECTORS WITH INDEPENDENTLY SELECTABLE BENDING AND TENSION SEPARATION LOADS
Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn. 06477
Filed Apr. 26, 1978, Ser. No. 900,329
Int. Cl.³ F16K 17/40
U.S. Cl. 137—68 R **26 Claims**



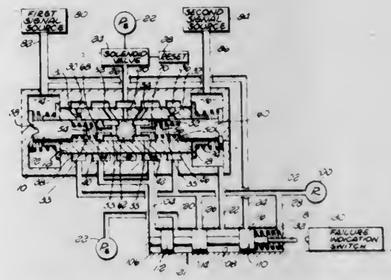
1. A frangible connector insert for frangibly connecting two members comprising:
(A) a tension ring secured to one of the members, the tension ring having an axially disposed surface and defining a plurality of radially disposed openings intersecting the axially disposed surface;
(B) a moment arm ring having an axially disposed surface and a radially disposed surface, the moment arm ring closely received by the tension ring to create an axial interface between their respective axially disposed surfaces, the moment arm ring defining an opening aligned with each opening in the tension ring;
(C) tension-mode frangible means disposed in the openings in the tension ring and extending across said axial interface between the tension ring and the moment arm ring into moment arm ring, the tension-mode frangible means holding the tension ring and moment arm ring together, the tension-mode frangible means shearing upon application of a tension load of sufficient magnitude to permit the tension ring and the moment arm ring and the members connected thereto to separate;
(D) a bending ring secured to the other of the members, the bending ring having a radially disposed surface for interfacing with the radially disposed surface of the moment arm ring; and
(E) bending-mode releasable means connecting the bending ring and the moment arm ring and thereby holding the members together, the bending-mode releasable means releasing upon application of a bending load of sufficient magnitude to permit the bending ring and moment arm ring and the members respectively connected thereto to separate
whereby when tension loads are applied, the tension-mode frangible means shear to permit the members to separate, and when bending loads are applied, the bending-mode releasable means release to permit the members to separate, wherein the magnitude of the tension-mode separating load and the bending-mode separating load are independently selectable.

4,232,698
PRESSURE RELIEF VALVE WITH PRESSURE INDICATING MEANS
Craig Hosterman, Scottsdale, and William J. Kerwin, Tucson, both of Ariz., assignors to Products of Advanced Technology, Inc., Phoenix, Ariz.
Filed Sep. 28, 1978, Ser. No. 946,627
Int. Cl.³ F16K 17/40; G01L 9/12
U.S. Cl. 137—68 R **11 Claims**



1. A pressure relief valve apparatus operatively attached to a high pressure cylinder for providing an indication of the pressure within the cylinder, said apparatus comprising in combination:
a. impedance means disposed within the pressure relief valve for providing an impedance representative of the pressure within the cylinder, said impedance means comprising a capacitor and including a flexible disc flexibly responsive to the pressure within the cylinder, said disc being electrically coupled as a positionable plate of said capacitor, said disc being rupturable in the event of a pressure rise within the cylinder above a predetermined value;
(b) an end plate disposed in proximity to said disc in fixed relationship thereto, said end plate being electrically coupled as a fixed plate of said capacitor; and
(c) means for sensing the impedance and providing an indication reflective of the pressure within the cylinder;
whereby, movement of said disc relative to said end plate varies the impedance of said capacitor.

4,232,699
HYDRO-MECHANICAL FAILURE DETECTION AND LATCHING APPARATUS
William W. Hsu, Burbank, Calif., assignor to Textron Inc., Providence, R.I.
Filed Jan. 12, 1979, Ser. No. 2,827
Int. Cl.³ F16K 31/12
U.S. Cl. 137—87 **7 Claims**

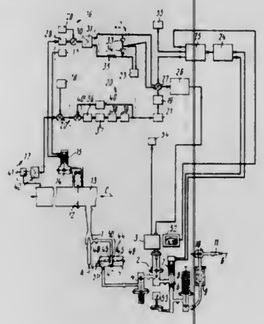


1. Hydromechanical failure detection and latching apparatus comprising:
(A) a housing;
(B) a sleeve defining a bore longitudinally therethrough and slidably disposed in said housing;
(C) means for applying first and second pressure signals to be monitored to opposite ends of said sleeve for causing said sleeve to slide responsive to a predetermined difference between said signals;
(D) a piston slidably disposed within said bore in said sleeve and movable therein between first and second limit positions;
(E) spring means centering said piston centrally of said bore in said sleeve;
(F) said piston defining reentrant bores at each end thereof and separated by a central portion of said piston;
(G) a source of fluid under pressure; and
(H) passageway means for communicating said fluid pressure from said source through one of said reentrant bores to an end area of said piston responsive to sliding of said sleeve, said central portion of said piston normally blocking said passageway means, said piston moving to one of its said limit positions responsive to application of said source of fluid pressure to an end of said piston.

4,232,700
METERING DEVICE
Iokhannes I. Sutt, ulitsa Vyistluse, 23/25, kv. 69, Tallin, U.S.S.R.
Filed Jul. 21, 1978, Ser. No. 926,817
Claims priority, application U.S.S.R., Jan. 17, 1978, 2562096
Int. Cl.³ G05D 11/08
U.S. Cl. 137—93 **11 Claims**

1. In a metering device determining and controlling the content of a gas in a liquid fed through a main, comprising:
an ejector for mixing said gas with said liquid, hydraulically associated with said main;
a first actuating mechanism;
a gas flow controller coupled to said first actuating mechanism;
a vacuum diaphragm valve coupled to said gas flow controller and pneumatically associated with said ejector;
a line for feeding said gas;
a gas pressure controller located on said gas feed line;
a first differential inductive pickup;
a rotameter coupled to said first differential inductive pickup for measuring the flow rate of said gas;
said rotameter being coupled to said gas flow controller and to said gas pressure controller;

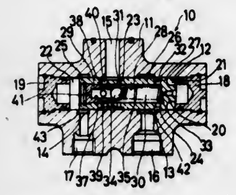
a restricting means arranged in said main;
a second differential inductive pickup;
a first converter;
a differential pressure gauge hydraulically associated with said restricting means and coupled to said second differential inductive pickup;
said restricting means, said differential pressure gauge, said second differential inductive pickup, and said first converter comprising a liquid flow meter;
the improvement comprising:
a concentration meter located on said main at a distance, from said ejector, sufficient for measuring the steady concentration of said gas in said liquid;
a device for setting the concentration of said gas in said liquid;
a gas-to-liquid ratio setter;
a second actuating mechanism coupled to said gas-to-liquid ratio setter;



an electronic gas-to-liquid ratio setter correction controller coupled to said device for setting the concentration of said gas in said liquid, coupled to said concentration meter, and coupled, via said second actuating mechanism, to said gas-to-liquid ratio setter;
a liquid flow meter;
a first signal distributor coupled to said first converter and to said liquid flow meter;
a second signal distributor;
a second converter coupled to said first differential inductive pickup and to said second signal distributor;
an electronic gas-to-liquid flow ratio controller connected between said gas-to-liquid ratio setter and first said actuating mechanism, and coupled to said first and second signal distributors; and
a pilot-operated check value connected between said ejector and said vacuum diaphragm valve.

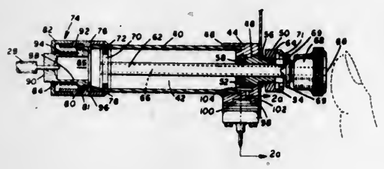
4,232,701
FLOW DIVIDER VALVE
Yoshiharu Adachi, Gamagori, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Apr. 24, 1979, Ser. No. 32,890
Claims priority, application Japan, Apr. 25, 1978, 53-48852
Int. Cl.³ G05D *11/03*
U.S. Cl. 137—101 **13 Claims**

1. A valve for dividing the flow of a fluid having a variable flow volume into two flows of said fluid having a substantially constant ratio of flow volumes, comprising:
(a) a body having a cylindrical bore, an inlet port, and first and second outlet ports;
(b) a valve spool axially slidably disposed in said cylindrical bore and dividing said cylindrical bore into first and second chambers;
(c) first passage means for flow of said fluid between said inlet port and said first chamber, and between said inlet port and said first outlet port, including:
(1) a first variable orifice formed by cooperation of the cylindrical bore of said body and said valve spool, the opening of said first variable orifice being varied by axial movement of said spool within said cylindrical bore; and
(2) a first orifice between said inlet port and said first variable orifice;
(d) second passage means for flow of said fluid between said inlet port and said second chamber and between said inlet port and said second outlet port, including:
(1) a second variable orifice formed by cooperation of the cylindrical bore of said body and said valve spool, the opening of said second variable orifice being varied by



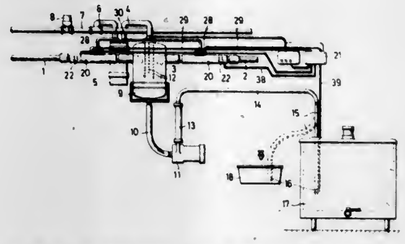
axial movement of said spool within said cylindrical bore; and
(2) a second orifice between said inlet port and said second variable orifice;
(e) the fluid pressure in said first and second chambers being proportional to the pressure of said fluid at said inlet port and acting on respective opposite ends of said valve spool for axial translation of said valve spool in said cylindrical bore for varying the openings of said first and second variable orifices; and
(f) normally closed valve means subjected to the difference between fluid pressure at said inlet port and fluid pressure in said first chamber for permitting, at a predetermined value of said pressure difference, fluid flow from said second passage means for increasing fluid flow through said first outlet port.

4,232,702
PRIMING APPARATUS FOR LIQUID INK WRITING INSTRUMENTS
Ronald J. Geil, Vermilion, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.
Division of Ser. No. 859,902, Dec. 12, 1977, Pat. No. 4,170,016. This application Jun. 28, 1979, Ser. No. 52,810
Int. Cl.³ F16K *17/04*
U.S. Cl. 137—115 **1 Claim**



1. An improved pressure relief valve, comprising:
a housing having an inlet opening and a pressure relief opening;
a piston slidably located in said housing wherein said pressure relief opening is axially aligned with said piston and said piston extends loosely through said pressure relief opening;
means for biasing said piston toward said inlet opening;
seal means between said piston and said housing for normally preventing fluid flow therebetween;
passage means located in said piston for connecting inlet pressure to said pressure relief opening upon movement of said piston through a predetermined distance against the action of said biasing means; and
an outlet passage through said piston.

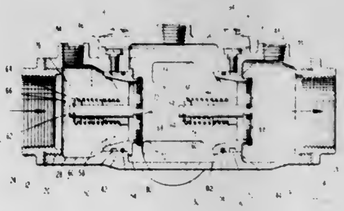
4,232,703
SAFETY CLOSE-OFF VALVE ARRANGEMENT FOR PIPE CONDUIT SYSTEMS AND INSTALLATIONS
Antonio M. Celi, Neustadt, Fed. Rep. of Germany, assignor to Karl W. Wiegand, Hennef, Fed. Rep. of Germany
Filed Dec. 21, 1977, Ser. No. 862,820
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 26583619
Int. Cl.³ F16K *31/00*
U.S. Cl. 137—172 **5 Claims**



1. A safety arrangement for separating liquids including milk, extraneous water and cleansing medium, for use with a system including a first running container, two supply conduits located upstream of the first running container and supplying the liquid into the latter, a negative pressure device connected with the first running container, an automatic cleansing device operative with the cleansing medium, a pump located downstream of and conveying the liquids from the first running container, and separate receiving means for receiving the respective liquids, the arrangement comprising sensing means operative for sensing characteristics of the different liquids and including two first sensing elements each located in a respective one of the supply conduits upstream of the first running container, and a second sensing element located downstream of the pump and immediately upstream of the receiving means so as to sense the characteristic of the liquids at these substantially spaced locations; closing means including two close-off valves each located between a respective one of said first sensing elements and the first running container and connected with the negative pressure device so as to operate by the latter; and common electronic control means arranged to electronically connect said sensing means with said closing means so as to actuate the latter in response to sensing of characteristics of the liquids by said sensing means.

4,232,704
IN LINE BACK FLOW PREVENTER
Bernard S. Becker, Belmont; John K. Bowman, Brighton, and Cyril A. Randall, Belmont, all of Mass., assignors to Amtrol Inc., West Warwick, R.I.
Filed Mar. 28, 1978, Ser. No. 890,964
Int. Cl.³ F16K *15/06*, *45/00*
U.S. Cl. 137—218 **17 Claims**

1. A device for preventing the back flow of water from a point of use into a water supply line comprising:
(a) a unitary casing having a water inlet opening, a water outlet opening, a drain vent inlet opening, and a removal opening, said water inlet and water outlet openings being coaxially aligned, the interior of said casing defining an inlet chamber, a central chamber, an outlet chamber, a first communicating passage between the inlet chamber and the central chamber and a second communicating passage between the central chamber and the outlet chamber, said chambers being coaxially aligned with each other and with said water inlet and water outlet openings to form a straight through flow path for the water, said interior of said casing also defining a drain vent chamber communicating with said drain vent opening and said central chamber, said drain vent chamber being offset from said coaxially aligned inlet, central and outlet chambers, said removal opening directly communicating with said central chamber;
(b) a first check valve assembly detachably mounted in said first communicating passage at the central chamber end thereof, in a manner which, after detachment of said first check valve assembly, allows removal of said first check valve assembly from said casing only via said central chamber, said first check valve being biased in a closed position to prevent the flow of water therethrough and opening to permit the flow of water therethrough when the water pressure in the water inlet chamber exceeds a predetermined level, said first check valve being coaxially aligned with said water inlet and outlet openings and said inlet, central and outlet chambers;
(c) a second check valve assembly detachably mounted in said second communicating passage at the central chamber end thereof, in a manner which, after detachment of said second check valve assembly, allows removal of said second check valve assembly from said casing only via said central chamber, said second check valve being biased in a closed position to prevent flow of water therethrough when the water pressure in said central chamber exceeds a predetermined level, said second check valve being coaxially aligned with said water inlet and outlet openings and said inlet, central and outlet chambers;



(d) a relief valve located within said casing interposed between said central chamber and said drain vent chamber, said relief valve being biased in an open position, said relief valve being offset from said coaxially aligned inlet, central and outlet chambers;
(e) a flexible diaphragm attached to said casing and to said relief valve, one side of said diaphragm communicating with said central chamber and with said drain vent opening, said central chamber communicating with said drain vent opening by a communicating route, including a valve seat passage, through said relief valve, the other side of said diaphragm communicating with said inlet chamber, said relief valve having an element which closes said valve seat passage when there is a pressure differential between said inlet and central chambers caused by flow of water from said inlet chamber into said central chamber through said first communicating passage, thereby preventing water flow from said central chamber to said drain vent chamber, said valve seat passage being open when said pressure differential is not present; and
(f) a cover removably attached to said casing over said removal opening therein, said first and second check valve assemblies being removable from said central chamber without removal of said flexible diaphragm when said cover is detached.

4,232,705

AUTOMATIC ROTARY IRRIGATION SYSTEM

James M. Hait, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 5, 1978, Ser. No. 903,320
Int. Cl.³ B05B 3/00
U.S. Cl. 137—899.1 **10 Claims**



1. An automatic rotary irrigation system for connection to a source of water for irrigating a relatively large area of land, said source being located at the center of the area to be irrigated, said system comprising a length of tubing for carrying water;

a plurality of irrigation outlets arranged in spaced relationship along said length of tubing for discharging water therefrom;

means for pivotally connecting one end of said tubing to said source;

a power mover connected to the opposite end of said tubing to pivotally move said tubing in a generally circular path around said source;

means for supporting said tubing at spaced points along the length thereof and for permitting it to traverse said area when said power mover moves said tubing;

control means for intermittently actuating said power mover, said control means including valve means for interrupting the flow of water from said source to said tubing, drain means for draining the water from said tubing, said drain means being responsive to said valve means to drain said tubing in response to the interruption of said flow in said tubing, a timing mechanism which periodically actuates said valve means according to a predetermining schedule, said control means actuating said power mover for a predetermined amount of time corresponding to a desired angular advance only while said valve means is actuated so that said tubing will be substantially empty of water when it is moved about said source.

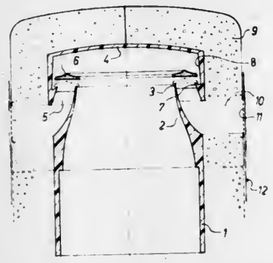
4,232,706

AUTOMATIC VALVE DEVICE FOR SANITATION WASTE PIPES

Kurt S. B. Ericson, Goudenregenlaan, 17, B-2610 Wilrijk, Belgium

Filed Aug. 31, 1978, Ser. No. 938,337
Claims priority, application Belgium, Aug. 31, 1977, 858265
Int. Cl.³ E03C 1/295
U.S. Cl. 137—375 **8 Claims**

1. An automatic valve device connectable to a sanitation waste pipe for preventing discharge of waste gas from the pipe to the atmosphere and for admitting atmospheric air into the waste pipe in response to a pressure reduction in the waste pipe, which comprises a tubular member having an open bore extending therethrough with an upper conical section which tapers inwardly and upwardly, a cylindrical cover member overlying said upper conical section having a top wall spaced above the upper end of said conical section to form a valve seat chamber and an interior wall having an inwardly extending portion spaced radially from at least part of the upper portion of said conical member to form an annular flow passage therebetween communicating with the valve seat chamber, said inwardly extending portion defining with the upper edge of



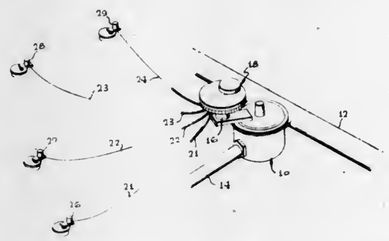
said conical section a support seat, a valve member movably mounted in said seat chamber and having a base portion designed for reception on said support seat to close said annular flow passage, said valve member being movably operative within said chamber to close said annular flow passage when the waste gas pressure in the waste pipe equals or exceeds atmospheric pressure and to open said flow passage to admit atmospheric air to the waste pipe when the waste gas pressure in the waste pipe is less than atmospheric pressure.

4,232,707

CONTROLLER FOR FLUID FLOW SYSTEMS

Oded E. Sturman, and Benjamin Grill, both of Northridge, Calif., assignors to Hydronic Systems, Inc, Woodland Hills, Calif.

Filed Jul. 25, 1978, Ser. No. 927,942
Int. Cl.³ G05B 11/01
U.S. Cl. 137—624.2 **7 Claims**



1. A fluid flow controller comprising:

a timing circuit which generates watering duration signals at predetermined intervals;

a cascade terminal; and

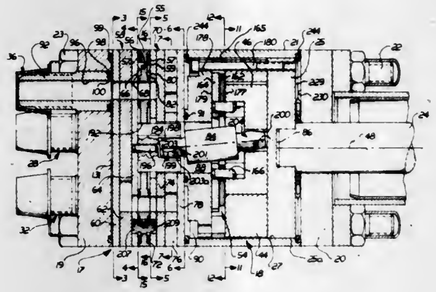
a stepper and control circuit having output terminals, and responsive to a pulse on said cascade terminal for generating an "on" pulse on a first output to turn on a valve, and responsive to signals from said timing circuit after generation of the "on" pulse to generate off and on control pulses on other outputs including an "off" pulse on said first output to turn off the valve and an "on" pulse on a second output to turn on a second valve, and an "off" pulse on the second output to turn off the second valve.

4,232,708

FLUID CONTROLLER

Laurence L. Miller, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 25, 1979, Ser. No. 51,795
Int. Cl.³ F15B 13/04, 13/10, 13/14
U.S. Cl. 137—625.21 **17 Claims**



1. A controller for controlling flow from a source to a motor, said controller having an inlet port for connection to the source and a working port for connection to the motor, said controller further including a pair of spaced apart end plates, a metering section and a control valve section disposed between said spaced apart end plates, an input shaft extending through one of said end plates and adapted to provide an input signal for operating said metering section and said control valve section, said control valve section comprising a plurality of adjacent plate valve members fixed between said spaced apart end plates, said plurality of fixed plate valve members defining a fluid chamber in fluid communication with said inlet port, the outer periphery of said plurality of fixed plate valve members, the outer periphery of a part of said metering section and the outer periphery of said end plates forming a part of the outer periphery of said controller, a movable plate valve member disposed in said fluid chamber, said movable plate valve member being movable in response to the input signal from a neutral condition to an operating condition for directing fluid from said inlet port to said metering section and from said metering section to said working port to direct metered flow to the motor.

10. A controller for controlling fluid flow from a source to a motor, said controller having an inlet port for connection to the source, a return port for connection to a reservoir, and a pair of working ports for connection to opposite sides of the motor, said controller further including a metering section and a control valve comprising a pair of relatively rotatable plate valve members having facing end surfaces in sliding abutting relation with each other, said plate valve members having a neutral condition blocking flow from the inlet port to the metering section and being rotatable away from said neutral condition to an operating condition to form flow passages directing metered flow to the motor through one working port and return flow from the motor to the reservoir through the other working port, a pressure dam groove disposed in the facing end surface of one of said relatively rotatable plate valve members, said pressure dam groove communicating with said return port when said plate valve members are in said neutral condition and disposed so as to be positioned between flow passages at metered fluid pressure and flow passages at return pressure when the plate valve members are rotated to an operating condition, the abutting facing end surfaces of said relatively rotatable plate valve members cooperating to block flow from the inlet port through the pressure dam groove to the return port when the plate valve members are in the neutral condition and to form a static body of fluid in said pressure dam groove in response to movement of said plate valve members to an operating condition, and fluid passage means in the facing end surface of the other plate valve member defining part of a fluid passage communicating said static body of fluid in said pressure dam groove with said inlet port in response to movement of said plate valve members to said operating condition to bring the pressure in said pressure dam groove to inlet pressure in order to minimize leakage of metered fluid to the return port.

11. A controller for controlling fluid flow from a source to a primary motor and to an auxiliary motor, said controller comprising a metering section for metering fluid flow in response to an input signal and a control valve section for directing fluid flow to the auxiliary motor and to the primary motor in response to said input signal, said control valve section comprising a series of adjacent plate valve members, said series of plate valve members being biased to a neutral condition and being relatively movable away from said neutral condition to place said controller in an operating condition, means for effecting relative movement of said plate valve members in response to said input signal to position said plate valve members in said operating condition, said plate valve members defining fluid passages for directing all flow from the source to the auxiliary motor when said plate valve members are in said neutral condition, said plate valve members defining other fluid passages for directing a flow of fluid from the source to said metering section and from said metering section to the primary motor when said plate valve members are in an operating condition, and said plate valve members having relatively movable surfaces which cooperate to restrict flow to the auxiliary motor as a function of the extent of the relative movement of the plate valve members away from said neutral condition.

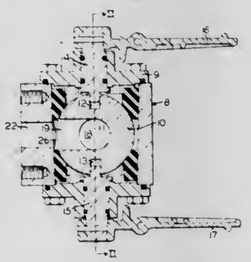
14. A controller for controlling fluid flow from a source to a motor, said controller comprising a series of relatively rotatable plate valve members for controlling flow to said hydraulic motor, said relatively rotatable plate valve members having a neutral condition and being relatively rotatable away from said neutral condition to an operating condition, first biasing means exerting a centering force on said plate valve members when said plate valve members are in said neutral condition and which force must be overcome to rotate said plate valve members away from said neutral condition, second biasing means for exerting an additional amount of centering force on said plate valve members for biasing said plate valve members to said neutral condition in response to a predetermined amount of relative rotation of said plate valve members away from said neutral condition.

4,232,709

FOUR-WAY BALL VALVE

Michael T. Zoric, N. Versailles, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 20, 1978, Ser. No. 953,146
Int. Cl.³ F16K 11/087
U.S. Cl. 137—625.47 **3 Claims**



1. A four-way ball type valve device for selectively controlling communication between two or more ports formed therein, said valve device comprising:

(a) a casing having at least three ports connectable to respective pipes;

(b) a ball-shaped valve member having a first passageway extending diametrically therethrough and a branch passageway normal to and intersecting said first passageway, said valve member being rotatably disposed in said casing and selectively operable to a plurality of positions in each of which positions fluid pressure is communicated between two or more of said ports via said passageways in said valve member; and

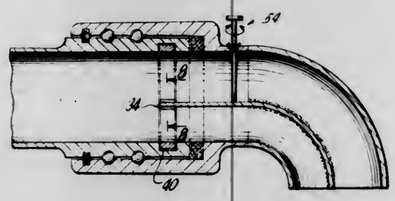
(c) a sealing element sealingly disposed between said casing and said valve member and having at least three openings therein registering with said ports in the casing, said sealing element having an inner surface contour complementing the outer surface of the ball-shaped valve member and providing sufficient clearance therebetween for permitting snug rotating action of the valve member therein and sufficient displacement thereof, responsively to fluid pressure in said passageways, for applying sealing pressure of the valve member against the cut-off port when only two of said ports are in communication with each other.

4,232,710

LIQUID PIPELINE EXTENDED VANE ELBOW

Donald J. Gallo, Whippany; Thomas L. Roscetti, Rockaway; Alan E. Emslie, Mountainside, all of N.J., and Frederick G. Hammitt, Ann Arbor, Mich., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1979, Ser. No. 8,874
Int. Cl.³ F15D 1/04
U.S. Cl. 138—39 **10 Claims**



1. A passage for flow of liquid therethrough comprising at least a curved pipe elbow section and an adjacent upstream straight pipe section adapted for receiving liquid flow in a direction from said straight section to said elbow section, at least a single curved vane mounted in said passage of said curved pipe elbow section at a predetermined constant radius, said vane having a main surface extending between the sides of said passage and extending lengthwise in a curved configuration corresponding to that of said curved pipe elbow section beyond the end of said curved pipe elbow section into said straight pipe section for a predetermined distance and having a leading edge which has an aerodynamic configuration that will not interfere with liquid flow, only said extended portion of said vane main surface being disposed at a negative angle relative to the direction of flow of said liquid through said straight pipe section, whereby the combination of said extended vane and said negative angle of said vane substantially suppresses cavitation of the liquid flowing through said passage without increasing the back pressure in said passage.

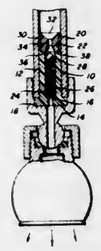
4,232,711

FLOW REGULATING DEVICE

Robert T. Ray, Sr., and Richard G. Pickett, both of Wilmington, Del., assignors to Aqua-Retain Valve, Inc., Wilmington, Del.

Filed Dec. 29, 1978, Ser. No. 139
Int. Cl.³ F15D 1/06
U.S. Cl. 138—44 **5 Claims**

1. A flow regulator comprised of a cylindrical housing adapted to be inserted into a water line, said housing being closed at one end thereof having an opening therethrough, said housing having a first bore adjacent the other end, said housing having a second bore extending from the inner end of said first bore to the closed end of said housing, a plug positioned in said first bore, said plug having an orifice therethrough and flow restricting means comprised of a spring and ball in said second bore whereby said orifice and said restricting means regulate the flow of water therethrough, the length of said spring combined with the diameter of said ball is less than the length of the second bore so that the ball is spaced from the orifice so as to reduce the turbulence in the water emerging from said orifice, and the diameter of said second bore is substantially constant throughout the length thereof so that the volume of water emerging from said second bore is substantially the same for all positions of said ball within said bore.

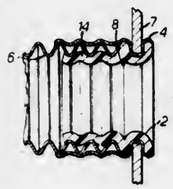


4,232,712

HEAT-RECOVERABLE ARTICLES

David T. Squires, Swindon, England, assignor to Raychem Limited, London, England

Filed Sep. 25, 1978, Ser. No. 945,299
Claims priority, application United Kingdom, Sep. 30, 1977, 40791/77
Int. Cl.³ F16L 47/00
U.S. Cl. 138—109 **20 Claims**



1. An article for attaching an elongate member to a wall at an aperture in the wall, the article comprising an inner sleeve, having both first and second ends open, and secured thereto an outer sleeve having first and second ends, the second end of the outer sleeve being open, at least a portion of the section of the outer sleeve between the second end of the outer sleeve and where the outer sleeve is secured to the inner sleeve being heat-shrinkable and extending over and being spaced apart from a portion only of the length of the inner sleeve, thus forming a securing part of the article for securing the elongate member to the article, at least a portion of the inner sleeve remote from the securing part of the article being heat-expansible, thus forming an attachment part of the article adapted to be passed through the aperture and when heated to expand to attach the article to the wall.

4,232,713

HEDDLE FRAME NOSE GUIDE

Frank H. Kaufmann, and Charles F. Kramer, both of Greenville, S.C., assignors to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Apr. 23, 1979, Ser. No. 32,656
Int. Cl.³ D03C 9/06
U.S. Cl. 139—91 **4 Claims**





1. A nose guide device for maintaining adjacent heddle frames of a weaving loom separated during shedding wherein each heddle frame includes top and bottom frame slats having a longitudinal open-top groove formed along a side edge thereof, said nose guide device comprising:

spaced elongated front and back sides;

side edge means joining and spacing said front and back sides;

said side edge means terminating short of the length of said front and back sides defining opposing open side edge portions and a corresponding open transverse slot extending therebetween for receiving a frame slat;

biasing means carried intermediate said front and back sides extending into said open transverse slot for engaging said frame slat;

one end of said front and back sides terminating in a tapered end portion defining a nose for separating adjacent heddle frames;

said front and back sides being split from one another at an opposing end thereof defining first and second free end portions bendable away from one another for straddling and receiving said frame slat therethrough to engage said biasing means; and

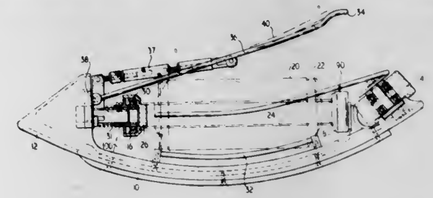
opposing hook portions formed adjacent the ends of said first and second free end portions for engaging in said open-top groove of said frame slat when said frame slat is received in said transverse slot and urged outwardly by said biasing means.

4,232,714

TRAVELING YARN DISPENSERS

Andrew K. Clokie, Dewsbury, England, assignor to Greenbat, Limited, Leeds, England

Filed Dec. 20, 1978, Ser. No. 971,524
Claims priority, application United Kingdom, Dec. 21, 1977, 53361/77
Int. Cl.² D03D 51/34
U.S. Cl. 139—371 **6 Claims**



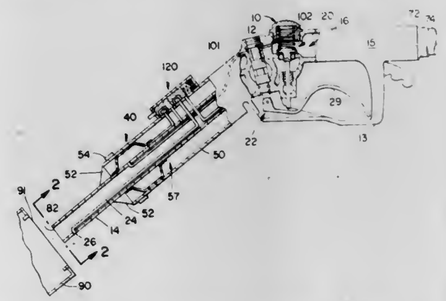
1. A traveling yarn dispenser for use in a textile machine comprising a body, means for mounting a yarn carrier within said body for rotation about the longitudinal axis of the yarn carrier, and an electric generator having a rotor, said rotor being driven from rotation of the yarn carrier.

4,232,715

COAXIAL VAPOR RECOVERY NOZZLE

Walter R. Pyle, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1978, Ser. No. 974,190
Int. Cl.³ B65B 3/18
U.S. Cl. 141—1 **25 Claims**



1. A vapor-recovery system for vehicle refueling wherein a fuel-dispensing system cooperates with portions of a vehicle fuel receiving and storage system, comprising:

a fuel-dispensing nozzle having a main body portion, a discharge spout projecting from the main body portion, said discharge spout having an outlet end proportioned for ease of insertion into a fuel tank fillpipe of a vehicle fuel receiving and storage system, a flow passage for the flow of fuel to said nozzle and through said main body portion and said discharge spout, a flow control valve in said main body portion operable to regulate the flow of fuel through said flow passage, a vapor-receiving passage formed in said main body portion, a vapor-recovery, rigid, tubular member projecting from said main body portion and coaxially arranged around said discharge spout to define with the exterior surface of said discharge spout a vapor-recovery passageway therebetween for receiving vapors displaced from the vehicle fuel tank during refueling, said vapor-recovery member having an inner end and outer end, the inner end of said vapor-recovery member mounted on said main body portion and communicating with said vapor receiving-passage in said main body por-

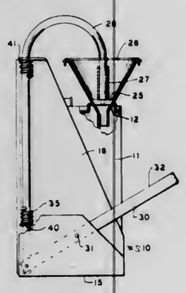
tion, the outer end of said vapor-recovery member located rearwardly of the outlet end of said discharge spout and proportioned for ease of insertion into the fuel tank fillpipe, a seal means located inwardly of the fuel tank fillpipe opening for receiving the outlet end of said discharge spout and the outer end of said vapor-recovery member to establish a vapor-tight seal with said vapor-recovery member when said discharge spout is operatively inserted in the fuel tank fillpipe so that substantially all the vapor expelled from the fuel tank during refueling flows through said vapor-recovery member to said vapor receiving passage in said main body portion, a valve means operable by a fluid pressure located in said vapor-recovery member inwardly of the outer end thereof to prevent the escape of vapors through the outer end of said vapor-recovery member, said valve means being in a closed position when said nozzle is not in use so that vapors located inwardly thereof cannot escape through the outer end of said vapor-recovery member and said valve means being in an open position when said nozzle is operatively inserted into the fuel tank fillpipe and said seal means sealingly engages said vapor-recovery member so that vapor expelled from the fuel tank during refueling may be directed through said vapor-recovery member to the vapor-receiving passage in said main body portion, and an actuating means for operating said valve means so that said valve means is closed when said nozzle is not in use and so that said valve means is open when said nozzle is operatively inserted into the fuel tank fillpipe and said seal means sealingly engages said vapor-recovery member.

4,232,716

WASTE SOLVENT COLLECTOR

Bob B. White, St. Petersburg, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 8, 1979, Ser. No. 1,572
Int. Cl.[3] B65B *3/06, 39/12*
U.S. Cl. 141—98 **5 Claims**



1. An apparatus for collection of liquid into a container having a top opening, said apparatus comprising:

a support structure including a base for supporting said container, a funnel having an upper end with an opening for receiving fluid, and a lower end for insertion into said top opening of said container, the outside contour of the funnel being complimentary to the geometry of said top opening of said container such that as the funnel is lowered it comes to rest on the rim of said top opening and produces a seal between the funnel and the container;

a closure member positioned inside said funnel for opening and closing a fluid passage through said funnel; and

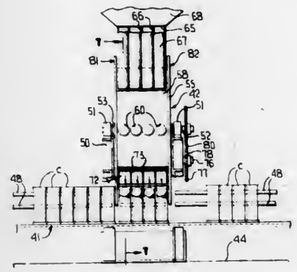
means, mounted on said support structure, operable to engage said closure member and said funnel for opening said closure member to allow passage of fluid through the funnel and simultaneously lifting the funnel from said top opening of said container through a sufficient distance to provide a clearance between said funnel and said container and thus allow venting of the container while fluid is poured through said funnel.

4,232,717

TENNIS BALL CAN FILLER

Joseph M. Allgaier, Chicago; Jack W. Richens, Naperville, and Rajendra K. Leekha, Glendale Heights, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,157
Int. Cl.[3] B65B *1/04*
U.S. Cl. 141—179 **10 Claims**



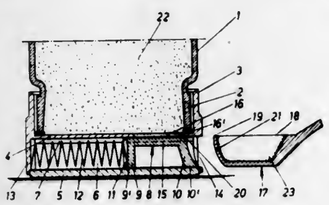
5. A filling apparatus for simultaneously filling plural containers, said apparatus comprising product supply means, dispensing means, and container positioning means, said container positioning means including means for sequentially positioning a series of containers adjacent said dispensing means for individually receiving products from said dispensing means, and said dispensing means including means for receiving products from said product supply and dispensing said products to containers of a positioned series of containers in timed relation to the positioning of such containers, said container positioning means including an endless conveyor support for supporting containers while engaged by said means for sequentially positioning said series of containers and for delivering containers to said means for sequentially positioning series of containers, said means for sequentially positioning series of containers being in the form of vanes extending transversely of said conveyor.

4,232,718

DEVICE FOR THE PORTIONED REMOVAL OF GRANULES

Gerhard Wippermann, Boerholz 72, 4057 Brüggen 2, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,400
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2749831; Jun. 1, 1978, 2824016
Int. Cl.[2] B65B *1/06*
U.S. Cl. 141—358 **13 Claims**



1. A device for the dosed removal of granules from storage containers, particularly household packages of coffee, tea or the like, comprising

a storage container comprising,

a bottom wall defining a discharge opening,

means defining a channel under said bottom wall, said channel opening toward a transverse side of said storage container,

a closure slider slidably disposed in said channel,

a spoon adapted to be pushed into said channel, said spoon being shaped complementarily to the cross-section of said channel, said spoon forming a trough having an edge spanning a larger surface than that of said discharge opening, said spoon having a front face edge abuttingly pressing back said closure slider when said spoon is inserted in said channel,

said closure slider being adapted to be pressed back against spring action, said closure slider being formed with a front surface,

said front face edge of said spoon being shaped to the shape of said front surface of said closure slider,

said bottom wall defines at least one prechamber above said discharge opening,

at least one division wall connected with said closure slider,

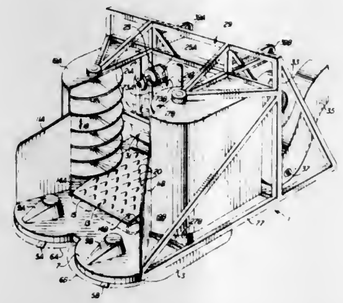
said at least one prechamber is covered by said at least one division wall in a closing position of said closure slider.

4,232,719

BRUSH HARVESTER

Robert E. Payton, P.O. Box 25424, Phoenix, Ariz. 85002

Filed Apr. 23, 1979, Ser. No. 32,128
Int. Cl.[3] A01G *23/08*
U.S. Cl. 144—34 R **13 Claims**



1. An apparatus for clearing vegetation, including brushwood and small trees, and producing chips therefrom, said apparatus comprising in combination:

a. horizontal cutting means disposed along a front end of said vegetation clearing apparatus for severing vegetation including brushwood, trees and the like as said vegetation clearing apparatus moves forward;

b. conveyer means for receiving severed vegetation as said vegetation clearing apparatus moves forward, said conveyer means having an inlet end and an outlet end, said conveyer means conveying the severed vegetation from said inlet end to said outlet end;

c. compacting means for forcing severed vegetation downward against said conveyer means to effect rearward movement of said vegetation by said conveyer means;

d. chopping means for receiving severed vegetation from the outlet end of said conveyer means and chopping the vegetation into chips and;

e. output means for receiving the chips from said chopping means and exhausting the chips into a container wherein said conveying means includes a continuous belt-like conveying element for engaging the severed vegetation and conveying the severed vegetation toward the outlet end, said conveyer means also including a pair of pulley-like roller elements for powering said conveying element to cause the upper portion of said conveying element to move from the inlet end to the outlet end of said conveyer means.

4,232,720

ROUND LOG MATERIAL AND METHOD OF PRODUCING THE SAME

Morimasa Hanaya, Kure, Japan, assignor to Toyo Pulp Co., Limited, Tokyo, Japan

Continuation of Ser. No. 487,508, Jul. 11, 1974, abandoned. This application Nov. 19, 1976, Ser. No. 743,378
Claims priority, application Japan, Aug. 4, 1973, 48-87848
Int. Cl.[3] A01G *23/08*
U.S. Cl. 144—309 AC **13 Claims**



1. A method of bulk loading and transporting timber, which includes cutting felled timber transversely into a plurality of log portions, each portion having a length substantially equal to its diameter, mechanically loading said log portions into a transport container at random, transporting the container to an unloading point at which the log portions are unloaded from the transport container, and chipping the log portions.

4,232,721

COLLAPSIBLE SOLUTION CONTAINER HAVING RECTANGULAR SHOULDER

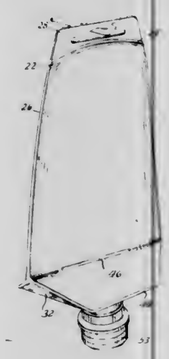
Jerry D. Martin, Highland Park; Stephen J. Pearson, Ingleside; Gary A. Ward, Round Lake, all of Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 9, 1979, Ser. No. 28,151
Int. Cl.[1] B65D *1/02*
U.S. Cl. 150—0.5 **36 Claims**

1. In a molded, collapsible solution container, which container defines a chamber-defining body portion wall having an integral neck portion and a shoulder portion at one end thereof and defining, in its normal, unstressed state, a transverse cross-section which tapers from said shoulder portion progressively along a major portion of its length to a flat, sealed end portion at the end of the container opposite to said one end, the improvement comprising, in combination:

said shoulder portion being rectangular in shape, the wall circumferences of said transverse cross-sections progressively decreasing in length along said container from

adjacent said shoulder portion toward said opposite end, in which the transverse cross-sections of said container along the majority of its length beginning adjacent said shoulder portion exhibit mutually perpendicular major and minor transverse axes, said major axes being longer than the minor axes, and two pairs of outwardly-angled

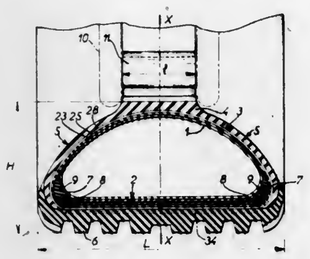


wall portions, each pair of wall portions defining a generally acutely angled apex connection together, said apex connections being positioned on said major axes, the transverse cross sections of said container along a majority of its length beginning adjacent said shoulder portion exhibiting generally planar central areas adjacent said minor transverse axes.

4,232,722
Patent Not Issued For This Number

4,232,723
ISOSTABLE TUBULAR TIRE
Georges Gazuit, Montlucon, France, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 10, 1978, Ser. No. 949,449
Int. Cl.³ B60C 5/12, 9/20
U.S. Cl. 152—350 **15 Claims**

1. A tubular tire for motor vehicles of the type including an inflatable inner tube, a casing of the radial type, a reinforcement in addition to the casing in the ground contacting area, a rim strip, some rubber sides, a tire tread and two semi-rigid circular rods set at the level of the reinforcement at the edges thereof characterized by the fact that the rim strip has a width included between approximately 0.25 L and approximately 0.35 L, wherein L represents the total width of the tire tread, by the fact that the transverse section of the tire has in a known manner an H over L ratio which is included between 0.5 and 0.6 wherein H represents the total height between the rim strip and the tire tread, and by the fact that seen in transverse section

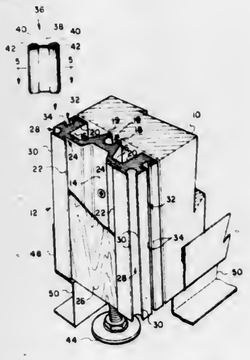


each side of the tire has a profile corresponding to a curve described by the equation:

$$x = \int_y^a \frac{y^2 - b^2}{V\sqrt{(a^2 - b^2)^2 - (y^2 - b^2)^2}} \cdot dy$$

which is substantially included between two points wherein the tangents are respectively vertical at y approximately equal to b and horizontal at y approximately equal to a, said approximately horizontal point of tangency corresponding substantially with the intersection of the tire vertical section centerline and the rim and said vertical point of tangency corresponding substantially with the outermost maximum cross-section width of the tire, the aggregate being such that the tire when seen in transverse section forms an isostable system.

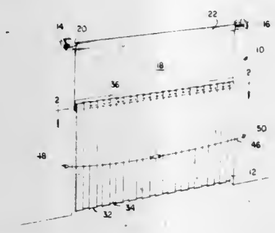
4,232,724
MODULAR PARTITION
Mortimer Brown, Terra Cotta, Canada, assignor to Nightingale Industries Limited, Toronto, Canada
Continuation-in-part of Ser. No. 745,001, Nov. 26, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,870
Int. Cl.² A47G 5/00
U.S. Cl. 160—135 **7 Claims**



1. A modular partition panel wall of the type in which a panel is adapted to be associated with at least one other such panel to provide a self supporting free standing wall, and comprising at least two said panels, each of said panels having;
a generally rectangular panel body portion having top and bottom edges and upright end edges at each end thereof having front and back faces;

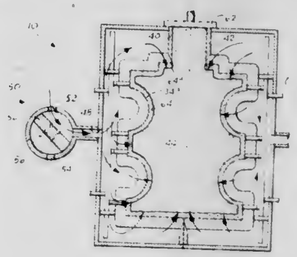
end connector members fastened along each said end edge of said panel extending from top to bottom thereof; and each said connector member having side edges coterminous with said front and back panel faces, and having inner and outer faces;
a median recess formed in said outer face of each said connector member intermediate said side edges for reception of fastening means therein;
panel contact means along each said side edge;
a semi-cylindrical groove along said inner face of said end connector member intermediate said side edges having an open side aligned with said median recess, said panel contact means and said groove terminating in a common plane whereby they lie flat along an adjacent end edge of a said panel;
at least one connector groove formed in each said end connector member extending from top to bottom thereof and defining a smooth cylindrical inner surface and having an open mouth directed at an acute angle relative to the plane of said panel body portion, and,
connector hinge strip means having a generally flat planar web portion and smooth cylindrical ribs along either side of said web portion, said rib being connected to said planar web portion in an offset assymetrical manner whereby a plane passing through the centres of both said ribs will lie parrallel to but spaced apart from the plane of said rib, one said rib being shaped to interfit telescopically and rotatably with a said connector groove, in one said end connector member, and the other said rib being shaped to interfit telescopically and rotatably with said connector groove in another said end connector member of a panel adjacent thereto, said ribs being interfitable with said grooves in both left and right handed positions, said web portion extending between said end connector members from top to bottom thereof and providing a continuous flat planar junction between said at least two panels, forming same into a wall as aforesaid.

4,232,725
PASS-THROUGH WEATHER CURTAIN FOR GARAGES AND THE LIKE
Kenneth Gidge, Nashua, N.H., assignor to BSL Corporation, Nashua, N.H.
Filed Dec. 6, 1978, Ser. No. 966,878
Int. Cl.³ A47H 1/00
U.S. Cl. 160—332 **9 Claims**



1. A curtain for use across doorways or the like, comprising
(a) a single rectangular upper panel of a flexible and substantially imperforate material of a width sufficient to extend entirely across said doorway and of a height sufficient to cover a substantial portion of the upper part of said doorway,
(b) mounting means engaging the upper marginal edge of said panel for freely suspending said panel by its upper edge across the top of said doorway,
(c) a plurality of relatively narrow rectangular elongated flexible strips all freely suspended in overlapping relation from the lower edge of said upper panel,
(d) said strips including means defining a graduated barrier to the circulation of air through said doorway which barrier is greater at the side portions of said curtain strips than at the center portion thereof,
(e) said strips being arranged in a single course of overlapping strips, each strip extending behind one adjacent strip and in front of another adjacent strip and said means including at least one relatively wide strip at each side of said curtain,
(f) said means including a greater number of layers of said strips at the side portions of said curtain than at the center portion thereof.

4,232,726
PROCESS AND CORE BOX ASSEMBLY FOR HEATLESS PRODUCTION OF HOLLOW ITEMS OF MINERAL GRANULAR MATERIAL
Anatol Michelson, 3235 Pine Valley Dr., Sarasota, Fla. 33579
Continuation-in-part of Ser. No. 939,660, Sep. 5, 1978, abandoned. This application Mar. 20, 1979, Ser. No. 22,170
Int. Cl.³ B22C 9/12
U.S. Cl. 164—12 **24 Claims**



1. A process for producing a hollow item, such as a foundry core, by reacting a catalyst gas with binder coated on granular material comprising:
providing a core box having a pattern formed of microporous material;
investing binder-coated granular material into a volume defined by said pattern;
sealing said core box and said pattern so that the volume encloses a gas at rest; and
applying a catalyst gas at a predetermined pressure through said pattern so that the catalyst gas exerts a uniform pressure from the entire interior surface of said pattern against the enclosed gas volume and penetrates a distance through the granular material for curing same determined by an equilibrium condition being reached between the applied catalyst gas pressure and pressure developed by the enclosed gas, said pattern being formed to permit continuous passage of catalyst gas therethrough so that the catalyst gas will impart pressure against all air molecules existing between granular material adjacent the interior surface of said pattern;
removing uncured granular material from the volume defined by said pattern.

14. A core box assembly for use in producing a hollow item, such as a foundry core, by reacting a catalyst gas with binder coated on granular material comprising:
a pair of core box sections each including a pattern section mounted thereon and spaced therefrom so that when said core box sections and their respective patterns are assembled along a parting line, an air space is provided which surrounds the pattern and an opening extends into the volume defined by the pattern for receiving granular material;
a gas-tight sealing member is provided at said opening for sealing said space after the granular material is introduced;
a port provided in at least one of said core box sections for

permitting introduction of a catalyst gas into the air space; and

said pattern being formed of microporous material which permits substantially uniform and continuous passage of the catalyst gas through the pattern and inwardly toward the hollow volume over the entire interior surface of said pattern.

4,232,727

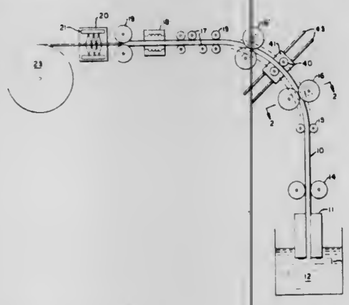
METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF STRIP

Terry F. Bower, Needham; M. Ronald Randlett, and George Shinopulos, both of Burlington, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 928,881, Jul. 28, 1978. This application Nov. 1, 1978, Ser. No. 956,793

Int. Cl.³ B22D *11/12*; B21B *1/44, 13/22*

U.S. Cl. 164—76 **23 Claims**



1. A method for the continuous production of metallic strip from a melt comprising:

(1) continuously casting a metallic rod from said melt in a pattern of forward and reverse stroke with respect to a continuous casting mold,

(2) continuously transforming the forward and reverse strokes of said rod to a forward motion having a substantially constant forward velocity, and

(3) continuously hot rolling said continuously produced rod into finished strip,

said casting step, transforming step and hot rolling step being performed to act on a metal rod which is continuous from said mold through said hot rolling step to continuously form an integrated strip.

4,232,728

METHOD FOR ENHANCED HEAT TRANSFER

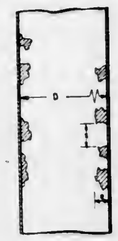
Gary W. Fenner, Grand Island, and Elias G. Ragi, Williamsville, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 721,861, Sep. 9, 1976, Pat. No. 4,154,293. This application Feb. 26, 1979, Ser. No. 15,425

Int. Cl.³ F28F *13/08*

U.S. Cl. 165—1 **4 Claims**

1. A method for enhanced heat transfer between a first fluid at first inlet temperature and a second fluid at second initial temperature substantially different from said first inlet temperature in a heat exchanger wherein said first fluid is flowed through at least one metal tube in heat transfer relation with said second fluid outside said tube, comprising the steps of: providing a single layer of randomly distributed metal bodies each individually bonded to the tube inner surface substrate spaced from each other and substantially surrounded by said substrate so as to form body void space with the tube effective inside diameter and body height related to each other such that in the ratio e/D, wherein e is the arithmetic average height of said bodies on said substrate and D is the effective inside diameter of the tube, e/D is at least 0.006, and the body void space is between 10 percent and 90 percent of the substrate total area; and passing said first fluid through said tube under turbulent



flow conditions in at least part of said tube such that its Equivalent Reynolds Number in such tube part is at least 9,000.

4,232,729

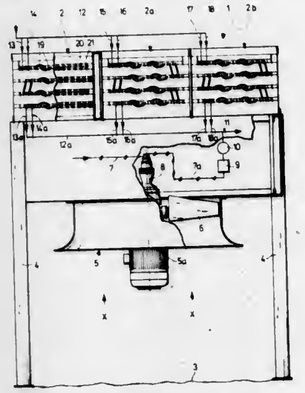
AIR-COOLED HEAT EXCHANGER FOR COOLING INDUSTRIAL LIQUIDS

Jocely P. Ingram, Sasolburg, South Africa; Harry Kassat, Bochum, and Herbert Kolenda, Witten-Herbede, both of Fed. Rep. of Germany, assignors to South African Coal, Oil & Gas Corp., Limited, Johannesburg, South Africa and Gea Luftkuehlergesellschaft Happel GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,704

Int. Cl.³ F28F *27/00*

U.S. Cl. 165—39 **20 Claims**



1. A heat exchanger for cooling a liquid in an external stream of cooling gas flowing in a predetermined direction, comprising: a liquid inlet conduit extending at a downstream portion of said external stream and a liquid outlet conduit extending at an upstream portion of said external stream; plural cooling conduit sets including a pair of adjoining cooling conduit connected parallel to each other between said inlet and outlet conduits, each of said cooling conduit sets being shaped into a meander-like configuration and defining straight conduit sections arranged side by side, said plural conduit sets being arranged in at least two rows spaced from one another in said predetermined direction, and each located in a plane transverse to said direction, and further defining connecting conduit sections connecting said straight conduit sections of respective cooling conduits in said pairs in series for providing in each set two parallel flows of the liquid meandering both in a direction counter to and transverse to said predetermined direction.

4,232,730

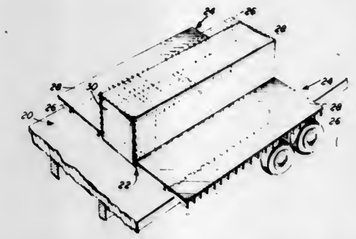
RADIOACTIVE MATERIALS TRANSPORTING CONTAINER AND VEHICLES

Stanton L. Reese, 11409 Duryea Dr., Potomac, Md. 20854

Division of Ser. No. 324,576, Jan. 18, 1973, Pat. No. 4,023,615, which is a continuation-in-part of Ser. No. 109,925, Jan. 26, 1971, Pat. No. 3,727,059. This application May 16, 1977, Ser. No. 797,391

Int. Cl.² F28F *5/00*; G21F *5/00*

U.S. Cl. 165—41 **22 Claims**



1. A conveyance for transporting radioactive materials which comprises a vehicle having a frame, a smooth-wall container for holding the radioactive material having a beta gamma radioactive absorbing material surrounding the radioactive material therein, a secondary container operable in opened and closed positions, means for facilitating the opening and closing of said secondary container, means for rigidly mounting said secondary container to said vehicle frame, and heat-dissipating means attached to said secondary container, said secondary container operable in said open position for facilitating placement and removal of said smooth-wall container onto and off of said vehicle frame and operable in said closed position to substantially surround and thermally contact said smooth-wall container for transferring heat generated within said smooth-wall container to the atmosphere by way of said heat-dissipating means.

4,232,731

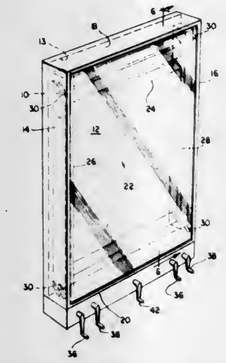
PASSIVE SOLAR DEVICE FOR HEATING AND COOLING

Roy Kaplow, Newton, and Marvin C. Lewis, Boston, both of Mass., assignors to General Solar Energy Corporation, Boston, Mass.

Filed Jun. 28, 1978, Ser. No. 919,863

Int. Cl.¹ F25B *29/00*

U.S. Cl. 165—48 S **20 Claims**



1. A solar control and storage unit for location at windows and the like, said unit comprising:

(a) means including a pair of generally parallel transparent panes defining a hermetic compartment, said panes being composed of glass;

(b) a gas which provides a good insulating capability within said compartment at substantially atmospheric pressure;

(c) a plurality of elongated, generally parallel vanes mounted in said compartment generally parallel to said panes;

(d) each of said vanes presenting at least three external facets and an internal compartment;

(e) a first of said external facets being characterized by relatively high absorptivity with respect to solar radiation and relatively low emissivity with respect to infrared radiation at an operating temperature;

(f) a second of said external facets being characterized by relatively high absorptivity and relatively high emissivity with respect to infrared radiation at said operating temperature;

(g) a third of said external facets being characterized by relatively high specular reflectivity with respect to solar radiation;

(h) a phase transformation energy storage medium within said internal compartment, said phase transformation occurring at said operating temperature; and

(i) means for adjusting said vanes for operation in at least a first mode, a second mode, and a third mode, said first of said facets facing outdoors and said second of said facets facing indoors in said first mode, said third of said facets facing outdoors and said first of said facets facing indoors in said second mode, said second of said facets facing outdoors and said first of said facets facing indoors in said third mode.

4,232,732

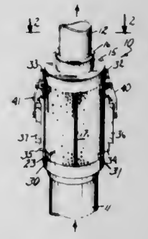
HEAT ARRESTER BOOT FOR ROOM STOVE

Albert V. Johnson, R.R. 1, Box 87, Erhard, Minn. 56534

Filed Apr. 24, 1978, Ser. No. 899,356

Int. Cl.³ F28F *3/08*

U.S. Cl. 165—77 **7 Claims**



1. A heat arrester boot for room stoves for extracting heat from waste gases and smoke comprising.

a bottom inlet chamber having an entrance port through which the waste gases and smoke enter, and a generally circular lip;

a top outlet chamber having an exit port from which the waste gases and smoke exit, and a generally circular lip,

a generally cylindrical central chamber between said inlet and outlet chambers and including a pair of cross sectionally arcuate door members to form a semi-cylindrical portion of said central chamber, and a semi-cylindrical chamber wall fixedly mounted on said inlet chamber and having opposite horizontally spaced ends, each of said door members being mounted on one of said ends of said chamber wall for outward pivotal movement about a generally vertical axis;

a pair of generally parallel rails attached to said outlet chamber;

a pair of parallel receiving cylinders attached to said chamber wall and slidably mounting said rails;

a pair of handles having first ends and second ends, said first

ends being pivotally connected to said receiving cylinders;

a pair of links pivotally connected at first ends to said handles between said first and second ends thereof;

a pair of anchoring members positioned on said rails, said anchoring members being pivotally connected to second ends of said links, said handles, said links and said anchoring members cooperating to impart reversible movement to said outlet chamber along a path defined by said rails and said receiving cylinders when said handles are raised and lowered;

means for adjustably securing said anchoring members to said rails; and

an inner core including a plurality of parallel spaced hollow cylindrical tubes having upper and lower ends, and generally circular top and bottom plates having a plurality of apertures formed therein for receiving said ends of said cylindrical tubes;

said lip of said inlet chamber being sized to receive said bottom plate, said lip of said outlet chamber being sized to surround said top plate when said outlet chamber is moved toward and near said central chamber.

4,232,733

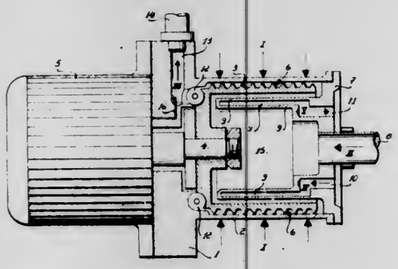
THERMAL EXCHANGER

Tadeusz Piotrowski, Vincennes, France, assignor to Etablissement Euroburner, Vaduz, Liechtenstein

Continuation of Ser. No. 817,034, Jul. 19, 1977, abandoned. This application May 16, 1979, Ser. No. 39,553

Int. Cl.³ F28F 9/02; F28D 11/02

U.S. Cl. 165—89 **9 Claims**



1. A heat exchanger for heating or cooling a liquid, comprising a stationary outer shell, a drum rotatable coaxially in the shell, the outer periphery of the drum being adjacent the inner periphery of the shell, stationary heat exchange means within the drum, means to feed a liquid into the drum past said stationary heat exchange means and then between said outer periphery of said drum and said inner periphery of said shell, and impeller means on and extending axially along said outer periphery of said drum to move said liquid in a circuitous path along said inner periphery of said stationary outer shell upon rotation of said drum.

4,232,734

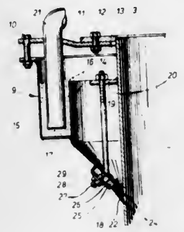
TRICKLER HEAT-EXCHANGE APPARATUS

Erich Hatje, Watenbüttel, and Norbert Reinert, Brunswick, both of Fed. Rep. of Germany, assignors to Buehler-Miag GmbH, Brunswick, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,352

Int. Cl.³ F28F 25/04

U.S. Cl. 165—118 **12 Claims**



1. In a heat-exchange apparatus, particularly in a cooler for cement manufacture, a combination comprising an upright wall having two sides, one of which is contacted by material to be cooled; cooling means adjacent an upper portion of the other of said sides and including a cooling water receptacle and a downwardly inclined guide baffle extending from said receptacle towards said other side and defining therewith a gap of non-uniform width; and a plurality of fibers bridging said gap and having free ends contacting said other side so that cooling water travels from said receptacle over said guide baffle and along said fibers to be discharged by the same onto said other side as a film which has a constant and substantially uniform thickness despite the non-uniform width of said gap.

4,232,735

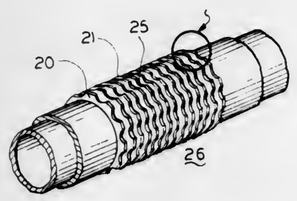
DOUBLE-WALLED FINNED HEAT TRANSFER TUBE

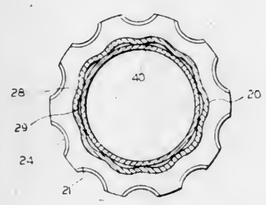
Sung C. Kim, Des Plaines, and Marvin P. Schwartz, Arlington Heights, both of Ill.

Filed May 5, 1978, Ser. No. 903,049

Int. Cl.³ F28F 1/14

U.S. Cl. 165—183 **6 Claims**





1. A double-walled heat transfer tube comprising:

an elongated inner tube;

an elongated outer tube extending over a portion of said inner tube;

said outer tube having a plurality of inwardly projecting ribs contacting the outer surface of said inner tube and acting to hold said inner and outer tubes in heat conducting relationship;

said ribs forming a plurality of channels between said inner and outer tubes; and

said outer tube having an external finned surface, said external finned surface including a plurality of rows of grooves extending axially over substantially the length of said outer tube each of said rows of said plurality of rows of grooves being in substantially radial alignment with a corresponding one of said plurality of ribs.

4,232,736

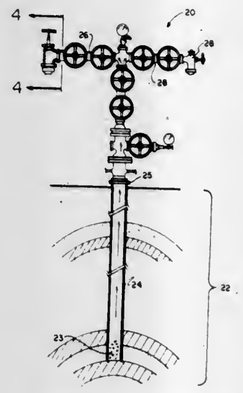
LEAK DETECTION SYSTEM AND CONTROL USING NON-RIGID BLADDER

Kibbie P. Pillette, Abbeville, La.

Continuation-in-part of Ser. No. 786,576, Apr. 11, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 954,578

Int. Cl.² E21B 43/12

U.S. Cl. 166—53 **16 Claims**



1. An apparatus for detecting leaks in suspect piping system fittings comprising:

a. non-rigid bladder means for sealably encapsulating a suspect fitting portion of a piping system where leaks may occur;

b. means for sealably attaching said non-rigid bladder means to the suspect fitting; and

c. valve closure means responsive to the occurrence of a leak in the suspect fitting and collected by said bladder means for halting the flow of fluid within the piping system to which said bladder means is attached.

4,232,737

DOUBLE TAPERED SURFACTANT WATERFLOOD OIL RECOVERY PROCESS

Timothy N. Tyler, and Joseph T. Carlin, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

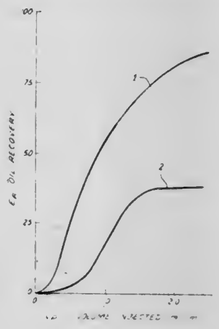
Filed Nov. 26, 1979, Ser. No. 97,470

Int. Cl.³ E21B 43/22

U.S. Cl. 166—273 **11 Claims**

1. In a method of recovering petroleum from a subterranean, petroleum-containing formation, said formation being penetrated by at least one injection well and by at least one spaced-apart production well, both wells being in fluid communication with the formation, said formation containing water of known or determinable salinity greater than 20,000 parts per million total dissolved solids, comprising injecting an aqueous, saline surfactant-containing fluid into the formation, said fluid containing at least one primary anionic surfactant comprising an organic sulfonate and at least one solubilizing co-surfactant selected from the group consisting of alkylpolyethoxy sulfates, alkylarylpolyethoxy sulfates, alkypolyalkoxyalkylene sulfonates, alkylarylpolyalkoxyalkylene sulfonates, and mixtures thereof, and following said surfactant fluid with an aqueous fluid containing a viscosifying amount of a hydrophilic polymer, the salinity of the polymer-containing fluid being less than 50,000 parts per million total dissolved solids, wherein the improvement comprises

decreasing both the salinity and concentration of solubilizing



co-surfactant of the surfactant fluid from a value at the leading edge of the surfactant fluid at which the salinity is from 50 to 150 percent of the salinity of the water present in the subterranean formation, to a final value at the trailing edge of the surfactant fluid at which the salinity is from 75 to 300 percent of the salinity of the hydrophilic polymer-containing fluid, and maintaining the concentration of solubilizing co-surfactant at a value which is at least sufficient to render the petroleum sulfonate partially soluble in the fluid at the salinity of each portion of the surfactant fluid.

4,232,738

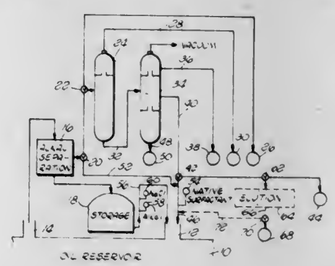
PETROLEUM RECOVERY PROCESS USING NATIVE PETROLEUM SURFACTANTS

Teh F. Yen, Altadena, and Paul A. Farmanian, Glendale, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Nov. 6, 1978, Ser. No. 958,291

Int. Cl.³ E21B 43/16, 43/20

U.S. Cl. 166—274 **28 Claims**



1. In a process for recovering petroleum from a subterranean reservoir thereof penetrated by at least one injection well and at least one production well spaced apart in the reservoir in which a liquid slug is injected through said injection well into said reservoir followed by the injection of alkaline floodwater whereby to displace oil from said reservoir for recovery through said production well, the improvement according to which said slug is non-aqueous and comprises at least a surfac-

tant portion of a fraction consisting essentially of natural components of petroleum, said fraction being distilled under conditions equivalent to vacuum of about 1 Torr in the temperature range of 100°–200° C. from petroleum of the type having reduced interfacial tension with water at high pH.

4,232,739

AQUEOUS POLYSACCHARIDE-CONTAINING FLUID HAVING SUPERIOR FILTERABILITY AND STABILITY AND THEIR USE IN RECOVERING OIL

Barbara J. Franklin, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1978, Ser. No. 905,490
Int. Cl.³ E21B *43/16*
U.S. Cl. 166—275 **13 Claims**

1. In a method of recovering oil from a subterranean, petroleum-containing formation penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the formation, said formation also containing brine containing greater than 7.5 parts per million water soluble borates (as boron) comprising injecting an aqueous viscous solution of a polysaccharide containing in excess of 10 percent D-mannose, wherein the improvement comprises preparing the fluid by the process comprising

(a) preparing a first solution containing 0.1 to 4.0 percent by weight polysaccharide in water having a salinity less than 15,000 parts per million total dissolved solids and containing less than 7.5 parts per million water soluble borates (as boron),

(b) shearing the first solution sufficiently to ensure that the first solution will pass readily through a 3 μm filter;

(c) diluting the first solution with brine having greater than 50,000 parts per million total dissolved solids including more than 7.5 parts per million water soluble borates as boron, the volume ratio of the first solution and brine being sufficient to produce a second polysaccharide solution having a concentration of polysaccharide from 10 to 5,000 parts per million polysaccharide; and

(d) shearing the second solution sufficiently to ensure that the second solution will pass readily through a 3 μm filter.

4,232,740

HIGH TEMPERATURE STABLE SAND CONTROL METHOD

Jack H. Park, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed May 23, 1979, Ser. No. 41,835
Int. Cl.² E21B *33/134, 43/04, 43/24*
U.S. Cl. 166—276 **32 Claims**

1. A method for treating a subterranean, petroleum-containing formation which contains unconsolidated sand, said formation being penetrated by at least one well in fluid communication with the subterranean formation, for the purpose of forming a permeable solid barrier which restrains the movement of particulate solid matter including sand while permitting passage of fluid including petroleum therethrough, comprising:

a. introducing a predetermined quantity of treating liquid comprising water which is saturated with calcium hydroxide, and additionally contains an effective amount of calcium salt having solubility greater than the solubility of calcium hydroxide, and an alkalinity agent having solubility greater than the solubility of calcium hydroxide, into the sand present in the formation;

b. allowing the treating liquid to remain in the sand mass for a predetermined period;

c. injecting a second quantity of treating liquid into the sand mass to displace the spent treating liquid therefrom; and

d. allowing the second quantity of liquid to remain in the formation for a predetermined period of time to cause cementing between the sand grains, thereby forming a permeable, competent, sand restraining barrier in the well.

22. A method of forming a permeable, mechanically stable sand restraining barrier in a formation penetrated by at least one

a. enlarging the well bore to form a cavity adjacent to the original well bore;

b. introducing a predetermined quantity of granular material of predetermined particle size and size range into the well bore;

c. introducing a treating liquid comprising water which is saturated with calcium hydroxide and additionally contains a predetermined quantity of a calcium salt having solubility greater than the solubility of calcium hydroxide and a predetermined quantity of an alkalinity agent;

d. allowing the treating liquid to remain in the sand pack for a predetermined period of time sufficient to cement the sand grains together; and

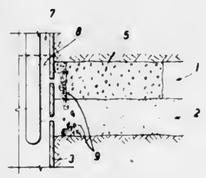
e. repeating steps c to d at least once.

4,232,741

TEMPORARILY PLUGGING A SUBTERRANEAN RESERVOIR WITH A SELF-FOAMING AQUEOUS SOLUTION

Edwin A. Richardson, Houston; Ronald F. Scheuerman, Bellaire; David C. Berkshire, Houston; Joseph Reisberg, Houston, and James H. Lybarger, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 30, 1979, Ser. No. 62,204
Int. Cl.³ E21B *33/16, 43/16, 43/27*
U.S. Cl. 166—281 **10 Claims**



1. A process for treating a subterranean reservoir into which a well is completed comprising:

compounding an aqueous solution in which the solutes consist essentially of at least one each of (a) a reactive compound for generating nitrogen gas at a rate affected by the temperature and pH of the solution, (b) a surface-active compound for causing the solution to be converted to a relatively immobile foam as gas is generated within the solution, (c) a pH-controlling system for initially maintaining a relatively high pH at which the gas-generating reaction rate is relatively slow at temperatures less than the reservoir temperature and subsequently maintaining a barely acidic pH at which that reaction rate is only moderately fast at temperatures near the reservoir temperature and, (d) a relatively slowly reactive acid-yielding compound for relatively slowly reducing the solution pH from said relatively high value to said barely acidic value; and,

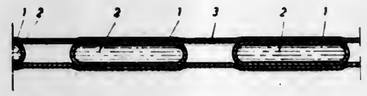
injecting the compounded solution into the reservoir at a rate such that (a) a significant portion of injected solution flows into at least the largest pores or other openings in or along the reservoir rock before that portion of solution has generated a significant fraction of the amount of gas it is capable of generating and (b) said portion of injected solution remains within said openings until it becomes converted into a relatively immobile foam.

4,232,742

FLAME-GUARD FOR ELECTRICAL INSTALLATIONS

Willy P. A. Dick, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 1, 1978, Ser. No. 911,488
Claims priority, application Sweden, Jun. 9, 1977, 7706753
Int. Cl.³ A62C *37/14*
U.S. Cl. 169—58 **3 Claims**



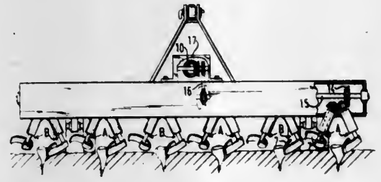
1. A flame protective device for electrical cable installations comprising a plurality of capsules secured together one after another to form a string, each of said capsules containing a substance having flame-extinguishing properties, said capsules being constructed to burst or open up when heated, thereby releasing said flame-extinguishing substance, the individual capsules being arranged in a line and a hose surrounding said capsules and maintaining the capsules in spaced positions in said line.

4,232,743

DEVICE FOR DIGGING UP TUBEROUS PLANTS, FOR EXAMPLE, BEETS

Cornelis J. Steketee, Driewegen, Netherlands, assignor to Vandenende B.V., Borssele, Netherlands

Filed Feb. 8, 1979, Ser. No. 10,253
Claims priority, application Netherlands, Feb. 24, 1978, 7802095
Int. Cl.³ A01D *25/04*
U.S. Cl. 171—55 **9 Claims**



1. Apparatus for digging up tuberous crops such as beets, comprising in combination:

frame means adapted to be moved over the ground surface;

a pair of shafts depending from said frame means in mutually diverging relation to each other transversely of the direction of movement of the frame means;

drive means for rotating said shafts;

each shaft terminating in a lower end portion adapted to move over the ground surface in closely spaced relation thereabove, the lower end portions of said shafts being laterally spaced apart relative to the direction of movement of the apparatus and each shaft defining an axis which is inclined, with respect to the vertical, laterally inwardly toward the other shaft; and

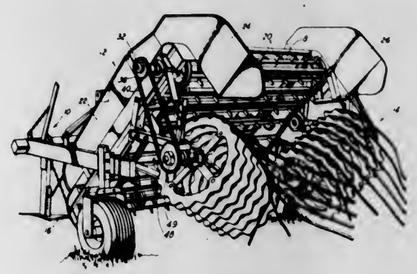
a pair of digger blades one at the lower end of one shaft and the other at the lower end of the other shaft, each digger blade having a leading end fixed to the lower end portion of its associated shaft and extending therefrom in a direction opposite to the direction of rotation of the shaft and in outwardly spiralling and helical relation to the axis of such shaft to terminate in a trailing end spaced below its respective shaft by an amount such that said trailing end follows a circular path centered on the axis of its shaft and perpendicular thereto with a portion only of such path lying below the ground surface, each blade presenting outer and inner surfaces extending between said leading and trailing ends thereof of widths sufficient respectively to displace soil laterally toward the other blade and to lift soil upwardly in response to rotation of the associated shaft while such blade is penetrated into the ground.

4,232,744

DIGGER-SHAKER-INVERTER APPARATUS

Jack E. Thompson, Chula, Ga., assignor to Lilliston Corporation, Albany, Ga.

Continuation of Ser. No. 616,178, Sep. 24, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,264
Int. Cl.³ A01D *29/00*
U.S. Cl. 171—101 **6 Claims**



1. In a root crop harvesting apparatus of the type having digging means operatively associated with the harvesting apparatus for digging and removing adjacent rows of root crop plants from their growing implantation in the ground, and conveying means operatively associated with the harvesting apparatus for conveying the rows of root crop plants removed by said digging means upwardly along upwardly inclined, spaced paths to elevated discharge regions while separating soil from the roots of the plants, the improvement which comprises a pair of open, reel-like structures disposed beneath said conveying means with one of the structures below one discharge region and the other structure below the other discharge region, and a set of trailing tine elements associated with each reel-like structure for supporting the respective rows of plants and crowding such rows together into a single windrow wherein the plants are inverted so that the plant foliage engages the ground and the roots are disposed uppermost in exposed relation; each reel-like structure comprising a series of spaced, annular discs having outer peripheral edges of undulating form and a series of circumferentially spaced rods extending between said discs adjacent the outer peripheries of said discs; means rotatably supporting said reel-like structures solely at their ends for rotation about downwardly and inwardly inclined axes thereby providing completely open central cores within said reel-like structures free of any interior obstructions between their ends with the inner ends of such structures being spaced apart; each set of tines including an outermost tine having a trailing end portion extending generally horizontally and laterally inwardly, an innermost tine having a trailing end portion extending generally vertically downwardly, and intermediate tines having trailing end portions which extend progressively from generally horizontally to generally vertically and in decreasing laterally directed fashion from said outermost tine to said innermost tine such that the tines of each set terminate essentially in a generally vertical plane to define a windrow-forming region between the set of tines, adjacent tines being in straddling relation to one of said discs and each tine having a mounting end portion which extends rearwardly from the front side of said reel-like structure above said circumferentially spaced rods and curves similarly to the disc with which it is associated and is disposed approximately at the level of the valleys of the undulated periphery of such disc to merge smoothly into its trailing end

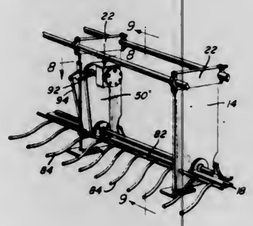
portion; and means for rotating said reel-like structures to urge the plants rearwardly along said tines while bumping and shaking those plants supported by said mounting end portions of the tines, each of said open reel-type structures extending along substantially half the length of its associated set of tines so as to subject the unearthed root crop to an extended cleaning action during the inversion process.

4,232,745

HARVESTER WITH MECHANICAL ROD WEEDER AND SOIL AGITATOR

Jose A. B. Viramontes, Star Rte. Box 18-A, Mesilla Park, N. Mex. 88047

Filed May 22, 1979, Ser. No. 41,882
Int. Cl.³ A01B *39/19*; A01D *15/04*
U.S. Cl. 172—44 **16 Claims**



14. In a crop harvesting implement for attachment to the rear of a tractor, the combination comprising:

a transverse elongated frame member;

a plurality of downwardly extending shanks, each shank being adjustably mounted upon said frame member for movement along a longitudinal dimension thereof;

a weeder bar extending through and being supported and journaled in each one of said shanks;

weeder bar drive means attached to said weeder bar for causing rotation of said weeder bar in a direction against the forward movement of said implement;

cleaner bar means having a plurality of sections, each section extending between two adjacent shanks, said cleaner bar means being positioned at not more than 1/16" behind said rod weeder;

agitator means having a plurality of tines connected for vertical oscillatory motion, said agitator means being connected to said shanks directly behind said cleaner bar; and

connector means for connecting said implement to the three-point hitch of a tractor.

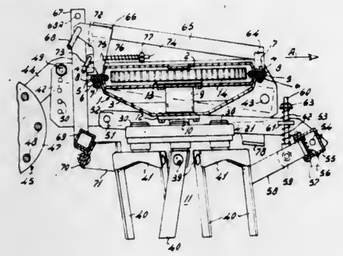
4,232,746

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 723,727, Sep. 16, 1976, abandoned. This application Aug. 8, 1978, Ser. No. 932,175
Claims priority, application Netherlands, Sep. 19, 1975, 11053
Int. Cl.³ A01B *33/06*
U.S. Cl. 172—59 **9 Claims**

1. A soil cultivating implement comprising a frame and a plurality of rotatable soil working members arranged in a transverse row, said members being journalled in an elongated portion of said frame and said portion extending transverse to the direction of travel, said soil working members being mounted on corresponding upwardly extending shafts and having downwardly extending soil working tools, driving means connected to rotate said members about axes defined by said shafts, said members being arranged in neighboring pairs that rotate in relative opposite directions and towards one another to pass soil rearwardly between the pairs, a supporting soil crumbler roller being positioned to the rear of said row of the working members and being adjustably interconnected to the frame with means that sets the working depth of said members, an elongated substantially horizontal soil deflector beam being positioned between the row of soil working members and said roller, said beam substantially coextending with said row and being located adjacent the rear of said soil working members, near the ground to deflect and level at least part of the soil thrown rearwardly by said soil working members, setting means interconnecting said beam to the frame and the



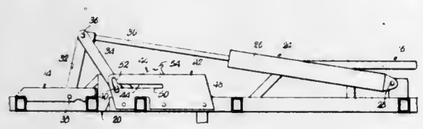
position of said beam being settable in any one of a plurality of different levels relative to the working depth of said members, said beam being normally positioned closely adjacent the ground, substantially below said frame leaving an open space between the beam and said frame, whereby a portion of the soil worked by said members can pass over the beam into the path of said roller to prepare a seed bed.

4,232,747

FARM IMPLEMENT AND CONTROL STRUCTURE FOR WING SECTIONS THEREOF

Billy J. Pfenninger, and F. Harrison Stansel, both of Hutchinson, Kans., assignors to Krause Plow Corporation, Hutchinson, Kans.

Filed Aug. 3, 1978, Ser. No. 930,494
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **19 Claims**



10. In a farm implement:

a pair of normally horizontal sections for supporting ground-engaging tool means;

hinge means interconnecting the sections for up and down swinging movement of one of said sections;

a lift link pivotally attached to said one section and normally extending upwardly therefrom;

a carriage;

a force-transmitting lever pivotally attached to said carriage and normally extending upwardly therefrom;

said link and lever converging as their normally uppermost ends are approached; and

power means pivotally connected with the other of said sections and with said uppermost ends of the link and lever,

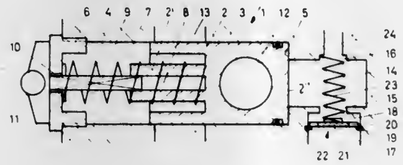
said carriage being supported by said other section for movement away from said one section as the power means swings the link and the lever to a position folding the one section into overlying relation to the other section.

4,232,748

SPRAY-ASSISTED PNEUMATIC STONE-WORKING APPARATUS

Hans Thoma, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 7, 1979, Ser. No. 37,398
Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819589
Int. Cl.³ B25D *17/16*; E21C *7/08*
U.S. Cl. 173—3 **9 Claims**



1. In a pneumatically operated stone-working tool including a tool drive, a pneumatic line connected to the tool drive for supplying pressurized gas thereto; a liquid spray-generating means for spraying the work area with a liquid; a liquid line connected to the spray-generating means for supplying liquid thereto; a control assembly for effecting energization and de-energization of the tool drive; the control assembly including a rotatable valve plunger in the pneumatic line; the valve plunger having a first angular position in which it maintains the pneumatic line open for allowing pressurized gas to be admitted to the tool drive from a source of pressurized gas; the valve plunger further having a second angular position in which it maintains the pneumatic line closed for preventing pressurized gas to be admitted to the tool drive; and a manually actuated lever connected to the valve plunger for rotating the valve plunger into the first or second angular position; the improvement wherein said control assembly comprises

(a) means defining a valve chamber in which said valve plunger is rotatably and linearly slidably received; said chamber being in the path of said pneumatic line and said liquid line; said plunger having a first linear position in which it maintains said pneumatic line closed in either angular position of said plunger and a second linear position in which it maintains said pneumatic line open solely when said plunger is in its said first angular position;

(b) force-exerting means continuously urging said plunger towards its said first linear position with a predetermined force; and

(c) a work face forming part of said plunger and being oriented for continuous exposure to a pressure of the liquid in that part of said chamber which is in communication with said liquid line; said pressure acting on said work face against said predetermined force for displacing said plunger into its said second linear position when said pressure increases to a predetermined level indicative of a safe pressure for operating said liquid spray-generating means.

4,232,749

CONVERTIBLE ROTARY/PERCUSSION DRILL

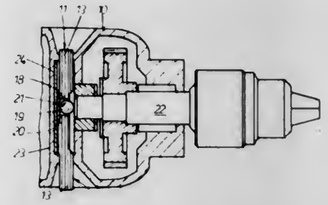
Fritz Rohrbach, Pieterlen, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,264
Claims priority, application Switzerland, Oct. 22, 1977, 2747537/77
Int. Cl.² B25D *15/00*
U.S. Cl. 173—48 **7 Claims**

1. In a drill selectively operable as rotary drill or percussion drill, mounted in a housing (**10**) having a recess, said drill having a spindle having a longitudinal axis, the improvement comprising

a ball (**19**) forming a bearing member;

a plastic slider (**11**) mounted in said recess for movement, under external control, from a first position wherein said drill is operative as a rotary drill to a second position wherein said drill is operative as a percussion drill, said plastic slider having an opening (**18**) aligned with said spindle along said longitudinal axis thereof when in said first position, the ball (**19**) being located in said opening for



constituting a thrust bearing for said spindle when said drill is operative as rotary drill;

a bearing plate (**21**) positioned in said further recess, said bearing plate and said ball together constituting said thrust bearing for said spindle when said drill is operative as rotary drill;

and at least one latching element (**14**) formed on the slider for selectively latching said slider in said first or said second position,

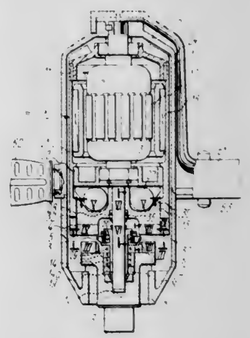
whereby the plastic slider and the latching elmeent will form a single unitary plastic member.

4,232,750

IMPACT WRENCH WITH A ROTARY TOOL DRIVE

Georgy A. Antipov, ulitsa Krasny Mayak, 3, kv. 146; Mikhail L. Gelfand, Yaroslavskoe shosse, 129, kv. 44; Boris G. Goldshtein, ulitsa Molodogvardeiskaya, 24, korpus 1, kv. 26, all of Moscow; Mikhail I. Rutgaizer, ulitsa Kuibysheva, 4, kv. 5; Nikolai K. Suut, ulitsa Lenina, 38, kv. 90, both of Vyborg Leningradskoi oblasti; Yakov I. Tsipenjuk, ulitsa Kirova, 5, kv. 30, Solntsevo Moskovskoi oblasti; Jury P. Shishulin, Jubileiny prospekt, 18, kv. 30, Khimki Moskovskoi oblasti; Apas G. Galimov, ulitsa Kuibysheva, 15, kv. 13, Sverdlovsk; Oleg Y. Sutyagin, ulitsa Dekabristov, 5, kv. 51, Sverdlovsk, and Oleg A. Yankovsky, ulitsa Soni Morozovoi, 175a, kv. 95, Sverdlovsk, all of U.S.S.R.

Filed Oct. 26, 1978, Ser. No. 954,756
Int. Cl.² B25B *21/02*
U.S. Cl. 173—93.6 **4 Claims**



1. An impact wrench comprising: a casing; a motor accommodated in said casing; a spindle journalled in said casing; an

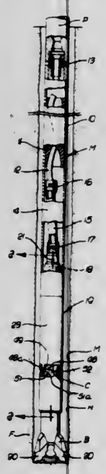
anvil having impact jaws and an axial bore, said anvil being coupled to said spindle for rotation therewith and being fixed axially with respect to said casing; a counterbore in said axial bore of said anvil; a composite hammer accommodated in said casing and including a driving part coupled to said motor for rotation therewith, an outer driven part connected to said driving part for combined rotation and having impact jaws engageable with the impact jaws of said anvil, and an inner driven part connected to the outer driven part for combined rotation and received in said counterbore of the anvil; said driven parts of the hammer being axially movable relative to said driving part of the hammer; flyweights located between said driving part of the hammer and said outer driven part of the hammer, axial movement of the driven parts of the hammer for bringing the impact jaws of the hammer and anvil into engagement being caused by said flyweights on rotation of said driving part of the hammer; a return spring mounted between said driven parts of the hammer; a device for providing preliminary interaction of the hammer and anvil before engagement of their respective impact jaws, including spring-loaded locking means and cam surfaces of said anvil, said spring-loaded locking members being mounted in the inner driven part of the hammer in an axial space between the impact jaws of said hammer and anvil; means defining cam surface means on the anvil and a working spring received in said counterbore of the anvil between said inner driven part of the hammer and said anvil, said device preventing engagement of the respective impact jaws until said locking means is moved from between the impact jaws by engagement with said cam surface means.

4,232,751

IN-HOLE MOTOR DRILL WITH BIT CLUTCH

Kurt H. Trzeciak, Fountain Valley, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 2, 1978, Ser. No. 957,179
Int. Cl.³ E21B 4/00
U.S. Cl. 175—101 **21 Claims**



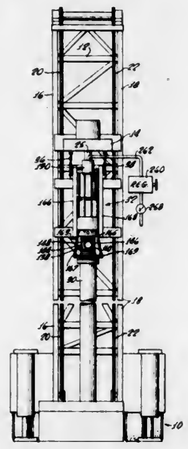
1. An in-hole motor comprising: an elongated motor stator including a housing connectable at one end to a pipe string; a rotor in said stator; a drive shaft extending from the other end of said housing and connected with said rotor for rotation therewith relative to said housing; a drill bit connector to mount a drill bit on said drive shaft for rotation therewith relative to said housing; bearings between said shaft and said housing to transmit thrust from said housing to said shaft in opposite directions to load said bit axially against the bottom of a bore hole and to pull said bit off the bottom of the bore hole; normally disengaged clutch means engageable between said housing and said shaft for coupling said shaft and housing for rotation together.

4,232,752

METHOD AND APPARATUS FOR DRIVING PIPE

Ernest D. Hauk, Yucca Valley, and Jesse C. Kirkpatrick, Mission Vijeo, both of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed Mar. 20, 1978, Ser. No. 888,312
Int. Cl.² E21B 1/02
U.S. Cl. 175—135 **29 Claims**



1. A pipe hammer comprising
an end cap,
inner and outer concentric sleeves fixed to said end cap in radially spaced relation to each other to define an annular chamber closed at one end by said end cap,
an annular piston slidably mounted in said chamber, an annular anvil slidably mounted in and sealing the other end of said chamber,
means for radially positioning said sleeves relative to each other at said other end of the chamber to maintain concentricity of said sleeves, said means comprising a forward housing around said outer sleeve, and annular retainer within said inner sleeve, and means for connecting said housing and retainer to said end cap,
means for reciprocating said piston within said chamber to cause the piston to repetitively strike said anvil, and
means for receiving blows from said anvil and transmitting such blows to a pipe to be driven.

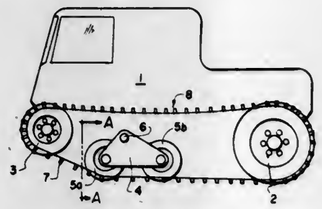
4,232,753

ENDLESS TRACK VEHICLE

Kaj Carlson, Singsby, Finland, assignor to Konetehdas Maskinfabrik NORCAR Ky Kb, Finland

Filed Oct. 25, 1978, Ser. No. 954,606
Claims priority, application Finland, Oct. 28, 1977, 773232
Int. Cl.² B62D 55/20
U.S. Cl. 180—9.2 R **7 Claims**

1. An endless track vehicle comprising, a vehicle body, a pair of driving wheels rotatably mounted near a rear end of the body supporting the rear end of the body, a pair of running wheels rotatably mounted and near an opposite front end of the body having a diameter smaller than that of the driving wheels and mounted at the location on the body so that the driving wheels extend lower than the running wheels, a pair of bogies pivotally mounted to the body between the driving and running wheels, two supporting wheels rotatably mounted to each of the bogies for supporting the front end of the body, a pair of tracks, each wrapped around a drive wheel, the supporting wheels of one bogie and a running wheel, each of said tracks comprising two spaced apart chains extending in a longitudinal direction of the body forming edges of each of said tracks, a



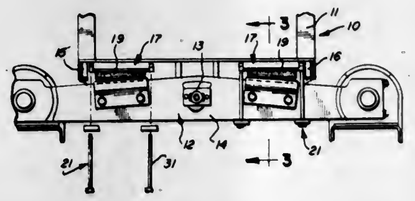
plurality of transverse blocks connected between each of said two chains, each of said chains comprising a plurality of links with the transverse blocks connected between adjacent links with each of said links in a plane extending at about 45° to a plane containing an axis of rotation of said driving wheels.

4,232,754

EQUALIZER BAR PAD CONSTRUCTION

Ara L. Corrigan, Davenport; Wayne G. Styck, Bettendorf, and Gerald M. Walden, Davenport, all of Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 19, 1979, Ser. No. 83,999
Int. Cl.³ B62D 55/00
U.S. Cl. 180—9.5 **17 Claims**



1. In a vehicle (10) having a frame (11) and an equalizer bar (12) movably mounted to the frame for carrying the ground-engaging tractive means of the vehicle, a pair of preloaded energy-absorbing pad assemblies (17,117), each comprising:
a baseplate (18,118) carried by the equalizer bar;
a resiliently compressible pad (19,119) carried on said baseplate;
a cover plate (20,120) overlying said pad to engage said frame and having a connecting portion (28,128); and
a removable clamp (21,121) having a first portion (31,131) removably secured to said connecting portion of the cover plate, and a second portion (32,132) releasably locked to said equalizer bar as an incident of a clamping force being developed in said clamp to compressively preload said pad between said cover plate and baseplate, release of said clamp permitting said pad to urge said cover plate forcibly against said frame or provide a preselected resistance to movement of said equalizer bar toward said frame during operation of the vehicle.

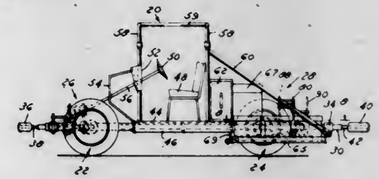
4,232,755

ELECTRIC MOTOR VEHICLE

Douglas Dow, 1052 Seminole, Detroit, Mich. 48214

Division of Ser. No. 766,534, Feb. 7, 1977, Pat. No. 4,171,730.
This application May 14, 1979, Ser. No. 38,503
Int. Cl.³ B60R 21/02
U.S. Cl. 180—65 R **7 Claims**

1. A motor vehicle including road engaging wheels and power means for driving at least one of said wheels and further including in combination with said wheels and power means:
an occupant compartment having a base structure forming a platform for the compartment and spaced apart flanges adjacent to the front and rear edges of the platform;
a pair of main frame members extending in spaced apart generally parallel relation for a substantial portion of the longitudinal dimension of the motor vehicle and lying in a plane so as to have a slidable fit through at least one of the downwardly directed platform flanges and extending at least part way toward the opposite platform flange; said main frame members supporting the occupant compartment and in turn being supported by the road engaging wheels;
means rigidly secured to that section of each main frame member under the compartment platform and forming a surface spacingly confronting at least one of the platform flanges; and



certain of the intervening spaces between the platform flanges and confronting surfaces of said rigidly secured means being substantially fully occupied by compressible energy absorbing material whereupon slidable movement of the platform relative to the frame members in the direction to compress such energy absorbing material will cushion the shock of a collision impact between the motor vehicle and an external object;
and means is provided for releasably holding the platform against sliding movement on the main frame members except in the event of a severe collision impact at which time the holding force will give way and permit the platform to slide longitudinally on the main frame members thereby compressing the energy absorbing material and absorbing part of the energy resulting from such an impact.

4,232,756

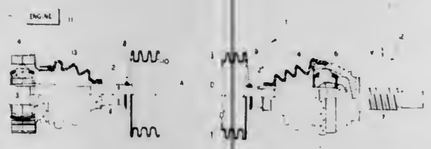
MOTOR-VEHICLE DRIVE-SHAFT ASSEMBLY

Hartmut Bathelt, Lenting, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,605
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2727966
Int. Cl.³ B60K 17/22
U.S. Cl. 180—70 P **7 Claims**

1. A shaft assembly for interconnecting an engine and a load, said assembly comprising:
a small-diameter input shaft lying generally on an axis and having a pair of ends one of which is adapted to be connected to said engine and the other of which has a predetermined shaft diameter;
a small-diameter output shaft lying generally on said axis and having a pair of ends one of which is adapted to be connected to said load and the other of which has a predetermined shaft diameter;
respective rigid and radially outwardly tapering input and output flanges fixed on the other ends of said input and output shafts and extending radially outwardly therefrom; and
a large-diameter torque-transmitting and circumferentially corrugated tube centered generally on said axis and having axially spaced input and output ends respectively fixed

to said input and output flanges, said tube being elastically radially and axially deformable but said input and output ends being relatively angularly nondisplaceable, said tube



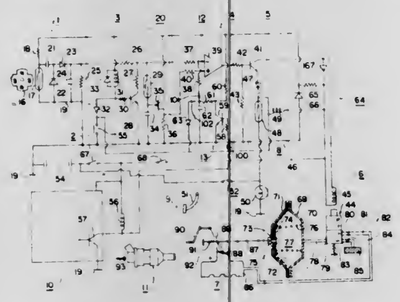
having an inner diameter equal to at least twice either of said shaft diameters and an outer diameter equal to at least three times either of said shaft diameters.

4,232,757

AUTOMOBILE SPEED CONTROL METHOD AND SYSTEM

Takeshi Ochiai; Masahito Muto, both of Toyota; Naoji Sakakibara, Chiryu, and Shoji Kawata, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 27, 1978, Ser. No. 900,623
Claims priority, application Japan, Apr. 28, 1977, 52/49438
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—176 **7 Claims**



2. An automatic speed control system for an automobile having a fuel injection engine and a throttle valve, and comprising:

a speed signal generator circuit which generates a first electrical signal indicating actual automobile speed;

desired automobile speed signal supply circuit means which supplies a second electric signal indicating desired automobile speed in response to a speed set operation of the automobile driver;

an electronic fuel injection control device which produces a fuel injection control signal;

a feedback signal generator circuit which generates a third electric signal indicating fuel injection rate in response to the fuel injection control signal from the electronic fuel injection control device;

a comparator circuit combining said first, second and third signals to provide an engine throttle valve control signal; and

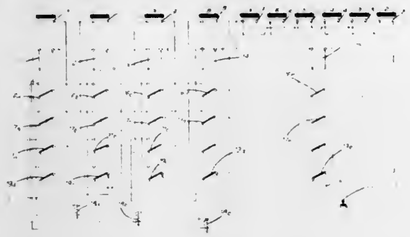
servomotor means for driving the throttle valve in response to the throttle valve control signal.

4,232,758

ELECTROMECHANICAL ANTI-THEFT SYSTEM FOR AUTOMOBILE VEHICLE

Pedro B. Crosas, Calle Agudas No, 32, Gerona, Spain

Filed Apr. 27, 1978, Ser. No. 900,502
Claims priority, application Spain, May 4, 1977, 459146
Int. Cl.[2] B60R *25/08*
U.S. Cl. 180—287 **3 Claims**



1. An electromechanical anti-theft system for an automobile vehicle having piping forming a brake line, a clutch line and a fuel line, the system comprising

three unidirectional solenoidal electrovalves for being situated in the piping of the brake line, the clutch line and the fuel line of the automobile vehicle, respectively;

a plurality of first control electromechanical relays each having a relay, each control relay except for a last control relay of said plurality of control relays winding and at least three normally open contact switches ;

a second control relay having a winding and at least two normally open contact switches;

an interlocking electromechanical relay having a relay winding, at least two normally closed contact switch means, and one normally open contact switch means;

means for connecting the system to an electrical power source;

series circuit means connected with the three electrovalves across the power source connecting means;

said series circuit means including at least one of said normally open contact switches of each of the first and second control relays and one of said normally closed contact switch means of the interlocking relay;

a second of said normally open contact switches of each of said first and second control relays connected in a respective series holding circuit including the corresponding relay winding and the second normally closed contact switch means of the interlocking relay across the power source connecting means;

said normally open contact switch means of the interlocking relay connected in series with the relay winding of the interlocking relay across the power source connecting means;

a plurality of first normally open push button switches corresponding to the plurality of control relays;

one of said first push button switches connected in a series circuit including the relay winding of the corresponding relay, and the second normally closed contact switch means of the interlocking relay across the power source connecting means;

each of the other first push button switches connected in a respective series operating circuit including the corresponding relay winding, the third normally open contact

switch of the respective preceding first control relay, and the second normally closed contact switch means of the interlocking relay across the power source connecting means; and

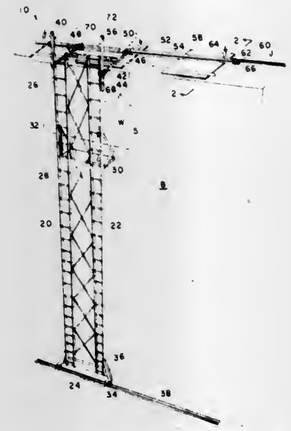
a plurality of second normally open push button switches all connected in parallel with each other and in series with the relay winding of the interlocking relay across the power source connecting means.

4,232,759

MOBILE LADDER-SCAFFOLDING SYSTEM

Ronald S. Jacobs, 1953 Hill Ave., Baltimore, Md. 21234

Filed Aug. 2, 1979, Ser. No. 63,078
Int. Cl.[3] E06C *1/397, 5/00, 9/12;* E04G *3/14*
U.S. Cl. 182—39 **15 Claims**



1. In a system of mobile scaffolding including vertical structure with a plurality of ladders and means mounting the plurality of ladders movably as a unit on a bottom track for shifting location along the wall of a build- having roof structure, a work platform in said system having means for engaging rung structure of said ladders, and lateral means engaging the roof of the building to stabilize the vertical structure, the improvement comprising: at least one vertical track member on an upper portion of a said ladder, the lateral means including: horizontal track structure, means for fixing the horizontal track structure to a roof, a vehicle, first movable captive-engagement of the vehicle with the vertical track member, and second movable captive-engagement of the vehicle with a portion of the horizontal track structure.

4,232,760

LADDER ASSEMBLY AND METHOD OF MAKING SAME

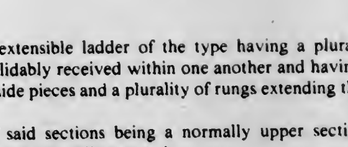
George L. Becht, Orchard Park; Jerome A. Melachowski, Williamsville, and Richard J. Wolicki, Buffalo, all of N.Y., assignors to Buffalo Brake Beam Company, Lackawanna, N.Y.

Continuation-in-part of Ser. No. 774,586, Mar. 7, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 896,791
Int. Cl.[2] E06C *5/24, 7/08, 7/50*
U.S. Cl. 182—194 **2 Claims**

1. A ladder having a plurality of rungs comprising:

a pair of metal styles, each style having a front planar face and a rear planar face disposed parallel to the rungs and having a plurality of rung receiving apertures so disposed that corresponding rung receiving apertures on each style are vertically aligned, and

a plurality of rungs disposed between said styles, each of said rungs consisting of a rod of cold working steel, the ends of said rods bent at substantially a 90° angle about an axis defined by a generally arcuate indentation forming the inside radius of said angle, the main body portion of said rods abutting the front planar face of said styles, the ends of said rods extending through the apertures of said styles



and secured therein by a cold formed head of greater dimension than said aperture, said head abutting the rear planar face of said styles.

4,232,761

EXTENSIBLE LADDER

Reginald C. Phillips, Tracy, New Brunswick, Canada (E0G 3C0)

Filed Dec. 5, 1978, Ser. No. 966,588
Claims priority, application Canada, Jan. 6, 1978, 293801
Int. Cl.[2] E06C *1/36, 1/397*
U.S. Cl. 182—195 **4 Claims**

1. An extensible ladder of the type having a plurality of sections slidably received within one another and having each a pair of side pieces and a plurality of rungs extending therebetween;

one of said sections being a normally upper section and having a normally top end;

hook means secured to said normally upper section and protruding upwardly and away from a plane generally defined by said side pieces, for securing said upper section to an object to suspend the ladder;

cord means having one end secured to a normally lowermost section of the ladder, the other end of said cord means being secured to manually operable reel means disposed in proximity of said top end of the upper section and secured to same;

wherein a bottom end of said normally lowermost section is provided with supporting wheels pivotable about an axis generally parallel with the rungs of said ladder, the periphery of said wheels protruding both downwardly beyond the bottom end of the ladder, and out of a plane generally coincident with the sidepieces of the ladder, the sense of the latter protruding being the same as that of the hook means.

4,232,762

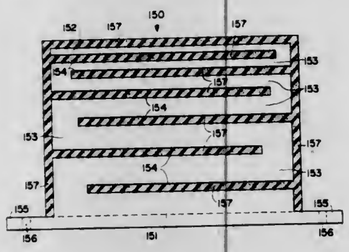
WIDE-BAND VIBRATION DAMPER

Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 722,128, Sep. 10, 1976, Pat. No. 4,120,382. This application Jul. 24, 1978, Ser. No. 927,388

Int. Cl.[3] F16F 7/00; F16L 55/02

U.S. Cl. 188—1 B 22 Claims



1. A wide-band vibration damper for damping sound propagating in a solid body, comprising sound vibration conductor means, the entire volume of which is solid material, said sound vibration conductor means having a first larger end and a second smaller end, said first larger end having a larger dimension than said second smaller end, whereby said solid material volume has a cross-section which diminishes from said first larger end to said second smaller end, said first larger and second smaller end being interconnected entirely by said solid material so that sound vibrations travelling from said first larger end to said second smaller end must travel entirely through said solid material volume, first means connecting said first larger end to said solid body for introducing sound vibrations into said solid material volume, support means located near said second smaller end, and damping material means operatively connecting said second smaller end to said support means for introducing sound vibrations in a damped manner into said support means, whereby said vibration conductor due to its diminishing cross-section transforms the sound vibrations into large excursions but small vibration forces.

4,232,763

FULL-COAT DISK BRAKE

Hermann Klaue, Tour d'Ivoire 24 e, 1820 Montreux, Switzerland

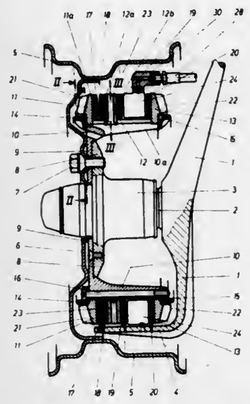
Filed Oct. 26, 1978, Ser. No. 955,143

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748195

Int. Cl.[3] F16D 55/10

U.S. Cl. 188—18 A 11 Claims

1. A fully coated disk brake comprising: a disk-shaped brake housing carrier fastened to rotatable means and revolving therewith; a brake housing seated on said brake housing carrier and open radially towards the outside; braking means with a friction coat and fixed in a peripheral direction, said braking means being axially displaceable; tightening means for pressing together said braking means during a braking action; carrier arms distributed over the periphery of said brake housing carrier and extending in an axial direction; said carrier arms mounting said braking means and having abutments restricting axial movement of said braking means; and radially outward running air passage channels between said braking means for admitting cooling air between said carrier arms into said brake housing and onto said braking means; said braking means being fully free within said rotatable means; said carrier arms being spaced at predetermined intervals from each other for admitting an adequate supply of cooling air, said rotatable means having sufficient interior space for aerating and cooling.



4,232,764

APPARATUS FOR MOUNTING ELONGATED ROD-LIKE MEMBER

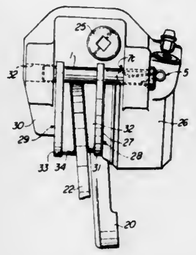
Masachika Yamamoto, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 24, 1978, Ser. No. 927,425

Claims priority, application Japan, Jul. 25, 1977, 52-89466

Int. Cl.[3] F16D 65/02

U.S. Cl. 188—73.6 9 Claims



6. In a disc brake apparatus for a motor vehicle including a brake disc mounted on an axle of said motor vehicle rotatably with a wheel, a bake housing positioned to straddle over said brake disc, and a pair of brake pads mounted on said brake housing and positioned at opposite sides of said brake disc so as to be caused to bear frictionally against said brake disc in opposite directions upon braking, and an apparatus for mounting a pin on said brake housing to support said brake pads comprising: an axial bore formed in said pin at one end portion thereof at which said pin is mounted on a supporting plate of said brake housing, said supporting plate being formed with a hole through which said pin extends, a stop means formed at an extremity of said pin for bearing against a corresponding surface of said supporting plate when said pin is fully inserted through said hole formed in said supporting plate, at least one radial throughhole extending from the inside of said axial bore outwardly and substantially perpendicularly to the longitudinal axis of said pin, said radial throughhole being formed at a position spaced from said stop means by a distance slightly greater than the thickness of said supporting plate, and a latch spring of a hairpin-like configuration having two spring legs, one of which has a main leg portion, an intermediate leg portion and a free end portion, said free end portion being bent so as to extend substantially perpendicularly to said main leg portion and having a length to extend through said radial throughhole upon insertion of said latch spring into said axial bore and to project outwardly for a certain distance to engage a side surface of said supporting plate under spring force of said latch spring, said intermediate leg portion being bent both away from the other of said spring legs and relative to both said main leg and free end portions to facilitate insertion and removal of said free end portion into and from said radial throughhole, said latch spring further including a bent head portion between said two spring legs, said head portion having a size greater than the diameter of said axial bore so that said head portion is located externally of said axial bore in position to be grasped and compressed to move said spring legs toward each other to facilitate removal of said latch spring from said axial bore after said latch spring has been placed in said axial bore at latch position, whereby said pin is mounted on said supporting plate axially immovably while said pin supports said brake pads movably along said pin at the opposite sides of said disc brake.

4,232,765

DRUM BRAKE

Kurt Rupprecht, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,218

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2804938

Int. Cl.[3] F16D 65/09

U.S. Cl. 188—78 2 Claims



1. In a drum brake including a bake shoe having a web, a hand brake lever pivotally attached to the brake shoe by a rivet extending through the hand brake lever and the web and having a stepped rivet shaft formed of adjoining first and second rivet shaft portions, a spring disc mounted on the rivet shaft to compensate for a play between the web and the hand brake lever; the improvement wherein said spring disc is situated between said hand brake lever and said web and is firmly riveted to said web by said first rivet shaft portion passing through said hand brake lever; said spring disc having a central radial annular portion of an outer diameter which is greater than the diameter of said first rivet shaft portion; said spring disc further having at least one radial spring tab starting at the end of said outer diameter and extending out of the plane of said central radial annular portion of said spring disc.

4,232,766

SELF-ADJUSTING DRUM BRAKE

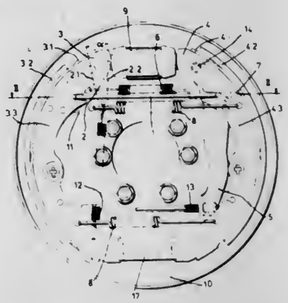
Kurt Rupprecht, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,921

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644575

Int. Cl.[2] F16D 65/52

U.S. Cl. 188—79.5 P 5 Claims



1. In a drum brake having a drum; first and second brake shoes arranged within the drum and provided with a brake lining oriented towards a drum face; a brake lever forming part of a parking brake and pivotally attached to the first brake shoe; return spring means continuously urging the brake shoes away from the drum face; a brake operating device having an actuated state in which the brake shoes are pressed, against the force of the return spring means, into frictional engagement with the drum face; the brake operating device having a released state in which an air gap is maintained between the lining of each brake shoe and the drum face; and a self-adjusting device operatively coupled to the brake shoes for automatically maintaining the air gap at a desired maximum value, the improvement in said self-adjusting device comprising

(a) a push rod of fixed length having opposite first and second ends; said return spring means urging said brake lever into operative abutment with said push rod at said first end thereof;

(b) an adjusting wedge having

(1) a first flank frictionally cooperating with a component forming a fixed part of said second brake shoe;

(2) a second flank frictionally cooperating with said push rod at said second end thereof; said return spring means urging said second brake shoe into operative abutment with said push rod with the intermediary of said adjusting wedge; said component of said second brake shoe and said push rod together defining a wedging space occupied by said adjusting wedge;

(3) a wedge angle defined by the inclination of said first and second flanks to one another; said wedge angle being of a magnitude to effect self-locking of said wedge when frictionally engaged by said component of said second brake shoe and said push rod;

(c) a clamping spring being attached, at one end, to said second brake shoe and further being attached, at another end, directly to said push rod for pressing said component of said second brake shoe and said push rod into frictional engagement with said first and second flanks, respectively, of said adjusting wedge separately from the effect of said return spring means; the magnitude of said wedge angle, the friction coefficient between said first flank and said component forming a fixed part of said second brake shoe and the friction coefficient between said second flank and said push rod as well as the forces of said return spring means and said clamping spring being so selected as to effect an equilib-

rium between the forces normally exerted on said adjusting wedge; and

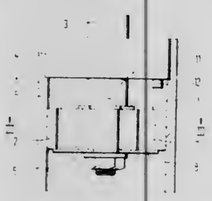
(d) an abutting and displacing means comprising a hook-like portion formed at said first end of said push rod; said hook-like portion projecting behind a part of said brake lever; said part of said brake lever being arranged to move towards said hook-like portion as said first brake shoe moves towards said drum face upon actuation of said brake operating device; in said released state said part of said brake lever and said hook-like portion define, between themselves, a clearance being identical to and determining said desired maximum value; said hook-like portion being arranged for transmitting to said push rod a displacing force derived from the travel of said brake shoes towards said drum face upon actuation of said brake operating device solely after said travel has exceeded the magnitude of said desired maximum value; said push rod being arranged to shift with respect to said component of said second brake shoe against the force of said clamping spring in response to said displacing force for dissolving said equilibrium and increasing said wedging space for allowing said wedge to shift and take up the increased wedging space.

4,232,767

ARRANGEMENT FOR ADJUSTING THE DAMPING FORCE OF A SHOCK ABSORBER

Cornelis De Kock, Oud-Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,908
Int. Cl.³ F16F 9/34
U.S. Cl. 188—319 **1 Claim**



1. A hydraulic telescopic shock absorber having a cylinder closed by a cylinder cap and filled with a damping medium in which a piston having a piston head and a piston rod is reciprocatingly arranged, said piston head dividing the cylinder into two portions and further provided with a plurality of longitudinally extending and circumferentially spaced passages extending therethrough, the passage openings on the lower surface of the piston head being closed by a ring-shaped resilient valve, a rigid pie-shaped closing member coaxially and movably mounted about the piston rod on the upper surface of the piston head, said closing member including a longitudinally extending adjustment tab which engages an adjustment pin fixedly mounted to the lower surface of said cylinder cap, and wherein said passages are selectively opened or closed by extending the piston rod until said pin engages said tab and thereafter rotating the piston rod to expose the desired number of passages.

4,232,768

AUTOMATIC EMERGENCY BRAKE

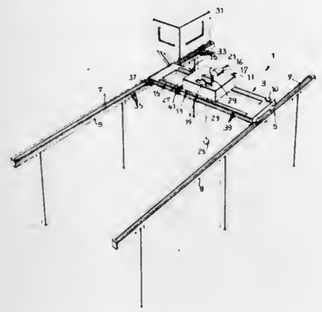
Jacques Dufresne, 6889 Lamont, Montreal, Quebec, Canada (H4E 2T8)

Filed May 1, 1978, Ser. No. 901,817
Int. Cl.² F16D 49/16; B60K 41/20
U.S. Cl. 192—2 **11 Claims**

1. An improved brake for a rotatable member mounted on a frame, comprising:

first and second support means mounted on the frame on both sides of the rotatable member, each support means carrying a brake and including means for pivotably attaching one of its ends to the frame, means for loosely attaching its other end to the frame, and means for mounting the brake on it intermediate its ends;

means on each support means for moving it relative to the frame to brake the rotatable member, said moving means comprising first and second brake frames pivotably connected to the support means at the loosely attached ends



thereof, spring means positioned between the brake frames and the support means for moving them apart to brake, and means for normally retaining the brake frames and support means together, against the force of the spring means, in a non-braking position; and

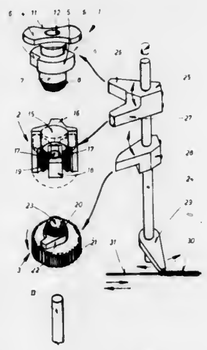
means for mechanically connecting the two support means together through the brake frames so that both of the brakes be operated by movement of only one of the support means if one of the moving means has failed.

4,232,769

RACKING MECHANISM FOR BOBBIN MACHINE

Juan C. Miró, Santa Maria de Barbara, Spain, assignor to Industria Espanola de Manufacturas Especiales, S.A., Barcelona, Spain

Filed Jan. 6, 1978, Ser. No. 869,033
Claims priority, application Spain, Jan. 8, 1977, 454,896
Int. Cl.² F16D 67/00; F16H 57/10
U.S. Cl. 192—4 R **12 Claims**



1. A bobbin-racking mechanism for a jacquard machine, said mechanism comprising:

a support;

a drive gear rotatable on said support about a drive axis;

a transmission member rotatable on said support independent of said drive gear about said drive axis;

an output member connectable to a bobbin and rotatable on said support independent of said drive gear and transmission member about said drive axis;

an output gear fixed to said output member and spaced from said drive gear;

a transmission gear rotatable on said transmission member about a transmission axis transverse to said drive axis and meshing simultaneously with said drive gear and said output gear, whereby on rotation of said transmission member said transmission gear orbits about said drive axis;

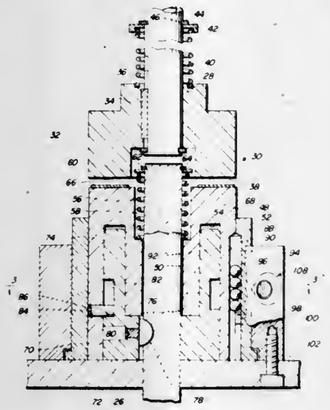
operator means engageable with said members and displaceable between a stopping position preventing rotation of said output member and permitting rotation of said transmission member and a racking position permitting rotation of said output member and preventing rotation of said transmission member; and a cam member connected to said drive gear and engageable with said operator means for displacing the latter from said racking into said stopping position.

4,232,770

DRIVE COUPLING

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 957,788
Int. Cl.³ F16D 23/14
U.S. Cl. 192—41 R **4 Claims**



1. An apparatus for drivingly connecting a driving shaft and a driven shaft comprising clutch means operatively associated with said shafts and means to actuate said clutch means, the improvement which comprises:

a first clutch member connected to said driven shaft for rotation therewith;

a second clutch member surrounding said driving shaft;

cam means connected for rotation with said driving shaft;

cam follower means connected to said second clutch member;

said cam follower having at least two positions with respect to said cam, one of which corresponds to coupled shafts and the other of which corresponds to uncoupled shafts; and

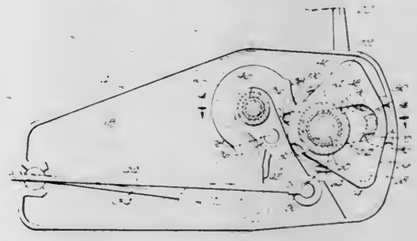
means to selectively actuate said cam and follower means comprising a one-way clutch associated with said second clutch member and providing a drag on said second clutch member upon reversal of the direction of rotation of said driving shaft thereby causing said cam follower to move from one cam position to another cam position.

4,232,771

SINGLE LEVER REMOTE CONTROL

Anthony P. Prince, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 789,798, Apr. 22, 1977, abandoned.
This application Jan. 8, 1979, Ser. No. 1,486
Int. Cl.³ B60K 29/02
U.S. Cl. 192—0.096 **10 Claims**



1. A throttle control for an engine having a throttle and a clutch, said control comprising a housing, a shaft member supported within said housing for rotation relative to said housing, a control lever connected to said shaft member for common rotation therewith relative to a neutral position, a shift lever mounted on said housing for movement between a neutral position and a shift position and adapted to actuate the engine clutch in response to movement of said shift lever, means connecting said shift lever to said shaft member for moving said shift lever from the neutral position to the shift position in response to rotational movement of said control lever from the neutral position, a throttle lever movable mounted on said housing and adapted to actuate the engine throttle in response to movement said throttle lever, a throttle drive member including a drive pin mounted on said shaft member for common rotation therewith in response to movement of said control lever from the neutral position, a cam member carried by said shaft member and connected between said throttle lever and said throttle drive member for movement between an idle position and a throttle advance position in response to rotation of said throttle drive member, said cam member including a cam track receiving said drive pin and having a shape effective to displace said cam member relative to said shaft member and to said throttle drive member to move said throttle lever in response to rotation of said throttle drive member, and guide means on said cam member and on said shaft member for guiding translatory movement of said cam member relative to the rotational axis of said shaft member in response to movement of said drive pin in said cam track.

4,232,772

ELECTROMAGNETICALLY CONTROLLED, RESETTABLE HIGH-SPEED SHAFT DISCONNECT

George E. Brissey, and Glen E. Gathers, both of Erie, Pa., assignors to General Electric Company, Wilmington, Mass.

Filed Jan. 5, 1978, Ser. No. 867,113
Int. Cl.² F16D 11/04, 27/10, 43/25
U.S. Cl. 192—114 R **4 Claims**

1. In a resettable disconnect adapted to connect driving and driven members in a power transmission system, the combination comprising,

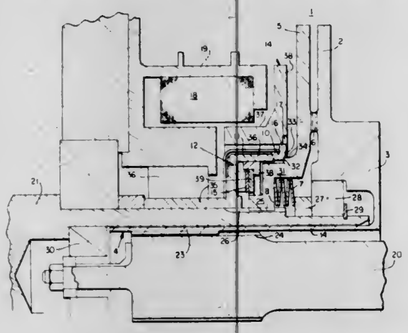
(a) a disengagable spring loaded, torque transmitting coupling disposed between the driving and driven members, said coupling having an axially moveable member and an axially fixed member;

(b) means for maintaining said axially moveable and axially fixed members engaged to transmit torque through said coupling, including;

1. radially moveable means having a tapered surface for contacting a tapered shoulder on the axially moveable coupling member to exert axial force on said axially

moveable member to maintain it in engagement with said axially fixed member against the separating force of spring loaded coupling,

2. cantilever spring means supporting said radially moveable member to allow centrifugal force to flex said spring and move said means with tapered surface radially outward and along the said tapered shoulder,
3. latching means to prevent said spring means from flexing outwardly thereby maintaining the radially move-



able means in contact with said axially moveable member;

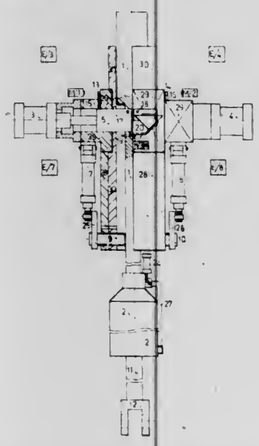
(c) means responsive to a malfunction or incipient malfunction in the system to disable the latching means to permit flexing of said spring means and movement of the tapered face of said radially moveable means outwardly and along the tapered shoulder on said axially moveable member in response to the separating force of said spring loaded coupling to release said coupling and terminate torque transmission.

4,232,773

SAFETY DEVICE FOR MECHANICAL ECCENTRIC CAM PRESSES

Renzo Cipriani, Fontanelle 52/d St., Fabriano, Italy

Filed Mar. 1, 1978, Ser. No. 882,420
Claims priority, application Italy, Mar. 14, 1977, 611 A/77
Int. Cl.[2] F16P *3/18*
U.S. Cl. 192—131 R **9 Claims**



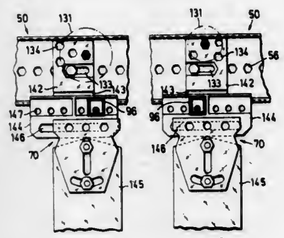
1. A safety device for a mechanical cam press including a frame and a ram having dies arranged for vertically reciprocating strokes comprising, in combination, a vertically extending shaft, a double acting hydraulic cylinder having a piston rod connected at its upper end to the lower end of said shaft and at its lower end to the ram of the press whereby said shaft, said cylinder, and piston rod and said ram move together reciprocally as a unit, said shaft having a portion of reduced diameter forming a stepped edge, a pair of opposed, independent, horizontally moveable slides arranged for reciprocating movement between an advanced position and a retracted position, a pair of pneumatic cylinders operated by control means, means for connecting each of said pneumatic cylinders to one of said slides for moving the said slides reciprocally in opposite directions, said slides in said advanced position having a portion in underlying relationship with said shaft stepped edge with a clearance of a few millimeters in the top, dead center position of said shaft to thereby prevent the inadvertent downward movement of said shaft and therefore said ram by engagement between said stepped edge for said portions of said slides; and an interlock means, releasably engageable with said shaft for retaining said shaft in an initial position to permit vertical adjustment of said ram.

4,232,774

SET OF COMPONENTS FOR PRODUCING VARIABLE LOAD-BEARING SCAFFOLDS

Rolf Gunti, Laufen, Switzerland, assignor to Masyc A.G., Laufen, Switzerland

Division of Ser. No. 827,213, Aug. 24, 1977, Pat. No. 4,172,677, which is a division of Ser. No. 608,399, Aug. 27, 1975, Pat. No. 4,056,180. This application Jun. 7, 1979, Ser. No. 46,178
Claims priority, application Switzerland, Aug. 27, 1974, 11677/74
Int. Cl.[3] B65G *39/12*
U.S. Cl. 193—35 J **3 Claims**



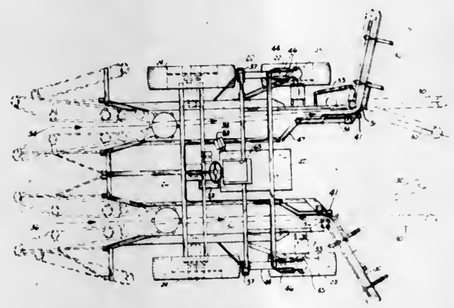
1. A set of components for producing load-bearing scaffolds comprising profile bars each of which has an approximately Σ-shaped cross-section with a flat center web section and two equally dimensioned flanges arranged in mirror image relationship, each of said center web sections and an inwardly angled free arm of each flange, which arm extends parallel to the center web section, being provided with perforations; connecting bars each of which has cross-section which is geometrically approximately similar to that of the profile bars with a center web section and two equally dimensioned flanges arranged in mirror image relationship and has such dimensions that a one of said connecting bars is slidably insertable into a one of said profile bars with engaging and fitting flanges at mutual superposed center web sections, the center web section of each of the connecting bars being provided with perforations, said profile and connecting bars being mutually detachably connectable by connecting means located through mutually superposed perforations; and bearing hole plates provided for supporting rollers of various envelope diameters, each of which bearing hole plates has a hole plate element attachable to the inside face of the center web section of a connecting bar and which hole plate has a fixing slot and series of bearing perforations arranged at various separations from the fixing slot to provide for various bearing heights.

4,232,775

STRUCTURAL AND OPERATIONAL IMPROVEMENTS FOR A TWO ROW HARVESTER AND PILER

Richard A. Duncan, 123 Len Ct., Thibodaux, La. 70301

Filed Sep. 22, 1978, Ser. No. 945,157
Int. Cl.[3] A01D *45/10*
U.S. Cl. 198—304 **6 Claims**



1. In a four-wheel harvester and pilers, having a right rear carrier frame member, sequential pairs of cane-moving chains, and a power train with hydraulic means for driving said chains and wheels and pilers,

(a) individual suspension means for independently mounting rear wheels on said harvester and pilers to provide harvester and pilers mobile stability on uneven ground

(b) individual speed range setting means and unitary mechanical speed control means respectively connected to said hydraulic means for driving said chains and wheels for individually setting speed ranges and controlling the speed within any of said ranges of said chains and wheels,

(c) single articulation piler means mounted behind and above said four wheels on said harvester and pilers and operably connected to said hydraulic means, and having longitudinally adjustable rub bar gate means fixed thereto for cooperating in side piling two rows of cut cane and center piling two rows,

(d) cane butt deflector means mounted on said harvester and pilers and pivotally adjustable to extend below and across said adjustable rub bar gate means for cooperating with said piler means in center piling two rows, and

(e) outward extension means fixed to said carrier frame member just forward of right rear wheel for providing additional fall space for center piled cane.

4,232,776

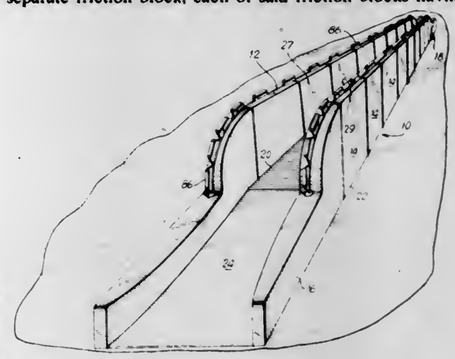
ACCELERATING WALKWAY

George A. Dean, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Filed Jan. 5, 1978, Ser. No. 867,111
Int. Cl.[3] B65G *13/07*
U.S. Cl. 198—322 **11 Claims**

1. A variable speed walkway comprising an acceleration section, a high speed section and a deceleration section, each of said sections comprising a plurality of rollers, each of said rollers in at least the acceleration and deceleration sections having a pulley thereon; a prime mover for each of said sections having an output shaft with a pulley thereon, means for individually and selectively varying the output speed of each of said prime movers; timing belt means in at least said acceleration and deceleration sections drivingly connected between the output shaft pulley and the pulleys of a selected number of said rollers in each of said sections; means for permitting passengers to enter said acceleration section, the rollers in said acceleration section being at rest during the passenger boarding operation, means for normally preventing passengers from entering said high speed section during passenger loading of said acceleration section and means for activating the prime movers in said acceleration section to accelerate passengers to the speed of said high speed section; sensor means adjacent the junction of said high speed section and said deceleration sections for sensing the arrival of a passenger at said deceleration section, and means for decelerating the rollers in said deceleration section to a selected exit speed beginning a selected time after the passenger is sensed by the sensor.

7. A variable speed handrail assembly adapted for use with a variable speed walkway, said handrail system comprising a plurality of blocks for a passenger to grasp, a plurality of friction blocks, means connecting each of said first blocks to a separate friction block, each of said friction blocks having a



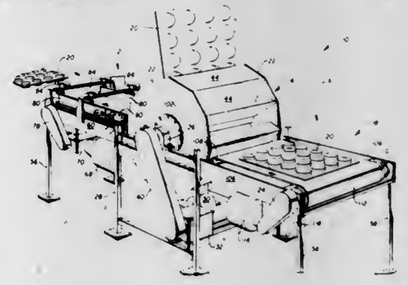
shaft extending therethrough, track means spaced apart on either side of said friction blocks, bearings on the end of each shaft engaging said track means, a plurality of rotatable means frictionally engaging said friction blocks and spaced along the path of said handrail for causing said friction blocks to move along said track means, a sheave mounted on each of said rotatable means, a prime mover having an output shaft and output sheave thereon and driving the sheaves on said rotatable means, belts drivingly connecting said output sheave and the sheaves connected to said rotatable means, the pitch diameters of the output sheave and the individual sheaves connected to said rotatable means being sized to move each friction block at the walkway speed at the location of said rotatable means.

4,232,777

PAN INVERTING APPARATUS AND METHOD

Jimmie L. Smith, Plano; John D. Honeycutt, McKinney, and Michael J. Doble, Lewisville, all of Tex., assignors to Stewart Engineering & Equipment Company, Richardson, Tex.

Filed Sep. 5, 1978, Ser. No. 939,652
Int. Cl.[3] B65G *47/24*
U.S. Cl. 198—404 **21 Claims**



1. Apparatus for inverting pans, trays or the like, comprising:

revolving pan wheel means including structure defining a plurality of pan receivers;

input means comprising endless belt means mounted for rotation about a course including a portion adjacent to one side of the revolving pan wheel means and responsive to rotation of the pan wheel means for engaging and selectively advancing a pan to be inverted into one of said pan receivers for rotation therewith through approximately a one-half revolution to effect inversion;

output means for engaging and advancing inverted pans out of the pan wheel means;

a pair of pan guide members mounted in spaced relationship above said endless belt;

sensing means for detecting the presence of a pan between said guide members and a predetermined rotational position of the pan wheel means; and

pan stop means extending into the path of motion of a pan on the endless belt means between said guide members to stop the pan and responsive to said sensing means to move out of said path of motion to permit advancement by the endless belt means of a pan received between said guide members into one of the pan receivers of the revolving pan wheel means.

4,232,778

TIMBER-CONVEYING METHOD AND APPARATUS

Alpo Rysti, Frisansintie 22, 02240 Espoo 24, Finland

Filed Mar. 28, 1978, Ser. No. 890,941
Claims priority, application Finland, Nov. 18, 1977, 773504
Int. Cl.[2] B65G *47/12*
U.S. Cl. 198—443 **6 Claims**



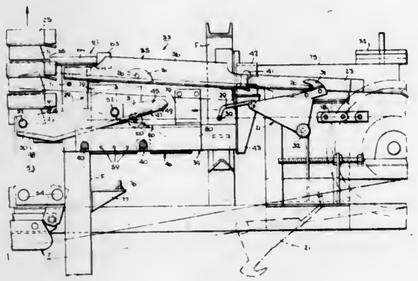
1. In an apparatus for conveying timber in a manner which will disperse a batch of timber pieces into individual timber pieces which are conveyed one after the other, delivering means for delivering a batch of timber to a predetermined location, conveyor means situated in part at said predetermined location for receiving a timber batch delivered by said delivering means to said predetermined location, said conveyor means including for timber conveyed thereby an initial path of movement which has an inclination, if any, with respect to a horizontal plane which is small enough to convey with said conveyor means the timber batch from the predetermined location with a substantial number of timber pieces disposed in overlying relationship with and frictionally engaging those timber pieces which directly engage the conveyor means, and said conveyor means including for timber conveyed thereby after said initial path of movement a subsequent path of movement which is curved smoothly upwardly so that the conveyor means conveys at least the pieces directly engaging said conveyor means upwardly along said subsequent path of movement, said subsequent path of movement having an inclination great enough such that the component of gravitational force acting on overlying timber pieces is sufficient in magnitude and direction so as to overcome the frictional forces which exist between the overlying timber pieces and the timber pieces directly engaging the conveyor means so that the overlying timber pieces will slide downwardly in a direction opposite to the direction of movement of the conveyor means and arrive at the initial path of movement of the conveyor means, so that by the time said conveyor means has conveyed timber pieces to the region of an end of said subsequent path of movement said conveyor means conveys substantially only timber pieces which directly engage said conveyor means one after the other and wherein said conveyor means includes at least a pair of coextensive endless flexible members each in the form of an endless chain, belt, or the like, said endless flexible members being laterally spaced from each other and having upper runs extending along said initial and subsequent paths of movement and lower runs situated beneath said upper run, said conveyor means including rotary means respectively having axes of rotation transverse to said paths of movement and respectively situated at ends of said initial and subsequent path of movement which are distant from each other, said endless means extending around said rotary means and forming a loop having opposed ends where said rotary means are respectively located, and said conveyor means further including a guide means extending along at least a part of the upper run of said endless means which travels along from said subsequent path of movement and situated in said loop for guiding said conveyor means for movement along said subsequent path of movement at said upper run of said conveyor means said guide means including a plurality of angle members which are carried by and distributed along each of said endless members and extending therefrom at least partly into said loop, said angle members each having an outer wall connected directly to said endless members and extending therefrom inwardly to said loop in a substantially vertical plane and an inner wall extending laterally from said outer wall at an end thereof a distance from said endless members, and said guide means including at least one guide rail having a configuration corresponding to at least part of said subsequent path of movement and situated at the side of said inner walls of said angle members opposite from said lower run for cooperating with said inner walls of said angle members to guide said upper run of said conveyor means for movement along said subsequent path of movement, said endless members respectively having at said upper run of said conveyor means upper surfaces for engaging timber pieces and carrying at said upper surfaces a projection means which projects at least to a slight extent upwardly from said upper surfaces at said upper run of said conveyor means for engaging behind at least some of the timber pieces to prevent the latter from moving downwardly along said upper run of said conveyor means at said subsequent path of movement thereof, said projection means extending laterally beyond said endless members and having at said upper run of said endless conveyor means a lower surface directed toward said inner walls of said angle members, and said guide rail having a surface engaging said lower surface of said projection means for contributing to the guiding of said endless members.

4,232,779

INFEED ASSEMBLY AND A DISCHARGE ASSEMBLY FOR A CONVEYOR SYSTEM

Rouzas R. Khoylian, Belmont, Mass.; James R. Cowdery, Pelham, N.H., and David B. Park, Wilmington, Mass., assignors to Design & Process Engineering, Inc., Billerica, Mass.

Filed Aug. 13, 1979, Ser. No. 65,870
Int. Cl.[3] B65G *37/00*
U.S. Cl. 198—472 **29 Claims**



13. An infeed assembly for moving a carrier from a horizontally disposed first conveyor having a hook assembly for conveying the carrier thereon to a vertically disposed second conveyor, said infeed assembly comprising

a pivotally mounted ramp assembly having a pair of ramp tracks for guiding a carrier thereon, said ramp assembly being pivotally mounted about a pivot axis;

at least one cam means for lowering said ramp assembly in response to the hook assembly moving into a predetermined position; and

a releaseable latch assembly mounted on at least one of said ramp tracks for engaging with the second conveyor during a subsequent upward pivoting of said ramp assembly.

27. A discharge assembly for moving a carrier to a horizontally disposed first conveyor having a hook assembly for conveying the carrier thereon from a vertically disposed second conveyor, said discharge assembly comprising

a pivotally mounted ramp assembly having a pair of pivotally mounted ramp tracks for guiding a carrier thereon, said ramp assembly being pivotally mounted about a pivot axis;

at least one cam means for raising said ramp assembly in response to the hook assembly moving into a predetermined position; and

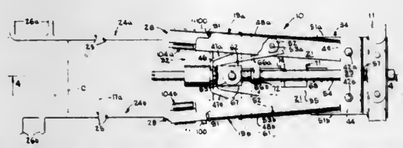
a releaseable latch assembly mounted on at least one of said ramp tracks for engaging with the second conveyor during a subsequent downward pivoting of said ramp assembly.

4,232,780

CONFECTION CONVEYOR

Stephen D. Cross, Fremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jun. 4, 1979, Ser. No. 45,041
Int. Cl.[3] B65G *47/86*
U.S. Cl. 198—479 **7 Claims**



7. An improved carriage for a transfer conveyor adapted to transfer products, such as frozen confections, from a first area to a second area, said carriage including a carriage frame, a pair of tong-receiving arms, a tong mounted to the end of each arm, each arm being pivotally connected at its rear end to said carriage frame so that the arms are mounted in opposed relationship to pivot in a plane in a scissor-like manner, and means for detachably mounting the tongs to the outer ends of said arms including a spring clip fixed to the projecting end of each arm, each spring clip including a resilient wall extending in parallel spaced relationship to a fixed wall at the projecting end of the associated arm, and means associated with each arm and tong for pivotally interconnecting the tong and arm to permit the tong to rotate about an axis which is normal to said resilient wall fixed wall and parallel to the plane of motion of the arms and to be received therebetween, said resilient wall flexing to permit said tong to be snapped into alignment with said arm.

4,232,781

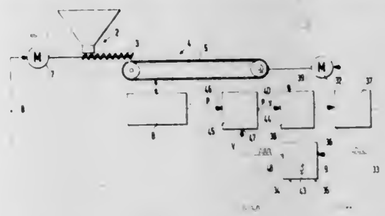
METHOD OF AND APPARATUS FOR OPERATING A DOSING ARRANGEMENT FOR GOOD AND POORLY FLOWING LOOSE MATERIAL

Karl-Heinz Müller, Aachen, Fed. Rep. of Germany, assignor to Dr. Hans Boeckels GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Jun. 21, 1977, Ser. No. 808,549
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627669
Int. Cl.[3] B65G *43/08*; G01G *11/12*
U.S. Cl. 198—505 **4 Claims**

1. In a method of operating a dosing arrangement, for good and poorly flowing loose material, having a dosing device with a controllable drive, a belt conveyor also with a controllable drive, and a gravimetrically operable measuring device provided with said belt conveyor, the improvement therewith which includes the step of:

adjusting at least one of said drives prior to the start of a dosing process so that the ensuing drive speed ratio between said drives results in predetermined thickness of
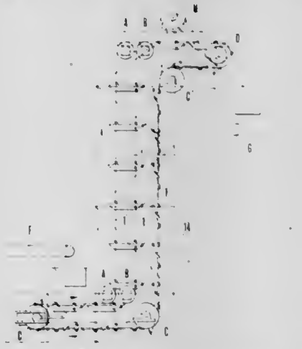


load kept approximately constant on said belt conveyor so that a predetermined ratio exists between the two controllable drives for achieving a desired thickness of the load of the belt conveyor in relation to the drive speed of the belt conveyor and independently of preset conveying thickness simultaneously adjusting both of said drives in an opposite manner.

4,232,782

CONTINUOUS CONVEYANCE SYSTEM

Satoshi Ikeda, Tokyo, and Kouhei Shibata, Kitamoto, both of Japan, assignors to Shinko Kiko Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,579
Int. Cl.[3] B65G *17/42, 17/48*
U.S. Cl. 198—706 **10 Claims**



1. A continuous conveyance system comprising in combination:

a plurality of conveyance containers of the kind which retain their shape in the absence of substantial external stresses, for conveying loose bulk, each conveyance container having a front and a rear portion, including opposing side walls having upper edges;

two pairs of endless spaced-apart chains respectively joined to the front and rear portions of each of said plurality of containers at said opposing side walls, said two pairs of endless chains comprising a first pair of endless chains for carrying the front portion of each said container and a second pair of endless chains for carrying the rear portion of each said container;

sprocket means for directing said two pairs of endless chains along a continuous path, said path including a plurality of successive segments, each segment having respective corresponding first and second ends whereby said endless chains are directed from said corresponding first ends to

said corresponding second ends, said plurality of segments including a first lower horizontal segment in which said endless chains are directed in a first horizontal direction, a first inclined segment in which said endless chains are directed in an upward direction and a second horizontal segment in which said two pairs of endless chains are directed in said first horizontal direction, the first end of said first inclined segment being disposed at the second end of said first horizontal segment, and the second end of said first inclined segment being disposed at the first end of said second horizontal segment, and a fourth segment in which said two pairs of endless chains are directed between said third segment second end and said first segment first end;

said sprocket means including a first plurality of sprockets disposed at said first inclined segment first end, a second plurality of sprockets disposed at said first inclined segment second end, a third plurality of sprockets disposed at said first horizontal segment first end, and a fourth plurality of sprockets disposed at said second horizontal segments second end, for directing said first and second pairs of endless chains in a first horizontal plane in said first horizontal segment and in a second horizontal plane in said second horizontal segment, and for directing said first pair of endless chains into a first inclined plane and directing said second pair of endless chains in a second inclined plane parallel said first inclined plane in said first inclined segment;

means for joining each of said conveyance containers to said first and second pairs of endless chains, said joining means including for each of said containers:

a pair of front protuberant elements having first and second front element ends, first means for respectively securing said pair of front protuberant elements at said first front element ends to said opposite sides of said front portion and first means for securing said second front element ends, to respective chains of said first pair of chains;

and a pair of rear protuberant elements having first and second rear element ends, second means for respectively securing said pair of rear protuberant elements at said first rear element ends to said opposing sides at said rear portion of said container, second means for fixing said second rear element ends to respective chains of said second pair of chains;

said front and rear protuberant elements extending beyond said opposing side wall upper edges;

at least one of said first and second securing means comprising means for pivotally securing one of said pairs of protuberant elements to said opposing side walls;

said endless chains continuously carrying said plurality of containers in an upright state from said first horizontal segment first end to said second horizontal segment second end.

4,232,783

STEP LINK FOR TRANSPORTATION APPARATUS

Joseph K. Kraft, Parsippany, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1979, Ser. No. 21,654

Int. Cl.³ B65G *17/38*

U.S. Cl. 198—851 **8 Claims**

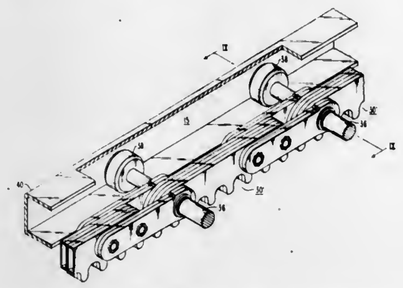
1. A toothed step link for interconnection with like step links via step axles to form an endless articulated belt for transportation apparatus, comprising:

first and second elongated elements of like construction having first and second ends, said first and second elongated elements being disposed in spaced relation with like ends adjacent to one another;

a third elongated element having first and second ends, said third elongated element having a plurality of teeth, said third elongated element having its second end disposed in the space between the first ends of said first and second elements;

said third element including at least one hollow metallic assembly formed of assembled right- and left-hand shell members, each of said right- and left-hand shell members having flat major wall portions formed of a metallic sheet having predetermined openings therethrough and a plurality of teeth along an outer edge, and including integral flange portions which extend outwardly from a common side of said flat major wall portion;

said flange portions including portions which encircle the outer periphery of said flat major portion, including said plurality of teeth, and portions which encircle the predetermined openings, with the ends of at least certain of said flanged portions lying in a common plane;



said right- and left-hand shell members being assembled with the ends of their flange portions which lie in a common plane being in contact with one another, with their flange portions which encircle their outer periphery cooperatively defining a side wall and a plurality of teeth, and with their flange portions which encircle the predetermined openings cooperatively defining the walls of openings which extend through the resulting hollow composite structure;

and means joining said first, second and third elements to provide an assembly wherein the first end of the third elongated element, and the second ends of the first and second elongated elements define male and female portions, respectively, for cooperating with female and male portions, respectively, of like assemblies.

4,232,784

STAND FOR INSTRUMENTS FOR MEDICAL USE

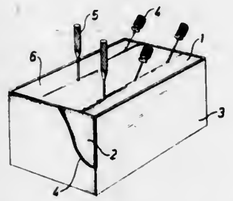
Sven-Gunnar Hesselgren, Kummelvägen 19, S-161 39 Bromma, Sweden

Filed Mar. 8, 1979, Ser. No. 18,627

Claims priority, application Sweden, Mar. 20, 1978, 7803160

Int. Cl.³ A61L *2/26, 2/06;* **B65D** *81/26;* **C23F** *11/00*

U.S. Cl. 206—210 **4 Claims**



1. A stand for maintaining and sterilizing metallic medical instruments comprising a casing including an upper open face, a bottom face, and a pair of sidewalls, and a plurality of sheets of liquid impregnatable paper arranged in said casing in face-to-face contact so as to form a stack of sheets between said sidewalls of said casing with the sides of said stack of sheets communicating with said upper open face and said bottom face of said casing, said plurality of sheets of paper being impregnated with a corrosion inhibitor so that said instruments are insertable between said sheets from said upper open face of said casing in a manner such that said instruments may be stored therein, and further whereby the entire surface of said instruments inserted between said sheets in said casing is in contact with said sheets of paper impregnated with corrosion inhibitor and may be retained in such configuration during a sterilization process.

4,232,785

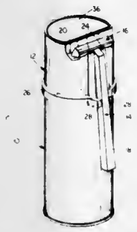
RAZOR STORAGE

Michael P. Lucas, Hingham, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 31, 1977, Ser. No. 764,035

Int. Cl.³ B65D *69/00;* **A45D** *27/22;* **B65D** *85/00*

U.S. Cl. 206—228 **16 Claims**



1. A razor storage arrangement comprising a container having a dispensing opening at its upper end, a protective cover for removable securance to said container in protective position over said dispensing opening, and a razor having an elongated handle and a head at one end of said handle, said head having portions that extend laterally on either side of said handle for support of a transversely extending shaving edge, a recess in said cover for receiving the head of said razor with said handle extending downwardly below said cover along the side of said container, and structure integral with said cover and complementary with said razor for retaining said razor in releasably supported relation on said container.

4,232,786

CASE FOR A TAPE

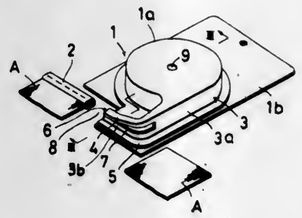
Kiyoshi Ogura, 1-7-203, 2-cho, Takeshirodai, Sakai-shi, Osaka-fu, Japan

Filed Apr. 10, 1979, Ser. No. 28,794

Claims priority, application Japan, Jul. 12, 1978, 53-96674[U]; Oct. 30, 1978, 53-149895[U]

Int. Cl.³ B65D *85/671*

U.S. Cl. 206—409 **5 Claims**



1. A package comprising:

a base sheet;

a cover fixed on said base sheet;

a roll of tape enclosed within said cover; and

a guide on said base sheet having a tangential portion extending from said case in a direction tangent to said roll, an end portion extending from the free end of said tangential portion and adjacent said cover and being open at the free end thereof, and a bend joining said tangential portion and said end portion, said end portion having a top wall inclined toward said base sheet from said bend to said open end, the tape extending tangentially from the roll through said tangential portion to said bend in the condition as drawn off said roll and having the inner face bent around said bend and having the portion extending along said end portion folded with the edges facing away from said roll, whereby when the tape is pulled from said open end, it is folded with the opening of the fold facing away from the roll.

4,232,787

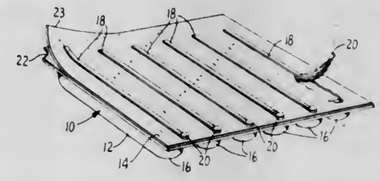
FOOD PACKAGING

Anne Holiday, 8620 Columbus, Sepulveda, Calif. 91343

Filed Apr. 2, 1979, Ser. No. 26,136

Int. Cl.³ B65D *85/20, 75/58, 77/32*

U.S. Cl. 206—443 **6 Claims**



1. A sealed package for holding a plurality of food units comprising:

a base receptacle with compartments for holding individual food units;

a lid piece for covering said base receptacle and each of said compartments and for maintaining in an airtight state individual food units within individual ones of said compartments;

and opening means associated with each of said compartments and forming a part of said lid piece for individually opening each of said compartments to remove food units without disturbing the integrity of the remaining compartments and

wherein said opening means comprising a beaded strip formed in said lid and extending along each of said compartments.

4,232,788

AUTO-EXPANSIBLE CUSHIONING BAG

Jacques Roth, 13, qual Mullenheim, Strasbourg (Bas-Rhin), France

Filed Jan. 31, 1979, Ser. No. 8,190

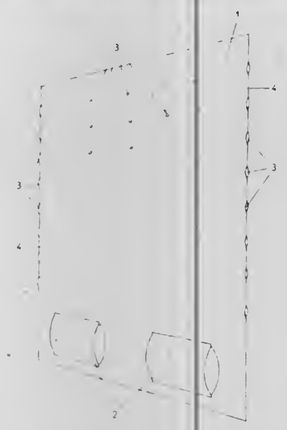
Claims priority, application France, Feb. 3, 1978, 78 03732; Dec. 14, 1978, 78 37019

Int. Cl.³ B65D *81/02, 85/30*

U.S. Cl. 206—524 **7 Claims**

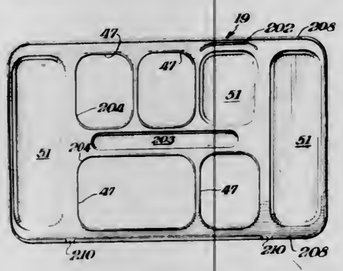
1. An auto-expansible cushioning bag, comprising a completely closed envelope of flexible, impervious and transparent

material, and at least two hermetically closed sachets, likewise of flexible, transparent and impervious material, which are



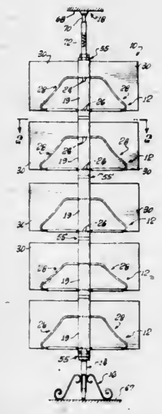
disposed in the envelope and contain the ingredients necessary for the production of a curable plastic foam.

4,232,789
FOOD SERVING TRAY FOR USE IN A FOOD PREPARATION UNIT
Donald A. Springer, San Jose, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 758,455, Jan. 11, 1977. This application Oct. 4, 1977, Ser. No. 839,389
Int. Cl.³ B65D 1/34, 6/04
U.S. Cl. 206—562 **17 Claims**



1. In a tray for use in a food preparation unit having a plurality of pairs of cantilevered support arms with a heater shelf secured to each pair of support arms and with the tray slidably positioned on each heater shelf, the tray comprising a generally flat element with a generally planar upper surface and with a leading wall and an oppositely disposed trailing wall and a pair of side walls opposite each other and intermediate said leading wall and said trailing wall, the improvement being said tray having at least one dish size opening extending through said element whereby a dish to be heated may be inserted therein and rest upon a heater on the heater shelf disposed beneath said tray, a raised edge around the perimeter of said upper surface along at least said leading wall and said trailing wall, and a pair of notches extending completely across said raised edge along said leading wall thereof and spaced inwardly from said side walls whereby said tray may be slid on the heater shelf and the pair of cantilevered support arms for the heater shelf thereabove may be disposed in said notches.

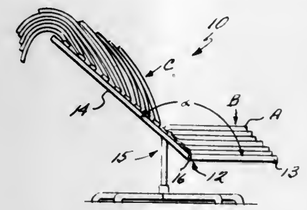
4,232,790
STORAGE AND DISPLAY DEVICE FOR RECORD ALBUMS AND TAPES
Rudy C. Serrano, 1739 N. Leafdale St., South El Monte, Calif. 91733
Filed May 11, 1977, Ser. No. 795,923
Int. Cl.² A47F 7/00
U.S. Cl. 211—40 **10 Claims**



1. A storage-and-display device for record albums and tape cartridges comprising:
a central, substantially fixed vertical pole,
a base member secured to the lower end of said pole,
a plurality of rack means disposed one above the other in contiguous superposed relation arranged to removably store and display record albums and tape cartridges, including journal means for individual rotation of each rack means, each of said rack means comprising:
a cylindrical housing having a substantially solid cylindrical vertical wall coaxial with and rotatably supported on said fixed pole,
at least one wire frame support bracket having wire leg members removably secured to said housing to extend outwardly therefrom,
mounting means including apertures in said cylindrical housing wall to receive said bracket leg members, the wire frame support bracket providing a spring-retaining action between the bracket and the mounting means,
locking means disposed on said bracket to engage said mounting means, and
at least one support track member secured between the wire members and maintaining the members in spaced relation.

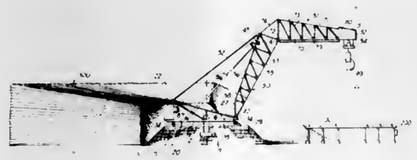
4,232,791
WATERFALL CARPET DISPLAY
Fred Howard, 500 10th Ave., New York, N.Y. 10018
Filed Jun. 17, 1977, Ser. No. 807,690
Int. Cl.² A47F 7/16
U.S. Cl. 211—47 **14 Claims**

1. A carpet display assembly comprising
a plurality of carpet sample clamps, each clamp including means for receiving an edge of a carpet sample, and
means for mounting said plurality of clamps so that all samples received thereby may lay flat in a substantially horizontal plane in a first position thereof, and may be pivoted more than 90° but less than 180° from said position and disposed in a second limp flipped-over, supported position, said mounting means comprising first and second substantially planar relatively rigid support members, said support members joined together along a co-operating edge of each, and said member making an angle α of greater than 90° with respect to each other; said mounting means further comprising rod means affixed to, and having portions extending parallel to, said second support member, said rod means receiving said clamps for pivotally mounting said clamps with respect to said support members; and wherein said rod means include a plurality



of spaced individual rod segments, disposed in pairs along the length of said second support member, each rod segment having a portion extending generally parallel to said second support member toward its paired rod segment, the rod segment of each pair having free ends that are spaced from each other.

4,232,792
CRANE
Dean W. Shields, Orangeburg, S.C., assignor to Kockums Industries, Inc., Talladega, Ala.
Filed Feb. 21, 1978, Ser. No. 879,444
Int. Cl.³ B66C 3/00
U.S. Cl. 212—160 **25 Claims**



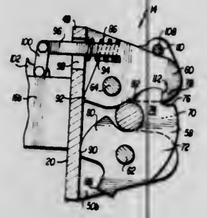
1. A crane comprising:
(a) a body having a carriage;
(b) said carriage having a vertical axis, said carriage being rotatably supported for pivoting about said vertical axis;
(c) a circular continuous rail extending around said vertical axis below said carriage; the center of the circle of said rail coinciding with said vertical axis; said carriage extending in opposite directions from said center outwardly and over circumferentially spaced portions of said rail for providing one end portion of said carriage over one portion of said rail and the other end of said carriage over the other portion of said rail;
(d) circumferentially spaced wheels rotatably mounted on said carriage at said other end portion for rotation about substantially horizontal radial axes, said wheels riding on said rail;
(e) an additional wheel means at said one end portion about substantially a horizontal radial axis, said additional wheel riding on said rail;
(f) said body including an open frame dog leg truss assembly having a base section extending upwardly and forwardly from said carriage, said base section having a proximal end pivotally secured to said one end portion of said carriage and an upper end outwardly of said rail, said truss assembly having a generally horizontal boom section secured by one end to and extending outwardly from said upper end, the outer end of said boom section forming the distal end of said truss assembly;
(g) sheave means at the distal end of said truss assembly;
(h) a cable winch means at said other end portion of said carriage;
(i) cable means extending from the winch means upwardly and over said carriage and thence through said truss assembly adjacent to the distal end of said base section and thereafter through said horizontal section and over said sheave means;
(j) a grapple on the end portion of said cable means below said distal end;
(k) counterweight means over the end portion of said rail adjacent to said winch;
(l) flexible cables connected adjacent to said counterweight and said winch and to said truss assembly adjacent to the junction of said base section and said horizontal section for supporting said truss assembly from pivoting outwardly; and
(m) pivot means between said carriage and said proximal end of said base section providing the pivotal securement therebetween.

4,232,793
CAR COUPLING ARRANGEMENT FOR RAILWAY PASSENGER CARS
Keith J. Hallam, Merrillville, and Dennis B. Marsden, Griffith, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed Apr. 18, 1979, Ser. No. 31,241
Int. Cl.³ B61G 3/04
U.S. Cl. 213—43 **16 Claims**



1. An end of car coupling arrangement for railway cars including
a supporting frame mounted on the end of said car,
a coupler structure including a box-like housing having a coupler pin projecting outwardly therefrom,
said housing including a receptacle laterally spaced from said coupler pin for receiving the coupler pin of a connected car,
means slideably supporting said coupler structure on said supporting frame, the improvement comprising;
a shank connected to said coupler housing and projecting rearwardly therefrom,
a pivot support member slideably supported on said supporting frame,
upper and lower pivot lugs on said pivot support member,
a vertical pivot shaft supported on said lugs,
bearing means connecting said shank and coupler housing to said shaft for horizontal swinging movement from a center position about a vertical axis,
means pivotally connecting one end of said shank to said pivot support member whereby said shank and coupler housing may be swung vertically about said bearing means from said center position,
and biasing means for returning said coupler shank to said center position.

4,232,794
AUTOMATIC CAR COUPLER
Ronnie C. Plaster, Rte. 1, Box 23, Tazewell, Va. 24651
Filed Oct. 4, 1978, Ser. No. 948,374
Int. Cl.³ B61G *1/06*
U.S. Cl. 213—179 **18 Claims**

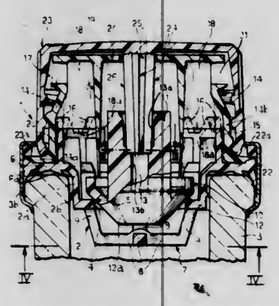


1. In a car coupler for coupling first and second adjacent cars together of a type comprising first and second coupling members respectively mounted on said first and second adjacent cars for interlocking with each other, the improvement wherein:

said first coupling member comprises an elongated coupling bar which is supported to have 360° of access thereabout;

said second coupling member comprises a frame member having a latching lever and a locking lever pivotally mounted thereon at latching-lever and locking-lever pivot mounts, said latching-lever pivot mount having an axis which is approximately parallel to, but laterally spaced to one side of, said bar when said first and second coupling members are interlocked with each other, said latching lever forming a latching hook having a nose portion for passing behind said bar into a blocking position for blocking separation of said bar from said second coupling member when said latching lever is pivoted to an interlocking position, a portion of said nose portion passing behind said bar defining an engagement surface, said locking lever defining a locking hook for moving into an engaging position from the other side of said bar for engaging said engagement surface to thereby lock said latching lever behind said bar in response to said latching lever moving to said interlocking position.

4,232,795
NON-REFILLABLE BOTTLE CLOSURE
Nicola Vigna, Montecarlo, Monaco, assignor to Tradall S.A., Geneva, Switzerland
Filed Jun. 20, 1979, Ser. No. 50,254
Claims priority, application Switzerland, Jul. 4, 1978, 7294/78
Int. Cl.³ B65D *49/02*
U.S. Cl. 215—21 **5 Claims**



1. In a bottle closure device, for sealably closing and preventing fraudulent filling of bottles fitted therewith, comprising:

a valve body adapted to be inserted as a plug into the neck of a bottle;

an annular flange at one end of said valve body, adapted to abut against the end face of the neck of said bottle;

means defining an annular valve seat within said valve body;

an inverted mushroom headed valve shutter located within said valve body, said valve shutter having:

(i) a hollow tubular stem the axial cavity of which is open at the free end thereof, and

(ii) an enlarged head for cooperation with said valve seat;

a cap support fixed at one end to said valve body; and

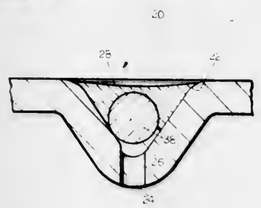
a cap, an externally threaded cylindrical portion of said cap support adapted for receiving a correspondingly threaded part of said cap, said cap having an axially extending central pin provided with longitudinal ribs, which pin engages into said axial cavity of said stem of said valve shutter when said cap is screwed onto said cap support, the improvement wherein,

(a) said longitudinal ribs each have a sharp outer edge,

(b) said axial cavity in said stem of said valve shutter has, an inner part adjacent said mushroom head of said valve shutter having a circular cross section, and

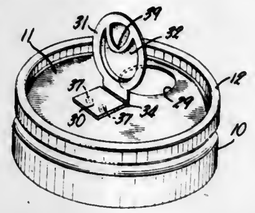
(c) the size of said ribs on said pin of said cap being such that, when said cap is completely screwed onto said cap support, the radius of the circular section of said inner part of the axial cavity, at any point along the axis of said inner part, is less than the radial distance between said sharp outer edges and the axis of said pin of said cap at that point.

4,232,796
THERMAL RELEASE PLUG FOR A FABRICATED PRESSURE VESSEL
Sharon J. Hudson, Jr., Lambertville, Mich., and Karl T. Petersen, Toledo, Ohio, assignors to Sharon Manufacturing Company, Toledo, Ohio
Filed Aug. 4, 1978, Ser. No. 930,900
Int. Cl.³ F16K *17/40*
U.S. Cl. 220—89 B **7 Claims**



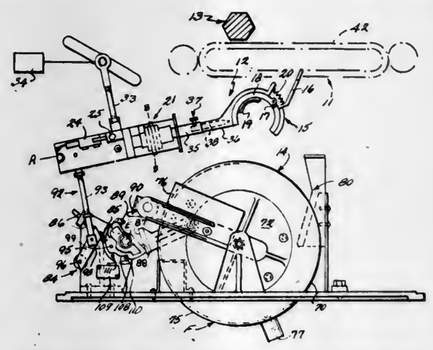
1. A safety vent structure for a pressure vessel fabricated of sheet metal casing sections brazed together, said structure comprising: an inwardly converging generally frusto-conical well formed in the wall of one of said sections, a vent opening in the bottom of said well, a plug member in said well, said plug member having a circular periphery, said well having radially disposed plug standoff means for supporting said plug member at spaced locations around said periphery in contact therewith such that peripheral portions intermediate said locations are spaced from the adjacent inner surface of said well, and a low temperature fusible sealant bridging the space between said plug member periphery and said inner well surface.

4,232,797
RECLOSABLE CONTAINER
Nelson J. Waterbury, 211 E. 70th St., New York, N.Y. 10021
Continuation-in-part of Ser. No. 908,141, May 22, 1978, Pat. No. 4,164,303. This application May 14, 1979, Ser. No. 38,948
Int. Cl.³ B65D *39/12, 41/32*
U.S. Cl. 220—359 **6 Claims**



1. In a container having a lid and a pour opening in the lid for the discharge of the contents of the container, an articulated closure for the opening comprising a mounting element on the lid adjacent the inner end of the opening, a relatively rigid closure element hinged to the mounting element for overlying the opening to seal the contents within the container, a lift element integrally formed with the closure element on the end opposite the mounting element and liftable relative to the closure element to break the seal and lift the closure element away from the lid along the hinged connection between the mounting and closure elements, depending means integrally formed from the underside of the mounting element to mount the mounting element to the lid and interlocking with the lid to prevent rotational movement of the mounting element relative to the lid, an opening in the lid to accommodate the depending means and enlargement means integrally formed on the depending means beneath the opening in the lid to anchor the mounting element thereon.

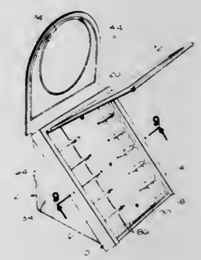
4,232,798
AUTOMATIC VENDING MACHINE FOR DELIVERING CONTAINERS HAVING EDIBLE PRODUCT THEREIN
Richard L. Hammel, Lima; Robert H. Schaefer, Lakeview; Frederick N. Lancia, Columbus; William A. Wolfe, Pataskala; Leonard F. Dearth, Columbus; Stephen L. Benton, Gahanna; H. Richard Homan, Westerville, and Arthur P. Bruce, Columbus, all of Ohio, assignors to The Kroger Company, Cincinnati, Ohio
Filed Mar. 29, 1978, Ser. No. 891,316
Int. Cl.³ G07F *13/10*
U.S. Cl. 221—12 **16 Claims**



9. An automatic vending machine for delivering items to be vended comprising an arm pivotally mounted to the machine for rotation about a generally vertical axis, said arm having an end thereof having item-holding means for receiving and holding items to be vended, and including spring biased releasable clamping means including lever means movable between a first and second position for releasing said clamping means; a delivery chamber having first and second alternately open and closed first and second doors, respectively, said first door blocking access to said delivery chamber from exterior of the machine and said second door blocking access from said delivery chamber to said arm; abutment means positioned so that said lever means is engageable with said abutment means when said item-holding means is within said delivery chamber; and receiving means so positioned in said delivery chamber to receive items being vended after release from said item-holding means; wherein the improvement comprises:

mechanical latching means for latching said first door in closed position until said arm item-holding means has been completely withdrawn from said delivery chamber after receipt of an item by said delivery chamber; and rod means operatively connected to said arm and said latch means for effecting unlatching of said first door in response to movement of said arm so that said first door is unlatched by said rod means after movement of said arm out of said delivery chamber; and wherein said first door includes means associated therewith for resetting said latching means to latch said first door after opening movement of said first door, at least past one-half open position, and removal of the item from said delivery chamber so that said first door is latched shut during movement of said arm into and out of said delivery chamber.

4,232,799
LOW PROFILE DISPLAY
Richard W. Housman, 3416 Manning Ave., Los Angeles, Calif. 90064
Filed Apr. 7, 1978, Ser. No. 894,228
Int. Cl.³ B65D *85/20*
U.S. Cl. 221—92 **19 Claims**



2. A vending device for the storage and display of articles of merchandise, comprising:

a housing having a plurality of vertical walls, one of said vertical walls extending longitudinally centrally of said housing, partitioning said housing into two substantially equal portions;

an array of bins in said housing, each bin for containing a plurality of articles of merchandise; and

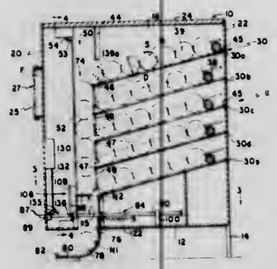
a cover member comprising a base region and a plurality of projections extending outwardly from each side of said base region, said cover member being symmetrical about a centerline of symmetry of said base region and secured to the top edge of said centrally extending wall along said centerline of symmetry for partially overlying each of said bins, and at least one of said projections extending over a portion only of each of said bins, whereby to permit an article of merchandise to be withdrawn from a bin by upward movement of said projection thereover relative to said base region.

4,232,800

APPARATUS FOR DISPENSING ROLLED NEWSPAPERS AND THE LIKE

Dennis R. Martin, 2309 State St., Saginaw, Mich. 48602, and George O. Hopper, Jr., Saginaw, Mich., assignors to Dennis R. Martin, Saginaw, Mich.

Filed Apr. 16, 1979, Ser. No. 30,537
Int. Cl.[3] B65G 59/06
U.S. Cl. 221—109 15 Claims



1. Article dispensing apparatus for individually dispensing generally cylindrical articles, such as rolled newspapers, comprising:

at least upper and lower superposed, vertically inclined article supporting racks, each having an upper end and a lower end;

means mounting said racks at such an angle that articles supported thereon will travel, by force of gravity, toward said lower end;

vertically disposed article guide means, spaced from said lower ends of said racks, defining, with portions of said racks, a generally vertically disposed chute for receiving said articles from said racks and passing them downwardly in a stack; said chute having a discharge opening at the lower end thereof for serially passing the articles in said column;

stop means mounted adjacent said lower end of said lower rack for movement between a first position preventing movement of said articles supported by said lower rack into said chute while an article passing into said chute from said upper rack is disposed between said stop means and said article guide means and a second position, when all articles passing to said chute from said upper rack are disposed at a level below the level of said stop means permitting articles to be gravity fed from said lower rack to said chute;

gate means adjacent said discharge opening movable between a blocking position interrupting the downward passage of said column of articles in said chute and a non-blocking position permitting the articles to serially pass through said discharge opening;

stack support and divider means coupled to said gate means for movement therewith between a remote position, when said gate means is in said blocking position, permitting the downward passage of articles in said chute to said gate means and an operative position interrupting the passage of, and vertically supporting, the articles trailing the lowermost article when said gate means is in said non-blocking position such that only the lowermost article is dispensed through said discharge opening;

said gate means including barrier means, disposed in the path of said lowermost article when said gate means is in said blocking position;

said barrier means having an opening therein receiving and passing said lowermost article when said gate means is in said non-blocking position; and

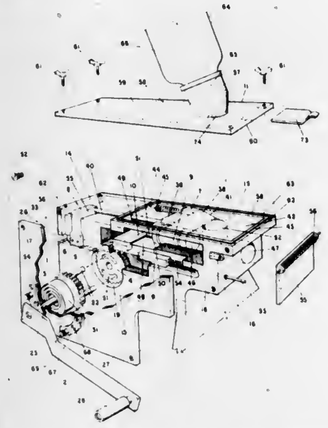
means adjustably mounting said stack support and divider means on said gate means in any selected one of a plurality of different vertical positions to selectively adjust the vertical distance between said barrier means and said divider means.

4,232,801

PORTION CONTROL DRESSING AND FOOD DISPENSER

George C. Chronis, 1309 Anaconda SW., Albuquerque, N. Mex. 87105

Continuation of Ser. No. 50,811, Aug. 21, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,124
Int. Cl.[3] B67D 5/42
U.S. Cl. 222—43 2 Claims



1. A portion control dressing and food dispenser device comprising:

a chassis having a dispensing end, a butt end, a handle side, a top and a bottom, a blank side; said chassis having a gear chamber perpendicular to the handle side, and a dispensing rack gear channel, from the butt end to the dispensing end, and a piston rack gear channel from the butt end to the dispensing end, and a cylindrical piston cylinder from the butt end to the dispensing end, and a valve chamber in the top of the chassis; wherein the dispensing rack gear channel intersects the gear chamber, and the piston rack gear channel intersects the gear chamber; and wherein the dispensing rack gear channel has a slot along its length providing access to the handle side of the chassis; and wherein the piston rack gear channel has a slot along apart of its length connection with and providing access to the piston cylinder; and wherein the chassis has a passage connecting the valve chamber with a piston cylinder near the dispensing end of the chassis;

a dispensing rack gear slideably inserts into the dispensing rack gear channel,

a piston rack gear slideably inserts into the piston rack gear channel,

an axle on which is rotatably mounted a follower gear, and on which is fixedly mounted a driver gear, said axle being rotatably mounted on the inside end of the gear chamber, wherein the follower gear engages and mates with the piston rack gear, and wherein the driver gear engages and mates with the dispensing rack gear;

a cover plate rotatably supports one end of the axle, the axle protruding through the cover plate;

a handle having a rotatable grip rigidly affixed to the end of the axle which protrudes through the cover plate;

a rectangular flat slide valve slideably mates into the valve chamber, said slide valve having a sloping front end and a flat butt end; wherein a valve rod is rigidly attached to and perpendicular to the flat end;

the valve chamber having a lip, said lip having a semicircular seal recess in its top and a helical spring stop rigidly affixed to the inside of the lip adjacent to the flat end of the slide valve, and said valve chamber having a valve rod port sized to slideably accept the valve rod;

a piston crank, generally rod like, is rigidly attached on one end to the piston rack gear, and rigidly affixed on the other end to the piston rod and slideably functions in the lengthwise slot along the piston rack gear channel;

a valve arm is rigidly affixed to the dispensing rack gear on one end, and rigidly affixed on the other end to the valve rod;

a helical return spring bears, when compressed, against the dispensing rack gear and the dispensing end of the dispensing rack gear channel;

a resilient seal;

a container mount having a threaded container adapter with a mouth for passage dressings or food from a container into the valve chamber, said container mount being generally flat and having a semi-circular seal recess sized and shaped to accept the resilient seal and to sealably mate with the seal recess in the lip of the valve chamber, said container mount being rigidly affixed to the top of the chassis over the valve chamber, with a resilient seal between the container mount and the chassis and the container mount secured to the chassis as by screws;

a dispensing door, and a means for opening and closing the dispensing door driven by the dispensing rack gear,

the follower gear having a plurality of driver slots, said driver slots being circular arcs in shape having a width sufficient to slideably accept driver pins;

a plurality of driver pins being round rod like members, rigidly affixed to a face of the driver gear, of size and length to slideably insert in to the driver slots of the follower gear,

a graduated stop mount having a plurality of taps, the stop mount being generally flat, circular arc in shape, rigidly affixed to the handle side of the chassis adjacent to the handle,

a stop bolt threaded to screw into the taps in the stop mount, and

a container, threaded at the mouth to screw mateably on to the container adapter,

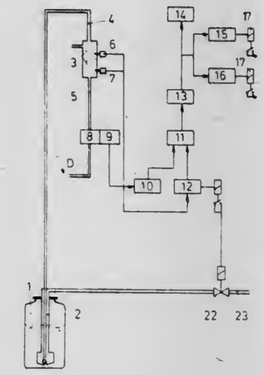
wherein by turning the handle, the driver gear moves the dispensing rack gear, closing the slide valve, opening the dispensing door, compressing the return spring and further turning of the handle causes the driver pins to engage the follower gear causing it to turn, the turning follower gear then moving the piston rack gear toward the dispensing end of the chassis causing the piston to discharge food or dressing in the cylinder; and wherein releasing the handle permits the compressed return spring to force the dispensing rack gear toward its starting position closing the dispensing door, and opening the slide valve; and further rearward travel of the dispensing rack gear causes the driver pins to slide in the driver slots until the driver pins re-engage the follower gear moving it toward its starting position thus retracting the piston causing a partial vacuum in the cylinder which causes food or dressing to move from the container into the valve chamber, through the passage into the cylinder; and wherein movement of the dispensing rack gear is stopped by the handle contacting the stop bolt; and wherein the invention is ready for the next turn of the handle.

4,232,802

APPARATUS FOR PULSEWISE DISPENSATION OF VERY SMALL AMOUNTS OF LIQUID, PARTICULARLY H_2O_2

Gerhard Buschmann, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,778
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757897
Int. Cl.[3] B67D 5/08
U.S. Cl. 222—56 3 Claims

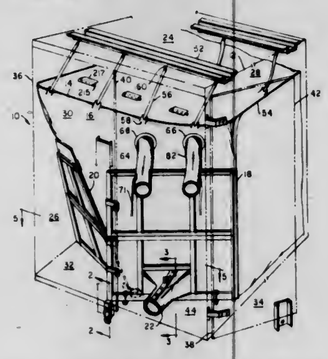


1. In an apparatus for the pulsewise dispensing of very small amounts of liquid controlled with a measuring instrument comprising ejecting means for the pulsewise ejection of a desired amount of liquid, a measuring vessel having a volume greater than the volume of the liquid to be ejected for each pulse and having an inlet and an outlet connected to the ejecting means and wherein the cross section of the vessel is adapted to the amounts of liquid to be controlled, sensing means having an upper and a lower sensing device positioned at said vessel between the inlet and the outlet and defining a refill volume therebetween and responsive to the level of the liquid therein for generating a signal when the upper and lower sensing devices are activated, and a reservoir of liquid, the improvement comprising pumping means responsive to the sensing means for supplying a substantially constant amount of liquid from the reservoir to refill the vessel independent of the liquid level in the reservoir, the pumping means comprising a neck portion and a foot portion having an inlet at the bottom thereof, a feed line to the measuring vessel passing through the neck portion and having one end terminating in proximity to the bottom of the foot portion, at least the foot portion of the pumping means immersed in the liquid contained in the reservoir and wherein the foot portion has a volume substantially greater than that of the neck portion and slightly greater than the refill volume of the measuring vessel, a check valve for opening and closing the foot portion inlet, a supply of compressed gas controllable by the sensing means and applied to effect the opening of the check valve when shut off and to close the check valve and act upon the liquid in the foot portion of the pump to supply same to the measuring vessel when turned on, a three-way valve disposed between the neck portion of the pump and the supply of compressed-air and a start/-stop device connected to the sensing means for controlling three-way valve in response to the signals received from the sensing means.

4,232,803
BULK MATERIAL RETAINING SYSTEM HAVING PLURAL RETAINERS

George H. Muller, Ann Arbor, and William T. Downs, Howell, both of Mich., assignors to A.I.R. Foundation, Ann Arbor, Mich.

Continuation of Ser. No. 758,386, Jan. 10, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,773
Int. Cl.³ B65D 35/28
U.S. Cl. 222—105 19 Claims

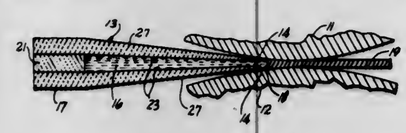


1. A bulk material retaining system comprising a generally rectangular parallelepipedic container including a top and bottom, right and left sides and front and back ends, wherein the back end of the container is an operable closure made generally of left and right doors mounted for pivotal movement about a vertical axis at the back end of the left and right sides respectively, a first retainer positioned vertically between the free end of the left door in a closed position and the right side of the container in spaced relation to the back end of the right side of the container, a second retainer positioned between firstly the left side of the container in spaced relation to the back end of the container and secondly along a continuous line extending upwardly first against the lower portion of the first retainer and then against the left door kept in a closed position, the second retainer being in a position vertically inclined toward the left side of the container and toward the left door kept in a closed position, a flexible liner supported within the container of substantially the same size as the container, said liner includes means for passing bulk material into it and evacuating air therefrom and means for discharging bulk material from the liner, and a manifold secured to the first retainer through which bulk material is discharged from the liner.

4,232,804
MOLTEN METAL FEED TIP

William R. Lewis, Riverside, and Dennis M. Smith, Crestline, both of Calif., assignors to Hunter Engineering Company, Riverside, Calif.

Filed Nov. 2, 1978, Ser. No. 957,186
Int. Cl.³ B22D 11/06, 11/10
U.S. Cl. 222—591 10 Claims



1. A molten metal feed tip for a continuous caster comprising:

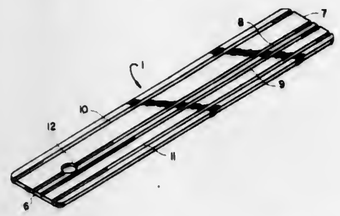
a pair of generally rectangular refractory members each having a downstream edge portion and an upstream edge portion, each of the members being formed of a compressed felt of refractory fibers comprising approximately equal proportions of alumina and silica rigidly bonded with a binder including colloidal silica; and

means adjacent the upstream portion for spacing the pair of members apart for forming a metal feeding gap between the members and admitting molten metal into such gap for flow towards the downstream edge portions.

4,232,805
SEWING FORM

Sally J. Flick, 10905 Westfield Blvd., Indianapolis, Ind. 46280

Filed May 5, 1977, Ser. No. 794,176
Int. Cl.³ A41H 33/00
U.S. Cl. 223—37 4 Claims

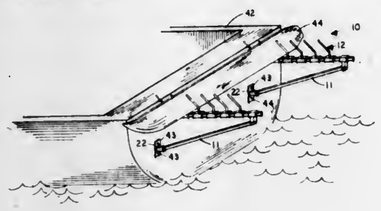


1. A thin, rigid, solid, rectilinear sewing form comprising a rectangular planar bottom surface; an opposing and parallel rectangular planar top surface; a pair of opposing longitudinal sides adapted to serve as folding guides; a pair of opposing ends; and one or more longitudinal grooves in the top surface parallel to the longitudinal edges of the form and running the full length of the form and located, spaced and adapted to serve as cutting guides for hand making cloth trim tape, cloth pockets or folded cloth rope.

4,232,806
WATER SKI RACK

Roland L. Shald, 3137 S. 116th Ave., Omaha, Nebr. 68144

Filed Feb. 22, 1978, Ser. No. 879,982
Int. Cl.² B60R 9/12
U.S. Cl. 224—42.44 5 Claims



1. A water ski rack comprising:

(a) a plurality of spaced apart frame units adapted for connection to a boat comprised of at least one elongated support bar having a first end and a second end and at least one brace bar having a first end and a second end wherein the second end of the support bar is pivotally attached to a support bracket which is slidably adjustable along the length of the brace bar and a first boat mounting bracket is pivotally attached to the first end of the support bar and a second boat mounting bracket is pivotally attached to the first end of the brace bar;

(b) a plurality of upwardly projecting ski holding elements with obliquely and inwardly slanted end projections on their upper portions affixed to the frame units and adapted to support at least one water ski wherein the ski holding elements are slidably adjustable along the frame units;

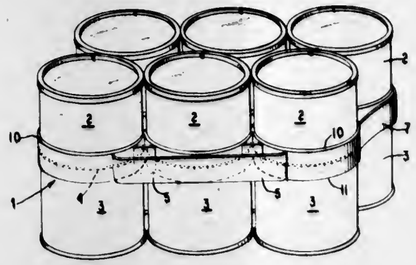
(c) securing means for selectively securing the ski holding elements along the length of the support bar; and

(d) securing means to selectively secure said support bracket to said support bar, whereby the angle of orientation of the support bar may be varied relative to the boat mounting brackets to maintain the support bar in a substantially horizontal position.

4,232,807
SEALING CARRIER PACK FOR CANS WITH BEADED EDGE

Gerhard Beier, Eisseler Strasse 47, 3090 Verden-Davelsen, and Wolfgang Matthies, Vionvillestrasse 10, 2800 Bremen, both of Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,249
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739143
Int. Cl.³ B65D 71/00
U.S. Cl. 224—45 A 10 Claims

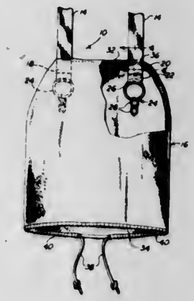


1. A pack carrier for cans having a substantially round cross-section with a beaded edge or circumferential projection at at least one end, said cans having a recessed openable closure on said end having said beaded edge comprising a flat frame having a carrying handle of extruded plastic, said flat frame being provided with a plurality of attached flat receiving and sealing areas opposing each other in pairs on the frame surface, said receiving and sealing areas having a flat surface of the dimension of the beaded edge of said can, said flat receiving and sealing areas being provided with outer extended elastic lips adapted to completely surround the outer beaded edges of said cans and bear upon them, said extended lips having a flange or bulge over said flat receiving and sealing area adapted to receive said beaded edge where the beaded edge is touched only below, laterally and on the top edge, one of said outer extending elastic lips of one of said flat receiving and sealing areas extending to and merging into the outer extending elastic lip of another of said flat receiving and sealing areas adjacent thereto tangentially, wherein, in one of said outer extended lips which extends to and merges with another of said outer extended lips adjacent thereto tangentially, said flange or bulge does not extend in the area tangential to two of said extended lips where at this tangential point and for a short distance on each side thereof said adjacent extended lips merge to one extended lip without a flange or bulge on either side thereof forming a vertical extension, said vertical extension at said tangential point being reduced in height to below the elevation of the beaded edge of the cans, the thickness of the extended lips at said vertical extension being such that the walls of said cans at the tangential points practically touch and support each other in a tight unit, whereby pairs of cans can be inserted therein and maintained in sealed and sanitary condition.

4,232,808
INSTRUMENT PROTECTING AND CARRYING STRUCTURE

Roy M. Gray, P.O. Box 10508, Phoenix, Ariz. 85064

Filed Oct. 9, 1979, Ser. No. 82,889
Int. Cl.³ F16B 39/24; A45C 11/08
U.S. Cl. 224—205 4 Claims



1. An instrument protecting and carrying structure comprising:

(a) an elongated strap of flexible material and having opposite ends;

(b) a cover bag for containing an instrument, said cover bag of flexible material and disposed in an inverted position with a closed upwardly disposed end and an open downwardly facing end;

(c) said strap having its opposite ends passing through the closed end of said cover bag at spaced apart locations with the opposite ends of said strap located within said cover bag adjacent the closed end thereof;

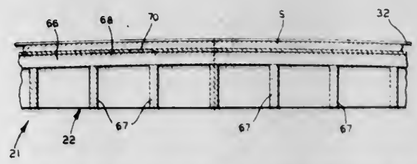
(d) said cover bag attached to said strap at the points where the opposite ends pass through the closed end of said cover bag; and

(e) coupling means on each of the ends of said strap for connection to the instrument containable in said cover bag.

4,232,809
APPARATUS FOR THERMALLY SEVERING GLASS

Hans W. Boehm, Toledo; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

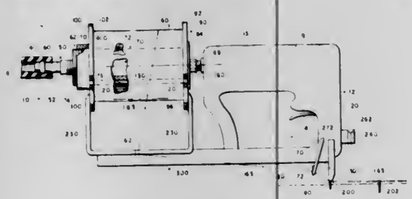
Continuation-in-part of Ser. No. 905,687, May 15, 1978, abandoned, which is a division of Ser. No. 767,051, Feb. 9, 1977, Pat. No. 4,113,162. This application Apr. 16, 1979, Ser. No. 30,177
Int. Cl.³ B26F 3/00, 3/12
U.S. Cl. 225—93.5 11 Claims



1. In apparatus for cutting a heavy, thick glass sheet along an intended line of cut, including means for supporting a heavy sheet of glass to be cut and means overlying said glass supporting means for cutting said sheet along an intended line of cut, the improvement which consists in that said glass supporting means comprises a table having a supporting surface against which said sheet of glass rests in position to be cut, said supporting surface having a convex curvature causing said sheet

to assume a complementary curvature when resting thereon, said convex supporting surface defining an arc having an axis extending normal to said intended line of cut.

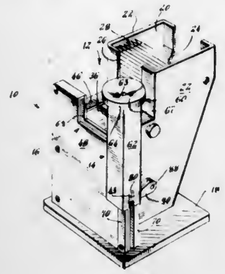
4,232,810
STRING STAPLER
B. Carson Russell, Omaha, Nebr., assignor to Carlson Stapler and Shippers Supply, Inc., Omaha, Nebr.
Filed Oct. 10, 1978, Ser. No. 950,125
Int. Cl.[2] B25C 1/04
U.S. Cl. 227—19 **5 Claims**



1. A string stapler comprising a stapling gun having a frame provided with a substantially elongated handle extending forwardly and rearwardly, said gun having an air inlet port on its rearward side behind said handle, said frame having a downward opening staple outlet having a substantially elongated shape extending from right to left, said outlet being disposed forwardly of said handle, a staple magazine fixed to said frame, staples in said magazine having recesses extending upwardly thereinto from the lower ends thereof, a trigger mounted on said frame, said gun delivering a staple from said magazine out through said outlet upon operation of said trigger when said air inlet port is connected to a source of pneumatic pressure, a string guide between said outlet and the rearward end of said handle whereby said gun is adapted to be moved rearwardly during operation between shooting of staples, means connecting said string guide to said frame, said string guide having a string cradling concave surface facing upwardly and having its lowermost part behind said staple outlet so that when a taut string extends across said string cradling surface closely under said staple outlet and forwardly from said staple outlet it will be bridged by such a staple shot from said outlet, a string spool disposed rearwardly of said handle, a string spool attaching assembly attaching said string spool rotatably to said frame, a string directing assembly attached to said frame rearwardly of said outlet and guiding said string from said spool forwardly to said string cradle.

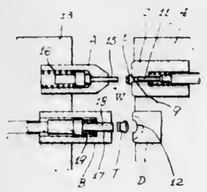
4,232,811
APPARATUS FOR DISPENSING AND INSERTING STICKS
Edward D. Cottrell, and Michael B. Robbins, both of Cattaraugus, N.Y., assignors to Champion International Corporation, Stamford, Conn.
Filed May 24, 1979, Ser. No. 42,003
Int. Cl.[3] A47J 43/00; B27F 7/02
U.S. Cl. 227—117 **14 Claims**

1. Apparatus for mounting a product on a stick, including:
reciprocating means for inserting said stick into said product along an axis of insertion;
means for delivering said stick to a feed position wherein the longitudinal axis of a stick thereat forms an angle with respect to said insertion axis; and
rotatable means operatively coupled to said reciprocating inserting means for rotatably shifting said stick from said feed position to said inserting means and into longitudinal



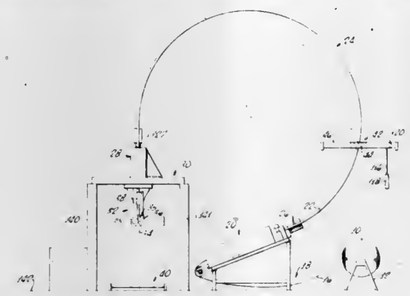
alignment with said insertion axis in response to downward movement of said inserting means.

4,232,812
APPARATUS FOR MAKING A TRI-METALLIC COMPOSITE ELECTRICAL CONTACT
Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Japan
Filed Jul. 24, 1978, Ser. No. 926,874
Claims priority, application Japan, Jul. 25, 1977, 52-88285
Int. Cl.[3] B23K 20/02
U.S. Cl. 228—3.1 **9 Claims**



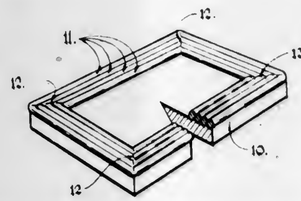
1. Apparatus for making a tri-metallic electrical contact by cold pressing, comprising
means for aligning a plurality of cut wires;
a first die and punch set having a first cavity for firmly sustaining therein the confronting end portions of a first pair of said aligned wires while the confronting end portions of a second pair of said aligned wires are disposed exteriorly of said first cavity,
said die and said punch being movable one with respect to the other for causing plastic deformation between said confronting end portions of said second pair of said wires at the exterior of said first cavity, thereby to cold press the last-named end portions together along a first seam,
means for transferring said aligned wires from said first die and punch set to a second die and punch set,
said second die and punch set having a second cavity for firmly sustaining therein said first seam and said end portions of said second pair of aligned wires after transfer of said wires to said second die and punch set, and with said end portions of said first set of wires being disposed exteriorly of said second cavity,
said die and said punch of said second set being movable one with respect to the other for causing plastic deformation in said confronting end portions of said first pair of aligned wires at the exterior of said second cavity thereby to cold press together the confronting end portions of said first pair of wires along a second seam, and
said means for transferring said aligned wires being operative to transfer said first seam and end portions of said second pair of wires directly to said second cavity while said confronting end portions of said first pair of wires are still in said first cavity.

4,232,813
METHOD AND APPARATUS FOR MAKING BENT PIPE
Homer L. Eaton, Leucadia, Calif., assignor to Eaton-Leonard Corporation, Carlsbad, Calif.
Filed Mar. 10, 1978, Ser. No. 885,329
Int. Cl.[3] B21D 9/00
U.S. Cl. 228—147 **67 Claims**



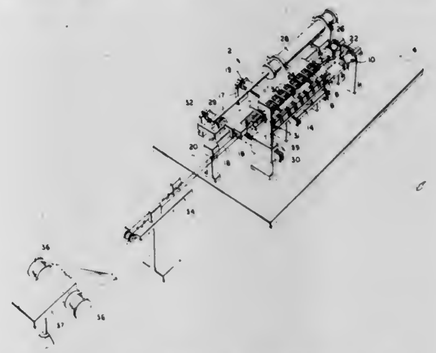
1. Apparatus for making bent pipe comprising
a source of flat stock,
means for withdrawing stock from said source,
means for forming the withdrawn stock into a continuous length of pipe,
a pipe bending head,
means for rotating said pipe bending head to control plane of bend,
means for feeding said continuous length of pipe from said forming means to said pipe bending head,
means for operating said bending head to bend said pipe, and
means for storing a variable length of said pipe in a curved path between said pipe forming means and said pipe feeding means.

4,232,814
METHOD AND APPARATUS FOR FABRICATING A SEALING COVER UNIT FOR A CONTAINER FOR A SEMICONDUCTOR DEVICE
Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.
Division of Ser. No. 5,790, Jan. 23, 1979, Pat. No. 4,190,176.
This application Jun. 14, 1979, Ser. No. 48,365
Int. Cl.[3] B23K 9/225
U.S. Cl. 228—173 E **5 Claims**



1. The method of fabricating an hermetic sealing cover unit for a container for a semiconductor device and including a metallic cover element comprising:
forming a flat single-layer multiturn wire winding of heat-fusible material in situ on the cover element, the periphery of said winding being substantially in registry with the periphery of the cover element;
and fusing said winding to said cover element at a plurality of space points.

4,232,815
INTEGRATED CIRCUIT LEAD COUPLING DEVICE AND METHOD
Masahiko Nakano, San Diego, and Nobuaki Miyauchi, both of San Diego, Calif., assignors to Kyocera International, Inc., San Diego, Calif.
Filed Nov. 6, 1978, Ser. No. 958,118
Int. Cl.[3] B23K 31/02; H01L 21/60
U.S. Cl. 228—180 A **29 Claims**

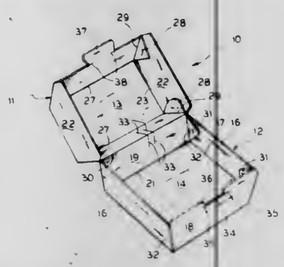


1. A method for coupling leads to integrated circuit packages comprising the steps of:
(i) providing a lead frame rail member comprising a plurality of resilient leads coupled to a first rail and a plurality of resilient leads coupled to a second rail, said first rail coupled to said second rail such that leads of said first rail are separated from and oppose said leads of said second rail;
(ii) spreading the leads of each said rail away from the opposing leads of the other rail;
(iii) placing an integrated circuit package between said opposing leads at intervals along the length of said lead frame rail member;
(iv) releasing said leads whereby a plurality of said leads resiliently engage each said integrated circuit package; and
(v) affixed said leads to said integrated circuit packages.

4,232,816
CLAMSHELL TYPE CARTON
Fred J. Johnson, Long Beach, Calif., and Richard L. Bell, Glenmoore, Pa., assignors to Container Corporation of America, Chicago, Ill.
Filed Mar. 16, 1979, Ser. No. 21,256
Int. Cl.[3] B65D 5/26, 05/66
U.S. Cl. 229—33 **2 Claims**

1. A carton formed from a cut and scored blank of paperboard or the like comprising:
(a) a cover of truncated pyramid configuration and a tray of like configuration hingedly joined along a fold line common to said cover and said tray;
(b) said tray and said cover each having:
(i) a central panel of generally rectangular form;
(ii) side, front and rear walls foldably connected to each central panel;
(iii) at least two of said walls positioned opposite each other having the shape of a trapezoid with the minor base thereof connected to its corresponding central panel;
(c) corresponding walls of said tray and said cover having said trapezoidal shape being provided with flaps foldably connected at inclined fold lines at the ends of said walls;
(d) each of said flaps being secured to an adjacent walls;

(e) the side walls of said cover extending beyond the side walls of said tray so that the cover overlies the tray with the free edges of said side walls of said tray being in



contact with the interior faces of the corresponding side walls of said cover thereby providing a gap for escape of moisture from the interior of the carton.

4,232,817

ADJUSTMENT CONTROL FOR A THERMOSTATIC VALVE

Bernhard W. Braukmann, and Rudolf Vollmer, both of Mosbach, Fed. Rep. of Germany, assignors to Braukmann Armaturen AG, Bahnweg, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,244

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2737083

Int. Cl.³ F24F *11/06*

U.S. Cl. 236—42 **6 Claims**



1. An adjustment control for a thermostatic radiator valve consisting of a non-rotatable component to said valve, a rotatable knob mounted on said non-rotatable component for setting the temperature control, said knob having a maximum rotation of about one revolution, a releasable spring like stop means operable between said non-rotatable component and said knob, said stop means limiting the rotation of said knob at a predetermined intermediate rotational position, said stop means consisting of a spring like member extending from said non-rotatable component and engageable with a predetermined interior portion of said knob to provide the stop, non releasable stop means between said knob and said component to limit the rotation of said knob after release of said spring like stop means, and a moveable member supported in said knob and extending therethrough, moveable against said spring like member to release the latter from the stop position to permit further rotation of said knob to said non releasable stop means.

4,232,818

CONTROL UNIT FOR STARTING A CLIMITIZATION PROCEDURE IN A BUILDING

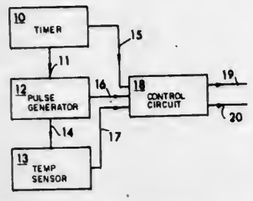
Jorn U. Christiansen, Hvidovre, Denmark, assignor to Tour & Andersson Aktiebolag, Johanneshov, Sweden

Filed Mar. 28, 1979, Ser. No. 24,536

Claims priority, application Sweden, Mar. 28, 1978, 7803490

Int. Cl.³ F23N *5/20*; G05D *23/00*

U.S. Cl. 236—46 R **14 Claims**



1. A control unit for controlling the start of a climatization procedure in a building, wherein a pulse generator is provided for generating pulses used in timing the operations of the control unit, first and second temperature sensor means are provided for sensing the interior temperature of the building and the external temperature outside of the building and for respectively producing first and second voltages in accordance therewith, and an equivalent electrical circuit for controlling the operations of the control unit is arranged to simulate the thermal properties of the building during temperature conditioning operations, i.e., heating or cooling, the equivalent electrical circuit being fed with a said first voltage representative of the interior temperature in the building, and a said second voltage representative of the external temperature outside of the building, and the time required for a discharge, a charge or an equalization of one or more voltages on condensers contained in the equivalent electrical circuit being representative of the period of time required for conditioning the temperature of the building, after the conditioning system has been out of use during a predetermined period of time, the discharge or charge or equalization time being short as compared with the time for conditioning the temperature of the building and being used for calculation of the correct moment for starting the conditioning procedure by the control unit, said pulse generator being arranged to generate pulses of a very high frequency, and said control unit further including a binary type pulse frequency divider for receiving pulses from said pulse generator and for producing a pulse train of binary pulses of a substantially lower frequency, a decadic counter connected to one output of said pulse frequency divider for converting the binary pulses into decadic pulses, said decadic counter including coincidence circuits connected to a plurality of outputs of the decadic counter for producing pulses representative of different end digits of the decadic numbers, and a plurality of different control means for controlling the start of the climatization procedure by said control unit connected to individual ones of said outputs of said decadic counter so that the sequence of operations of said control unit under the control of said equivalent electrical circuit takes place in an order determined by said end digits.

4,232,819

CONTROL SYSTEM FOR ENVIRONMENTAL APPARATUS

Charles Bost, Melbourne, Fla., assignor to Sentry Controls, Inc., Melbourne, Fla.

Filed Jul. 10, 1978, Ser. No. 922,837

Int. Cl.³ E05B *19/26*

U.S. Cl. 236—47 **15 Claims**

1. A switching system for controlling operation of conventional electrical apparatus such as an air conditioner or the like

of the type having a power cord adapted to plug into a supply of electrical current, said switching system comprising:

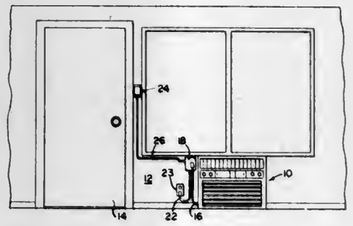
a first housing having first means for receiving said power cord and second means for connecting with said current supply;

a switching circuit in said first housing for making and breaking a circuit connection between said power cord and said current supply through said first and second means;

a second housing;

a magnetic detector with said second housing;

circuit means electrically coupling said magnetic detector with said switching circuit in order to operate said switching circuit to alternately make and break said circuit connection between said power cord and said current supply responsive to detection of a magnetic element adjacent said second houseing, said circuit means including:



(a) means for making said circuit connection responsive to the presence of said magnetic element in said second housing, and breaking said circuit connection responsive to removal of said magnetic means from said second housing;

(b) means for introducing a first time delay period between detection of the removal of said magnetic element in said second housing and breaking of said circuit connection;

(c) means for initiating a second time delay between detection of said magnetic element in said second housing and operation of said switching means;

(d) means for bypassing said second time delay initiating means to energize said switching means following detection of said magnetic element in said second housing; and

a keying mechanism having a magnetic element therewith and dimensioned to permit movement of said magnetic element into and out of said second housing.

4,232,820

HEAT COLLECTOR SYSTEM

Alfred E. Ritter, Mülheim, and Jürgen Kleinwächter, Lörrach, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Fördenung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 829,427

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720319

Int. Cl.² F24J *3/02*

U.S. Cl. 237—2 B **9 Claims**

1. A heat collector system comprising:

(a) a heat collector having an inlet conduit means, an outlet conduit means, and containing a heat transmitting liquid,

(b) a heat pump having first and second heat exchangers in the form of an evaporator and a condensor and a cooling fluid circuit interconnecting said heat exchangers,

(c) said heat collector being effective to take radiation heat from the environment,

(d) the heat collector having a structural configuration effective to additionally absorb convection heat as a convector which causes a good heat transmission between the ambient air and said heat transmitting fluid,

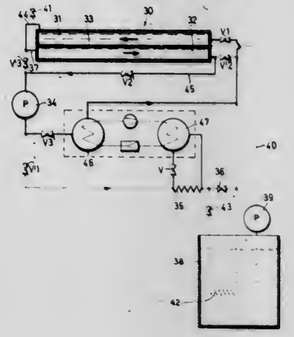
(e) first fluid flow means for connecting the first heat exchanger between said inlet and outlet conduits,

(f) a heat consuming mechanism,

(g) second fluid flow means for connecting the condensor with the heat consuming mechanism,

(h) third fluid flow means for connecting the heat consuming mechanism between said inlet and outlet conduits while bypassing the first and second heat exchangers,

(i) the evaporator being capable of supplying liquid to the



heat collector at a temperature below the temperature of the ambient air,

(j) the collector includes two superimposed chambers including an upper chamber made of transparent material and having a heat conductive surface and a lower chamber having a structural configuration effective to absorb heat radiation, and

(k) valve means being effective to selectively direct the fluid flow only through the lower chamber or first through the upper and then through the lower chamber.

4,232,821

HEATING AND VENTILATION SYSTEM

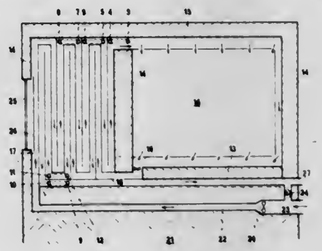
Anders D. Backlund, Holmen, S-820 90 Ytterhogdal, Sweden

Filed May 4, 1978, Ser. No. 902,620

Claims priority, application Sweden, May 6, 1977, 7705311

Int. Cl.³ G05D *23/00*

U.S. Cl. 237—2 B **3 Claims**



1. A system for heating and ventilating objects and spaces in buildings surrounded by an outer wall, said system comprising:

(a) a heat pumping device having condenser means for heating air to be used for heating said objects and spaces, evaporator means for recovering heat energy from the air discharged from said spaces and objects and means for circulating the air;

(b) first and second air circulating passages, each of the passages comprising a plurality of separate channels in the wall, channels of the respective passages being arranged alternately, at varying distances from the outer surfaces of

the wall, in heat exchanging relationship with one another;

(c) the evaporator means comprising a plurality of series-connected sections, each of the evaporator sections being disposed in heat exchanging relationship with one of the channels of the first passage, each of said evaporator sections operating at different temperatures; and,

(d) the condenser means comprising a plurality of series-connected sections, each of the condenser sections being disposed in heat exchanging relationship with one of the channels of the second passage, each of said condenser sections operating at different temperatures

(e) whereby the circulating air;

(1) passes the condenser sections one after another, heat emission to the air taking place with step-wise increasing temperatures,

(2) passes said spaces and objects after being heated by said condenser sections, and,

(3) passes said evaporator sections one after another, giving off heat to the evaporator sections at step-wise decreasing temperatures, thereby achieving lower average operating temperatures.

4,232,822

METHOD OF AND ARRANGEMENT FOR CORRECTING THE HEIGHT OF RAILWAY UPPER STRUCTURES

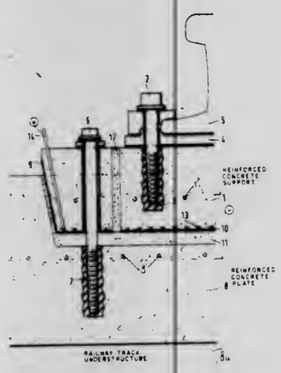
Volker Hahn, Leinfelden, and Werner Fastenau, Esslingen-Rüdern, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,605

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659161

Int. Cl.[2] E01B 1/00

U.S. Cl. 238—7 **11 Claims**



5. A support structure for correcting height of unballasted railway tracks which comprises an upper structure including: a reinforced concrete plate, reinforced concrete support means having a bottom side and detachably inserted in said reinforced concrete plate, filling means of hardened material that can be softened again and located between said reinforced concrete plate and said reinforced concrete support means, rail holding means connected to said reinforced concrete support means for detachably holding railway rails in position, fastening means for detachably holding said concrete support means to said reinforced plate, and a heating coil arranged between said reinforced concrete support means and said reinforced concrete plate, said heating coil being provided to soften hardened material of said filling means to facilitate lifting and filling at the bottom side of said reinforced concrete support means.

4,232,823

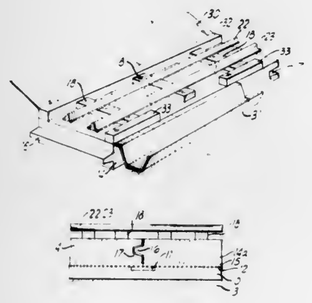
METHOD AND APPARATUS FOR INSTALLATION OF QUENCH CAR TRACK FOR COKE OVEN BATTERIES

Paul P. Eggermann, Milltown, N.J., assignor to Inseco Associates, Inc., East Brunswick, N.J.

Filed May 7, 1979, Ser. No. 36,572

Int. Cl.[3] E01B 1/00

U.S. Cl. 238—7 **18 Claims**



1. A method for installation of railroad track on a subsoil, comprising the steps of:

compacting the subsoil;

depositing a slag base on the subsoil and subsequently grading the base;

embedding at least two parallel elongated levelling blocks in said base, with said blocks protruding a predetermined distance therefrom and the upper surfaces of said blocks substantially coplanar;

placing a layer of nonpermeable flexible sheet material on said base and levelling blocks;

depositing a layer of aggregate on said sheet material;

placing at least two elongated precast concrete panels on said aggregate layer overlying said levelling blocks, each of said panels having a plurality of vertically oriented holes therethrough;

installing ties and rails on said precast concrete panels; and

injecting a viscous hardenable grout into said aggregate layer through said holes, and allowing said grout to harden.

15. A quench car track installation for a coke oven battery, comprising:

a slag base;

at least two parallel elongated levelling blocks embedded in said base;

a layer of nonpermeable sheet material on said base and levelling blocks;

a layer of aggregate on said sheet material overlying said levelling blocks;

a bonding agent distributed through said aggregate layer for bonding the particles thereof together;

at least two elongated precast concrete panels disposed on said aggregate layer with adjoining portions thereof overlying said levelling blocks;

a plurality of ties restrained against movement in a horizontal plane with respect to the upper surfaces of said panels; and

a pair of rails mounted on said ties.

4,232,824

METHOD AND APPARATUS FOR THE PNEUMATIC SPRAYING OF LIQUID PRODUCTS

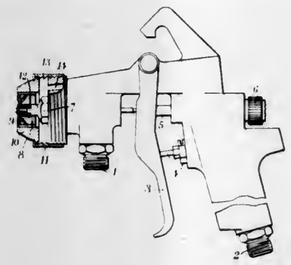
Michel Binoche, Paris, France, assignor to S K M, Societe Anonyme, Staines, France

Filed Mar. 14, 1978, Ser. No. 886,360

Claims priority, application France, Mar. 22, 1977, 77 08469

Int. Cl.[3] B05B 7/08

U.S. Cl. 239—8 **4 Claims**



1. Method of pneumatically atomizing liquids, comprising the steps of utilizing a flat jet of paint under a pressure of 1 to 5 bars, in combination with two systems of compressed air, one system being an indirect one and comprising two sheets parallel to the fan-shaped paint sheet issuing from the nozzle and between which it is encompassed, the other system, consisting of two symmetric jets in relation to said flat jet of paint, inclined in the direction of spraying of this jet and directed directly against said paint jet encompassed by two sheets of compressed air, having a power sufficient to pass through said sheets of compressed air, penetrate into said paint jet, and atomize said paint jet, and cooperating with said first compressed air system to constitute the final jet forming a mixture of air and atomized paint encompassed between two parallel sheets of compressed air.

4,232,825

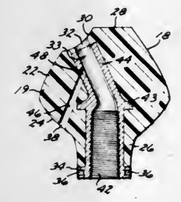
SAFETY FOUNTAIN HEAD

Richard L. Berry, Jr., 178 Roycroft Ave., Long Beach, Calif. 90803

Filed Mar. 29, 1979, Ser. No. 24,886

Int. Cl.[3] E03B 9/20

U.S. Cl. 239—28 **1 Claim**



1. A fountain head for a drinking fountain which comprises:

a solid form body molded of a resilient, impact-absorbing plastic having a bulbous shape with a reduced diameter neck, and having a concave groove along the upper edge of a sidewall;

a vertical tubular, open-ended metal sleeve coaxially received in said neck, extending into and terminating within said body, said sleeve having an axially inclined leg portion in alignment with said groove;

conduit attachment means distally carried on the lower end of said sleeve;

a downwardly-facing drain and aeration port in the leg portion of said metal sleeve;

a discharge port coaxial with the groove of said sidewall of said body in open communication with the upper end of said metal sleeve and spaced above the upper end of said sleeve;

a drain and aeration passageway extending downwardly and sidewardly through said body, the upper end of said passageway facing said drain and aeration port of said metal sleeve, and said passageway being flared outwardly and downwardly to prevent material from obstructing said passageway; and

the intermediate portion of said metal sleeve having a rib received within and molded into said body.

4,232,826

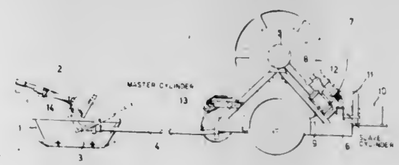
LIQUID SLUDGE DISPOSAL

Michael Broughton, Spalding, England, assignor to Farrow Irrigation Limited, England

Continuation-in-part of Ser. No. 821,216, Aug. 2, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 32,919

Int. Cl.[3] B05B 3/18, 15/02; B65H 75/34

U.S. Cl. 239—112 **4 Claims**



1. Apparatus for liquid sludge disposal, comprising

a land sledge having mounted thereon a sludge spray gun;

a mobile winching hose reel having a power coupling for connection to a tractor power take-off to provide winching power, and arranged for connection to a pumped supply of liquid sludge;

a flexible drag hose connecting said sledge and said gun to a said winching hose reel for feeding said pumped supply of sludge to said gun;

a compressor coupled to an air reservoir and arranged to fill the reservoir with compressed air automatically when the apparatus is in use;

a release mechanism arranged to release said compressed air from the reservoir through said hose and said gun, thus emptying substantially all of the sludge in said hose and said gun, when pumping of said liquid sludge ceases; and

an automatic stop mechanism for decoupling said winching hose reel from said power take-off, said automatic stop mechanism being arranged to be actuated by return of said sledge to said reel.

4,232,827

ROCKING-ARM LAWN SPRINKLER

Gian F. Roman, Pasiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy

Filed Dec. 22, 1978, Ser. No. 972,232

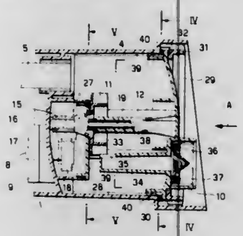
Claims priority, application Italy, Oct. 3, 1978, 22941/78[U]

Int. Cl.[3] B05B 3/16

U.S. Cl. 239—242 **4 Claims**

1. Rocking-arm lawn sprinkler for lawns, fields, gardens and cultivated land in general, of the kind comprising a tubular rocking arm with radial perforations therethrough and with a closed end and the opposite end fed with irrigation water and substained for rotation by a box containing a motion-producing system actuated by said irrigation water, characterized in that said box has a rear lid which has a circular periphery fitted into a circular aperture in said box, and an exteriorly threaded

retaining ring threaded into mating threads on the periphery of said aperture whereby upon removal of said retaining ring said



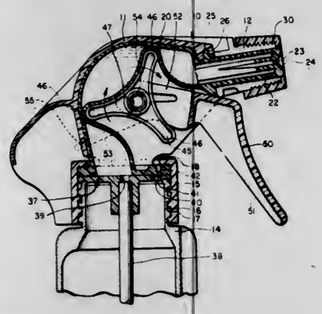
lid can be slipped out of said aperture for giving access to said motion producing system.

4,232,828

HAND HELD LIQUID SPRAY HEAD WITH REMOVABLE LIQUID CONDUIT

Newton L. Shelly, Jr., 3105 Joslyn, Memphis, Tenn. 38128

Filed Nov. 28, 1977, Ser. No. 855,351
Int. Cl.³ B05B 11/00
U.S. Cl. 239—329 17 Claims



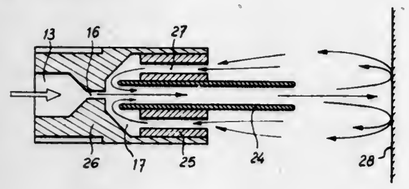
1. A liquid spray head comprising, in combination:
- a housing including an interior chamber, an inlet portion in communication with said chamber, an outlet portion in communication with said chamber, and an aperture extending between said chamber and the exterior of the housing;
- flow defining insert means disposed within said chamber and insertable therein through said aperture, said insert means including an inlet portion extending into said inlet portion of said housing and providing liquid receiving means therein, an outlet portion extending into said outlet portion of said housing and providing liquid spray means therein, and a compressible center portion for establishing liquid communication between said inlet and outlet portions;
- a rotor removably mounted for rotation within said chamber and including a plurality of working surfaces disposed to bear against said center portion of said insert means so as to progressively occlude said center portion between said inlet and outlet portions of said insert upon rotation of said rotor whereby liquid therein is forced from said inlet to said outlet portions thereof;
- user-actuable trigger means pivotably mounted to said housing and extending through said aperture into operative engagement with said rotor for rotating said rotor to force fluid through the spray head, said rotor and trigger means being removable from said housing through said aperture to facilitate insertion and removal of said flow defining insert means.

4,232,829

NOZZLE ARRANGEMENT FOR ENCAPSULATING MACHINES

Roland F. Gruber, 1, Brusselstraat, B-1744 Sint-Ulrika Kapelle, Belgium

Filed Sep. 20, 1978, Ser. No. 944,002
Claims priority, application Belgium, Sep. 21, 1977, 858900; Nov. 28, 1977, 861262
Int. Cl.³ B05B 1/00
U.S. Cl. 239—433 4 Claims



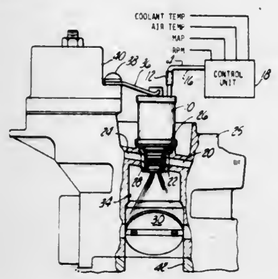
1. A device for putting capsules in position in the encapsulation head of an encapsulating machine comprising at least one expansion chamber, inlet means for feeding air under pressure to said expansion chamber and tubular air outlet means, said device being provided with further air inlet means connected to the atmosphere, said further air inlet means being effected and arranged so that a zone of air at overpressure is created at the outlet from the tubular air outlet means, a slight depression is obtained in the expansion chamber owing to the suction produced by the air introduced into said tubular air outlet means and that a continuous circulation of air takes place round the device.

4,232,830

ELECTROMAGNETIC FUEL INJECTOR

Gary L. Casey, Troy; Albert Blatter, Southfield; John A. Miller, Auburn Heights, and William B. Claxton, West Bloomfield, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 1, 1978, Ser. No. 956,692
Int. Cl.³ B05B 1/32
U.S. Cl. 239—585 16 Claims



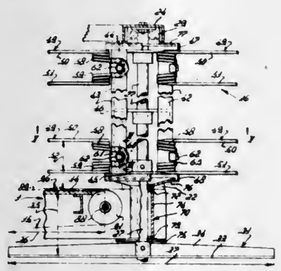
1. An electromagnetic fuel injector valve comprising:
- a tubular injector body forming an inner chamber between its ends with a centrally bored front end cap fixed to one end and a centrally bored rear end cap fixed to the other;
- a bobbin, wound with a coil, disposed in said inner chamber between said end caps and having a longitudinal bobbin bore substantially aligned with the central bore of each end cap;
- means for electrically connecting said coil to a source of an injection signal;
- a valve assembly including a valve housing and needle valve, said needle valve reciprocally mounted within a centrally located valve housing bore which terminates in a metering orifice, said needle valve operable to open and close the metering orifice, said front end cap bore being singly stepped to form a shoulder that separates said front end cap bore into a mounting bore and an armature guide bore, said valve housing positioned in the mounting bore to where it abuts said shoulder and said valve needle extending into the armature bore where it is attached to an armature movable in said armature guide bore;
- first means for communicating fuel from a pressurized source to said valve housing bore;
- a core member mounted through said rear end cap bore that extends into said bobbin bore to where it is adjacent said armature and forms an air gap therebetween; and
- a closure spring under compression disposed such that a force is applied to the needle valve to cause a closing of the metering orifice;
- wherein said coil sets up a magnetic force across said air gap when said injection signal is present that overcomes the closure spring force to open the metering orifice by lifting the armature and valve needle to where it abuts said core member.

4,232,831

DEVICE FOR SPREADING MATERIAL

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 4, 1977, Ser. No. 839,311
Claims priority, application Netherlands, Oct. 4, 1976, 7610949
Int. Cl.³ A01C 17/00, 19/00
U.S. Cl. 239—673 10 Claims



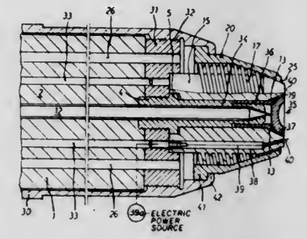
1. A spreader comprising a hopper for containing material to be spread and having a delivery outlet and at least one rotary distribution member arranged adjacent said delivery outlet and adapted to rotate about a substantially vertical axis at least in part in said outlet, said distribution member comprising a carrier and resilient working members mounted thereon, and carrier extending in at least generally the same direction as the axis of rotation of said distribution member and being spaced from said axis, a plurality of said working members being provided, and working members being disposed in pairs and each said pair being formed from a single curved length of spring steel rod, a helical-wound spring portion of each said rod being formed between the two integral working members of said pair of working members, said helically-wound spring portion being spaced from said carrier.

4,232,832

ATOMIZER DEVICE

Joseph De Fusco, St. Gall, Switzerland, assignor to Gema AG, Switzerland

Filed Dec. 26, 1978, Ser. No. 973,112
Claims priority, application Switzerland, Dec. 23, 1977, 15997/77
Int. Cl.³ B05B 5/00, 7/12
U.S. Cl. 239—707 10 Claims



1. Atomizer device, for wet lacquer, or the like coating materials, comprising:
- an atomizer head having an air outlet part for air and having a liquid outlet part for liquid; a liquid conduit which terminates at an outlet end located in said liquid outlet part;
- said atomizer head having an inner part which adjoins said outlet end of said liquid conduit; said inner part having an outside;
- ducts communicating from said liquid conduit outwardly to said inner part outside, whereby said liquid conduit outlet end communicates with said inner part outside;
- a hollow intermediate part surrounding said outlet end of said liquid conduit and said inner part; said air outlet part being radially outside said intermediate part; said inner part having an outlet end extending generally in the direction of exit of air through said air outlet part and liquid through said liquid outlet part; said inner part outside widening toward said outlet end of said inner part; between said intermediate part and said widened portion of said inner part outside, an outlet slot for liquid is defined;
- at least one electrode passing through said intermediate part and projecting out of said intermediate part and beyond said liquid conduit outlet end and also projecting from said intermediate part between said liquid conduit outlet end and said air outlet part.

4,232,833

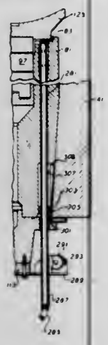
CONE CRUSHER SETTING INDICATOR

Karl Werginz, Dunwoody, Ga., assignor to Litton Systems, Inc., Columbia, S.C.

Division of Ser. No. 880,060, Feb. 22, 1978, Pat. No. 4,168,036. This application Mar. 19, 1979, Ser. No. 22,223
Int. Cl.³ B02C 2/04
U.S. Cl. 241—37 3 Claims

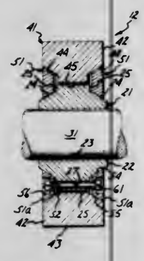
1. A crusher setting indicator for a cone crusher, which crusher includes a movable mantle and a stationary concave, comprising:
- a rod, supported by said crusher, arranged for linear movement along a line, the position of said rod along said line of linear movement being directly related to the position of said mantle along said line;
- said crusher further including a center hub having an axially extending path formed therein, said rod being positioned within said path wherein said path is a crusher lubrication path and said rod is tubular, said rod thereby being adapted to form a portion of said lubrication path;
- said crusher further including a cone support bearing seat arranged for movement along said line wherein one end of said rod is in abutting relationship with said seat;

biasing means coupled to said rod for biasing said rod into said abutting relationship with said seat; and



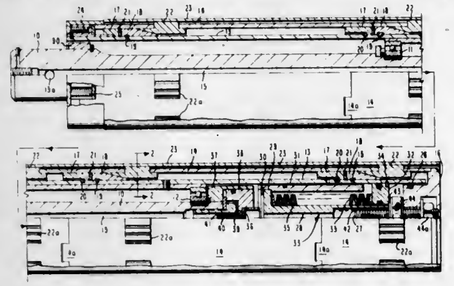
means responsive to the position of said rod along said line for providing an indication of the distance, along said line, between said mantle and said concave.

4,232,834
ROLL CRUSHER
Duane W. Player, Salt Lake City, Utah, and James A. Weil, Plymouth, Minn., assignors to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.
Filed Aug. 13, 1979, Ser. No. 65,836
Int. Cl.[3] B02C *4/30*
U.S. Cl. 241—293 **18 Claims**



1. A roll crusher comprising:
(a) a hub constructed for mounting on a drive shaft, the hub being of annular configuration and defining axial end faces and an outer circumferential support surface;
(b) a replaceable roll member of annular configuration sized for mounting on the hub in concentric relation therewith, the roll member defining axial end faces, an outer circumferential roll crushing surface and an inner circumferential mounting surface;
(c) the support surface of the hub defining first and second angular shoulders that incline radially inward to the respective axial end faces of the hub;
(d) the mounting surface of the roll member defining first and second angular surfaces that incline radially outward to the respective axial end faces of the roll member;
(e) the first and second angular shoulders respectively disposed in opposed relation to the first and second angular surfaces to define first and second annular recesses having converging sides and each facing axially outward;
(f) means associated with the support and mounting surfaces for preventing relative rotation between the hub and roll member in assembled relation;
(g) a clamping ring for each of said annular recesses, each clamping ring having opposed inner and outer circumferential surfaces that are angled to matably cooperate with the converging sides of the associated recess;
(h) and connecting means for axially urging each clamping ring into the recess to wedge the roll member radially outward relative to the hub.

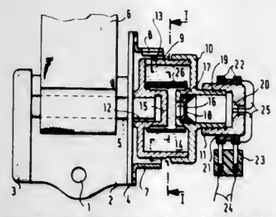
4,232,835
BOBBIN CHUCK
Joshua Benin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 12, 1979, Ser. No. 56,948
Int. Cl.[3] B65H *54/54*
U.S. Cl. 242—46.4 **2 Claims**



1. a bobbin chuck for mounting replaceable bobbins on the external surface thereof comprising: a shaft having a central bore; a tubular member mounted for rotation on said shaft and concentric therewith; a sleeve having a plurality of openings disposed in a concentric relationship about said tubular member, said sleeve being movable axially with respect to said tubular member and rotatable therewith; a plurality of camming members fixed to said tubular member and supporting said sleeve in said concentric relationship, said camming members having tapered camming surfaces; a plurality of radially and axially movable cam followers having mating surfaces engageable with the camming surfaces and extending through the openings in the sleeve for gripping bobbins on said chuck; a first resilient means located at one end of said chuck and seated against said tubular member and said sleeve for urging said sleeve axially in one direction to urge the camming surfaces of said cam follower against said tapered camming surface to move said cam followers into a gripping position; a second resilient means located at the other end of the tubular member against said sleeve for urging the camming member axially in a direction opposite to said one direction; and pneumatic means supplied with pressurized gas from the central bore of the shaft for releasing said first resilient means and allowing said second resilient means to urge said sleeve in said direction opposite said one direction and urge said cam followers away from said tapered camming surfaces to release said cam followers from a gripping position; said pneumatic means including a pressure actuated movable seal positioned between said shaft and said tubular member to direct pressurized gas to and from said pneumatic means, said pressure actuated movable seal comprising a floating piston with an orifice therethrough located between the bore in said shaft and the tubular member and movable toward and away from said pneumatic means and a tube carried by said floating piston to engage said pneumatic means.

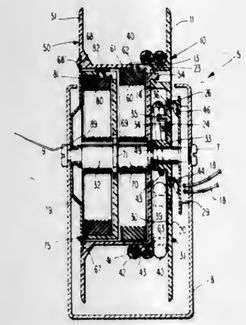
4,232,836
RE-TIGHTENER WITH PYROTECHNIC PROPELLANT CHARGE FOR SAFETY-BELT AUTOMATIC WIND-UP DEVICES
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany
Filed Apr. 2, 1979, Ser. No. 26,078
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814550
Int. Cl.[3] A67B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **9 Claims**

1. In a retightener for safety-belt automatic wind-up devices having a winding shaft mounted in a bearing block, a safety belt wound around the shaft, a retightening element connected to the shaft, with a pyrotechnic propellant charge which when activated by firing the charge generates an explosive pressure on the retightening element to tighten the safety belt around the body of a motor vehicle passenger to be protected and a liquid medium disposed intermediate the retightener and the pyrotechnic propellant charge, the improvement comprising a receptacle having a circumferential surface containing the



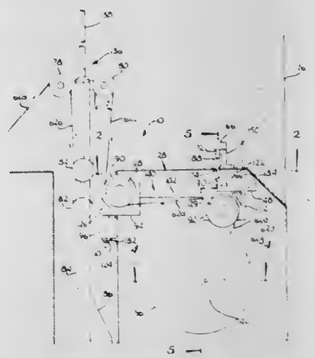
liquid medium coupled to the winding shaft and rotated with the winding shaft, and at least one jet nozzle disposed in the circumferental surface of the receptacle directed substantially tangentially to the axis of rotation of the winding shaft and against a stationary guide ring with guide vanes surrounding the receptacle wherein the guide ring together with the receptacle form a turbine system and wherein the liquid issuing from the jet nozzles when the propellant charge is fired, hits the guide vanes and thereby imparts a strong rotary impulse to the rotatable receptacle.

4,232,837
RETRACTABLE CORD REEL
Morris Cutler, Wyndmoor, and Bernard J. Tamarin, Philadelphia, both of Pa., assignors to The Vacuum Cleaner Corporation of America, Philadelphia, Pa.
Continuation of Ser. No. 835,771, Sep. 22, 1977, abandoned, which is a continuation of Ser. No. 640,540, Dec. 15, 1975, abandoned, which is a division of Ser. No. 473,885, May 28, 1974, Pat. No. 3,929,210. This application May 2, 1979, Ser. No. 35,259
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107 **11 Claims**



1. A retractable cord reel assembly comprising:
(a) a main hub having a first axial aperture,
(b) an auxiliary hub concentric with and disposed within said main hub and having a second, non-circular axial aperture coaxial with said first axial aperture,
(c) a first spring coiled within said main hub with its inner end fastened to said main hub,
(d) a second spring coiled within said auxiliary hub with its outer end fastened to said auxiliary hub,
(e) a bushing having a generally cylindrical intermediate portion to which the inner end of said first spring is fastened, an inner, substantially planar end portion whose outline is congruous with the outline of said second non-circular axial aperture, and an outer end portion whose outline is substantially congruous with said first aperture, said inner end portion being disposed in said second aperture whereby said bushing rotates in unison with respect to said auxiliary hub, said outer end portion being disposed for rotary movement within said first aperture, and
(f) an arbor which passes through said second aperture, the bore of said bushing and said first aperture, said arbor being fastened to the inner end of said second spring.

4,232,838
POSITIVE SELF-ORIENTING TRAVERSE APPARATUS IN WIRE TAKE-UP MACHINE
Ben Bravin, Los Angeles, Calif., assignor to Dynamex Corporation, Long Beach, Calif.
Filed Mar. 19, 1979, Ser. No. 21,787
Int. Cl.[3] B65H *54/30*
U.S. Cl. 242—158 R **15 Claims**



1. In an apparatus for winding wire and the like in uniform layers onto a reel, the combination comprising:
a first wire guide means for defining a first wire path and guiding wire along said first path;
a first pivot means for pivotally mounting said first wire guide means about a first axis, said first axis of said first pivot means being substantially tangential to said first wire path defined by said first wire guide means;
a second wire guide means for defining a second wire path and guiding wire along said second path;
a second pivot means for pivotally mounting said second wire guide means about a second axis;
orientation means coupled to said first and to said second wire guide means, said orientation means being a means for maintaining said first and second wire paths substantially co-planar; and
drive means for reciprocally driving said second wire guide means along a predetermined path,
whereby said wire from a wire source is guided from said source to said first wire guide means, from said first wire guide means to said reciprocating second wire guide means and then from said second wire means onto said reel.

4,232,839

METHOD AND SYSTEM FOR CONTROLLING THE DECELERATED APPROACH OF AN AERODYNE

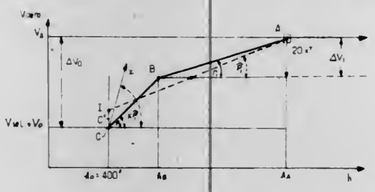
Jean-Luc Sicre, Meudon la Foret, and Daniel Gruaz, Le Chesnay, both of France, assignors to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.), Velizy-Villacoublay, France

Filed Nov. 10, 1977, Ser. No. 850,134

Claims priority, application France, Nov. 12, 1976, 76 342181; Oct. 12, 1977, 77 30703

Int. Cl.³ G05D *1/00, 1/12*

U.S. Cl. 244—188 **6 Claims**



1. A method of controlling the decelerated approach of an aircraft on glide radioalignment, said aircraft having equipment comprising at least one landing gear which can take the positions gear retracted and gear down, at least one control surface such as a flap which can take at least three positions, flap in final position for landing, flap at one notch from the final position for landing, and flap at two notches from the final position for landing, and a throttle having a slow position, comprising the following steps:

(a) approaching the capture of glide at high speed, at which the aircraft equipment is in the positions gear retracted and flap at two notches from the final position for landing;

(b) determining, at the capture of the glide, a theoretical trajectory in two stages, AB and BC, in a program of speed/altitude variables, the trajectory having the following characteristics,

(i) point C is situated at a predetermined altitude ho and at a speed Vsel+Vo (Vsel being a predetermined speed and Vo a reference speed),

(ii) in the first stage AB, the speed of the aircraft is reduced by at least a predetermined speed ΔV_1, and

(iii) the slope along these two stages satisfies the equation

$$P2 = kP1$$

P1 and P2 being the respective slopes of stages AB and BC, with k being an experimentally determined value;

(c) determining an altitude hA which the aircraft is to reach in the first stage;

(d) decelerating the aircraft in a first phase including at the start thereof engaging the landing gear in the gear down position and engaging the flap at one notch from the final position for landing;

(e) determining the actual trajectory of the aircraft and comparing the actual trajectory with the theoretical trajectory;

(f) correcting the power by manipulating the throttle if the total deceleration is too great after a decrease of speed ΔV compared to point A;

(g) determining the altitude h_B where the second stage should begin;

(h) decelerating the aircraft in a second phase at the beginning of which the flap is engaged in final position for landing and the throttle is placed in the slow position;

(i) correcting the power by manipulating the throttle; and

(j) capturing and maintaining Vref, whereby the speed of the aircraft should be less than the speed Vsel+Vo and/or the altitude of the aircraft is reduced below a predetermined altitude.

4,232,840

TAPE CASSETTE

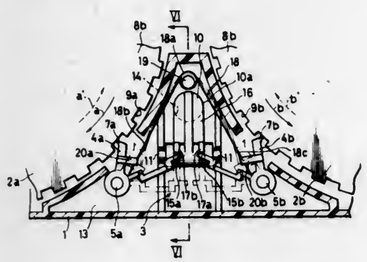
Kokichi Sugawara, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1979, Ser. No. 34,762

Claims priority, application Japan, May 8, 1978, 53-61346[U]

Int. Cl.³ G11B *23/10*

U.S. Cl. 242—198 **8 Claims**



1. A tape cassette for use in a magnetic recording and reproducing apparatus comprising a housing including a bottom wall, first and second tape reel members rotatably mounted in said housing, said first and second reel members being mounted in said housing a predetermined distance apart defining an access space therebetween, each said reel member including a flanged portion having a toothed peripheral extent, a first reel locking member pivotally mounted on said bottom wall within said access space adjacent the toothed peripheral extent of said first reel member, a second reel locking member pivotally mounted on said bottom wall within said access space adjacent the toothed peripheral extent of said second reel member, each said reel locking member being pivotable from a first position wherein an end portion thereof is adapted to lockingly engage the toothed peripheral extent of a respective reel member to a second position wherein said end portion is disengaged from the toothed peripheral extent of a respective reel member, a signal wound torsion spring disposed within said access space and interconnecting said first and second reel locking members, said spring having a first leg connected with a portion of said first reel locking member to normally urge the latter into its said first position in locking engagement with the toothed peripheral extent of said first reel member and a second leg connected with a portion of said second reel locking member to urge the latter into its said first position in locking engagement with the toothed peripheral extent of said second reel member, and control lever means pivotably mounted in said housing and being pivotable from a first position spaced from said reel locking members to a second position in contact with a portion of each said reel locking member whereby, when said control lever means moves from its said first position to its said second position, each said reel locking member moves from its respective first position to its respective second position thereby releasing said first and second reel members so they are free to rotate.

4,232,841

MAGNETIC RECORDING TAPE CASSETTE

Noritsugu Hashimoto, Takaoka, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 13, 1978, Ser. No. 951,147

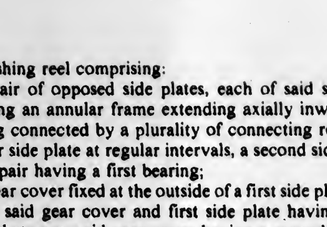
Claims priority, application Japan, Oct. 14, 1977, 52-138154[U]

Int. Cl.³ G11B *23/10*

U.S. Cl. 242—199 **6 Claims**

1. A magnetic recording tape cassette comprising top and bottom cases, each of the cases having a front wall with a plurality of openings, a rear wall and side walls; a plurality of bosses formed adjacent to the respective corners of the cases, said cases being assembled together by means of screw passing through holes disposed in the respective bosses, said assembled cases defining a chamber therebetween for receoving a magnetic recording tape;

each of said bosses situated adjacent to the front wall of the bottom case being composed of a base part having an arcuate wall extending between the inside faces of the front wall and one of the side walls and a circular connecting column projected from the top face of the base part so



as to be engaged within the hole defined in the corresponding boss situated in the top case, a part of the peripheral face of the connecting column being formed so as to be aligned with the arcuate wall, and

at least one rib with a predetermined thickness formed integral with each of the bosses situated adjacent to the front wall of the bottom case so as to project radially from the corresponding arcuate wall.

4,232,842

FISHING REEL HAVING SUPPORT FOR A DEFLECTED SPOOL SHAFT

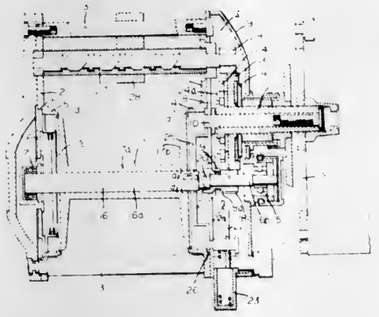
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 9, 1979, Ser. No. 19,144

Claims priority, application Japan, Mar. 14, 1978, 53-33064[U]

Int. Cl.³ A01K *89/015*

U.S. Cl. 242—212 **5 Claims**



1. A fishing reel comprising:

(a) a pair of opposed side plates, each of said side plates having an annular frame extending axially inwardly and being connected by a plurality of connecting rods to the other side plate at regular intervals, a second side plate of said pair having a first bearing;

(b) a gear cover fixed at the outside of a first side plate of said pair, said gear cover and first side plate having a space therebetween, said gear cover having a second bearing;

(c) a handle shaft rotatably supported between said first side plate and said gear cover, said handle shaft projecting outwardly of said gear cover and carrying a handle bar at the projecting end of said handle shaft;

(d) a master gear supported to said handle shaft, said master gear being arranged within said space;

(e) a spool shaft journaled between said first bearing and said second bearing, said spool shaft having a larger diameter shaft portion and a smaller diameter shaft portion, said larger shaft portion being journaled to said first bearing, said smaller diameter shaft portion being journaled to said second bearing and having a first engaging portion;

(f) a spool fixed to said larger diameter shaft portion of said spool shaft, said spool comprising a trunk and a pair of flanges which extend from both axial ends of said trunk radially outwardly thereof, said flanges having slightly smaller outer diameters than the inner diameters of said annular frames, the outer periphery of said flanges opposing the inner peripheries of said annular frames;

(g) a pinion supported to said smaller diameter shaft portion of said spool shaft to be axially slidable therealong said pinion being arranged within said space, meshed with said master gear, and provided at one axial end with a second engaging portion engageable with said first engaging portion of said spool shaft;

(h) control means for controlling the sliding motion of said pinion; and,

(i) support means provided at said first side plate and having a support portion supporting said spool shaft at a substantially intermediate portion thereof, said support portion of said support means being adapted to be normally free from said spool shaft but to support said spool shaft by contact therewith when said spool shaft deflects a predetermined amount.

4,232,843

MOLDED NOZZLE FOR ROCKET MOTOR

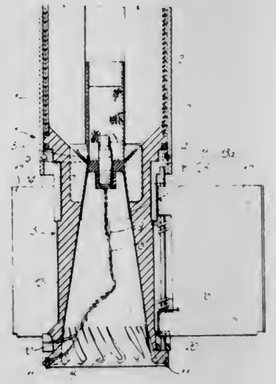
Michael N. Clark, Loretteville, and Donald L. Smith, St. Foy, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ontario, Canada

Filed Mar. 30, 1978, Ser. No. 891,924

Claims priority, application Canada, May 25, 1977, 279107

Int. Cl.² F42B *13/32*

U.S. Cl. 244—3.29 **10 Claims**



1. A rocket nozzle assembly comprising:

(a) an ablative fibre-reinforced thermosetting plastic nozzle body having a throat and an exit for positioning in a rocket motor chamber;

(b) an elongated metallic retaining ring integrally molded in an circumscribing said body adjacent said throat for positioning said nozzle body in said rocket motor chamber and to spread out aerodynamic and thermal expansion loads over the nozzle body and transmit these loads to the rocket motor chamber;

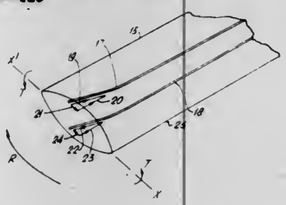
(c) a metallic fin supporting ring integrally molded in and circumscribing said body adjacent said exit; and
(d) a metallic electrical contact ring integrally molded in and circumscribing said exit electrically insulated from the rocket and adapted to be electrically connected to a firing circuit.

4,232,844

AEROFOIL WITH COMPOSITE TIP SECTION HAVING SKEWED FIBRES

Arnold J. Sobey, Hindhead, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 2, 1979, Ser. No. 445
Claims priority, application United Kingdom, Jan. 3, 1978, 00097/78
Int. Cl.³ B64C 3/20
U.S. Cl. 244—123 **3 Claims**



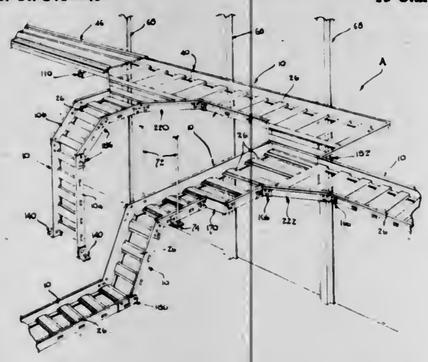
1. An aerofoil having a direction of principal bending stiffness extending substantially spanwise, said aerofoil comprising a tip section formed at least in part of composite structure in which a plurality of fibres extend generally parallel to a spanwise axis of said areofoil and wherein a substantial number of said fibres terminate at said tip section in positions skewed to the spanwise direction such that the direction of principal bending stiffness is diverted away from the spanwise direction in said tip section towards an edge of the aerofoil.

4,232,845

ON-SITE MODULAR SUPPORT SYSTEMS FOR SUPPORTING CABLES, CONDUIT AND THE LIKE

Raymond Turner, Newcastle, Australia, assignor to Aquila Steel Company, Ltd., Sydney, Australia

Filed Apr. 20, 1978, Ser. No. 898,019
Int. Cl.³ F16L 3/00, 3/22; H02G 3/04
U.S. Cl. 248—49 **15 Claims**



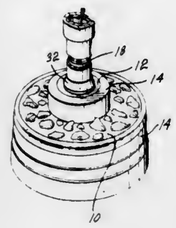
1. A modular support system capable of being assembled at an on-site location, said modular support system comprising:
(a) a plurality of support rails, each of said support rails being comprised of;
(1) a structural wall,
(2) means associated with said structural wall for connection of said structural wall to a generally stationary structural member,
(3) means forming a plurality of spaced apart slots in the structural wall of said rail, and
(4) a support flange angularly struck from said structural wall,
(b) a plurality of rungs, each of said rungs being comprised of;
(1) a plate having a pair of opposed end margins,
(2) a pair of leg sections extending outwardly from said plate, and
(3) at least one tab extending outwardly from each of said end margins, said tabs being sized and located to extend through said slots in the structural walls of a pair of spaced apart support rails, said tabs capable of being displaced relative to the location and shape of said slots so that said rungs are removably but captively attached to said support rails, and where said support flanges of a pair of spaced apart rails face each other when said rungs are attached to said pair of spaced apart rails, and said flanges being located so that said leg sections of said rungs are engagable with said support flanges when said rungs are attached to said pair of spaced apart rails.

4,232,846

BASE FOR POLES

Raymond Bressani, 137 Deschenes St., Rawdon, (Domaine Langlois), Canada (J0K 1S0)

Filed Feb. 26, 1979, Ser. No. 14,997
Int. Cl.² F16M 13/00
U.S. Cl. 248—158 **5 Claims**



1. A base for poles comprising:
(a) a first block of concrete of predetermined shape, having lateral walls covered with a layer of asbestos cement or plastic;
(b) a second smaller block of concrete of predetermined shape having lateral walls covered with a layer of asbestos cement or plastic and partly submerged into said first block of concrete; and
(c) a tubular sleeve embedded vertically into the first concrete block and extending into a hole of predetermined diameter in the second block, said second block and the portion of the tubular sleeve located within said second block, serving as a socket for receiving a pole and wherein the hole in said second block is of the same diameter as the outer diameter of a pole having the same inner diameter as the outer diameter of said tubular sleeve, so as to fit tightly over said tubular sleeve.

4,232,847

CONCRETE SCREED OR FORM SUPPORT

Carl W. Cooper, 368 Fifth Ave., San Diego, Calif. 92103

Filed Jul. 11, 1977, Ser. No. 814,227
Int. Cl.³ F16M 13/00
U.S. Cl. 248—218.4 **1 Claim**

1. A concrete screed or form support comprising: a formed and tempered rod of metal, for attachment to a stake; said rod having a generally upright three-point clamp portion shaped for partial encircling positioning on a stake with portions disposed about the axis of the clamp portion to exert a non-slip grip upon such stake; said rod having an off-set lower terminal



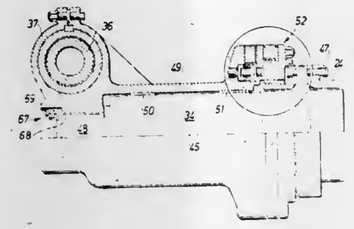
L-shaped portion capable of basal as well as lateral support of a board or the like, and having an integral handgrip lever portion extending upwardly a considerable distance and outwardly at an angle to said axis, said lever being capable of being grasped for greatly amplifying leverage in forcing said clamp portion into and out of engagement with said stake.

4,232,848

DRILL BOOM ARRANGEMENT

Erich V. Kimber, Handen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 10, 1979, Ser. No. 28,892
Claims priority, application Sweden, Apr. 11, 1978, 7804052
Int. Cl.³ F16M 1/00
U.S. Cl. 248—652 **18 Claims**



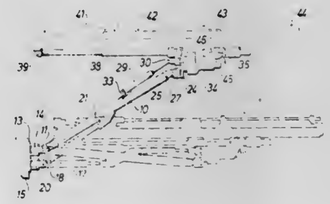
11. A drill boom arrangement comprising:
a boom support (13),
a boom (10) pivotably carried by said boom support,
a boom head (24) which carries an elongated rock drilling apparatus (40,41) and is itself pivotably carried by said boom,
a power operated self-braking turning device (34) for turning said elongated rock drilling apparatus relative to said boom head about an axis (45) which is substantially parallel with a vertical swinging plane of said elongated rock drilling apparatus,
a power operated coupling means (52) which is coupled in parallel with said turning device (34) between the boom head (24) and the rock drilling apparatus (40,41) said coupling means comprising a first friction coupling (52) for locking said elongated rock drilling apparatus relative to said boom head against rotation about said axis (45), and
a slip-coupling (67) arranged operatively in series with said self-braking turning device (34) and in parallel with said first friction coupling (52), so that the locking torques of said first friction coupling (52) and said slip coupling (67) are added.

4,232,849

DRILL BOOM ARRANGEMENT

Erich V. Kimber, Handen, and Axel L. Lundström, Hägersten, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 10, 1979, Ser. No. 28,662
Claims priority, application Sweden, Apr. 11, 1978, 7804051
Int. Cl.³ F16M 1/00
U.S. Cl. 248—654 **34 Claims**



1. A drill boom arrangement with hydraulic parallel motion means for positioning an elongated rock drilling apparatus (40,41) to different drilling positions with respect to a boom support, comprising:
a boom support (13);
a boom (10) pivoted at the rear end thereof on a first universal joint (11,12) for lateral and vertical swinging;
first (17) and second (16) hydraulic cylinder means pivotally connected between said boom (10) and support (13) for swinging said boom;
a boom head (24) carrying said elongated rock drilling apparatus (40,41) and pivoted at the forward end of said boom (10) on a second universal joint (25,26) for lateral and vertical swinging;
third (28) and fourth (29) hydraulic cylinder means for swinging said boom head (24) and rock drilling apparatus (40,41);
a third universal joint (18,19) arranged on one side of the vertical swinging plane of the boom (10);
said boom support (13) carrying said first hydraulic cylinder means (17) for swinging about said third universal joint (18,19);
a fourth universal joint (30',31') arranged on the other side of the vertical swinging plane of the boom (10);
said third hydraulic cylinder means (28) being pivotally connected to said boom head (24) for swinging about said fourth universal joint (25,31);
a fifth universal joint (18',19');
said boom support (13) carrying said second hydraulic cylinder means (16) for swinging about said fifth universal joint (18',19');
a sixth universal joint (30,31) on the opposite side of the vertical swinging plane of the boom (10) with respect to said fifth universal joint;
said fourth hydraulic cylinder means (29) being pivotally connected to said boom head (24) for swinging about said sixth universal joint (30,31);
a hydraulic circuit including conduit means connecting said first hydraulic cylinder means (17) with said third hydraulic cylinder means (28) for hydraulically slave coupling thereof and conduit means connecting said second hydraulic cylinder means (16) with said fourth hydraulic cylinder means (29) for hydraulically slave coupling thereof whereby to maintain substantially parallel displacement of said rock drilling apparatus (40,41) during positioning thereof.

4,232,850

DRILL BOOM ARRANGEMENT

Erich V. Kimber, Handen, and Nils Hökby, Enskede, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 10, 1979, Ser. No. 28,891
Claims priority, application Sweden, Apr. 11, 1978, 7804054
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—654 **10 Claims**



1. In a drill boom arrangement for positioning an elongated rock drilling apparatus to different drilling positions with respect to a boom support, comprising a boom support (13), a boom (10), a first universal joint (11,12) connecting said drill boom (10) to said boom support (13), first (17) and second (16) hydraulic cylinders coupled to said boom (10) for pivoting said boom in a vertical swinging plane, and second (18, 19) and third (18^1, 19^1) universal joints connecting respectively said first and second hydraulic cylinders (17, 16) to said boom support (13),

the improvement wherein:

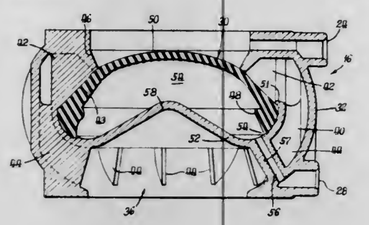
said second and third universal joints (18, 19 and 18^1, 19^1) are located on different sides of the vertical swinging plane of said boom (10) so as to provide means for swinging said boom both laterally and vertically during extension and contraction of solely either one of said first and second hydraulic cylinders.

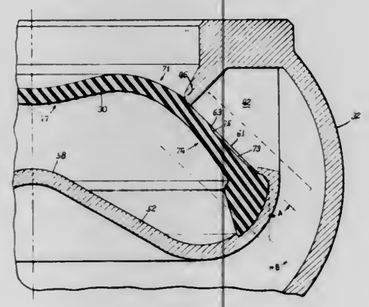
4,232,851

FLUID CONTROL VALVE AND LINER THEREFOR

Dwight N. Johnson, El Toro, Calif., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 730,962, Oct. 8, 1976, Pat. No. 4,198,029. This application Feb. 6, 1979, Ser. No. 10,141
Int. Cl.³ F16K *31/126*
U.S. Cl. 251—61.1 **7 Claims**





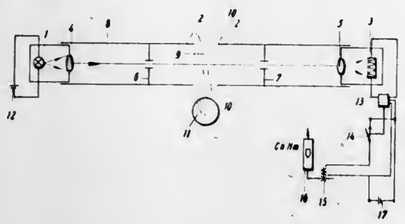
1. In a valve for controlling fluid flow through a conduit including a housing defining an inlet opening, a substantially coaxial outlet opening and an interior cavity therebetween, a baffle extending transversely across the central portion of the cavity to define an annular passageway for the flow of fluid from the inlet opening to the outlet opening, a plurality of ribs extending from the periphery of the baffle toward the inlet opening of the housing to provide a generally frustoconical grill having a plurality of ports therein, an elastomeric, concavo-convex liner disposed on the upstream side of the baffle with its peripheral edge in sealing relation with the periphery of the baffle so as to define a control chamber between the liner and the baffle, the inner surface of said grill and the outer surface of said liner being in confronting relation, the baffle having a central protuberance projecting toward the liner upon which the liner is draped during inversion of the liner, and means for decreasing and increasing the fluid pressure in the control chamber, a decrease of the pressure in the chamber causing the liner to invert and to roll along the frustoconical grill from a closed position where all of the ports are covered by the liner to positions where progressively greater areas of the ports are exposed, thereby permitting controlled and progressively increasing fluid flow through the ports and through the annular passageway, an increase in the pressure of the chamber causing reverse movement of the liner, the improvement comprising disposing the inner surface of said grill and the outer surface of said liner so that with the valve in its closed position said surfaces are spaced apart from each other.

4,232,852

APPARATUS FOR CONTROL OF THE CARBURIZATION OF PARTS IN A VACUUM FURNACE

Ferdinand Limque, Berg en Dal, Netherlands, and Franz Bless, Kleve, Fed. Rep. of Germany, assignors to Ispen Industries International Gesellschaft mit beschränkter Haftung, Kleve, Fed. Rep. of Germany

Division of Ser. No. 822,840, Aug. 8, 1977, Pat. No. 4,168,186. This application May 2, 1979, Ser. No. 35,126
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636273
Int. Cl.³ C21D *1/45*
U.S. Cl. 266—80 **5 Claims**



1. An apparatus for the control of the carburizing of parts under vacuum in a vacuum furnace, in which as a carbon carrier a hydrocarbon gas addition is introduced controlled into the furnace, comprising

means for operatively detecting the occurrence of a soot mist formation in the furnace,

means operatively connected to said detecting means for feeding the hydrocarbon gas addition into the furnace when said detecting means does not detect the soot mist formation,

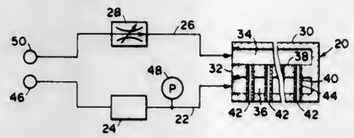
said detecting means for at least partially interrupting said feeding means and the feeding of the hydrocarbon gas addition into the furnace upon the detection of the occurrence of the soot mist formation, and for activating said feeding means again to feed the hydrocarbon gas addition into the furnace when the soot mist formation decays.

4,232,853

STEEL STOCK COOLING APPARATUS

Seiji Bando, and Ebata Sadao, both of Okayama, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Jun. 28, 1978, Ser. No. 919,851
Claims priority, application Japan, Jul. 4, 1977, 52-89032; Aug. 22, 1977, 52-112674
Int. Cl.³ C21D *1/62*
U.S. Cl. 266—114 **7 Claims**



1. A steel stock cooling apparatus wherein a mixture of water with air is injected onto steel stocks for cooling, said apparatus comprising:

a main body;

injection pipes which are each communicated at one end thereof with a water supply section and each inject at the other end thereof water supplied from said water supply section;

at least one air introducing hole communicated with an air supply section is formed at the intermediate portion of each of the injection pipes;

said water supply section and air supply section are holes formed in said main body, respectively; and

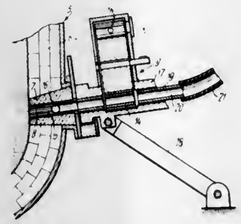
the axes of said holes are in parallel to each other.

4,232,854

METHOD OF INTRODUCING POWDERED REAGENTS INTO MOLTEN METALS AND APPARATUS FOR EFFECTING SAME

Dzhondo F. Barbakadze, ulitsa Gldanskaya, 6, kv. 35, Tbilisi; Mamuka S. Mindeli, ulitsa Pionerskaya, 8, Rustavi; Petr G. Macharashvili, ulitsa Lenina, 27, kv. 8, Rustavi; Vazha V. Rusidze, prospekt Druzhby Narodov, 57, kv. 64, Rustavi, and Otari N. Suladze, Pionersky proezd, 3, Rustavi, all of U.S.S.R.

Filed May 26, 1978, Ser. No. 909,990
Int. Cl.³ C21C *5/48*
U.S. Cl. 266—266 **3 Claims**



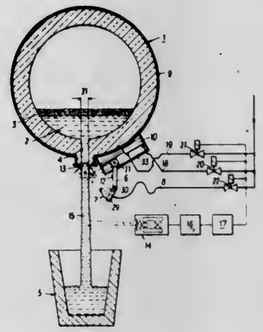
1. A method of introducing powdered reagents into a molten metal in a stream of carrier gas through a tuyere disposed in a refractory lining of a metallurgical vessel, consisting in introducing powdered reagents into the molten metal at a feed rate of 0.04 to 0.6 kg per sec. under a pressure of carrier gas which is 1.8 to 4.0 times the static pressure of molten metal above the tuyere, with the powder-to-carrier-gas ratio being 3 to 35 kg per cubic meter.

4,232,855

TAP-HOLE CLOSING ARRANGEMENT

Johann Hartl, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 12, 1979, Ser. No. 74,882
Claims priority, application Austria, Oct. 4, 1978, 7147/78
Int. Cl.³ C21C *5/48*
U.S. Cl. 266—272 **4 Claims**



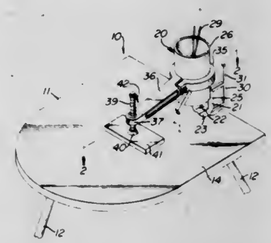
1. In a tap-hole closing arrangement provided at a metallurgical vessel for separating metal and slag and of the type including a tap hole wall defining a tap hole, a closure body insertable into said tap hole on leaving free an annular gap relative to said tap hole wall and including a compressed-gas conduit containing a mouth-side outlet opening, an outer jacket surrounding said closure body and tapering towards the mouth of said compressed-gas conduit, the improvement which is characterized in that said outer jacket is formed by a spherical-calotte-shaped face passing over into a frustroconical face on the side of the mouth so as to define a truncated cone, the height of said truncated cone being at least 1 time and at most 2.5 times the diameter of said mouth-side outlet opening of said compressed-gas conduit, and the aperture angle of said truncated cone amounting to at least 15 and at most 70°.

4,232,856

WORK HOLDING TABLE

Timothy J. Eichfeld, and Horace C. Disston, Jr., both of Pennsauken, N.J.

Continuation-in-part of Ser. No. 907,093, May 18, 1978, Pat. No. 4,140,308, which is a continuation-in-part of Ser. No. 6,095, Jan. 24, 1979. This application Feb. 16, 1979, Ser. No. 12,603
Int. Cl.³ B25B *1/00*
U.S. Cl. 269—93 **7 Claims**



1. A work holding table comprising an elevated plate defining a table top, a yoke having a throat sized large enough to shiftably receive the edge margin of said plate for movement of said yoke to a selected position along the plate margin, a column upstanding from said yoke above and over said plate, said throat being further sized small enough to firmly cock the yoke on the plate margin upon upward force applied to said column,

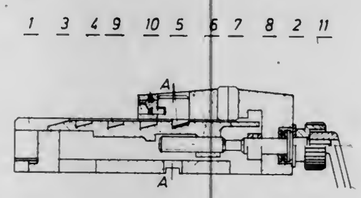
a sleeve having an internal dimension greater than the external dimension of and loosely circumposed about said column for sliding therealong and tiltable about a generally horizontal axis between a longitudinal position lowered relative to and slidable on the column and a canted position raised relative to and jammed against upward movement along the column, said sleeve being releasably contractible about said column to urge the sleeve from its canted position toward its longitudinal position, an arm extending from said sleeve for location over said plate and movable with said sleeve between an outstanding position and an upwardly swung position upon sleeve movement between respective longitudinal and canted positions, whereby said arm is downwardly engagable with a work piece on said table in upwardly swung position to releasably clamp the work piece on the table upon contraction of said sleeve and apply upward force to the column to firmly cock the yoke in a selected position on the plate margin.

4,232,857

MACHINE VISE

Slawomir J. Bezubik, and Stanislaw Laszcz, both of Bialystok, Poland, assignors to Fabryka Przyrzadow i Uchwytow PONAR-BIAL Zaklad Nr 1-Wlodacy, Bialystok, Poland

Filed Jun. 6, 1979, Ser. No. 47,825
Claims priority, application Poland, Jun. 17, 1978, 207728
Int. Cl.³ B25B *1/12*
U.S. Cl. 269—212 **1 Claim**



1. A machine vise apparatus having a body, a stationary jaw disposed at a terminus of said body, guide means disposed in said body having a movable strip formed of a movable jaw, adapted to cooperate therewith and move in said guide means, and a lead screw for registration with said movable strip, said apparatus comprising: a series of thrust recesses formed on the upper surface of said movable strip, a securing catch disposed in said movable jaw whereby, said recesses accommodate said securing catch which is in mesh with a driving means, and a threaded hole formed at the lower surface of said movable strip, adapted to cooperate with said lead screw.

4,232,858

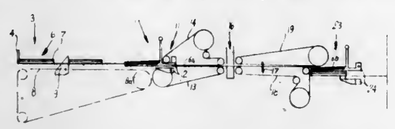
METHOD AND MEANS FOR MANIPULATING MARGINALLY PERFORATED NOTE BOOKS PRIOR TO INTRODUCTION OF SPIRALS

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 854,835, Nov. 25, 1977, Pat. No. 4,157,821. This application Sep. 19, 1978, Ser. No. 943,814
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1968, 1817815; Feb. 1, 1978, 2804100
Int. Cl.³ B42B *5/12*
U.S. Cl. 270—53 **36 Claims**

1. A method of changing the shape of straight holes consisting of registering perforations provided in an elongated marginal portion of each sheet of a pile of sheets which are about to receive a spiral having a predetermined radius and a predetermined helix angle and serving to hold the sheets of the pile together, comprising the steps of moving at least some sheets of said pile in a first direction substantially at right angles to the respective elongated marginal portions and moving at least some sheets of said pile in a second direction which is substantially parallel to the respective elongated marginal portions whereby the movements of sheets in said first direction result in conversion of said straight holes into substantially V-shaped holes whose configuration resembles the projection of a convolution of said spiral into a plane which is normal to the axis of said spiral, and the movements of sheets in said second direction result in inclination of said holes with respect to the planes of said sheets at an angle which at least approximates said helix angle.

9. An arrangement for changing the shape of straight holes consisting of registering perforations provided in an elongated marginal portion of each sheet of a pile of sheets which are about to receive a spiral having a predetermined radius and a predetermined helix angle and serving to hold the pile together, comprising a holder having means for gripping the outermost sheets of the pile while leaving at least some of the holes exposed; and aligning means including means for moving



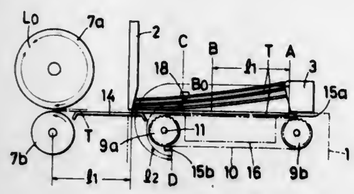
at least some sheets of the pile in said holder in a first direction substantially at right angles to the respective elongated marginal portions and for moving at least some sheets of the pile in said holder in a second direction which is substantially parallel to the marginal portions of the sheets whereby the movements of sheets in said first direction result in conversion of said straight holes into substantially V-shaped holes whose configuration resembles the projection of a convolution of said spiral into a plane which is normal to the axis of the spiral, and the movements of sheets in said second direction result in inclination of said holes with respect to the planes of said sheets at an angle which at least approximates said helix angle, said moving means comprising at least two mandrels disposed at the opposite sides of the pile in said holder means for imparting to said mandrels a composite movement including introducing each mandrel into a hole from the respective side of the pile in said holder and pivoting at least one mandrel with respect to the other mandrel.

4,232,859

BLANK FEEDING APPARATUS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Kabushiki Kaisha (Rengo Co., Ltd.), Osaka, Japan

Filed Jan. 19, 1979, Ser. No. 5,016
Claims priority, application Japan, Jan. 27, 1978, 53/9719; Feb. 24, 1978, 53/21340
Int. Cl.³ B65H *3/24*
U.S. Cl. 271—35 **1 Claim**



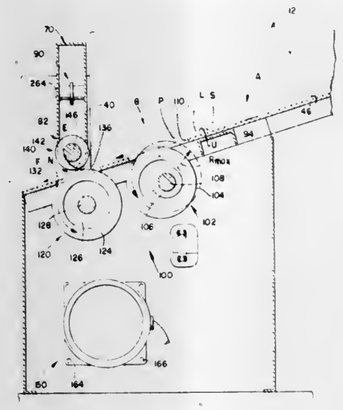
1. Apparatus for feeding blanks of paperboard or the like one after another from a stack of blanks to processing rolls, said apparatus comprising:
an endless conveyor means disposed under said stack of blanks for feeding blanks one after another from said stack to said processing rolls,
at least one kicker means secured on said endless conveyor means for pushing the rear end of the blank at the bottom of said stack toward said processing rolls,
motor means for driving said conveyor means,
a first transducer means for generating pulses (ϕ_A), the number thereof being proportional to the distance the surface of one of said processing rolls has rotated,
a second transducer means for generating pulses (ϕ_B), the number thereof being proportional to the distance the conveyor means has travelled,
a sensor for detecting said kicker and giving a signal,
a first setting means for setting a first value (Lo) determined by the circumference of said one of said processing rolls and a second value (B_o) determined by the distance the kicker travels during one cycle,
a second setting means for setting a third value (l_2) determined by the distance the kicker travels during the time from the operation of said sensor to the stopping thereof,
computation control means for receiving said first and second values and the pulses from said first transducer means and the pulses from said second transducer means and performing a computation expressed by $(Lo-Bo-\phi_A+\phi_B)$, to determine an error signal,
combining means for combining together said error signal and a voltage proportional to the signal from said first transducer means,
stop control means responsive to the signal from said sensor for subtracting the pulses from said second transducer from said third value,
means for selecting the higher one from the two signals, that from said combining means and that from said stop control means, and comparing it with a voltage proportional to the speed of the conveyor means and producing a speed command signal proportional to the difference therebetween, and
motor control means for receiving said speed command signal to control said motor means so that one cycle of kicker operation will be completed while said one of said processing rolls makes a full turn, said one cycle including the acceleration, tuned-run and deceleration periods.

4,232,860

PAPER FEEDER

Frank H. Brown, Norwich, N.Y., assignor to Automecha Ltd., Oxford, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,835
Int. Cl.³ B65H *3/06, 3/46*
U.S. Cl. 271—119 **13 Claims**



1. A friction feeder comprising:
a base;
a feed tray on said base;
a paper stop assembly releasably mounted on said base;

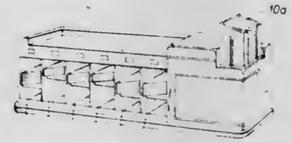
a main feed wheel assembly mounted on said base adjacent said feed tray;
a stone wheel assembly mounted on said base to be adjacent said feed wheel assembly for accepting paper from said feed tray to move such paper from said feed tray, said stone wheel assembly including a mounting shaft;
an eccentric wheel assembly mounted on said base adjacent said feed tray and including a drive shaft mounted on said base and a wheel eccentrically mounted on said drive shaft to contact paper contained in said feed tray in a manner which lifts a portion of that paper from said feed tray to define a bulge in that paper and cause a leading edge of such paper to tilt with respect to a vertical orientation;
a drive means connected to said eccentric wheel assembly and to said main feed wheel assembly for driving those two assemblies; and
adjusting means for adjusting the location of said stone wheel assembly with respect to said main feed wheel assembly to define a gap between such assemblies of a predetermined size, said adjusting means including a crank and an adjusting rod on each end of said stone wheel mounting shaft and connecting means connecting said adjusting rods together so that rotation of one adjusting rod causes rotation of the other adjusting rod.

4,232,861

SORTING METHOD AND MACHINE

Michael Maul, Schwabach near Nurnberg, Fed. Rep. of Germany, assignor to Maul Lochkartengerate GmbH, Schwabach, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,212
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658171
Int. Cl.² B65H *39/10*
U.S. Cl. 271—287 **6 Claims**



1. A method of sorting sheets comprising the steps of feeding to an infeed station successive ones of M groups of sheets, each group consisting of N identical sheets, the sheets within each group differing from those of the others of the groups; and
converting these M×N sheets into N sets, each set containing M sheets, each sheet within a set coming from a different respective one of the M groups, the sequence of sheets within each set corresponding to the sequence in which the M groups were fed to the infeed station, this conversion comprising:
performing a first sorting operation, independently of routing information, if any, provided on the sheets, by depositing successive ones of the sheets of the successive groups of sheets onto successive ones of a limited number of collecting stations in a cyclical manner utilizing cyclically operating counting means to control performance of the first sorting operation, the number of collecting stations utilized being smaller than the number N of sets to be formed, until all M×N sheets have been deposited onto collecting stations,
then performing at least one further sorting operation, likewise independently of routing information, if any, provided on the sheets, each further sorting operation comprising
first taking the slacks accumulated at the collecting stations out of the collecting stations and feeding them back in into

the infeed station in the order in which successive collecting stations received sheets during the preceding sorting operation,

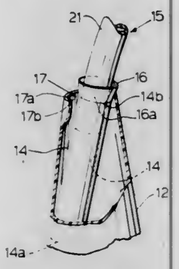
and then performing another such sorting operation, again utilizing cyclically operating counting means to control performance of the sorting operation, until all M×N sheets have again been deposited onto collecting stations.

4,232,862

OBSTACLE SAFETY DEVICE

Michael Mason, 604 Primrose La., Schaumberg, Ill. 60194

Filed Feb. 1, 1979, Ser. No. 8,683
Int. Cl.³ A63B 5/02
U.S. Cl. 272—102 **1 Claim**



1. An obstacle device set comprising:

a cone-shaped support means having an opening in a top thereof;

a plurality of curved obstacle rods each having a different radius of curvature and each having a vertical portion and a horizontal portion; and

a flanged bushing for receiving an end of each vertical portion of each said rod, said bushing having a shank portion which is received in said opening in said support means and extends therein a sufficient distance to maintain said horizontal portion of each said rod generally parallel to the ground, said bushing having a coefficient of friction sufficient to allow rotation of said vertical portion of each said rod about a central upright axis of said cone,

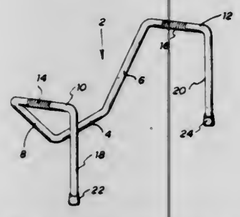
such that said obstacle rods may be selectively removably engaged in said support means to provide a set of obstacles of varying heights.

4,232,863

FITNESS BAR

Herschel Roach, Clarksville, Tex., assignor to O & R Products, Incorporated, Clarksville, Tex.

Filed May 19, 1978, Ser. No. 907,484
Int. Cl.³ A63B 1/00
U.S. Cl. 272—111 **8 Claims**



1. A fitness bar for supporting a person during performance of physical exercise, comprising:

a pair of transverse spaced apart beam bars;

a pair of support legs extending downwardly from the beam bars for engaging a supporting surface to support one end of the fitness bar, said support legs being spaced apart a distance substantially the same distance as said beam bars;

a base bar for being disposed along the supporting surface between said beam bars and support legs to support the other end of the fitness bar;

a pair of support arms extending upwardly and outwardly at an angle from the distal ends of said base bar between said beam bars and support legs, said beam bars extending laterally from the upper ends of said support arms; and

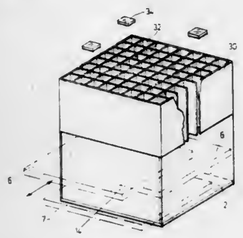
said transverse beam bars being spaced apart a distance to allow a person to perform physical exercise by grasping said beam bars and moving through strenuous positions between said beam bars.

4,232,864

GAME APPARATUS WITH MOVABLE SUPERIMPOSED BOARDS AND VIEWING STRUCTURE

James J. Yaworsky, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2LR)

Filed Jan. 2, 1979, Ser. No. 358
Int. Cl.³ A63F 3/00, 9/00
U.S. Cl. 273—241 **7 Claims**



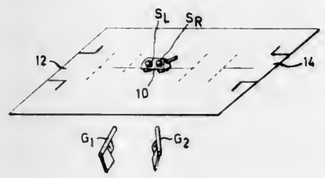
1. A game apparatus comprising at least two corresponding playing surfaces, playing pieces adapted to releasably engage said playing surfaces, means to superimpose said playing surfaces, wherein at least one of said playing surfaces is movable from the superimposed position and wherein said playing pieces and said playing surfaces are at least partially transparent providing observation of non-overlapping playing pieces when said playing surfaces are superimposed, the apparatus further including a viewing means having a planar network structure defining open apertures and means to cover such apertures, said viewing means located above superimposed playing surfaces to provide at least partial viewing of superimposed playing surfaces and playing pieces.

4,232,865

RADIATION SENSING MOBILE TARGET GAME

Lim B. Chen, and Lim L. Cher, both of Hong Kong, Hong Kong, assignors to Cybiotronics Limited, Hong Kong, Hong Kong

Filed Mar. 27, 1978, Ser. No. 890,493
Int. Cl.³ F41J 5/02, 7/00, 9/02
U.S. Cl. 273—311 **8 Claims**



1. A game for testing the ability of players, which comprises:

a mobile target;

means for emitting a narrow beam of radiation, said radiation emitting means comprising a gun emitting a single pair of pulses upon each actuation of a trigger thereof;

sensing means on said mobile target responsive to said radiation of said emitting means and comprising a radiation detector and a circuit for detecting said emitting pulses, said circuit including gating means for gating a second received pulse under the control of a first received pulse such that said circuit is only responsive to pulses of radiation having a predetermined separation in time;

drive means on said mobile target for displacing said mobil target; and

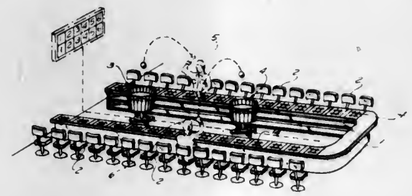
control means for controlling said drive means in response to sensed radiation, said control means being set to cause said mobile target to undergo a predetermined change in velocity for a predetermined length of time in response to said sensed radiation.

4,232,866

APPARATUS FOR PLAYING A GAME OF CHANCE

Attilio Pennachio, 14 Amber Cir., Las Vegas, Nev. 89106

Filed Oct. 2, 1978, Ser. No. 947,630
Int. Cl.³ A63B 63/02; A63F 5/02; F41J 5/04
U.S. Cl. 273—374 **11 Claims**



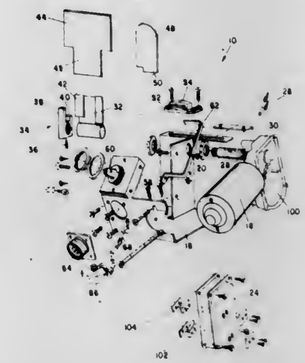
1. A gambling apparatus comprising a generally U-shaped table member having a pair of spaced apart substantially parallel table sections and a plurality of seats disposed along the outside portions of said sections for accommodating numerous participators; receptacle means disposed between said table sections, said receptacle means including a basket and a generally circular base member, said base member having formed therein six equally spaced circular recesses, the centers of said recesses defining a circle concentric with the periphery of the base member said base member further including a central closed mound encircled by said recesses, each of the recesses being associated with a number from 1 to 6, each of said numbers from 1 to 6 being indicated on the outside of the receptacle adjacent its associated recess, each of said numbers from 1 to 6 further being indicated on said mound portion adjacent its respective associated recess; a ball which may be directed by one of said participators to said receptacle for randomly falling into one of said recesses; means for leveling said base member to ensure the completely random entry of said ball into said one, or, at random, into any one of said recesses; a display having six display conditions corresponding respectively to the numbers from 1 to 6 associated with the base recesses; electrical control means for communicating the presence of the ball in one of the base recesses to said display for displaying the number from 1 to 6 corresponding to the respective ball containing recess; and a plurality of individual layouts, each of which is disposed on said table sections at each seat, each of said layouts including a plurality of separate betting zones each of which denotes a manner of winning and the payoff for the respective manner of winning, said betting zones including zones for each number and various groups or combinations of numbers.

4,232,867

PORTABLE TARGET RAISING AND LOWERING DEVICE SYSTEM

Edward D. Tate, Sr., 165 Charles Cir., Seaford, Va. 23696

Filed Mar. 29, 1979, Ser. No. 24,915
Int. Cl.³ F41J 7/00, 7/02
U.S. Cl. 273—406 **8 Claims**



5. A portable training system having devices for raising and lowering a replaceable target used in gunnery practice, said device comprising:

a. a rotatable control shaft;

b. a target holder freely mounted on said control shaft and adapted to hold the replaceable target;

c. a control arm rigidly mounted on said control shaft for engaging said target holder;

d. a first remotely controlled motor means for rotating said control shaft in a first direction to cause rotational movement of said control arm, and corresponding rotational movement of said target holder, between a first lowered position and a second raised position and for rotating said control shaft in a second direction to cause rotational movement of said control arm from the second raised position to the first lowered position;

e. a second remotely controlled motor means for moving said target holder from the second raised position to the first lowered position; and

f. remote control means for controlling said first and second motor means such that in first mode of operation using a replaceable target of a first type said control arm engages said target holder as both said control arm and said target holder move from the first lowered position to the second raised position, and said control arm engages the replaceable target and hence said target holder as said control arm and said target holder move from the second raised position to the first lowered position; and such that in second mode of operation using a replaceable target of a second type, said contol arm engages said target holder as both said control arm and said target holder move in said first direction from the first lowered position to the second raised position and said control arm disengages from said target holder when said control arm moves in said second direction leaving said target holder in the second raised position said target holder being moved from the second raised position to the first lowered position by said second remotely controlled motor means.

4,232,868

STATIONARY RECORD PLAYER

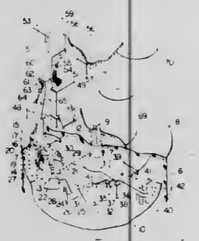
Yasushi Okamura, and Kiichiro Tanaka, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1978, Ser. No. 952,389

Claims priority, application Japan, Oct. 19, 1977, 52-126266; Oct. 19, 1977, 52-126267; Oct. 19, 1977, 52-126268; Feb. 20, 1978, 53-18963; Mar. 6, 1978, 53-25568; Mar. 23, 1978, 53-33864; Mar. 24, 1978, 53-34455

Int. Cl.³ G11B *3/40*

U.S. Cl. 274—9 C **10 Claims**



1. A stationary record player having a turn table adapted to be rotatively driven by an electric motor or the like, and a pickup pivotally secured to said turn table, said pickup having a stylus adapted to move along the recording groove in a stationary record medium when said pickup is rotated together with said turn table, so as to reproduce the signal on said record medium, characterized by comprising a lift member adapted to detect the arrival of said stylus at the final position of reproduction, said lift member including a lift lever being pivoted to said turn table, one end of said lift lever being held by the pickup until the pickup reaches a final inward position whereby said one end is released allowing the remaining end of said lift lever to be pivoted upward; a play lever for operating a switch for supplying current to the electric motor in response to an actuation thereof; locking mechanism for maintaining actuation of said play lever; and an automatic release mechanism connected to said locking mechanism, having an activating arm disposed at the same radial position along the turn table as the remaining end of said lift lever and located above the remaining end of the lift lever operated in response to the release of said lift lever whereby said play lever is released stopping said electric motor.

4,232,869

PICKUP CARTRIDGE

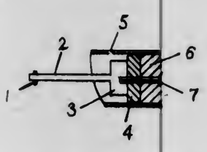
Takashi Wakabayashi, Ibaragi, and Kazuhisa Morimoto, Settsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 31, 1978, Ser. No. 938,497

Claims priority, application Japan, Sep. 8, 1977, 52/108540; Sep. 9, 1977, 52/109312

Int. Cl.³ G11B *3/18*

U.S. Cl. 274—37 **4 Claims**



1. A pickup cartridge comprising: a cantilever having a stylus mounted on one end portion thereof; and a damper material supporting the other end portion of said cantilever, said damper material being formed of an elastomer comprising a polymer blend of a silicone rubber polymer and polyisobutylene the blend ratio of said polymer blend is between 10 and 60 weight parts of said polyisobutylene on the basis of 100 weight parts of said silicone rubber polymer.

4,232,870

CLAMPING DEVICE FOR A ROTATABLE INFORMATION CARRYING RECORD

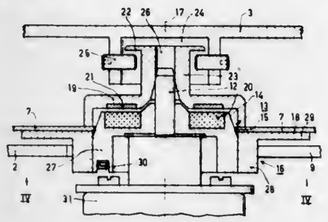
Johannes A. Iemenschot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 734,659, Oct. 21, 1976, abandoned. This application Jun. 11, 1979, Ser. No. 47,394

Claims priority, application Netherlands, Aug. 24, 1976, 7609375

Int. Cl.³ G11B *17/02*; G01D *15/32*; G11B *25/04, 3/62*

U.S. Cl. 274—39 R **2 Claims**



1. A clamping device for clamping a rotatable disc-shaped record carrier provided with a center hole into position, comprising:

a drive spindle having a driven end and a free end, and being rotatable about an axis of rotation and axially immovable;

a centering member pivotable about said axis of rotation and being provided with a centering surface whose diameter varies from smaller than to greater than the diameter of the record hole, said centering surface being in contact with the edges of said record center hole during the rotation of the record and said centering member being axially immovable;

record loading means movable to a position opposite the centering member and bearing on the record in this position for pressing the centering surface against the edge of the record center hole;

record carrier means provided with a record support surface radially spaced from said centering surface of said centering member for immediately confining said record carrier to a position perpendicular to the axis of rotation of said drive spindle, and for lowering the record carrier onto said centering surface while maintaining the perpendicular relationship between the record carrier and the axis of rotation of said drive spindle during axial and rotational motion of the record carrier means;

and means for axially resiliently biasing the record carrier means toward the record carrier with a force less than that necessary to overcome the weight of the record combined with the pressing force of the record loading means, thereby facilitating the lowering of said record carrier.

4,232,871

MANUAL RECORD CLEANER

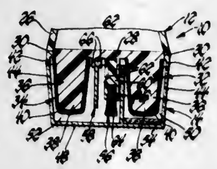
Richard C. Horian, 27234 Westland, Detroit, Mich. 48240, and James G. Horian, 7340 Indiana, Dearborn, Mich. 48126

Filed Nov. 1, 1976, Ser. No. 737,295

Int. Cl.³ G11B *3/58*

U.S. Cl. 274—47 **14 Claims**

1. A manual record cleaner comprising: a manually grasped body having leading and trailing projections spaced from each other; each projection being of a rigid material and having a blunt end including a covering of a soft pile for cleaning records during relative movement between the cleaner and the records while in an engaged condition; a brush located between the leading and trailing projections in a spaced relationship to each projection; said brush having bristles that extend away from the body to a plane extending between the soft pile covered blunt ends of the rigid projections so as to loosen dust accumulation from a record being cleaned with the projection coverings slidingly engaging the record; said brush bristles having a flexible length that is a plurality of times the thickness of the soft pile coverings on the blunt ends of the rigid projections; the rigid blunt ends on the projections and the pile coverings thereon cooperating to control the degree to which the bristles extend into the record grooves so that effective cleaning can be achieved without damaging the sound track surfaces of the record grooves; and an upwardly opening receptacle for mounting the cleaner body with the projections and brush projecting downwardly thereinto, said cleaner body closing the receptacle when mounted thereon to retain any cleaning liquid dampness that may be present on either projection covering.



4,232,872

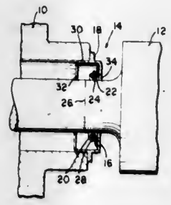
OIL SEAL

Stanley M. Miyabara, 1002 Gen. McArthur Dr., Brentwood, Tenn. 37027

Filed Apr. 2, 1979, Ser. No. 26,411

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—47 **2 Claims**



1. An annular seal for preventing oil leakage, said seal adapted to fit around a driven member as a unitary item and comprising two outer right-angled shoulders each of which comprises a top portion and a side portion substantially perpendicular to said top portion, said shoulders being joined together by a flanged projecting neck, and an inner V-shaped lip, one V arm of which extends as a lengthened section substantially perpendicular to said top portion of one of said shoulders and fits against said side portion of said one of said shoulders in a parallel manner, the top portion of the other of said shoulders being adapted to fit snugly against a housing, said side portion of said other of said shoulders being shorter than said side portion of said one of said shoulders, and said V-shaped lip being adapted to fit at its point firmly against said driven member.

4,232,873

RING SPRING FOR COMPOSITE MACHINERY SEALS AND METHOD OF MANUFACTURING SAME

Jules M. Hock, 16056 Arbela Dr., Whittier, Calif. 90603

Filed Mar. 12, 1979, Ser. No. 19,848

Int. Cl.³ F16J *15/32, 15/10*

U.S. Cl. 277—206 A **5 Claims**

1. An elastomeric resilient ring spring for use in an annular elastomeric boot of the U-cup type having an exposed annular groove which is generally x-shaped, the surface defining the annular groove comprising opposed, inwardly directed, first and second lobes extending into and defining the minimum transverse dimension across said groove, the tips of said first and second lobes being generally aligned with each other, and a third inwardly directed lobe extending from the base of said groove, perpendicular to said first and second lobes, midway



therebetween, said ring spring being generally +-shaped including four lobes, first and second opposed lobes extending parallel to the plane of said ring spring, third and fourth opposed lobes extending perpendicular to the plane of said ring spring, the dimensions of said ring spring being approximately the same as those of said groove whereby rotation of said ring spring about its axis through an angle of 45° permits mating of said ring spring into said groove in said boot.

4,232,874

TANK MOUNTED ON BACK OF FOUR-WHEEL DRIVE TRACTOR

Stuart Ystebo, 2421 - 16th Ave. South, Moorhead, Minn. 56560

Filed Nov. 17, 1978, Ser. No. 961,736

Int. Cl.³ B65D *11/22*; B60P *3/22*

U.S. Cl. 280—5 A **48 Claims**



1. A tank mountable on a rear drive unit of a tractor with a mounting bracket, said drive unit having rear drive wheels comprising: a one-piece body of plastic material reinforced with fibers having a chamber for storing liquid, said body comprising a bottom wall having a front transverse portion, a rear transverse portion, and a plurality of first ribs projected upwardly into the chamber, each first rib extended from the front portion to the rear portion of the bottom wall, each first rib having a bead of foamed plastic covered with plastic material, a front wall joined to the front transverse portion, a rear wall joined to the rear transverse portion, said front wall having a height greater than the height of the rear wall, side walls joined to the bottom wall and front and rear walls, a top wall joined to the front wall, rear wall, and side walls to cover the top of the body and close the top of the chamber, said top wall being generally flat and sloping downward and rearward from the front wall toward the rear wall, said top wall being made of plastic material reinforced with fibers and having a plurality of laterally spaced second ribs projected downwardly into the chamber, each second rib extended from the front wall to the rear wall, each second rib having a bead of foamed plastic covered with plastic material, a plurality of upright baffle plates located in the chamber, each plate extended from the front wall to the rear wall and engageable with the bottom wall and top wall, means mounted on the top wall providing an inlet passage open to the chamber, said bottom wall and rear wall having central sections providing a downwardly directed well, second means mounted on the bottom wall providing an outlet

passage in the lower portion of the well open to the chamber, and means mounted on the rear wall for receiving liquid and discharging liquid into the tank chamber, said means mounted on the rear wall including tubular means located in the chamber for carrying liquid toward the end walls and discharging liquid to the end sections of the chamber.

4,232,875
SKI POLE GRIP WITH SELF HINGE FOR IMPROVED FORWARD REACH
Garry W. Klees, 9130 SE. 72nd Pl., Mercer Island, Wash. 98040
Filed Jan. 29, 1979, Ser. No. 7,046
Int. Cl.[3] A63C *11/22*
U.S. Cl. 280—822 8 Claims



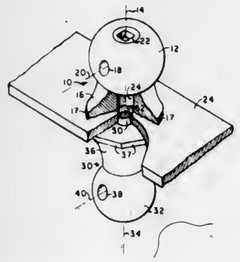
1. A ski pole grip axially engaging the upper portion of a ski pole, said grip having a length in excess of the width of the user's hand, said grip comprising:
an upper enlarged head portion;
a body member adapted to be grasped by the user; and,
a hand encircling loop means flexibly attached at one end thereof to said body adjacent said enlarged portion and depending downwardly therefrom, one portion thereof lying adjacent and substantially parallel to said body and being progressively thickened toward the bottom thereof to increase the rigidity of said one portion and support the heel of the user's hand, said hand encircling loop means including a second portion extending upwardly across the back of the user's hand to a distal end positioned adjacent but not connected to said enlarged portion of said body, said loop being flexible, resilient and movable away from said enlarged portion so as to release from user's hand, whereby axial forces are transmitted to the heel of the user's hand.

4,232,876
GANG PLOW HITCH
John S. Burres, Box 375, Condon, Oreg. 97823
Filed Feb. 8, 1979, Ser. No. 10,594
Int. Cl.[3] B62D *53/00*
U.S. Cl. 280—412 5 Claims



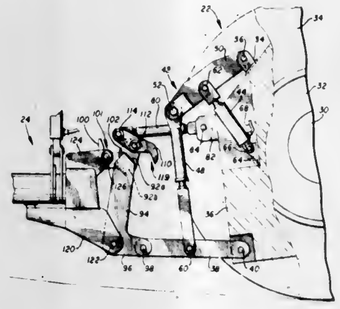
1. A gang plow hitch for at least one pair of multiple bottom gang plows of the type including forward transverse mounting beams, said plow hitch including a longitudinal beam having front and rear ends, said front end being adapted for universal connection to a draft vehicle, the rear end of said longitudinal beam including a horizontal transverse header beam supported therefrom for angular displacement about a horizontal axis transverse to said longitudinal beam and generally paralleling said header beam, one end of said transverse header beam projecting outwardly to one side of said longitudinal beam and including longitudinally spaced anchor means for pivotally attaching the forward transverse mounting beam of a forward gang plow thereto for angular displacement about a first axis paralleling said transverse header beam, a main horizontal diagonal beam pivotally anchored at its forward end to said one end of said header beam and inclined toward its rear end outwardly beyond the other side of said longitudinal beam, an elongated horizontal adjustable length adjustment beam, anchor means pivotally anchoring one end of said adjustment beam relative to said header beam for angular displacement relative thereto about an upstanding axis spaced intermediate the opposite ends of said header beam, attaching means attaching the other end of said adjustment beam to said diagonal beam for adjustment therealong to maintain said adjustment beam in position substantially paralleling the direction of intended movement of said hitch throughout limited angular adjustment of said diagonal beam relative to said header beam, an elongated longitudinal short couple beam, means universally coupling the forward end of said short couple beam to said rear end of said diagonal beam, and the rear end of said short couple beam including mounting means for rigidly mounting the forward transverse mounting beam of a rear gang plow to said short couple beam rear end, said diagonal beam being of a length in relation to the angulation thereof relative to said header beam to properly laterally space the forward and rear gang plows operatively associated therewith said rear gang plow projecting laterally outwardly of the other side of said longitudinal beam.

4,232,877
DUAL BALL TOWING HITCH
Russell E. Milton, 712 E. 4th St., Alturas, Calif. 96101
Filed Apr. 11, 1979, Ser. No. 29,023
Int. Cl.[3] B62D *53/00*
U.S. Cl. 280—415 A 5 Claims



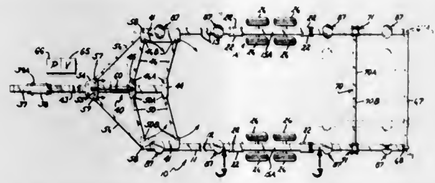
1. A trailer hitch comprising
a first ball member comprising a first spheroid portion having a vertical axis of rotation,
a first base support portion connected to said first spheroid portion, said first base support portion having an axis of rotation coincident with said vertical axis of rotation of said first spheroid portion,
means defining a first hole in said first ball member, said first hole intersecting said vertical axis of rotation of said first spheroid portion, with the axis of rotation of said first hole perpendicular to said vertical axis of rotation of said first spheroid portion,
means defining a second hole projecting through said first base support portion a part of the distance through said first ball member, the axis of rotation of said second hole being coincident with the vertical axis of rotation of said first spheroid portion,
a second ball member comprising a second spheroid portion having a vertical axis of rotation,
a second base support portion connected to said second spheroid portion, said second base support portion having an axis of rotation coincident with said vertical axis of rotation of said second spheroid portion,
means defining a third hole in said second ball member, said third hole intersecting said vertical axis of rotation of said second spheroid portion, with the axis of rotation of said third hole perpendicular to said vertical axis of rotation of said second spheroid portion,
a towbar attached to a vehicle, and
means for connecting said first ball member to said second ball member and to said towbar, with said vertical axis of said first spheroid portion coincident with the vertical axis of rotation of said second spheroid portion.

4,232,878
APPARATUS FOR COUPLING A TRACTOR AND FARM IMPLEMENT
George E. Moore, Jr., 1906 Field, San Angelo, Tex. 76902
Filed Jun. 14, 1978, Ser. No. 915,455
Int. Cl.[3] A01B *59/043*
U.S. Cl. 280—461 A 8 Claims



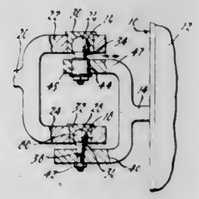
8. Apparatus for coupling a tractor to a trailing implement comprising:
a pair of lower trailing arms extending from the tractor toward the implement,
an upper arm extending from the tractor toward the implement,
attachment means for attaching the ends of said lower arms to the implement,
a coupling arm rotatably attached at one end to said upper arm and rotatably attached at an intermediate point to the farm implement at a point spaced from the point of connection of said lower trailing arms to the implement, and
a limiter bar attached to the implement adjacent the point of connection of said coupling arm to the farm implement at the intermediate point on said coupling arm, and wherein said coupling arm extends beyond the connection of said coupling arm to the implement such that the extension of said coupling arm rotates toward said limiter bar as the implement rotates downwardly about the connection to the lower trailing arms.

4,232,879
EQUIPMENT TRAILER
Phillip E. Boxrud, Route 3, Madelia, Minn. 56062
Filed Feb. 9, 1979, Ser. No. 10,624
Int. Cl.[3] B60P *3/10*; B62D *53/06*
U.S. Cl. 280—656 12 Claims



1. An equipment trailer comprising a pair of longitudinally extending frame members, means joining said frame members at a leading end thereof adapted to be connected to a prime mover, said means joining including a hitch pole assembly, link means mounted between said hitch pole assembly and each of said longitudinally extending frame members adjacent the leading ends thereof, including portions on the longitudinally extending frame members movably mounted relative to said hitch pole assembly, power means to move said movably mounted portions relative to the hitch pole to cause said longitudinally extending frame members to move in direction toward or away from each other under control of said power means to vary the spacing between said longitudinally extending frame members, at least one removable cross beam positioned rearwardly of said link means, each cross beam comprising telescoping first and second portions spanning the width between said longitudinally extending frame members, and support means at opposite ends of said cross beam to support the cross beam on the longitudinally extending frame members, said support means on at least one end of the cross beam comprising a hanger means including a latch member which fits over the top of the associated longitudinally extending frame member and having a portion passing to the outside of the associated longitudinally extending frame member, and means between at least one end of the cross beam and the hanger means to support the respective cross beam against lower side portions of the associated longitudinally extending frame member and adjacent the exterior side of said associated longitudinally extending frame member.

4,232,880
ADJUSTING SLEEVE FOR A WHEEL ASSEMBLY
Carroll D. Dickerson, New Hudson, and Robert W. Stevens, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Apr. 9, 1979, Ser. No. 28,624
Int. Cl.[3] B62D *17/00*
U.S. Cl. 280—661 2 Claims



1. A vehicle wheel mounting assembly comprising;
an axle with lower and upper vertically spaced control arms;
a spindle mounting a wheel assembly;
said spindle having a lower and upper arm vertically spaced and pivotably connected to said lower and upper control arms;
a first ball joint mounted in said upper control arm;
a second ball joint mounted in said lower control arm;
a stud portion of one of said ball joints passing through an aperture in one of said arms of said spindle and rigidly secured thereto;
a sleeve mounted in a cylindrical aperture in the other of said arms of said spindle;
said sleeve having a substantially cylindrical outer surface adapted to rotate about in said cylindrical aperture of said spindle;
said sleeve having an axially extending eccentric hole therethrough which has an axis parallel and offset with respect to the axis of the cylindrical outer surface;
said hole having a tapered section away from said second ball joint to receive a tapered section of a ball stud of said second ball joint;
said sleeve having an outer integral collar adjacent one end

and radially extending outward beyond said cylindrical outer surface forming a shoulder which is axially spaced from said spindle arm;

said sleeve having a slot axially extending from the top to the bottom of said sleeve and radially extending from said eccentric hole to said outer surface and through said outer collar allowing radial expansion of said sleeve when said tapered stud is pressed therein to press fit and frictionally lock said outer surface against a side of said cylindrical aperture in said spindle and said stud against sides of said hole in said sleeve to rigidly secure said stud to said spindle arm at a desired position.

4,232,881

SUSPENSION ARRANGEMENT FOR MOTOR VEHICLES

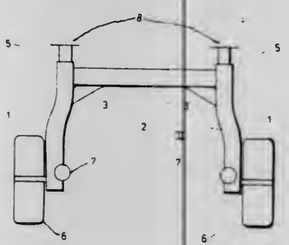
Hans J. Kölbel, Wolfsburg, and Harald Andres, Velpke, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,830

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2735939

Int. Cl.³ B60G *11/18*

U.S. Cl. 280—721 **2 Claims**



1. In a vehicle suspension having wheels mounted to bending and torsion-resistant longitudinal control arms and a bending resistant, but torsion yielding cross-strut with a generally U-shaped cross section mounted between said control arms, and gusset plates between said cross-strut and said control arms, the improvement wherein there is provided a transverse corrugation on said cross-strut in the vicinity of the end of said gusset plate to influence the stress gradient of said cross-strut in said vicinity, which is the point of largest discontinuity in rigidity of said cross-strut, so that said cross-strut is strengthened overall.

4,232,882

MOTORIZED PASSIVE SEAT BELT SYSTEM

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1977, Ser. No. 834,936

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **12 Claims**

1. In a passive seat belt system in a vehicle including a door and a seat belt adapted to be positioned about an occupant in a seat, one end of said belt being connected to a retractor and the other end of said belt being mounted to said vehicle, the improvement comprising:

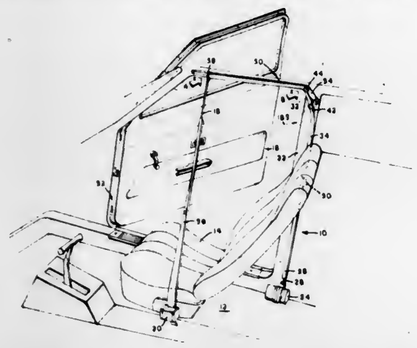
(a) rod means having one portion connected at said seat belt;

(b) hook means connected to said rod means and engageable with said belt;

(c) an electric motor to which one end of said rod means is drivingly connected;

(d) switch means in said vehicle actuated in response to opening and closing of said door, said switch means being in electrical connection with said motor so that when said switch means is actuated, said motor is actuated; and

(e) said rod means being extended from said motor and being moved to a forward position when said door is opened to thereby move said seat belt to a forward position permitting free ingress to and egress from said vehicle, with said hook means supporting a portion of said belt, and said rod means being moved by said motor to a rearward position when said door is closed to thereby move said seat belt to



a rearward occupant-engaging position, said hook means being movable into supporting engagement with said belt upon movement of said rod means to its forward position upon opening of said door and said hook means being movable out of supporting engagement with said belt upon movement of said rod means to its rearward position upon closing of said door.

4,232,883

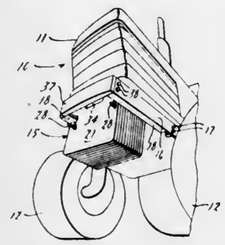
COUNTERWEIGHT ASSEMBLY FOR A VEHICLE

Clarence G. Bourgeous, Mt. Clemens, and Oliver G. Miller, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 19, 1979, Ser. No. 21,938

Int. Cl.³ B62D *37/00*; B60K *5/02*

U.S. Cl. 280—759 **3 Claims**



1. A counterweight assembly for a vehicle having its engine supported on a chassis with a substantial portion of the engine overhanging one end of the chassis;

the counterweight assembly comprising an open-end support frame anchored to the chassis and extending longitudinally from the latter beneath the overhang of the engine;

the support frame having parallel side rails located on opposite sides of the chassis;

and each side rail at the bottom thereof having an inwardly turned flange terminating in an upwardly inclined track portion;

a plurality of weights suspended from the support frame;

each weight having a slot opening inwardly from each vertical edge to receive a rail flange;

each slot terminating in a wall portion contoured for substantially tangential contact with an edge of the inclined track portion of the side rail flange received in the slot;

the inclined track portions on the support frame flanges and the contoured wall portion of each slot in the weights co-acting to cause self-alignment of the weights with each other upon insertion of the weights into the support frame through the open end thereof and to minimize sliding resistance as the weights are moved in the direction of the chassis toward locating stop means;

and securing means locking the weights in place on the support frame.

4,232,884

LIGHTWEIGHT TRAILER BED CONSTRUCTION

Merl DeWitt, 38 Carr St., Lakewood, Colo. 80226

Filed Aug. 24, 1978, Ser. No. 936,242

Int. Cl.² B62D *21/00*

U.S. Cl. 280—785 **6 Claims**



1. A lattice frame for a lightweight trailer comprising:

(a) at least two central channel members extending from end to end of the trailer, each said channel being formed of relatively lightweight metal plate with its longitudinal edges bent at approximately 90° providing flanges and a connecting web to form a channel;

(b) a plurality of central Z-shaped members of substantially the same width as said central channels spaced along said channels and secured thereto, each Z-shaped member formed of relatively thin metal plate with opposed edges bent in opposite directions forming flanges at an acute angle of less than 90° to the plane of the web between said flanges and an angle member secured at each end of the web secured to the web of said central channels;

(c) a plurality of outer Z-shaped members having opposed flanges at an acute angle to a web therebetween and having flanges on the ends of the web secured to said channels on the opposite side of said central Z-shaped members and extending outwardly and normally to said channels, said Z-shaped members being formed of relatively thin metal plate with opposed edges bent in opposite directions forming flanges at less than 90° to the plane of the web between said flanges;

(d) outside channels being secured to the outside ends of said outer Z-shaped members, each said outside channel being formed of relatively thin metal plate having its longitudinal edges bent in the same direction at 90° to the web between said flanges;

(e) a pair of end plates having top and bottom flanges formed by bending the top and bottom edges thereof at about 90°, said end plate being secured to the ends of said central channel members and said outside channels to complete the lattice frame;

(f) the top flanges of all the elements being in planar alignment for the attachment of decking thereto.

4,232,885

PASSIVE SEATBELT SYSTEM

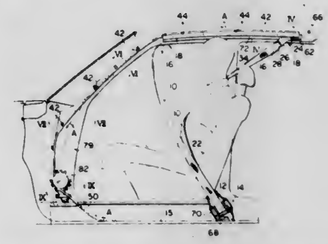
Ichiro Suzuki, Nagoya; Masanao Motonami, and Hisashi Ogawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 6, 1979, Ser. No. 17,943

Claims priority, application Japan, Aug. 16, 1978, 53/112188

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **8 Claims**



1. A passive seatbelt device which automatically fastens a restrictive belt about a seated passenger and releases it when the passenger gets in or out of the vehicle comprising:

a guide rail fastened to the roof side of a vehicle longitudinally along the body;

a movable truck, movable along the guide rail and to which is fastened an outer end of the passenger-restrictive belt;

a winding roller fastened at the center of the vehicle such that it winds up the inner end of said belt containing an emergency locking device which stops unwinding of the belt in a vehicular emergency;

a narrow belt fastened to one end of said truck;

a winding roller fastened onto a roof side of said vehicle rearwardly of said guide rail for winding up said narrow belt and containing means which stops the unwinding of the narrow belt in a vehicular emergency; and

means for moving said truck towards the front of the vehicle when the passenger gets in or out of the vehicle, said means comprising a sliding block which engages with the truck from the rear of the vehicle whereby the truck may move separately from the sliding block towards the front of the vehicle and a means for moving said sliding block.

4,232,886

TENSIONING DEVICE FOR SEAT BELT

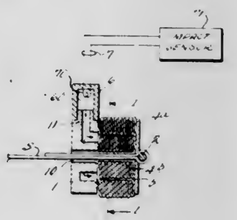
Noboru Tsuge, Kariya; Satosi Kuwakado, Aichi; Toshihiro Takei, and Toshiaki Shimogawa, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 13, 1979, Ser. No. 20,045

Claims priority, application Japan, Mar. 21, 1978, 53-32012

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **9 Claims**



1. A tensioning device for a vehicle seat belt comprising:

a base member,

a movable plate member,

flexible bellow means, including at least one bellow shaped cylindrical body, connected between said base member and said plate member to form a sealed chamber therebetween, said bellow means being normally in a contracted state,

means for connecting one end of said seat belt through said base member to said plate member, and

gas supplying means for releasing high pressure gas into said sealed chamber to elongate said bellow means by said high gas pressure for moving said plate member in a direction away from said base member to tension said seat belt at an urgent time.

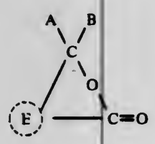
4,232,887

LACTONE COMPOUNDS CONTAINING AN INDOLIZINE RADICAL

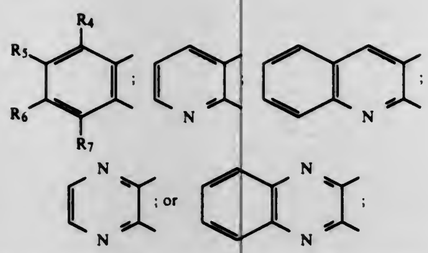
William J. Becker; Sheldon Farber, and Troy E. Hoover, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 5, 1979, Ser. No. 17,764
Int. Cl.³ B01M 5/16
U.S. Cl. 282—27.5 **83 Claims**

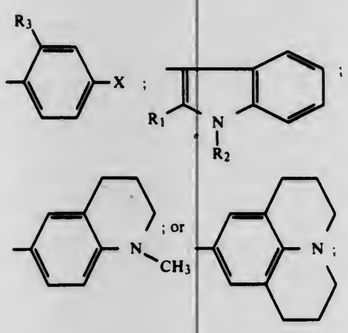
1. A compound represented by the formula:



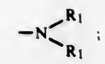
wherein E is:



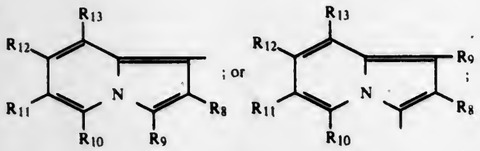
R_4, R_5, R_6 and R_7 are: hydrogen, chlorine or dialkylamino;
A is:



X is:



or morpholino;
R_1 and R_2 are: hydrogen, alkyl, phenyl or methyl phenyl;
R_3 is: hydrogen, alkoxy or chlorine;
B is:



R_8 is: phenyl, phenyl which is substituted by methoxy, phenyl, chloro or dimethylamino, naphthyl, pyridyl or alkyl;
R_9 is: hydrogen, alkyl or phenyl; and
R_{10}, R_{11}, R_{12} and R_{13} are: hydrogen or alkyl.

81. A pressure-sensitive record unit comprising:

(a) mark-forming components comprising at least one chromogenic compound according to claim 1 and an electron-accepting Lewis acid material reactive with the chromogenic compound;

(b) support web or sheet material; and

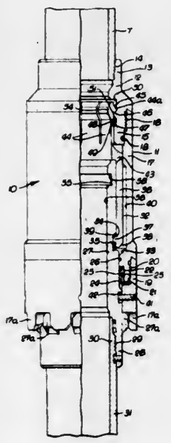
(c) a releasable liquid solvent for the mark-forming components arranged in continguous juxtaposition with the mark-forming components and supported by the sheet material, wherein the mark-forming components upon pressure release of the liquid solvent are brought into reactive contact in the released solvent.

4,232,888

WIRELINE RELEASABLE SEAL CONNECTOR FOR WELLPIPE STRINGS

Amareswar Amancharla, League City, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 19, 1978, Ser. No. 916,719
Int. Cl.³ E21B 17/046
U.S. Cl. 285—18 **17 Claims**



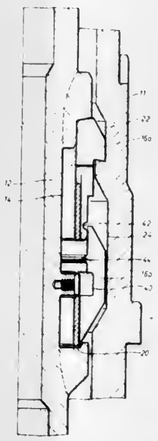
1. A releasable connector for use in a well pipe string in a well bore comprising: an inner tubular body having lower means for connection with a downwardly extending pipe; an outer tubular body telescopically engaged with said inner body and having upper means for connection with an upwardly extending pipe; releasable means for releasably securing said bodies to each other; first latch means releasably secured to said outer body; second latch means connected to said first latch means and releasably secured to said inner body; said releasable means being released in response to initial longitudinal movement of said outer body upwardly of said inner body to release said outer body from said first latch means; first holding means on said outer body extending under and engaging said second latch means to hold said second latch means secured to said inner body; downward movement of said outer body relative to said first and second latch means disengaging said outer body from said second latch means and reconnecting said first latch means to said outer body to permit release of said second latch means from said inner body and allow said outer body to be elevated from said inner body.

4,232,889

RECOCKABLE WELL HANGER

Samuel W. Putch, Houston, Tex., assignor to Norman A. Nelson, Houston, Tex., a part interest

Filed Jun. 6, 1978, Ser. No. 913,151
Claims priority, application United Kingdom, Jun. 16, 1977, 25322/77
Int. Cl.³ F16L 35/00
U.S. Cl. 285—141 **1 Claim**



1. A pipe hanger assembly for vertically suspending an inner pipe from an outer pipe having a substantially constant diameter above a locking notch and a locating notch which pipe hanger assembly comprises:

(a) an elongated tubular hanger body for passing through said outer pipe connected to said inner pipe, defining an annular recess in its outer peripheral surface, having a stop shoulder at the upper end and at the lower end of said annular recess, having a locking surface in the upper portion of said annular recess, and having a holding shoulder located intermediate to the ends of said annular recess;

(b) a resiliently expandable and contractable cylindrical upper locking ring slideably positioned about said hanger body in the hanger body annular recess, said upper locking ring having a tapered shoulder at the top thereof for contacting said stop shoulder at the upper end of said hanger body annular recess, having a support surface for engaging said outer pipe locking notch, and having a chamfered outer top edge for disengaging from said locking notch and having an upper inner periphery for engaging said hanger body locking surface;

(c) a resiliently expandable and contractable cylindrical lower locking ring having a recess in its internal peripheral surface, and having chamfered top and bottom ends for engaging and disengaging said outer pipe locating notch, wherein said lower locking ring is mounted about said hanger body within said annular recess such that said hanger body holding shoulder engages said lower ring recess allowing lower locking ring transverse movement but not longitudinal movement and such that the upper portion of said lower ring is telescopically mounted about the lower portion of said upper ring; and

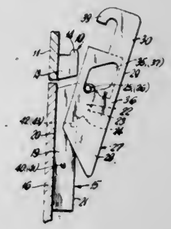
(d) detent means comprising a chamfered male flange transversely arrayed within the upper inner periphery of said lower ring and a chamfered female groove, for receiving said chamfered male flange, transversely arrayed about the lower outer periphery of said upper locking ring, for maintaining said upper locking ring and said lower locking ring compressed and in telescoped relationship while passing said pipe hanger assembly upwardly or downwardly within said outer pipe above said locking and locating notches, and for maintaining said upper locking ring and said lower locking ring expanded and in disengaged relationship upon said lower locking ring encountering said locating notch.

4,232,890

FASTENER WITH CAMMING HANDLE

Cuyler Hoen, Rennesselaer, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.

Filed Mar. 9, 1979, Ser. No. 19,280
Int. Cl.³ E05C 5/02
U.S. Cl. 292—114 **9 Claims**



1. A fastener for removably attaching a first panel to a second panel comprising

a strike member adapted to be secured to said first panel and having a protrusion means;

a plastic resin fastener body member having a body portion with an outer area to be secured to said second panel and an inner area opposite said outer area and having a raised portion having a slanting cam area merging thereto and a cut-back area;

a plastic resin handle member having a gripping portion with an inner area which lies against said fastener body member inner area upon closure of the fastener, a central portion forming a cavity having a cam surface joining its rear wall and its said inner area, said cam surface riding on said cam area and being removably secured in said cut-back upon closure of said fastener, and an extension portion having a hook-like member which removably catches said strike member protrusion means for closing said fastener; and

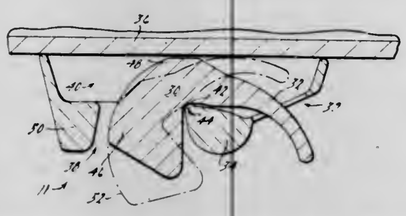
means connecting said handle member and said fastener body member to permit rotational movement of said handle member and its movement toward and away from said strike member.

4,232,891

DOOR HARDWARE WITH POSITIVE TORQUE

Stephen J. Ringe, Detroit, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed May 30, 1978, Ser. No. 910,493
Int. Cl.³ E05C 3/04
U.S. Cl. 292—218 **5 Claims**



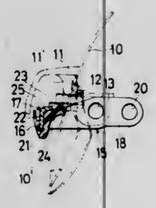
1. A door for a shipping container comprising; a hinge pivotally supporting said door at one edge of an opening to said container, a cam rod supported for rotation on and relative to said door at an edge of the door opposite to the hinged edge thereof, a cam finger having a free end and a supported end mounted on one end of said rod, a housing secured to said container having a cam surface engagable by said cam finger for camming the door to a closed position, means for rotating said rod, and cam finger relative to said housing, said cam finger having a first substantially planar surface when said door is in the closed condition, the point of contact between the cam surface on said housing and said planar surface of said cam finger lying in a plane which is spaced to the opposite side of the axis of rotation of said cam rod from the projecting end of said finger, whereby the vector of the reaction force of said cam surface on said cam finger results in a moment on said rod in a latching direction due to an opening force on said door independent of movement of said cam rod and cam finger in a direction parallel to the plane of said door opening and relative to the cam surface on said housing.

4,232,892

OUTSIDE DOOR HANDLE ASSEMBLY FOR VEHICLES

Nobuyuki Kuki, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 20, 1978, Ser. No. 898,041
Claims priority, application Japan, Mar. 31, 1977, 52-39902; Mar. 31, 1977, 52-39904
Int. Cl.² E05C 13/00
U.S. Cl. 292—347 **4 Claims**



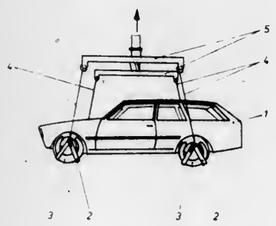
1. An outside door handle assembly for vehicles comprising, a handle case having means for securing said case to an outer panel of a vehicle door and a handle member including a handle operating portion made of plastics and an arm portion made of metal connected to said handle operating portion and rotatably supported on said handle case, said handle operating portion of said handle member being provided with a groove and boss means and said arm portion of said handle member being provided with two leg portions rotatably supported to said handle case, a bent portion having a connection portion inserted into said groove of said handle operating portion and a securing portion for receiving and securing said boss means of said handle operating portion.

4,232,893

DEVICE FOR GRIPPING TIRED WHEELS OF A VEHICLE

Joachim Kijewski, Bad Oeynhausen-Rehme, Fed. Rep. of Germany, assignor to Auto-Weber GmbH & Co. KG, Minden, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,969
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733406
Int. Cl.³ B66C 1/20
U.S. Cl. 294—82 AH **10 Claims**



1. A device for gripping tired wheels of a vehicle comprising, for each wheel to be gripped, a pair of arms articulated together at one end, a suspension point provided at said articulated ends of said arms, a gripping device located at the other end of each of said arms for engagement with the tread of a tire on each axial side of their ground engagement portions, and each said gripping device including a pair of gripping limbs disposed respectively on opposite sides of the tire and movable towards and away from each other for gripping engagement with opposite sidewalls of the tire and disengagement therefrom.

4,232,894

SELECTIVELY RELEASABLE OVERSHOT AND PULL TOOL

William T. Taylor, P.O. Box 309, Warren, Tex. 77664

Filed Aug. 2, 1979, Ser. No. 62,912
Int. Cl.³ E21B 31/12
U.S. Cl. 294—86.21 **18 Claims**

1. A tool used to retrieve an article in a well bore, comprising:

a first assembly adapted to be connected to apparatus extending down in to the bore, said first assembly including:

a pin extending radially of the bore;

a shoulder for butting against the article to limit movement of said first assembly toward the article; and

caged fingers with each finger having an end movable to a position for engaging the article;

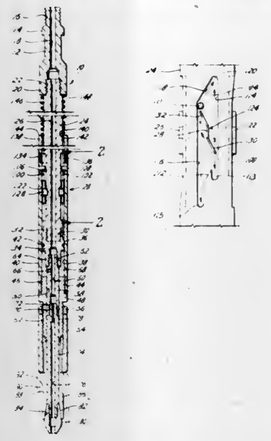
a second assembly movably mounted with said first assembly for moving the fingers into the engaging position, said second assembly including:

a body having a cavity with two grooves of unequal length extending axially of the bore, the pin of said first assembly being disposed within the cavity for moving within the grooves;

a spring mounted with the body for moving the pin from alignment with the shorter groove to alignment with the longer groove when said second assembly is moved relative to the first assembly;

an annular shoulder sloping radially of the well bore for moving the ends of the fingers into the engaging position as the pin moves in the longer groove; and

means mounted with said first assembly for urging said second assembly axially of the well bore, said urging means moving the annular shoulder of said second assembly toward the caged fingers of said first assembly for moving each end of the fingers radially into the engaging position after the shoulder on said first assembly limits its movement toward the article.

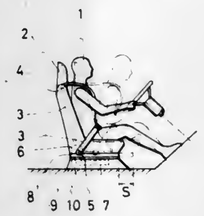


4,232,895

IMPACT ABSORBING DEVICE FOR PROTECTING VEHICLE'S OCCUPANT FROM IMPACT CAUSED BY COLLISION

Komaki Yoshio, Hadano; Fukuda Shigehisa; Fukuda Tsuguhiro, both of Uenomuro; Nakao Noriaki, Mito; Suzuki Katsuhide, and Ishizuka Matsuo, both of Yatabe, all of Japan, assignors to Japan Automobile Research Institute, Inc., Japan

Filed Jul. 11, 1977, Ser. No. 814,615
Int. Cl.² B60N 01/02
U.S. Cl. 296—65 A **6 Claims**



1. In a vehicle seat structure including a seat mounting having a first portion for securing to the vehicle, and a second portion to which a seat may be secured, said second portion being relatively movable with respect to said first portion along the direction of movement of the vehicle, the improvement which comprises:

(i) said second portion is engaged with said first portion for said relative movement so as to be guided thereby along the direction of movement

(ii) a plastically deformable deformation member is secured to one of said first and second seat

(iii) die means are secured to the other of said first and second seat mounting portions,

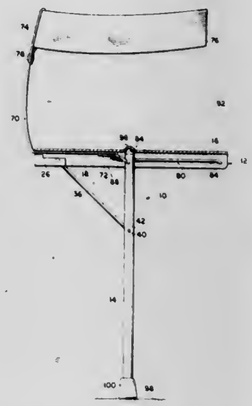
said deformation member and said die means being positioned for engagement one with the other such that, when said second portion moves with respect to said first portion, said die means progressively deforms said deformation member for the absorbtion of kinetic energy resulting from deceleration of the seat structure.

4,232,896

PORTABLE AND COLLAPSIBLE SEAT

Lloyd Caldwell, Choteau, Okla., assignor to Lloyd Caldwell, Choteau, Okla.

Filed Aug. 6, 1979, Ser. No. 63,990
Int. Cl.³ A47C 1/00
U.S. Cl. 297—4 **4 Claims**



1. A portable and collapsible seat adapted to be suspended from the belt of a user comprising a substantially flat and elongated base in the shape of a rectangle formed by a pair of relatively long parallel side edges connected at their ends to a pair of relatively short parallel end edges perpendicular to the long edges, a pair of elongated flanges extending outwardly from one side of said base at right angles thereto and along the long side edges thereof, a leg extending from a first end thereof to a second end thereof and having a length greater than the length of said base, a V-shaped link having a flattened portion adjacent its center and being curved at its ends, the flattened portion of said link being received in a hole said leg intermediate the ends thereof, the curved ends of said link being received in openings in said elongated flanges adjacent one end of said base, said flanges being provided with extensions at said one end of said base being bent inwardly away from said one end and towards the longitudinal center of said base to provide a clamp for the first end of said leg when said leg is positioned to lie against said base, a clip pivotally connected to said leg adjacent said second end of said leg, said clip having a pair of arms extending outwardly at right angles to said leg on opposite sides thereof and for a distance slightly less than the width of said base, a flexible strap having a width slightly less than the width of said base and having one end connected to the arms of said clip, said belt extending from said one end thereof along the surface of said base between the said leg and said base and terminating at an end opposite from one said end thereof in a loop adapted to be received on said belt of said user, said clip and said one end of said strap lying closely adjacent the end of said base opposite from said one end thereof when said leg is positioned to lie against said base, a pair of flat strips extending inwardly towards each other at right angles to said flanges and overlying said strap in parallel relation to said base so as to form a track for said clip and said one end of said belt when said leg is pivoted outwardly away from said base, whereby, said first end of said leg is first pivoted away from said one end of said base and out of said clamp and, whereby subsequent movement of said strap and said clip in a direction from the opposite end of said base towards said one end thereof will cause said leg to pivot around said link relative to said base until said leg is substantially perpendicular to said base.

4,232,897

LIE BACK BUGGY

Owen F. Maclaren, deceased, late of Barby, England; by William L. Barber, executor, Rugby, and by Marie I. Maclaren, executor, Barby, both of England, assignors to Andrews Maclaren Ltd., England

Filed Jul. 6, 1978, Ser. No. 922,439
Claims priority, application United Kingdom, Jul. 7, 1977, 28599/77; Feb. 17, 1978, 6424/78; Aug. 26, 1978, 35902/78
Int. Cl.³ A47C 4/30
U.S. Cl. 297—45 7 Claims



1. A chair frame of elongate rigid members which are interpivoted and foldable into a compact bundle in which the rigid members extend substantially parallel to each other, the chair frame comprising:

(a) two base members which are pivotally interconnected to form a laterally collapsible X-frame in which the opposite ends of the two base members provide front and back corners of the X-frame;

(b) two back members which are disposed on coplanar axes and respectively extend upwardly from pivotal connections at the back corner of the X-frame;

(c) two lower brace members respectively pivoted, at their lower ends, to the front corners of the X-frame;

(d) two upper brace members respectively pivoted, at their upper ends, to the upper ends of the back members;

(e) two knuckle joints respectively connecting the two lower brace members to the two upper brace members so as to prevent folding of the back members towards the X-frame when the chair frame is extended with the lower brace members respectively extending substantially colinearly with the upper brace members and the front or rear corners of the X-frame are held apart, but to allow the knuckle joints to move towards the back corners of the X-frame, thus permitting folding of the back members towards the X-frame when the back corners of the X-frame are allowed to move towards each other;

(f) two seat support members respectively pivoted to the chair frame at or adjacent the back corners of the X-frame and respectively pivoted to the lower brace members between the knuckle joints and the front corners of the X-frame;

(g) two upwardly extending back rest members which are disposed on coplanar axes and form part of a laterally collapsible back rest, respectively supported on the two seat support members and respectively mounted for pivotal movement so that the upper ends of the back rest members are movable between upper and lower positions;

(h) a laterally collapsible bracing frame which can be locked to hold the back corners of the X-frame apart and is located adjacent the X-frame so that the back rest members can be moved between their upper and lower positions without being obstructed by the collapsible bracing frame;

(i) the laterally collapsible bracing frame comprising two locking struts interconnected by a pivot and respectively pivotally connected at opposite ends to the back corners of the X-frame, two link members, each such link member being supported on a respective first pivot at one end of the link at a fixed location on a respective back member, the fixed location being remote from the respective back corner of the X-frame and each such link member being pivotally connected, remote from the first pivot of the link member, to the pivotal connection of the two locking struts by a common member which forms with a locking strut, a link member and a back member a parallelogram linkage;

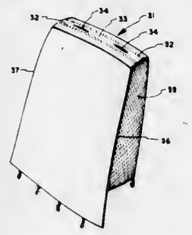
(j) the common member forming a slide arranged to limit movement of the parallelogram linkage, and pivotally connected to one end of two obliquely disposed supporting members having their other ends connected to respective back corners of the X-frame.

4,232,898

CONFORMABLE SEATBACK COVER

Alberta Bodrero, 276 W. 6th North, Logan, Utah 84321

Continuation of Ser. No. 806,178, Jun. 13, 1977, abandoned.
This application Aug. 17, 1978, Ser. No. 934,413
Int. Cl.³ A47C 31/10
U.S. Cl. 297—219 3 Claims



1. A conformable vehicle-type seatback cover adapted for easy installment and removal while retaining a professionally fitted appearance conforming to selected seatback configurations, comprising:

a. front and back panels of durable fabric having width dimensions approximating respective front and back surface widths of a selected seatback, said panels having sufficient length to extend from a base portion of said seatback to a top portion thereof with the front panel having an extended base portion to facilitate threading thereof under the seatback for attachment to the back panel;

b. narrow side panels having width dimensions moderately less than the corresponding thickness of said seatback and constructed of a stretchable fabric, said side panels being attached at lateral edges thereof to corresponding lateral edges of said respective front and back panels, said combination of front, back and side panels forming a covering structure substantially preconformed to said seatback configurations;

c. a top panel having dimensions sufficient to join the top edges of said front, back and side panels; and

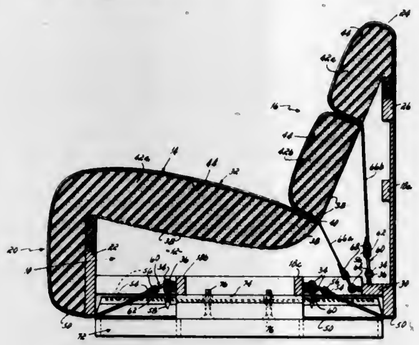
d. nonfraying, decorative, leather-like reinforcing material affixed over said top panel to inhibit fraying of the top panel when openings are made therein for accommodating headrests or similar seatback accessories and to enhance the appearance of the cover, the reinforcing material being stitched to the top panel with the stitching defining a central section in which openings may be made.

4,232,899

SEATING UNIT AND METHOD OF CONSTRUCTION

Lee H. Fister, Jr., Centerville, Ohio, assignor to August Incorporated, Centerville, Ohio

Filed Jun. 4, 1979, Ser. No. 45,194
Int. Cl.³ A47C 27/00
U.S. Cl. 297—229 6 Claims



1. A seating unit comprising,

a rigid chair frame having a front, a back, sides, and an occupant seating area having a seat and a back portion,

rigid transverse cross members extending between said sides and attached securely thereto,

a rigid back transverse member extending between said sides and attached securely thereto at the back of said frame,

webbing strips extending between said sides in the area of the occupant seating area,

a one-piece upholstery cover adapted to overlie the occupant seating area of said frame,

said cover having a top side with a seat and back portion for occupant seating overlying the seating area of the frame, said seat and back portion of said cover having an underside,

at least one fabric casing attached to the underside of said back portion, said cover having a bottom portion having side, front and back sides, each side having fabric pockets at their lowermost portion,

rigid rods in each fabric casing and in each fabric pocket,

clip means connected to said rigid rods at one end and having clips at the other end,

a plurality of eyebolts secured to said transverse cross members and to said back member, said clip means securing the rigid rods in the fabric casings to said eyebolts in the back member, and said clip means securing the rigid rods in the fabric pockets of the side, front and back sides of the bottom portion to the eyebolts in the transverse cross members.

4,232,900

CHAIR CONTROL

James A. Parker, Orange, Mass., assignor to Collier-Keyworth Company, Gardner, Mass.

Filed Mar. 26, 1979, Ser. No. 24,402
Int. Cl.² A47C 7/40
U.S. Cl. 297—305 5 Claims

1. In a chair having a base, a vertical post supported by said base, a frame rotatable with respect to said base, a chair seat mounted on said frame, and a chair back resiliently and pivotably connected to said frame for tilt and return of said chair back to a rest position,

a chair control for adjustment of said chair back rest position and adjustment of the degree of resiliency of said connection, said control comprising

a rod support unit comprising a spring brace mounted on said frame beneath said seat and providing an aperture,

a rod assembly connected to said chair back at a universal joint and having its remote end extending through said aperture, said rod assembly being slidable through said aperture,

a spring tension handwheel concentric with said rod assembly and disposed between said rod support unit and said universal joint, said spring tension handwheel being internally threaded for axially adjustable connection to said rod assembly,

said rod support unit further comprising a spring retainer on the face of said spring brace nearest said universal joint, said spring retainer having an aperture corresponding with said spring brace aperture,



a compression spring concentric with said rod assembly and confined between said spring retainer and said spring tension handwheel,

said chair control further comprising

rod assembly front travel stop means adjacent said rod assembly remote end and engageable with said rod support unit, and

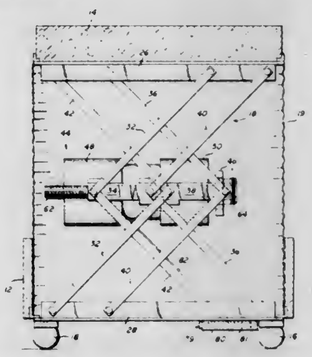
chair back rest position control means connected to said rod assembly for adjusting the distance between said front travel stop means and said universal joint.

4,232,901

ADJUSTABLE OTTOMAN

Elaine M. Harrington, 708 44th St., Des Moines, Iowa 50312, and Paul C. Meaning, 1624 E. 24th St., Des Moines, Iowa 50317

Filed Oct. 12, 1979, Ser. No. 84,316
Int. Cl.³ A47C 9/12, 25/00
U.S. Cl. 297—439 8 Claims



1. An adjustable foot rest comprising a base, elevating mechanism housed within said base, said elevating mechanism including an electric motor, a cushion supported on said elevating means and switch means for actuating said electric motor to raise and lower said cushion, said elevating mechanism comprising a pair of spaced apart lazy-tong assemblies and said electric motor being supported solely by a member extending between said spaced apart lazy-tong assemblies so that said

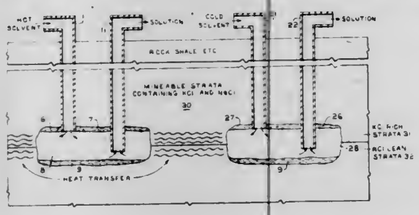
electrical motor is adapted to move both vertically and horizontally.

4,232,902

SOLUTION MINING WATER SOLUBLE SALTS AT HIGH TEMPERATURES

Ephraim A. Cuevas, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 9, 1979, Ser. No. 10,563
Int. Cl.[2] E21C *41/08*
U.S. Cl. 299—4 **26 Claims**



1. A method of mining a water soluble salt from a subterranean formation containing a water soluble salt deposit comprising:

(1) feeding into the deposit through a bore hole in communication therewith a first aqueous solvent at a temperature above the deposit temperature to heat the deposit substantially above its natural temperature and dissolve salt from the deposit;

(2) withdrawing from the deposit first solvent enriched in salt;

(3) feeding into the deposit through a bore hole in communication therewith a second aqueous solvent at a temperature lower than the temperature of the first solvent, thereby dissolving a substantially increased amount of salt in excess of the amount of salt that would be dissolved by the second solvent in the absence of the increased deposit temperature and thereby recapturing heat from the deposit by the second solvent; and

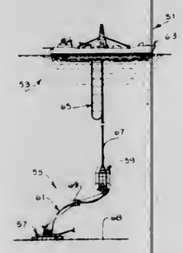
(4) withdrawing from the deposit the second solvent enriched in salt.

4,232,903

OCEAN MINING SYSTEM AND PROCESS

Conrad G. Welling, Atherton; Gordon H. Davenport; Guenter Reichert, both of San Jose; Charles M. Snyder, Saratoga; Milton C. Harrold, Ben Lomond; Salvatore H. Donze, Santa Clara, and Frank R. Larsen, Saratoga, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Dec. 28, 1978, Ser. No. 973,854
Int. Cl.[3] E02F *3/92, 3/94, 7/00*
U.S. Cl. 299—8 **99 Claims**



1. A method of mining manganese nodules from the ocean floor and lifting the nodules to a surface ship and comprising,

extending a relatively rigid pipe string downwardly from the surface ship until the lower end of the pipe string is positioned a relatively short distance above the ocean floor,

placing a self-propelled, maneuverable, miner vehicle having a nodule pick-up mechanism on the ocean floor,

connecting the miner vehicle to the lower end of the pipe string by a flexible linkage comprising power, data and control lines for the miner vehicle and which is long enough and flexible both longitudinally and laterally to permit the vehicle to operate longitudinally and laterally beneath the end of the pipe string within an area having a substantial lateral extent and within a boundary envelope determined by the flexible linkage,

sensing the location of the miner vehicle within the permitted area of operation.

viewing the topography of the ocean floor adjacent the vehicle,

indicating the location of the miner vehicle within the permitted area of operation and displaying the topgraphy of the ocean floor on indicator means located in the ship,

self-propelling and maneuvering the miner vehicle on the ocean floor,

actively controlling the speed and direction of the miner vehicle from a control center within the ship in response to the information indicated by the indicator means, and

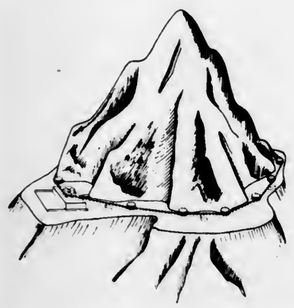
coordinating the movement of the ship with the movement of the vehicle to cause the ship and pipe string to follow the motion of the miner vehicle and to move the area of permitted operating along with and in the direction of movement of the miner vehicle as required to retain the miner vehicle in said boundary envelope.

4,232,904

METHOD AND APPARATUS FOR DEEP MINING USING CHAIN DRIVEN IN FIXED DIRECTION

Robert L. Hurd, 2063 Manor Dr., Lexington, Ky. 40502

Filed Feb. 21, 1979, Ser. No. 13,749
Int. Cl.[3] E21C *29/14, 41/04*
U.S. Cl. 299—18 **11 Claims**



1. The method of removing a first solid material from a second solid material when the first material is embedded in the second material in layers, said method comprising the steps of:

surrounding the portion of said first solid material which is to be removed by a driving chain having spaced therealong cutting surfaces,

rotating said driving chain and cutting surfaces around said first material in a fixed direction, and

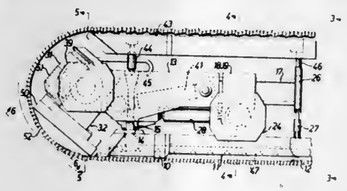
applying continuous outward pressure on said driving chain so as to maintain said cutting surfaces in contact with said first material at a location substantially opposite from the location from which said pressure is applied, said pressure being applied with a force sufficient to cause said cutting surfaces to dislodge said contacted first material.

4,232,905

TUNNELLING MACHINE

Helmut Dick, Spiez, Switzerland, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 30, 1979, Ser. No. 25,549
Claims priority, application United Kingdom, Apr. 4, 1978, 13172/78
Int. Cl.[3] E21D *9/10*
U.S. Cl. 299—31 **10 Claims**



1. A tunnelling machine comprising:

a frame (12, 13),

means (20–25, 35–40) for immobilizing the frame in the tunnel,

a swingable unit (31) carried by said frame to be swingable about a horizontal first axis (I) that is transverse to the machine and motor means (41) for swinging said swingable unit about said first axis (I),

said swingable unit comprising a housing (32), a head (50) rotatably mounted in the housing to be rotatable about a second axis (II) that is transverse to said first axis (I), motor means (51) for rotating the head, and a plurality of free rolling cutters (53–58) mounted on the head in a convex arrangement to form a convex front face of the head,

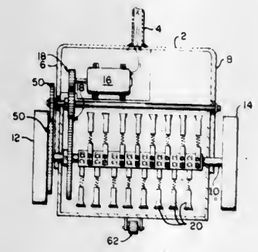
said second axis (II) passing said first axis (I) at a distance and on the trailing side with respect to the head so as to cause the cutters to cut both when they are on the leading side of the head and when they are on the trailing side of the head upon simultaneous rotation of the head and swinging of the swingable unit in a working swing stroke while the frame is fixed in the tunnel by said immobilizing means so as to hold the first axis (I) fixed.

4,232,906

MACHINE FOR STRIPPING SHINGLES

Dale A. Torbenson, Hensel, N. Dak. 58241

Filed Apr. 2, 1979, Ser. No. 26,331
Int. Cl.[3] E04D *15/00*
U.S. Cl. 299—39 **7 Claims**



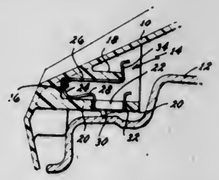
1. A machine for stripping shingles from a surface, said machine comprising a frame having a handle portion and first and second leg portions, an axle mounted on said leg portions and extending therebetween, a portion of said axle between said leg portions being rectangular in cross-section configuration, first and second wheels mounted on said axle, motor means mounted on said frame, drive means interconnecting said motor means and said axle, and cutter assemblies fixed to said axle, each of said cutter assemblies comprising a base block portion comprising a flat plate adjacent and fixed to a flat surface of said axle, a coil spring portion connected to said base portion and extending outwardly therefrom, and a cutter portion connected to said spring portion and extending outwardly therefrom, whereby operation of said motor causes rotation of said axle and thereby rotative movement of said cutter assemblies, said cutter assemblies being further caused to move radially in response to centrifugal and counterforces of and acting upon said coil spring portion.

4,232,907

VEHICLE WHEEL WITH WHEEL COVER AND RETAINING CLIP

Hans R. Beisch, Amherstburg, Canada, assignor to Norris Industries, Inc., Ypsilanti, Mich.

Continuation of Ser. No. 807,572, Jun. 17, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 31,376
Int. Cl.[3] B60B *7/00*
U.S. Cl. 301—37 R **40 Claims**



1. In combination for covering at least a portion of the outer face of a wheel, including,

a wheel cover including a plurality of recesses,

each recess being defined by at least a pair of oppositely disposed spaced wall portions on the wheel cover, each of the wall portions defining an interruption,

a plurality of spring clips each having a pair of resilient leg portions positioned within an individual one of the recesses and disposed against individual ones of the wall portions of such individual recess,

each spring clip normally having a spacing between the resilient leg portions greater than the spacing between the wall portions of each recess and the resilient leg portions of each spring clip, when positioned within each recess, being preloaded by the restraint of the wall portions, and

each spring clip additionally including a first flanged extension of a particular one of the leg portions outside of the associated recess, at a position engaging the interruption defined by a particular wall portion, to be constrained by the interruption,

the flanged extension providing an engagement with the wheel and a fastening of the wheel cover to the wheel, and

each spring clip additionally including a second flange at a position engaging the interruption in the other wall portion.

4,232,908

COMBINATION PUSH-PULL VALVE ASSEMBLY

George W. Stearns, Florissant, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed Feb. 7, 1978, Ser. No. 875,807
Int. Cl.[3] B60T *13/00*
U.S. Cl. 303—9 **28 Claims**

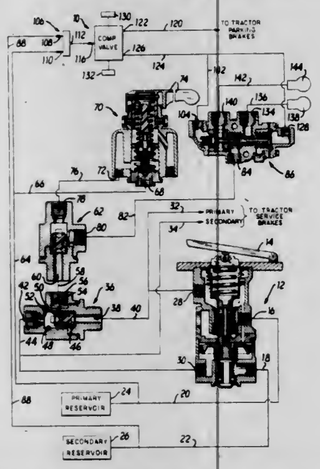
1. A combination control valve comprising:

(a) a body;

(b) an air inlet into said body;

(c) a first manual push-pull control valve in said body connected between said air inlet and a first outlet;

(d) said first manual push-pull valve having first and second selectable positions;
(e) first valve means in said first manual push-pull control valve for connecting air pressure from said air inlet to said first outlet when said first manual push-pull control valve is in its first position and for blocking the flow of air pressure from said air inlet to said first outlet when in its second position;
(f) said first valve means being further operative to vent air pressure from said first outlet when said first manual push-pull control valve is in its second position;
(g) a second manual push-pull control valve having first and second selectable positions in said body connected to a second outlet;
(h) an emergency valve connected to said air inlet;
(i) a first passage for admitting air pressure to said second manual push-pull control valve;
(j) a pressure-responsive control shuttle reciprocatably disposed in said body;
(k) a second passage for admitting air pressure to said control shuttle;
(l) resilient means for biasing said control shuttle into a first position;
(m) said control shuttle being operative when in its first



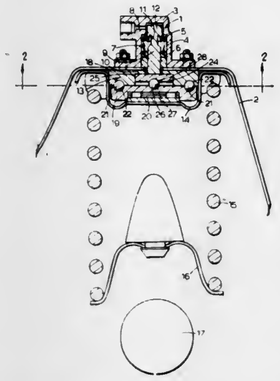
position to oppose said second manual push-pull control valve from being placed in its second position;
(n) a third passage connecting air pressure from said first outlet to said control shuttle;
(o) air pressure responsive means on said control shuttle responsive to air pressure exceeding a predetermined value to displace said control shuttle to a second position wherein it does not oppose said second manual push-pull control valve being in its second position;
(p) said emergency valve being displaceable from a first position to a second position by air pressure at said air inlet exceeding a second predetermined value;
(q) means on said emergency valve for blocking at least said second passage when said emergency valve is in its first position;
(r) said second passage being connected to said first outlet; and
(s) said second manual push-pull control valve having seal means for blocking said first passage and preventing the connection of air pressure to said second outlet and for venting air pressure at said second outlet when said second manual push-pull control valve is in its first position, and for providing air pressure communication between said first passage and said second outlet when said second manual push-pull control valve is in its second position.

4,232,909

VEHICLE LOAD SENSING ASSEMBLIES

Glyn P. R. Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed May 19, 1978, Ser. No. 907,583
Claims priority, application United Kingdom, May 19, 1977, 21204/77
Int. Cl.³ B60T 8/18
U.S. Cl. 303—22 R **6 Claims**



1. A vehicle load-sensing assembly for use with a vehicle fluid-pressure braking system comprising an input member subjected to a force in a road spring, a valve having a movable valve member for controlling the flow of fluid through said valve, and a thrust transmitting mechanism located between said input member and said valve member, wherein said thrust transmitting mechanism comprises a rotary operating plate acting on said input member, a relatively fixed reaction plate, camming means disposed between said operating plate and said reaction plate for translating axial movement of said input member into rotary movement of said operating plate and vice versa, and transmission means for transmitting rotary movement of said operating plate to said valve member to regulate the flow of fluid through said valve.

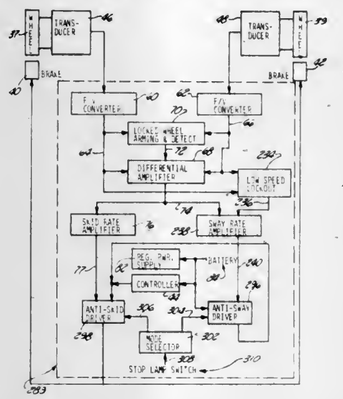
4,232,910

SYSTEMS AND METHODS FOR CONTROLLING TRAILER BRAKES AS A FUNCTION OF TRAILER WHEEL ROTATION

Robert C. Snyder, Country Club Hills, Ill., assignor to Motor Wheel Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 472,644, May 23, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,010
Int. Cl.² B60T 8/10
U.S. Cl. 303—96 **86 Claims**

61. In a brake control system for use in an articulated system including a towing vehicle and a towed vehicle such as a trailer or the like of the type having first and second nondriven wheel units disposed at respective opposite sides of said towed vehicle, each wheel unit having at least one wheel therein, first and second brake means operatively associated with at least one wheel in each wheel unit, respectively, and brake activating means adapted to be activated by an operator of a towing vehicle to apply said first and said second brake means, the combination comprising first and second means for generating respective first and second signals which vary proportionally to the angular velocity of at least one wheel in each of said wheel units, respectively, means for comparing said first and second signals to each other and providing a differential signal representing a difference between said first and second signals, and means operatively coupled to said brake activating means and responsive to said differential signal for simultaneously regulating brake application by said first and said second brake means at one wheel in each wheel unit proportionally to said differential signal such that a change in wheel speed differen-



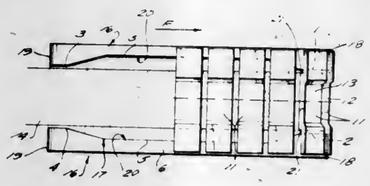
tial between one wheel in one unit and one wheel in the other unit causes a corresponding change in brake regulation.

4,232,911

CARRIAGE WITH ARTICULATED TRACK

Alfred A. M. Valantin, Clermont, France, assignor to Charbonnages de France, Paris, France

Continuation of Ser. No. 858,065, Dec. 6, 1977, abandoned. This application May 24, 1979, Ser. No. 42,136
Claims priority, application France, Dec. 7, 1976, 76 36768
Int. Cl.³ B22D 55/10, 55/20
U.S. Cl. 305—16 **7 Claims**



1. A carriage for a machine, such as a roof support, comprising:
a beam having rounded ends; and
an articulated track encircling the beam,
said articulated track being guided by friction in a guide path formed around the beam, which guide path has lateral clearance on the straight part of the beam and guides the track without play around the rounded ends of the beam;
the guide path on the straight part of the beam being formed with said lateral clearance on either side of at least one and at most two narrowed regions where there is localised reduction of lateral play of the track in the guide path.

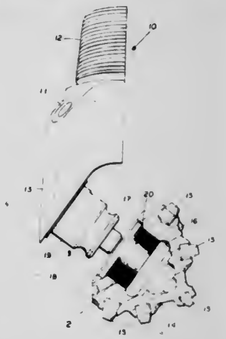
4,232,912

EARTH BORING BIT WITH GRIDDED FERROUS BEARING SURFACE

Robert L. Williamson, Fort Worth, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 11, 1978, Ser. No. 968,647
Int. Cl.³ F16C 33/24
U.S. Cl. 308—8.2 **4 Claims**

1. A rolling cone cutter earth boring bit, comprising:
a bit body, said bit body having at least one downwardly extending arm;
a cantilevered bearing pin of ferrous alloy extending from said arm;
a rolling cone cutter of ferrous alloy adapted to be rotatably mounted on said bearing pin;
bearing and cutter retaining means between said bearing pin and said cone cutter;



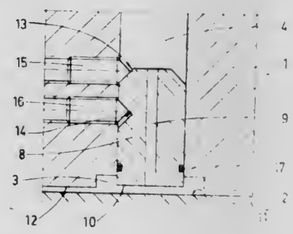
a quenched and tempered ferrous alloy bearing surface between said rolling cone cutter and said bearing pin;
a quantity of knurls and indentations on said bearing surface; and
a layer of anti-galling material overlying said bearing surface.

4,232,913

RESTRICTOR FOR A BEARING POCKET IN A HYDROSTATIC BEARING

Bengt Nilsson, Lidköping, Sweden, assignor to Lidkopings Mekaniska Verkstads AB, Lipkoping, Sweden

Continuation of Ser. No. 721,876, Sep. 9, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,225
Claims priority, application Sweden, Oct. 9, 1975, 7511301
Int. Cl.³ F16C 32/06
U.S. Cl. 308—9 **5 Claims**



1. In an assembly comprising at least first and second movable machine elements having confronting first and second hydrostatic bearing surfaces, means defining a channel in said first machine element, at least one bearing pocket surrounding said channel at the end thereof adjacent said second bearing surface, a member mounted in said channel having an axial end face parallel to said second bearing surface defining therebetween a slot restrictor, said member having a through port to convey pressure medium from said channel directly to said slot restrictor inboard of said bearing pocket, means mounting said member for depthwise adjustment in said channel between an upper limit position and a lower limit position wherein the space between said axial end face and said second bearing surface is greater than the space between the said first and second bearing surfaces, actuation of said member in said channel between said limit positions selectively varying pressure in the bearing pocket from a constant pressure source and

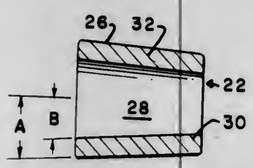
in turn varying the space between said first and second bearing surfaces.

4,232,914

HOLLOW ROLLER TAPERED BEARING

Willard L. Bowen, III, Harwinton, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Feb. 26, 1979, Ser. No. 15,010
Int. Cl.³ F16C *19/36*
U.S. Cl. 308—215 11 Claims



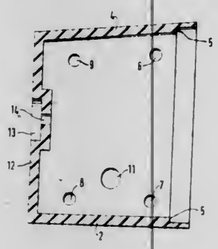
1. A tapered bearing comprising: inner and outer members having inner and outer tapered raceways confronting one another to define an annular space; and a plurality of hollow rollers located in said annular space, each hollow roller having an axial bore extending completely therethrough, the ratio of the diameter of the axial bore to the outside diameter of each hollow roller being uniform for its full length.

4,232,915

CONSOLE FOR HOLDING NAUTICAL INDICATORS

Joachim Hahn, Oberursel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,702
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720764
Int. Cl.² A47B *87/00*; H01H *9/02*
U.S. Cl. 312—107 9 Claims



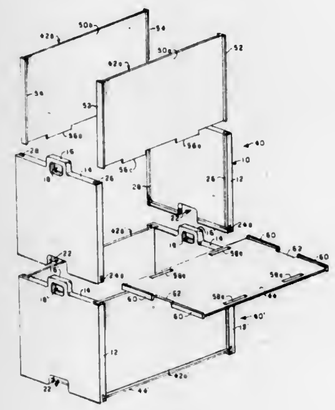
1. A console for holding nautical indicators, comprising:
a one-piece molded plastic housing having integral side walls, a back wall, a bottom wall, a top wall and an open front for receiving and holding an indicator, said console being dimensioned to hold only a single indicator with a front frame thereof covering the open front of the console;
said side walls including a pair of spaced apart, generally parallel side walls each having an opening therein in like positions in the respective walls; and
said openings being covered by a frangible membrane comprising a thin spayed-on-skin, whereby a plurality of said consoles may be placed side-by-side, with the membranes covering the openings in adjacent side walls of adjacent consoles pierced for receiving fasteners through the respective openings to secure the single consoles together to form a combination console.

4,232,916

DEMOUNTABLE AND STACKABLE MULTIPURPOSE CONTAINER

Daniel Correia, 226 Sierra Dr., Walnut Creek, Calif. 94596

Filed Nov. 27, 1978, Ser. No. 964,263
Int. Cl.³ A47B *87/00, 47/00*
U.S. Cl. 312—107 1 Claim



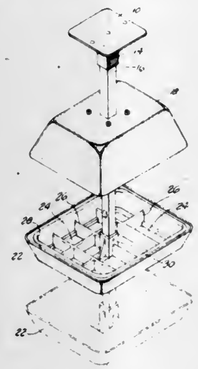
1. A multipurpose container comprising
a pair of end members having a face, a top edge, a first side, a second side and a bottom edge,
a first slot having a narrow opening width and a wide recessed width, said first slot disposed on said face of said end member parallel to and proximate said bottom edge of said end member,
a second slot having a narrow opening width and a wide recessed width, said second slot disposed on said face of said end member parallel to and proximate said first side edge of said end member,
a third slot having a narrow opening width and a wide recessed width, said third slot disposed on said face of said end member parallel to and proximate said second side edge of said end member,
a plurality of spacer slots disposed on said face of said end member, said spacer slots being disposed parallel to said first and second side edges and equally spaced along said face,
a variety of top and side members, said members having top, bottom, first and second end edges and comprising
means along said end edges for slidably engaging said second and third slots of said end members and being retained therein,
a bottom member having first and second end edges and comprising
means along said end edges of said bottom member for slidably engaging said first slot of said end member and being retained therein,
means defining a raised portion disposed on said top edge of said end member,
means defining a recess in said bottom edge of said end member adapted to receive a like raised portion of another end member of a like multipurpose container, and
means defining a recess in said end edges of said bottom member, said recess adapted to receive and cooperate with said raised portion of a like multipurpose container end member to vertically align said stacked multipurpose containers.

4,232,917

COLLAPSIBLE COLUMN WITH COVERED TRAY

John H. Reinhardt, 1640 Braeburn Rd., Altadena, Calif. 91001

Filed Dec. 21, 1978, Ser. No. 971,809
Int. Cl.² F16M *11/00*; B61G *3/00*
U.S. Cl. 312—128 8 Claims



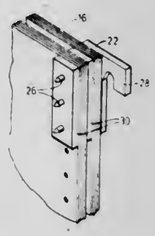
8. A ceiling mounted adjustable height tray comprising
a mounting bracket adapted to be mounted to a a ceiling,
a collapsible column comprising a fixed hollow column portion and first and second movable hollow column portions, said fixed hollow column portion being connected to said mounting bracket and having an aperture in one side thereof, said first movable hollow column portion being adapted to be slidably received within said fixed hollow column portion and having a pair of longitudinally separated apertures in one side thereof and a first spring biased latch engaging the upper of said apertures, and said second movable hollow column portion being adapted to be slidably received within said first movable hollow column portion and having a pair of longitudinally separatered apertures in one side thereof and a second spring biased latch engaging the upper of said apertures,
a tray connected to said second movable hollow column portion and being divided into a plurality of compartments for holding articles separately,
a cover supported by said fixed hollow column portion and adapted to cover said tray when said collapsible column is fully collapsed, and
a latch mechanism housed within said second movable hollow column portion and comprising a spring biased, pivoted bar having one end protruding from the underside of said tray and having a third latch on the other end adapted to engage the lower of said apertures in said second movable hollow column portion and to disengage therefrom when said bar is pivoted,
the respective apertures in said hollow column portions being located such that said collapsible column may be maintained in a fully collapsed configuration by the engagement of said third latch with said aperture in said fixed hollow column portion and the lower of said apertures in said first and second movable hollow column portions, may be maintained in a partially extended configuration by the simultaneous engagement of said first latch with said aperture in said fixed hollow column portion and the upper of said apertures in said first movable hollow column portion and said third latch with the lower of said apertures in said first and second movable hollow column portions, and may be maintained in a fully extended configuration by the simultaneous engagement of said first latch with said aperture in said fixed hollow column portion and the upper of said apertures in said first movable hollow column portion and said second latch with the lower of said apertures in said first movable hollow column portion and the upper of said apertures in said second movable hollow column portion.

4,232,918

SUPPORT SYSTEM FOR FILING COMPUTER PAPER

Karl Leber, 369 Merton St., Toronto, Ontario, Canada (M4S 1B3)

Filed Mar. 5, 1979, Ser. No. 17,246
Claims priority, application Canada, May 5, 1978, 302889
Int. Cl.³ A47B *63/00*
U.S. Cl. 312—184 9 Claims



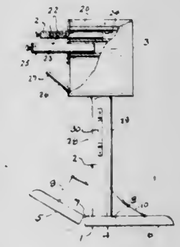
1. A stationery suspension system for filing a desired number of sheets of stationery having aligned holes vertically spaced along at least an upper portion of both sides thereof in a filing space having a pair of parallel spaced horizontally extending support bars, the suspension system comprising:
a pair of stationery engaging assemblies, each assembly having a first member with a plurality of vertically spaced parallel prongs extending therefrom, and a second member with a corresponding number of vertically spaced apertures therethrough, the prongs of the first member being adapted to be respectively received through a corresponding number of the holes along one side of the sheets of stationery, the apertures of the second member being adapted to respectively removably receive the prongs therethrough to retainably secure said one side of the sheets of stationery between the first and second members, one of the members of each assembly having a hook portion to engage a respective one of the support bars whereby the sheets of stationery may be vertically suspended together in the filing space.

4,232,919

PORTABLE STAND FOR USE IN LOADING A MUZZLE LOADING RIFLE

Nelson C. Stewart, P.O. Box 862, Franklin, N.C. 28734

Filed Jul. 26, 1976, Ser. No. 708,434
Int. Cl.² A47B *91/00*; A47F *7/00*
U.S. Cl. 312—254 10 Claims



1. A portable stand for use in loading a muzzle loading rifle comprising a base, an upright member rigidly attached to said base, means at the upper end of said upright member for receiv-

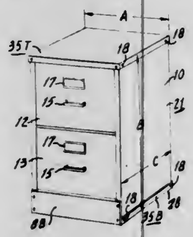
ing the muzzle of a rifle, cushion means attached to said base to receive the butt of said rifle, and channel means attached to said upright member into which said rifle can be inserted in an upright position with the butt of said rifle resting on said cushion means and the end of the muzzle of said rifle in said muzzle receiving means.

4,232,920

PREFABRICATED METAL DRAWER FILE CABINETS OR SIMILAR ARTICLES

Finley M. Bukaitz, Clifton, N.J., assignor to Kero Metal Products Co., Inc., Carlstadt, N.J.

Filed Jun. 7, 1979, Ser. No. 46,451
Int. Cl.³ A47B *87/00*
U.S. Cl. 312—257 R **10 Claims**



1. A prefabricated drawer cabinet apparatus of the type having a closed bottom surface, a closed top surface, a back wall located between said top and bottom surfaces and first and second side walls relatively perpendicular to said back wall, with a front surface containing at least one drawer slideably mounted between said side walls for storage of suitable materials, comprising:

(a) a top and a bottom box-like housing; each having two opposite side walls of equal length and height, and two additional side walls perpendicular to said opposite side walls, each of the same relative length and each of a height relatively equal to the height of said opposite side walls, said top and bottom housings each having a closed bottom surface and an open top surface,

(b) a right and a left side wall member, each of the same dimensions and mirror images of each other, said side walls each having an "L" flange along one back side thereof and a "C" flange along the other front side thereof, said side walls being positioned between said top and bottom housings and coupled to said opposite side walls of said top and bottom housings to form a box-like member, with an open front and open back, each of said side walls having at least one support flange extending therefrom and located at the same distance from one of said top and bottom housings with said supporting flanges facing each other,

(c) a back planar panel covering said back opening,

(d) a drawer support frame assembly having first and second channel members extending between and located on said flanges between said side walls, and third and fourth cross channel members perpendicular to and secured to said first and second members to form a support frame assembly of a "picture frame" configuration,

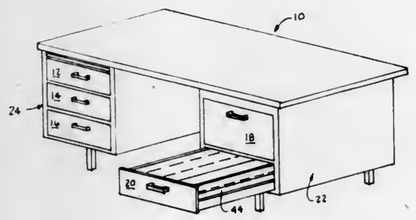
(e) a drawer of a box-like configuration and having first and second sides; each of which has a bottom flange portion for sliding on said third and fourth cross channels, said drawer positioned on said support frame for withdrawl of the same from said front end opening of said box-like member.

4,232,921

DRAWER SUSPENSION ASSEMBLY

David L. Peele, Kernersville, N.C., assignor to Miller Desk, High Point, N.C.

Filed Dec. 11, 1978, Ser. No. 968,255
Int. Cl.³ A47B *88/00*; F16C *21/00*
U.S. Cl. 312—350 **3 Claims**



1. In a suspension system for supporting a drawer from a cabinet structure wherein the drawer includes side walls defining elongated, longitudinally extending grooves therein and front and rear walls, and the cabinet structure includes a plurality of horizontally spaced, vertically disposed members, first support means recessed within and secured to said drawer side walls, and second support means secured to said cabinet structure and cooperating with said first support means, said first support means including a track member recessed within each groove and secured to and extending longitudinally of each of said drawer side walls, each said track member including an elongated channel member having a substantially C-shaped cross-section, the depth of each groove substantially corresponding to the thickness of a track member received therein such that the outermost surfaces of the track member are substantially flush with the outermost surfaces of a drawer side wall, and said second support means including generally horizontally disposed, spaced mounting plates, secured to selected vertically spaced members of said cabinet structure, each said plate including a flat, relatively thin, elongated member positioned in a vertical plane and extending generally longitudinally of said drawer side walls, said recessed track members of said flat, thin mounting plates permitting minimum spacing between said drawer side walls and said cabinet structure thereby permitting use of drawers of increased width, a plurality of horizontally spaced rollers fixedly secured to each said mounting plate and received within each said side wall recess and positioned for rolling engagement within a track member upon displacement of the drawer, said cabinet structure including a framework defined by horizontally disposed, parallel, top and bottom side rails and top and bottom end rails secured to said vertically disposed members, said vertically disposed members comprising spaced, parallel, front and rear vertical rails and vertically extending stretchers intermediate said front and rear vertical rails, and wherein said mounting plates have end portions secured to said vertical front rails and stretchers, respectively, and wherein a plurality of horizontally spaced rollers are mounted upon each said plate, one roller being secured adjacent a vertical front rail and a second roller being secured substantially midway between a vertical front rail and a stretcher.

4,232,922

SIGNAL POWER COUPLING TO ROTARY SHAFT

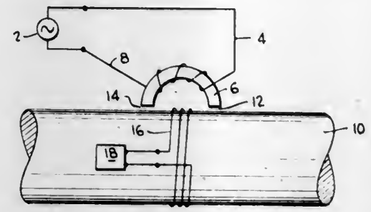
Horace A. Teass, Jr., 25 Mead Rd., Armonk, N.Y. 10705

Filed Jul. 3, 1979, Ser. No. 54,611
Int. Cl.³ H01R *39/00*
U.S. Cl. 339—5 R **3 Claims**

1. A system for coupling electrical power to a load mounted on a rotary shaft without mechanically contacting the shaft comprising:

a rotary shaft;

a transformer primary having a core positioned adjacent but spaced apart from said shaft by air gaps whereby said core, said shaft and said air gaps form a complete magnetic circuit; and



an insulated conductor abutting and wrapped around said shaft to form a winding thereon whereby said winding rotates with said shaft and is positioned to be inductively associated with said transformer primary.

4,232,923

ELECTRICAL CONNECTOR

Tomonari Otsuki, Tokyo, and Hiromasa Inouye, Musashino, both of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 845,176, Oct. 25, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,988
Claims priority, application Japan, Oct. 22, 1976, 51-141429
Int. Cl.³ H05K *1/12*
U.S. Cl. 339—17 LC **10 Claims**

1. An electrical connector for mounting on a printed circuit board, said connector comprising:

a housing having a substantially continuous bottom surface for contacting one side of a printed circuit board, said housing including at least one contact mounting passageway perpendicular to and extending through said bottom surface and said housing further having at least one contact receiving opening spaced from said passageway perpendicular to and extending through said bottom surface, said opening receiving a male contact inserted thereinto through said bottom surface in a direction perependicular to said bottom surface and parallel to said passageway;

at least one resilient conductive female contact having a terminal end extending through said contact mounting passageway, an intermediate curved portion resiliently flexed within said housing against the opposite side of said housing from said bottom surface, said intermediate portion being elongated in a direction generally perpendicularly away from said terminal end and extending substantially parallel to said bottom surface to present a low profile in a direction perpendicular to said bottom surface and thereby reducing the dimensions of the connector in a direction perpendicular to said printed circuit board, and a folded back wiping contacting end adjacent said contact receiving opening for engaging said male contact inserted into said contact receiving opening of said housing generally perpendicular to said intermediate portion, said folded back end protruding at least partially into said contact receiving opening for receiving contact mating forces from said male contact in a direction perpendicular to said contact receiving opening and substantially lengthwise along said resiliently flexed elongated intermediate portion of said female contact; and

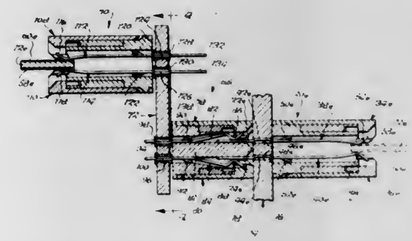
means for retaining said contact in said housing.

4,232,924

CIRCUIT CARD ADAPTER

Mark H. Kline; John T. Liebel, Jr., and Ronald D. Sheridan, all of Williamsville, N.Y., assignors to Nanodata Corporation, Buffalo, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,645
Int. Cl.³ H05K *1/07*
U.S. Cl. 339—17 L **21 Claims**



1. An adapter for transferring the electrical connections of a circuit card of an electrical system from a stationary connector in a congested area on one side of a reference board to a convenient access area on the opposite side of the board, said electrical connections of said circuit card comprising a plurality of discrete electrical contact regions and said stationary connector including a plurality of contacts having a positional relationship with said contact regions for mating with said contact regions to connect said card to said system in a predetermined manner and said reference board having means on both sides for making electrical connection to said system, said adapter comprising:

(a) first means for making electrical connections to said system at a location on the opposite side of said reference board in correspondence with said contacts of said stationary connector;

(b) second means for making electrical connections to said circuit card in correspondence with said electrical contact regions of said circuit card; and

(c) means defining an electrical path between said first and second means, said path having a length significantly less than the distance measured along said circuit card in a direction outwardly of the plane of said reference board when said circuit card is connected to said stationary connector, said path defining means being arranged to convey signals between said first and second means of said adapter in a manner interchanging the connections between said first and second means relative to the positional relationship between said electrical contact regions of said circuit card and said contacts of said stationary connector on the other side of said reference board so that said circuit card is connected electrically to said system on the other side of said reference board in the same manner as it was by said stationary connector on the one side of said reference board;

(d) whereby said circuit card can be disconnected from said stationary connector and moved to said opposite side of said reference board and connected to said second means of said adapter to facilitate working on said circuit card in a manner which does not increase significantly the electrical path length from said reference board to said circuit card and in a manner such that said circuit card functions electrically in the system in the same manner as it did when connected to said stationary connector.

4,232,925

HIGH-VOLTAGE THREE PHASE ELECTRICAL SWITCH GEAR

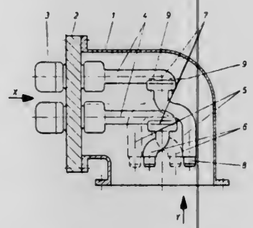
Reinhold Behnke, Mannheim; Wolfgang Wagenbach, Oftersheim, and Erwin Müller, Karlstein, all of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 18, 1978, Ser. No. 970,311

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 7738424[U]

Int. Cl.³ H01R *29/00*; H02B *1/10*

U.S. Cl. 339—31 R **6 Claims**



1. An insulated high-voltage right angle connection comprising:
(a) three phase conductors;
(b) casing means arranged in a right angle bend and surrounding said phase conductors;
(c) insulation means supporting said phase conductors at the corners of an equilateral triangle;
(d) said phase conductors each including a straight section and a crank section, and means joining said sections to allow selectively positioning said crank sections at either of two positions 180° apart to enable the high-voltage right angle connection to be connected to a mating connector in either of two positions of the right angle connection which are 180° apart.

4,232,926

LOCKING MECHANISM FOR COUPLING AND UNCOUPLING ELECTRICAL CONNECTORS

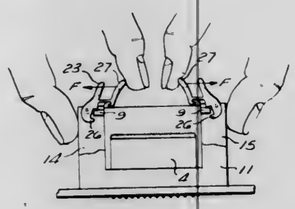
Hiromasa Inouye, Mushashino; Matsuo Kato, and Hiroaki Ito, both of Mooka, all of, Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 16, 1978, Ser. No. 961,318

Claims priority, application Japan, Nov. 21, 1977, 52-155340[U]

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **10 Claims**



1. A locking mechanism for coupling together and uncoupling first and second electrical connector parts, comprising: at least one actuator pivotally mounted on said first connector part and having a means for applying force in both an insertion and an extractive direction as said actuator pivots, said actuator further including a latch member; at least one engageable means on said second connector part cooperating with said force applying means of said actuator to receive said force in both an insertion and an extraction direction; and a locking means on said second connector part remote from said engageable means for latching with said latch member when said actuator is pivoted in said insertion direction and said connector parts are fully coupled to hold said first and second connector parts coupled together.

4,232,927

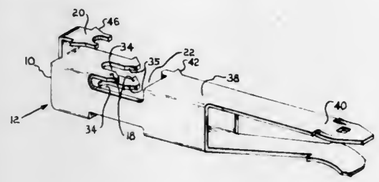
ELECTRICAL CONNECTOR

John R. Stull, Lewisberry, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1979, Ser. No. 21,568

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—99 R **6 Claims**



1. An electrical terminal having first and second contact ends interconnected by an intermediate bridge, said first contact end having a pair of spaced slotted insulation-displacing contacts, one above the other, said second contact end having means for engaging contact elements in other electrical circuits, said bridge being recessed in an area adjacent said first contact to present an access for an insulated wire and the slots in said insulation-displacing contacts having wire entrance openings adjacent and opening into the recess in said bridge, the pair of insulation-displacing contacts positioned so that they pierce the same insulated wire.

4,232,928

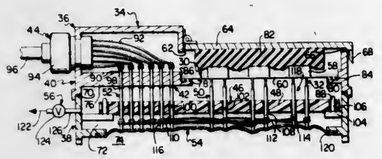
APPARATUS EMPLOYING FLEXIBLE DIAPHRAGM FOR EFFECTING SUBSTANTIALLY UNIFORM FORCE, INDIVIDUAL COUPLINGS WITH MULTIPLE ELECTRICAL CONTACTS OR THE LIKE

Price D. Wickersham, Shawnee Mission, Kans., assignor to DIT-MCO International Corporation, Kansas City, Mo.

Filed Jun. 27, 1979, Ser. No. 52,605

Int. Cl.³ H01R *4/64*

U.S. Cl. 339—117 P **7 Claims**



1. In electrical interfacing apparatus for effecting concurrent, separate, electrical connections between respective ones of a plurality of individually engageable, electrically conductive, contact structures arranged in a first predetermined pattern of generally co-planar character in which some of said contact structures may be displaced in either direction from precise co-planarity with other of said contact structures and respectively corresponding ones of a plurality of individually engageable, electrically conductive, contact members arranged in a second predetermined pattern of generally co-planar character in which some of said contact members may be displaced in either direction from precise co-planarity with other of said contact members, wherein said connections to be effected preferably involve substantially equally forceful, respective engagements with each of said contact structures and each of said contact members:
means for supporting said contact structures in a first spatial zone;
means for supporting said contact members in said first zone with said pattern of contact members offset generally laterally from said pattern of contact structures and with the plane of general co-planarity of said pattern of contact members being substantially parallel to the plane of general co-planarity of said pattern of contact structures;
shiftable, electrically conductive, contacting structures within said first zone for each of said contact structures respectively,
each of said contacting structures having a force-receiving portion and an engaging portion,
the engaging portion of each of said contacting structures being disposed adjacent the corresponding contact structure for engaging the latter when a force is applied to said force-receiving portion thereof;
shiftable, electrically conductive, contacting elements within said first zone for each of said contact members respectively,
each of said contacting elements having a force-receiving portion and an engaging portion,
the engaging portion of each of said contacting elements being disposed adjacent the corresponding contact member for engaging the latter when a force is applied to said force-receiving portion thereof;
fluid barrier means for separating said first zone from a second spatial zone,
said barrier means including yieldable diaphragm means having areas respectively adjacent to each of said force-receiving portions of said contacting structures and said contacting elements,
said areas being sufficiently flexible to be displaceable toward said first zone and respectively operable for forcefully engaging the force-receiving portion of the corresponding contacting structures and contacting members with substantially equal forces in response to a fluid pressure differential between said first and second zones involving a relatively greater pressure in said second zone than in said first zone;
means for creating a fluid pressure differential between said first and second zones involving a relatively greater fluid pressure in said second zone than in said first zone; and
means for electrically coupling each of said contacting structures with a corresponding one of said contacting elements.

4,232,929

MULTI-ROW PLUG CONNECTOR WITH A FITTED SHIELD PLATE

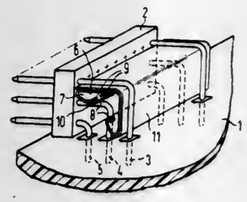
Franz Zobawa, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,484

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832243

Int. Cl.³ H01R *3/06*

U.S. Cl. 339—143 R **8 Claims**



1. A multi-row plug connector pin strip for transmitting small signals with low crosstalk in data processing systems, comprising: an insulating strip having mounted therein at least one row of pins which forms a signal plane and an adjacent row of pins which forms a ground plane; a shield plate spring-clamped in position between the two rows, edges of the shield plate being inwardly bent to contact all the pins of the ground plane row; and an insulating film on the shield plate between the signal plane row and the shield plate.

4,232,930

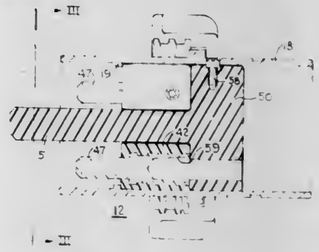
BATTERY PLUG AND RECEPTACLE FOR USE IN MINES

John J. Teti, Saltville, Va., assignor to Pyott-Boone Machinery Corp., Saltville, Va.

Filed May 1, 1978, Ser. No. 901,420

Int. Cl.³ H01R *13/64*

U.S. Cl. 339—186 M **3 Claims**



1. A connector assembly comprising mating receptacle and plug members, each comprising:
a metal housing having a cylindrical opening formed therein;
a plurality of cartridges disposed to fit within the cylindrical opening in said metal housing each cartridge having in cross section, an outer portion which defines a portion of a circle and said cartridges having inner portions which together form a selected geometrical opening when said cartridges are disposed within said housing;
each cartridge including at most one electrical connection means which forms part of only one of the electrical connections completed by the connector assembly;
an insulating keeper member disposed to hold said cartridges in place; and,
said insulating keeper of said plug member comprising a polarity prong which projects through said geometric opening.

4,232,931

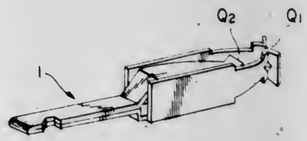
CONNECTOR FOR COAXIAL CABLES

Takeshi Takeuchi, and Takao Terasawa, both of Yokohama, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 970,950

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—258 R **11 Claims**



1. A connector for connecting coaxial cables comprising an axial extending wall member which is comprised of a first element folded over on itself to form a fold defining one terminating end of said wall member, said wall member having a

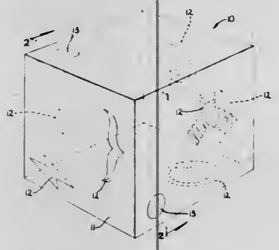
first section and a second section, said first section being defined by opposed and abutting portions of said first element and extending from said fold to said second section, said second section having opposed and spaced portions of said first element and extending from said first section to the other terminating end of said wall member, said opposed and spaced portions of said second section of said wall member having means thereon defining a first lip between which said coaxial cable passes, said opposed and spaced portions of said second section of said wall member having generally parallel side edges, a pair of elements disposed generally perpendicular to said opposed and spaced portions of said second section of said wall member, said pair of elements each having a first part disposed on said side edges and a second part extending axially beyond said other terminating end of said wall member, said second part of said pair of elements being spaced from one another and having means thereon defining a second lip between which said coaxial cable passes, said second lip being axially spaced from said first lip.

4,232,932

KALEIDOSCOPIC TOY

Stephen K. Atwater, 2216 Stand, and Joseph Wolfson, 224 23rd Pl., both of Manhatten Beach, Calif. 90266

Filed Apr. 23, 1979, Ser. No. 32,393
Int. Cl.³ G02B *23/00*
U.S. Cl. 350—4.1 **6 Claims**



1. An improved kaleidoscopic toy which has no moving parts and which provides a plurality of reproduceable multcolored optical shapes and patterns comprising:
   a. a polygon having a plurality of inner sidewalls, each of said inner sidewalls having a mirrored surface with a plurality of transparent areas, each of which is in a particular shape and which is colored with a stain glass paint of any one of a variety of colors; and
   b. means for viewing each of said mirrored surfaces of said inner sidewalls whereby an individual viewer may view a combination of oppositely disposed said inner sidewalls so that said colored transparent areas on each of said oppositely disposed inner sidewalls combines to form a unique optical pattern.

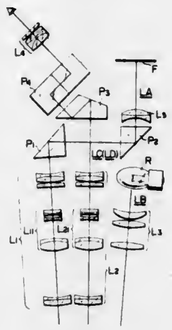
6. A method for manufacturing a kaleidoscopic toy which has no moving parts and which provides a plurality of reproduceable multi-colored optical shapes and patterns comprising the steps of:
   a. forming six identical flat, square-shaped members from a transparent material;
   b. using a plurality of flat members in various shapes to form a painting mask in order to provide transparent areas;
   c. coating the outer surface of each of said six identical flat, square-shaped members with a first layer of mirror backing paint;
   d. coating said first layer with a second layer of dark paint;
   e. coating said transparent areas with stain glass paint of any one of a variety of colors; and
   f. assembling said six identical flat, square-shaped members into a cube.

4,232,933

OPTICAL SYSTEM OF COLPOSCOPE

Kenichi Nakahashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1979, Ser. No. 3,018
Claims priority, application Japan, Feb. 17, 1978, 53/19124[U]
Int. Cl.³ G02B *21/00*
U.S. Cl. 350—19 **12 Claims**



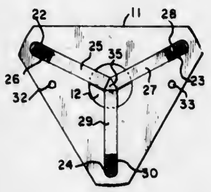
1. An optical system of colposcope comprising a pair of laterally spaced, independent observation optical sub-systems each having a family of objective lenses including a magnification varying optical sub-system, the magnification varing subsystem in one observation sub-system being ganged with the magnification varying sub-system in the other observation sub-system, a photographing optical sub-system having a family of objective lenses including a magnification varying optical sub-system which is ganged with the magnification varying sub-systems of the observation sub-systems, and an illumination optical sub-system for illuminating an object being examined, the optical axes of the four optical sub-systems being disposed so that they converge on the object being examined.

4,232,934

UNIVERSAL CONNECTOR ASSEMBLY PARTICULARLY ADAPTED FOR USE WITH FIBER OPTIC CABLES

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Division of Ser. No. 791,383, Apr. 27, 1977. This application Jun. 27, 1978, Ser. No. 918,927
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.20 **7 Claims**



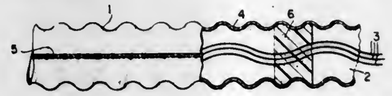
1. A connector apparatus for accommodating various diameter fiber optic cable assemblies to be exposed to a source of light contained within a housing upon which said connector apparatus is mounted, comprising:
   (a) a connector housing member having an aperture directed from a top to a bottom surface, said housing having on a bottom surface, a plurality of transverse slots each communicating with said aperture and each extending transverse thereto towards a side of said housing, said slots extending into said housing for a predetermined depth and of a width substantially narrower than said depth,
   (b) a plurality of clamp members, each separate one positioned within an associated one of said slots, each of said clamp members of a "C" shaped configuration and located within said slot, with the length of said "C" from said top to bottom arms relatively equal to said predetermined depth and the width of said "C" relatively equal to said width of said slot whereby said "C" member is positioned in said slot in an upstanding relation with said main central side as joining said arms facing said aperture,
   (c) a plurality of spring biasing means, each separate one positioned in one of said slots to coact with and urge said associated clamp member within said aperture, with said spring biasing means positioned between the arms of said "C" with the main side of said "C" shaped member being forced into said aperture by said spring biasing means to contact each of said clamp members similarly urged by said associated spring to cause said main sides of said clamp members to coact to form a triangular opening with each side relatively equal to the width of said slot, whereby a cable inserted in said aperture is retained therein by said clamp members coacting therewith due to the forces exerted by said spring members.

4,232,935

COMMUNICATIONS CABLE WITH OPTICAL WAVEGUIDES

Peter Rohner, Isernhagen, and Michael Still, Langenhagen, both of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,179
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1977, 2743260
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.23 **3 Claims**



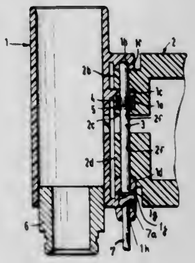
1. A flexible optical signal transmitting cable comprising:
   a plurality of elongated, wave shaped, optical fibers extending in an axial direction;
   a transversely corrugated, longitudinally seam welded, metallic tubular member formed about but spacially separated from said plurality of optical fibers which only partially fill the inner cross-section of said metallic tubular member;
   water resistant support means that fill the unoccupied remaining portions of the complete interior cross-section of said metallic tubular member along at least longitudinal intervals of said metallic tubular member, said water resistant support means preventing axial propogation of any water penetrating the interior of said metallic tubular member and providing direct, non rigid, radial support of each of said optical fibers within each of said longitudinal intervals of said tubular member for permitting unilinear axial unfolding thereof upon tensional forces being applied thereto, said optical fibers having been continuously formed by feeding same in a longitudinal path while simultaneously shaping a metal strip about said optical fibers into a tubular member, injecting a water resistant filler material at a first point along said longitudinal path prior to the closing of the opposite longitudinal edges of said metal strip, and welding said longitudinal edges and corrugating the welded tubular member downstream of said first point; and
   a tubular, flexible jacket of insulating material positioned about said corrugated metallic tubular member, including elements of high tensile strength for limiting the axial expansion of said corrugated metallic tubular member.

4,232,936

PIVOT-JOINT CONSTRUCTION FOR BINOCULAR TELESCOPE

Karl-Heinz Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG, Bünde, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,446
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2804174
Int. Cl.³ G02B *7/12*
U.S. Cl. 350—75 **8 Claims**



1. In a binocular telescope including a pair of optically aligned telescope tubes pivotally mounted on a connecting bridge for adjusting the interocular distance between the tubes, the improvement which comprises a pivot-joint between tube and bridge elements wherein one of said tube and bridge elements is a first element including one central hinge tab with an opening therethrough and a forward hinge tab and a rearward hinge tab spaced apart from said central hinge tab and formed with holes aligned with said opening, said other element is a second element including a forward tab between said forward and central hinge tabs on said first element and a rearward tab between said rearward and central hinge tabs on said first element and formed with holes aligned with said opening, said tabs on said second element engaging said central tab, a hinge pin through the aligned opening and holes of said tabs and means mounted in said central tab for providing friction against said engaging tabs on said second element in the direction of the pin required for maintaining the adjusted interocular distance between the telescope tubes, the surfaces of said forward and rearward hinge tabs on said first element in nonstressed relation with said adjacent hinge tabs on said second element for anchoring said pin and providing alignment between the optical axis of the telescope and said pivot-joint.

4,232,937

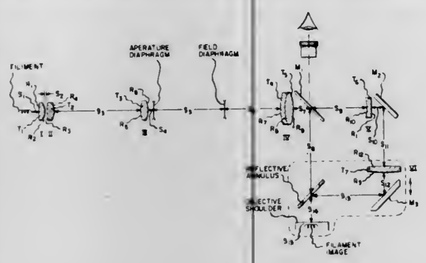
BRIGHT FIELD-DARK FIELD ILLUMINATION SYSTEM

Krishnaiyer Swaminathan, Santa Monica, Calif., and Milton H. Sussman, Amherst, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 16, 1978, Ser. No. 951,684
Int. Cl.³ G02B *21/06*
U.S. Cl. 350—91 **4 Claims**

1. A vertical bright-field and dark-field microscope illuminator having a light source and a microscope objective with a shoulder aligned on an optical axis, which comprises, a first lens system for collecting light from the source, a second lens system for receiving light from said first lens system and focusing an image of the source, a partially transmissive mirror selectively positionable on the optical axis to deflect light from said second lens system toward the objective for bright-field microscopy, an annular reflector located on the optical axis near the objective, an alternate optical axis used when said

mirror is positioned off the optical axis, a relay system on said alternate optical axis to focus light presented to said annular



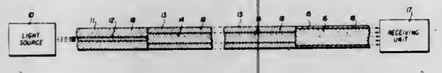
reflector near the objective shoulder for dark-field microscopy.

4,232,938

TELECOMMUNICATION SYSTEMS USING OPTICAL WAVEGUIDES

Franklin W. Dabby, Woodbridge, and Ronald B. Chesler, Cheshire, both of Conn., assignors to Times Fiber Communications, Inc., Wallingford, Conn.

Filed Oct. 6, 1978, Ser. No. 949,032
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.20 **16 Claims**



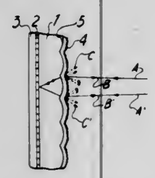
1. A method for transmitting light signals from a source of light to a receiver comprising passing light emitted from a source of light through a telecommunication system comprising at least one transmitting optical waveguide having a core of diameter d_1, connecting said source of light to least one optical waveguide cable comprising at least one optical waveguide having a core of diameter d_2 and at least one receiving optical waveguide having a core of diameter d_3, connecting said at least one optical waveguide cable to said receiver for light signals, wherein $d_1<d_2<d_3$ and wherein the outer diameters of said optical waveguides are equal.

4,232,939

SCREEN WITH HIGH LUMINANCE AND WIDE ANGLE

Tomoo Kikuchi, 12-35, Shimoochiai 3-chome, Shinjuku-ku, Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,235
Claims priority, application Japan, Jan. 4, 1978, 53-038592
Int. Cl.[3] G03B 21/60
U.S. Cl. 350—129 **5 Claims**



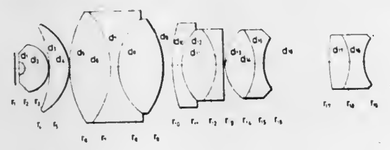
1. A screen with high luminance and wide diffusing performance which comprises: a base plate of a transparent thermoplastic resin sheet, a specular surface formed by vacuum evaporation on one side of the base plate, lenticulars formed on the other side of the base plate in continuous vertical rows and having convex surfaces, and a diffusing layer of low diffusing performance formed on the convex surfaces of said lenticulars.

4,232,940

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

Jihei Nakagawa, Hagiyama-machi 5-6, Higashimurayama-shi, Tokyo-to, Japan

Filed Jun. 28, 1978, Ser. No. 919,834
Claims priority, application Japan, Jun. 29, 1977, 52-76533
Int. Cl.[2] G02B 3/00, 9/62
U.S. Cl. 350—175 ML **3 Claims**



1. An objective lens system for microscopes comprising a first semispherical lens component having an embedded semispherical lens element, a second positive meniscus lens component having a concave surface on the object side, a third cemented lens component consisting of a positive element, a negative element and a positive element, a fourth cemented lens component consisting of a negative element, a positive element and a negative element, a fifth cemented meniscus lens component having a convex surface on the object side, and a sixth cemented meniscus lens component having a convex surface on the object side and arranged with a relatively wide airspace from said fifth lens component, and said lens system satisfying the following conditions:

$$-80f<f_4<f_5<f_6<-29 \quad (1)$$

$$13f>|f_{456}|>11f,\ f_{456}<0 \quad (2)$$

$$5.5f>d_{16}>5f \quad (3)$$

$$\nu_{12}=2.57,\nu_{13}=66.8 \quad (4)$$

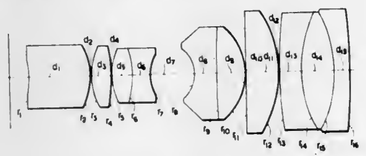
wherein the reference symbols f_4, f_5 and f_6 represent focal lengths of the fourth, fifth and sixth lens components respectively, the reference symbol f_{456} designates total focal length of the fourth, fifth and sixth lens components considered as an assembly, the reference symbol f denotes focal length of said lens system as a whole, the reference symbol d_{16} represents air space formed between the fifth and sixth lens components, and the reference symbols ν_{12} and ν_{13} designate Abbe's numbers of the two elements of the sixth lens components.

4,232,941

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

Tsutomu Tojo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,722
Claims priority, application Japan, Aug. 26, 1977, 52-102357
Int. Cl.[3] G02B 9/62
U.S. Cl. 350—175 ML **7 Claims**



1. An objective lens system for microscopes comprising a first meniscus lens component having a concave surface on the object side and positive refractive power, a second positive lens component, a third cemented meniscus lens component having a concave surface on the image side, a fourth cemented meniscus lens component having a concave surface on the object side, a fifth positive lens component and a sixth cemented three-element lens component, and said lens system satisfying the following conditions:

$$1.85>n_1>1.70 \quad (1)$$

$$100<(\nu_3-\nu_4)+(\nu_6-\nu_5)<103 \quad (2)$$

$$\left[\frac{\theta_4-\theta_3}{\nu_3-\nu_4}\leqq 0.001\ ,\ \frac{\theta_5-\theta_6}{\nu_6-\nu_5}\leqq 0.001\right] \quad (3)$$

$$0\leqq\frac{\theta_4-\theta_3}{\nu_3-\nu_4}\leqq 0.001\ ,\ 0\leqq\frac{\theta_5-\theta_6}{\nu_6-\nu_5}\leqq 0.001$$

$$0.1f<d_1/n_1<0.3f \quad (4)$$

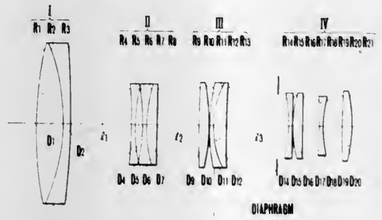
wherein the reference symbol d_1 represents thickness of the first lens component, the reference symbol n_1 designates refractive index of the first lens component, the reference symbols ν_3, ν_4, ν_5 and ν_6 denote Abbe's numbers of both the elements of the third lens component and both the elements of the fourth lens component respectively, the reference symbols θ_3, θ_4, θ_5 and θ_6 represent values of θ given by $\theta=(n_g-n_F)/(n_F-n_C)$ for both the elements of the third lens component and both the elements of the fourth lens component respectively and the reference symbol f designates focal length of the lens system as a whole.

4,232,942

OPTICALLY COMPENSATED ZOOM LENS

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,630
Claims priority, application Japan, May 18, 1977, 52-57451
Int. Cl.[3] G02B 15/14
U.S. Cl. 350—184 **11 Claims**



1. An optically compensated zoom lens comprising, from the object side,

a first lens group having a positive refractive power and consisting of only a cemented bi-convex lens having a divergent contact surface;

a second lens group having a negative refractive power and consisting of a negative lens and a cemented negative lens having a convergent contact surface convex toward the front;

a third lens group having a positive refractive power and consisting of a positive lens and a cemented positive lens having a second divergent contact surface, said second divergent contact surface being of curvature of the opposite sign to that of the curvature of the first divergent contact surface of said first lens group; and

a relay lens group including a plurality of lenses with the frontmost surface concave toward the front,

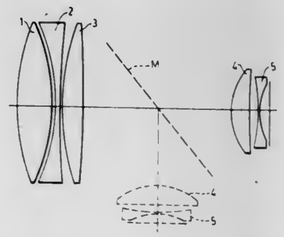
whereby, when zooming, said first and said third lens groups are axially moved in fixedly spaced relation to each other on the opposite side of said second lens group and said second lens group is fixed.

4,232,943

MODIFIED PETZVAL LENS

Phillip J. Rogers, Meliden, Wales, assignor to Pilkington P. E. Limited, Lancashire, England

Continuation-in-part of Ser. No. 719,361, Sep. 1, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,481
Claims priority, application United Kingdom, Sep. 13, 1975, 37722/75
Int. Cl.[3] G02B 9/34, 9/60, 17/06
U.S. Cl. 350—202 **23 Claims**



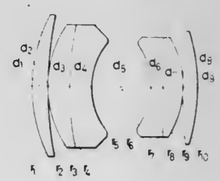
1. A modified Petzval lens having a focal length F, the lens having a front part comprising at least one positive element with a focal length between +1F and +3F and a negative element with a focal length between −1.2F and infinity, the focal length of the front part as a whole being between +1F and +6F and the negative element of the front part not being cemented to any other element and having a refractive index less than or equal to 0.13 greater than the refractive index of any positive element of the front part, a rear part comprising a positive singlet element with a focal length between +0.4F and +1.2F, and a field flattener behind the rear part and comprising a single negative element with a focal length between 0.4F and −1.1F.

4,232,944

STANDARD PHOTOGRAPHIC LENS

Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,853
Claims priority, application Japan, Sep. 13, 1977, 52-110241
Int. Cl.[3] G02B 9/36
U.S. Cl. 350—222 **4 Claims**



1. A standard photographic lens system comprising a first positive meniscus lens component, a second cemented doublet component consisting of a positive meniscus lens element and a negative meniscus lens element, a third cemented doublet component consisting of a negative lens element and a positive lens element and a forth positive lens component, and said lens system satisfying the conditions enumerated below:

$0.41f < r_3 < 0.44f$ (1)

$0.5f < r_4 < 1.2$ (2)

$0.25f < r_5 < 0.29f$ (3)

$0.25f < -r_6 < 0.28f$ (4)

$f < -r_7 < \infty$ (5)

$0.33f < -r_8 < 0.4f$ (6)

$0.22f < d_5 < 0.28f$ (7)

$1.71 < n_1 < 1.73$

$1.71 < n_2 < 1.73$

$1.71 < n_5 < 1.75$

$1.67 < n_6 < 1.70$ (8)

$16 < \nu_2 - \nu_3 < 25$ (9)

$14 < \nu_5 - \nu_4 < 21$ (10)

$0.14f < d_3 + d_4 < 0.19f$ (11)

$0.10f < d_6 + d_7 < 0.14f$ (12)

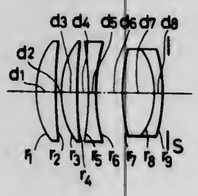
wherein the reference symbols r_3, r_4 and r_5 represent radii of curvature on the surfaces of the respective elements of the second lens component, the reference symbols r_6, r_7 and r_8 designate radii of curvature on the surfaces of the respective elements of the third lens component, the reference symbol d_5 denotes the airspace between the second and third lens components, the reference symbol n_1 represents refractive index of the first lens component, the reference symbol n_2 designates refractive index of the object side element of the second lens component, the reference symbol n_5 denotes refractive index of the image side element of the third lens component, the reference symbol n_6 represents refractive index of the fourth lens component, the reference symbols ν_2 and ν_3 designate Abbe's numbers of both the elements of the second lens component, the reference symbols $\nu 4$ and $\nu 5$ represent Abbe's numbers of both the elements of the third lens component, the reference symbols d_3 and d_4 represent thicknesses of both the elements of the second lens component, the reference symbols d_6 and d_7 designate thicknesses of both the elements of the third lens component and the reference symbol f designates focal length of the entire lens system as a whole.

4,232,945

PHOTOGRAPHIC CAMERA LENS SYSTEM HAVING A SHORT TOTAL LENGTH

Kazushi Hyakumura, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,726
Claims priority, application Japan, Aug. 11, 1977, 52/96274
Int. Cl.³ G02B 9/34
U.S. Cl. 350—223 **4 Claims**



1. A photographic camera lens system having a short total length comprising a first positive meniscus lens component, a second positive meniscus lens component, a third negative lens component and a fourth cemented lens component consisting of a biconvex lens element and a negative lens element, and said lens system satisfying the following conditions:

$$1.86 \leqq \phi_1 + \phi_2 \leqq 2.01 \quad (1)$$

$$0.60 \leqq \phi_1 \leqq 0.86 \quad (2)$$

$$1.77 \leqq n_2 \leqq 1.81 \quad (3)$$

$$-0.40f \leqq r_8 23 \; -0.35f \quad (4)$$

$$1.4 \leqq \phi_{(67)}/\phi_{(45)} \leqq 1.9 \quad (5)$$

wherein the reference symbols r_1 through r_9 represent radii of curvature on the surfaces of the respective lens elements, the reference symbols d_1 through d_8 designate thicknesses of the respective lens elements and airspaces therebetween, the reference symbols n_1 through n_9 denote refractive indices of the lens elements and airspaces therebetween, the reference symbols ϕ_1 and ϕ_2 represent refractive powers of the first and second lens components, reference symbols $\phi_{(45)}$ and $\phi_{(67)}$ represent values which are defined by the following formulae:

$$\phi_{(k)} = (n_{k+1} - n_k)\frac{1}{r_k},$$

$$\phi_{(k,\,k+1)} = \phi_{(k)} + \phi_{(k+1)} - \frac{d_k}{n_{k+1}}\phi_{(k)} \cdot \phi_{(k+1)}$$

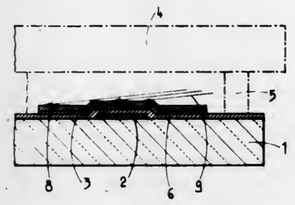
$$k = (1.2 \ldots 9)$$

4,232,946

LIQUID CRYSTAL ALIGNMENT LAYERS

Fereydoun Gharadjedaghi, and Bernard Le Fur, both of Neuchatel, Switzerland, assignors to Ebauches S.A., Canton of Neuchatel, Switzerland

Filed Dec. 19, 1978, Ser. No. 970,981
Claims priority, application Switzerland, Dec. 28, 1977, 16115/77
Int. Cl.² G02F 1/13
U.S. Cl. 350—320 **10 Claims**



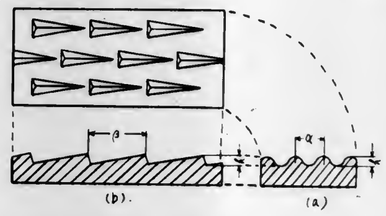
1. Method of manufacturing an electro-optic passive display cell having a helical nematic liquid crystal comprising two plates between which is disposed the said crystal, according to which one deposits on the inner face of each of the said plates an alignment film by evaporation under vacuum under an incidence ensuring an alignment of the molecules of the liquid crystal which thus orientate themselves along a direction determined by the process of evaporation, characterized by the fact that one realizes the said film by applying, on at least one of the said plates, two layers of an alignment material under an incidence of about 5°, the projection, on the plate, of the vector of application of one of the said layers forming an angle of 180° with the projection, on the plate, of the vector of application of the other layer, the whole in such a way that the molecules of the liquid crystal are then anchored on the said plate under an angle, smaller than 10°, such that the average anchoring angle on the two plates be smaller than 5°.

4,232,947

FIELD EFFECT MODE LIQUID CRYSTAL DISPLAY

Fumiaki Funada, Tenri, and Keiichiro Shimizu, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 1, 1975, Ser. No. 592,225
Claims priority, application Japan, Jul. 1, 1974, 75689
Int. Cl.³ G02F 1/133
U.S. Cl. 350—341 **5 Claims**



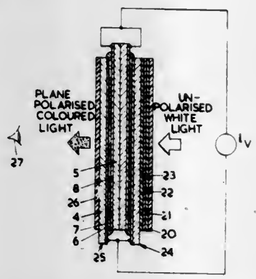
1. A liquid crystal cell comprising:
a layer of field effect mode liquid crystal material;
a pair of opposing parallel plates for sandwiching said liquid crystal layer and defining first and second interfacial surfaces therewith;
at least one of said plates being transparent;
each of said interfacial surfaces having a polarized anisotropic micro groove structure defined therein;
each said micro groove structure being characterized by substantially similar peak and valley asymmetric profiles along one axis thereof; and
said interfacial surfaces being opposed in complementary fashion such that the peaks of the said micro groove structure of one said surface are opposite the valleys of the said micro groove surface of the other said surface to thereby constrain a uniform alignment of molecules in said layer of liquid crystal material.

4,232,948

LIQUID CRYSTAL DISPLAY DEVICE

Ian A. Shanks, Malvern, England, assignor to Secretary of State for Defence, London, England

Filed Jul. 12, 1974, Ser. No. 488,069
Claims priority, application United Kingdom, Jul. 18, 1973, 34162/73
Int. Cl.³ G02F 1/133
U.S. Cl. 350—347 R **18 Claims**



1. A liquid crystal device comprising:
(1) a liquid crystal cell capable of rotating plane polarized light and comprising:
(i) two spaced transparent slides,
(ii) a layer of a liquid crystal material comprising a cholesteric liquid crystal material having a molecular pitch substantially different from the wave length of visible light disposed between the two slides and
(iii) an electrode structure mounted on each slide for applying an electric field across the thickness of the liquid crystal layer;
(2) at least one layer of birefringent material arranged parallel to the cell; and
(3) a polarizer and analyzer arranged parallel to the cell;
the arrangement being such that when an electric field is applied to the electrode structures the color of light passing through the device is observed to vary with variation in applied electric voltage.

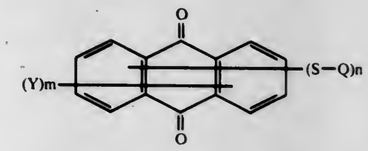
4,232,949

LIQUID CRYSTAL COMPOSITIONS CONTAINING PLEOCHROIC DYE

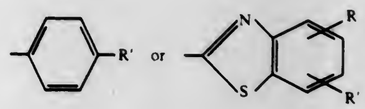
William A. Huffman, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 23, 1979, Ser. No. 14,540
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 350—349 **14 Claims**

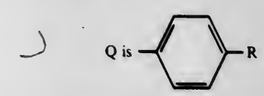
1. A composition having positive dielectric anisotropy comprising at least one nematic liquid crystal material having positive dielectric anisotropy and a pleochroic dye compound in an amount effective to provide a pleochroic character having the general formula:



wherein
Y is independently, $-NH_2$, $-NO_2$ or $-OH$;
Q is independently,



and (S—Q) is present only in one or more of positions 1, 4, 5 and 8;
R and R' independently represent hydrogen or a nonionic substituent;
m is 0, 1 or 2;
n is an integer from 1 to 4; and
m+n is 4 or less;
provided, that when



then n=2, m=0, and S—Q is present only in positions 1 and 4, 1 and 5, 1 and 8, 4 and 5 or 5 and 8.

4,232,950

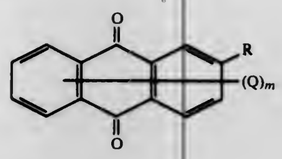
LIQUID CRYSTAL COMPOSITIONS INCLUDING PLEOCHROIC DYE

Judith L. Benham, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 23, 1979, Ser. No. 14,541
Int. Cl.³ C09K 3/34; C02F 1/13
U.S. Cl. 350—349 **14 Claims**

1. A composition having positive dielectric anisotropy comprising at least one nematic liquid crystal material having positive dielectric anisotropy and a pleochroic dye in an

amount effective to provide a pleochroic character having the general formula:



wherein

Q is independently $-NH_2$, $-NO_2$, $-OH$, $-Cl$ or $-F$;
R is $-CH_3$, $-OCH_3$ or $-H$; and
m is an integer from 1 to 4.

4,232,951

MESOMORPHIC ISOCYANATE EXTENDED RIGID POLYMERS

Shaul M. Aharoni, Morris Plains; John P. Sibilia, Livingston, and Deborah R. Kozlowski, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 4, 1978, Ser. No. 931,211
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 350—350 R **8 Claims**

1. In a device for displaying indicia, performing memory functions or indicating temperature, comprising (1) a containing structure for liquid capable of liquid-crystalline behavior; (2) a heat source or electrical field source so positioned with reference to said structure, that under the influence of applied heat or an electrical field from said source, the liquid-crystalline behavior of said liquid is induced, said behavior resulting in the displaying of indicia, performing of memory functions, or indicating of temperature; and (3) a means for observing said behavior; the improvement which comprises providing as said liquid one from the group consisting of a liquid-crystalline polyisocyanate homopolymer or copolymer, liquid-crystalline solutions thereof, and liquid-crystalline solutions of a non-liquid-crystalline polyisocyanate homopolymer or copolymer; said homopolymer or copolymer consisting essentially of isocyanate units of formulae:

R—NCO,

wherein R is

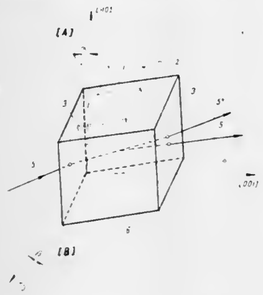
(1) linear C_4 or linear or branched C_5-C_{12} alkyl, or substituted alkyl;
(2) linear C_4 or linear or branched C_5-C_{12} terminal alkenyl, or substituted terminal alkenyl; said formulae including, for copolymers, an admixture of isocyanate units wherein R is of formulae (1) or (2), or mixture thereof, with isocyanate units of the formula:
(3) $Ar—(CH_2)_n—NCO$, wherein Ar is phenyl or substituted phenyl and n is an integer value of 3 to 4; or an admixture of isocyanate units wherein R is of formulae (1), (2) or (3), or mixture thereof, with isocyanate units of the formula:
(4) R—NCO, wherein R is linear C_1-C_3 alkyl or substituted alkyl; and in the above formula (1)-(4) inclusive, any substituents on R and Ar are inert under the polymerization conditions and do not adversely affect the liquid-crystalline behavior of said polyisocyanate, and the molar ratios of Ar-containing isocyanate units to R-containing isocyanate units, in said copolymers thereof, are about 4:1 to 1:3.

4,232,952

ACOUSTO-OPTIC DEVICE

Cestmir Barta; Jiri Ctyroky, both of Prague, Czechoslovakia; Iraida M. Silvestrova, and Jurij V. Pisarevskij, both of Moscow, U.S.S.R., assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Mar. 29, 1979, Ser. No. 25,267
Claims priority, application Czechoslovakia, Apr. 1, 1978, 2106/78
Int. Cl.³ G02F 1/33
U.S. Cl. 350—358 **2 Claims**



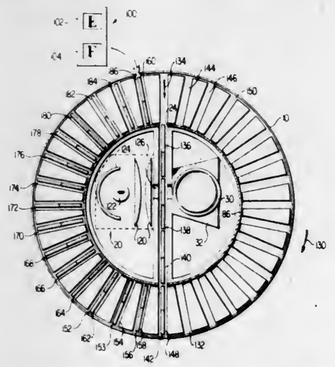
1. An acousto-optic device comprising a single crystal of pure or mixed univalent mercury halide formed in the shape of a parallelepiped having a first face provided with a source of acoustic wave, and a pair of opposite faces polished for the entrance and exit of light waves, said first face being perpendicular to the direction [A], said direction [A] being inclined from the crystallographic direction [110] about the crystallographic direction [110] by an angle α said crystal being simultaneously inclined from the crystallographic direction [110] about the direction [A] by an angle β so that the edge formerly parallel to the [110] direction points in the direction [B] and two opposite faces are simultaneously parallel to the directions [A] and [B].

4,232,953

GRAVITY-FEED ROTARY TRAY SLIDE PROJECTOR

Fernando Alvarez-Sabater, P.O. Box 3628, Caracas 101, Caracas, Venezuela

Filed Jun. 27, 1979, Ser. No. 52,952
Int. Cl.³ G09F 11/30; G03B 23/02
U.S. Cl. 353—111 **10 Claims**



1. In a combination slide projector and rotary slide tray wherein the slide projector includes lamp means for illuminating a slide, projection optics means for projecting an illuminated slide, and means for rotating the rotary slide tray, and wherein the slide tray has slots for receiving radially arranged slides for projection, the improvement comprising:

said slide tray having diametrically opposed slots arranged vertically, and said projector having a fixed central portion positioned inside the tray, said lamp means and projection optics means being arranged on the fixed central portion of the projector at the center of said rotary slide tray;

a slide passage in said fixed central portion having an entrance and an exit, each of which can be in simultaneous registry with diametrically opposed slots in said rotary slide tray containing said slides, said slide passage being arranged between said lamp means and said projection optics means and having a projection aperture located therein and aligned with the optical axis of said lamp means and said projection optics means;

said slides to be projected being planar double slides formed of two individual single slides, each having a photographic image thereon and being arranged with like horizontal edges adjacent each other; and

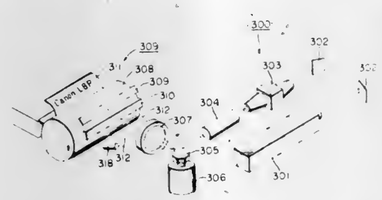
said slides being contained in said slots in a predetermined pattern such that not all available slots contain a slide; whereby, upon causing said vertically arranged rotary slide tray to rotate, said slides are caused to drop from said rotary slide tray under the force of gravity into the entrance of the passage and to abut slides already in slots in the rotary slide tray such that one image of said double slide is aligned with said projection aperture and the image thereon is projected, and upon further rotation of said rotary slide tray, said slide will fall under the force of gravity into an empty slot in said rotary slide tray.

4,232,954

RECORDING POSITION ADJUSTER

Takashi Kitamura, Yokohama; Asao Watanabe, Higashikurume; Takashi Nakano, Yokohama; Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki, and Taisuke Tokiwa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 616,675, Sep. 25, 1975, Pat. No. 4,059,833. This application Sep. 9, 1977, Ser. No. 831,919
Claims priority, application Japan, Feb. 3, 1975, 50-14544; Feb. 4, 1975, 50-14530; Feb. 4, 1975, 50-14534; Feb. 13, 1975, 50-18528; Mar. 1, 1975, 50-25120
Int. Cl.² G03B 15/00
U.S. Cl. 354—7 **33 Claims**



1. A character size changing apparatus comprising:

(a) a beam forming means which, by application of character dot signals, forms a beam modulated by the character dot signals;
(b) deflecting means which deflects the beam obtained from said beam forming means to scan a recording medium;
(c) signal generating means which, by application of character signals and scanning line instructing signals, generates character dot signals corresponding to said character signals and belonging to the instructed scanning lines;
(d) counting means for forming the scanning line instructing signals, wherein said counting means advances according to the number of times the beam scans said recording medium;
(e) instructing means for instructing the size of a character to be formed on said recording medium; and
(f) control means for controlling said counting means to advance only once in response to a plurality of beam scans when a large character size is instructed by said instructing means.

4,232,955

MEMORY LOCKING MEANS OF AN EXPOSURE CONTROL CIRCUIT FOR A CAMERA

Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Continuation of Ser. No. 882,757, Mar. 2, 1978, abandoned, which is a continuation of Ser. No. 703,607, Jul. 8, 1976, abandoned. This application Aug. 30, 1979, Ser. No. 71,257
Claims priority, application Japan, Jul. 8, 1975, 50-83864
Int. Cl.³ G03B 7/089
U.S. Cl. 354—51 **5 Claims**



1. A memory locking means of an exposure control circuit for a camera including a light measuring circuit for constantly supplying a changing voltage output indicative of changing scene brightness, a memory circuit connected therewith for memorizing the voltage output of the light measuring circuit, and normally closed first switching means connected in series between the light measuring circuit and memory circuit which is opened in response to shutter release operation for locking and memorized voltage in the memory circuit, electronic switching means connected in series with the first switching means between the light measuring circuit and the memory circuit for locking the memorized voltage in the memory circuit independently of the first switching means, a time constant circuit connected between a power source and said electronic switching means, and normally open manually operable second switching means connected between said time constant circuit and said power source, said time constant circuit being adapted to turn on said electronic switching means when the manually operable second switching means is turned on and turn off said electronic switching means when a time period determined by the time constant circuit has lapsed since the manually operable second switching means was turned on.

4,232,956

DATA RECORDABLE CAMERA

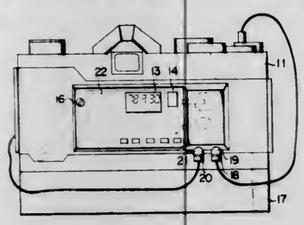
Akihiko Hashimoto, Hachioji, and Tamotsu Koiwai, Akikawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 80,160
Claims priority, application Japan, Oct. 3, 1978, 53-121833
Int. Cl.³ G03B 17/24
U.S. Cl. 354—106 **7 Claims**

1. A data recordable camera comprising:

data producing means for producing at least a time data and a timing data;
data recording means for converting the time data from said data producing means into an optical image to exposure a film;

data display means for displaying selectively the time data and timing data from said data producing means; and



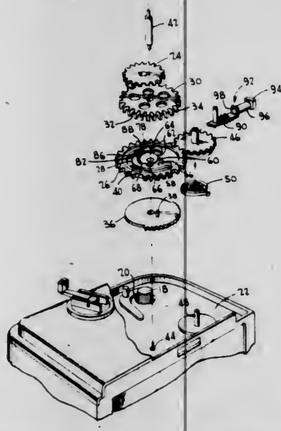
means for transferring the timing data from said data producing means to a motor drive device whereby the motor drive device is driven at a timing of the timing data.

4,232,957

CAMERA MULTIPLE EXPOSURE CONTROL MECHANISM

John M. Kovacs, 45-2 Royal Crest Dr., Nashua, N.H. 03060

Filed Sep. 7, 1979, Ser. No. 73,196
Int. Cl.³ G03B *19/02, 17/26*
U.S. Cl. 354—209 **10 Claims**



1. A multiple exposure control mechanism for a camera having a body with a magazine activating gear operable as a shutter is cocked to drive a film take-up spool via a film advance gear mechanism including a main gear means driven by the magazine activating gear and intermediate gear means coupling the main gear means with the film take-up spool in a film magazine detachably connected with the camera body, said multiple exposure control mechanism comprising

pawl means carried on and rotatable with the main gear means and movable into and out of engagement with the intermediate gear means;

cam means carried on the main gear means having a cam surface positioned to engage said pawl means and movable to control movement of said pawl means relative to the intermediate gear means; and

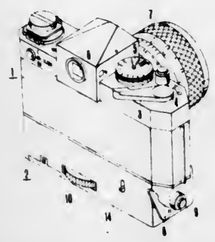
actuating means mounted on the film magazine and selectively movable to engage and move said cam means against said pawl means whereby said actuating means controls engagement of said pawl means with the intermediate gear means to selectively prevent the magazine activating gear from driving the film take-up spool when the shutter is cocked thereby permitting multiple exposures of a film frame.

4,232,958

MEANS FOR ADVANCING FILM IN CAMERAS HELD IN VARIOUS FILM FRAME ORIENTATIONS

Hidehiko Fukahori, Kawasaki; Tomonori Iwashita, Fuchu, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1979, Ser. No. 58,205
Claims priority, application Japan, Jul. 18, 1978, 53-87327
Int. Cl.³ G03B *1/00, 7/26, 17/02, 17/38*
U.S. Cl. 354—212 **9 Claims**



1. For an elongated film format camera having a housing and a winding arrangement with a manual winding member and a shutter release arrangement with a shutter release member located on the housing in a first position relative to an operator's hand position for convenient use when the camera is held for an elongated, horizontal film format, a vertical format adapter comprising:

an adapter housing attachable to a camera housing,

coupling means on said adapter housing for engaging the winding arrangement and the shutter release arrangement in the camera,

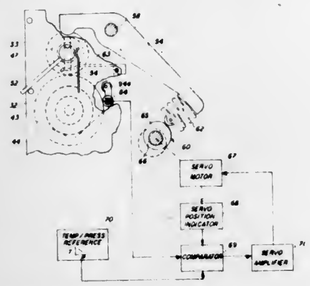
a second manual winding member and a second shutter release member coupled to the coupling means and located on the adapter housing at positions corresponding to the first manual winding member and the first shutter release member relative to the hand of an operator when the adapter is attached to the camera and the adapter and camera are held for vertical film format.

4,232,959

TONER IMAGE FUSING APPARATUS

Antoun I. Ateya, and Walter A. Stryjewski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,556
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU **8 Claims**



1. In apparatus for fusing a toner image carried by a support, and including first and second members forming a nip through which a support bearing a toner image is passed, means for heating at least one of said members and means for sensing the temperature of said at least one heated member, the improvement comprising:

means for supporting said members in variable pressure engagement; and

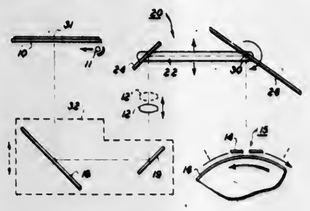
means for varying the pressure of engagement of said members while said members are engaged in response to the sensing by said sensing means of a change in temperature of said at least one heated member.

4,232,960

SCANNING SYSTEM

Edwin F. Glab, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1979, Ser. No. 13,098
Int. Cl.³ G03G *15/28*; G03B *27/70*
U.S. Cl. 355—8 **9 Claims**



1. A scanning system for projecting light images of a stationary object at a predetermined magnification ratio along an optical path onto a curvilinear photosensitive surface moving through an exposure station in a first direction comprising

a flat platen supporting the object,

an aperture plate located at the exposure station adjacent the path of movement of the photosensitive surface, the aperture plate enabling only that portion of the light image passing through the aperture to expose the photosensitive surface,

the aperture plate moving in a direction opposite the direction of movement of the photosensitive surface, and

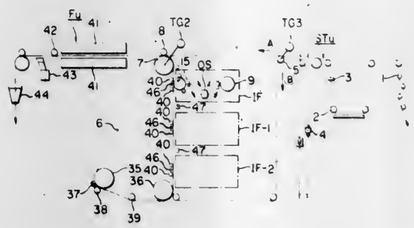
an optical system disposed along the optical path between the object and the photosensitive surface, the optical system including first means movable in a linear direction towards and away from the photosensitive surface to alter the length of the optical path and a second means rotatable about an axis to scan the light image.

4,232,961

IMAGE FORMATION APPARATUS

Takeshi Masuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,547
Claims priority, application Japan, Jul. 22, 1977, 52/88175
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 R **13 Claims**



1. An image formation apparatus comprising:

means defining a plurality of drums each having an original image associated therewith;

a photosensitive medium;

means for forming a latent image corresponding to each original image on said photosensitive medium;

means for forming a visible image on the basis of the latent image;

means for transferring the visible image to a recording material; and

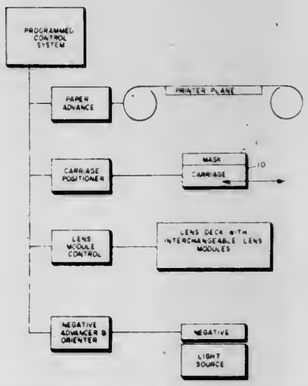
means for adjusting the axial deviation of each of said drums to align the original images thereon such that the transferred visible images are aligned.

4,232,962

FORMAT ASSEMBLER FOR PHOTOGRAPHIC PRINTER

Mark R. Sauer, Williamson, N.Y., assignor to UNL Incorporated, Webster, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,345
Int. Cl.³ G03B *27/44*
U.S. Cl. 355—46 **8 Claims**



1. A format assembler for a photographic printer having a control system controlling component movements that include movements of interchangeable lens modules with different lens arrays, a paper advance along a printing plane, and a film negative advancer and orienter, said format assembler comprising:

a. a carriage movable along a path parallel with said printing plane and extending in the direction of said paper advance between said lens modules and said printing plane;

b. a mask carried in a fixed position on said carriage to be interchangeable with other masks having different shapes;

c. said mask having a predetermined shape related to light transmitted through preselected lenses of said lens arrays;

d. means for positioning said carriage in a predetermined plurality of positions along said path for locating said mask in different positions wherein said mask blocks said light transmitted through different preselected lenses of said lens arrays;

e. said predetermined shape of said mask being arranged to block off light through preselected lenses of one lens array when said mask is in a first position to allow exposure of one longitudinal side of a paper area and then to block off light transmitted through preselected lenses of a second lens array when said mask is in a second position to allow a successive exposure on the opposite longitudinal side of said paper area without advancing said paper; and

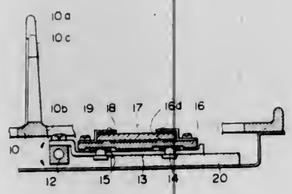
f. said control system including means for controlling said positioning of said carriage in programmed relation to said component movements.

4,232,963

DEVICE FOR POSITIONING MOVABLE REFLECTOR OF OPTICAL SYSTEM OF ELECTROPHOTOGRAPHIC COPYING APPARATUS

Tadao Koike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 2, 1979, Ser. No. 16,722
Claims priority, application Japan, Mar. 6, 1978, 53/27427[U]
Int. Cl.[3] G03B *27/48*
U.S. Cl. 355—49 2 Claims



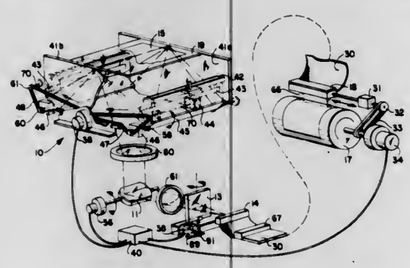
1. A device for positioning a movable reflector having a reflection surface and of an optical system of an electrophotographic copying apparatus including a lens and a plurality of reflectors, at least one of said reflectors being movable between an operative position in which said movable reflector is disposed in an optical path and obstructs the normal optical path from another fixed reflector and in an inoperative position in which said movable reflector is out of the optical path, said device comprising:
a reference plate;
means for securing said movable reflector thereto;
a bracket supporting said reference plate;
a housing for said bracket;
means pivotally mounting said bracket on said housing;
a plurality of positioning stoppers on said housing for positioning said movable reflector; and
a plurality of reference surfaces on said reference plate, each of said reference surfaces being machined to the same level, some surfaces being in contact with the reflection surface of the reflector and each of the other surfaces being brought into contact with one of said positioning stoppers in a predetermined position when said reflector is in its operative position.

4,232,964

DOCUMENT ILLUMINATION SYSTEM

Eugene Nodov, Richardson; Burton W. Scott, Plano, both of Tex.; George W. Denlinger, Springboro, and Richard Sutera, Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 12, 1979, Ser. No. 75,054
Int. Cl.[3] G03B *27/54*
U.S. Cl. 355—70 19 Claims



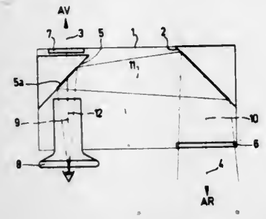
7. Document illumination apparatus comprising a document support member for supporting a document in a flat scanning plane, a pair of parallel illumination line sources positioned in a plane parallel to said flat scanning plane and at opposite ends of the area of document support, anamorphic optical means for receiving illumination from said line sources and directing substantially one-dimensional images thereof toward superimposed positions on said scanning plane, scanning means for scanning said superimposed images across said scanning plane and refocussing means for adjusting the foci of said images during said scanning.

4,232,965

OPTICAL SIGHTING DEVICE

Georges Sauerwein, Feucherolles, France, assignor to AB Broderna Kjellstrom, Stockholm, Sweden

Filed Aug. 25, 1978, Ser. No. 936,802
Claims priority, application France, Sep. 2, 1977, 77 26757
Int. Cl.[3] G01C *1/00*
U.S. Cl. 356—144 7 Claims



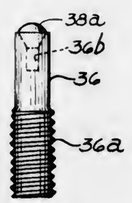
1. A handheld optical sighting device which permits simultaneous observation of two objects, one directly forward of an observer and the other directly to the rear of the observer along parallel paths comprising, sighting means and reflective surfaces enabling images of the two objects to substantially coincide when the sighting device is in alignment with and between the two objects located forward of and to the rear of the sighting device, respectively, wherein the sighting means for the forward object comprises means for directly receiving the light rays coming from said forward object so that these rays impinge an the observer's eye without being reflected, whilst light rays coming from the rear object are subjected to a 180° reflection resulting from two successive reflections of 90°, caused by said reflective surfaces before entering into the said sighting means.

4,232,966

CONTACT LENS DEVICE

Fred Schpak, Evanston, and Ian D. Malkes, Morton Grove, both of Ill., assignors to Laco Laboratories, Inc., Skokie, Ill.

Filed Jun. 12, 1979, Ser. No. 47,897
Int. Cl.[3] G01N *21/01*
U.S. Cl. 356—244 16 Claims



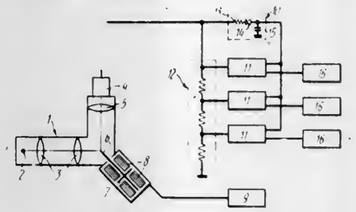
1. A device for supporting a contact lens to enable the parameters of the lens, including the curvature of the surface of the lens, to be measured with an optical instrument comprising: a body member; and a lens-engaging, solid, resilient material supported by the body member, said lens-engaging material being resiliently deformable by the surface of a contact lens in engagement therewith and capable of adhering by slight pressure to said surface of the lens whereby the lens can be oriented in any desired plane with respect to an optical measuring instrument without movement in relation to or dislodgment from the lens-engaging material, said lens-engaging material being further characterized in that it is dry, non-blocking and non-smearing with respect to said surface of the contact lens and has a refractive index such that it substantially eliminates reflection from said surface of the lens.

4,232,967

INSTRUMENT FOR MEASURING SIZES AND QUANTITY OF PARTICLES IN FLUID MEDIUM

Konstantin A. Grachev, Naberezhnaya Kosmonavtov, 3, kv. 67; Viktor A. Berber, ulitsa Shelkovichnaya, 184, kv. 65; Viktor E. Sokolov, ploschad Ordzhonikidze, 14, kv. 17; Vladimir V. Pavlov, ulitsa Sovetskaya, 21, kv. 56; Alexei N. Popov, ulitsa Zheleznodorozhnaya, 5/9, kv. 31, and Vladimir A. Zolotenko, 2 Detsky proezd, 2, kv. 18, all of Saratov, U.S.S.R.

Filed Jun. 30, 1978, Ser. No. 920,998
Int. Cl.[3] G01N *15/02*
U.S. Cl. 356—336 4 Claims



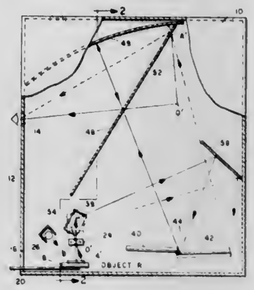
1. An instrument for measuring the size and quantity of particles in a fluid medium, comprising a dark chamber; a light source accommodated within said chamber; means for shaping a light beam emitted by said light source received in said chamber; means for introducing the fluid medium into said chamber so that it crosses the light beam shaped from the light source; an element simulating a calibrated particle mounted within said chamber; a light-sensitive device installed in said chamber to convert the light scattered by particles contained in the flow of the fluid medium which crosses the shaped light beam emitted by said light source, and also a part of the light beam, directed from said element to electric pulses; said element for simulating a calibrated particle being adapted to periodic change, in the course of measurements, the brightness of the light received by said light-sensitive device; means for varying the brightness of the part of light received by said light-sensitive device; a converter circuit for converting output electric pulses of said light-sensitive device to d.c. voltage, the input of said circuit being connected to the output of said light-sensitive device; a divider having an input connected to the output of said light-sensitive device; threshold devices having their signal inputs connected to the outputs of said divider which serves to distribute the electric pulses received from light-sensitive device according to the size of particles to said threshold devices; the output of said converter circuit being connected to reference inputs of said threshold devices whose trigger levels depend on the d.c. voltage at the output of said converter circuit; means for counting and displaying the quantity of pulses corresponding to the number of particles in the flow being studied, separately for each size group.

4,232,968

OPTICAL COMPARATOR WITH 3-D IMAGE

Paul S. Kempf, 842 Juanita, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 895,245, Apr. 10, 1978, Pat. No. 4,168,912. This application Dec. 26, 1978, Ser. No. 972,655
Int. Cl.[3] G01B *9/08*
U.S. Cl. 356—393 11 Claims



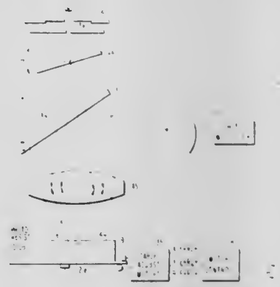
1. An optical comparator for providing a 3-D image to one eye, comprising:
a housing;
a holder movably mounted in said housing and having means for holding a pair of objects to be compared in spaced corresponding alignment;
a pair of projection lenses spaced from said holder and positioned to project images of the objects in separate optical paths, one optical path including means for inverting and reverting the image;
separating means positioned to receive the projected images and separate corresponding portions of the images along a common dividing line;
image forming means for forming a composite of the projected images joined at the common dividing line;
and said housing having an eye opening positioned for viewing said image forming means.

4,232,969

PROJECTION OPTICAL SYSTEM FOR ALIGNING AN IMAGE ON A SURFACE

Janusz S. Wilczynski, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1979, Ser. No. 43,924
Int. Cl.[3] G01B *11/27*
U.S. Cl. 356—401 26 Claims



1. A projection optical apparatus for aligning an image on a surface having at least one alignment edge, comprising:
source means for generating source radiation;
mask means for interrupting said source radiation and passing at least an alignment portion of said source radiation;

light coupling means having at least one radiation transparent portion for passing said alignment portion of source radiation in a projection direction and passing in an opposite direction a portion of radiation reflected from the surface; said light coupling means having a radiation transfer means for transmitting source radiation that is diffracted by said at least one alignment edge;

lens means for focusing said alignment portion of said source radiation to form at least one alignment image on said surface and for focusing the radiation reflected from the surface to pass through said at least one radiation transparent portion of said light coupling means, and for focusing to a separate location the radiation diffracted by said at least one alignment edge; and

alignment means for moving said at least one alignment image relative to said at least one alignment edge and monitoring the intensity of said diffracted radiation, and for aligning said surface with respect to said mask means at an alignment position defined by a maximum intensity of said diffracted radiation.

4,232,970

APPARATUS FOR AUTOMATIC DIAGNOSIS OF CELLS

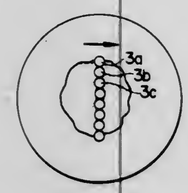
Ichiro Sawamura, and Kosaku Tsuboshima, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,771

Claims priority, application Japan, Apr. 30, 1977, 52-50559

Int. Cl.[3] G01N *21/22, 33/16, 21/60*

U.S. Cl. 356—432 **4 Claims**



1. An apparatus for automatic diagnosis of cells wherein sequential steps from delivery of a sample to a diagnosis thereof are automatically performed, comprising:

a microscope having a displaceable scanning stage and an objective for producing an image of a sample;

a sample carrier including means for supporting a plurality of samples and means for delivering one of said samples to the scanning stage;

automatic focusing means for focusing the microscope with respect to the sample delivered to the scanning stage, said automatic focusing means comprising a scan sensor including a pair of pinholes which are separated from each other by a predetermined distance and are located before and behind the position of the image plane of said objective of said microscope, a pair of pinhole light sensitive devices for receiving light passing through said pinholes and for generating an output representative of the light received thereby, a galvanometric mirror located to reflect light received from said objective, and optical means for splitting light reflected by said galvanometric mirror so as to substantially simultaneously pass through each of said pinholes;

moving means for moving the scanning stage to scan said sample;

detector means for detecting diameter L and absorbance A of each nucleus of selected cells included in said sample as it moves relative to said detector means, said detector means comprising a plurality of optical fibres each having first and second ends, said first ends being disposed in alignment with each other and at a position where the magnified image of said sample is focused by said objective of said microscope for scanning said sample, and a light sensitive device for each of said optical fibres arranged opposite the second ends of said optical fibres for converting light detected by said light sensitive devices into an electrical signal;

processing means for processing the electrical signals developed by said detector means to calculate a value of AL^2 proportional to the amount of DNA included in each said nucleus of the cells selected in said sample and for generating output data representative of the processed electrical signals;

determination means responsive to said output data generated by said processing means for sorting said values of L and corresponding values proportional to AL^2 for each said nucleus of said cells selected in said sample into one quadrant of a system of coordinates with an axis of abscissas for L and an axis of ordinates for AL^2 according to whether said value L and corresponding value AL^2 are greater than or less than a predetermined reference value for L and AL^2, and for determining whether said cells are affected by cancer; and

control means for controlling the operation of said sample carrier, said automatic focusing means, said moving means, said detector means, said processing means and said determination means in the proper sequence to effect automated diagnosis.

4,232,971

INTEGRATING SPHERE TYPE STANDARD LIGHT SOURCE DEVICE

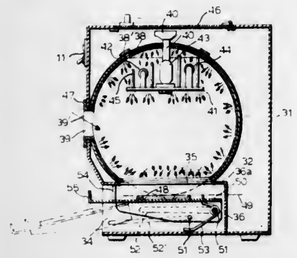
Shigeru Suga, 20-2, Yoyogi 5-chome, Shibuya-ku, Tokyo, Japan

Filed Mar. 22, 1979, Ser. No. 23,094

Claims priority, application Japan, Mar. 23, 1978, 53-036113[U]

Int. Cl.[3] G01N *21/47*; G01J *1/00*

U.S. Cl. 356—446 **7 Claims**



1. An integrating sphere type standard light source, comprising: a spherical shell having the inner surface coated with a white coating having a high reflectivity, said shell having a light source aperture in the top thereof, a viewing aperture in the side thereof and a specimen exposure aperture in the bottom thereof; a light source means mounted in said light source aperture and depending into said shell and including a source of light and a light shielding plate between said source of light and the remainder of the interior of said shell, said light shielding plate being coated with a white coating having a high reflectivity; a specimen supporting plate beneath said specimen exposure aperture and normally positioned for supporting a specimen at the bottommost point of an imaginary spherical surface which is an extension of the internal surface of said shell into said specimen exposure aperture; and means on which said specimen supporting plate is mounted for moving said specimen plate into and out of the normal position thereof for placing a specimen to be observed on said specimen supporting plate.

4,232,972

METHOD AND APPARATUS FOR MIXING SUBSTANCES

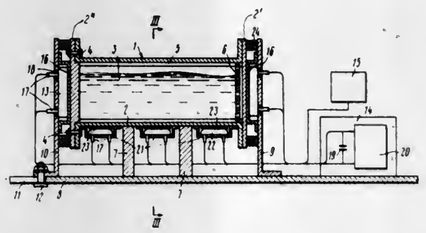
Igor A. Levin, ulitsa, 15, korpus 1, kv. 113, Moscow, Petrozavodskaya, U.S.S.R.

Filed Mar. 21, 1979, Ser. No. 22,437

Claims priority, application U.S.S.R., Apr. 6, 1978, 2593846

Int. Cl.[3] B01F *11/00*

U.S. Cl. 366—108 **20 Claims**



1. An apparatus for mixing substances, comprising:

a reservoir having end walls and a side wall;

a mixing means disposed within said reservoir;

a reciprocating movement mechanism of said mixing means;

a current source, having a storage capacitor, of said reciprocating movement mechanism;

eddy current electromagnetic inductors of said reciprocating movement mechanism, disposed in immediate proximity to said end walls of said reservoir and coupled to said current source;

a turn-on sequencer for said eddy current electromagnetic inductors; and

elements of said reciprocating movement mechanism, made of an electrically conductive material being disposed in intimate contact with said eddy current electromagnetic inductors.

4,232,973

CONTINUOUS MIXING APPARATUS FOR FLOWABLE PRODUCTS

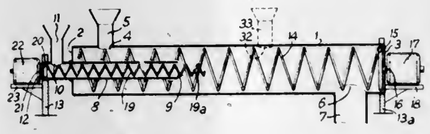
Pierre Ligouzat, Chavenay, France, assignor to Societe Symac, Ruell Malmaison, France

Filed Jan. 17, 1979, Ser. No. 4,169

Claims priority, application France, Jan. 20, 1978, 78 01670

Int. Cl.[3] B01F *15/02, 7/08*

U.S. Cl. 366—157 **20 Claims**



1. Apparatus for continuously mixing two flowable products, the apparatus comprising a first duct having an entry port through which a first flowable product stream can pass into the first duct and an exit port through which the mixed flowable products can pass out of the first duct, first entraining means provided with a helical element and serving to impart helical motion to the first flowable product stream within the first duct, a second duct concentrically mounted within the first duct and provided with an entry port through which a second flowable product stream can pass into the second duct, the second duct being arranged to open into the first duct between the said entry and exit ports thereof to allow said second stream to pass into the first duct, and second entraining means serving to move said second flowable product stream along the second duct, the first and second entraining means being distinct from each other and serving to move the product streams in the same direction.

4,232,974

MEANS FOR THE PRODUCTION OF A MULTI-COMPONENT PLASTICS MATERIAL

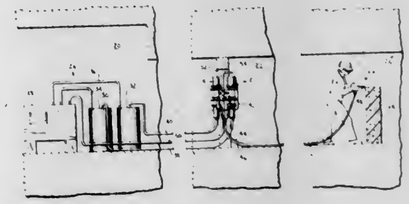
Ludwig Schmidt, Dortmund, and Werner Wellie, Essen, both of Fed. Rep. of Germany, assignors to Ruhrkohle, A.G. and Schaum-Chemie W. Bauer K.G., both of Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 800,224, May 25, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,364

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624752

Int. Cl.[3] B01F *15/04*

U.S. Cl. 366—162 **5 Claims**



1. Foam generating apparatus for producing multicomponent foam at a predetermined site in an underground mine comprising:

supply vessels for at least first and second components of the foam located at a generally fixed location remote from said predetermined site;

a fluid power source located at a generally fixed location remote from said predetermined site;

conduits connected to each of said supply vessels and fluid power source;

a pump means transportable by an operator to a temporary location in proximity with said predetermined site, said pump means comprising a protective casing adapted to be carried on the back of said operator, a plurality of independently operable pumps detachably received within said casing for being protected by same when in use in the mine, said pumps having inputs connected to said supply vessel conduits by which the components of the foam are separately received from said supply vessels and outputs by which the components are separately delivered, and a common power supply connection connected to said fluid power source conduit for driving said pumps; and

foam applying means having conduit means coupled to the outputs of said pumps for conveying the components to said predetermined site, said foam applying means mixing said components and applying same at said predetermined site to form said foam.

4,232,975

PRINT HAMMER CONTROL

Milburn H. Kane, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1979, Ser. No. 42

Int. Cl.[3] B41J *1/26*

U.S. Cl. 400—144.2 **8 Claims**

1. A method of controlling impression in a daisy wheel printer having means for converting required daisy wheel selection times to carrier velocity codes, means for providing

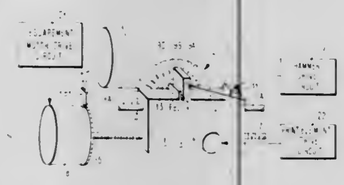
an impact force code, and storage means selectively and sequentially addressed by said codes to obtain sync information, print hammer turn on time information related to said sync information, and print hammer on time information, said method comprising:

(a) addressing said storage means with a velocity code to determine a sync point;

(b) addressing said storage means with said velocity code and an impact force code to determine a turn on time for said hammer relative to said sync point; and

(c) addressing said storage means with said velocity code and said impact force code for determining an on time for said hammer.

3. A system for controlling print impression in a carrier type daisy wheel printer having a print hammer carried by said carrier and wherein the information available to said system is comprised of carrier velocity information based upon character selection time, impact information based on a desired impact force, and carrier position information, said system comprising:



(a) a logic table for storing escapement counts for initiation of hammer cycles for characters to be printed, delays to hammer turn on times, hammer on times, and interlock times;

(b) means for first addressing said table with said carrier velocity information for a character to be printed to obtain an escapement count for initiation of a hammer cycle;

(c) means for comparing said escapement counts for initiation of hammer cycles based on said carrier velocity information with said carrier position information;

(d) means upon a comparison of an escapement count for said character to be printed and said position information for establishing a hammer sync point to be used for determining a hammer turn on time;

(e) means for determining said hammer turn on time based on both said carrier velocity and hammer impact information; and

(f) means for determining a hammer on time for said character to be printed based on said impact information.

4,232,976

RIBBON CARTRIDGE FOR PRINTING MACHINES AND MECHANISM FOR FEEDING THE RIBBON

Francesco Bernardis, and Paolo Prevignano, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

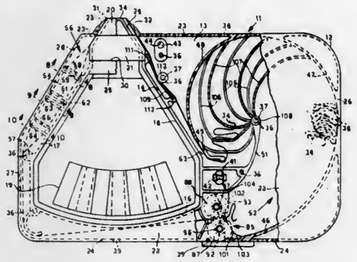
Filed Dec. 22, 1977, Ser. No. 863,420

Claims priority, application Italy, Dec. 29, 1976, 70118 A/76

Int. Cl.³ B41J *33/10*

U.S. Cl. 400—196.1 **3 Claims**

1. A cartridge for an inked ribbon for a printing machine comprising a container having a base, a lid, a series of inner walls defining a storage zone and an inked ribbon disposed in loops distributed at random in said storage zone wherein the storage zone comprises an entrance area, an exit area and a slit, said storage zone being spiral shaped to increase the space for the ribbon from the entrance area to the exit area, said inked ribbon extending through the slit to the exterior of the storage zone, wherein the base and the lid comprise a series of ribs projecting towards the inside of the storage zone, staggered with respect to each other and substantially spiral shaped so as to take the loops of the inked ribbon away from the inner walls



and reduce the density of said loops from the exit area to the slit.

4,232,977

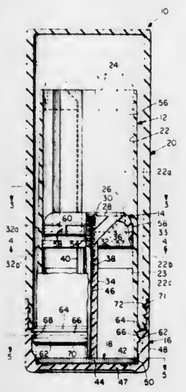
PACKAGE FOR ANTIPERSPIRANT/DEODORANT

Raymond A. Chutter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 18, 1978, Ser. No. 952,357

Int. Cl.³ A45D *40/04*

U.S. Cl. 401—68 **2 Claims**



1. An elevating dispensing package for a stick form product, said package comprising:

an elongated sleeve of molded plastic and having a bore extending therethrough, the upper end of which defines a open mouth, said bore being generally circular in cross section with an upper portion thereof adjacent said mouth provided with at least one lengthwise extending chordal surface which terminates at a location spaced from the mouth of said bore by a distance approximating the length of the range of elevating movement of said package, a smooth, generally cylindrical, intermediate sealing portion and an unobstructed lower portion extending to the lower end of said bore;

an elevating platform of molded plastic slidably disposed within said sleeve bore and adapted for loading into said sleeve through the unobstructed lower portion thereof and to be moved from a lowermost position to an uppermost position therewithin, the platform comprising a product-support surface of generally circular conformation, a depending peripheral skirt, and an elongated, depending, threaded central stem, the upper part of said skirt being provided with lug means thereon to coact with the chordal surface of the upper portion of said sleeve bore to prevent relative rotation therebetween, said platform having a diameter across said lug means which is substantially similar to that of said upper portion and of said sealing portion of the bore of the sleeve to facilitate said loading, the lower part of said skirt having an annular outwardly extending, resilient sealing means associated therewith, the lug means on the upper part of said skirt and the resilient sealing means on the lower part of the skirt being separated by a finite distance, said elevating platform in its lowermost position having said annular sealing means in interference contact with the intermediate cylindrical sealing portion of the sleeve bore to form a circumferential seal between said elevating platform and said sleeve bore and simultaneously having said lug means in contact with the upper portion of said sleeve bore; and

a handwheel rotatably mounted at the lower end of said sleeve, said handwheel having a threaded stem extending axially upwardly therefrom and in threaded engagement with the depending central stem of said elevating platform without extending through said product support surface, so that rotation of said handwheel relative said sleeve and elevating platform provides axial movement of said elevating platform within said sleeve bore without the threaded stem projecting into said product,

whereby said package has a vaportight lower seal when the elevating platform is in its lowermost position and the concurrent capability of axial elevating platform movement within said sleeve.

4,232,978

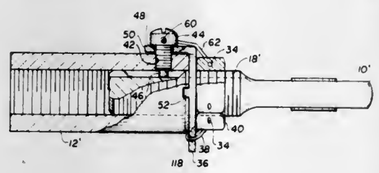
DOUBLE LOCKING DEVICE

Murray Cohen, Seaford, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,498

Int. Cl.² F16B *39/00*

U.S. Cl. 403—317 **10 Claims**



1. Means to double lock a connection, said means comprising:

a first part to be used in a connection, said first part having a longitudinal bore and a slot in its end face and a bore through its sidewall into said longitudinal bore;

a second part to be inserted into and thereby joined with the first part in the longitudinal bore with means therein making the connection between the first part and the second part, said second part having a longitudinal groove;

a lock key having a groove tab within said groove and a slot tab within said slot when interposed with said first part and said second part, said lock key further having a shelf that extends over said first part with a bore through the shelf that upon seating of the slot tab in the slot is aligned with the bore through the sidewall of said first part;

a jamnut to hold said lock key such that the slot tab is in the slot and the bore of the shelf is aligned with the bore through the sidewall of said first part; and

a dog screw with threads of a limited length and a reduced diameter dog extending beyond the threads, said dog screw being insertable through the bore of the shelf and threaded within the bore in the sidewall of said first part that lies under the shelf, said dog being projected into said groove to, with said lock key, prevent removal of said second part from said first part and thereby double lock the connection thereof.

4,232,979

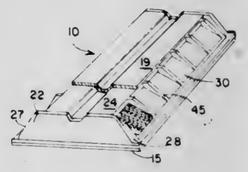
PAVEMENT MARKER

Glenn W. Johnson, Jr., Summit, N.J., and Sidney A. Heenan, Park Ridge, Ill., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 789,266, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,860, Apr. 30, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,186

Int. Cl.³ E01F *9/04*

U.S. Cl. 404—16 **9 Claims**



1. In a pavement marker providing a marking on a roadway surface, the marking being visible from an oncoming vehicle on the roadway, the pavement marker including means to position the marker relative to the associated roadway surface, and including a lens member of light-transmitting synthetic resin having a front face inclined at an angle of at least 15° to the associated roadway surface and a rear face having reflex reflective means on at least a portion thereof for reflecting light transmitted through said front face back toward the source thereof, the improvement comprising a thin sheet of untempered glass having a thickness no greater than about 15 mils fixedly disposed on said front face of said lens member at least in a portion of the areas overlying the reflex reflective means on the rear face of said lens member, said glass sheet being in compression throughout the expected temperature range to which the pavement marker is exposed in use, said glass sheet reducing the degradation of optical efficiency normally caused by abrasive tire contact on said lens member while allowing adequate cleaning of said pavement marker by tire-wiping action whereby the optical efficiency of said pavement marker is enhanced.

4,232,980

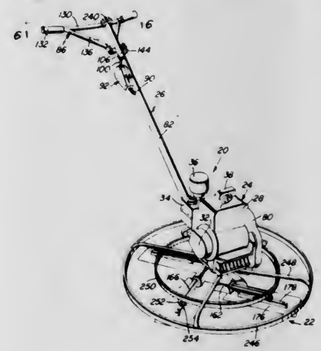
ROTARY POWER TROWEL

Christian T. Tertinek, Canandaigua, and Alan J. Stone, Honeoye, both of N.Y., assignors to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,786

Int. Cl.² E01C *19/22*

U.S. Cl. 404—112 **18 Claims**



16. In a rotary powered trowel having prime mover means,

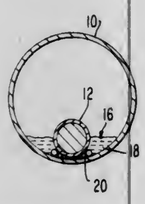
a troweling blade assembly, drive means interconnecting the prime mover means and blade assembly to rotate said blade assembly, and handle means connected to said trowel to enable an operator to manipulate and control the trowel, that improvement comprising said troweling blade assembly including support means connected with and driven by the drive means, said support means including a plurality of sleeves, a blade support arm mounted in each of the sleeves and projecting outwardly therefrom for angular movement about the longitudinal axis of the blade support arm, a longitudinally elongated blade attached to each blade support arm, and means connected with each blade support arm to tilt the blade support arm and blade to vary the pitch of the blade, said means for tilting the blade including an offset lug attached to each blade supporting arm outwardly of the sleeve, a vertically movable thrust plate disposed above the support sleeves for the blade support arms, connecting rods universally, adjustably and positively connecting the thrust plate and lugs, a thrust bearing engaged with the thrust plate, and means operative from the handle means remote from the prime mover means to apply downward thrust on said thrust bearing, thrust plate and lugs to vary the pitch of the blades about the longitudinal axis of the portion of the blade supporting arms received in the support sleeves, said connecting rods preventing the blade from flopping freely when the trowel is lifted with the blades spaced from the working surface.

4,232,981

BEADED LIQUID PRODUCT AND METHOD FOR REDUCING COEFFICIENT OF FRICTION

Fred C. Lee, San Francisco, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Jun. 26, 1978, Ser. No. 918,899
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—154 **39 Claims**



1. A method of moving an inner member along an outer support capable of containing a flowable mixture comprising: providing a flowable, pumpable mixture of a liquid and a number of beads disposed in the liquid; moving the mixture into and along the support in a flow, the specific gravities of the liquid and the beads being different; decreasing the flow so that the beads will be distributed to form a work field of beads near one inner surface portion of the support after said flow has decreased; and moving the member along the support in contact with the mixture and in engagement with the beads in said work field to minimize the friction between the member and the support.

4,232,982

EXCAVATING AND PIPELINE INSTALLATION SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 683,970, May 6, 1976, Pat. No. 4,116,014. This application May 24, 1978, Ser. No. 909,002
Int. Cl.² F16L *1/02*
U.S. Cl. 405—179 **4 Claims**

1. A method of installing a pipeline in a predetermined location beneath the surface of the earth comprising:
joining a plurality of pipe sections end to end to form a pipe string;
positioning the pipe string on the surface of the earth directly above the predetermined location;
receiving the pipe string within a pipe string receiving zone located between laterally adjacent first and second excavating wheels;
rolling the pipe string over bolster rollers contained within the pipe string receiving zone;
continuously excavating a pipeline receiving trench directly beneath the received and positioned pipe string;



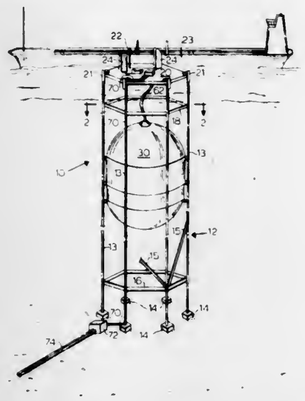
continuously conveying the material excavated from the pipeline receiving trench rearwardly;
rolling the pipe string under a plurality of pipe rollers;
exerting a downwardly directed force by the pipe rollers on the pipe string;
continuously positioning the pipe string in the pipe string receiving trench subsequent to the excavation thereof; and
continuously redepositing the excavating material into the pipeline receiving trench on top of the pipe string positioned therein.

4,232,983

OFFSHORE SUBMARINE STORAGE FACILITY FOR HIGHLY CHILLED LIQUIFIED GASES

Sidney F. Cook, 2800 Jefferson Way SW., Corvallis, Oreg. 97330, and Mark Stolowitz, 6924 Plymouth #99, Stockton, Calif. 95207, assignors to Sidney F. Cook and Mark L. Stolowitz, both of Corvallis, Oreg.

Filed Dec. 7, 1978, Ser. No. 967,472
Int. Cl.³ B63B *35/00*; E02B *17/00*; F17C *1/12*
U.S. Cl. 405—210 **12 Claims**



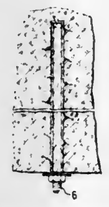
2. An offshore, submarine storage facility in the ocean and the like for liquid energy gases and the like at cryogenic liquifying temperatures, said facility comprising:
frame means in the sea aligned in a generally vertical orientation;
insulated tank means mounted to move up and down within said frame means, said tank means including:
positioning means for moving said tank means up and down within said frame means to various selected storage depths in the sea,
sea pressure transfer means for transferring ambient sea pressure at selected depths at which said tank means is positioned from time to time to the contents stored in said tank means to provide ambient pressure at said selected depth to said contents so as to promote and maintain liquid state thereof,
volume expansion and contraction means for expanding and contracting the interior storage volume of said tank means vertically in accordance with the volume of liquid stored therein and ambient external pressure gradient applied from time to time,
insulated flexible transfer conduit means extending from the surface of the sea to said tank means for transferring liquid to and from said tank means.

4,232,984

METHOD OF ANCHORING ELEMENTS AND A DEVICE FOR CARRYING OUT SAID METHOD

Evert G. I. Sandahl, Bjärred, Sweden, assignor to Cementa AB, Malmo, Sweden

Filed Sep. 8, 1978, Ser. No. 940,663
Claims priority, application Sweden, Sep. 21, 1977, 77105674
Int. Cl.³ E04G *21/12*
U.S. Cl. 405—261 **4 Claims**



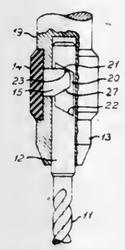
1. A cartridge for anchoring elements in rock, concrete and similar material by means of embedding a portion of the element which is to be anchored in a borehole, comprising a casing which is closed but which is penetrable by a said anchoring element to be subsequently inserted therein, a binder mixture which substantially fills the casing, and a rigidifying member surrounding the binder and which is yieldable without spring effect when a said element penetrates the cartridge, said casing being penetrable to water but not to said binder.

4,232,985

PERCUSSIVE TOOL SHAFT

Mogens B. Nielsen, Dalvangsvej 2, DK-2600 Glostrup, Denmark

Division of Ser. No. 785,165, Apr. 6, 1977, Pat. No. 4,146,240. This application Jan. 15, 1979, Ser. No. 3,402
Claims priority, application Denmark, Apr. 7, 1976, 1651/76
Int. Cl.³ B23B *51/00*
U.S. Cl. 408—226 **7 Claims**



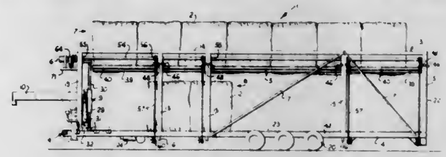
1. For use with a rotary tool holder having a socket member rotatable in at least one direction, a substantially cylindrical bore in said socket member, and a driving element defining upper edge surface means, first driving surface means, and first cam surface means, said driving element mounted in said socket member so as to be displaceable transversely to the longitudinal axis of said bore between an extended position in which part of said driving element extends into said bore, and a retracted position in which said element is retracted from said bore, a shaft for a tool of the percussive type comprising a shaft member having cutting means at one end and a free end capable of being inserted into said bore, said shaft member defining a substantially cylindrical surface, at least one recess formed in said cylindrical surface for engaging with said driving element when said shaft member is inserted into said bore, said recess being defined and spaced from said free end and forming adjacent to said free end an abutment surface means extending transversely to the longitudinal axis of said shaft member, said recess defining second driving surface means and second cam surface means, said second cam surface means having a radial distance from the longitudinal axis of said tool shaft decreasing gradually in a first rotational direction and co-operating with said first cam surface means so as to move said driving element out of engagement with said recess when said shaft member is rotated relative to said socket member in a first direction, the axial distance between said abutment surface means and said free end of said tool shaft member decreasing in said first direction and co-operating with said upper edge surface means to bring said first driving surface means into engagement with said second driving surface means to actuate said tool shaft for rotation relative to said socket member in a second direction opposite to said first direction when said abutment surface means and said upper edge surface means are pressed together by axially directed forces when said shaft member is operatively positioned within said bore, said second driving surface means having a radial distance from the longitudinal axis of said tool shaft increasing gradually in said first rotational direction.

4,232,986

TRAILER WITH MULTIPLE BALE ELEVATING APPARATUS AND METHOD OF BALE HANDLING

Howard L. Johnson, 4500 NW. 108th St., Kansas City, Mo. 64154

Filed Sep. 28, 1978, Ser. No. 946,819
Int. Cl.³ B60P *1/38*
U.S. Cl. 414—24.5 **6 Claims**



1. A multiple bale handling apparatus comprising:
(a) an elongated mobile frame;
(b) conveyor means extending along said frame, said conveyor means being capable of supporting a plurality of bales therealong;
(c) elevator platform means extending along said frame;
(d) elevating means mounted on said frame, connected to said platform means, and operable to elevate said platform means with a bale thereon from a position wherein said bale is resting on said conveying means to a height above said conveying means permitting additional bales to be received on said conveyor means, whereby said frame supports bales in upper and lower layers simultaneously for transport;
(e) said platform means including a plurality of platform sections; and said elevating means including;
(f) a plurality of shafts rotatably supported on said frame;
(g) a sprocket on each of said shafts;
(h) an elevating chain engaged with said sprocket and connected to one of said platform sections; and
(i) motor means operatively coupled with said shafts and operable to rotate same thereby effecting elevation of said platform sections.

4,232,987

MACHINE AND SERVICE TRUCK ASSEMBLY FOR LOADING, UNLOADING AND STORING CERAMIC TILES

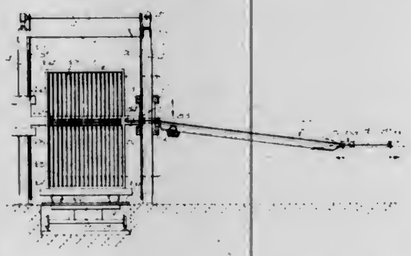
Giavelli Giordano, Piazza Salvo d'Acquisto, 12, Sassuolo (Modena), Italy

Filed Nov. 22, 1978, Ser. No. 963,013

Claims priority, application Italy, Dec. 16, 1977, 46926 A/77; Dec. 23, 1977, 46927 A/77

Int. Cl.³ B65G *67/02, 39/02*

U.S. Cl. 414—331 **8 Claims**



1. A machine and service truck assembly for loading, unloading and storing ceramic tiles, comprising:

a horizontal frame substantially of L shape in plan, arranged to move vertically on vertical guides;

a set of horizontal conveying belts disposed orthogonally on one arm of said L frame and terminating in a belt conveyor system;

a set of motorised projecting rollers branching in plan from the other ram of said L frame and having a length approximately equal to the width of the set of conveyor belts, and forming a roller surface, said rollers each having spaces therebetween;

a service truck comprising a plurality of vertical adjacent frames each provided with equidistant horizontal cross members, said frames being disposed in planes parallel to said projecting rollers, the distance between adjacent frames being greater than the outer dimension of a projecting roller and the thickness of each frame being less than the spaces between rollers so that the frames can be received in the spaces between rollers; and

means for vertically moving said L shaped frame; and

means for moving said truck parallel to the axis of said projecting rollers.

4,232,988

ARTICLE STORAGE AND RETRIEVAL SYSTEM

Uwe Kochanneck, Neuer Graben 81, 46 Dortmund, Fed. Rep. of Germany

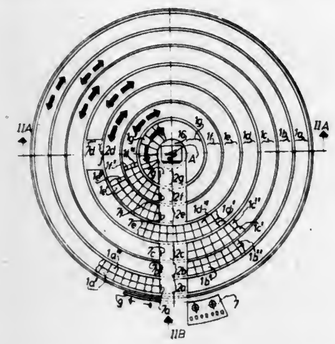
Continuation of Ser. No. 680,876, Apr. 27, 1976, abandoned. This application Apr. 19, 1978, Ser. No. 898,313

Claims priority, application Fed. Rep. of Germany, May 3, 1975, 2519864

Int. Cl.³ B65G *1/133*; A47B *49/00*

U.S. Cl. 414—331 **4 Claims**

1. A storage and retrieval system for articles, comprising: a plurality of annular tracks which are concentric about an axis with a radially innermost track and a radially outermost track; a like plurality of trains, each train including a coaxially located cylindrical shelf for supporting storage holders, all shelves being uniformly arranged in horizontal rows and vertical columns, and each train being rotatable on a corresponding track and having a vertical gap to provide a radially directed access aisle extending to the axis when all gaps are radially aligned with each other; a stationary cylindrical shelf surrounding one of the trains and having a gap; a plurality of conveyors, each conveyor corresponding to one of the trains and being associated therewith and operating in a manner that each conveyor displaces corresponding storage holders along the columns and rows; an elevator movable along the access aisle; a plurality of drivers, each driver corresponding to and being associated with a corresponding one of the trains to



enable the corresponding one of the trains to rotate on a corresponding track; and a control coupled to the drivers and causing the trains to be driven to a predetermined angular positions with respect to the access aisle.

4,232,989

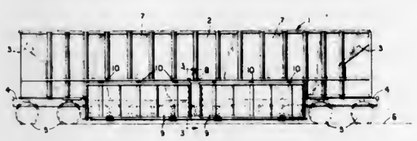
CAM ACTUATED RAILWAY HOPPER CAR DOOR OPERATING MECHANISM

Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 1, 1978, Ser. No. 901,953

Int. Cl.³ B61D *7/08, 7/18, 7/30*

U.S. Cl. 414—387 **21 Claims**



1. For a railway hopper car having an underframe and a longitudinally extending discharge door hingedly mounted on the car for movement laterally outward from a closed to an open position relative to a hopper having a discharge opening, an improved door operating mechanism comprising:

a longitudinal actuating rod extending beneath and carried by the underframe of said car,

means for longitudinally displacing said rod,

a bell crank pivotally mounted to the underframe for rotation about a generally vertical axis,

said bell crank pivotally connected to said rod for rotation in response to longitudinal displacement of said rod,

an operating rod, supported on said car having first and second ends, said first end being pivotally connected to said bell crank and said operating rod extending transversely therefrom for generally reciprocating movement in response to rotation of said bell crank,

a pair of vertically disposed stop members rigidly mounted to the bottom of said hopper adjacent to said discharge opening and positioned laterally outward of said bell crank,

horizontally disposed latch means supported between said stop members having a pair of hook-shaped members pivotally interconnected with each other and with said second end of said operating rod,

a latch catch rigidly affixed to said discharge door, engageable by said hook-shaped members for maintaining said door in a closed position, and

said hook-shaped members each including an arm appending laterally therefrom engagable by a respective stop member for pivoting said hook-shaped members relative to the second end of said operating rod in response to reciprocating movement of said operating rod, said members pivoting between a locked position between said stop members wherein said members operatively associate with each other and engage said latch catch in grasping relation and an unlocked position wherein said members are disengaged from said latch catch by said arms engaging said respective stop members.

7. In a railway car having a hopper and a hingedly mounted discharge door for movement between a closed and an open position relative to a discharge opening for the hopper, a door operating mechanism comprising:

an operating rod supported on said car selectively reciprocable between open and closed positions, movable generally transversely to the bottom edge of said hopper,

said rod having an end in the vicinity of the bottom edge of said hopper,

support means extending perpendicularly generally downward from the bottom edge of said hopper and adjacent to said discharge opening having a pair of spaced generally parallel stop members, said end of said operating rod being reciprocable along a path passing generally midway between said stop members and generally perpendicular to the plane of said stop members,

a latch catch rigidly affixed to the bottom of said discharge door,

latch means supported by said support means and pivotally connected to the end of said rod for reciprocating movement in conjunction therewith, said latch means including a pair of pivotally interconnected hook-shaped members, each hook-shaped member including a latch keeper at its outer end and an arm extending from the keeper and engageable by one of said stop members whereby said hook-shaped members are rotated in opposite directions relative to the end of said operating rod between latch catch engaging and disengaging positions in response to the reciprocating movement of said operating rod, and

each hook-shaped member having a latch lobe engageable by a portion of said latch catch whereby said latch keepers are urged toward each other to a latch catch grasping and engaging position about the latch catch in response to said discharge door being moved from an open toward a closed position,

said latch means being disposed between said stop members such that said latch catch is drawn in between said stop members after engagement by said latch keepers in response to said operating rod moving into a closed position.

4,232,990

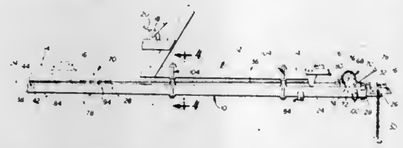
WINCH-OPERATED EXTENDABLE TONGUE FOR BOAT TRAILERS AND THE LIKE

Richard C. Pierce, R.R. #1, Stratton, Nebr. 69043

Filed Jul. 20, 1978, Ser. No. 926,526

Int. Cl.³ B60P *1/00*

U.S. Cl. 414—559 **5 Claims**



1. For use with a vehicle-drawn trailer, the winch-operated extendable tongue which comprises: a first elongate rigid tubular element having front and rear ends and an elongate slot intermediate its ends, said rear end being open; connecting means carried by the front end of said first tubular element for detachably hitching same to a towing vehicle; a second elongate rigid tubular element having an open front end and a rear end, said second tubular element being sized to telescopically receive said first tubular element for relative movement therein between a fully retracted position with the connecting means on the front end of the inner tubular element projecting forwardly beyond the open front end of the second tubular element and an extended position wherein the rear end of said first tubular element remains housed inside the second to an extent effective to cooperate therewith in defining a rigid beam; a first pulley journalled for rotation about a transverse axis adjacent the rear end of the second tubular element beyond the corresponding end of the first tubular element; a transverse shaft carried by the second tubular element spaced forwardly of the first pulley and extending into the first tubular element through the slot therein; a second pulley mounted on the transverse shaft for rotational movement thereon within said first tubular element; and, winch means carried by the second tubular element for movement therewith relative to said first tubular element, said winch means including a drum mounted for rotation about a transverse axis, means operatively associated with said drum for rotating same in either direction, and a length of cable reaved from a first point of attachment on the projecting end of the first tubular element, around the winch drum several turns, rearwardly around the first pulley and forwardly inside both tubular elements, around the second pulley and rearwardly again to a second point of attachment inside the first tubular element adjacent the rear end thereof, said winch being operative upon rotation in one direction to drive the telescoped elements apart into extended relation thus increasing the distance separating a towing vehicle fastened to the connecting means from a towed trailer or the like depending from the rear end of the second tubular element, and upon rotation in the opposite direction to drive the aforesaid telescoped elements together into retracted relation thus closing the gap separating the towing vehicle from that which is being towed thereby.

4,232,991

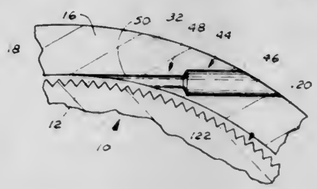
ROTARY MOTOR

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Inc., Kalamazoo, Mich.

Filed May 30, 1978, Ser. No. 910,732

Int. Cl.³ F03B *5/00*

U.S. Cl. 415—90 **6 Claims**



1. In a rotary motor, the rotor of which is propelled by a jet of high-pressure fluid propellant, the combination which comprises

an annular rotor consisting of a ring having a diameter much greater than its thickness and its width, and a roughened annular surface;

a housing having a smooth annular surface apposed to said roughened annular surface and uniformly spaced therefrom in all directions;

bearing means for rotatably supporting said annular rotor consisting of apposed annular races separated by rolling means and united in freely rotating, inseparable relation one to the other and to said rolling means, said bearing means having an inside diameter at least equal to the inside diameter of said annular rotor and having one race affixed to said housing and the other race affixed to said rotor; and

jet orifices arranged to direct a plurality of jets of high-pressure fluid propellant into the space between the apposed

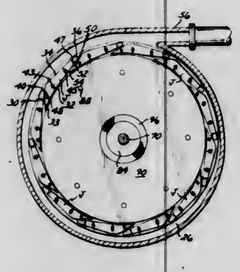
surfaces of said rotor and said housing at spaced intervals about the periphery thereof and so oriented that at least a portion thereof impinges on said roughened surface at an acute angle, said housing and said rotor having apposed spaced-apart surfaces forming a peripheral passageway communicating with the space between said first-named apposed surfaces and the ambient atmosphere, whereby said jets fan out from the point of impact on the rotor to said peripheral passageway before reaching the next jet.

4,232,992

GEOTHERMAL TURBINE AND METHOD OF USING THE SAME

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110

Filed Oct. 23, 1978, Ser. No. 953,650
Int. Cl.[3] F01D 1/36, 17/14; F03G 7/04
U.S. Cl. 415—90 11 Claims



5. A geothermal turbine assembly of the type that includes a housing that defines a confined space, a shaft rotatably supported in said housing and extending transversely through said confined space; a plurality of spaced discs supported from said shaft in said confined space, said plurality of discs having a plurality of transversely aligned center openings therein, said discs of substantially smaller diameter than that of said confined space; inlet means in an outer portion of said housing through which a pressurized and heated multiphase fluid from a geothermal source may be discharged, said fluid including steam and droplets of water; discharge means in said housing in communication with said aligned centered openings through which said multiphase fluid may flow after traversing a spiral path in said spaces to impart rotational power to said shaft due to the loss of kinetic energy to said plurality of spaced discs, said turbine assembly being characterized by:

a. a plurality of elongate nozzle members disposed in overlapping relationship in said housing exteriorly of said discs, each pair of said members cooperating to define a converging space, a throat, and a diverging space therebetween, said converging spaces in communication with said multi-phase fluid discharged into said confined space, and said diverging spaces substantially tangentially disposed relative to the outer periphery of said discs;

b. first means for pivotally supporting said nozzle bodies from said housing to permit the transverse cross-sections of said converging spaces, throats, and diverging sections to be varied to positions where said multiphase fluid discharges from said diverging openings at maximum velocity for a particular multiphase fluid of known pressure and temperature; and

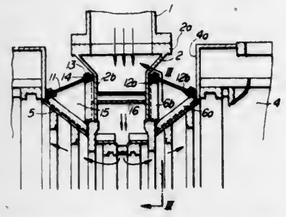
c. second means for removably locking said nozzle bodies in fixed positions relative to one another after said nozzle bodies have been pivoted to positions where said multiphase fluid discharges at said maximum velocity from said diverging spaces.

4,232,993

LOW PRESSURE CASING FOR A STEAM TURBINE

Tadasu Ikeda, and Takamitsu Taki, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 2, 1978, Ser. No. 911,925
Claims priority, application Japan, Jun. 13, 1977, 52/68887
Int. Cl.[3] F01D 3/02, 25/26, 25/08
U.S. Cl. 415—103 4 Claims



1. A low pressure casing of a single shell type for a steam turbine which houses a turbine rotor therein, comprising:

steam admitting means located in an upper central part of said casing and formed therein with a steam admitting port for admitting turbine driving steam therethrough into the interior of said casing;

turbine diaphragm means rigidly secured to an inner surface of said casing for supporting stationary blades arranged in a multiplicity of stages axially of the turbine;

exhausted steam chamber means disposed at opposite ends of said casing axially of the turbine for receiving steam of low temperature and low pressure exhausted thereinto after doing work in the turbine; and

shell means of the casing connecting said steam admitting means to said exhausted steam chamber means;

wherein the improvement comprises:

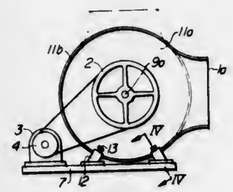
wall means enclosing an outer periphery of the shell means of said casing and connected at its end to said steam admitting means and said exhausted steam chamber means, temperature moderating spaces being defined between an inner surface of said wall means and an outer surface of the shell means of the casing, whereby the temperature differential produced between the outer and inner surfaces of the shell means of the casing can be minimized, and wherein said wall means comprises rings which are frusto-conical in shape and have a larger diameter at one end thereof which is disposed near said steam admitting means than at the other end thereof which is disposed remote from said steam admitting means.

4,232,994

CENTRIFUGAL TURBOMACHINE

Koh Tsuji, Ebina, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 30, 1977, Ser. No. 865,875
Claims priority, application Japan, Jan. 14, 1977, 52-2404
Int. Cl.[3] F01D 25/24
U.S. Cl. 415—127 1 Claim



1. A centrifugal turbomachine comprising:

an impeller mounted on a rotatable shaft,

a housing for said impeller in the form of a spiral casing having suction and discharge ports therein, said suction port having its center line aligned with the axis of said rotatable shaft, and the center line of said discharge port and the axis of said rotatable shaft lying substantially in a plane,

a base for mounting said spiral casing thereon,

an outer casing provided outside of said spiral casing and being in the form of a cylinder concentrical with the axis of said rotatable shaft over at least three-fourths of the circumference of said cylinder, a portion of said outer casing merging in an overlapping relation with a discharge port of said spiral casing and forming a unitary structure therewith, and an end portion of said outer casing extending to the outside of a side plate of said spiral casing, and

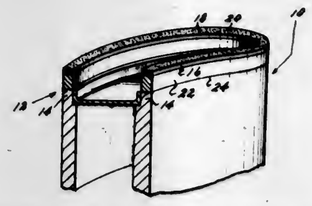
mounting means secured to said base and including arcuate slots having a diameter equal to the outer diameter of said outer casing and having a central angle of arc smaller than 180°, the end portion of said outer casing being adjustably secured in said slots by fastening means whereby the discharge direction of fluid flow from said turbomachine may be adjusted by adjusting the position of said unitary structure relative to said base and mounting means.

4,232,995

GAS SEAL FOR TURBINE BLADE TIP

Kenneth W. Stalker, Cincinnati; John W. Zelahy, West Chester, and Norman P. Fairbanks, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 863,017, Dec. 21, 1977, Pat. No. 4,169,020.
This application Nov. 27, 1978, Ser. No. 963,864
Int. Cl.[2] F01D 11/08
U.S. Cl. 415—172 A 4 Claims



1. A turbomachinery blade including a blade body and a blade projection about the radial outer periphery of the blade body, the projection including a metallic body and an abrasive outer tip, the improvement comprising:

said outer tip of said projection is a composite of an inner tip portion and an outer tip portion,

the inner tip portion comprising a shaped member discrete from the projection body, of an alloy resistant to oxidation, sulfidation and thermal fatigue at operating temperatures, and bonded with the metallic body of the projection, and

the outer tip portion comprising a matrix based on an element selected from the group consisting of Cr, Co, Ni and alloys including Cr, Co and Ni and in which there is entrapped a plurality of abrasive particles protruding radially outwardly from said outer tip portion, the particles having a hardness greater than the hardness of said surface of the other member, the outer tip portion bonded with said inner tip portion,

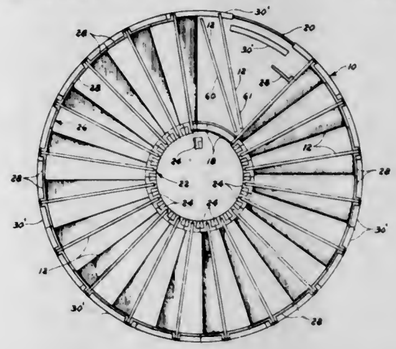
the thickness of the matrix being less than the longest dimension of the abrasive particles in the direction of their protrusion from the outer tip portion.

4,232,996

LIGHT WEIGHT FAN ASSEMBLY

Lewis J. Stoffer, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,368
Int. Cl.[3] F04D 29/34
U.S. Cl. 416—191 3 Claims



1. A fan assembly, comprising: a plurality of fiber reinforced composite hub support hoops; a plurality of fiber supported composite tip support hoops radially spaced from said hub support hoops; a plurality of fiber reinforced composite fan blades positioned between the hub support hoops and the tip support hoops; a segmented fiber reinforced composite hub platform secured to said blades with the hub support hoops held between the blades and the hub platform segments and a segmented, fiber reinforced composite tip platform secured to said blades; a plurality of metal channel segments positioned adjacent the tip hoops between the tip hoops and the blades; the hub platform segments and tip platform segments being secured to the blades with heat-and-compression-cured locking pins; said blades, said hub platform segments and said tip platform segments having reinforcing fibers passing around the locking pins.

4,232,997

METHOD AND APPARATUS FOR CONTROLLING COMPRESSORS

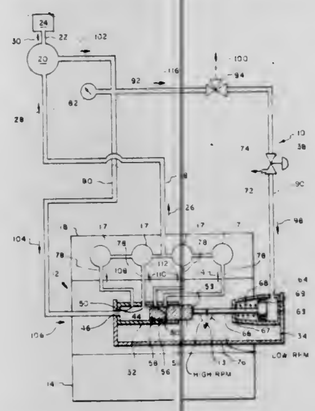
John E. Grimmer, Franklin, and Robert L. Donahue, Indianapolis, both of Ind., assignors to Grimmer Schmidt Corp., Franklin, Ind.

Filed Apr. 27, 1978, Ser. No. 900,426
Int. Cl.[3] F04B 49/02
U.S. Cl. 417—4 21 Claims

1. Control apparatus for a compressor having at least two compression chambers, each with a compressed air output proportional to compressor speed, said chambers being arranged in a parallel feeding relation to a common delivery conduit which receives airflow from one chamber independently of the pumping operation of the other chamber, unloading means operable on said chambers to selectively bring in said chambers one at a time for pumping and take out said chambers one at a time from pumping and a variable speed prime mover driving said compressor having a speed regulating member adapted to change the speed of the compressor, said control apparatus comprising:

control means responsive to compressed air demand on said compressor including a movable control member arranged for simultaneously adjusting both said unloading means and said speed regulating member in relation to air pressure demand on the compressor in increments over a range of compressor speeds at and between two different selected speed settings and in increments over a range of air pressure demands, the air flow rate in said common

delivery conduit being changed by bringing in for pumping or taking out from pumping selected of said compression chambers at a selected compressor speed, said control and speed regulating members being varied so that as the demand increases the compressor speed and the number of chambers pumping are simultaneously increased to increase compressed air output from said compressor and as the demand decreases the compressor speed and the number of chambers pumping are simultaneously decreased to decrease compressed air output from said compressor over said ranges of compressor speed and air pressure demand, said movable control member being arranged to automatically return to a position establishing a minimum operating condition of minimum speed and minimum power input for the compressor when there is essentially no demand on said compressor.

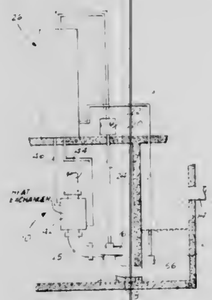


4,232,998

METHOD AND APPARATUS FOR REGULATING ELECTROLYTE SOLUTION LEVEL IN A LIQUID RHEOSTAT

George M. Osgood, 4474 SW. Arthur Way, Portland, Oreg. 97221

Filed Mar. 17, 1978, Ser. No. 887,634
Int. Cl.³ F04B *49/06*
U.S. Cl. 417—36 **9 Claims**



1. Apparatus for pumping liquid from a well comprising:
pump means driven by a variable speed electric motor operable for pumping liquid from the well;
a liquid rheostat operatively connected to said electric motor for controlling the speed thereof, said liquid rheostat including an electrode compartment and an electrolyte solution reservoir, said compartment including drain means for permitting solution contained therewithin to be drained into said reservoir;
a circulating pump driven by a second variable speed electric motor operable for circulating solution from said reservoir to said compartment through a conduit; and
control means operable for selectively regulating motor speed of said circulating pump in response to the amount of liquid in the well to thereby regulate solution level in said compartment.

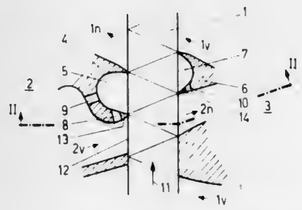
9. A method for regulating electrolyte solution level in a liquid rheostat, said liquid rheostat being used in a system for pumping liquid from a well and including an electrode compartment interconnected by a conduit to an electrolyte solution reservoir comprising:
circulating the solution through the conduit from the reservoir to the compartment by a motor-driven circulating pump;
sensing liquid level in the well; and
controlling the circulating rate of said circulating pump in response to changes in the amount of liquid in the well by controlling the motor speed of the circulating pump.

4,232,999

SUPERCHARGERS FOR INTERNAL COMBUSTION ENGINES

Nicolaus Croes, Baarn, Netherlands; Hansulrich Hörler, Zurich, and Hubert Kirchhofer, Gebenstorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 722,420, Sep. 13, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,954
Claims priority, application Switzerland, Oct. 10, 1975, 13198/75
Int. Cl.³ F04F *11/02*
U.S. Cl. 417—64 **11 Claims**



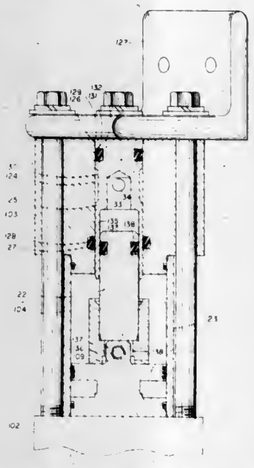
1. In a supercharger for an internal combustion engine, the supercharger being of the gas-dynamic pressure-wave type comprising first and second spaced housing portions forming a rotor chamber therebetween, a rotor mounted for rotation in said rotor chamber, said rotor comprising a plurality of open-ended cells, a high pressure feed duct disposed in said first housing portion for conducting hot high-pressure engine exhaust gas into said rotor cells, a low pressure discharge duct disposed in said first housing portion for conducting expanded low-energy exhaust gas, a low pressure feed duct in said second housing portion for conducting combustion air to be compressed, a high pressure discharge duct disposed in said second housing portion for conducting combustion air compressed by said high pressure exhaust gas in said rotor cells, a pocket formed in at least one of said housing portions between said high and low pressure ducts thereof, said pocket being open toward the rotor chammber and separated from said adjacent high pressure duct by a wall portion of the associated housing portion, the improvement wherein an opening is formed in said wall portion between the associated pocket and high pressure duct for conducting fluid from the latter to the former in a direction transversely of the direction of travel of fluid in said last-named high-pressure duct, said opening being open toward said rotor chamber and having a height less than the height of said last-named high-pressure duct, said opening including a depth of sufficient magnitude that the outer portion of said opening remote from said rotor chamber is essentially unobstructed by pressure waves from said rotor cells, the cross-sectional area of said opening being dimensioned to conduct fluid quantities in excess of a predetermined amount from said last-named high-pressure duct.

4,233,000

VARIABLE RATIO INTENSIFIER

Bruce M. Cox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 896,664, Apr. 17, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 99,449
Int. Cl.³ F04B *21/04*
U.S. Cl. 417—402 **4 Claims**



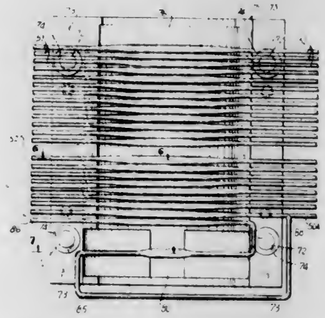
1. An improved hydraulic pressure convertor including a body having an inlet and an outlet, a motor assemblage carried by the body and including a power cylinder and a differential driving piston reciprocable therein, a pumping assemblage, means connecting the differential driving piston to the pumping assemblage, a first conduit in continuous communication at one end with the inlet and with the power cylinder at the side of the differential driving piston to which fluid pressure is to be applied for driving the differential driving piston on its power stroke, a second conduit continuously in communication at one end with the power cylinder at the opposite side of the differential driving piston, each of said conduits having a valving port spaced from its said one end, a valve operative in a first operating position in which it blocks the valving port of the first conduit and concurrently connects the valving port of the second conduit with the outlet and operative in a second operating position in which it effects communication of said ports with each other and concurrently stops communication of the second port with the outlet, lost motion connecting means connecting the valve to the differential piston so as to effect actuation of the valve toward said first operating position past a predetermined center position as the differential piston is moved a predetermined distance on its power stroke and to effect actuation of the valve toward said second operating position past said center position as the differential piston is moved a predetermined distance on its return stroke, and over-center spring means connected to the valve and operative when the valve is actuated past said center position in directions toward said first and second operating positions, respectively, to drive the valve with a snap action to the one of the said first and second operating positions toward which the valve was being actuated as it passed said center position, wherein the improvement comprises:
said hydraulic pressure convertor having a variable ratio of the pressure of the outlet fluid from said pumping assemblage to the pressure of the inlet fluid to said motor assemblage by varying the size of a detachable piston assembly attached to said differential driving piston in said power cylinder and varying the size of a pumping assemblage means operatively associated with said detachable piston assembly, wherein
said differential driving piston comprises a driving piston having stem means operably associated with said motor assemblage, having differential piston connected to the stem portion, thereby separating said motor assemblage and said pumping assemblage, and having stub connecting shaft means connected to said differential driving piston and extending into said power cylinder, the stub connecting shaft means having a transverse bore therethrough;
said pumping assemblage having a housing being formed having a substantially cylindrical bore therethrough and having a seal means located in an annular cavity therein; and
said detachable piston assembly comprising:
piston means;
sleeve means secured to the piston means, the sleeve means having a bore therein receiving the stub connecting shaft means of said differential driving piston therein and having a transverse bore therein which aligns with the transverse bore in the stub connecting shaft means of said differential driving piston when the sleeve means is assembled thereto; and
resilient pin means securing the sleeve means to the stub connecting shaft means of said differential driving piston by engaging the transverse bore in the sleeve means and the transverse bore in the stub connecting shaft means.

4,233,001

PERISTALTIC PUMP

Carl J. Schmid, Port Washington, N.Y., assignor to Peerless Electronics Research Corporation, Westbury, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,161
Int. Cl.³ F04B *43/12, 45/08*
U.S. Cl. 417—475 **13 Claims**



1. Pumping apparatus comprising, in combination:
an array of compressible tubes in parallel substantially coplanar relationship with each other;
rotor means located adjacent one side of the array of tubes in position to simultaneously occlude each of said tubes between a first part of spaced points along the length of the tube;
means supporting the rotor means for rotational movement relative to the array of tubes;
a platen assembly located adjacent the other side of the array of tubes in position to urge the same into contact with the rotor means, the platen assembly having a first ledge portion facing the periphery of the rotor means for defining the location of said first pair of spaced points and a

second ledge portion facing the periphery of the rotor means for defining the location of a second pair of spaced points;

means for rotating the rotor means to progressively occlude the compressible tubes between said first pair of spaced points and thereby pump a first fluid through the tubes in a given direction; and

an additional compressible tube containing a fluid different from said first fluid, the additional tube extending in said given direction between the rotor means and the first ledge portion of the platen assembly, then back in a direction opposite to said given direction between the rotor means and the second ledge portion of the platen assembly, and then to a junction point in open communication with one of the tubes in said array;

the rotation of said rotor means progressively occluding said additional compressible tube between said first pair of spaced points, to pump said different fluid therethrough in said given direction, and progressively occluding said additional compressible tube between said second pair of spaced points, to periodically admit said different fluid to said one tube in timed relation to the flow of the first fluid therein.

4,233,002

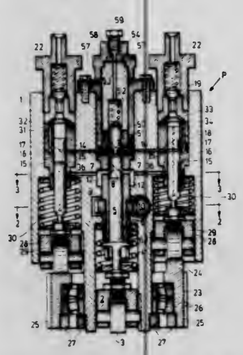
FUEL INJECTION SYSTEM

Benjamin Birenbaum, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2L7)

Continuation-in-part of Ser. No. 768,843, Feb. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 660,912, Feb. 26, 1976, abandoned. This application May 9, 1978, Ser. No. 904,199

Int. Cl.³ F02M *41/04*; F04B *23/00*

U.S. Cl. 417—485 **2 Claims**



1. A fuel injection apparatus for use in a multi-cylinder internal combustion engine; said apparatus comprising a pump head, including a pump head casing; a central pump unit consisting of a pump plunger bushing and a pump plunger reciprocal in the pump plunger bushing, and including a fuel metering means so that said pump unit both meters and pumps fuel; a distributor apparatus comprising a plurality of distributor valves arranged in a circular pattern about said central pump unit, and including valve plungers; a rotary distributor cam having a single distributor lobe for orbiting in said circular pattern and moving said valve plungers in succession from a non-distributing to a distributing position in sequence with the delivery stroke of said pump unit; said distributor having a planar face for holding said valve plungers stationary when in the distributing position through the entire delivery stroke of said pump unit; spring means for returning said valve plungers to said non-distributing position where they rest on a flat surface of said distributor cam through said casing and into said pump plunger bushing; delivery ducts extending from said pump plunger bushing; delivery ducts extending from said pump unit to said distributor valves; and cam and spring means for reciprocating said pump plunger, each of said distributor valves distributing in succession fuel metered and pumped by said pump unit.

4,233,003

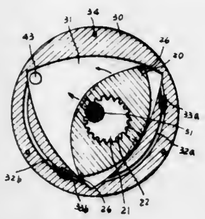
ROTARY PUMP

Wang-Shing Jeng, 6-1, Alley 27, La. 278, Yung Chi Rd., Taipei, Taiwan

Filed Oct. 10, 1978, Ser. No. 949,894

Int. Cl.³ F04C *18/02, 23/00, 29/08*

U.S. Cl. 418—8 **8 Claims**



1. A rotary pump comprising:

a cylinder having three connected inner walls, and two channels extending in two of said walls, each said channel having a check valve at a similar end;

a front wall fastened on the front side of said cylinder having a bearing at its center and a fluid inlet surrounding said bearing;

a rear wall fastened on the rear side of said cylinder having a bearing at its center and a fluid outlet surrounding said bearing, said outlet being connected with an exhausting pipe and another exhausting pipe connecting with a check valve on said rear wall;

a piston rotatably mounted in said cylinder having two arc surfaces and a circular internal hole, each said surface including a groove at its center and an outlet port and an inlet port located on both sides of the groove, and both of said ports having check valves therein, said internal hole having a gear section and an enlarged section having a smooth surface;

a shaft supported by said two bearings on said front and rear walls, said shaft including three sections, a front section having a gear, a middle section of circular rod having a smooth surface and a diameter similar to the gear section, and an enlarged rear section having a smooth surface;

a separating plate closely rotatably mounted in the rear section of said piston hole and having a shaft hole corresponding to the middle section of said shaft;

a plunger closely rotatably mounted in the rear section of said piston hole having a fluid passage and a shaft hole corresponding to the rear section of said shaft, and having a thickness of slightly larger than the diameter of the outlet ports on said piston.

4,233,004

SEAL FOR AN ECCENTRIC-ROTOR MACHINE

Erich Gaschler, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

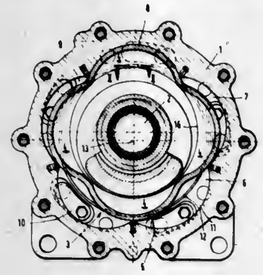
Filed Mar. 5, 1979, Ser. No. 17,542

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809621

Int. Cl.³ F01C *19/00*; F04C *18/10*

U.S. Cl. 418—144 **2 Claims**

1. In an eccentric-rotor machine including a housing having a longitudinal axis and defining a plurality of work chambers; radial housing walls bounding the work chambers; a multi-lobe rotor arranged in the housing for orbital motion therein to sequentially and cyclically decrease and increase the volume of each chamber in the execution of inward and outward strokes, respectively; the rotor having opposite radial rotor walls each defining a clearance with an adjacent respective radial housing wall; and sealing means arranged in the clearance for sealing the work chambers; the improvement wherein said sealing means comprises a sealing ring of circular course; said sealing ring being concentric to said axis and having a diameter such that in each chamber a length portion of said sealing ring is



situated externally of the outline of the rotor when the volume of the respective chamber is at a maximum, whereby said length portion is out of contact with the respective radial rotor wall during a terminal phase of the outward strokes and a beginning phase of the inward strokes of said rotor and said length portion is in contact with said respective radial rotor wall during a beginning phase of the outward strokes and a terminal phase of the inward strokes.

4,233,005

HYDRAULIC GEAR PUMP WITH RECESSES IN NON-WORKING GEAR FLANKS

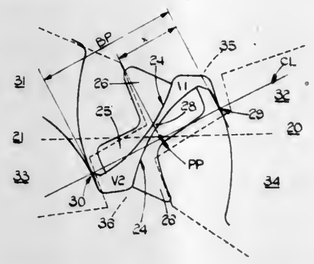
Harry S. Bottoms, Henley-in-Arden, and Ronald A. Heath, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 28, 1978, Ser. No. 974,039

Claims priority, application United Kingdom, Jan. 18, 1978, 1997/78

Int. Cl.³ F04C *2/18, 15/00*

U.S. Cl. 418—190 **7 Claims**



1. A hydraulic pump comprising a housing, a pair of meshed externally-toothed gear elements in a chamber within the housing, said housing having inlet and outlet ports which communicate with said chamber on opposite sides of a zone in which said gear elements are in mesh, said housing including a bridge portion separating said inlet and outlet ports, the non-working flank of each gear tooth having recesses adjacent the end faces of the gear element and an unrecessed land extending from the root to the tip of the tooth between said recesses, adjacent pairs of contact points between said gears defining, together with said non-working flanks, an inter-tooth volume which includes said recesses and whose capacity changes as said gears rotate, each said inter-tooth volume comprising two volumes on respective sides of a minimum clearance between said non-working flanks, one of said two volumes increasing and the other of said two volumes decreasing after said minimum clearance has passed through the pitch point of the gears, said bridge portion providing means for co-operating with said tooth recesses so that said inlet and outlet ports intercommunicate through said inter-tooth volume at a time not later than that at which said minimum clearance passes through said pitch point, and said inter-tooth volume first communicates with said inlet port by way of said other volume.

4,233,006

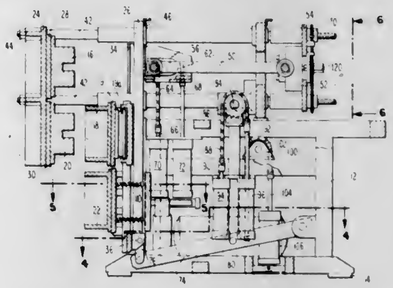
MACHINE FOR FORMING EXPANDED RESINOUS PRODUCTS

Walter Panas, Millville, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed Oct. 10, 1978, Ser. No. 949,958

Int. Cl.³ B29D *27/00*

U.S. Cl. 425—4 R **25 Claims**



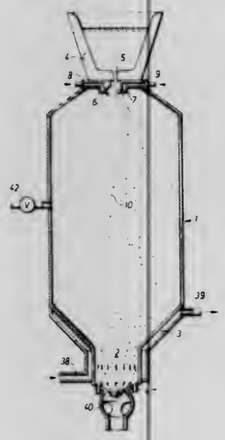
1. Apparatus for molding heat expandable cellular resin products comprising mating heated male and female molds and mating cooled male and female molds, said heated and said cooled male molds positioned on a first platen and said heated and said cooled female members positioned on a second platen, said platens including means for moving at least one of said platens toward and away from the other of said platens and thereby for opening and closing said mating molds, one of said platens further including mold transfer means for moving said heated mold mounted thereon from a first mold transfer limit position, in which said mating heated and mating cooled male and female molds face one another, to a second mold transfer limit position, in which said heated mold on said platen with mold transfer means is moved into a position facing said cooled mold on the opposite platen, the edges of said heated molds in said first mold transfer position remain slightly spaced from one another when said platens are in said mold closed position, one of said platens including movable heated mold mounting means adapted to be moved relative to said platen in the platen mold closure direction, after said platens are in the platen mold closed position, whereby the edges of said heated molds are brought into contact with one another, the cooled mold on said platen with mold transfer means including ejection means adapted to eject a cooled product retained thereon, said apparatus further including means for introducing heat expandable cellular resin into said heated male and female molds, upon engagement thereof.

4,233,007

APPARATUS FOR POWDER MANUFACTURE BY ATOMIZING A MOLTEN MATERIAL

Stig A. Karlsson, Tierp, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Dec. 17, 1975, Ser. No. 641,522
Claims priority, application Sweden, Dec. 18, 1974, 7415957
Int. Cl.³ B22D *27/08*
U.S. Cl. 425—7 **5 Claims**



1. An apparatus for granulating a molten material, preferably molten metal, by disintegration of a stream of the molten material by fluid jets, directed under high pressure against said stream, comprising a casting tundish of at least one casting opening, a first slit nozzle, and a second slit nozzle, one on each side of said casting opening, the first of said nozzles being directed in relation to the center axis of the casting opening such that said nozzle and fluid jet emanating therefrom form an acute angle to said stream, wherein the improvement comprises a second nozzle, in a plane perpendicular to a pouring direction from said casting tundish, as a concave segment of a curve with the concave side of said nozzle facing the casting opening and directed essentially in the same direction as said casting opening and defining a concave segment of less than about 180°.

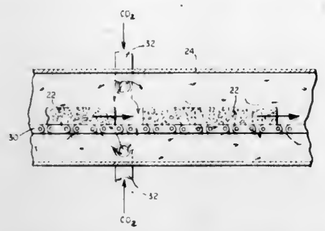
4,233,008

APPARATUS FOR THE MANUFACTURE OF CONCRETE PRODUCTS

John A. Murray, Norristown, Pa., assignor to U.S. Terrazzo Panels, Inc., Bryn Mawr, Pa.

Continuation of Ser. No. 817,263, Jul. 20, 1977, abandoned, which is a continuation of Ser. No. 468,566, May 9, 1974, abandoned, which is a continuation of Ser. No. 317,060, Dec. 20, 1972, abandoned, which is a division of Ser. No. 106,364, Jan. 14, 1971, abandoned. This application Jun. 29, 1978, Ser. No. 920,270
Int. Cl.³ B29C *11/00*
U.S. Cl. 425—77 **1 Claim**

1. In an apparatus for manufacturing terrazzo concrete products from a moist mixture containing copolymeric additive and which mixture is compressed to form uncured free-standing shaped members of predetermined height and then cured in a dry atmosphere essentially consisting of carbon dioxide, a carbon dioxide chamber constructed to be relatively gas tight and having an entrance and an exit provided with flexible seal means adapted to allow passage of said shaped members while maintaining the carbon dioxide content of the atmosphere within said chamber to about at least 95%, the improvement which comprises the height of said chamber being in the range



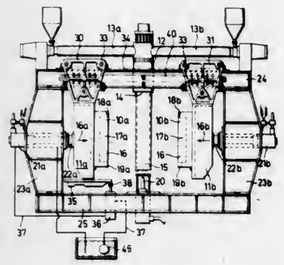
of 1½ to 4 times the predetermined height of said shaped members.

4,233,009

APPARATUS FOR SEPARATION OF WASTE MATERIAL FROM A MOULDED ARTICLE

Reinold Hagen, Bonn-Holzlar, Fed. Rep. of Germany, assignor to Kautex-Maschinenbau, GmbH, Bonn-Holzlar, Fed. Rep. of Germany

Division of Ser. No. 745,720, Nov. 29, 1976, Pat. No. 4,150,080. This application Aug. 31, 1978, Ser. No. 938,630
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1973, 2364510
Int. Cl.² B29C *17/07, 17/10*
U.S. Cl. 425—142 **11 Claims**



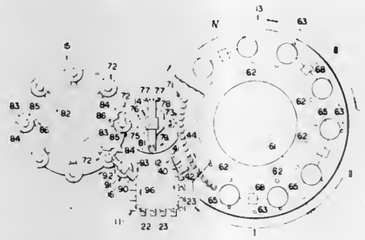
1. An apparatus for producing hollow plastic articles by a blowing process, comprising:
(a) a hollow mould having two relatively movable co-operable mould sections provided with pinch edges;
(b) means for locating a parison into a position between the mould sections,
said mould sections defining a cavity dimensioned in such a way that upon closing of the mould surplus material of the parison is located outside of the cavity;
(c) drive means connected to the mould sections for advancing the mould sections toward one another into engagement with the parison such that regions of the parison are pinched together and welded to each other by the pinch edges of the mould sections;
(d) means for admitting a compressed gas to the parison in the mould cavity for expanding the parison in the mould cavity;
(e) an energy supply; and
(f) control means connected to the energy supply and the drive means, said control means being operative to control the supply of energy from the energy source to the drive means, such that the supply of energy to the drive means is increased to thereby increase the speed at which the mould sections are advanced toward one another once the parison is substantially welded by the pinch edges, the increased speed being sufficient to produce and at least partially sever the parison from the surplus material.

4,233,010

ORIENTATION-BLOW MOLDING EQUIPMENT

Sadao Suzuki, Tokyo, Japan, assignor to Yoshino Kogyosho Co. Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,439
Claims priority, application Japan, Dec. 27, 1977, 52-159155
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—143 **10 Claims**



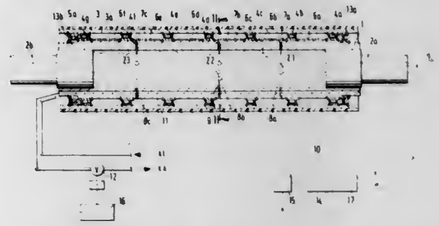
1. Equipment for producing biaxially oriented containers comprising:
a jig having a neck support which can hold the neck of a plastic piece positioned upside down, a mandrel provided beneath said neck support, and a core shaft for longitudinal orientation of said piece which is provided inside said mandrel so as to be freely movable upwardly or downwardly and which has a blow-molding air passage;
a core metal movable in a continuous path in a heating chamber, said core metal having a cylindrical holder, a hollow shaft freely rotatably supported at the center of said cylinder, a cylinder provided at the upper end of said shaft, a support holder extending from the top of said cylinder for supporting said mandrel of said jig, and a gear provided at the lower end of said shaft for transmitting a rotational motion;
said heating chamber having a rotary disk to which a plurality of said core metals are attached, said heating chamber being provided with several sets of heating elements and heat-exhausting damper devices so as to provide therein several heating zones along the transfer passage of said core metals attached to said rotary disk for heating stepwise said piece mounted on said jig;
a shielding plate having radial fins which are rotated in association with the movement of said core metal for preventing thermal atmosphere at the exit of said heating chamber from being suddenly disturbed and preventing a thermal influence on the piece;
a support holder braking means for stopping the rotation of said core metal, said braking means being provided at a position a predetermined distance apart from said shielding plate in the direction of the rotation of said rotary disk;
a mold loader which catches said jig holding the thermally processed piece for loading the same from the core metal which has stopped rotating by the action of said support holder braking means to a blow molding machine of rotary station type;
a means for rotating said jig while transferring said jig from said heating chamber to said molding machinery;
a blow molding machine of rotary station type having a plurality of molds and provided beneath said molds with a cylinder rod for pushing upwardly said orienting core shaft of said jig placed in each said mold and for introducing compressed air into the same;
a mechanism for pushing up said core shaft;
an unloading means for taking out said jig from said mold placed at the final station of said blow molding machine;
a conveyor having a plurality of attachment hooks for removing the jig from said unloading means to release the molded container from said jig and for catching the mandrel of the thus released jig to mount a new piece thereonto; and
a transfer apparatus provided at a corner of said conveyor for mounting said jig which has advanced to said corner onto the core metal positioned at the entrance of said heating chamber.

4,233,011

ROLLS OF CONTROLLABLE FLEXURE, ESPECIALLY FOR MACHINES FOR THE PRODUCTION AND PROCESSING OF WEBS OF PAPER OR PLASTIC

Walter Bolender, Erkrath, and Ernst Wallaer, Langenfeld, both of Fed. Rep. of Germany, assignors to ER-WE-PA Maschinenfabrik & Eisengiesserei, Ekrath, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,660
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837913
Int. Cl.² B30B *15/14, 3/04*; B29D *7/14*
U.S. Cl. 425—143 **11 Claims**



1. A roll having controllable flexure comprising: a substantially cylindrical inner element; a tubular outer member configured to extend over a portion of the length of the inner member and surrounding same; means mounting the outer member on the inner member for rotation about the cylindrical axis of the inner member; and means for producing forces acting radially between the inner member and outer member along a generatrix comprising at least one electrically powered heating element disposed on the inner element and extending over at least a portion of the axial length of the inner element and over a given circumferential area that is smaller than 180° to produce a temperature differential therein and a corresponding flexure in response thereto, at least one means for sensing the temperature difference between the portion of the inner member at said at least one heating element and the portion of the inner member diametrically opposite thereto and means for regulating the temperature differential at a selected value for said at least one heating element to obtain a corresponding degree of flexure of the inner member and thereby the outer member.

4,233,012

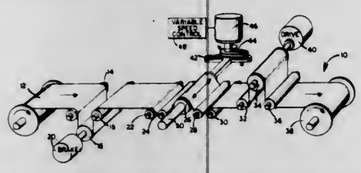
BIAS STRETCHING APPARATUS FOR IMITATION-LEATHER

Charles M. Willwerth, Newburyport, and John P. Silvia, Tewksbury, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.

Division of Ser. No. 810,920, Jun. 29, 1977, Pat. No. 4,140,827. This application May 3, 1978, Ser. No. 902,568
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—162 **10 Claims**

10. An apparatus for the diagonal-bias-stretching under tension of a continuously moving laminate material containing a grain-design effect thereon, which apparatus comprises:
(a) a source of laminate material which comprises a fibrous woven base sheet, a coated polymeric layer and a discontinuous polymeric layer to define a raised surface-design effect thereon;

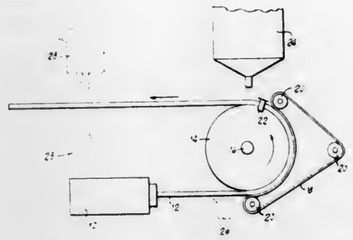
(b) a driving roller to unwind the laminate material from a source and to advance the unwound material continuously under tension from the source along a longitudinal line of advance through a series of rollers;
(c) at least one elastomer-coated, smooth-surface, reciprocating roller disposed in the line of advance of the sheet material whose surface is in contact with the base layer of the sheet material along a line of contact generally perpendicular to the continuously moving line;
(d) a first pair of elastomer-coated nip rollers on one side and a second pair of elastomer-coated nip rollers on the other side of the reciprocating roller, and spaced apart from the reciprocating roller a controlled distance, the first and second pair of nip rollers disposed in the line of advance of the sheet material and generally parallel to the reciprocating roller, and having a line of contact with the material just before or just after the reciprocating roller, which is generally perpendicular to the line of advance;
(e) a hold-back roller with braking means upstream of the



first pair of nip rollers, and adapted to provide controlled tension between the first pair of nip rollers and the line of contact of the material with the reciprocating roller;
(f) the drive roller providing controlled tension between the second pair of nip rollers and the line of contact of the material leaving the reciprocating roller;
(g) a wind-up roller whereby material processed through the apparatus is wound up after processing;
(h) means to reciprocate the reciprocating roller in a direction generally normal to the line of advance between positions from either side of the line of advance, while the first and second pair of nip rollers retain the material in the line of advance, to provide for diagonal bias-stretching of the material as it moves along the line of advance; and
(i) means to control the frequency of movement of the reciprocating roller and the length of the stroke of the reciprocating roller, thereby providing an apparatus which stretches and relaxes the laminate material as it advances under tension to enhance the surface-design effect thereon and to improve the hand of the material.

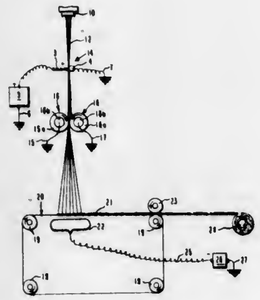
4,233,013
APPARATUS FOR PRODUCING CONTINUOUS CURED RUBBER STRIPS
Georg G. A. Böhm, Akron, and William W. Barbin, Massillon, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 641,150, Dec. 15, 1975, Pat. No. 4,122,137. This application May 16, 1978, Ser. No. 906,575
Int. Cl.³ B29H 5/04
U.S. Cl. 425—174.4 **11 Claims**

1. Apparatus for the continuous production of cured rubber strips having a surface design comprising:
(a) means for extruding rubber into a soft, viscous continuous rubber strip;
(b) moving molding means having the selected design formed in recesses on its surface for continuously receiving the soft, viscous rubber strip;
(c) means for forcing the rubber into said recesses under pressure;
(d) means for directing a beam of high energy ionizing radiation into the viscous rubber while maintaining it under pressure in the recesses to completely cure the rubber; and
(e) means for removing the cured rubber strip from the recesses;



said molding means being constructed of a material having minimum reflection for such radiation.

4,233,014
APPARATUS FOR PREPARING A NONWOVEN WEB
George A. Kinney, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 956,348, Oct. 31, 1978. This application Sep. 19, 1979, Ser. No. 77,034
Int. Cl.³ B29H 5/24
U.S. Cl. 425—174.8 R **2 Claims**

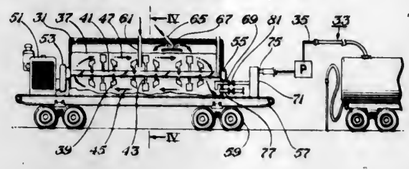


1. In an apparatus for preparing a uniform nonwoven web from a continuous bundle of untwisted filaments that includes means for continuously providing the bundle, means for applying an electrostatic charge to the filaments of the bundle and a collecting surface for the charged filaments, the improvement comprising: a pair of contiguous counter rotating elastomer-covered electrically grounded rolls having contacting surfaces located between said means for applying an electrostatic charge and the collecting surface, said rolls forming a nip through which the charged filaments are passed toward said collecting surface; and means for generating an electrostatic field between said rolls and said collecting surface.

4,233,015
EMPLOYING QUICKLIME IN STABILIZING EARTH
Joe D. Teague, 4813 Black Oak La., Fort Worth, Tex. 76114, and Paul J. Wright, 1207 Sotogrande Blvd., Apt. 315, Euless, Tex. 76039
Filed Dec. 14, 1978, Ser. No. 969,421
Int. Cl.² E02D 3/14
U.S. Cl. 405—263 **11 Claims**

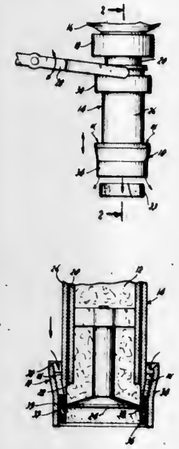
1. A method of treating subsurface layers of earth for controlling movement of subsurface water and building strength of the subsurface layers comprising the steps of:
a. admixing in a slurry mixing tank unslaked lime called quicklime and water to form a hot hydrated lime slurry at elevated temperature above ambient temperature; and

b. injecting said hot lime slurry before cooling below ambient temperature and at an elevated temperature above ambient at a plurality of predetermined, spaced apart locations and at a plurality of depths



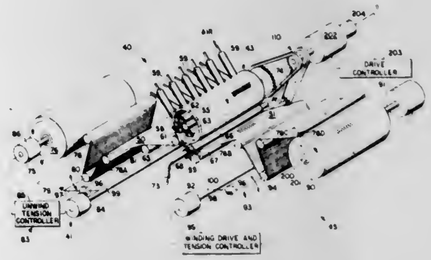
such that said subsurface layers are treated in situ to obtain added strength and to obtain stabilized moisture content.

4,233,016
FOOD PRODUCT FORMING APPARATUS
Joseph T. Chin, Elmhurst, N.Y.; Arthur M. Hochhauser, Allentown, Pa., and John P. McCarthy, Huntington, N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.
Filed Sep. 28, 1978, Ser. No. 946,755
Int. Cl.³ A21C 5/00
U.S. Cl. 425—288 **9 Claims**



1. In a food product apparatus of the type which includes a nozzle having an axial bore extending longitudinally therethrough for conducting a slurry of said food product delivered at one end of said nozzle to an opening at the other end of said nozzle, said opening being constructed and arranged for radially outwardly discharging given amounts of said slurry, the improvement comprising a forming device constructed and arranged in spaced-apart relationship with said nozzle, said device having an inner wall the axis of which is aligned with the axis of said nozzle for forming corresponding outside walls on the exteriors of each of said given amounts of discharged slurry to form said food product, said inner wall radially spaced from and confronting said opening to define a region adjacent said opening and extending radially outwardly from said opening toward said inner wall, said inner wall being constructed and arranged so that said region is substantially unobstructed in a direction parallel to said wall both axially above and below said opening, wherein each given amount of discharged slurry is substantially entirely connected within said region when said outside wall is formed thereon, said food product being free to be removed from both said nozzle and said device in said parallel direction.

4,233,017
APPARATUS FOR DEBOSSING AND PERFORATING A RUNNING RIBBON OF THERMOPLASTIC FILM
Malcolm B. Lucas, and Robert H. Van Coney, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Division of Ser. No. 733,961, Oct. 19, 1976, Pat. No. 4,151,240. This application Jan. 25, 1979, Ser. No. 6,950
Int. Cl.³ A21C 11/10
U.S. Cl. 425—290 **2 Claims**



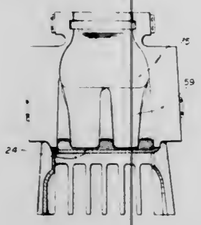
1. An apparatus for continuously debossing and perforating a running ribbon of film of thermoplastic material, said apparatus comprising:
a frame;
a debossing-perforating cylinder having a perforated tubular wall having a multiplicity of radially inwardly tapered holes through it;
means for rotating said cylinder on its axis of gyration;
means for forwarding a smooth running ribbon of thermoplastic film onto said tubular wall of said cylinder at a first location fixed with respect to said frame;
means for forwarding said running ribbon of film from said cylinder at a second location fixed with respect to said frame which second location is circumferentially spaced from said first location;
vacuum means for maintaining substantially constant predetermined levels of tension in said film being forwarded onto and from said cylinder;
means for sufficiently isolating a portion of said film running intermediate said first and said second locations from said levels of tension by means for applying a vacuum to said portion of film so that said portion of film can be heated to above its thermoplastic temperature without having it macroscopically distended;
means for sufficiently heating said portion of film and subjecting it to a sufficient radially inwardly directed pneumatic differential pressure to cause said sector of film to be debossed and perforated sufficiently to assume the image of the pattern of the radially outwardly facing surface of said perforated tubular wall and to form tapered capillaries of the film material in the holes of the perforated tubular wall; and
means for sufficiently cooling said portion of film before it reaches said second location to cause the debossing and perforations to be set in said film, and to enable said predetermined level of tension to be applied to said film by means for applying a vacuum to said film, said film being forwarded from said cylinder without causing said film to be substantially distended in the machine direction.

4,233,018

EGG ROLL EXTRUSION AND HANDLING APPARATUS

Dennis L. Chinfen, 58 Pellan Crescent, Kanata, Ottawa, Ontario, Canada

Continuation of Ser. No. 771,459, Feb. 24, 1977, abandoned. This application Aug. 1, 1978, Ser. No. 930,060
Claims priority, application Canada, Feb. 27, 1976, 246749
Int. Cl.³ B29F *3/06*; A21C *11/10*
U.S. Cl. 425—297 **13 Claims**



1. In an extrusion device for forming and shaping food product to a chosen cross section area and shape, the product requiring mild compressive action for proper binding, and wherein mild shear forces acting on said product are effective to cause separation, breakup and damage to said product affecting said proper binding, said device include a housing and means for forcing such food product through said housing,

means in said housing which comprises,

means defining a first section having an inlet receiving a flow of food product forced into said housing by said forcing means and having an exit region of a first predetermined cross section area and shape, said first section means initially shaping the cross section of said flow to conform to said first predetermined cross section area and shape,

and means defining a stabilizing section having an inlet smoothly continuously transitioning from the exit region of said first section and having an outlet of second cross section area and shape corresponding to said chosen cross section area and shape for said food product,

said inlet of said stabilizing section having a cross section corresponding to said first cross section area and shape, whereby said food product exits said first section and smoothly enters said stabilizing section, said first cross section area being up to about 15% greater than said second cross section area at said outlet, and said stabilizing section comprising a defined longitudinal passage whose dimensions transverse to the longitudinal direction of said passage do not increase from said inlet of said stabilizing section to said outlet,

whereby said first section delivers said product to said stabilizing section as a continuous even flow and alters the cross section of flow of said food product from said first predetermined cross section area and shape to said chosen cross section area and shape as said product passes through said stabilizing section to said outlet and proper binding of said product is effected.

4,233,019

APPARATUS FOR DELIVERING PARISONS OF PRESELECTED LENGTH AND DIAMETER

Yuji Sawa, and Sigeru Endo, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,404
Claims priority, application Japan, Aug. 24, 1977, 52-100566
Int. Cl.³ B29C *17/07, 17/16*
U.S. Cl. 425—305.1 **7 Claims**

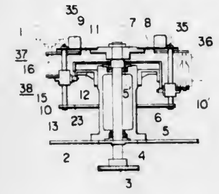
1. An apparatus for delivering a parison from a die of an extruder to a molding means comprising:

(a) a rotary member supported by a rotation shaft, said rotary member being rotated in a horizontal plane between said die and said molding means by rotation of said rotary shaft;

(b) a plurality of upper chuck means disposed around the circumference of said rotary member for cutting and securing said parison extruded from said die when closed and for releasing said parison when opened, each said upper chuck means provided with a cutter;

(c) an equal plurality of lower chuck means, each said lower chuck means being associated with one of said upper chuck means and vertically slidable with respect to said associated upper chuck means in synchronism with said rotation of said rotary member for securing and stretching said parison when closed and for releasing said stretched parison when opened;

(d) a stationary cylindrical guide cam member adjacent said rotary shaft and in rotational contact with each said lower chuck means for causing each said lower chuck means to



move away from each associated upper chuck means as each said associated lower chuck means and upper chuck means are rotated by said rotary member between said die and said molding means; and

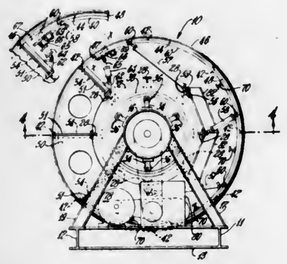
(e) said rotary member including an upper plate fixed to said rotary shaft, a lower ring-like plate disposed around said rotary shaft, a plurality of pairs of guide shafts disposed between said upper and lower plates for slidingly supporting said lower chuck means for movement toward and away from said upper chuck means, an equal plurality of rotatable spline shafts disposed between said upper and lower plates, each of said rotatable spline shafts disposed between said upper and lower plates, each of said rotatable spline shafts being adjacent an associated pair of said guide shafts and coupled to the upper and lower chuck means supported by said associated pair of guide shafts, and means for rotating said spline shafts to open and close said upper and lower chuck means.

4,233,020

COLLAPSIBLE MANDREL

Leo A. Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 13, 1979, Ser. No. 20,122
Int. Cl.³ B29C *13/04*
U.S. Cl. 425—471 **5 Claims**



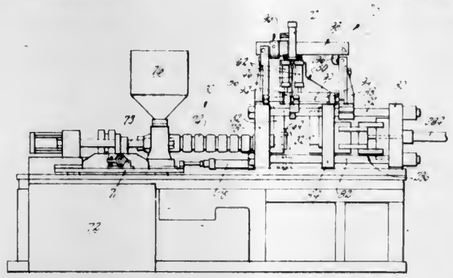
1. A rotatable collapsible mandrel (**10**) useful in the production of cylindrical fluid retaining walls of thermosetting resin and glass fiber reinforcing material, the mandrel (**10**) comprising a rigid inner core (**28, 30, 32**) rotatable about a horizontal axis, a tubular steel shell (**44**) having a longitudinal slit (x—x) to permit collapsing thereof by flexure of a portion on one side of the slit (x—x) radially inwardly, means (**50**) rigidly connecting a minor portion of the periphery of the shell (**44**) on the other side of the slit (x—x) to the rigid inner core (**28,30,32**), the shell (**44**) being flexible on the one side of the slit (x—x) over a major portion of its periphery, and a plurality of rows of support members (**57, 58**), the support members of each row being aligned axially of the shell (**44**) and being pivotally connected at one end to the rigid inner core (**28, 30, 32**) and at the other end to the flexible portion of the shell (**44**), and the rigid inner core (**28, 30, 32**) being rotatably supported on the inside from only one end and the other end being free for removal of a fluid retaining wall formed on the shell (**44**).

4,233,021

PLASTIC BOTTLE FORMING MACHINE

Robert Spurr, West Hartford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 30, 1978, Ser. No. 891,859
Int. Cl.² B29C *17/07*
U.S. Cl. 425—525 **19 Claims**



1. A hollow article molding machine comprising a split parison mold; core rod means for removable insertion into said parison mold to form a parison cavity; means for injecting a moldable material into said parison cavity; blow mold means; blow head means for removable engagement with said blow mold; means for moving said core rod means into and out of said parison mold; means for moving said blow head means into and out of engagement with said blow mold; a pair of split neck rings; a support carrying said neck rings; means for moving said neck ring support for alternating cooperation of said neck rings with said parison mold and said blow mold and for transferring a molded parison from said parison mold to said blow mold; a first platen carrying at least one parison mold half and at least one blow mold half in side-by-side relation; a second platen carrying the other parison mold half and the other blow mold half in mirror image side-by-side relation; means mounting said platens for relative movement to open and close said molds in unison; and mounting means positioned between said platens mounting said core rod means; blow head means; and means for moving core rod means and blow head means.

4,233,022

APPARATUS FOR FORMING HEAT TREATED BLOWN THERMOPLASTIC ARTICLES

Thomas E. Brady, Sylvania, and Santos W. Go, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

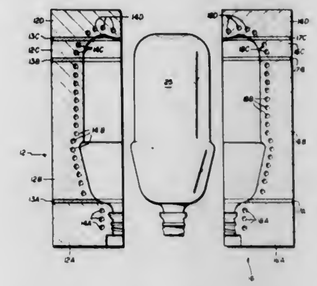
Division of Ser. No. 824,389, Aug. 15, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 922,931
Int. Cl.³ B29C *17/07, 25/00*
U.S. Cl. 425—525 **1 Claim**

1. An apparatus for heat treating a blown oriented thermoplastic article in a final blow mold, comprising:

a final blow mold comprising sectional members which cooperatively define an interior cavity having a longitudinal axis and essentially conforming to the size and shape of a final blown thermoplastic article that is a hollow container having a neck, a blown body portion, a bottom, and an annular heel integrally interconnecting the bottom and the body;

means to provide the thermoplastic material between the blow mold for blowing at its orientation temperature;

each sectional member including at least four thermally segregated portions corresponding to said bottle portions along a longitudinal axis of the cavity, thermal insulation layers separating each sectional member portion from the adjacent sectional member portion;



means to blow the material to the final container shape and means for applying a fluid pressure to the interior of the article while the article is heat treated;

heating means to heat treat parts of the final article in thhe sectional member by heating the annular oriented body and heel bottle portions, said heating means including internal fluid ducts within those sectional member portions corresponding to the body and heel bottle portions and means for supplying heated fluid to said internal ducts,

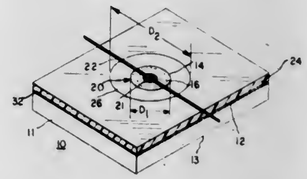
wherein the neck and bottom portions of said sectional members include internal fluid ducts, and means for supplying coolant fluid to the internal ducts of the neck portion.

4,233,023

PHOTOFLASH LAMP HAVING EXPANDABLE BURNING VOLUME

Peter D. Johnson, Schenectady, and Charles E. Jones, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,683
Int. Cl.³ F21K *5/00*
U.S. Cl. 431—362 **14 Claims**



1. A photoflash lamp for providing an expandable volume to accommodate oxygen and reaction products generated upon combustion of a combustible mixture contained therein, comprising:

(a) plate means having a substantially flat surface on each

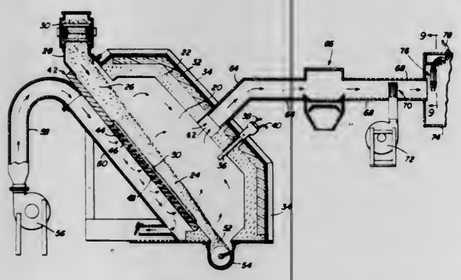
side and one of said sides having a recess medially disposed therein;
(b) a combustible mixture substantially filling said recess;
(c) primer means overlying said plate surface and centrally disposed in the opening of said recess for igniting said combustible mixture; and
(d) transparent, substantially flat plate expandable sealing means formed over said recess and affixed to said plate means surface for confining said combustible mixture within said recess, said sealing means expanding during combustion of said combustible mixture so as to define a volume between said sealing means and said plate means greater than the volume of said recess.

4,233,024

APPARATUS FOR DESTRUCTIVE DISTILLATION OF CELLULOSIC MATERIALS

Vernon F. Plass, 6320 Coteswood, Memphis, Tenn. 38134

Filed Nov. 20, 1978, Ser. No. 961,925
Int. Cl.³ F23J *5/00, 7/00*
U.S. Cl. 432—72 **13 Claims**



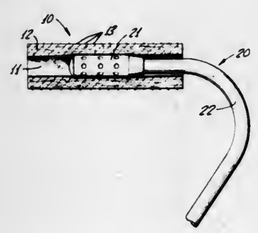
9. A refractory gas production chamber for partial combustion of cellulosic material to produce combustible gases, comprising; feed means for introducing the cellulosic material, support means for supporting the cellulosic material, forced primary air means for controllably introducing primary air into the gas production chamber, and duct means for withdrawing the gases from the gas production chamber, said support means comprising an inclined support chute extending at an angle from the top to the bottom of said gas production chamber, the chute having a bottom surface in the form of a flat grate perforated for controllable passage therethrough of said primary air from the forced primary air means, the gas production chamber further including at the lower exit of said chute removal means for continuous withdrawal of non-destroyed cellulosic material propelled thereinto by said primary air, and igniting means for maintaining partial combustion in the said gas production chamber, said perforated grate being made from a refractory composition interlaced with metallic needles.

4,233,025

HOLLOW COTTON ROLL

William A. Larson, 1215 Paseo Dorado, Fullerton, Calif. 92631, and Dale P. Wilterink, 1645 W. Cris Ave., Anaheim, Calif. 92802

Filed Mar. 8, 1979, Ser. No. 18,782
Int. Cl.³ A61C *5/14, 17/04*
U.S. Cl. 433—136 **16 Claims**



1. An elongate, generally cylindrical, hollow absorbent roll for use with an aspirator comprising:
a layer of an open mesh fabric defining an inner wall of said roll, said aspirator being insertable within said fabric;
a layer of an absorbent material surrounding said fabric layer; and
a layer of braided yarn surrounding said absorbent material to retain same.

4,233,026

REDUCING GRINDING TIME AND COMPOSITIONS THEREFOR

Gerhard Hitschfel, Niedernhausen; Peter Jürges, Eppstein, and Rudolf Munk, Floersheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 862,581, Dec. 20, 1977, abandoned. This application Jul. 17, 1979, Ser. No. 58,293
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657774
Int. Cl.³ D06M *13/18*; D06P *1/16, 1/60*; C09K *11/02*
U.S. Cl. 8—52 **28 Claims**

1. A substantially homogeneous ground composition which, in water-free form, consists essentially of two components: (A) a sparingly-soluble or insoluble dyestuff and (B) from 0.5 to 50 percent by weight of the composition of at least one water-soluble non-ionic compound of the formula

Y-O-Z-H (I)

wherein
Y is



X is an aromatic ring system having from 6 to 10 carbon atoms;
each of
R^1, R^2 and R^3 is a member selected from the group consisting of hydrogen, alkyl and alkenyl, at least one of R^1, R^2 and R^3 being other than hydrogen, and each of R^1, R^2 and R^3, which is other than hydrogen, having from one to four carbon atoms;
Z represents a member selected from the group consisting of $(C_2H_4O)_m$, $(C_3H_6O)_n$ and a combination thereof; and
each of
m and n represents an integer from 2 to 15.

4,233,027

METHOD FOR PRINTING AND FLOCKING FABRICS SIMULTANEOUSLY

Rafael P. Albero, Plaza del Pintor Gisbert, num. 2, Alcoy (Alicante), Spain

Filed May 1, 1978, Ser. No. 901,500
Claims priority, application Spain, Jan. 28, 1978, 466,438
Int. Cl.³ D06P *5/00, 7/00*
U.S. Cl. 8—488 **3 Claims**

1. A method for printing and flocking a fabric which comprises the steps of moving the fabric along a path; applying dye to the fabric in accordance with a printing pattern to print such pattern directly on the fabric itself without interrupting the moving thereof; applying adhesive over regions of the fabric to be flocked without interrupting the moving of the fabric; and, applying flocking material to said regions of the fabric without interrupting the moving thereof.

4,233,028

PROCESS FOR THE LEVEL DYEING OF POLYACRYLONITRILE MATERIALS OF SLOW, NORMAL AND RAPID ABSORPTIVE CAPACITY

Josef Koller, Reinach; Ulrich Horn, Basel; Peter Moser, Binningen; Manfred Motter, Aesch, all of Switzerland, and Pierre Galafassi, Rixheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 703,864, Jul. 9, 1976, abandoned. This application Jan. 24, 1978, Ser. No. 871,918
Claims priority, application Switzerland, Jul. 14, 1975, 9168/75
Int. Cl.³ D06P *1/41, 5/00, 3/76*
U.S. Cl. 8—534 **21 Claims**

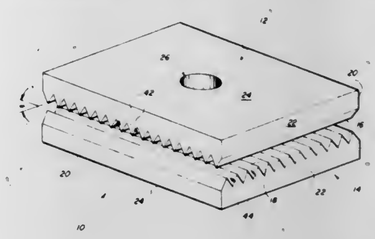
1. A process for dyeing polyacrylonitrile material in level shades, regardless of the absorptive capacity of the polyacrylonitrile material, in the absence of inorganic electrolytes, which process comprises the steps of applying to the polyacrylonitrile material an aqueous dye liquor containing at least two migrating cationic dyes having a cation-molecular weight smaller than 275, a parachor smaller than 680 and a log P smaller than 2.8, and adding to the liquor, before, during or after dyeing, at least one organic cationic migration auxiliary which is not a migrating retarder and which has a cation-molecular weight between 100 and 200, a parachor smaller than 620 and a log P smaller than 5.4.

4,233,029

LIQUID TRANSPORT DEVICE AND METHOD

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,689
Int. Cl.² G01N *31/00*
U.S. Cl. 23—230 R **33 Claims**



1. A liquid transport device for controlled fluid flow comprising
two fixedly mounted opposing surface areas substantially all portions of which are spaced apart throughout a zone of intended liquid transport a distance no greater than will maintain a capillary flow of liquid introduced therebetween, and means to permit the introduction of liquid between said surfaces,
each of said surfaces including, across at least a portion thereof, means for directing capillary flow of introduced liquid along predetermined paths, said directing means on the respective surfaces being relatively oriented so that the paths directed by a substantial portion of one of said surfaces form positive angles with respect to the paths directed by the directly opposing portion of the other surface,
whereby capillary flow of liquid between said surfaces occurs in a controlled multidirectional manner with a predetermined peripheral configuration.

4,233,030

METHODS AND APPARATUS FOR LIQUID CHROMATOGRAPHY

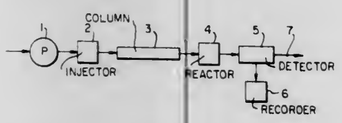
Peter J. Twitchett, Lapworth, and Peter L. Williams, Basingstoke, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 6, 1978, Ser. No. 884,621

Claims priority, application United Kingdom, Mar. 8, 1977, 9678/77; Apr. 27, 1977, 17633/77

Int. Cl.[2] G01N *31/08, 33/16, 21/38;* G01J *1/10*

U.S. Cl. 23—230 R **17 Claims**



1. A method of high pressure liquid chromatography wherein the eluent from a chromatographic column enters a detector adapted to detect a known or suspected constituent by means of an optical property, wherein the eluent while flowing between the column and the detector is irradiated in order to convert the constituent photochemically to a species which possesses this property or in which said property is changed in magnitude to a substantial degree.

4,233,031

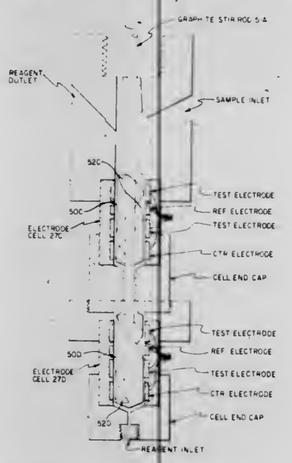
ELECTROCHEMICAL TESTING SYSTEM AND METHOD

Wayne R. Matson, Ayer, and Ronald Vitukevich, Everett, both of Mass., assignors to Environmental Sciences Associates, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 868,654, Jan. 11, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,060

Int. Cl.[3] G01N *27/30, 33/48, 33/50*

U.S. Cl. 23—230 B **44 Claims**



1. In serum iron testing, a method of electrochemical testing compatible with micro sized samples of serum comprising:

preparing a substantially iron-free matrix including a lower aliphatic alcohol and between about 5½ Formal and about 8½ Formal HCl;

introducing a predetermined quantity of serum into said matrix to provide an electrolytic sample, and adding a measured quantity of said sample containing a measured quantity of se m to an electrolytic cell;

applying to a first electrode in said cell a potential to measure the quantity of copper and iron in said cell;

applying to a second electrode in said cell a potential to measure a different quantity selected from copper and iron;

obtaining signals corresponding to current flow at each of said electrodes; and

comparing said signals to measure the quantity of iron.

4,233,032

FETAL LUNG MATURITY TEST

Bernard E. Statland, Sacramento, Calif., and Geoffrey Sher, Reno, Nev., assignors to University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed Feb. 12, 1979, Ser. No. 11,253

Int. Cl.[3] G01N *33/48, 13/00*

U.S. Cl. 23—230 B **6 Claims**

1. A method for measuring fetal or neonatal lung maturity employing amniotic fluid comprising:

combining a predetermined volume of amniotic fluid with graduated amounts of 95% aqueous ethanol to 100% ethanol to provide at least six mixtures of graduated ethanol volume fractions from 0.45 to 0.50 to 0.01 graduations;

agitating each of the mixtures in substantially the same manner; and

determining the highest ethanol volume fraction which results in a persistent foam at the interface;

wherein an ethanol volume fraction of greater than 0.45 with persistent foam indicates fetal lung maturity.

4. A kit for use in the method according to claim 1, containing six vials, each of the vials containing different amounts of 95% aqueous ethanol to 100% ethanol, so that upon admixture with a fixed amount of amniotic fluid, the vials provide ethanol volume fractions ranging from 0.45 to 0.50 at 0.01 graduations.

4,233,033

METHOD AND APPARATUS FOR MEASURING THE O_2 CONTENT OF A GAS

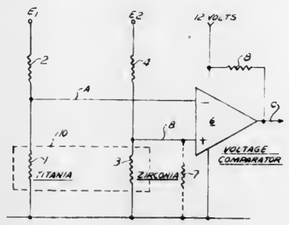
Raymond J. Elfler, Farmington Hills; Walter F. Datwyler, Jr., Royal Oak, both of Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Autolite Corporation, Fostoria, Ohio

Filed Sep. 19, 1979, Ser. No. 76,881

Int. Cl.[3] G01N *27/04*

U.S. Cl. 23—232 E **21 Claims**



1. A method for obtaining an electrical signal which is a function of the oxygen content in an exhaust gas of an internal combustion engine, the method comprising:

connecting a first resistor comprised of titania in series with a second resistor having a predetermined resistance;

connecting a third resistor comprised of stabilized zirconia in series with a fourth resistor having a predetermined resistance;

connecting the first and second resistors in parallel relationship with the third and fourth resistors;

applying a potential across the resistors;

exposing said resistors to the exhaust gas an internal combustion engine;

obtaining a first electrical signal which is a function of the first and second resistors; and

obtaining a second electrical signal which is a function of said third and fourth resistors.

4,233,034

DESULFURIZATION OF COAL

J. Wayne Miller, Yorba Linda, Calif., and Mark J. Anderson, St. Paul, Minn., assignors to Union Oil Company of California, Brea, Calif.

Filed May 3, 1979, Ser. No. 35,436

Int. Cl.[3] C10L *9/02;* C10B *57/00*

U.S. Cl. 44—1 SR **31 Claims**

1. A process for desulfurizing coal and other carbonaceous materials which contain pyritic sulfur, organic sulfur and sulfate sulfur which comprises: contacting an aqueous slurry of said coal or carbonaceous material with a transition metal salt, hydrogen and a buffer that buffers within the pH range of from about 4 to about 10 under reaction conditions; and contacting said coal or carbonaceous material with an acid.

17. A process for desulfurizing coal and other carbonaceous materials which contain pyritic sulfur, organic sulfur and sulfate sulfur which comprises contacting an aqueous slurry of said coal or carbonaceous material, a transition metal salt, hydrogen, and a buffer that buffers within the pH range of from about 4 to about 10 at a temperature of from about 200° F. to about 450° F. and a pressure of from about 100 psig to about 4000 psig, for about 30 minutes to about 5 hours, raising the temperature from about 450° F. to about 700° F. for about 30 minutes to about 25 hours; and contacting said coal or carbonaceous material with an acid.

4,233,035

ADDITIVES FOR AVIATION AND SIMILAR FUELS

Edward A. Allen, Havant; Peter C. Phillips, Emsworth, and Terence Smithson, Southsea, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 777,684, Mar. 15, 1977, abandoned. This application Jul. 14, 1978, Ser. No. 924,718

Claims priority, application United Kingdom, Mar. 17, 1976, 10834/76

Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—73 **14 Claims**

1. A hydrocarbon fuel containing a metal de-activator which is a hydroxy oxime having the formula

$$R^1-\underset{\displaystyle NOR^3}{\overset{\displaystyle \|}{C}}-R^2$$

wherein R^1 represents an alkyl group or a benzenoid aromatic group, R^2 represents an orthohydroxy benzenoid aromatic group or an α-hydroxy group having the formula

$$-\underset{\displaystyle OH}{\overset{\displaystyle |}{CH}}-R^4$$

wherein R^4 represents an alkyl or benzenoid aromatic group; and R^3 represents a hydrogen atom or an alkyl group.

4,233,036

PROCESS FOR PREVENTING ADHESION OR CAKING OF COAL

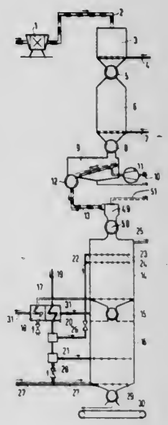
Christian Koch, and Alfred E. Behrmann, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,410

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813765

Int. Cl.[3] C10J *3/06;* C10L *9/04*

U.S. Cl. 48—210 **2 Claims**



1. In a method of preventing adhesion or caking of solid hydrocarbon-containing raw materials comprising coal which in the presence of hydrogen are partially gasified by hydrogenation gasification in a reaction vessel through which the raw material passes while being heated to a temperature above 700° K., which comprises passing raw materials in particle form downwardly through the reaction vessel, introducing a hydrogen-containing gas into a lower portion of the reaction vessel at a temperature above 700° K. into contact with the raw materials to heat the raw materials to a temperature above 700° K. and to effect hydrogenation gasification of part of the raw materials, the improvement comprising intermittently contacting the particles of raw materials as they pass downwardly through the reaction vessel in the absence of impediments in the path of the raw materials to deflect its flow, in a temperature zone of about 600° to 700° K. with a medium which is at a temperature above 1000° K. in contact with the particles to rapidly heat the surfaces of the raw material particles to above 700° K. by direct contact with the hot medium alone, in the absence of combustion of raw materials with added oxygen to cause the raw material particles to become non-caking in its downward passage through the reaction vessel at a temperature above 700° K.

4,233,037

METHOD OF AND APPARATUS FOR REDUCING BACK CORONA EFFECTS

Duane H. Pontius, Birmingham, and Wallace B. Smith, Trussville, both of Ala., assignors to The United States of America as represented by the Administrator U.S. Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 882,673, Mar. 2, 1978, abandoned. This application Jul. 13, 1979, Ser. No. 57,163

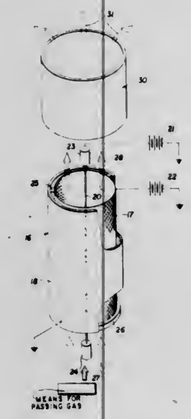
Int. Cl.[3] B03C *3/08, 3/40*

U.S. Cl. 55—2 **8 Claims**

1. A method of removing particulate material from gas using a charging stage and a separate electrostatic collecting stage while reducing back corona effects in the charging stage, the

method comprising providing in said charging stage an ion field of given polarity between at least one corona discharge electrode and at least one passive electrode in said charging stage, removing ions of opposite polarity which may result from back corona discharge from said at least one passive electrode by capturing the ions of opposite polarity with at least one intermediate, apertured electrode positioned between said at least one corona discharge electrode and said at least one passive electrode, passing gas containing particulate material to be removed substantially longitudinally through the space between said at least one intermediate, apertured electrode and said at least one corona discharge electrode to charge said particulate material while preventing gas containing particulate material from longitudinally entering the space between said at least one passive electrode and said at least one intermediate electrode, and thereafter passing said gas containing said particulate material to be removed out from said charging stage containing said at least one corona discharge electrode, said at least one passive electrode and said at least one intermediate electrode, into said separate electrostatic collecting stage to collect said particulate material in said electrostatic collection stage.

4. An apparatus for removing particulate material from gas



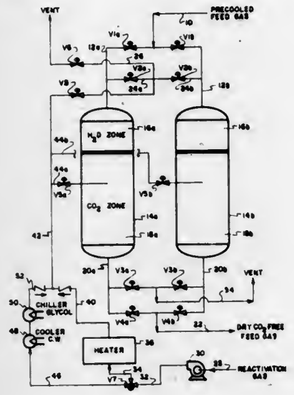
using a charging stage and a separate electrostatic collection stage while reducing back corona effects, the apparatus comprising said charging stage, said charging stage having at least one passive electrode, at least one corona electrode spaced from said at least one passive electrode and at least one apertured intermediate electrode positioned between said at least one corona electrode and said at least one passive electrode for intercepting ions originating from back corona discharge from said at least one passive electrode; means for applying a voltage of given polarity relative to said at least one passive electrode to said at least one corona electrode; means for applying a voltage of said given polarity relative to said at least one passive electrode to said at least one intermediate electrode at a lesser magnitude than the magnitude applied to said at least one corona discharge electrode; means for passing gas containing entrained particulate material longitudinally through the space between said at least one corona discharge electrode and said at least one intermediate electrode to charge the particles as a result of corona discharge from said at least one corona electrode; means for preventing longitudinal entry of gas containing entrained particulate material into the space between said at least one passive electrode and said at least one intermediate electrode; and wherein said separate electrostatic collection stage is positioned downstream from said charging stage.

4,233,038

REACTIVATION SYSTEM FOR WATER-CARBON DIOXIDE ADSORBERS

John C. Tao, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 6, 1979, Ser. No. 64,233
Int. Cl.³ B01D *53/04, 53/26*
U.S. Cl. 55—33 **7 Claims**



1. A method for the regeneration of molecular sieve adsorbents used in the adsorption of water and carbon dioxide contaminants from a feed gas stream passed sequentially through first and second adsorbent zones containing molecular sieve wherein the water is adsorbed in the first adsorbent zone and the carbon dioxide is adsorbed in the second adsorbent zone, which comprises:

(a) regenerating the first adsorbent zone by introducing a heated regeneration gas stream intermediate the first and second adsorbent zones, and passing the heated regeneration gas through the first adsorbent zone in a direction countercurrent to the flow of the feed gas stream therethrough; and subsequently

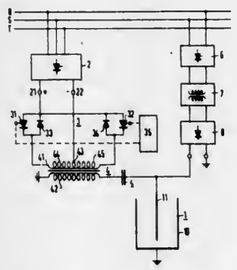
(b) cooling the first adsorbent zone and regenerating the second adsorbent zone by passing cooled regeneration gas sequentially through the first and second adsorbent zones in a direction cocurrent to the flow of the feed gas stream therethrough.

4,233,039

POWER SUPPLY FOR AN ELECTRIC PRECIPITATOR

Walter Schmidt, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,135
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713675
Int. Cl.³ B03C *3/02*
U.S. Cl. 55—139 **2 Claims**



1. In a power supply for an electric precipitator, said power supply including a d-c voltage source and a pulsed a-c voltage source coupled to the high-voltage electrodes of said precipitator, the improvement comprising said pulsed a-c voltage source comprising

a high-voltage transformer including a primary winding and a secondary winding, said secondary winding being coupled to said high-voltage electrodes;

a d-c voltage source having positive and negative voltage terminals, one of which is coupled by means of a center tap to said primary winding of said transformer;

first and second thyristors, coupled to the ends of said primary winding and to the other of said voltage terminals, and adapted to be triggered in alternating fashion at the frequency of the voltage pulses desired to be generated; and

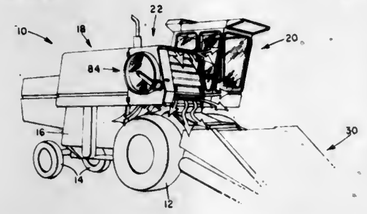
first and second diodes coupled to the ends of said primary winding and to the other of said voltage terminals in anti-parallel relationship with said first and second thyristors.

4,233,040

SELF-CLEANING ROTARY FILTER FOR THE COOLING AIR INLET OF AN ENGINE ENCLOSURE

Bernard F. Vogelaar, Moline; Bruce L. Warman, Silvis, and James R. Nelson, Geneseo, all of Ill., assignors to Deere & Company, Moline, Ill.

Filed Jul. 5, 1978, Ser. No. 922,398
Int. Cl.² B01D *33/22, 35/02, 35/18*
U.S. Cl. 55—269 **33 Claims**



1. In an agricultural machine having a mobile body and a power unit carried by the body, the power unit including a wall having an air inlet, an internal combustion engine, a heat exchanger for cooling the engine and a blower operable to draw cooling air through the inlet and over the heat exchanger, an improved air cleaning apparatus for the cooling air comprising:

a rotatable air filter supported adjacent the wall and having an axis of rotation and including a filter element, having a foraminous portion and exterior and interior sides, covering the inlet for filtering and holding on its exterior side foreign material from the cooling air moving through the inlet;

means for rotating the filter in a given direction;

a duct having, in relation to the direction of filter rotation, opposite leading and trailing walls and an exterior wall extending between said leading and trailing walls and having an air inlet opening adjacent the exterior side of the filter element, said duct inlet opening spanning a portion of the filter element and disposed so that as the filter rotates, other portions of the filter element move past and adjacent the opening, each portion passing in sequence adjacent the leading and trailing walls respectively, said duct being connected to the blower so that the blower draws cleaning air through the duct and through the duct inlet opening, a portion of said cooling air being diverted from the interior side of the filter element and drawn outwards through the filter element and entraining foreign material held on the exterior side of the filter element and carrying it through the duct; and

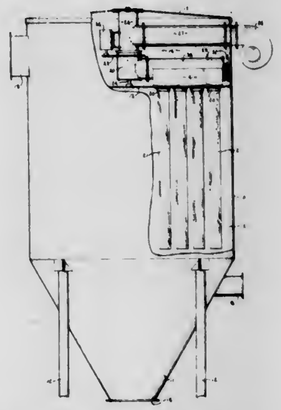
agitating means operatively associated with and responsive to air filter rotation for entering the duct intermittently and engaging at least a portion of the foreign material in the duct so as to facilitate its passage through the duct.

4,233,041

BAGHOUSE WITH ROTATING SWEEP ARM

Richard D. Noland, 1900 W. 47th Pl., Suite 308, Shawnee Mission, Kans. 66205

Filed May 14, 1979, Ser. No. 38,513
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—287 **7 Claims**



1. Apparatus for separating particulate matter from a gas stream, said apparatus comprising:

a cylindrical housing;

a substantially horizontal, circular partition disposed interiorly of said housing, thereby defining a first chamber above said partition and a second chamber beneath said partition, said partition having a plurality of uniform, circular openings therethrough, said circular openings being arranged in concentric rings outwardly from the center of said partition;

an inlet conduit connected to said second chamber for directing a particulate laden gas stream into said second chamber;

an outlet conduit communicating with said first chamber to exhaust gas therefrom;

a plurality of vertically arranged cylindrical filters disposed in said second chamber and having open upper ends secured to said openings through said partition;

a cleaning sweep arm pivotally mounted within said first chamber to rotate in a circular orbit over said partition;

drive means coupled to said cleaning sweep arm to rotate said arm in a circular orbit over said partition;

pressurized air supply means connected to said cleaning sweep arm to supply pressurized cleaning air thereto; and

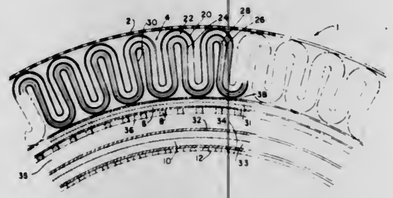
cam controlled valve means positioned and arranged with respect to said cleaning sweep arm to cause cleaning air to be delivered to one of said concentric rings of circular openings in said partition during a full revolution of said arm over said partition to thereby clean, one at a time, the filters in said one of said concentric rings, and then to cause cleaning air to be delivered through the circular openings, one at a time, of another of said concentric rings during the subsequent revolution of said arm.

4,233,042

AIR-OIL SEPARATOR

Ting C. Tao, Bedford Heights, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 6, 1978, Ser. No. 884,051
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—482 **10 Claims**



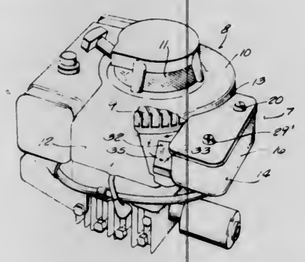
1. Separator apparatus comprising;
upper and lower supports
radially spaced annular permeable casings concentrically disposed about a central axial core,
first and second spaced filter means disposed concentrically about the central axial core respectively on opposite sides of one of said permeable casings and extending axially between the supports for agglomerating and filtering fluids,
said first filter means comprising pleated agglomerator media means having upper and lower ends disposed in sealing relationship with the upper and lower supports respectively,
said second filter means comprising radially spaced annular filter elements concentrically disposed about the core, wrapped directly adjacent on the outer radial side of one of said permeable casings, the annular filter elements comprising layers of filter material having relatively high loft having upper and lower ends disposed in sealing relationship with the upper and lower supports respectively,
said casings, said annular filter elements and said agglomerator media means having upper and lower ends disposed in sealing relationship with the upper and lower supports respectively.

4,233,043

AIR CLEANER FOR INTERNAL COMBUSTION ENGINE

Robert K. Catterson, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Aug. 30, 1978, Ser. No. 938,039
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—315 **1 Claim**



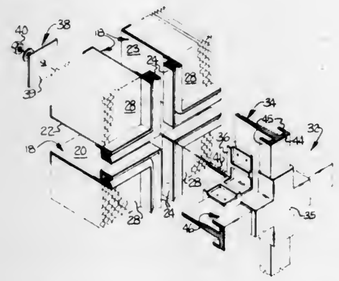
1. In combination with (a) an internal combustion engine having a blower housing through which cooling air is circulated by a blower, (b) a carburetor and an air intake leading thereto, and (c) an air filter element enclosed in a filter housing to filter air flowing between an air intake to the housing and an air outlet from the housing that is connectible to the air intake leading to the carburetor,
the improvement comprising:
(1) a straight air duct having opposed open ends, one of the open ends comprising an entrance to the duct and the other an exit from the duct,
the entrance of the air duct being positioned within the blower housing to receive air circulated by the blower and direct the air with an abrupt change in direction to flow towards the exit of the duct,
(2) the air intake to the filter housing communicating at an angle with the air duct so that air entering the filter housing undergoes a second abrupt change of direction and much of any particulate contaminants entrained in the air flowing through the duct leave through the exit end of the duct,
(3) the filter housing having bottom and side walls and a removable cover,
(4) the air filter element being in the form of an endless air pervious wall having inner and outer surfaces and having top and bottom edges, the latter of which is seated on the bottom wall of the filter housing and the filter element dividing the filter housing into inner and outer compartments,
(5) the air intake to the filter housing leading to said inner compartment,
(6) guide means on the inner surface of the bottom wall of the filter housing snugly fitting the bottom edge of the filter element to minimize the possibility of leakage of air from the inner compartment to the outer compartment and to also hold the bottom edge of the filter element against displacement from its intended shape by suction within said outer compartment,
(7) an internal cover snugly fitted to the top edge of the air filter element, and a removable retaining member drawing said internal cover down onto the top edge of the filter element, and
(8) shape retaining means on said internal cover engaged over opposite portions of the top edge of the filter element to coact with said guide means on the inner surface of the bottom wall of the shell in holding the filter element against displacement from its intended shape.

4,233,044

SELF-CLEANING FLUID SEALED AIR FILTER

Thomas T. Allan, San Francisco, Calif., assignor to Flanders Filters, Inc., Washington, N.C.

Filed May 13, 1976, Ser. No. 685,977
Int. Cl.³ B01D *46/54*
U.S. Cl. 55—355 **1 Claim**



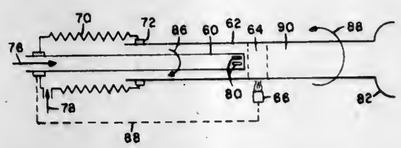
1. A high efficiency air filter comprising a frame formed of wooden or chipboard material and having a centrally disposed air flow opening therethrough and a front peripheral surface surrounding said airflow opening, a continuous channel formed in said front peripheral surface in the material of said frame and extending rearwardly from said front surface of said frame a substantial distance, a filter pack sealably disposed within said frame and filling said air flow opening, a fluid substantially filling said channel to a level not above said front surface and having a consistency substantially the same as that of petrolatum and characterized as being subject to easy deformation at room temperature, and such that the fluid filled sealing channel is adapted to sealably receive a mating retaining flange in the housing to seal the filter in assembled relation therein, the improvement therein comprising
means mounted to said frame for contacting each side of the mating retaining flange and for wiping the sides of the retaining flange substantially free of the fluid upon the filter being withdrawn from the retaining flange and housing, said contacting and wiping means comprising a pair of resilient wiper lips adhered to said front surface of said frame and extending across the top of said channel from opposite sides thereof to substantially cover and enclose said fluid, and a frangible portion interconnecting said wiper lips.

4,233,045

APPARATUS AND METHOD FOR MAKING OPTICAL FILAMENT PREFORM

Arnab Sarkar, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 27, 1978, Ser. No. 963,837
Int. Cl.³ C03C *7/02*
U.S. Cl. 65—3 A **17 Claims**



1. In the method of manufacturing an optical waveguide preform which includes the steps of:
providing a first tube,
moving a heat source relative to said first tube in a longitudinal direction, thereby forming within said first tube a moving hot zone, and
flowing a reactant gas through said hot zone to produce a suspension of particulate material, at least a portion of which flows downstream from said hot zone where at least a portion thereof comes to rest on the inner surface of said first tube in a region of said first tube that is cooler than that portion of said tube that surrounds said hot zone, to form a deposit on said inner surface,
the improvement which comprises:
moving a second tube within said first tube while maintaining the end of said second tube, which is within said first tube, a fixed distance from said hot zone; and
flowing at least a portion of said reactant gas through said second tube, radially outwardly from the end thereof, and through said hot zone.

4,233,046

METHOD OF MAKING GLASS FIBERS HAVING A REDUCED TENDENCY TO GIVE GUMMING DEPOSITS

Douglas M. Walser, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 946,996, Sep. 29, 1978. This application Jun. 22, 1979, Ser. No. 51,087
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3 C **7 Claims**

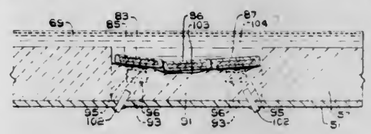
1. In a method of forming a sized glass fiber strand comprising drawing glass streams through orifices in a bushing to form individual glass fibers, moving the fibers away from the bushing at a high rate of speed and forming them into a strand, and applying to the fibers while they are moving at this speed and before they are formed into a strand a starch-based sizing solution; 4 percent to 52 percent by weight of the salt of a polyamino functional polyamide resin, said polyamino functional polyamide resin salt being formed from the condensation reaction product of a carboxylic acid and a polyamine, said polyamine having greater than 2 amine groups per molecule, and a carboxylic acid having 1 to 5 carbon atoms; 5 to 25 percent by weight of a wax from the group consisting of animal waxes, vegetable waxes, mineral waxes and synthetic waxes; and 9 percent to 77 percent by weight of a fatty triglyceride; and collecting the glass strands so produced; the improvement comprising:
using in the size solution about 50 to about 65 weight percent based on the non-aqueous components in the solution of a starch containing cross-links that has been partially cooked to within about 50 percent of complete cooking so that the sized glass strands produced have a reduced tendency to form gummy deposits under high relative humidity conditions.

4,233,047

IN SITU REPAIR OF DELAMINATED FLOAT BATH BOTTOM REFRACTORY

James C. Stultz, and George A. Pecoraro, both of Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 1, 1979, Ser. No. 35,038
Int. Cl.³ C03B *18/16*
U.S. Cl. 65—27 **10 Claims**



1. A method of repairing a cavity in the bottom of a glass float forming chamber containing molten metal comprising: limiting the glass flow in the chamber to eliminate glass overlying said cavity, opening an access into the chamber above the level of the molten metal, inserting through said access and into the molten metal a repair block which comprises a material selected from the group consisting of tungsten, molybdenum, tantalum, and alloys and ceramic refractory combinations thereof such that the aggregate repair block has a higher specific gravity than the molten metal in the chamber, the repair block being of a size adapted to fit within the cavity without substantially projecting above the elevation of the chamber bottom, and moving the repair block into the cavity, whereby further growth of the cavity is inhibited.

4,233,048

REMOVING FRAGMENTS OF FRACTURED GLASS SHEETS DURING TEMPERING

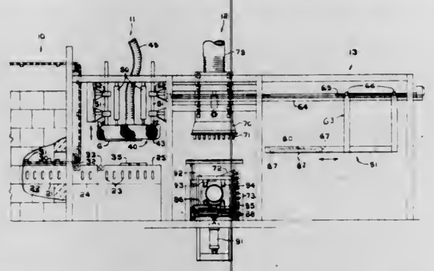
Dean W. Gintert, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1979, Ser. No. 55,203
Int. Cl.³ C03B *27/04*
U.S. Cl. 65—27 **9 Claims**

1. In a method of tempering glass sheets wherein a hot glass sheet is supported between upper and lower nozzle housings which apply cold tempering medium toward the opposite major surfaces of said glass sheet at a rate sufficient to establish at least a partial temper in the glass sheet, whereby sometimes said sheet is fractured to form fragments during said cooling step and said lower nozzle housing is pivoted to remove at least some of said fragments by sliding, the improvement comprising pivoting said lower nozzle housing beyond an orientation that requires said fragments to be removed by sliding to an orientation wherein fragments that do not slide off the lower nozzle housing during said pivoting to said orientation are free to drop by gravity without sliding from said lower nozzle

housing when said lower nozzle housing pivots beyond said orientation.

5. Apparatus for tempering glass sheets comprising an upper nozzle housing having a lower apertured wall and a lower nozzle housing having an upper apertured wall, means for supporting said housings in operative positions relatively closely spaced to one another to define a narrow passage therebetween for receiving a glass sheet between said nozzle



housings, means to supply cold tempering medium under pressure to said upper and lower nozzle housings for delivery through the apertures of said apertured walls toward the opposite major surfaces of said glass sheet, means for pivoting said lower nozzle housing into an orientation such that fragments that result from an occasional fracture of a said glass sheet that do not slide off said lower nozzle housing during said pivoting are free to drop by gravity at the end of said pivoting.

4,233,049

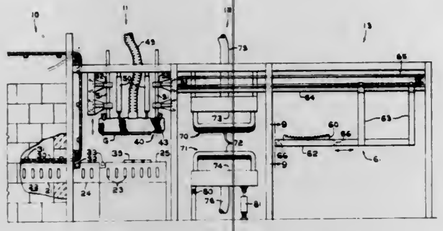
METHOD AND APPARATUS FOR SHAPING GLASS SHEETS BY DROP FORMING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 960,404, Nov. 13, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,425

Int. Cl.³ C03B *23/02*

U.S. Cl. 65—106 **25 Claims**



1. A method of shaping glass sheets, comprising the steps of:
heating a glass sheet to approximately its softening point and bringing the glass sheet to rest on support means;
translating a vacuum platen having a flat, perforated surface toward the support means to bring the flat, perforated surface into close proximity to, and parallel with, a surface of the glass sheet;
drawing vacuum through the flat, perforated surface so as to retain the glass sheet on the platen;
translating the platen away from the support means to lift the glass sheet from the support means and to bring the glass sheet into a generally horizontal orientation on the underside of the platen;
bringing into vertical alignment with and beneath the glass sheet held on the platen a shaping mold having a contour defining the desired contour for the glass sheet; and
releasing the glass sheet from the platen so as to fall onto the shaping mold and conform to the contour defined by the shaping mold.

4,233,050

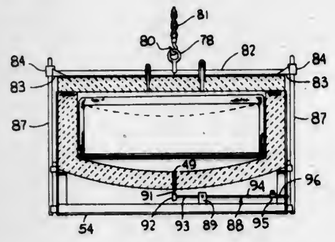
SHAPING GLASS SHEETS BY GRAVITY SAG BENDING FOLLOWED BY BLOW FORMING

John A. Comperatore, Natrona Heights; David J. Wise, New Kensington, and Edward D. Black, Brackenridge, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 9, 1979, Ser. No. 18,964

Int. Cl.² C03B *23/02*

U.S. Cl. 65—107 **9 Claims**



6. A method of shaping glass sheets by blow forming comprising cradling an assembly of at least two glass sheets to be shaped in a flexible blanket of fiber glass cloth, wrapping the periphery of said cloth around the marginal edge of said assembly, applying a frame-like ring over the folded portion of said fiber glass cloth blanket resting on the upper surface of the upper glass sheet of said assembly, reversely folding said fiber glass cloth blanket around said frame-like ring to form a ring assembly, mounting said assembly so formed above an upward facing shaping surface of a blow forming tool, heating said ring assembly so formed and so mounted to the glass deformation temperature, but below the devitrification temperature of the glass while mounted over said shaping surface, enclosing said blow forming tool to form a sealed chamber containing said ring assembly, and pressurizing said sealed chamber at a low positive pressure while maintaining said deformation temperature until said glass sheets conform to said shaping surface of said blow forming tool.

4,233,051

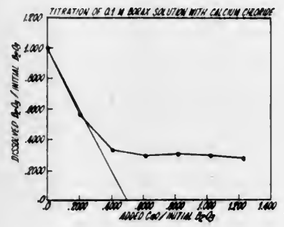
METHOD FOR PRODUCING CALCIUM BORATES

Walter L. Eastes, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 11, 1979, Ser. No. 47,521

Int. Cl.³ C03C *13/00, 3/14*

U.S. Cl. 65—134 **11 Claims**



1. A method for producing calcium borates by precipitation from solution comprising an initial step of forming an aqueous solution of borax and calcium chloride wherein the calcium chloride calculated as CaO and the borax calculated as B_2O_3 are presented in initial amounts having a molar ratio of CaO/B_2O_3 ranging from 0.2 to 0.6.

4,233,052

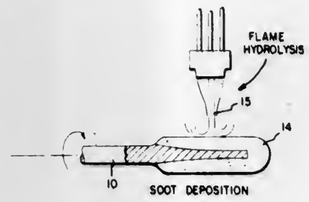
CARBON COATING FOR A STARTING MEMBER USED IN PRODUCING OPTICAL WAVEGUIDES

Ellen K. Dominick, Trumansbury, and George W. Scherer, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 828,149, Aug. 26, 1977. This application Apr. 16, 1979, Ser. No. 30,353

Int. Cl.³ C23C *13/08*

U.S. Cl. 65—144 **4 Claims**



1. Apparatus for making preforms for optical waveguides comprising:
a substantially cylindrical starting member having a smooth outside peripheral surface;
a coating of particulate carbon without impurities on the outside periphery of said starting member, said carbon being present in an amount which is completely disintegrated during heating to the consolidation temperature of glassmaking particulate material; and
means for applying said glassmaking particulate material to said starting member to form an adherent coating of glass; whereby the starting member can be removed from said glass by separation at the interface between the carbon and the starting member or shearing within the carbon layer, to produce a preform from the glass.

4,233,053

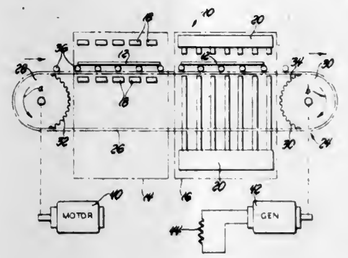
SPEED ADAPTIVE CONVEYOR DRIVE FOR A GLASS MANUFACTURING SYSTEM

John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551

Filed Mar. 16, 1979, Ser. No. 21,136

Int. Cl.³ C03B *35/18*

U.S. Cl. 65—163 **8 Claims**



1. A conveyor drive system for transporting a glass sheet through a glass processing station along a direction of travel comprising:
a conveyor drive defined by at least one continuous drive loop trained over first and second pulleys mounted at opposed ends of a lateral side of the processing station;
a plurality of elongated rollers spaced apart from one another along the direction of travel and extending transversely with respect thereto, the plurality of rollers being in driving engagement with the conveyor drive for rotational motion upon motion of the continuous drive loop;
drive torque means, coupled to the first pulley of the conveyor drive, for providing driving torque to the conveyor drive to move the glass sheet along the direction of travel; and
means, driven by the second pulley of the conveyor drive, for providing a counter-torque which increases with the speed of the second pulley for the purpose of stabilizing the motion of the conveyor drive.

8. In a glass sheet conveyor system for a glass processing station of the type having a conveyor drive defined by at least one continuous drive loop trained over first and second spaced pulleys mounted at opposed ends of a lateral side of the processing station; a glass sheet transport bed defined by a plurality of elongated rollers, the plurality of rollers being in driving engagement with the continuous drive loop; and torque means for applying torque to the first pulley of the conveyor drive; the improvement comprising:
means driven by the second pulley for applying an adaptive counter-torque to the second pulley of the conveyor drive in response to the speed of the second pulley, which, in cooperation with the torque means stabilizes the motion of the conveyor drive against slip-stick frictional phenomenon.

4,233,054

PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES, THEIR PRODUCTION, HERBICIDAL COMPOSITIONS CONTAINING THEM, AND THEIR USE

Henry Szczepanski, Rheinfelden; Otto Rohr, Therwil, both of Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Beat Böhner, and Hermann Rempfler, both of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

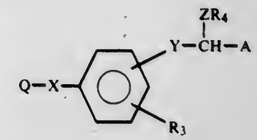
Filed Mar. 12, 1979, Ser. No. 19,999

Claims priority, application Switzerland, Mar. 17, 1978, 2932/78

Int. Cl.³ A01N *29/08*; C07C *69/76, 101/72*

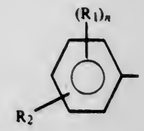
U.S. Cl. 71—70 **10 Claims**

1. A phenoxy-phenoxy-alkanecarboxylic acid derivative of the formula I



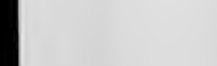
(I)

in which
Q is a radical



A is a radical —COB,
B is a radical —OR_5,
R_1 is a halogen atom,
n is the number 0, 1 or 2,
R_2 is a halogen atom or the trifluoromethyl, nitro, or carbamoyl group,
R_3 is hydrogen, halogen, a C_1-C_4-alkyl group, or the nitro, or carbamoyl group,
R_4 is C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, benzyl or phenyl both optionally substituted by halogen, or C_2-C_6-alkoxyalkyl or C_3-C_{12} cycloalkyl,
R_5 is hydrogen or the cation of a base $1/mM^{m\oplus}$ wherein M is an alkali metal cation or an alkaline—earth metal cation

or an Fe, Cu, Zn, Mn or Ni cation, or an ammonium group



m as integer 1, 2 or 3 takes account of the valency of the cation, and R_a, R_b, R_c and R_d independently of one another are each hydrogen, benzl or a C_1-C_4-alkyl group which is unsubstituted or substituted by —OH, —NH_2 or C_1-C_4-alkoxy, or

R_5 is a C_1-C_{18}-alkyl group which is unsubstituted or is substituted by halogen, nitro, C_1-C_8-alkoxy, C_2-C_8-alkoxyalkoxy, C_3-C_6-alkenyloxy, C_1-C_8-alkylthio, C_2-C_8-alkanoyl, C_2-C_8-acyloxy, C_2-C_8-alkoxycarbonyl, carbamoyl, bis-(C_1-C_4-alkyl)amino, tris-(C_1-C_4-alkyl)-ammonium, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkenyl, or a phenoxy group which is unsubstituted or in its turn mono- or poly-substituted by halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy; or is a C_3-C_{18}-alkenyl group which is unsubstituted or is mono- to tetrasubstituted by halogen or monosubstituted by phenyl or methoxy-carbonyl; or is a C_3-C_8-alkynyl group; or a C_3-C_{12}-cycloalkyl group which is unsubstituted or substituted by halogen or C_1-C_4-alkyl; or a C_3-C_8-cycloalkenyl group; or a phenyl group which is unsubstituted or is mono- or poly-substituted by halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, NO_2, CF_3, COOH, OH, SO_3H, NH_2 or —NH(C_1-C_4-alkyl) or —N(C_1-C_4-alkyl)$_2$;

X, Y and Z are each an oxygen atom or a sulfur atom.

5. A herbicidal and plant-growth regulating composition which contains as active substance an effective amount of a phenoxy-phenoxy-alkanecarboxylic acid derivative of the formula I, claim **1**, together with a suitable carrier therefor.

6. A method for the selective control of weeds in crops of cereals or rice comprising applying thereto or the locus thereof a herbicidally effective amount of a compound according to claim **1**.

8. A method for reducing the vegetative growth in soya bean crops comprising applying to said crops an effective growth reducing amount of a compound according to claim **1**.

9. A method for defoliating and desiccating cultivated plants shortly before the harvesting thereof comprising applying to said plants an effective defoliating and desiccating amount of a compound according to claim **1**.

4,233,055

QUATERNARY AMMONIOALKANECARBOXYLIC ACID ANILIDES AS PLANT GROWTH INFLUENCING AGENTS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

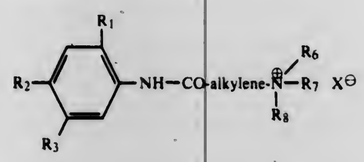
Division of Ser. No. 751,616, Dec. 16, 1976, Pat. No. 4,141,718. This application Dec. 11, 1978, Ser. No. 968,317

Claims priority, application Switzerland, Dec. 23, 1975, 16704/75; Dec. 23, 1975, 16705/75

Int. Cl.[3] **C07C** *103/54, 103/68, 103/70*

U.S. Cl. 71—76 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, chlorine, methyl or trifluoromethyl,

R_2 is methyl, halogen or n-butoxy,

R_3 is hydrogen, chlorine or trifluoromethyl,

"alkylene" has from 1 to 3 carbon atoms,

one of R_6, R_7 and R_8 is C_1-C_4 alkyl, cyclopropylmethyl, cyanomethyl, allyl, butenyl, or propargyl and the other two of R_6, R_7 and R_8 are allyl, and

X is the anion of any non-phytotoxic acid.

4,233,056

NOVEL GLYCYLMETHYLPHOSPHINIC ACID DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND USE THEREOF

Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

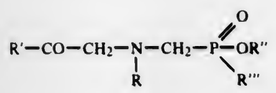
Filed Aug. 7, 1978, Ser. No. 931,343

Claims priority, application Switzerland, Aug. 11, 1977, 9883/77

Int. Cl.[3] **A01N** *57/10;* **C07F** *9/30, 9/32*

U.S. Cl. 71—86 **6 Claims**

1. A glycylmethylphosphinic acid derivative of the formula I



(I)

wherein

R represents hydrogen, a C_1-C_6 alkyl radical, benzyl, diphenylmethyl or triphenylmethyl, or the group HOOC—CH_2—,

R′ represents a —OH or —OR_1 group, in which R_1 represents a cation, a C_1-C_6 alkyl radical, a C_1-C_6 alkyl radical substituted by halogen, hydroxyl, lower alkoxy, carboxyl or cyano, a lower alkenyl or alkynyl radical, a cycloalkyl radical, or R′ represents the amino group,

R″ represents hydrogen, a cation, and lower alkyl or hydroxyalkyl,

R‴ represents a C_1-C_4 alkyl radical which can be mono- or polysubstituted by halogen atoms, hydroxyl or carboxyl groups, or represents a phenyl radical, or a phenyl radical substituted by halogen, lower alkyl, haloalkyl or di-(lower) alkylamino, and the plant physiologically acceptable salts thereof.

4,233,057

3-[5-(1-PHENOXY-ALKYL, -ALKYNYL, -ALKENYL, OR HALOALKYL)-1,3,4-THIADIAZOL-2-YL]-4-HYDROXY-1-METHYL-2-IMIDAZOLIDINONES

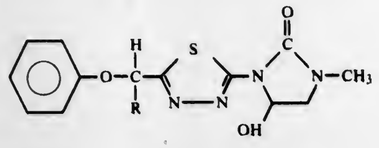
Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 14, 1979, Ser. No. 39,021

Int. Cl.[3] **C07D** *277/38*

U.S. Cl. 71—090 **25 Claims**

1. A compound graphically represented by Formula I



wherein:

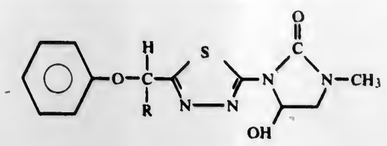
R is an alkyl of up to four carbon atoms,

an alkenyl of up to three carbon atoms,

an alkynyl of up to three carbon atoms, or

a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl, and 2-bromoethyl.

10. A method of controlling weeds, which comprises contacting the weeds with a herbicidally effective amount of a compound graphically represented by Formula I



(I)

wherein

R is an alkyl of up to four carbon atoms, an alkynyl of up to three carbon atoms, an alkenyl of up to three carbon atoms, or a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl and 2-bromoethyl.

4,233,058

4,5-DICHLORO-IMIDAZOLE-1-CARBOXYLIC ACID ARYL ESTERS AND THEIR USE AS PLANT PROTECTION AGENTS

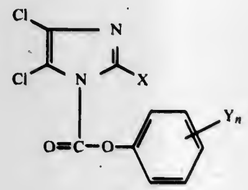
Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 835,092, Sep. 21, 1977, Pat. No. 4,183,742. This application Mar. 23, 1979, Ser. No. 23,362

Int. Cl.[3] **A01N** *43/50;* **C07D** *233/90*

U.S. Cl. 71—92 **5 Claims**

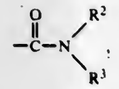
1. A 4,5-dichloro-imidazole-1-carboxylic acid aryl ester of the formula



(I)

in which

X represents

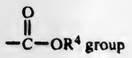


in which

R^2 represents a hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with up to 8 carbon atoms or the formyl group,

R^3 represents phenyl which may optionally carry one or more substituents selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylmercapto with 1 to 4 carbon atoms and trifluoromethyl,

Y represents halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, nitro, cyano or a



group

in which

R^4 represents alkyl with 1 to 6 carbon atoms and n represents 0, 1, 2, 3, 4 or 5.

5. A method of protecting a plant against weeds which comprises applying to the plant or its habitat a herbicidally effective amount of a compound according to claim **1**.

4,233,059

1,2,3-TRIAZOLE CARBOXYLIC ACID AMIDES AND BIOCIDAL COMPOSITIONS CONTAINING THE SAME

Hans-Rudolf Krüger; Friedrich Arndt; Dietrich Baumert; Hartmut Joppien; Ernst A. Pierok, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Scherlag Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

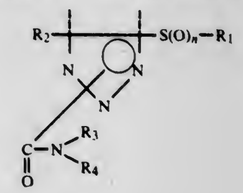
Filed Aug. 1, 1979, Ser. No. 62,795

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834879

Int. Cl.[3] **C07D** *249/04;* **A01N** *9/12, 9/14*

U.S. Cl. 71—92 **152 Claims**

1. 1,2,3-triazole carboxylic acid amides of the formula



I,

in which

R_1 is C_1-C_{10}-alkyl, C_2-C_8-alkenyl or alkinyl or is aryl-C_1-C_3-alkyl which may be substituted in one or several places by C_1-C_6-alkyl and/or halogen and/or C_1-C_6-alkoxy and/or nitro and/or trifluoromethyl,

R_2 is hydrogen or C_1-C_{10} alkyl in which the chain may be interrupted in one or several places by oxygen- or sulfur atoms and which may be substituted by halogen,

R_3 and R_4 are the same or different and are hydrogen, C_1-C_{10} alkyl, C_1-C_{10} alkyl which is substituted by halogen or C_1-C_3-alkoxy, C_2-C_8-alkenyl or alkinyl, aryl-C_1-C_3-alkyl which may be substituted in one or several places by C_1-C_6-alkyl and/or halogen and/or C_1-C_6-alkoxy and/or nitro and/or trifluoromethyl, a C_3-C_8 cyclo aliphatic hydrocarbon group which may also be substituted in one or several places by C_1-C_6-alkyl, or an aromatic hydrocarbon group which may be substituted in one or several places by C_1-C_6 alkyl and/or halogen and/or C_1-C_6-alkoxy and/or nitro and/or trifluoromethyl, or wherein

R_3 and R_4 together with the adjoining nitrogen atom conconstitute a 3 to 7-member ring which may include further oxygen, sulfur or nitrogen atoms and wherein

n is 0, 1 or 2,

or an isomeric mixture from any of the listed compounds.

152. A biocidal composition having herbicidal, insecticidal, acaricidal, fungicidal and/or nematocidal activity comprising about 10 to 80% by weight of the active agents of claim **1** and about 90 to 20% by weight of liquid or solid carrier materials which may include up to about 20% by weight of surface active agents.

4,233,060

α-PHENOXY-THIOLPROPIONIC ACIDS

Beat Böner, Binningen; Otto Rohr, Therwil; Hermann Rempfler, Binningen, all of Switzerland, and Georg Pissiotas, Lörach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsely, N.Y.

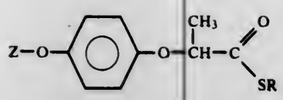
Filed Nov. 20, 1978, Ser. No. 962,517

Claims priority, application Switzerland, Nov. 24, 1977, 14398/77

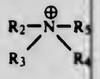
Int. Cl.[3] **C07C** *153/23;* **C07D** *213/62, 295/08, 295/14*

U.S. Cl. 71—94 **8 Claims**

1. A compound of the formula



wherein R represents hydrogen, a metal cation or an amine or ammonio cation



wherein each of R_2, R_3, R_4, R_5 independently represents hydrogen, C_1-C_4 alkyl, C_1-C_4 alkyl substituted by hydrogen or cyano, cyclohexyl, phenyl or benzyl, or two or three of the symbols R_2 to R_5, together with the nitrogen to which they are attached form a pyridine, piperidine, morpholine or picoline ring; and Z represents phenyl substituted by halogen, trifluoromethyl, cyano or nitro, or pyridyl substituted by halogen or trifluoromethyl, and the physiologically acceptable salts thereof.

4,233,061

NOVEL BENZENESULFONAMIDE DERIVATIVES

Tetsuo Takematsu; Makoto Konnai, and Hiroyoshi Omokawa, all of Utsunomiya, Japan, assignors to Utsunomiya University, Tochigi, Japan

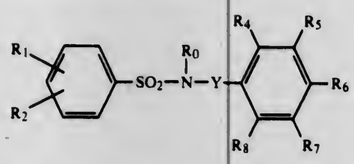
Division of Ser. No. 837,911, Sep. 29, 1977, Pat. No. 4,157,257. This application Dec. 29, 1978, Ser. No. 974,517

Claims priority, application Japan, Oct. 1, 1976, 51/118343; May 20, 1977, 52/58369; Aug. 2, 1977, 52/92803

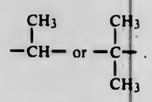
Int. Cl.[2] A01N 9/14

U.S. Cl. 71—103 **24 Claims**

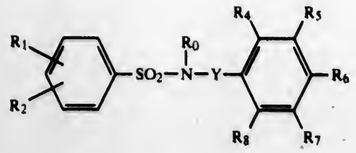
1. A compound of the formula



wherein R_0 represents alkyl containing up to 15 carbon atoms, alkenyl containing 2 to 4 carbon atoms or propargyl; R_1 and R_2, independently from each other, represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms; one or two of R_4, R_5, R_6, R_7 and R_8 represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms and the remainder represent hydrogen; and Y represents

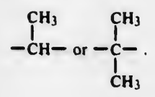


19. A method for controlling weeds in a rice crop which comprises applying to the locus to be protected from the weeds a herbicidally effective amount of a compound of the formula



(I)

wherein R_0 represents alkyl containing up to 15 carbon atoms, alkenyl containing 2 to 4 carbon atoms or propargyl; R_1 and R_2, independently from each other, represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms; one or two of R_4, R_5, R_6, R_7 and R_8 represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms and the remainder represent hydrogen; and Y represents



4,233,062

ATOMIZATION INTO A CHAMBER HELD AT REDUCED PRESSURE

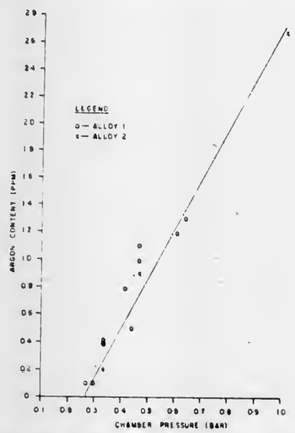
Richard J. Siddall, Ross-On-Wye, England, assignor to Huntington Alloys Inc., Huntington, W. Va.

Filed Aug. 9, 1978, Ser. No. 932,327

Claims priority, application United Kingdom, Oct. 8, 1977, 33555/77

Int. Cl.[3] B22D 23/08; C21C 7/00

U.S. Cl. 75—0.5 C **7 Claims**



1. In a process for the production of metal powder by atomization of a molten metal stream in which a gaseous medium is impinged there against, the improvement which comprises reducing the gas entrapment of the metal powder produced by conducting the atomization process at a subatmospheric pressure of about 0.5 bar (0.05 M Pa) or below during the atomization period in which said gaseous medium impinges against said molten metal stream and maintaining said subatmospheric pressure at said level until the process is substantially complete.

4,233,063

PROCESS FOR PRODUCING COBALT POWDER

Joseph E. Ritsko; John J. Culkin; Martin B. MacInnis, and Howard L. Acla, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 14, 1979, Ser. No. 38,972

Int. Cl.[2] C22B 23/04

U.S. Cl. 75—0.5 AA **9 Claims**

1. A process for producing cobalt metal powder, the basic process comprising the steps of forming cobalt ions in solution, complexing said cobalt ions with ammonia in the presence of halide ions to form a cobalt ammine halide solution, digesting said cobalt ammine halide solution in the presence of ammonia to form a cobalt containing precipitate, separating said cobalt containing precipitate from the resulting solution, and heating cobalt containing precipitate in a reducing atmosphere to obtain a cobalt metal powder wherein the improvement comprises heating the resulting solution at a pH from about 7.5 to 14 at a sufficient temperature for a sufficient period of time to produce an ammonia enriched vapor and an aqueous mixture comprising a solution substantially free of ammonia and another cobalt containing precipitate.

4,233,064

METHOD OF SCAVENGING STEEL

Edward J. Dunn, Jr., 101 B Village Round, Wescosville, Pa. 18106

Continuation-in-part of Ser. No. 942,139, Sep. 13, 1978. This application Apr. 4, 1979, Ser. No. 26,902

Int. Cl.[3] C21C 7/00, 7/02, 7/04

U.S. Cl. 75—58 **20 Claims**

1. A method of refining steel characterized by a safer more effective and efficient adding of an active elemental or alloyed substance capable of combining with the dissolved impurities for the primary purpose of reducing or eliminating the voluminous polluting smoke that is normally associated with such additions which method comprises the placement upon the end of a refractory covered vertical rod, a consummable solid body of a pressed together mixture of materials comprising an active substance which has a limited solubility in the steel and an inactive material or mixtures of inactive material selected from the group consisting of iron, aluminum, elements which will alloy with the steel and oxides thereof, so that upon effecting an immersion of the subsequent assembly into a deep molten steel pool and the holding in place thereof, the pressed together shape dissolves, with the rate of dissolution being controlled to within desired limits by the appropriate choice of the composition and dimensional shape of the solid body, resulting in the composition and the shape of the solid body providing a means by which a given amount of active substance can be added to the molten steel at a rate that does not allow the active substance to exceed its solubility limit in the steel and thus prevent any active substance from reaching the surface to react with the air to cause air pollution.

4,233,065

EFFECTIVE BORON ALLOYING ADDITIVE FOR CONTINUOUS CASTING FINE GRAIN BORON STEELS

Maharaj K. Koul, Tonawanda, N.Y., assignor to Foote Mineral Company, Exton, Pa.

Continuation-in-part of Ser. No. 888,338, Mar. 20, 1978, abandoned. This application Dec. 8, 1978, Ser. No. 967,696

Int. Cl.[2] C21C 7/00; B22D 27/18, 21/02

U.S. Cl. 75—134 S **3 Claims**

1. A boron alloying additive for continuous casting of boron steel consisting essentially of from about 0.5 to about 1.5 percent boron, from about 8 to about 15 percent calcium, from about 8.5 to about 20 percent titanium, up to about 1.5 percent of aluminum, from about 40 to about 60 percent silicon and balance iron, said percentages being by weight, based on the total weight of said alloy.

4,233,066

ELECTRICAL CONDUCTOR OF ALUMINIUM

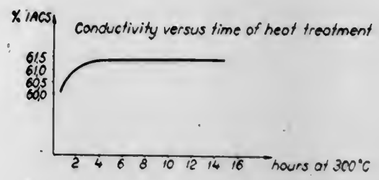
Anders O. Sundin, Helsingborg, and Wolfgang A. Broanvall, Hittarp, both of Sweden, assignors to Aktiebolaget Elektrokoppar, Helsingborg, Sweden

Continuation-in-part of Ser. No. 520,947, Nov. 4, 1974, abandoned, which is a continuation of Ser. No. 323,274, Jan. 12, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,714

Claims priority, application Sweden, Apr. 27, 1972, 5549/72

Int. Cl.[3] C22C 21/16

U.S. Cl. 75—142 **12 Claims**



1. Electrical conductor consisting essentially of aluminium having an electrical conductivity when unannealed of at least 59% of the conductivity for annealed copper according to international standard (International Annealed Copper Standard, IACS), in which the conductor consists essentially of 0.001–0.10 percent by weight of beryllium, 0.05–0.35 percent by weight copper and 0.01–0.20 percent by weight magnesium, the total amount of beryllium, copper and magnesium being at the most 0.50 percent by weight, balance aluminium.

4,233,067

SOFT COPPER ALLOY CONDUCTORS

Kazuo Sawada, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 8, 1979, Ser. No. 1,955

Claims priority, application Japan, Jan. 19, 1978, 53-5070; Jan. 20, 1978, 53-5530

Int. Cl.[2] C22C 9/00; C22F 1/08

U.S. Cl. 75—153 **2 Claims**

1. Soft copper alloy conductors which consist essentially of 5–200 ppm of calcium, the balance being substantially copper, and having a 0.2% proof stress which is 12 kg/mm^2 or less.

4,233,068

MODIFIED BRASS ALLOYS WITH IMPROVED STRESS RELAXATION RESISTANCE

Warren F. Smith, Jr., Branford, Conn.; John M. Vitek, Oak Ridge, Tenn., and Eugene Shapiro, Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

abandoned. This application Nov. 5, 1979, Ser. No. 91,416

Int. Cl.[3] C22C 9/04; C22F 1/08

U.S. Cl. 75—157.5 **16 Claims**

1. An essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said alloy consisting essentially of one component selected from the group consisting of 0.05 to 0.5% by weight magnesium or 0.05 to 0.5% by weight magnesium in combination with 0.02 to 0.5% by weight aluminum, a second component selected from the group consisting of 0.05 to 3.0% by weight silicon or 0.05 to 0.3% by weight silicon in combination with 0.1 to 2.0% by weight tin, from 8 to 32.8% by weight zinc, balance copper, with the amount of said aluminum, silicon or tin being inversely related to the amount of said zinc and with the maximum wt.% zinc=32.8 $-4.8\times$(wt.% Al) $-2.3\times$(wt.% Sn) $-6.5\times$(wt.% Si).

7. A method for producing an essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said method comprising the steps of:

(a) casting an alloy consisting essentially of one component selected from the group consisting of 0.05 to 0.5% by weight magnesium or 0.05 to 0.5% by weight magnesium in combination with 0.02 to 0.5% by weight aluminum, a second component selected from the group consisting of 0.05 to 3.0% by weight silicon or 0.05 to 3.0% by weight silicon in combination with 0.1 to 2.0% by weight tin, from 8 to 32.8% by weight zinc, balance copper, with the amount of said aluminum, silicon or tin being inversely related to the amount of said zinc and with the maximum wt.% zinc $=32.8-4.8\times$(wt.% Al) $-2.3\times$(wt.% Sn) $-6.5\times$(wt.% Si);

(b) hot working said alloy at a temperature above the recrystallization temperature of the alloy and below the solidus temperature of the alloy;

(c) cold working said alloy with up to but not including a 100% reduction in area; and

(d) annealing the worked alloy at 150° to 900° C. to recrystallize the alloy to a grain size of 0.005 to 0.050 mm.

4,233,069

MODIFIED BRASS ALLOYS WITH IMPROVED STRESS RELAXATION RESISTANCE

Warren F. Smith, Jr., Branford; John M. Vitek, Cheshire, and Eugene Shapiro, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 919,964, Jun. 28, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,417

Int. Cl.³ C22C *9/04*; C22F *1/08*

U.S. Cl. 75—157.5 **15 Claims**

1. An essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said alloy consisting essentially of from 0.05 to 0.5% by weight magnesium, from 0.02 to 0.5% by weight aluminum, from 8 to 32.8% by weight zinc, balance copper, with the maximum wt.% zinc $=32.8-4.8\times$wt.% aluminum.

7. A method for producing an essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said method comprising the steps of:

(a) casting an alloy consisting essentially of from 0.05 to 0.5% by weight magnesium, from 0.02 to 0.5% by weight aluminum, from 8 to 32.8% by weight zinc, balance copper, with the maximum wt.% zinc $=32.8-4.8\times$wt.% aluminum;

(b) hot working said alloy at a temperature above the recrystallization temperature of the alloy and below the solidus temperature of the alloy;

(c) cold working said alloy with up to but not including a 100% reduction in area; and

(d) annealing the worked alloy at 150° to 900° C. to recrystallize the alloy to a grain size of 0.005 to 0.050 mm.

4,233,070

LEAD ALLOYS FOR ELECTRIC STORAGE BATTERY

John McWhinnie, Bolton, and John L. Dawson, Swinton, both of England, assignors to Chloride Group Limited, London, England

Filed May 23, 1979, Ser. No. 41,710

Claims priority, application United Kingdom, May 26, 1978, 22886/78

Int. Cl.² H01M *35/04*

U.S. Cl. 75—167 **8 Claims**

1. A lead alkaline earth metal alloy which consists of 0.075A/40% to 0.13A/40% by weight of at least one alkaline earth metal, 0.0001% to 0.1% aluminium, 0.005% to 0.05% by weight magnesium, the balance being lead and impurities, the alkaline earth metal being selected from the group consisting of calcium, strontium and barium and A being the atomic weight of the alkaline earth metal.

4,233,071

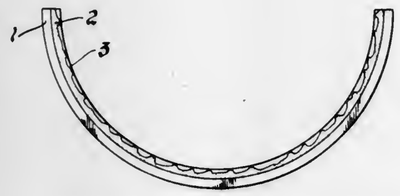
BEARING HAVING IRON SULFUR MATRIX

John C. Bierlein, Washington, and Edward J. Shipek, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 719,857, Sep. 9, 1976, which is a continuation-in-part of Ser. No. 621,495, Oct. 10, 1975, Pat. No. 3,985,408. This application Jan. 4, 1979, Ser. No. 970

Int. Cl.³ B22F *5/00, 3/26*

U.S. Cl. 75—231 **3 Claims**



1. A bearing matrix which is a porous coherent body of sintered particles providing score resistance and adapted for lubricant impregnation, said matrix consisting by weight of ½ to 6 percent sulfur; 0 to 60 percent copper; and iron; the copper being present as desired to proportionally reduce the sintering temperature.

4,233,072

SLIDING MEMBER HAVING WEAR- AND SCUFF-RESISTANT COATING ON ITS SURFACE

Tamotu Watanabe, Kashiwazaki; Tatsuei Sakata, Nishiyama, and Yoshikuni Mizuma, Kashiwazaki, all of Japan, assignors to Riken Corporation, Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,592

Claims priority, application Japan, Jul. 28, 1977, 52-89762

Int. Cl.³ B22F *5/00*

U.S. Cl. 75—236 **3 Claims**

1. A sliding member having a wear resistant coating produced by plasma-arc spraying a mixture comprising 60 to 85% by weight of molybdenum powder, 10 to 30% by weight of nickel-chromium alloy powder and 5 to 20% by weight of titanium carbide powder on its sliding surface.

4,233,073

IRON-BASE SINTERED ALLOY FOR VALVE SEAT AND METHOD OF MAKING THE SAME

Kazutoshi Takemura, Kashiwazaki, Japan, assignor to Riken Piston Ring Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1978, Ser. No. 899,110

Claims priority, application Japan, May 2, 1977, 52-49860

Int. Cl.² C22C *33/02, 38/38, 38/22, 38/30*

U.S. Cl. 75—243 **2 Claims**



1. Wear resistant and machinable sintered iron-base alloy especially suitable for valve seat manufacture, having a chemical composition by weight of 0.6–2.1% carbon, 1.0–8.0% chromium, 0.5–4.0% tungsten, 2.0–12.0% cobalt, 1.0–5.0% nickel and balance essentially iron, having a microstructure comprising pearlite and globular hard alloy phase uniformly dispersed in said pearlite with martensite surrounding said hard alloy phase being formed with atomized powder of pre-alloyed hard metal having chemical composition by weight of 1.0–3.0% carbon, 20–40% chromium, 10–20% tungsten and 40–60% cobalt.

2. Method of producing sintered iron-base alloy especially suitable for valve seat manufacture, comprising the steps of mixing 5–20% by weight of pre-alloyed and atomized hard alloy powder having chemical composition by weight of 1.0–3.0% carbon, 20–40% chromium, 10–20% tungsten and 40–60% cobalt; 0.6–1.5% graphite powder, 1.0–5.0% nickel powder and remainder of iron powder; compacting the mixture into a desired shape; and sintering said compacted mixture at a temperature ranging 1100° to 1200° C., then cooling said compacted and sintered mixture to a room temperature.

4,233,074

PHOTOGRAPHIC POLYESTER FILM BASE WITH SUBBING LAYER CONTAINING PHOSPHORIC ACID DERIVATIVE

Geoffrey M. Dodwell, and Norman E. Gambles, both of Brentwood, England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,813

Claims priority, application United Kingdom, Jun. 24, 1977, 26504/77

Int. Cl.² G03C *1/78*

U.S. Cl. 430—535 **16 Claims**

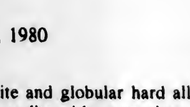
1. A method of preparing film base material consisting of biaxially oriented synthetic linear polyester which comprises stretching extruded synthetic polyester material in one direction and then coating on this material a copolymer in the form of an aqueous latex consisting essentially of

(a) 20 to 95% by weight of vinylidene chloride;

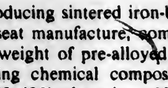
(b) 5 to 50% by weight of a plasticising comonomer selected from the group consisting of (1) an alkyl acrylate or methacrylate, where the alkyl moiety contains 1 to 6 carbon atoms (2) acrylonitrile and (3) vinyl chloride;

(c) 0 to 20% by weight of a copolymerisable acid; and

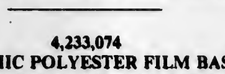
(d) 0 to 25% by weight of other comonomers different from (a) to (c) together with 10 to 40 percent by weight of solids in the latex of at least one phosphoric acid derivative of the formula



wherein M is an alkali metal, ammonium or hydrogen, R_1 is methyl, ethyl or hydrogen and R is methyl, ethyl or an ethylene oxide group of the formula $-(CH_2CH_2O)_nR_2$ or a propylene oxide group of the formula



wherein R_2 in each case is alkyl or optionally substituted acyl, aryl or aralkyl and n is 1 to 20, or a mixed ethylene oxide/propylene oxide group of the formula



where the ethylene oxide and propylene oxide moieties are arranged either in blocks or randomly in the chain and the sum of p and q is n, drying this coating and completing the orientation of the polyester film material.

4,233,075

PRESERVATIVE SOLUTION FOR MATERIAL SHINING CLOTH

Stephano Picone, 1727 Riverside Dr., Dearborn, Mich. 48120

Filed Jul. 13, 1979, Ser. No. 57,388

Int. Cl.³ C09D *3/00*

U.S. Cl. 106—3 **2 Claims**

1. A method for making a vegetable base preservative solution and its addition to material surfaces, comprising the steps of:

(a) providing a volume of water selected from the range of 3½ gallons to 4½ gallons;

(b) mixing 16 ounces of okra in said volume of water;

(c) adding a food preservative agent to the mixture of water and okra in an amount selected from the range of 2 tablespoons to 3½ tablespoons;

(d) boiling the mixture of water, okra and food preservative agent for about one hour and forty-five minutes to make a syrupy solution; and,

(e) cooling and ageing the solution for at least one month,

(f) bringing the solution to boiling and adding towels made of soft material,

(g) immersing towels in said solution for 20–25 minutes,

(h) cooling towel mixture,

(i) draining off excess solution and drying.

4,233,076

NOVEL SAND/SILICATE COMPOSITIONS FOR FOUNDRY MOLDS/CORES

Jean-Pierre Blanc, Antony, and Francois Meiller, Palaiseau, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 18, 1978, Ser. No. 970,793

Claims priority, application France, Dec. 19, 1977, 77 38182

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.35 **20 Claims**

1. In a moldable composition of matter comprising an intimate uniform admixture of sand, an alkali metal silicate, and at least one of a hardening agent; selected from the group consisting of an alkylene carbonate, an organic monocarboxylic or dicarboxylic acid or methyl ester thereof, carbon dioxide and blast furnace slag; the improvement comprising a demolding agent which comprises an alumina having an average grain size distribution of between 0.2 and 5μ.

4,233,077

PREPARING EXTRUDABLE REFRACTORY HARD METAL-WAX BLENDS

John G. Hazel, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1977, Ser. No. 792,422

Int. Cl.² C04B *35/64*; C08J *3/20*

U.S. Cl. 106—43 **12 Claims**

1. A method of preparing an extrudable refractory powder composition which comprises:

(a) mixing submicron refractory powder selected from the group consisting of borides, carbides, and nitrides of metals of Groups III, IV, and V of the Periodic Table of the Elements with organic solvent that is chemically inert to the refractory powder and liquid at room temperature to form an agglomerate-free slurry of submicron refractory powder and organic solvent,

(b) mixing said slurry with between about 10 and 50 percent by weight of solvent-free powder of organic plasticizer at temperatures above the melting point of said organic plasticizer to obtain a liquid slurry, said plasticizer being solid at room temperature and a viscous liquid above 35° C., said solvent being miscible with said plasticizer at the mixing temperatures and in the proportions used,

(c) heating said slurry to remove substantially all of said solvent while avoiding vaporization of said plasticizer, and

(d) cooling solvent-depleted slurry to form a solid, agglomerate-free extrudable refractory powder composition in which the refractory powder is well dispersed.

4,233,078

REFRACTORY COMPOSITION FOR FORMING A MONOLITHIC STRUCTURE

William E. Brown, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jul. 3, 1979, Ser. No. 54,506
Int. Cl.³ C04B 35/54, 35/56
U.S. Cl. 106—56 **6 Claims**

1. A refractory composition for forming a monolithic structure consisting essentially of (1) from 5% to 15% graphite, (2) from 0% to 20% silicon carbide, (3) from 0 to 5% carbon black, (4) from 5% to 20% clay, (5) from 1% to 5% sodium borate, (6) from 1% to 3% of an organic binder, and (7) from 1% to 12% water, the remainder of the composition being (8) refractory aggregate chosen from high alumina material and aluminosilicate material, all percentages being by weight and based on the total dry weight of the composition which composition has a substantially reduced loss of workability or plasticity during storage in a sealed container.

4,233,079

ALUMINOUS REFRACTORY COMPOSITIONS CONTAINING CARBON, SILICON AND CHROME OXIDE

Harold L. Rechter, Country Club Hills, Ill., assignor to Chicago Fire Brick Company, Chicago, Ill.

Continuation-in-part of Ser. No. 17,270, Mar. 5, 1979. This application Oct. 26, 1979, Ser. No. 88,549
The portion of the term of this patent subsequent to Jul. 1, 1980, has been disclaimed.
Int. Cl.³ C04B 35/52
U.S. Cl. 106—56 **12 Claims**

1. In a refractory composition comprising alumina or aluminum silicate refractory material, carbon and powdered silicon, the improvement of having chromic oxide and carbon present in the composition in amount sufficient to give greater resistance to slag over that of aluminous composition in which chromic oxide and carbon are absent, said carbon being present in up to about 35%.

4,233,080

ANHYDRITE CELLULAR CONCRETE AND COMPOSITE BUILDING ELEMENTS

Robert Koeppel, Bron, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 852,063, Nov. 16, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,209
Claims priority, application France, Nov. 30, 1976, 76 36028; Dec. 21, 1976, 76 38489
Int. Cl.³ C04B 11/06, 11/14
U.S. Cl. 106—87 **16 Claims**

1. A method of producing cellular concrete from a binder, water, and a porogenic system which comprises, forming a composition of an insoluble anhydrite binder together with aluminum powder and an alkaline agent reactive with the aluminum to produce a gas, and an anhydrite setting catalyst, inserting the composition into a mold, and permitting the composition to expand and harden into a cellular concrete, said anhydrite being characterized by a granulometry having at least about 15% by weight of particles of a diameter less than about 10 μm and at least about 20% by weight of particles having a diameter larger 20 μm with an average diameter of between about 5 and about than about 30 μm, the anhydrite likewise being characterized by a Blaine surface area between about 1000 and about 8000 sq. cm/g.

4,233,081

PROCESS FOR DISPERSING FINELY DIVIDED PARTICLES IN AN AQUEOUS MEDIUM

Lucien Plumet, Vilvoorde, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed Feb. 11, 1976, Ser. No. 657,101
Claims priority, application Luxembourg, Feb. 17, 1975, 71867
Int. Cl.³ C09D 3/20, 3/36, 5/02; C08L 33/08
U.S. Cl. 106—214 **30 Claims**

1. In a painting composition obtained by dispersing finely divided water-insoluble particles in an aqueous medium by using as dispersing agent a salt of a carboxylated polymer, the improvement wherein the dispersing agent used comprises a salt of a polymer derived from an alpha-hydroxyacrylic acid, which salt contains at least 50 mol % of units of the formula



wherein R_1 and R_2 independently represent hydrogen or an alkyl group containing 1 to 3 carbon atoms and wherein M represents a cationic radical resulting from the dissociation of a base.

4,233,082

PLASTICIZED SULFUR COATING COMPOSITION

Milutin Simic, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 601,552, Aug. 4, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,143
Int. Cl.³ C08K 3/06, 5/41
U.S. Cl. 106—287.23 **5 Claims**

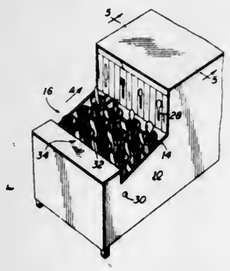
1. A composition of matter comprising at least 50 weight percent sulfur; from 0.05 to 15 weight percent, an aliphatic linear polysulfide sulfur plasticizer; from 0.5 to 25 weight percent an aromatic polymeric polysulfide formed by reacting one mol of phenol with at least two mols of sulfur; and from about 2 to 25 weight percent an inorganic filler selected from mica and asbestos.

4,233,083

PRESORTED FLATWARE WASHING METHOD AND APPARATUS

Donald E. Roberts, Downers Grove, Ill., assignor to Hillside Engineering, Inc., Hillside, Ill.

Filed Dec. 7, 1978, Ser. No. 967,207
Int. Cl.³ B08B 7/04; A47L 15/24
U.S. Cl. 134—25.2 **9 Claims**



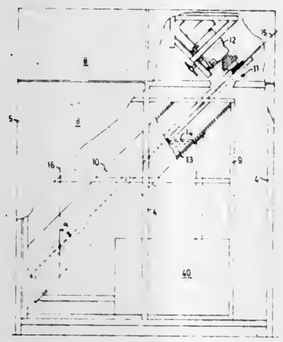
1. Flatware washing apparatus comprising in combination,
a loading station,
a processing station for washing articles passed therethrough,
a discharge station,
a plurality of perforated washing containers for holding pieces of flatware in a substantially upright position,
driven endless conveyor means attached to said containers for moving said containers through a closed circuit from station to station so as to cause flatware placed in said containers at said loading station to be moved through said washing station to said discharge station in a substantially upright condition,
a plurality of flatware receiving receptacles for receiving said pieces of flatware,
discharge means located at said discharge station for automatically discharging said flatware from each of said containers into respective ones of said receptacles,
each of said containers comprising a generally cylindrical body portion having an outwardly flared top portion and a bottom having a generally convex upper surface spaced from the lower edge of said cylindrical body portion,
means hingedly connecting said bottom to said cylindrical body portion,
a cam follower carried by said bottom, and
cam track means located at said loading and washing stations for cooperating with said cam follower to hold said bottom in a flatware holding position beneath said cylindrical body portion as said containers move through said loading and washing stations,
whereby soiled flatware may be sorted as it is loaded into said containers at said loading station and is thereafter automatically washed and discharged through the bottoms of said containers in the sorted condition into said receptacles.

4,233,084

DEVICE FOR TREATMENT OF ARTICLES WITH AT LEAST ONE TREATMENT AGENT

Karl A. Bergsand, Floda, Sweden, assignor to Göteborgs Maskinkonsult AB, Sweden

Filed Dec. 11, 1978, Ser. No. 968,559
Int. Cl.³ B08B 3/04
U.S. Cl. 134—67 **14 Claims**



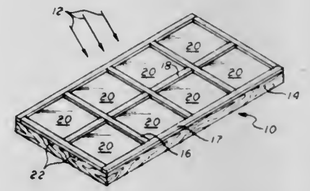
1. A device for treatment of articles with at least one treatment agent, comprising at least one conveyor module for transporting articles through at least one treatment zone where the articles are exposed to treatment with at least one treatment agent, said conveyor module comprising a conveyor having two runs, a first run for lowering articles into the treatment zone and a second run for raising articles out of the treatment zone, said runs being interconnected in the treatment zone and generally being located in a conveyor plane oriented at an angle relative to the vertical; said conveyor being of the endless type having two generally parallel runs; the conveyor module comprising adjacent to the conveyor an article support having a support face generally parallel to the conveyor plane and being located so as to allow articles to be moved by means of the conveyor along the support face; said support face having passages to allow passage of treatment agent from one side to the other; and the angle between the conveyor plane and the vertical being greater than 30° but less than 60°; the treatment zone being located within a container having an opening for the conveyor module; said container being provided with a partition dividing the container into a larger and a smaller compartment, the conveyor module extending through the larger compartment and with its lower end into the smaller compartment, there being provided different treatment agents in the two compartments.

4,233,085

SOLAR PANEL MODULE

Guy A. Roderick, and Peter Locke, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Filed Mar. 21, 1979, Ser. No. 22,418
Int. Cl.² H01L 31/04
U.S. Cl. 136—244 **16 Claims**



1. Apparatus forming a solar panel module from a plurality of solar panel units each with a transparent vitreous substrate having a first surface adapted for receiving incident solar radiation and a second opposite surface supporting a plurality of CdS-type photovoltaic cells in a back-wall configuration electrically interconnected by an outer conductive layer, comprising:
a frame assembly resistant to environmental exposure and defining surfaces for supporting edge portions of said substrate;
means flexibly securing said solar panel units on said support surfaces; and
an electrically insulating film disposed over said outer conductive layer of each said solar panel unit,
said frame and said insulating frame cooperating to form an insulated mounting for each solar panel unit of said module.

7. An improved photovoltaic panel comprising a plurality of CdS-type photovoltaic cells in a back-wall configuration on a transparent vitreous substrate and interconnected by an outer conductive layer, the improvement comprising:
a bituminous layer contacting said outer conductive layer to a depth effective to seal said photovoltaic cells from environmental contaminants and to form an insulated external surface adjacent said conductive layer.

4,233,086

METHOD FOR PROVIDING A DIFFUSION BARRIER

Gunnar Vesterlund, Vasteras, Sweden, assignor to AB Asea-Atom, Vasteras, Sweden

Filed Nov. 28, 1978, Ser. No. 964,192
Int. Cl.² G21B 3/06; C23F 7/02
U.S. Cl. 148—6.3 **6 Claims**

1. A method for manufacturing a diffusion resistant, copper clad, zirconium alloy tube comprising:
furnishing a tube constructed of a zirconium alloy material;
depositing a copper lining on at least the internal surfaces of said tube; and

contacting at least the internal copper-lined surfaces of the tube with steam at a temperature in the range of 200 to



550° C. until a barrier of zirconium oxide is formed between the copper lining and the zirconium-based alloy.

4,233,087

PHOSPHATE COATING PROCESS

Brian A. Cooke, Knotty Green, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 20, 1978, Ser. No. 962,482

Claims priority, application United Kingdom, Nov. 29, 1977, 49608/77

Int. Cl.[2] C23F 7/10, 7/12

U.S. Cl. 148—6.15 Z **8 Claims**

1. A continuous process of applying a phosphate coating to a ferrous or zinciferous metal substrate by treating the said substrate with an acidic phosphating solution of zinc phosphate in the presence of hydrogen peroxide or of a hydrogen peroxide-liberating substance wherein the phosphating solution comprises:

(a) 0.005–0.5 g.atoms of zinc (Zn) per liter of solution.

(b) 0.0002–0.02 g.moles of hydrogen peroxide per liter of solution and

(c) orthophosphate (PO_4) such that the molar ratio PO_4/Zn in solution is in the range 0.5–3.7, and wherein, as phosphating proceeds, the solution is replenished with hydrogen peroxide or with a hydrogen peroxide-liberating substance and with at least two other replenishment feeds, replenishment feed (i) and replenishment feed (ii), to maintain the solution at a desired composition and defined in (a), (b) and (c) above and wherein:

replenishment feed (i) comprises sufficient zinc (Zn) to maintain the desired concentration (a) in the solution, and sufficient orthophosphate (PO_4) together with another anion N^{n-} to maintain the molar ratio PO_4/Zn in the solution within the range defined in (c), the replenishment feed (i) having a free acidity of F gram equivalents/Kg of the said feed, and replenishment feed (ii) comprises an alkaline material selected from the group consisting of the hydroxides, carbonates and bicarbonates of alkali and alkaline earth metals, said alkaline material being soluble in water at the concentration of said replenishment feed (ii) and has a total alkalinity of A gram equivalents/Kg of replenishment feed (ii);

the ratio of the quantities of replenishment feeds (ii) and (i) respectively with are added to the phosphating solution within a significant period of time being (XF/A) where the value of X is in the range 0.5–1.5, and the anion N^{n-} being selected such that the acid H_nN has a pK_a value in the nth dissociation step not greater than 3.

4,233,088

PHOSPHATIZATION OF STEEL SURFACES AND METAL-COATED SURFACES

Max Kronstein, Bronx, N.Y., assignor to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Mar. 29, 1979, Ser. No. 24,966

Int. Cl.[3] C23F 7/10, 7/12

U.S. Cl. 148—6.16 **21 Claims**

1. A process for inhibiting corrosion, providing an adherent foundation, and, in the case of a zinc-coated surface, eliminating the irregular appearance due to a surface condition which is usually described as the formation of a "spangle" pattern, by pretreating metal surfaces for subsequent application of organic coating systems which comprises

treating a metal surface with a phosphatizing bath comprising a reactive aqueous solution or dispersion prepared by introducing a metal oxide of a metal other than the metal of the metal surface to be treated into an aqueous medium containing phosphate ions released from the dissolving or dispersing of an alkali metal phosphate or an alkali metal acid phosphate or phosphoric acid or combinations thereof and introducing a ligand-forming organic polymer into said aqueous medium; said introduced metal oxide being an oxide of a metal selected from the group consisting of molybdenum, vanadium, tungsten, lead, titanium, manganese and copper; and said metal oxide being introduced in an amount approximately stoichiometric with said phosphate ions;

whereby there is formed in said aqueous medium a metal phosphate or a metal acid phosphate of the introduced metal oxide by reaction between the introduced metal oxide and the phosphate ions which is capable of interreacting with the metal of the metal surface being treated and resulting in a protective reaction coating comprised of the metal component of the introduced metal oxide as well as of the metal of the treated metal surface together with the phosphate ions of the phsophatizing bath; said ligand-forming organic polymer being introduced into said aqueous medium in an amount of from about 5% to about 10% by weight of the reaction-formed metal phosphate or metal acid phosphate in said aqueous medium and becoming a part of said protective reaction coating;

following which the treated metal surface is washed with a water rinse, a so-called chromic acid rinse or rinse containing chromic acid as well as phosphoric acid and again followed by a water rinse.

4,233,089

LOW-ALLOYED STEEL FOR THE PREPARATION OF VALVE SPRING WIRE

Christer Lanner, Garphyttan, Sweden, assignor to Aktiebolaget Garphytte Bruk, Garphytte, Sweden

Continuation of Ser. No. 835,281, Sep. 20, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,617

Claims priority, application Sweden, Sep. 20, 1976, 7610405

Int. Cl.[3] C22C 38/06

U.S. Cl. 148—36 **4 Claims**

1. Valve spring wire of low-alloyed steel, characterized in that the wire has been oil hardened and tempered and in that the steel consists essentially of the following composition, expressed in weight percent:

C	0.5	1.0%
Si	0.1	1.5%
Mn	1.0	2.0%
Al_{tot}	0.01	0.05%
N	0.004	0.020%

the remainder being iron as well as normally occuring impurities.

4,233,090

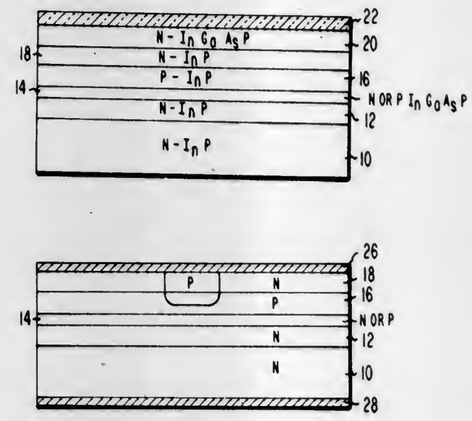
METHOD OF MAKING A LASER DIODE

Frank Z. Hawrylo, Trenton, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,787

Int. Cl.[3] H01L 21/208

U.S. Cl. 148—171 **6 Claims**



1. In a method of making a semiconductor laser in which a plurality of layers of single crystal semiconductor material are epitaxially deposited in succession on a substrate to form an active region having heterojunctions on each side thereof and a conductivity modifier is diffused along a narrow stripe into the outermost of the epitaxial layers to a depth adjacent the active region, the improvement comprising:

(a) depositing as the outermost layer a layer of a material which (1) readily accepts the conductivity modifier, (2) has a band-gap lower than the preceding adjacent layer, and (3) can be selectively etched from the preceding adjacent layer,

(b) diffusing the conductivity modifier through the said outermost layer into the preceding adjacent layer, and then

(c) etching away said outermost layer to expose the surface of the preceding adjacent layer.

4,233,091

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING IMPROVED ALIGNMENT MARKS

Yunosuke Kawabe, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1979, Ser. No. 71,085

Int. Cl.[2] H01L 21/20, 21/302, 21/76

U.S. Cl. 148—175 **4 Claims**

1. A method of manufacturing a semiconductor device of a V-groove isolation structure type havng an alignment mark, said method comprising the steps of:

forming an oxide layer on an epitaxial layer which is formed on a semiconductor substrate;

forming an oxidation resistant masking layer on said oxide layer;

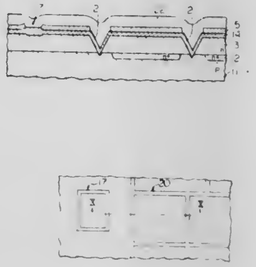
selectively etching said masking layer to expose a part corresponding to a V-groove forming area and a part corresponding to an alignment mark area of said oxide layer;

selectively etching said exposed part corresponding to said V-groove forming area of said oxide layer to expose a part of said epitaxial layer;

anisotropically etching said exposed part of the epitaxial layer to form a V-groove;

oxidizing the surface of said V-groove and a part of said epitaxial layer which lies under said exposed part of said oxide layer corresponding to said alignment mark area;

filling said V-groove with polycrystalline silicon;



Oxidizing said polycrystalline silicon and further oxidizing said part of said epitaxial layer which lies under said exposed part of said oxide layer to form said alignment mark; and

removing the remaining masking layer.

4,233,092

UTILIZING LEAD COMPOUNDS OF SULPHUR, SELENIUM AND TELLURIUM AS DOPANT SOURCES

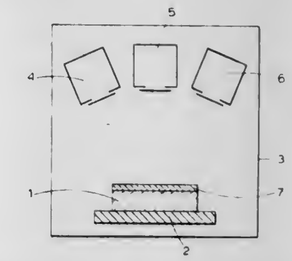
Jeffrey J. Harris, Crawly, England, and Colin E. C. Wood, Freeville, N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1979, Ser. No. 74,617

Claims priority, application United Kingdom, Sep. 22, 1978, 37800/78

Int. Cl.[2] H01L 21/203, 29/207

U.S. Cl. 148—175 **3 Claims**



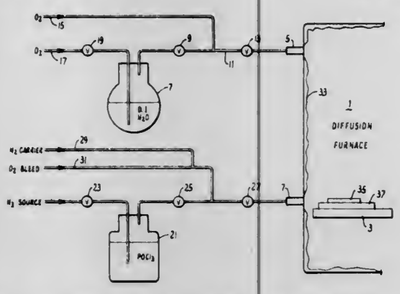
1. A method of growing an n-type GaAs layer on a substrate by molecular beam epitaxy comprising the step of directing respective molecular beams of gallium, arsenic and a compound defined by PbX onto a heated substrate surface, wherein X represents one of the elements sulphur, selenium and tellurium.

4,233,093

PROCESS FOR THE MANUFACTURE OF PNP TRANSISTORS HIGH POWER

Pei Chow, Jefferson Square Apts.-12A, 13000 NW. Cornell Rd., Portland, Oreg. 97229

Filed Apr. 12, 1979, Ser. No. 29,269
Int. Cl.[3] H01L *21/225*
U.S. Cl. 148—189 5 Claims



1. In the process of making PNP high power transistors wherein a silicon wafer is predoped with a N-type impurity such as phosphorus and the wafer heated in a base diffusion step to diffuse the dopant into the body of the silicon, the improvement comprising carrying out said diffusion step in a heated reaction vessel wherein the walls of the vessel have been first precoated with phosphorus.

4,233,094

EXPLOSIVE COMPOSITION FORMING NO WATER AS A REACTION PRODUCT DURING DETONATION

Calvin J. Konya, 6990 Summers Rd., Huntsburg, Ohio 44046

Filed Jan. 15, 1979, Ser. No. 3,365
Int. Cl.[3] C06B *33/04*
U.S. Cl. 149—43 5 Claims

1. A water-free and hydrogen-free explosive composition consisting essentially of, in percent by weight, 65 to 73% sodium nitrate, 21 to 35% powdered aluminum and up to 6% carbon black, said explosive composition being oxygen balanced and forming no water as a reaction product during detonation.

4,233,095

METHOD FOR PRODUCING IMPROVED GELATINE EXPLOSIVE COMPOSITIONS

Bidhan C. Ghosh; Gopal M. Chopra, and Soumendra N. Sen, all of Bihar, India, assignors to Indian Explosives Limited, Calcutta, India

Division of Ser. No. 926,610, Jul. 21, 1978. This application Nov. 13, 1978, Ser. No. 959,534
Int. Cl.[2] C06B *25/30*
U.S. Cl. 149—95 19 Claims

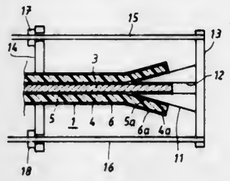
1. A method of producing a gelatine explosive composition comprising mixtures of liquid nitric esters, blasting soluble nitrocotton, oxidizing salts, fuels and at least one dispersing agent with a marked reduction in the quantities of liquid nitric esters and blasting soluble nitrocotton content, the method comprising the steps of adding at least one of said dispersing agent to said liquid nitric esters, adding the resulting mixtures to said blasting soluble nitrocotton in a conventional mixer for the formation of a gel and subsequently adding said oxidizing salts and said fuels to form a homogenous mixture.

4,233,096

CABLE SPLICING METHOD WITH REDUCED WASTE OF CROSS-LINKED POLYMER INSULATION

Karl-Gunnar Wiberg, Stockholm, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 14, 1979, Ser. No. 12,242
Claims priority, application Sweden, Feb. 17, 1978, 7081832
Int. Cl.[3] B21F *15/02*; B65N *69/02*; B29C *19/00*
U.S. Cl. 156—49 9 Claims



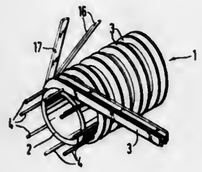
1. A method for splicing two electrical cables which have conductors insulated with a cross-linked polymers, the steps comprising
(a) heating the insulation nearest the ends of the cables to be spliced to an elevated temperature,
(b) displacing the heated insulations in both a radial and axial direction with respect to the ends of the cables to be spliced so as to expose the conductors to be joined,
(c) allowing the displaced insulations to cool so they will retain their displaced forms,
(d) joining the ends of the conductors of the cables to be spliced, and
(e) reheating the displaced insulations such that they will return to substantially their original shape and position around the respective conductors.

4,233,097

METHOD OF MAKING A FLEXIBLE PLASTIC TUBE

Eugen H. Stahl, Böttingen, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 906,757, May 17, 1978, Pat. No. 4,172,474. This application Mar. 19, 1979, Ser. No. 21,888
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722928
Int. Cl.[3] B31C *13/00*; F16L *11/08*
U.S. Cl. 156—143 2 Claims



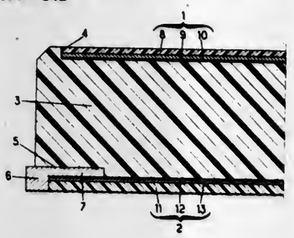
1. A method of forming a composite plastic tube, comprising, extruding an inner tubular wall portion, winding a continuous length of a U-shaped reinforcing strip around the inner tubular wall portion in successive spiral turns which are axially spaced apart, said reinforcing strip of U-shape configuration having side walls which define a first cavity therebetween over said reinforcing strip and a second cavity between sidewalls of adjacent strips, said side walls each having a radially diverging outwardly tapering cross-sectional shape symmetrically diverging from the radial median plane of said strip, by which the cross-sectional shape of said second cavity is tapered in the radially outward direction, and applying an outer tubular wall by extruding it over the reinforcing strip so as to join it to the side walls of said reinforcing strip.

4,233,098

METHOD OF MAKING METAL-PLASTIC SKI

Daniel Urbain, Thionville, France, assignor to Laminoirs a Froid de Thionville, Thionville, France

Filed Mar. 24, 1978, Ser. No. 889,867
Claims priority, application France, Mar. 24, 1977, 77 08881
Int. Cl.[2] A63C *5/12*
U.S. Cl. 156—242 9 Claims



1. A process for fabricating a metal plastic ski including a plastic core between a top metallic structure and a bottom metallic structure, said process comprising the steps of
forming a core for the ski by molding a thermoplastic material soluble in a solvent, said core having a shallow top recess and a shallow bottom recess for nesting respectively the top and bottom metallic structures of the ski;
obtaining a first semi-finished metal laminate sheet having a high elastic limit and precoated with an organic coating on each surface thereof by a continuous coating process during which said sheet is cleaned, chemically treated, coated on one surface with a protective coating constituting the upper covering of the ski, coated on its other surface with an intermediary gluing layer of a substance soluble in at least said solvent and said coatings are cured;
obtaining a second semi-finished metal laminate sheet having a high elastic limit and precoated with an organic coating on each surface thereof by a continuous coating process during which said second sheet is cleaned, chemically treated, coated on one surface with a material constituting the runner surface of the ski, coated on its other surface with an intermediary layer of a substance soluble in at least said solvent, and said coatings are cured;
cutting said first and second semi-finished metal laminates to predetermined profiles, similar respectively to profiles of said top and bottom recesses, to form said top and bottom metallic structures of the ski;
applying to said intermediary gluing layers of said top and bottom structures a cold glue comprising at least said solvent; and
nesting said top and bottom structures in said top and bottom recesses of said core and pressing said structures against said core to form a ski.

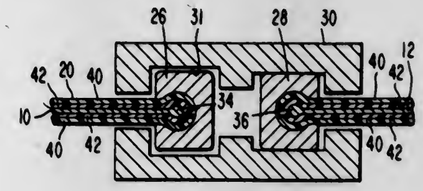
4,233,099

SLIDE FASTENER METHOD OF MANUFACTURE

Ned W. McGuire, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 859,671, Dec. 12, 1977, Pat. No. 4,156,303. This application Dec. 20, 1978, Ser. No. 971,582
Int. Cl.[2] A44B *19/24*
U.S. Cl. 156—242 5 Claims

1. A method of forming a reinforcing and finishing strip on the ends of textile tapes of a slide fastener comprising the steps of
superimposing reinforcing and finishing strip portions on at least one of the front and back sides of end portions of the tapes, the strip portions having an inner layer facing the textile tapes and an outer film laminated to the inner layer, the outer film consisting of a nylon 6 having a melting temperature substantially greater than 163° C., and the inner layer consisting of a blend of a nylon 6 and nylon 6—6 having a melting temperature within the range from 148° to 163° C.,
engaging the outer film of the strip portions with a heated tool having a temperature within the range from 148° to 163° to heat the strip portion to the melting temperature of the inner layer but below the melting temperature of the outer film, and



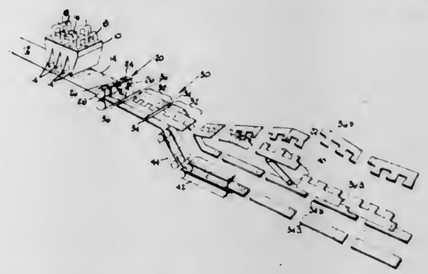
pressing the strip portions by means of the tool onto the end portions of the tapes so that the inner layer is molded into interstices of the tape end portions and in intimate contact with substantial surface portions of the fibers of the tape end portions to securely bond the strip portions to the at least one side of the end portions of the tape with the outer film remaining coherent and generally uniform in thickness.

4,233,100

METHOD AND APPARATUS FOR MANUFACTURING A LAMINATED SHINGLE

Richard N. Cunningham; Douglas D. Smith, both of Jefferson County, Colo., and Romain E. Loeffler, deceased, late of Jefferson County, Colo. (by Carolyn R. Loeffler, legal representative), assignors to Johns-Manville Corporation, Denver, Colo.

Filed Jul. 2, 1979, Ser. No. 54,198
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—260 19 Claims



1. A method of forming laminated shingles comprising:
(a) providing a substantially continuous web of composition shingle material;
(b) cutting said web to define a series of sets of shingle members along the length of said web, each said set comprising at least one overlay portion and at least one underlay portion, the shingle members in each said set having a predetermined positional relationship with one another in said series;
(c) separating said members defined in step (b) from one another while maintaining the members in said sets and maintaining said sets in said series;
(d) conveying said sets to a laminating work station;
(e) laminating each said underlay portion in a set to an over-

lay portion from the same set to form a laminated shingle; and

(f) collating the shingles formed in step (e) to form stacks of shingles having a predetermined number of shingles in each stack.

4,233,101

METHOD OF LINING A PIPE

Frederick Scragg, Loge du Tisseraud, Trinity, and Peter Marshman, Medlers, Pont Marquet, St. Brelade, both of Channel Islands

Continuation of Ser. No. 859,232, Dec. 9, 1977, abandoned. This application May 23, 1979, Ser. No. 41,784

Claims priority, application United Kingdom, Dec. 9, 1976, 51392/76; Jan. 7, 1977, 480/77; May 17, 1977, 20615/77

Int. Cl.³ B29C *17/07*

U.S. Cl. 156—287 **7 Claims**



1. A method of lining a pipe comprising applying a nontacky adhesive layer to the inner surface of the pipe, the adhesive being capable of being heat activated at a first temperature value, to cause it to become tacky, inserting in the pipe a film of thermoplastic material to overlie the nontacky adhesive layer on the inner surface of the pipe, applying a uniform purely radial force to said thermoplastic material, while the adhesive is still nontacky, heating the assembly in an axially progressive manner, by affecting relative axial displacement between the pipe and a source of heat to raise the temperature to a value below said first temperature value to render the thermoplastic film to a plastic state and then heating the assembly at least to said first value to activate the adhesive and cause it to adhere to the thermoplastic film.

4,233,102

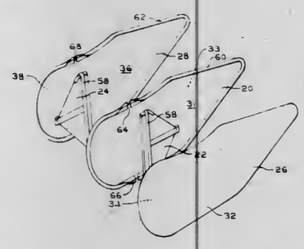
METHOD OF MAKING AN INFLATABLE FLOTATION DEVICE

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, OhioIO

Filed Nov. 20, 1978, Ser. No. 962,520

Int. Cl.² B29H *7/03;* **B32B** *31/20*

U.S. Cl. 156—292 **2 Claims**



1. A method of making in inflatable emergency flotation bag having an inflation chamber divided into a plurality of fluidly independent subchambers, the method comprising the steps of:

(A) forming a pair of similarly sized and contoured outer wall panels from vulcanized rubber coated fabric sheet;

(B) forming an inner longitudinal wall panel of a size and contour similar to said outer wall panels from vulcanized rubber coated fabric sheet;

(C) forming at least two similarly shaped transverse wall members from vulcanized rubber coated fabric sheet;

(D) using unvulcanized rubber coated fabric tape to adhere selected peripheral portions of one of said at least two transverse wall members to the inner surface of one of the outer wall panels and a selected one of the opposite surfaces of said inner longitudinal wall panel;

(E) using unvulcanized rubber coated fabric tape to adhere selected peripheral portions of the other of said at least two transverse wall members to the inner surface of the other of said outer wall panels and the surface of said inner longitudinal wall panel opposite said selected one of the opposite surfaces thereof; and

(F) using unvulcanized fabric tape to join said panels to each other along their peripheral margins.

4,233,103

HIGH TEMPERATURE-RESISTANT CONDUCTIVE ADHESIVE AND METHOD EMPLOYING SAME

Joseph M. Shaheen, La Habra, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1978, Ser. No. 971,580

Int. Cl.² C09J *5/00;* **B32B** *31/00*

U.S. Cl. 156—331 **5 Claims**

1. A method for bonding a semiconductor die to a substrate which comprises applying to the substrate a film of an adhesive formulation comprising an alloy of gallium-tin eutectic and gold dispersed in a solution of a polyimide resin; positioning a semiconductor die in contact with the film; pressing the die firmly in place; and curing the adhesive formulation to a solid bond material.

3. A high temperature-resistant, conductive adhesive composition comprising a mixture of (1) an alloy of gallium-tin eutectic and gold and (2) a polyimide resin.

4,233,104

AUTOMATIC WEB SPLICING AND FEEDING APPARATUS

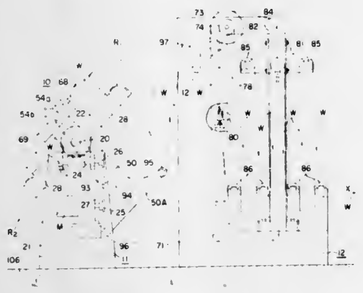
Rikio Fujishima; Kunisuke Nishihara, both of Zama, and Hideo Hosoi, Naritahigashi, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Dai Nippon Insatsu Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,692

Claims priority, application Japan, Sep. 8, 1978, 53/110320

Int. Cl.³ B65H *19/08, 19/18*

U.S. Cl. 156—504 **9 Claims**



1. An automatic web splicing and feeding apparatus comprising:

a web feeder including supporting means, a rotary shaft with both ends thereof rotatably supported by said supporting means, a pair of spaced apart web roll holding arms with their central portions fitted to said rotary shaft, two pairs of push members secured to opposing surfaces of said arms near the extreme ends thereof for detachably holding both ends of hollow shafts of two web rolls, lever members mounted on said rotary shaft on the outside of said arms, automatic web splicing means supported by said lever members for bonding the trailing end of the web of one of said two web rolls to the leading end of the web of the other web roll, and means for driving said rotary shaft so as to move one of said two pairs of push members to a web working position;

web storing means for storing said web supplied from said web splicing means and for feeding said web therefrom to web working means located downstream of said web storing means; and

means for determining direction and angle of rotation of said rotary shaft.

4,233,105

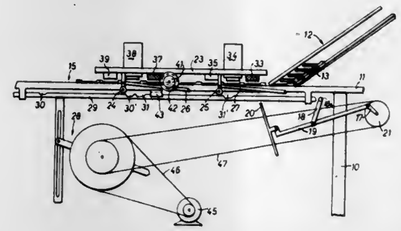
LABELLING DEVICES FOR TAPE CASSETTES INCLUDING AN ADHESIVE APPLYING DEVICE, LABEL APPLYING DEVICE, A PRESSURE DEVICE, AND A TURN OVER ROLL

Rolf Albinger, Alte Landstrasse 40, 6314 Unterägeri, Switzerland

Filed Sep. 4, 1979, Ser. No. 72,211

Int. Cl.³ B32B *31/00;* **B65C** *9/00, 11/04*

U.S. Cl. 156—559 **18 Claims**



1. A labelling apparatus for tape cassettes comprising a magazine for the cassettes, a feed path for the cassettes, means for successively feeding the cassettes from said magazine to said feed path and for advancing said cassettes stepwise along said feed path, a carrier disposed above said feed path, an adhesive applying device mounted on said carrier, a label applying device mounted on said carrier, a pressure applying device mounted on said carrier, said adhesive applying device, label applying device and pressure applying device being mounted on said carrier in succession in the direction of advance of said cassettes along said feed path, carrier raising and lowering means associated with said cassette feeding means operable to hold said carrier in a raised position relative to said feed path during the advance of said cassettes and to lower said carrier towards said feed path when said cassettes are stationary on said feed path whereby in the lowered position of said carrier said adhesive applying device applies adhesive to a first cassette on the feed path, said label applying device applies a label to the applied adhesive on a second cassette on the feed path and said pressure applying device applies pressure to the applied label on a third cassette on the feed path.

4,233,106

METHOD FOR ION CONTROL OF SOLUTIONS

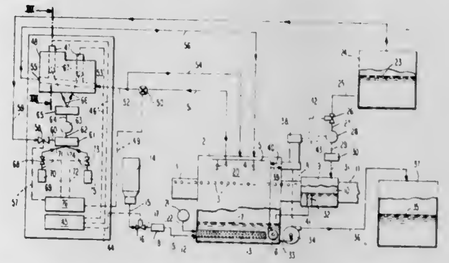
Daniel L. Goffredo, Riverton, N.J., assignor to Chemcut Corporation, State College, Pa.

Division of Ser. No. 865,859, Dec. 30, 1977. This application Jul. 9, 1979, Ser. No. 55,990

Int. Cl.² C23F *1/02*

U.S. Cl. 156—627 **2 Claims**

1. In a method of treating articles with an etchant or other treatment solution, wherein a chamber is provided for treating articles therein, wherein treatment solution is delivered to articles in said chamber, wherein the ion concentration of the treatment solution is detected in a sensor cell and communicated to a regulator for controlling the amount of an ion-corrective fluid that is added to the treatment solution to compensate for deviation from desired ion concentration so detected, the improvement comprising, shutting off the supply of treatment solution to the sensor cell, providing replenisher treatment solution to the sensor cell for cleaning the cell, then rinsing the cell with water, then passing a standardizing solution of known ion concentration through the cell and recalibrating the regulator against the solution of known ion concentration.



4,233,107

ULTRA-BLACK COATING DUE TO SURFACE MORPHOLOGY

Christian E. Johnson, Sr., Middletown, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Apr. 20, 1979, Ser. No. 31,706

Int. Cl.³ C23F *1/00*

U.S. Cl. 156—632 **17 Claims**



17. A method of producing an ultra-black coating, having a spectral reflectance on the order of about from 0.5 to 1.0% at wavelengths of light ranging from about 320 to 2140 nanometers, on a substrate, the blackness being associated with a unique surface morphology consisting of a dense array of microscopic pores etched into the surface, said method comprising:

(a) preparing a substrate selected from the group consisting of a metal, a ceramic, glass and a plastic for plating with a nickel-phosphorus alloy;

(b) immersing the thus-prepared substrate in an electroless plating bath maintained at a pH of about from 3.5 to 6.5, at a temperature ranging from about 50° C. to 100° C., and containing nickel and hypophosphite ions in solution, for about from 15 minutes to 2 hours whereupon an electroless nickel-phosphorus alloy coating, containing about from 3.7 to 12.2 mass percent of phosphorus, is deposited on the substrate;

(c) removing the resulting substrate, coated with the electroless nickel-phosphorus alloy, from the plating bath and washing and drying it;

(d) immersing the dried substrate, coated with the electroless nickel-phosphorus alloy obtained in step (c), in a bath containing one part water and one part concentrated nitric

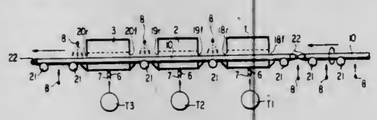
acid at a temperature of about 50° C. for about from 5 to 15 seconds whereupon the substrate surface coating develops ultra-blackness, said blackness being associated with the morphology described above; and

(e) washing and drying the resulting substrate covered with the nickel-phosphorus alloy coating having the ultra-black surface with the aforedescribed morphology.

4,233,108
PROCESS FOR USE IN ETCHING THE OUTER SURFACE OF A METAL MEMBER

Masamitu Tamura; Yukio Yasuhara; Shigeharu Nakamura; Masaru Sakai; Kazuo Akagi; Ryohei Kazihata, and Norio Satohara, all of Shimonoseki, Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 825,469, Aug. 17, 1977, abandoned, which is a continuation of Ser. No. 620,231, Oct. 6, 1975, abandoned. This application Mar. 5, 1979, Ser. No. 17,374
Claims priority, application Japan, Oct. 5, 1974, 49-114872
Int. Cl.² C23F *1/00*
U.S. Cl. 156—639 **6 Claims**



1. An etching process for use in chemically etching the outer surface of a metal member in a plurality of tanks including inlet and outlet openings in the front and rear opposed walls thereof, comprising the steps of:

positioning said plurality of tanks in series and aligning said inlet and outlet openings of said tanks, respectively;

disposing an etching treating solution within each of said plurality of tanks;

feeding said metal member though said inlet and outlet openings of said tanks and through said tanks in a direction parallel to the longitudinal axis of said member while rotating the same about said longitudinal axis thereof;

immersing said metal member in said etching treating solution within each of said plurality of tanks;

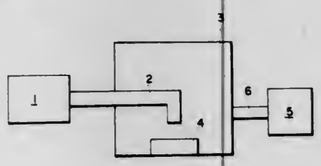
forceably conducting etching treating solution in the axial direction of feeding of said metal member within each of said tanks; and

independently feeding said metal member through said inlet and outlet openings and through said tanks in a continuous and sequential manner while rotating said metal member.

4,233,109
DRY ETCHING METHOD

Junichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation-in-part of Ser. No. 759,120, Jan. 13, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 924,066
Claims priority, application Japan, Jan. 16, 1976, 51/4469; Aug. 27, 1976, 51/102825; Aug. 27, 1976, 51/102826
Int. Cl.³ C23F *1/00*; H01L *21/306*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—643 **37 Claims**



1. A dry etching method performed in a processing chamber containing at least one workpiece therein, said method comprising the steps of:

(1) preliminarily evacuating said processing chamber above a first predetermined degree of vacuum to remove residual gas from said processing chamber;

(2) generating plasma reaction gas containing component particles not required for the etching and component particles required for the etching;

(3) directing at least part of said component particles required for the etching to move substantially linearly to collide with said at least one workpiece in one direction;

continuously evacuating said processing chamber to a second predetermined degree of vacuum lower than said first predetermined degree of vacuum and

thereby performing at least partially reactive directional etching of said workpiece.

4,233,110
PROCESS FOR ETCHING AND PREPARING NICKEL-POLYESTER OFFSET PRINTING PLATES

Siegfried Richter, Fullinsdorf, and Josef Vinkovic, Kreuzlingen, both of Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 846,329, Oct. 23, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 23,448
Claims priority, application Switzerland, Oct. 29, 1976, 13648
Int. Cl.² B41C *1/00*; B41N *3/02*
U.S. Cl. 156—656 **10 Claims**

1. Process for etching a nickel-polyester layered offset plate, which is made by electroless nickel-plating of polyester and subsequently coated on the nickel-layer by a photoresist layer, after exposure of the photoresist layer under a transparent master and development of the offset-plate, the offset-plate is etched by an aqueous etching solution containing copper (II) ions, as the only etching agent, together with Cl^- ions and preparation of an offset printing plate from said etched nickel-polyester layered plate, characterized in that:

(1) said nickel layer of said nickel-polyester layered plate is etched with said aqueous etching solution, said etching solution additionally containing:

(a) a salt which is inert as against said nickel-polyester layered plate, or 10 to 40 weight percent of an organic solvent, which is miscible or nonmiscible with water and which is inert as against said nickel-polyester layered plate, and 60 to 90 weight percent of de-ionized water; and

(b) a wetting agent or pyridine;

(ii) subsequent to the etching process, the photoresist is removed and the printing parts of the polyester of said nickel-polyester layered plate are oleophilized with an oleophilization agent which is an aliphatic acid, aromatic acid, acid chloride or acid anhydride; and

(iii) the non-etched portion of said layer of nickel of said nickel-polyester layered plate is hydrophilized with a solution of a complexing agent for nickel ions, which opposite the solvating sphere of the nickel complex has only hydrophilic groups,

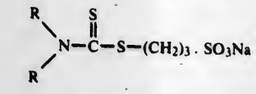
said oleophilization of said polyester layer and hydrophilization of said nickel layer being executed separately in different process steps or executed concurrently in one process step using one solution containing said oleophilization agent and said complexing agent, and said aqueous etching solution not containing a side-wall protective additive.

4,233,111
DISSOLUTION OF METALS UTILIZING AN AQUEOUS H_2SO_4-H_2O_2-3-SULFOPROPYLDITHIOCARBAMATE ETCHANT

Silvester P. Valayil, Youngstown, and Moenes L. Elias, Canfield, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 25, 1979, Ser. No. 52,060
Int. Cl.³ C09K *13/06*; C23F *1/00, 3/02*
U.S. Cl. 156—666 **19 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of an additive of 3-sulfopropyldithiocarbamate sodium salt having the general formula



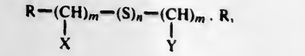
wherein R is selected from the group consisting of C_1-C_4 alkyl, phenyl, C_7-C_{10} alkaryl and C_7-C_{10} aralkyl.

4,233,112
DISSOLUTION OF METALS UTILIZING AN AQUEOUS H_2SO_4-H_2O_2-POLYSULFIDE ETCHANT

Silvester P. Valayil, Youngstown, and Moenes L. Elias, Canfield, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 25, 1979, Ser. No. 52,059
Int. Cl.³ C09K *13/06*; C23F *1/00, 3/02*
U.S. Cl. 156—666 **29 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a polysulfide compound additive having the general formula



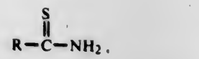
wherein R is a hydroxyl group, a carboxyl group, a sulfonic acid group or a sulfonic acid salt group, each X independently from each other can be hydrogen, hydroxyl or C_1-C_4 alkyl, each Y independently from each other can be hydrogen, hydroxyl or C_1-C_4 alkyl, m is an integer from 1 to 18, and n is an integer from 2 to 5.

4,233,113
DISSOLUTION OF METALS UTILIZING AN AQUEOUS H_2O_2-H_2SO_4-THIOAMIDE ETCHANT

Silvester P. Valayil, Youngstown, and Moenes L. Elias, Canfield, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 25, 1979, Ser. No. 51,761
Int. Cl.³ C09K *13/06*; C23F *1/00, 3/02*
U.S. Cl. 156—666 **19 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a thioamide additive having the general formula

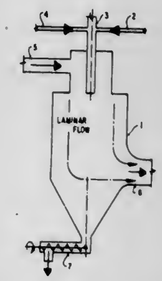


wherein R is either an aryl or a heterocyclic group and the aryl group is selected from phenyl, alkyl substituted phenyl groups containing from 7 to 10 carbon atoms and amino substituted phenyl groups and the heterocyclic group is selected from those containing at least one nitrogen atom in the ring structure.

4,233,114
SPRAY DRYER

Francesco Saverio Maria Gastaldi, Via G. Modena, 20, Milan, Italy

Continuation of Ser. No. 856,778, Dec. 2, 1977, abandoned, which is a continuation of Ser. No. 633,089, Nov. 18, 1975, abandoned. This application Apr. 24, 1979, Ser. No. 32,961
Claims priority, application Italy, Nov. 18, 1974, 29525 A/74
Int. Cl.² B01D *1/18*
U.S. Cl. 159—4 D **1 Claim**



1. A direct drying spray dryer in which the substance to be dried is dispersed from the top of a drying chamber and a hot gas circulates from an upper portion towards a lower portion of the chamber, said dryer consisting of:

(a) a vertically extending cylindrical chamber comprising a lower conical section, a central section of a first diameter, and an upper section of a diameter less than that of the first diameter and having on its top a downwardly and vertically extending inflow nozzle means for the substance to be dried, said nozzle means being coaxial with the cylindrical chamber and terminating in an end at the bottom of the upper section within the chamber and spaced from the top thereof, said end being directed directly toward the center of the bottom of the chamber, a horizontal solution feed pipe above the top and opening directly into one side of the nozzle means, and a horizontal air feed pipe coaxial with the solution feed pipe, above the top, and opening directly into the other side of the nozzle means;

(b) an entrance for hot gas opening into the side of the upper section of the chamber immediately adjacent and just below the top thereof in a direction directly toward the longitudinal axis of the nozzle means, said entrance being between the end of the nozzle means and the top of the chamber, and means for inducing a gas flow in the chamber from the upper section thereof;

(c) an exit for dried particles originating at and extending from the side of the chamber at an angle of about 90° to the longitudinal axis of the chamber and spaced above the bottom thereof;

(d) a bottom portion on the chamber below said exit having a length of about a chamber diameter for collecting large sized particles;

(e) means on said bottom portion for removal of said large size particles; and

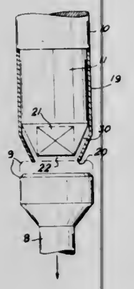
(f) said entrance, said nozzle means and said exit being fluidly connected to each other only through said chamber.

4,233,115

SAFETY APPARATUS FOR A NUCLEAR REACTOR

Roland Jacquelin, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 6, 1978, Ser. No. 894,002
Claims priority, application France, Apr. 15, 1977, 77 11418
Int. Cl.[2] G21C 7/08
U.S. Cl. 176—36 C **3 Claims**



2. A safety apparatus for a nuclear reactor comprising
an absorbing element having a supporting head;
an operating rod which is vertically movable and having a lower end;
an upper open container adapted to permit a sliding displacement of said absorbing element under the effect of gravity;
disconnectable link means between the supporting head and the lower end of said operating rod, adapted to disconnect said operating rod from said absorbing element at a given temperature, said link means comprising
an armature of an electromagnet fixed at the lower end of said operating rod and creating an attracting magnetic force, said armature having a first expansion coefficient and
a jacket carried by the operating head and surrounding with a clearance the end of said rod, whereby its edge is flush with the head of the absorbing element, said jacket having a second expansion coefficient said jacket having at a temperature lower than said given temperature a first length and at said given temperature a second length, said second length being such that the distance between said lower end and said head is sufficient to annul the effect of said attracting magnetic force on said head.

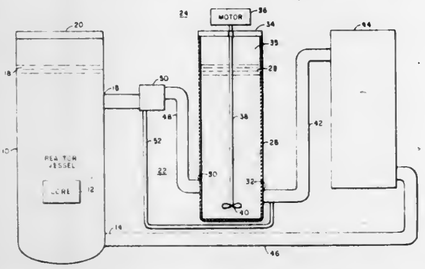
4,233,116

NUCLEAR REACTOR COOLANT TRANSPORT SYSTEM

James D. Mangus, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 585,727, Jun. 10, 1975, now Defensive Publication No. T945,008. This application Oct. 18, 1977, Ser. No. 843,183
Int. Cl.[2] G21C 15/00
U.S. Cl. 176—65 **2 Claims**

1. An arrangement for transporting reactor coolant fluid in a nuclear reactor system comprising:
a sealed reactor vessel;
a primary variable speed pump having an inlet and outlet and being of a type having a motor disposed above a coolant reservoir and an elongated shaft connecting said motor to an impeller, said impeller receiving coolant from said inlet and discharging coolant to said outlet, said impeller also being in fluid communication with said reservoir;
a heat exchanger;
piping for directing coolant between said vessel, pump and heat exchanger in a recirculating loop including upstream piping directly connecting said pump inlet and the one of said vessel and heat exchanger upstream of said pump;
means for controlling the pressure of coolant entering said pump inlet including a bypass conduit directing a portion



of said coolant exiting said pump to said upstream piping, discharging said portion into said upstream piping through a plurality of nozzles, said nozzles disposed about the outer periphery of said upstream piping and directed such that said portion is injected into said piping from the outer periphery of said piping into said piping generally in the direction of coolant flowing in said piping.

4,233,117

MANUFACTURE OF ABRASION-RESISTANT COKE

Harald Jüntgen; Karl Knoblauch, both of Essen; Josef Degel, Hattingen; Dieter Zündorf, Essen, and Klaus Giessler, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 806,931, Jun. 20, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,376
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627479
Int. Cl.[3] C10B 47/20, 47/30, 53/08, 57/00
U.S. Cl. 201—6 **7 Claims**

1. A method of making abrasion-resistant shaped coke, particularly coke for use in adsorbing sulfur oxides from flue gases, comprising the steps of forming a mixture of particulate carbonaceous material and of between 5-35% by weight thereof of a binder for the material; converting the mixture into shaped bodies; introducing the shaped bodies into a rotary furnace having an unobstructed inner cross-section free of entraining elements; and outgassing the shaped bodies in the furnace at between about 500°-900° C. to convert them into coke bodies, the step of outgassing comprising heating the shaped bodies exclusively by heating the furnace at the exterior thereof, and flushing the interior of the furnace with an inert gas to produce in the interior an atmosphere containing at most 5% by volume of oxygen wherein the bodies are heated to a temperature of between about 500°-700° C. while preventing the ignition of the expelled gases and protecting the bodies against exposure to significant mechanical stresses.

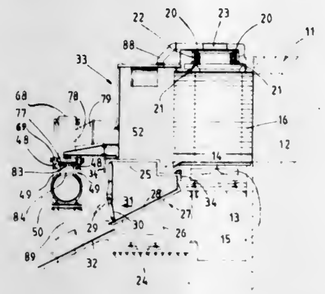
4,233,118

EQUIPMENT FOR COLLECTING, EXTRACTING AND PURIFYING FOUL GASES ARISING ON THE COKE SIDE OF A BATTERY OF CHAMBER COKE-OVENS WITH VERTICAL FLUE

Johann G. Riecker, Ratingen, and Horst Schröter, Viersen, both of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 2,964
Int. Cl.[2] C10B 33/00, 39/14, 45/00
U.S. Cl. 202—230 **8 Claims**

1. In equipment for collecting, extracting, and purifying gases arising on the coke side of a battery of coke oven chambers with vertical heating flues, and wherein said equipment includes: gas gallery track means parallel to and alongside said chambers; a coke batch-conveying truck movable on said gas gallery track means alongside said chambers and having a door-lifting and cleaning device and a coke batch guide which is movable on the truck in the directions both parallel and transverse to the movement of said truck alongside said chambers; a quench train having a locomotive and a quench truck movable alongside said chambers; a hood overhanging the loading area of the quench truck and movable alongside said chambers; a stationary gas extracting and purifying device; a gas collection duct arranged parallel to said chambers and connected to said stationary gas extracting and purifying device, said gas collection duct defining a longitudinally extending opening, said opening covered by an elastic cover belt which is liftable from said gas collection duct opening; and a gas transfer device connected to said hood and movable on said gas collection duct under said belt for lifting said belt from



said gas collection duct opening thereby effecting transfer of said gases from said hood to said collection duct;
the improvement comprising:
track means on said gas collection duct;
frame means for carrying said hood and extending substantially horizontally, said frame means being supported at three spaced-apart points; and
first, second, and third wheel means, one wheel means at each of said three support points for supporting said frame, said first wheel means being mounted for movement along said gas gallery track means and said second and third wheel means being mounted for movement along said gas collection duct track means, the distance of said frame support point on said gas gallery track means from the line joining said other two frame support points on said gas collection duct track means being less than the distance between said other two frame support points on said gas collection duct track means.

4,233,119

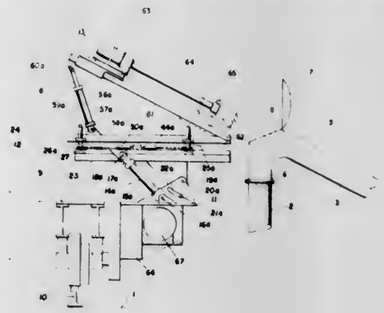
ASCENSION PIPE AND ELBOW CLEANING APPARATUS

Leo J. Meyers, and Louis A. Grant, both of Pittsburgh, Pa., assignors to Louis A. Grant, Inc., Pittsburgh, Pa.

Filed Jan. 23, 1979, Ser. No. 5,841
Int. Cl.[2] C10B 43/06
U.S. Cl. 202—241 **15 Claims**

1. In a cleaning apparatus carried by a car traveling along a coke oven, having a cleaning element for the cleaning of the inner surface of the lateral legs of ascension pipe elbows, the improvement comprising:
(a) a base support mounted on the car;
(b) a movable support comprising a lower plate connected to the base support and an upper plate superimposed upon and remotely connected to the lower plate;
(c) means for adjusting vertical displacement between said upper and lower plates;

(d) means for laterally and angularly moving the upper plate relative to the lower plate;
(e) said cleaning element being pivotally mounted on the movable support, and comprising a cleaning head mounted on an arm and means for moving said arm in a forward or rearward direction, whereby upon initial



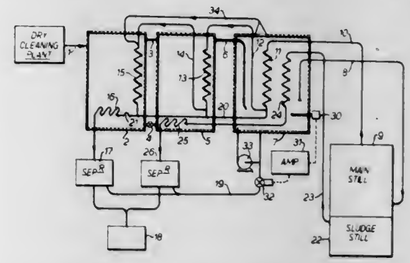
alignment of the cleaning element with the lateral leg of the ascension pipe elbow by positioning the car and the base support mounted thereon and by pivoting the cleaning element on the movable support, the cleaning element may be further aligned by adjustment of the position of the upper plate of the movable support.

4,233,120

DISTILLATION METHOD FOR SOLVENT RECOVERY

David Finlay-Maxwell, Huddersfield, England, assignor to John Gladstone & Company (Engineering) Limited, Galashiels, Scotland

Filed Apr. 14, 1978, Ser. No. 896,412
Int. Cl.[3] B01D 3/42, 3/36
U.S. Cl. 203—2 **9 Claims**



1. A solvent recovery process comprising
(a) distilling a first volume of a soiled solvent of a type herein described in order to separate solvent vapor from the soiling contaminants;
(b) passing the solvent vapor in indirect heat transfer relationship with a second volume of soiled solvent so as to effect heating of said second volume;
(c) introducing controlled amounts of water into said second volume such that said second volume comprises an azeotropic mixture of water and solvent having a boiling point lower than that of the solvent, whereby said azeotropic mixture can be heated to boiling by heat transfer from said solvent vapor;
(d) condensing the solvent vapor and the vapor arising from boiling of the said azeotropic mixture of water and solvent;
(e) separating water from such condensate as is thereby obtained so as to recover the solvent therefrom;

(f) transferring and distilling contaminant sludge from the distillation of said first volume out of said first volume; and

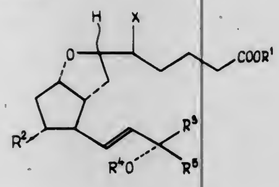
(g) passing solvent vapor arising from such distillation of said contaminant sludge in indirect heat exchange relationship with said second volume for heating the same.

4,233,121

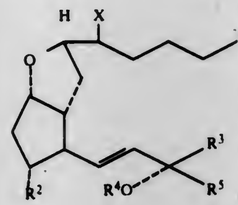
PROCESS FOR THE PREPARATION OF 5-HALO-6,9 α-OXIDO-PROSTAGLANDIN DERIVATIVES

Enikö Szebenyi nee Györi, , assignors to Chinoin Gyógyszer és Végyeszeti Termékek Gyára R.T., Budapest, Hungary

Filed May 21, 1979, Ser. No. 41,104
Claims priority, application Hungary, May 29, 1978, CI1832
Int. Cl.[3] C25B *3/02, 3/06*; C07D *307/77*
U.S. Cl. 204—59 R 15 Claims



1. A process for the preparation of a 5-halo-6,9α-oxido-prostaglandin derivative of the formula II



(II)

wherein

R^1 is hydrogen alkyl which can be substituted with aryl, amino, hydroxyl or halogen, a pharmaceutically acceptable organic or inorganic cation or a conventional hydroxyl protecting group;

R^2 is hydrogen hydroxyl or a conventionally protected hydroxyl group;

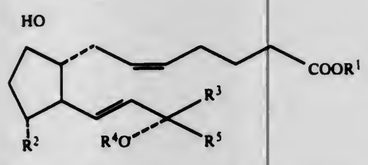
R^3 is hydrogen or lower alkyl;

R^4 is hydrogen or a conventional hydroxyl protecting group;

R^5 is straight or branched chain alkyl, which can contain one or more heteroatoms and which can be substituted with a substituted or unsubstituted aryl group, and

X is halogen,

which comprises subjecting a prostaglandin $F_{2\alpha}$ derivative of the formula I



(I)

to electrochemical oxidation in a protic medium containing halide ions.

4,233,122

ELECTROLYTIC PROCESS FOR POTASSIUM HYDROXIDE

Richard W. Lynch, Chattanooga; Garland E. Hilliard, and Ronald L. Dotson, both of Cleveland, all of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 1, 1979, Ser. No. 44,827
Int. Cl.[3] C25B *1/34*
U.S. Cl. 204—98 7 Claims

1. A process for the production of potassium hydroxide in an electrolytic membrane cell by employing in combination:

(a) a membrane comprised of a carboxylic acid substituted polymer prepared by reacting a fluorinated olefin with a comonomer having a functional group selected from the group consisting of carboxylic acid and a functional group which can be converted to carboxylic acid;

(b) a potassium chloride brine feed through the anolyte chamber of the cell having a concentration in the range from about 250 to about 300 grams of potassium chloride per liter;

(c) a cell operating temperature in the range from about 90 to about 100° C.;

(d) producing a depleted brine in the anolyte chamber after electrolysis in which the potassium chloride consumed by electrolysis ranges from about 5 to about 15 percent by weight of the potassium chloride originally present in the brine feed, and,

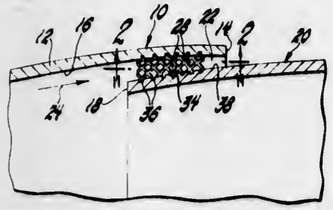
(e) maintaining a catholyte potassium hydroxide concentration in the range from about 500 to about 600 grams potassium hydroxide per liter.

4,233,123

METHOD FOR MAKING AN AIR COOLED COMBUSTOR

Ganz G. Hammer, Jr., Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1978, Ser. No. 970,630
Int. Cl.[2] G03C *5/00, 11/00*; C25F *3/02*
U.S. Cl. 204—129.65 1 Claim



1. A method for fabricating a gas turbine engine combustor wall having a curved surface thereon for flow of cooling air film across the inner wall surfaces of a downstream wall portion of a combustor comprising the steps of: preforming an annular metal part having a curved end surface, coating said surface with photoresist material, preparing a transparency having a crosshatch grid thereon of continuously curved intersecting lines selected to correspond to the curvature of said end surface to project as a straight line grid thereon, positioning the surface and coated photoresist material thereon on an adjustable work platform, projecting the crosshatched curved grid pattern from said transparency against the photoresist material through an angle to cause the curved grid pattern lines of the phototransparency to be exposed as a uniform straight line grid pattern on the photoresist material, developing the exposed straight line grid pattern on the photoresist material, masking all areas of the coated curved surface except the exposed straight line grid pattern thereon, and thereafter etching the uniform straight line pattern into metal of the curved end surface to produce a uniform pattern of raised lands with straight edges across the curved end surface of the annular metal part for producing a uniform surface scrubbing action and cooling of the metal part during flow of the air film thereacross.

4,233,124

ELECTROLYTIC STRIPPING BATH AND PROCESS

Lillie C. Tomaszewski, Dearborn, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Oct. 29, 1979, Ser. No. 89,059
Int. Cl.[3] C25F *5/00, 3/02*
U.S. Cl. 204—146 21 Claims

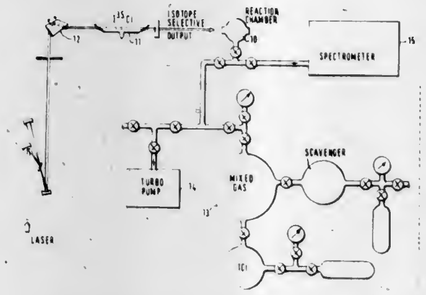
1. An electrolytic stripping bath for stripping metal deposits from a different basis metal comprising an aqueous solution having a pH of about 1 to about 14 and containing a halogen compound in an amount sufficient to activate the bath, a stripping component selected from the group consisting of (a) a bath soluble primary, secondary and/or tertiary amine having a carbon content of C_1 to C_8, (b) a bath soluble inorganic nitrate and/or organic nitro compound and mixtures of (a) and (b), and an inhibiting agent present in an effective amount to inhibit attack of the basis metal comprising a compound selected from the group consisting of glucoheptonic acid, malic acid, and mixtures thereof as well as the Group IA, IIA and ammonium salts thereof.

4,233,125

METHOD OF PHOTOCHEMICAL SEPARATION OF ISOTOPES

Fritz P. Schäfer, Göttingen-Nikolausberg, and Michael Stuke, Bovenden, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 907,034
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722310
Int. Cl.[3] B01J *1/10*
U.S. Cl. 204—157.1 R 10 Claims



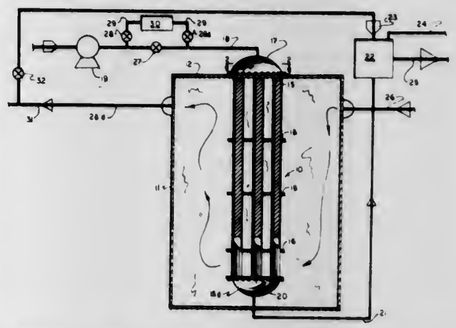
1. In a method of photochemical separation of isotopes, wherein molecules containing differing isotopes of an element are selectively excited by laser radiation of a predetermined wavelength corresponding to an absorption band in the visible or ultraviolet range, the wavelength being chosen to lift molecules containing a given isotope into an electronically excited state and to leave similar molecules containing a different isotope relativey unexcited, and the excited molecules are rendered isolatable by means of chemical reaction with a scavenger, the improvement that the selectively excited molecules are brought into reaction with a coreactant which is selected, under the prevailing conditions, firstly to react collectively in a simple additive reaction and substantially no other reaction with the excited molecules effectively to produce a single stable non-dissociating addition product and secondly to react collectively to a minimum extent with the relatively unexcited molecules.

4,233,126

OZONE PRODUCED BY CHEMONUCLEAR GENERATION

Robert I. Garcia, Baton Rouge, La., assignor to Innovative Chemicals, Inc., Baton Rouge, La.

Filed Jun. 8, 1978, Ser. No. 913,699
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 H 18 Claims



1. The process for producing ozone from an oxygen containing stream comprising:

(a) providing a chemonuclear ozone generator having a plurality of generally parallel, spaced apart generator tubes received in a coolant container;

(b) placing sealed tubes containing gamma-ray emitting material within some of said generator tubes, and at least the interior surface of said remaining tubes being a material that emits photons which have an energy greater than about 5 eV when contacted by the gamma radiation;

(c) flowing said oxygen containing stream through said remaining generator tubes and thereby subjecting the oxygen containing stream material to irradiation from said surface material in combination with direct gamma irradiation to generate ozone in said oxygen material; and

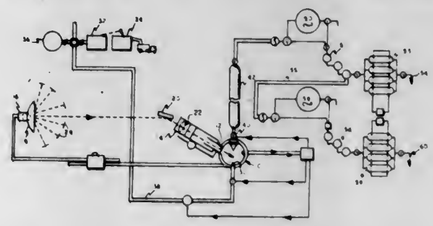
(d) flowing a cooling fluid over said generator tubes to remove heat therefrom.

4,233,127

PROCESS AND APPARATUS FOR GENERATING HYDROGEN AND OXYGEN USING SOLAR ENERGY

Daniel E. Monahan, 4925 Central Ave., Charlotte, N.C. 28205

Filed Oct. 2, 1978, Ser. No. 948,061
Int. Cl.[3] B01J *19/08, 19/26*
U.S. Cl. 204—157.1 R 38 Claims



1. A process for generating hydrogen and oxygen, comprising

(a) injecting water into a reaction chamber,

(b) collecting rays of the sun and reflecting said rays into said chamber,

(c) concentrating said rays at a point spaced from and within the walls of said chamber to raise the temperature therein to the dissociation temperature of water,

(d) dissociating said water into a hydrogen component and an oxygen component, and
(e) separating the dissociated hydrogen from the oxygen.

4,233,128
PHOTOSYNTHESIS OF MERCAPTANS

Jean Ollivier, Arudy; Guy Souloumiac, and Jeannine Suberlucq, both of Pau, France, assignors to Societe Nationale Elf-Aquitaine (Production), Paris, France

Filed Apr. 30, 1979, Ser. No. 34,616
Claims priority, application France, May 5, 1978, 78 13341
Int. Cl.³ B01J *19/08*
U.S. Cl. 204—158 R **12 Claims**

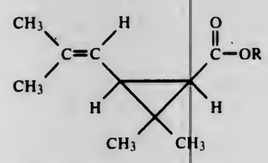
1. In the method of synthesizing a mercaptan by the photochemical reaction between an ethylenically unsaturated compound and hydrogen sulfide, in the presence of a group VA element promoter, the improvement which comprises the reaction medium containing a ketone selected from the group consisting of benzophenone, thiobenzophenone and substituted benzophenones and thiobenzophenones.

4,233,129
PROCESS OF PREPARATION OF ALKYL ESTERS OF DL CIS CHRYSANTHEMIC ACID

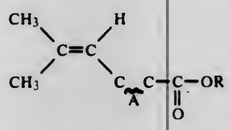
Michel Franck-Neumann; Christiane Dietrich-Buchecker, both of Strasbourg, and Michel Miesch, Mulhouse, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 20, 1979, Ser. No. 59,291
Claims priority, application France, Jul. 24, 1978, 78 21814
Int. Cl.³ B01J *19/08*
U.S. Cl. 204—158 R **10 Claims**

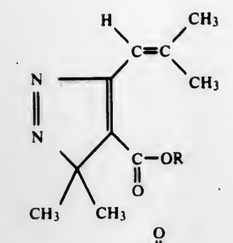
1. A process for the preparation of alkyl esters of 2,2-dimethyl-3RS-(2'-methyl-1'-propenyl)-cyclopropane-1SR-carboxylic acid, or alkyl esters of dl cis chrysanthemic acid having the formula



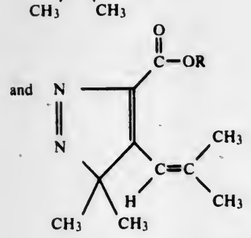
wherein R is an alkyl having from 1 to 6 carbon atoms consisting essentially of the steps of
(A) reacting methyl lithium with 2-methyl-pent-2-en-4-yne in an inert organic solvent,
(B) reacting the lithiated derivative obtained with a C_1-C_6 alkyl chloroformate at a temperature below 0° C. in an inert organic solvent,
(C) recovering an alkyl ester of an unsaturated acid having the formula



wherein R has the above assigned values and ⌇ represents a carbon to carbon bond selected from the group consisting of
an ethylenic bond and an acetylenic bond,
(D) reacting said alkyl ester of an unsaturated acid with diazo-2-propane at a temperature below 0° C. in an inert organic solvent, to obtain when ⌇ is an acetylenic bond a mixture of compounds having the formula selected from the group consisting of

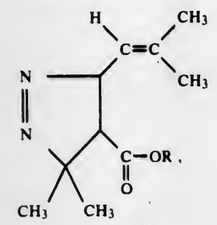


(1)

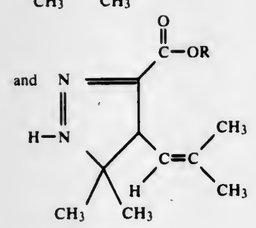


(2)

which can be separated, and when ⌇ is an ethylenic bond, a mixture of compounds having the formula selected from the group consisting of



(3)



(4)

which are separated,
(E) subjecting the alkyl ester of formula 1,2, or mixtures thereof to irradiation and of formula 3 to irradiation and heating, and
(F) recovering said alkyl esters of dl cis chrysanthemic acid.

4,233,130
INK AND COATING COMPOSITIONS AND METHOD

George W. Borden, Charleston; Oliver W. Smith, South Charleston, and David J. Trecker, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 103,912, Jan. 4, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,695
Int. Cl.² C09D *3/72*
U.S. Cl. 204—159.23 **31 Claims**

1. A composition comprising:
I—an arcylated epoxidized soybean oil compound having in the molecule at least two groups of the formula

wherein X is hydrogen or methyl, said compound being the reaction product of epoxidized soybean oil reacted with acrylic acid or methacrylic acid and
II—a photosensitizer.

4,233,131
PROCESS FOR PREPARING ALKYLENE EPISULFIDES AND EPISELENIDES

Charles T. Ratcliffe, and James T. Yardley, both of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 29, 1979, Ser. No. 89,649
Int. Cl.³ C07D *32/000*
U.S. Cl. 204—162 R **10 Claims**

1. A process for the preparation of alkylene episulfides or episelenides which comprises contacting elemental sulfur or elemental selenium, respectively, with an olefin while irradiating the sulfur/seleniumolefin materials with electromagnetic radiation in the infrared to ultraviolet range, said olefin having 2 to 6 carbon atoms and being represented by the formula:

$$R^1R^2C=CR^3R^4$$

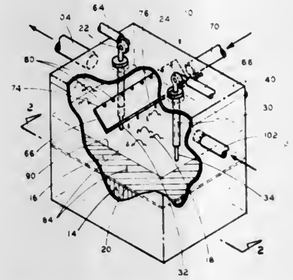
wherein R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen and alkyl groups of 1 to 4 carbon atoms.

3. The process of claim 1 wherein the olefin is ethylene.

4,233,132
METHOD AND APPARATUS FOR PRODUCING HYDROGEN

Randall Carr, 4624 S. Georgia, Amarillo, Tex. 79110; L. E. Geoffroy, 6214½ Belpree, Amarillo, Tex. 79106; Rodger H. Flagg, 1415 Lynn Ave., Fort Wayne, Ind. 46805, and Donald L. Carr, 3103 S. Pittsburg, Amarillo, Tex. 79103

Filed Mar. 19, 1979, Ser. No. 21,457
Int. Cl.³ C10G *15/00*; C25B *15/00, 9/00, 1/02*
U.S. Cl. 204—169 **19 Claims**



1. A process for producing hydrogen gas comprising the steps of: passing a current through electrodes disposed within a hydrocarbon oil layer which is formed as a supernatant layer above a water layer, electrically dissociating the water layer and forming whereby a continuous outflow of hydrogen, and replenishing the water which is electrically dissociated in the aforementioned manner.

4,233,133
PASSIVATING BATH FOR SEMICONDUCTIVE BODIES

Antonio Gambardella, Cornaredo, and Marco Panigada, Pavia, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

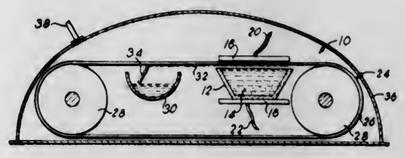
Filed Sep. 12, 1979, Ser. No. 74,773
Claims priority, application Italy, Sep. 21, 1978, 27906 A/78
Int. Cl.³ C25D *13/02, 13/10*
U.S. Cl. 204—181 N **7 Claims**

1. In a process for protectively coating a semiconductive body by immersing same in a bath having particles of a vitreous or ceramic passivating material suspended therein and electrophoretically depositing said particles on the immersed body,
the improvement wherein said bath consists essentially of an organic solvent, an amine, and a hydrohalogenic acid in proportions yielding a pH between substantially 4 and 10.

4,233,134
METHOD AND APPARATUS FOR EXTRACTING POLAR SUBSTANCES FROM SOLUTION

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Oct. 19, 1977, Ser. No. 843,670
Int. Cl.³ B03C *5/00*
U.S. Cl. 204—186 **4 Claims**

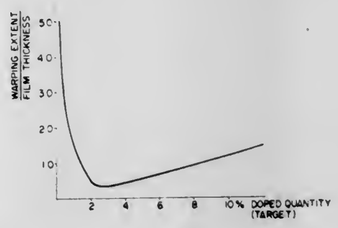


1. A method of extracting water from an aqueous solution which includes the steps of presenting the solution in spaced relationship, yet open communication and close proximity to means carrying a high voltage positive electrical charge whereby the water migrates to said charged means for collection thereon, and separating the water from said charged means.

4,233,135
METHOD OF FABRICATING PIEZOELECTRIC THIN FILM

Mitsuo Sakakura, Saitama, and Tetsuo Takaku, Tsurugashima, both of Japan, assignors to Toko, Inc., Saitama, Japan

Filed Feb. 15, 1979, Ser. No. 12,536
Claims priority, application Japan, Feb. 27, 1978, 53-2176878
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 SP **4 Claims**



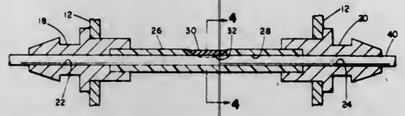
1. A method of fabricating a piezoelectric thin film of zinc oxide by means of a sputtering process, characterized by sputtering zinc and beryllium together in an oxygen atmosphere to thereby produce a thin film of zinc oxide containing 1 to 10 atom % of beryllium.

4,233,136

LIQUID MEMBRANE ELECTRODE

Frederick F. Spaziani, Lexington, and James E. Fowler, Watertown, both of Mass., assignors to Nova Biomedical Corporation, Newton, Mass.

Filed Jul. 17, 1978, Ser. No. 925,518
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—195 L **13 Claims**



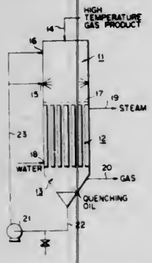
1. A flow-through electrode assembly comprising a tube or organic plastic material having a cylindrical tube wall defining therewith a cylindrical liquid sample flow path through said electrode, characterized in that said plastic material of said tube is interrupted and a membrane defines said cylindrical tube wall at said interruption of said plastic material, said membrane comprising a matrix of an organic plastic material containing a non-volatile solvent plasticizer and an ion exchange material dissolved in said solvent plasticizer, further characterized in that said membrane is chemically bonded to and integral with the remainder of said tube wall and further characterized in that the interior of said tube wall, including said membrane portion, comprises a smooth, continuous, cylindrical surface defining a flow path for said liquid sample.

4,233,137

METHOD OF HEAT RECOVERING FROM HIGH TEMPERATURE THERMALLY CRACKED HYDROCARBONS

Kiyoji Ozaki, Yokohama; Akinobu Fukuhara, Sagamihara; Takuji Hosoi, Kawasaki, and Yasuo Sagi, Iwaki, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama and Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 855,310, Nov. 28, 1977, Pat. No. 4,150,716, which is a continuation of Ser. No. 655,957, Feb. 6, 1976, abandoned. This application Mar. 30, 1979, Ser. No. 25,494
Claims priority, application Japan, Feb. 7, 1975, 50-15252
The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.
Int. Cl.² C10G *9/16*; C10J *3/86*
U.S. Cl. 208—48 Q **11 Claims**



1. A method of recovering heat from a high temperature gas product obtained by thermal decomposition of hydrocarbons in the form of high pressure steam which comprises

(a) precooling, in a vessel comprising a precooling zone, a heat exchange zone and a separating zone, the high temperature gas product in the precooling zone by mixing said gas product with a sprayed low temperature hydrocarbon oil of a by-product obtained from said thermal decomposition of hydrocarbons, which contains from 30 to 80 percent by weight of a pitch based on the weight of said sprayed low temperature hydrocarbon oil, as a quench to a temperature of from 300° C. to 400° C.;

(b) passing the resulting mixture downwardly from the precooling zone through the tubes of a substantially vertical shell-and-tube type heat exchange means, at a linear gas velocity of 15 to 50 meters per second in said tubes to form a thin liquid film layer of the sprayed oil on the inside walls thereof, and transferring the heat contained in said resulting mixture into a high pressure water flowing through the shell side of the heat exchange means and recovering therefrom a high pressure steam of from 40 to 100 kg/cm²;

(c) separating the said hydrocarbon oil in the separating zone from said resulting mixture passed through the tubes of said heat exchange means downwardly to the separating zone; and

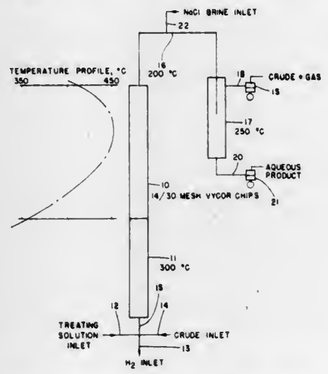
(d) recirculating the separated hydrocarbon oil as a quench to the precooling zone.

4,233,138

PROCESS FOR THE VISBREAKING OF HIGH-METALS CRUDES AND RESIDS

Louis D. Rollmann, Princeton, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,428
Int. Cl.³ C10G *9/00*
U.S. Cl. 208—106 **7 Claims**



1. In a process for visbreaking crude and resid feeds containing a quantity of metal values promoting the significant formation of coke, the improvement which comprises carrying out the visbreaking with an effective amount of at least one inorganic sulfide of an alkali metal sulfide, an alkaline earth metal sulfide, hydrogen sulfide or ammonium sulfide admixed with said feed to suppress coke formation.

4,233,139

ACID CATALYZED HYDROCARBON CONVERSION PROCESSES UTILIZING A CATALYST COMPRISING A GROUP IVB, VB OR VIB METAL OXIDE ON AN INORGANIC REFRACTORY OXIDE SUPPORT

Lawrence L. Murrell, Elizabeth; Chang J. Kim, Somerset, and Dane C. Grenoble, Plainfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 25, 1978, Ser. No. 927,828
Int. Cl.³ C10G *11/04*, *47/12*, *49/04*, *49/18*
U.S. Cl. 208—112 **16 Claims**

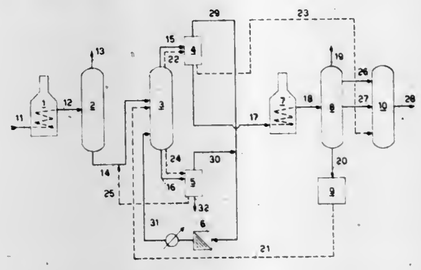
1. In a hydrocarbon conversion process wherein hydrocarbon fractions are cracked over acid catalysts at elevated temperatures, the improvement comprising using as the catalyst a material comprising a catalytic metal oxide selected from the group consisting of the oxides of tungsten, niobium, and mixtures thereof and tungsten or niobium oxides in combination with one or more additional metal oxides selected from the group consisting of tantalum oxide, hafnium oxide, chromium oxide, titanium oxide and zirconium oxide supported on an inorganic refractory metal oxide base selected from the group consisting of alumina, zirconia, boria, thoria, magnesia, zirconium-titanate, titania, chromia, kieselguhr and mixtures thereof, said catalyst being steamed prior to use.

4,233,140

PROCESS FOR REGENERATING EXHAUSTED OILS

Sergio Antonelli, Peschiera Borromeo, and Michele Borza, Cremona, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Dec. 18, 1978, Ser. No. 970,185
Claims priority, application Italy, Jan. 12, 1978, 19203 A/78
Int. Cl.² C10M *11/00*
U.S. Cl. 208—180 **9 Claims**



1. A process for regenerating spent oils, characterized by comprising the steps of:

(a) Heating the oil in a first oven,

(b) Sending the heated oil to a pre-distillation column and separating at the column head the water and the light hydrocarbons,

(c) Recovering from the bottom of the pre-distillation column the oil which is sent to a solvent-extraction section to remove from the oil the major fraction of the impurities contained therein,

(d) Heating the oil raffinate exiting the extraction section after having stripped the solvent therefrom in a second oven,

(e) Feeding the oil from the heating stage to a stage of distillation under vacuum with a bottom temperature higher than 300° C., to separate from the column side the lubricating bases having the lower viscosity and deprived of impurities and discharging from the bottom the heavier lubricating bases in which the remaining impurities have been concentrated,

(f) Subjecting the heavier lubricating fraction to a heat treatment at a temperature from 300° C. to 450° C. under adiabatic conditions for a time varying from 1 to 120 minutes,

(g) Subjecting the heavier lubricating fraction, after the heat treatment, to a second extraction with solvent, and

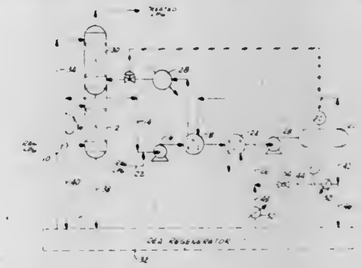
(h) Sending the heavy lubricating base raffinate and the other bases having a lower viscosity, separately, to a hydrofinishing stage.

4,233,141

PROCESS FOR REMOVAL OF CARBONYL SULFIDE IN LIQUIFIED HYDROCARBON GASES WITH ABSORPTION OF ACID GASES

David K. Beavon, Pasadena, and Mark Mackles, Tarzana, both of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Filed Apr. 27, 1979, Ser. No. 33,875
Int. Cl.³ C07C *7/11*; C01B *31/26*, *17/16*; C07C *9/10*
U.S. Cl. 208—236 **18 Claims**



1. A process for purifying liquified hydrocarbon gases containing as an impurity carbonyl sulfide which comprises:

(a) intimately mixing the liquified hydrocarbon gas containing carbonyl sulfide with a liquid aqueous solution of an absorbent for at least hydrogen sulfide which absorbent does not combine irreversibly with carbonyl sulfide, hydrogen sulfide, and carbon dioxide in a hydrolysis reaction zone maintained at a temperature sufficient to hydrolyze the contained carbonyl sulfide to hydrogen sulfide and carbon dioxide and hydrolyzing the carbonyl sulfide to form a two phase mixture of liquified hydrocarbon gas containing at least a portion of the hydrogen sulfide and carbon dioxide formed by hydrolysis and the liquid aqueous solution of the absorbent containing at least hydrogen sulfide;

(b) separating the liquified hydrocarbon gas containing hydrogen sulfide and carbon dioxide from the liquid aqueous solution of the absorbent containing at least hydrogen sulfide;

(c) contacting the liquified hydrocarbon gas containing the hydrogen sulfide and carbon dioxide with a hydrogen sulfide lean aqueous absorbent for at least hydrogen sulfide which does not combine irreversibly with carbonyl sulfide, hydrogen sulfide, and carbon dioxide at a temperature lower than the temperature of the hydrolysis reaction zone to absorb hydrogen sulfide from the liquified hydrocarbon gas.

4,233,142

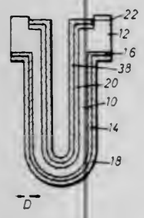
ELECTROCHEMICAL MEASURING CELL

Franz-Josef Rohr, Abtsteinach, and Hubert Holick, Lampertheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 935,787
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 2738755
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—195 S **15 Claims**

1. In an electrochemical measuring cell for determining the oxygen content in gases, particularly in exhaust gases from internal-combustion engines or combustion chambers, having an ion-conducting solid electrolyte for passage of oxygen ions through the solid electrolyte with a measuring electrode disposed as a first layer on a surface of the ion-conducting solid electrolyte and a reference electrode disposed as a second layer on a surface of the ion-conducting solid electrolyte opposite the first layer, the combination therewith of a catalytically

active porous third layer coating the first layer measuring electrode, said third layer containing a material with a medium partial oxygen pressure to obtain a change in voltage from the electrochemical measuring cell with change in air number with a characteristic which has a medium slope in the range of the air number of about 1 wherein a medium slope means an approximately linear voltage change of the measuring cell of about 500 mV corresponds to a change of the air number of between 0.1 and 0.5 and wherein the third layer contains a mixture of an inert ceramic material with a material of the formula



$Me_x^I\ Me_y^{II}\ Me^{III}\ O_3$

where Me^I is a member selected from the group consisting of lanthanum, gadolinium and praseodymium; Me^{II} is a member selected from the group consisting of strontium, calcium and barium; and Me^{III} is a member selected from the group consisting of manganese, nickel, cobalt and chromium, and x has a value of 0.74 to 0.92, and y has a value of 0.08 to 0.26.

4,233,143

MEASURED VALUE RECEIVER FOR THE POLAROGRAPHIC MEASUREMENT OF GASES IN LIQUIDS

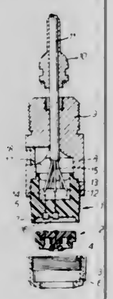
Ole F. Knudsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 25, 1978, Ser. No. 954,328

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748191

Int. Cl.[3] **G01N** *27/30, 27/46*

U.S. Cl. 204—195 P **1 Claim**



1. A measured value receiver for the polarograph measurement of gases in liquids, comprising a mounting member having an end face with associated cathode and anode contacts, carrier means having a base with a face in abutting engagement with said end face, means for connecting said carrier means to said mounting member, said carrier means having an annularly shaped wall and a central post member extending from said base and forming an annularly shaped recess, said wall having an end face and said post member having a supporting face disposed a greater distance from said base than said end face, said post supporting face having a cathode associated therewith, said carrier means having an anode projecting into said chamber, said cathode and anode having corresponding contacts in said base face cooperable with said like contacts in said mounting member end face, a diaphragm permitting diffusion of gas attached to said wall end face to enclose said recess to form a completely fluid tight chamber, and a quantity of electrolyte filling said chamber with said quantity being selected so that said diaphragm is in contact with said supporting face and has an inwardly and concavely formed contour to allow for temperature responsive expansion and contraction of said electrolyte.

4,233,144

ELECTRODE FOR VOLTAMMETRIC IMMUNOASSAY

Salvatore J. Pace, Yorktown Heights, and Anand Kumar, Monroe, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,206

Int. Cl.[2] **G01N** *27/30, 33/16*

U.S. Cl. 204—195 B **8 Claims**

1. A voltammetric monitoring electrode for measuring electrochemical changes resulting from an immunoreaction between complementing immunoreactants, said voltammetric monitoring electrode comprising an electroactively-labelled immunoreactant attached to a surface thereof.

4,233,145

DEVICE FOR THE PROCESSING OF POURABLE BULK MATERIAL

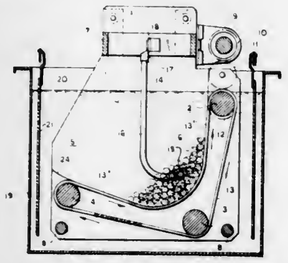
Horst Bläsing, Berlin, and Manfred Gute, Nuremburg, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 22,156

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812559

Int. Cl.[3] **C25D** *17/16, 17/22*

U.S. Cl. 204—202 **7 Claims**



1. A device for chemically and electro-chemical processing, especially electroplating, of pourable bulk material, comprising a tank adapted to contain a chemical solution; means removably supported on said tank spaced from the inner surface thereof for forming a trough to receive the material to be processed, said trough forming means comprising a pair of transversely spaced side plate means, a pair of reversing rollers turnably mounted in said side plate means with one of said reversing rollers at a lower elevation and the other at a higher elevation, an endless perforated belt extending about said reversing rollers and having an upper and a lower run, said side plate means being constructed to guide said upper run of said belt along a path having a first branch descending from said reversing roller mounted at said lower elevation of said side plate means at a small angle to the horizontal to a deepest point of said trough and a second branch rising from the deepest point in nearly vertical direction to the reversing roller at the higher elevation, and a tension roller engaging the lower run of said belt; means connected to said side plate means for removably supporting said trough forming means on said tank and for

connecting lifting means to said trough forming means so that the latter may be lifted out of said tank; and reversible drive means operatively connected to one of said rollers to drive said belt in one or the other direction so that during processing the material said upper run may be driven in a direction moving from the lower reversing roller towards the upper reversing roller, whereby said second nearly vertical branch of said upper belt will retain the material in the trough while when the trough forming means is lifted out of said tank, said drive means may be reversed so that the material will be discharged from the trough over said first branch of said upper run and the lower reversing roller.

4,233,146

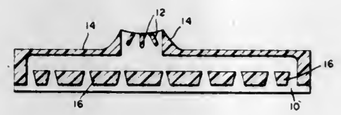
CELL FLOW DISTRIBUTORS

Noel Y. Rothmayer, Madison; Preston Keusch, Paramus, and Dietrich E. Kattermann, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 9, 1979, Ser. No. 19,056

Int. Cl.[3] **C25B** *13/02, 9/00;* **H01M** *2/14*

U.S. Cl. 204—255 **13 Claims**



1. An improved cell including two substantially rectangular, substantially parallel membranes of substantially equal size separated by a gasket in the form of a four-sided frame having a substantially rectangular outer perimeter of dimensions substantially the same as those of said membranes, a substantially rectangular cutout, a fluid inlet port on one side and a fluid outlet port on an opposite side, said membranes also separated by a substantially rectangular membrane spacer substantially coplanar with and surrounded by the gasket, wherein the improvement comprises an inlet distributor in communication with and adjoining the inlet port for directing the fluid through the cell, the distributor comprising:

(a) a covering comprising two substantially parallel closely spaced, flexible sheets, the ends of the sheets opposite the inlet port grasping a first edge of the spacer; and

(b) a plurality of inserts disposed between and joined to the sheets and so dimensioned and positioned that the flow of fluid through the cell is substantially uniform.

4,233,147

MEMBRANE CELL WITH AN ELECTRODE FOR THE PRODUCTION OF A GAS

Umberto Giacopelli; Bruno Grassi, both of Rosignano-Solvay, Italy, and Rene Crabbe, Brussels, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 930,239, Aug. 2, 1978, abandoned, which is a continuation of Ser. No. 772,563, Feb. 28, 1977, abandoned. This application Jul. 17, 1979, Ser. No. 58,367

Claims priority, application France, Mar. 8, 1976, 76 06764

Int. Cl.[3] **C25B** *9/00*

U.S. Cl. 204—266 **7 Claims**

1. In an electrolytic cell of the membrane type having at least two vertical electrodes comprising an anode and a cathode, a membrane between the anode and the cathode, at least one of both said anode and said cathode comprising a vertical conductive plate, said plate having a horizontal zone for connecting an electrical lead thereto, said plate having vertically extending narrow slots distributed thereon, the slots comprising vertical elongated slots, said plate having vertically disposed elongated vanes extending obliquely from an active face of said plate and disposed adjacent ones of the vertical elongated slots, each of said vanes being disposed opposite a corresponding slot substantially in parallel vertical rows, and said vertical elongated slots and said vertical vanes being disposed effectively to transfer gas from the active face of the plate to a rear side of the

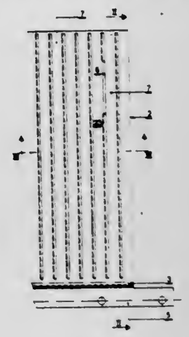


plate and thus avoid bubbles of gas in an anode-cathode gap between the anode and the cathode and effective to reduce composition of electrical energy during electrolysis.

4,233,148

ELECTRODE COMPOSITION

David E. Ramsey, Johnson City, and Lloyd I. Griadstaff, Elizabethton, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,430

Int. Cl.[3] **C25B** *11/04*

U.S. Cl. 204—291 **11 Claims**

1. An electrode suitable for the production of aluminum in a Hall cell comprising a homogeneous sintered ceramic body having the composition of 67 to 78% SnO_2, 19 to 30% GeO_2 and from 1 to 3% of an electroconductive oxide selected from the group consisting of Sb_2O_3, Bi_2O_3, and MnO_2.

4,233,149

ANODE SUPPORT MEMBER

Kazuo Toda; Tadashi Hosoda, both of Urawa, and Yutaka Matsuo, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1979, Ser. No. 12,125

Int. Cl.[3] **C25B** *11/10;* **C25D** *17/04, 17/06, 17/12*

U.S. Cl. 204—297 W **19 Claims**



1. An anode member for anodic oxidation treatment, wherein said anode member is constructed of at least one of: constructive zirconium alloy material or scrap of zirconium alloy tube such as rejected product or short dimensioned products.

4,233,150

PROCESS FOR BENEFICIATION OF NON-SULFIDE IRON-FREE ORES

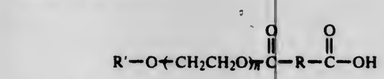
Samuel S. Wang, Cheshire, and Eugene L. Smith, Jr., Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 819,302, Jul. 27, 1977, abandoned, Ser. No. 723,840, Sep. 16, 1976, abandoned, Ser. No. 686,629, May 14, 1976, abandoned, and Ser. No. 650,094, Jan. 19, 1976, abandoned. This application Jan. 19, 1979, Ser. No. 4,643

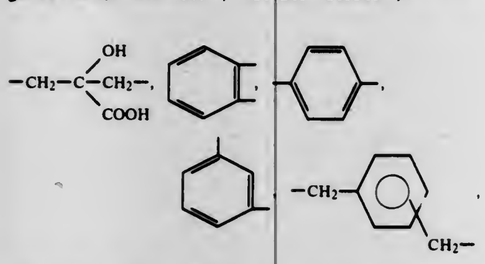
Int. Cl.³ B03D *1/02*

U.S. Cl. 209—166 **8 Claims**

1. A process for the beneficiation of non-sulfide, iron-free ores which comprises classifying the ore to provide particles of flotation size, slurrying the sized ore in aqueous medium, conditioning the slurry with an effective amount of a combination of about 99 to about 5 weight percent of a fatty acid derived from a vegetable or animal oil and, correspondingly, from about 1 to about 95 weight percent of a partial ester of a polycarboxylic acid having at least one free carboxylic acid group, and floating the desired ore by froth flotation, said partial ester having the structure:



wherein R' is a primary or secondary alkyl group of about 8 to 18 carbon atoms, n is an integer of about 1-10 and R is a bivalent grouping selected from $-CH_2-_m$ wherein m is an integer of 1 to 6, —CH=CH—, —CHOH—CHOH—,



ortho, meta, and para, $-C_6H_8-$, and $-C_6H_{10}-$.

4,233,151

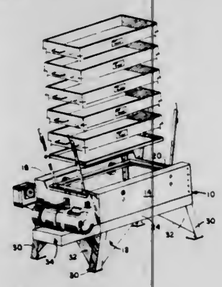
SHAKER MECHANISM FOR A STACK OF SIEVE TRAYS

John A. Gundlach, Everett, Wash., assignor to Everett Metal Products, Everett, Wash.

Filed Aug. 14, 1978, Ser. No. 933,633

Int. Cl.³ B07B *1/46*

U.S. Cl. 209—319 **13 Claims**



10. Mechanism for shaking a stack of sieve trays, comprising:

a frame including a pair of spaced apart side members and a supporting base;

a carrier for a stack of sieve trays positioned between said spaced apart side members;

means mounting said carrier onto inner portion of said frame side members, for horizontal rectilinear translation, said means comprising support rails and anti-friction rollers in rolling contact with said support rails, said anti-friction rollers comprising a lower set of horizontal spaced apart rollers and an upper set of horizontally spaced apart rollers, said support rail being positioned vertically between said upper and lower sets of rollers;

said rollers being metal cam rollers and each said support rail including a detachable lower bearing strip in contact with the lower rollers and a detachable upper bearing strip in contact with the upper rollers, said bearing strips being constructed from a structural plastic material;

power drive means for translating the carrier and any sieve trays mounted thereon back-and-forth; and

means for securing a stack of sieve trays onto said carrier.

4,233,152

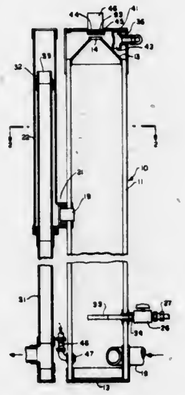
APPARATUS AND METHOD FOR THE TREATMENT OF LIQUORS

Robert C. Hill, Santa Clara; Niel E. Nielson, Mountain View; Ronald L. Kreiling, Danville, and Ralph A. Nice, Burlingame, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 19, 1979, Ser. No. 21,430

Int. Cl.² C02B *3/08*

U.S. Cl. 210—703 **18 Claims**



1. A contactor for treating liquors with gas containing ozone for removing contaminating solids and the destruction of bacteria and viruses, the gas being supplied from a source of the same, the contactor comprising an elongated vertical tank, inflow piping connected to the lower portion of the tank, outflow piping connected to an intermediate portion of the tank and spaced upwardly from the inflow piping, means connected to said source for introducing said gas containing ozone into the tank at a level between the inflow and outflow connections, means for maintaining a quiescent zone of liquor and a desired liquor level in the upper portion of the tank, means at the upper end of the tank for receiving and mechanically shearing and impacting foam discharging from the tank to collapse the foam bubbles, and means for collecting and removing the liquor of the collapsed bubbles and for the discharge of gas evolved from the same, said means for maintaining a desired level of liquor in the tank consisting of a vertical standpipe having its lower end connected to receive liquor from the outflow piping.

4,233,153

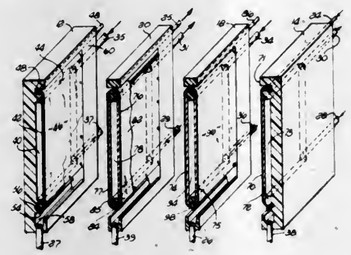
CONTINUOUS METHOD AND APPARATUS FOR SEPARATING SOLVENT FROM SOLUTE

Harold T. Hammel, Del Mar, and James E. Maggert, San Diego, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 851,918, Nov. 21, 1977, Pat. No. 4,153,546. This application Mar. 27, 1978, Ser. No. 890,442

Int. Cl.² B01D *17/00*

U.S. Cl. 203—10 **5 Claims**



1. An apparatus for the continuous separation of a volatile solvent from a solution of said solvent and a relatively non-volatile solute, comprising:

means for defining a cool, extended surface;

means for defining a warm, extended surface opposite said cool surface and spaced therefrom a predetermined distance;

means for flowing solution over said warm surface comprising a sheet of thin fibrous material, means for disposing said sheet in direct contact with said warm surface, and means for releasing said solution above said warm surface for conduction by said sheet in a substantially continuous thin film over said warm surface confined thereon to define a continuous vapor gap between said warm and cool surfaces whereby to form a condensate on said cool surface; and

means for recovering condensate formed on said cool surface separately from said solution, said predetermined distance being at least greater than the combined thickness of said flowing solution and said condensate.

4,233,154

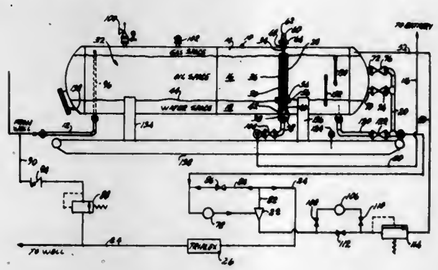
METHOD FOR TREATING PETROLEUM WELL PUMPING POWER FLUID

Charles L. Presley, Houston, Tex., assignor to Kobe, Inc., Huntington Park, Calif.

Filed Dec. 29, 1978, Ser. No. 974,528

Int. Cl.² B01D *21/10*

U.S. Cl. 210—800 **6 Claims**



1. An improved method of providing a power liquid to downhole machinery of a petroleum well by a system including a separation vessel for separating production liquid from the well into liquid phases, a pump for increasing the hydrodynamic head of the power liquid taken from at least one of the liquid phases separated from the production fluid in the separation vessel, and means for re-introducing power liquid of such increased hydrodynamic head back into the well, the improvement comprising:

(a) providing partition means in the separation vessel to separate the tank into at least two compartments, a first of these compartments liquid dimensioned to accomodate surges of production liquid, and a second of these compartments being for the phase separation of production liquid fed from the first compartment;

(b) providing flow line means from the second compartment for the discharge of liquid therefrom;

(c) providing flow line means from the first compartment for providing the power liquid to a pump;

(d) providing liquid phase level control means for the first compartment comprising a phase level control line in the separation vessel between the first and second compartments, the phase level control line having an entrance in the first compartment at a level corresponding to the water phase and an outlet in the second compartment, the entrance being lower in elevation than the outlet, the flow line means from the second compartment having an entrance lower in elevation than the outlet of the phase level control line, whereby a minimum liquid level is maintained in the first compartment to act as a reservoir for power liquid and an interface between the oil phase and water phase is maintained within a desired elevational band; and

(e) feeding production liquid from said first compartment through said phase level control line to said second compartment.

4,233,155

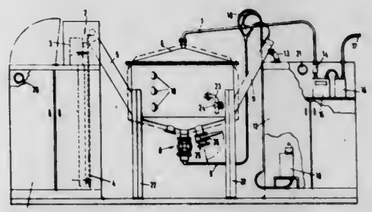
APPARATUSES FOR THE ANAEROBIC DIGESTION OF NATURAL ORGANIC WASTE

Dennis L. Hawkes; Rex Horton, both of Mid-Glamorgan, and David A. Stafford, Cardiff, all of Wales, assignors to Hamworthy Engineering Limited, Fleets Corner, England

Filed Nov. 22, 1978, Ser. No. 963,095

Int. Cl.³ B01D *55/14*

U.S. Cl. 210—92 **10 Claims**



1. Apparatus for the anaerobic digestion of natural organic waste comprising a closed container in which the organic waste can be retained while the anaerobic microrganism present in the waste digests the same, a feed tube which extends downward into said container on one side thereof and through which said natural organic waste is introduced into said container, an inclined outlet tube which extends upward from the container on the opposit side thereof to a point higher than the lower end of said inlet tube such that the liquid level in the container remains above the ends of the inlet and outlet tubes which communicate with the container and hence the space in the container above the liquid level is sealed from the atmosphere by said liquid, the inclination of said outlet tube being such that as waste is introduced into the container through the feed tube and the liquid overflows through the outlet tube,

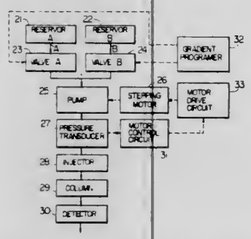
solids which have not settled to the bottom of the container settle onto the inclined wall of the outlet tube and remain in the container, a gas outlet in the top of the closed container through which the gases produced by digestion of the organic waste are collected; a diffuser located in the bottom of said container, a gas pump for pumping the collected gases through said diffuser, means establishing communication between said gas outlet and sid gas pump, and means establishing communication between said gas pump and diffuser beneath the container, said diffuser comprising a flexible membrane perforated with holes which are sufficiently fine to open only when pressurized by gas from said gas pump, whereby efficient mixing of the contents and intimate contact between gas and bacteria therein is effected, improving the efficiency of anaerobic digestion of waste in the container.

4,233,156

LIQUID CHROMATOGRAPHY APPARATUS

Katsuo Tsukada, Nakamachi, and Sadabumi Ohnuma, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 7, 1979, Ser. No. 18,334
Claims priority, application Japan, Mar. 10, 1978, 53/26554
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—101 **12 Claims**



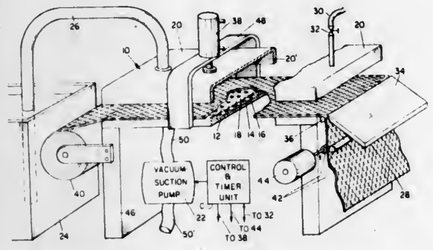
1. A liquid chromatography apparatus comprising:
at least one reservoir for storing at least one liquid mobile phase;
at least one valve for controlling the liquid mobile phase flowing out of said at least one reservoir;
a reciprocating dual-piston pump including two pistons for filling two chambers with the liquid mobile phase flowing out of said valve and pumping alternately the liquid mobile phase filled in said chambers, one end of each piston being in contact with the periphery of a rotatable cam in opposition to one end of the other piston at 180 degrees, the other end of each piston extending into each of said chambers, each of said pistons being reciprocated linearly along the contour of said cam with the rotation of said cam, thus filling said liquid mobile phase into said chambers and pumping said liquid mobile phase out of said chambers;
an injector for injecting a specimen into the liquid mobile phase passed through said pump;
a column for separating the specimen injected by said injector, into components;
a detector for detecting the components of said specimen separated by said column;
a programmer for controlling the operating time of said at least one valve;
motor means coupled to said cam of said pump for driving said pump through successive cycles of reciprocation;
said cam having a shape such that when the time derivative of displacement of one piston is positive over an angle range, the time derivative of displacement of the other piston is a negative fixed value over substantially the entire angle range that said one piston is positive, and when the time derivative of displacement of said one piston is negative over an angle range, the time derivative of displacement of said other piston is a positive fixed value over substantially the entire angle range that said one piston is negative.

4,233,157

TRAVELLING SHEET, FLAT-BED FILTER APPARATUS AND SYSTEM

Peter A. Miller, Mozartstrasse 16, D 6370 Oberursel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 466,171, Apr. 10, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,192
Int. Cl.³ B01D *29/02, 29/36*
U.S. Cl. 210—137 **3 Claims**



1. Travelling sheet, flat-bed filter apparatus to filter contaminated liquids supplied from a contaminant tank (**24**) and deliver filtered fluid to a fluid outlet (**50**) comprising
a housing (**10**; **12**, **20**) defining a chamber therein and having a bottom wall (**12**);
a perforate divider means (**18**) located essentially horizontally and subdividing the chamber into an upper contaminant chamber (**20'**) and a lower filtrate chamber (**14**) therebelow;
a web of filter medium (**28**), extending from outside of the housing into the contaminant chamber (**20'**) and therebeyond outside of the housing,
the perforate divider means having unperforate, marginal portions;
the housing defining said contaminant chamber including a shallow hood, or cap-shaped element (**20**) extending over said perforate divider means (**28**) and having depending edges, said depending edges being positioned to directly engage the web of the filter medium (**28**) in the region of the marginal unperforate portions of said perforate divider means;
contaminated liquid inlet means formed in said hood, or cap-shaped element (**20**) and a connection conduit (**26**) extending between said contaminant tank (**24**) and the contaminated liquid inlet means to supply liquid to said upper contaminant chamber means (**20'**);
means (**44**) engageable with said web of filter medium moving fresh filter medium from a supply (**40**) into the contaminant chamber, and remove used filter medium therefrom;
moving means (**38**) coupled to the hood, or cap-shaped element (**20**) to selectively move said depending edges of said element in engagement with the filter medium, or lift them off the filter medium,
filtrate outlet means (**50**) connected to said filtrate chamber (**14**);
means to effect sealing engagement of said filter medium (**28**) with the depending edges of said hood or cap-shaped element (**20**) and the unperforate marginal portions of the perforate divider means (**18**) and additionally to move liquid through the filter, comprising
a combination of a vacuum and a liquid suction pump means (**22**) connected to the filtrate chamber (**14**) and forming the sole source of pressure differential to move the contaminant liquid from the contaminant tank (**24**) through said conduit means and the inlet means into the contaminant chamber (**20'**), for filtration by the filter medium (**28**)

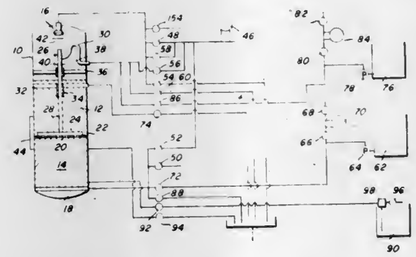
and pumping to the fluid outlet (**50**) to provide for direct supply of liquid from said contaminant tank (**24**) to the contaminant chamber (**20'**) and exposure of said combination pump means (**22**) to only fluid which is uncontaminated and simultaneously provide for a vacuum within the contaminant chamber (**20'**) which holds the edges of the movable hood, or cap-shaped element (**20**) in sealing contact with said filter medium and against the unperforate portions of said perforate divider means (**18**);
support means (**16**) located in the lower filtrate chamber (**14**) and supporting said perforate divider means (**18**) within the housing spaced from a bottom plate (**12**) of the housing and wherein, to use the filter as a protected gas or protected atmosphere filter to protect the interior of the filter chamber from contact with the ambient air,
the portion of the housing defining said filter chamber (**814**) and forming the bottom wall comprises a bottom plate (**812**) having marginal unperforate portions;
the depending edges of the shallow hood, or cap-shaped element (**820**) engaging said unperforate portions of the bottom plate, with said filter medium interposed;
duct means (**865**, **866**) formed in one of said portions and terminating at the surface facing the other of said portions; and
a source (**970**) of protective gas, said duct means being connected to the source of protective gas to supply protective gas to said contaminant chamber (**820'**) upon vacuum-and-liquid suction operation of said pump means (**22**), leakage of said gas at the junction of said portions, with said filter medium (**828**) interposed, introducing said protective gas into said contaminant chamber and preventing ingress of ambient air.

4,233,158

LIQUID TREATMENT TANK HAVING A VOLUME COMPENSATING STRUCTURE FOR USE WITH VOLUME VARIABLE LIQUID TREATMENT MATERIAL

William A. Wachsmuth, 1531 Pinetree Crescent, Mississauga, Ontario, Canada (L5G 2S9)

Filed Nov. 1, 1978, Ser. No. 956,670
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—283 **33 Claims**



3. A liquid treatment apparatus, comprising:
a generally vertically disposed tank having two fluid permeable beds therein arranged generally one above the other so as to define an upper bed and a lower bed, each of said beds being composed of a liquid treatment material with at least said lower bed being volume variable;
a fluid permeable partition in said tank separating said beds, said partition supported by said lower bed and in turn supporting said upper bed, said partition being freely longitudinally movable with respect to said tank in response to expansion and contraction of said lower bed and including partition conduit means for collecting and distributing fluids between said beds, said partition conduit means being an integral part of said partition and being freely longitudinally movable therewith;
a main partition fluid conduit passing between the inside and the outside of said tank to which said partition conduit means is connected; and,
said partition including sealing means about its periphery which engages the inside wall of said tank to prevent the passage of said liquid treatment material between said partition and said inside wall while permitting the relative movement of said partition with respect to said tank.

4,233,159

SOLID-LIQUID SEPARATION ELEMENT AND APPARATUS

Teruo Senda, and Mitsunobu Otani, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,641
Claims priority, application Japan, Nov. 28, 1977, 52-141688
Int. Cl.³ B01D *23/24*
U.S. Cl. 210—413 **8 Claims**



1. A solid-liquid separation apparatus for use in the treatment of waste water comprising:
(a) a solid-liquid separation element composed of a screen having a plurality of openings therein and guide members mounted on the back surface of said screen for accelerating the through-flow of the liquid, which is conveyed along the back surface of said screen, said guide member being mounted so that S_2 satisfies the equation

$$S_2/\sin\theta < W_2 \cdot \cos\theta$$

wherein S_2 is the thickness of the through-flow water which is conveyed along the back of said screen, W_2 is the distance between the tops of the back surface of the screen and θ is an angle formed between a horizontal plane and the screen, and
(b) a means for cleaning the screen, said cleaning means having a brush, said brush adapted for reciprocation in rubbing contact with the back surface of the screen, and the range of reciprocating motion of said brush being more than the width of said screen.

4,233,160

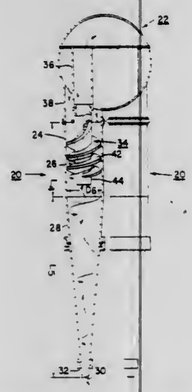
HYDROCYCLONE SEPARATOR ARRANGEMENT

Jacek J. Maclerewicz; Johannes J. Richters, and James E. St. John, all of Calgary, Canada, assignors to Elast-O-Cor Products & Engineering Limited, Calgary, Canada

Division of Ser. No. 831,283, Sep. 7, 1977, Pat. No. 4,163,719. This application Apr. 17, 1979, Ser. No. 31,012
Int. Cl.² B01D *21/26, 33/02*
U.S. Cl. 210—512 M **8 Claims**

1. A cleaning system for liquid suspensions comprising an elongated combination feed and accept header having a plurality of hydrocyclone separators detachably connected thereto and projecting outwardly therefrom in spaced apart relation therealong, each said hydrocyclone separator including an elongated separator chamber having a large end and an oppo-

sitely disposed small end with a reject outlet therein, the large end of the separator chamber having an annular rim, and a tubular outlet for accept material disposed at said large end in concentric relation to said annular rim, with an annular inlet for feed suspension into said separator chamber being defined between said annular rim and the tubular accept outlet, said feed and accept header including an outer wall and a dividing wall therein to separate feed suspension from accept suspension; a plurality of tubular accept nipples connected to said dividing wall in aligned spaced apart relation for fluid flow therethrough and each being sealingly detachably connected to a respective one of the tubular accept outlets of the hydrocyclone separators; a corresponding plurality of tubular feed



nipples each surrounding a respective one of said accept nipples in spaced concentric relation therewith and connected to said outer wall of the feed and accept header for fluid flow therethrough and means for sealingly detachably connecting each feed nipple to a respective one of the annular rim portions at the large ends of the respective hydrocyclone separators, whereby feed suspension can pass toward the separator chambers of the hydrocyclones through the annular inlets between said feed and accept nipples while permitting accept suspension to pass from each separator chamber through said connected tubular accept outlets and accept nipples and thence through said dividing wall for flow through the feed and accept header.

4,233,161

SUBLIMABLE COMPOSITION

Haruhito Sato; Hiroshi Ichikawa; Hiroshi Hayashi, and Konomu Kurisaki, all of Chiba, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

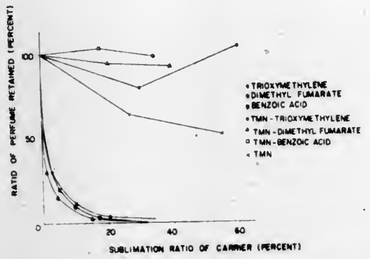
Filed Dec. 20, 1977, Ser. No. 862,620

Claims priority, application Japan, Dec. 25, 1976, 51-155650; Dec. 25, 1976, 51-155652; Mar. 30, 1977, 52-34674; May 21, 1977, 52-58220; May 24, 1977, 52-59360; May 27, 1977, 52-61255; Jun. 7, 1977, 52-66298

Int. Cl.[3] C09K *3/00*; A61K *7/46*

U.S. Cl. 252—1 **19 Claims**

7. A sublimable composition comprising (i) a sublimable hydrocarbon comprising at least one hydrocarbon selected from the group consisting of adamantane, endo-trimethylenenorbornane, cyclododecane, norbornane and trimethylnorbornane and (ii) a sublimable polar compound comprising at least one compound selected from the group consisting of dimethyl fumarate, benzoic acid, trioxymethylene, cumarin, p-dichloro-



benzene, ϵ-caprolactam 1,4-cyclohexanediol, phthalide, lactide and triisopropyltrioxane.

4,233,162

OIL WELL FLUIDS AND DISPERSANTS

Leroy L. Carney, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 677,199, Apr. 15, 1976, Pat. No. 4,108,799, which is a continuation-in-part of Ser. No. 356,239, May 1, 1973, abandoned, Ser. No. 500,999, Aug. 27, 1974, abandoned, and Ser. No. 543,723, Jan. 24, 1975, abandoned, which is a division of Ser. No. 353,060, Apr. 20, 1973, Pat. No. 3,896,031, said Ser. No. 500,999, is a division of Ser. No. 417,431, Nov. 19, 1973, Pat. No. 3,850,248. This application Feb. 7, 1978, Ser. No. 875,722

The portion of the term of this patent subsequent to Jul. 22, 1992, has been disclaimed.

Int. Cl.[3] C09K *7/02*

U.S. Cl. 252—8.5 C **6 Claims**

1. An improved aqueous drilling fluid containing a surfactant-dispersant and a colloidal suspension of asphaltic solids in an aqueous fluid in the absence of oil comprising water and an additive comprised of colloidal asphaltic solids and a surfactant-dispersant comprising a mixture of sulfonated lignin mixed with a fatty acid amide, wherein the fatty acid precursor contains 12–18 carbon atoms and the amine precursor is an alkyl or aryl amino sulfonic acid, wherein the alkyl or aryl radicals contain 1–6 carbon atoms, wherein the fatty acid amide is mixed with said sulfonated lignin in an amount equal to about 25–75% of said mixture and wherein said additive is present in said aqueous drilling fluid in an amount in the range of from about 0.5–2% by weight of the fluid.

4,233,163

CATALYST SYSTEM FOR FLAME RETARDANT FINISHING

Harold McDonald, Harrington Park, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 815,894, Jul. 15, 1977, abandoned, which is a division of Ser. No. 662,474, Mar. 1, 1976, Pat. No. 4,076,650, which is a continuation-in-part of Ser. No. 605,575, Aug. 18, 1975, abandoned. This application Jul. 18, 1978, Ser. No. 925,676

Int. Cl.[2] D06M *13/32, 15/62*

U.S. Cl. 252—8.6 **20 Claims**

1. A composition for flame retarding textiles comprising an unsaturated flame retardant, copper sulfate and hydrogen peroxide wherein said unsaturated flame retardant comprises at least one copolycondensed oligomeric vinylphosphonate consisting essentially of the product resulting from the reaction, in stoichiometric ratio of from about 1:10 to 10:1, between a bis (2-haloalkyl) vinylphosphonate and at least one pentavalent phosphorus ester of the structure ROP(=O)XY where R is selected from the class consisting of C_1—C_{20} alkyl and C_1—C_{20} chloro- or bromoalkyl groups and X and Y are groups selected from the class consisting of RO—, C_1—C_{20} alkyl, C_2—C_{20} alkenyl, phenyl, phenoxy, amino, C_1—C_{20} alkyl substituted amino, phenyl substituted amino, C_2—C_{20} alkylene bonded to the same or to another ROP(=O) moiety and C_2—C_{20} alkyleneoxy and C_2—C_{20} alkylenedioxy bonded to the same or to another ROP(=O) moiety, wherein said reaction is carried out at an elevated temperature for a period of time sufficient to evolve R-halide as a by-product and to form a P(O)-O-alkylene-O-P(O) linkage, with the proviso that said product is not the homo-condensed product of bis (2-haloalkyl) vinylphosphonate; the weight ratio of said unsaturated flame retardant to the combined weight of copper sulfate and hydrogen peroxide is from about 2:1 to about 20:1 and the weight ratio of copper sulfate to hydrogen peroxide is from about 1:1 to about 1:210.

4,233,164

LIQUID FABRIC SOFTENER

James E. Davis, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 5, 1979, Ser. No. 45,710

Int. Cl.[3] D06M *13/34, 13/40, 13/46*

U.S. Cl. 252—8.8 **7 Claims**

1. A liquid fabric conditioning composition comprising

(a) from about 2% to about 11% by weight of the composition of non-cyclic quaternary ammonium cationic fabric conditioning agent;

(b) from about 1% to about 5% by weight of the composition of a nonionic fabric conditioning agent selected from the group consisting of:

(i) C_{10}–C_{26} fatty acid esters of mono- or polyhydroxy alcohols containing 1 to 12 carbon atoms; and

(ii) esters of fatty alcohols having from 12 to 24 carbon atoms in the alkyl chain and mono- or poly-carboxylic acids having from 1 to 8 carbon atoms in the alkyl chain; whereby the total number of carbon atoms in the ester is equal to or greater than 16;

(c) from about 0.1% to about 1.3% by weight of the composition of protonated di-polyethoxy mono-alkyl amine;

(d) from about 1% to about 6% by weight of the composition of a lower alcohol; and

(e) water; wherein the total amount of cationic plus nonionic fabric conditioning agents is no more than about 11%.

4,233,165

WELL TREATMENT WITH EMULSION DISPERSIONS

William M. Salathiel; Thomas W. Muecke; Claude E. Cooke, Jr., all of Houston, Tex., and Norman N. Li, Edison, N.J., assignors to Exxon Production Research Company, Houston, Tex.

Filed May 24, 1978, Ser. No. 909,139

Int. Cl.[3] C09K *3/00*

U.S. Cl. 252—8.55 R **34 Claims**

13. In a method of treating a subterranean formation surrounding a well in which a treating composition is injected into said formation, the improvement wherein said treating composition comprises a dispersion of a water-in-oil emulsion in an aqueous medium, said emulsion comprising from about 30 to about 95 volume percent of said treating composition and further having an internal aqueous phase and an external oil phase, said external oil phase comprising from about 3 to about 50 volume percent of said emulsion and containing a liquid hydrocarbon and from about 0.5 to about 40 weight percent of a surfactant soluble in said hydrocarbon.

4,233,166

COMPOSITION FOR RECOVERING HYDROCARBONS

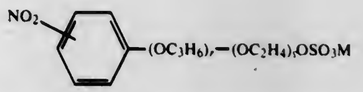
Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 871,898, Jan. 23, 1978, Pat. No. 4,186,800. This application Jan. 25, 1979, Ser. No. 6,938

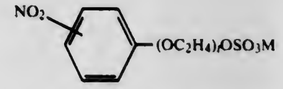
Int. Cl.[3] E21B *43/22*

U.S. Cl. 252—8.55 D **4 Claims**

1. A fluid for use in recovering hydrocarbons from subterranean formations comprising water containing from about 0.001 to about 1.0 weight percent of an interfacial tension reducer selected from the group consisting of a compound of the formula:



wherein r is an integer of from 2 to about 5, s is an integer of from 8 to about 60 and M is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and a compound of the formula:



wherein t is an integer of from 8 to about 40 and M has the same meaning as previously described.

4,233,167

LIQUID DETERGENT SOFTENING AND BRIGHTENING COMPOSITION

John A. Sramek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 14, 1979, Ser. No. 48,411

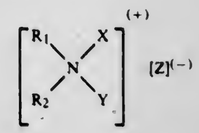
Int. Cl.[2] C09K *11/06*; C11D *1/835, 3/42*; D06M *13/46*

U.S. Cl. 252—8.75 **5 Claims**

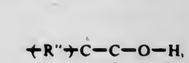
1. An aqueous, stable, liquid detergent composition having enhanced softening and brightening properties comprising:

(a) a water soluble non-ionic surfactant system having a relatively high cloud point in amounts from about 10 to 50% by weight,

(b) a quaternary ammonium fabric softener having an equivalent weight from about 400 to 2000 in amounts from about 0.75 to 6% by weight of the formula:



wherein Z is a water soluble, salt-forming anion, R_1 is a C_{10}–C_{20} alkyl radical, R_2 is R' or a C_{10}–C_{20} alkyl radical, X and Y are the same or different and are methyl, ethyl, 2-hydroxyethyl, 2-hydroxy propyl, —R"—C—C—O—H, or



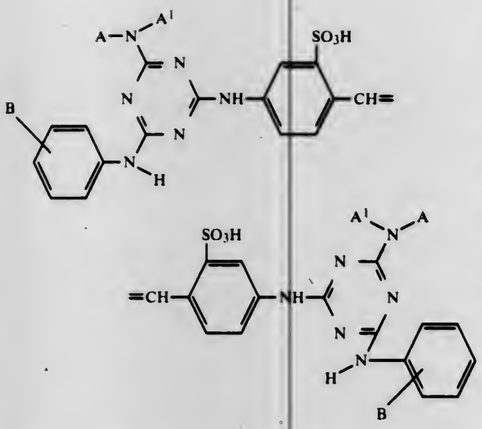
wherein R" is a polymer having from 1 to 10 ethoxy, isoproxy or mixed ethoxy-isopropoxy units, and R' is polyethoxy ethanol having from 1 to 10 ethoxy units only when:

(i) X and Y are both methyl, or

(ii) X is methyl and Y is polyethoxyethanol having from 1 to 10 ethoxy units,

(iii) X is ethyl and Y is polyethoxy ethanol having from to 10 ethoxy units;

(c) an optical brightener of the formula:



wherein A and A^1 are the same or different and are hydrogen, methyl, ethyl, isopropyl, 2-hydroxyethyl, propanamido or taken together are morpholino or anilino; B is H, m-SO_3H or p-SO_3H wherein the total number of —SO_3H groups is from 3 to 5, and the salts thereof having water soluble anions, wherein the equivalent weight ratio of (b) to (c) is from about ½:1 to 1:1, wherein the weights are based on the total weight of the aqueous composition;

(d) a hydrotrope is sufficient amounts to maintain a stable composition; and

(e) an aqueous solvent medium wherein said composition has a pH of from 6 to 10.

4,233,168

LUBRICANT COMPOSITIONS CONTAINING DISPERSANT ADDITIVES

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 857,703, Mar. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 801,441, May 27, 1977, Pat. No. 4,160,648, which is a continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,426

The portion of the term of this patent subsequent to Jul. 10, 1996, has been disclaimed.

Int. Cl.[3] C07C *125/06*; C07D *295/14*; C10M *1/32*

U.S. Cl. 252—51.5 A **24 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity, and a minor amount of a hydrocarbylpoly(oxyalkylene) aminocarbamate of molecular weight from about 600 to 10,000, and having at least one basic nitrogen atom; wherein said poly(oxyalkylene) moiety is composed of oxyalkylene units selected from 2 to 5 carbon oxyalkylene units of which at least a sufficient number are branched chain oxyalkylene units to render said carbamate soluble in said composition; and said hydrocarbyl group contains from 1 to about 30 carbon atoms.

4,233,169

POROUS MAGNETIC GLASS STRUCTURE

George H. Beall, Big Flats; Gerald R. Mansfield, Painted Post, and Jan W. H. Schreurs, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 13, 1979, Ser. No. 29,577

Int. Cl.[3] C03B *0/00*; C03C *3/22, 15/00*; C04B *35/26*

U.S. Cl. 252—62.59 **4 Claims**

1. Porous bodies of magnetic glass and/or crystal-containing material with interconnected pores less than 10,000 Å in diameter and having iron-containing, magnetic crystals incorporated therein with dimensions of less than about 1000 Å which are essentially enveloped within the glass and/or crystal structure, wherein said glass consists essentially of a vitreous silica skeleton with said magnetic crystals enveloped therewithin, said crystal-containing material consists essentially of a glassy-crystalline skeleton with said magnetic crystals enveloped therewithin, and said crystal portion of said glassy-crystalline skeleton consists essentially of a silica-containing species.

4,233,170

WATER-GLYCOL HYDRAULIC FLUID CONTAINING POLYOXYALKYLENE ETHERS

Fumihide Genjida; Toyoaki Nasuno; Hideo Kobayashi, and Motohiko Ii, all of Kyoto, Japan, assignors to Sanyo Chemical Industries, Limited, Kyoto, Japan

Filed Jan. 11, 1979, Ser. No. 2,600

Claims priority, application Japan, Feb. 7, 1978, 53-13325

Int. Cl.[3] C10M *3/22*

U.S. Cl. 252—73 **20 Claims**

1. A non-flammable hydraulic fluid, which comprises: 5–30% of a water soluble polymer comprising a polyoxyalkylene ether of a polyhydric alcohol having at least five hydroxyl groups and having no nitrogen atom, 30–60% of water and 15–60% of a glycol; wherein said polyoxyalkylene ether has oxalkylene groups comprising both oxyethylene groups and other oxyalkylene groups in random form.

4,233,171

DISHWASHING DETERGENT EFFECTIVE AT LOW TEMPERATURE

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 872,761, Jan. 27, 1978, Pat. No. 4,187,190, and Ser. No. 737,588, Nov. 1, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,185

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.[3] C11D *7/56, 7/18, 7/38*

U.S. Cl. 252—99 **16 Claims**

1. A detergent composition suitable for machine dishwashing at lowered washing temperature which consists essentially of: a chelating agent for sequestering the calcium and magnesium ions expected to be present in the wash water; alkaline material providing an alkalinity of at least 12% alkali metal oxide; a water-soluble oxidizing bleach in an amount supplying about 0.3 to about 3.0 weight percent of the composition of an oxidizing component selected from the group consisting of chlorine and oxygen; and certain combinations of nonionic surfactants:

A. a low-foaming water-soluble polyol which is polyoxypropylene-terminated block copolymer having a polyoxyethylene core;

B. an oil-soluble condensate of about 1 to about 5 moles of ethylene oxide with a hydrophobic organic compound containing a single —OH group; and

C. a high-foaming water-soluble condensate of at least about 7 moles of ethylene oxide with a hydrophobic organic compound containing a single —OH group, all three surfactants being present in at least 1% for a total of at least 7%.

4,233,172

LOW PHOSPHATE CONTENT DISHWASHING DETERGENT

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 872,761, Jan. 27, 1978, which is a continuation-in-part of Ser. No. 737,588, Nov. 1, 1976, abandoned. This application Oct. 13, 1978, Ser. No. 951,245

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.[3] C11D *7/56, 7/54*

U.S. Cl. 252—99 **13 Claims**

1. A dry powder, low-phosphate machine dishwashing composition which consists essentially of:

about 10 to about 20 weight percent of a phosphorus-containing compound selected from the group consisting of an alkali metal tripolyphosphate and an alkali metal hexametaphosphate;

at least 8 weight percent of carbonate compounds selected from the group consisting of alkali metal carbonate, bicarbonate or sesquicarbonate, providing a carbonate-to-phosphate weight ratio of about 0.8:1 to about 1.3:1; and

at least about 1 up to about 10 weight percent of said composition of a water-soluble high-foaming nonionic surfactant which is an ethoxylated monohydric compound containing at least about 7 moles of ethylene oxide per mol of monohydric compound, and a foam reducing agent therefor.

4,233,173

DETERGENT COMPOSITIONS CONTAINING DIPOTASSIUM N-CHLOROIMIDODISULFATE BLEACHING AGENT

James M. Mayer, Maryland Heights, and John H. Payne, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 9, 1978, Ser. No. 959,394

Int. Cl.[3] C11D *7/54*; D06L *3/00*

U.S. Cl. 252—102 **3 Claims**

1. A solid detergent formulation comprising at least 5 percent by weight of a surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and amphoteric surfactants and mixtures thereof, and a sufficient amount of substantially stable, crystalline dipotassium chloroimidodisulfate to bleach stains on fabrics in an aqueous solution.

4,233,174

QUICK-BREAK CLEANING COMPOSITIONS

Geoffrey P. Sheridan, Manchester, England, assignor to Lankro Chemicals Limited, England

Filed Jan. 12, 1979, Ser. No. 3,121

Claims priority, application United Kingdom, Jan. 19, 1978, 2160/78; Dec. 15, 1978, 48773/78

Int. Cl.[3] C11D *1/70, 1/72, 7/50*

U.S. Cl. 252—170 **13 Claims**

1. A cleaning composition which comprises:

(a) from 35 to 80 wt % of a surfactant selected from the group consisting of a fatty alcohol ethoxylate having from 8 to 18 carbon atoms in the alcohol moiety and from 2 to 10 moles ethylene oxide per mole alcohol, a higher alkyl phenol ethoxylate having from 8 to 12 carbon atoms in the alkyl moiety and from 4 to 10 moles ethylene oxide per mole phenol and mixtures thereof; and

(b) from 65 to 20 wt % of phenol ethoxylate having from 3 to 10 moles ethylene oxide per mole of phenol.

12. A composition as claimed in claim 1 which is a solution in a solvent selected from the group consisting of white spirit, kerosene and gas-oil of about equal parts by weight of a C_{12} to C_{15} fatty alcohol ethoxylate containing about 4 moles of ethylene oxide per mole and about 50% by weight of phenol ethoxylate containing about 4 moles of ethylene oxide per mole.

4,233,175

REAGENT FOR TREATING FLUE GASES AND METHOD OF PREPARATION

Bernard Delmon, Wavre, and Ghislain Van Houte, Louvain, both of Belgium, assignors to Unibra, Brussels, Belgium

Continuation-in-part of Ser. No. 628,663, Nov. 4, 1975, Pat. No. 4,115,518. This application Sep. 1, 1978, Ser. No. 938,973

Claims priority, application France, Nov. 6, 1974, 74 36862

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—192 **8 Claims**

1. A reagent for treating flue gases consisting of an intimate mixture of a powdered main component selected from the group consisting of calcium, magnesium, and mixed calcium and magnesium oxides, hydroxides, carbonates, bicarbonates, and mixtures thereof, and an additive selected from the group consisting of chloride and bromide salts of alkali metals, ammonium, and alkaline-earth metals, and mixtures thereof, said additive being present in an amount of from 0.1 to 15% by mole with respect to said powdered main component and having been added to or produced in the main component by impregnating the solid powdered main component with a liquid solution of said salt or of the corresponding amount of hydrochloric acid or hydrobromic acid and removing the solvent by drying.

4,233,176

NON-PETROLEUM BASED METAL CORROSION INHIBITOR

Alvin J. Conner, Sr., 2156 Agriculture St., New Orleans, La. 70122

Filed May 9, 1979, Ser. No. 37,418

Int. Cl.[2] C23F *11/14, 11/12*

U.S. Cl. 252—392 **16 Claims**

1. A non-petroleum based metal corrosion inhibiting composition consisting essentially of a solution of one part by weight of an aqueous concentrate and up to five parts by weight of water, said aqueous concentrate comprising, per 100 parts by weight of the concentrate:

(a) 5 to 20 parts by weight of a monobasic organic acid having from 8 to 20 carbon atoms;

(b) 0.5 to 4 parts by weight of a lubricant;

(c) 0.5 to 4 parts by weight of an alkylaminoalkanolamine of the formula:

$$H_2NR^1—N(R^3)—R^2—OH$$

where R^1 and R^2 are independently alkylidene of 1-4 carbon atoms, and R^3 is hydrogen or alkyl of 1-4 carbon atoms;

(d) 10 to 35 parts by weight of benzoic acid; and

(e) 5 to 20 parts by weight of an amine which forms a water soluble salt with benzoic acid.

4,233,177

PROPELLANT OF REDUCED COMBUSTIBILITY

Augustinus J. M. Wittenhorst, Westerburg, Fed. Rep. of Germany, assignor to Von Treu AG, Switzerland

Filed Jul. 28, 1978, Ser. No. 929,199

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1977, 2734490

Int. Cl.[3] E09K *3/30*

U.S. Cl. 252—305 **5 Claims**

1. A propellant for aerosols free from fluorochlorohydrocarbons and having reduced combustibility having as the predominant component at least one liquified hydrocarbon of the group consisting of propane, isobutane and butane, 2 to 20 weight % of at least one chlorohydrocarbon of the group consisting of dichloromethane and 1,1,1-trichloroethane and 0.5 to 10 weight percent of an inert gas of the group consisting

of carbon dioxide, nitrous oxide and noble gases based on the total amount of liquified hydrocarbon and chlorohydrocarbon.

4,233,178

MICRO-CAPSULES AND METHOD FOR THEIR PRODUCTION

Mitsuru Fuchigami, Takasago, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,376
Claims priority, application Japan, Sep. 28, 1977, 52-116249
Int. Cl.[3] B01J *13/02*
U.S. Cl. 252—316 **8 Claims**

1. A method of producing micro-capsules containing a hydrophobic material comprising the steps of dispersing the hydrophobic material in an acidic aqueous solution of a styrene-maleic anhydride copolymer as dispersing agent or emulsifier for said hydrophobic material, adding to the dispersion a melamine-formaldehyde precondensate, and heating the mixture in a acidic state to harden the melamine-formaldehyde precondensate to form the wall of the microcapsule.

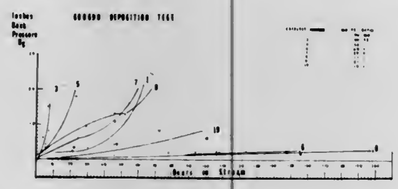
8. Micro-capsules containing the hydrophobic material produced according to the method of claim 1.

4,233,179

PROCESS FOR STEAM REFORMING OF HYDROCARBONS

Karl J. Russ, Louisville, Ky., and Donald R. Broughton, Lanesville, Ind., assignors to United Catalysts Inc., Louisville, Ky.

Filed Dec. 8, 1975, Ser. No. 638,505
Int. Cl.[2] C01B *3/40*
U.S. Cl. 252—373 **7 Claims**



1. A process for the steam reforming of normally liquid hydrocarbons to produce hydrogen and the oxides of carbon which comprises the steps of:

A. passing said normally liquid hydrocarbons and steam at a ratio of about 1.5 to about 5 mols of steam per atom of carbon in said normally liquid hydrocarbons and at a pressure in the range of from about 1 to 50 atmospheres and at a temperature in the range of from 800 to 1800 degrees F. over a catalyst comprising catalytically active constituents for said reaction impregnated onto a low surface area refractory support

B. the improvement in which said catalytically active constituents comprise nickel, expressed as the metal, in a weight concentration of from about five to thirty percent and promotional amounts of the oxides of manganese and iron, in which the ratio of manganese to iron, expressed as the metal, does not exceed 2:1 and in which:

1. said catalytically active constituents are not chemically bound to said refractory support, having been impregnated onto said low surface area refractory support from a solution of their heat decomposable water soluble salts, followed by calcination at a temperature of at least 700° F. but not in excess of 1200° F. for sufficient time to convert each of said salts to the oxide.

4,233,180

PROCESS FOR THE CONVERSION OF CARBON MONOXIDE

Arthur L. Hausberger, and Edward K. Dienes, both of Louisville, Ky., assignors to United Catalysts Inc., Louisville, Ky.

Division of Ser. No. 859,271, Dec. 9, 1977, Pat. No. 4,153,580.
This application Nov. 13, 1978, Ser. No. 960,485
Int. Cl.[3] C01B *2/10*
U.S. Cl. 252—373 **8 Claims**

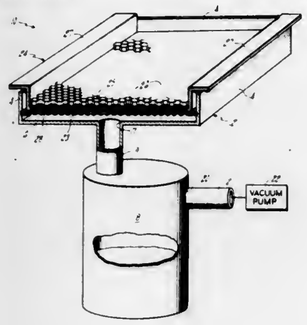
1. A process for the catalytic conversion of carbon monoxide with steam to form hydrogen and carbon dioxide in the presence of a catalyst which comprises the step of passing a reaction mixture comprising carbon monoxide and steam at a temperature of from 300° to 1000° F., but above the dew point temperature of said reaction mixture and at a pressure below the dew point pressure of said reaction mixture but within the range of from 1 to 200 atmospheres over a catalyst comprising a compound of molybdenum supported on a stabilized aluminous support comprising aluminum oxide in the gamma phase in intimate association with a rare earth metal oxide of the lanthanum series.

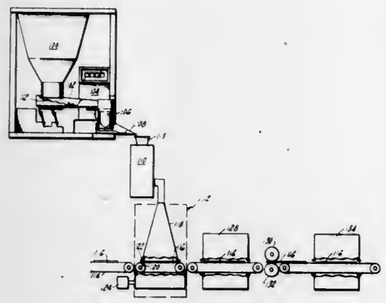
4,233,181

AUTOMATED CATALYST PROCESSING FOR CLOUD ELECTRODE FABRICATION FOR FUEL CELLS

Glen J. Goller, West Springfield, Mass., and Richard D. Breault, Coventry, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 30, 1979, Ser. No. 43,917
Int. Cl.[3] H01M *4/88, 4/04, 4/96*
U.S. Cl. 252—425.3 **11 Claims**





1. The method of making an electrochemical cell catalyst material comprising the steps of:

forming an aqueous co-suspension of polytetrafluoroethylene particles and catalyzed carbon to form a floc suspension;

forming pellet shapes within a mold, the mold including a plurality of pellet shaped cavities with a porous filter medium forming the bottoms of the cavities, the step of forming pellet shapes including filling the mold cavities with the floc suspension and filtering out the excess liquids through the filter medium without the application of significant pressure leaving uncompressed wet floc solids within the mold cavities;

drying the pellet shapes within the mold cavities at temperatures no greater than about 150° F. for form dry, uncompressed floc pellets; and

removing the pellets from the mold cavities.

8. In a method for applying a catalyst layer to the surface of electrochemical cell electrode substrates, the steps of:

forming an aqueous co-suspension of catalyzed carbon particles and polytetrafluoroethylene particles;

causing the carbon particles and polytetrafluoroethylene particles to floc and maintaining the floc in suspension;

forming the floc into pellet shapes at essentially atmospheric pressure by pouring the suspension into a mold comprising a plurality of pellet shaped mold cavities with a porous filter medium forming the bottoms of the mold cavities, drawing a vacuum under the filter medium to draw excess liquid through the filter medium, wherein substantially uncompressed wet floc solids remain behind in the mold cavities;

drying the pellet shapes within the mold cavities at temperatures no greater than about 120° F. to form dry, uncompressed floc pellets;

removing the dry floc pellets from the mold;

placing the pellets in a hopper;

automatically feeding, at spaced intervals, a predetermined amount of pellets from the hopper into grinding apparatus, the pre-determined amount of pellets being the amount necessary to apply a dry floc layer of certain catalyst loading to a single electrode substrate;

grinding the predetermined amount of pellets in the grinding apparatus to form a powder having a maximum floc particle size of about 5 microns;

applying the powder in dry form, as a uniform layer, directly from the grinding apparatus onto the surface of an electrochemical cell electrode substrate;

compacting the layer; and

sintering the layer.

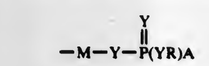
4,233,182

HIGH ACTIVITY CATALYST FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Glen R. Hoff, Naperville, Ill., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 973,108
Int. Cl.[3] C08F *4/62, 4/64, 4/68, 4/02*
U.S. Cl. 252—429 C **45 Claims**

1. An alpha-olefin polymerization catalyst comprising (A) an organometallic promoter selected from the group consisting of Group IA, IIA, IIB, IIIA, and IVA metal alkyls, hydrides, alkylhydrides, and alkylhalides; and (B) a solid, hydrocarbon insoluble component which is the reaction product of components comprising (1) at least one compound of a Group IVB, VB or VIB metal, (2) at least one divalent metal salt of a phosphorus acid ester, said salt containing the structure



$$-M-Y-\overset{\overset{Y}{\|}}{P}(YR)A$$

wherein M is a divalent Group IIA, IIB, IVA, VIIB, or VIII metal, each Y is independently oxygen or sulfur, A is hydrogen, —YH, R, or —YR, and each R is independently an organic radical or a halo- or amino-substituted organic radical, said organic radical being an alkyl radical of 1 to about 12 carbon atoms, an aryl radical of 6 to about 10 carbon atoms, or an alkaryl or aralkyl radical of 7 to about 12 carbon atoms, and (3) at least one alkylaluminum halide, wherein the atomic ratio of metal contained in (1) to metal contained in (2) ranges from about 0.05:1 to about 10:1 and the amount of (3) employed is at least effective to halide the metal contained in (1) and (2); said reaction being carried out under substantially anhydrous conditions.

4,233,183

PROCESS FOR PRODUCING PLATE-SHAPED DENITRATING CATALYST

Hideya Inaba; Kenichi Nagai; Yasumi Kamino, and Kazuo Maeda, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Feb. 6, 1979, Ser. No. 9,962
Int. Cl.[3] B01J *35/04*
U.S. Cl. 252—432 **9 Claims**

1. A process for producing a catalyst for reducing nitrogen oxides in exhaust gases and comprising the steps of preparing a slurry from hydrated titania and a sol selected from the group consisting of silica sol, alumina sol and titania sol, firing the slurry to obtain a porous material, pulverizing the porous material to a powder, supporting the powder on a metal net with an inorganic dehydration-condensed binder and filling the openings of the net to form a plate-like piece having the metal net as its core, drying or firing the piece to obtain a porous carrier and depositing a catalytically active component on the porous carrier.

4,233,184

ALUMINUM PHOSPHATE-ALUMINA COMPOSITIONS AND CATALYSTS COMPRISING THE SAME

Neville L. Cull, Baker, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1979, Ser. No. 4,456
Int. Cl.[3] B01J *27/14, 31/12*
U.S. Cl. 252—437 **26 Claims**

1. An aluminum phosphate-alumina composition prepared by the steps which comprise reacting a mixture comprising an aluminum alkoxide and an organic phosphate having the formula $(RO)_3PO$ wherein R is a hydrocarbon radical selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl, aralkyl radicals and mixtures thereof, in the presence of moist air, to form an aluminum phosphate-alumina precipitate, and separating said aluminum phosphate-alumina precipitate from said mixture.

4,233,185

CATALYSTS FOR OXIDATION AND REDUCTION

Arthur G. Knapton, Henley on Thames, and Ian R. McGill, Thatcham, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Nov. 29, 1977, Ser. No. 855,698
Claims priority, application United Kingdom, Dec. 8, 1976, 51219/76
Int. Cl.[3] B01J *23/10, 23/64*
U.S. Cl. 252—462 **17 Claims**

1. A catalyst suitable for use in oxidation and reduction reactions comprising a substrate carrying a coating comprising at least one intermetallic compound selected from the group consisting of $TiPt_3$, LnPd, $LnPd_3$, Ln_5Pd_2 (where Ln = Sm, Gd, Dy, Ho and Er), $TaIr_3$, $NbIr_3$, TaPd, TiRu, NbIr, $TaRh_3$, $NbRh_3$, VIr_3 and $CeRu_2$.

4,233,186

CATALYSTS FOR WATER DEALKYLATION OF AROMATIC HYDROCARBONS

Daniel Duprez, Poitiers, and Michel Grand, Serezin du Rhone, both of France, assignors to Elf Union, Paris, France

Filed Mar. 16, 1979, Ser. No. 21,193
Claims priority, application France, Mar. 20, 1978, 78 07987
Int. Cl.[3] B01J *21/04, 23/40, 23/70, 23/72*
U.S. Cl. 252—466 B **13 Claims**

1. In a water dealkylation catalyst for petroleum fractions containing monoalkylated or polyalkylated aromatic hydrocarbons including at least one metal of group VIII deposited in a proportion of from 0.1 to 5% by weight on a spinel having improved activity, selectivity and stability, the improvement which comprises a carrier of mixed spinel of the formula $(M_xM'_{1-x})Al_2O_4$ wherein M is a bivalent base metal of group VIII of the Periodic Table, M' is a bivalent metal selected from groups 2a, 7b, 1b and 2b of the Periodic Table, wherein the molar ratio M/M' is from about 0.5:1 to 50:1 and wherein x is the molar fraction of M.

4,233,187

CATALYST AND PROCESS FOR STEAM-REFORMING OF HYDROCARBONS

Kenton Atwood, New Albany, Ind.; James H. Wright, Louisville, and Jay S. Merriam, La Grange, both of Ky., assignors to United Catalysts Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 817,160, Jul. 20, 1977, abandoned, and a continuation-in-part of Ser. No. 708,941, Jul. 27, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,005
Int. Cl.[3] B01J *21/04, 23/74, 35/02*
U.S. Cl. 252—466 J **2 Claims**

1. A hydrocarbon reforming catalyst comprising a cylindrical refractory support consisting essentially of alumina in the alpha phase, said support having a surface area of not more than 15 square meters per gram and having two or more gas passages extending axially therethrough from one end to the other and a catalytically active amount of nickel or cobalt oxide deposited there upon in a concentration of from 6 to 30% by weight expressed as the metal, said catalyst having a Relative Activity Coefficient Factor (ACF^R) and a Relative Pressure Factor (PF^R) in excess of that when compared to a standard ring, said (ACF^R) being in excess of 1 and the ratio of said (ACF^R) to said (PF^R) being in excess of 1:1, the height (H) of said support bearing a relationship to the effective internal diameter of each of said gas passages (ID), the ratio of H:ID being less than 4:1.

4,233,188

CATALYST FOR TREATING EXHAUST GAS FROM AN INTERNAL COMBUSTION ENGINE

Haren S. Gandhi, Farmington Hills, and Mordecai Shelef, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 963,540, Nov. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 830,277, Sep. 1, 1977, abandoned, which is a division of Ser. No. 705,642, Jul. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 607,659, Aug. 25, 1975, abandoned. This application Aug. 6, 1979, Ser. No. 64,317
Int. Cl.[3] B01J *23/44, 23/46, 23/64, 23/74*
U.S. Cl. 252—470 **3 Claims**

1. A catalyst for treating oxides of nitrogen, carbon monoxide and unburned hydrocarbons found in an exhaust gas stream from an internal combustion engine operating with an air/fuel feed system capable of producing air/fuel ratios which vary as much as 1.0 units of air/fuel ratio to the rich and lean sides of a stoichiometric ratio, which catalyst comprises:
a substrate having a high surface area to volume ratio;
a selective three-way equilibrium catalyst formed of iridium present on said substrate in an amount from about 10 ppm to about 5,000 ppm, said selective three-way equilibrium catalyst being a catalyst having excellent three-way selectivity when treating exhaust gases produced by burning air/fuel mixtures of about stoichiometric proportions
an oxygen storage material on said substrate selected from the group of base metals or base metal oxides which can undergo rapid changes in oxidation state, said oxygen storage material being present in an amount from about 500 ppm to about 50,000 ppm, said oxygen storage material being capable of temporarily withdrawing and storing oxygen from exhaust gases produced when air/fuel mixtures having more oxygen present than necessary to burn all the fuel present are burnt, whereby during brief oxygen rich periods said oxygen storage material can take up oxygen and the catalyst operate as if the air/fuel ratio was stoichiometric;
a catalyst selected from the group consisting of nickel and tungsten, said catalyst being present on said substrate in an amount from about 500 ppm to about 10,000 ppm, said catalyst being effective to remove carbon monoxide and unburned hydrocarbons from exhaust gases produced when air/fuel mixtures having more fuel than can be completely oxidized by the oxygen present in the mixture are burnt; and
an oxidation catalyst formed from palladium, said oxidation catalyst being present on said catalyst substrate from about 500 ppm to about 10,000 ppm, said oxidation catalyst being effective under conditions in which sufficient oxygen is available in the exhaust gases for oxidizing carbon monoxide and unburned hydrocarbons.

4,233,189

CATALYST OF RHODIUM ON ZIRCONIA

Haren S. Gandhi, Farmington Hills; Joseph T. Kummer, Ypsilanti; Mordecai Shelef, Birmingham; Henryk K. Stepien, and Hsien C. Yao, both of Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 12, 1979, Ser. No. 19,816
Int. Cl.[3] B01J *21/06, 23/46*
U.S. Cl. 252—472 **2 Claims**

1. A catalyst system which comprises:
a substrate;
a washcoat on said substrate, said washcoat consisting essentially of zirconia; and
a catalyst on said washcoat, said catalyst consisting essentially of rhodium.

4,233,190

PROCESS FOR THE PRODUCTION OF CARBON DIOXIDE ABSORPTION AGENT PELLETS FOR USE IN RESPIRATORY EQUIPMENT

Jürgen Schäfer, Frankfurt, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 892,038, Mar. 31, 1978. This application Jul. 17, 1979, Ser. No. 58,241
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715635
Int. Cl.[3] B01J *23/02*
U.S. Cl. 252—475 **3 Claims**

1. A process for the production of carbon dioxide absorption agent pellets for respiratory equipment using a moving conveyor having a surface with shaped depressions therein, comprising finely grinding lime and adding water to it by continuously moving the water and lime through a slaking zone to slake the lime, continuously moving the slaked line through a kneading zone in which the lime is continuously kneaded to form it into a pasty mass, continuously pressing the pasty mass into the shaped depressions of the conveyor, drying the mass while it is in the depressions to form the mass into carbon dioxide absorption pellets, and ejecting the pellets from the conveyor depression conveyors.

4,233,191

ELECTRICALLY CONDUCTIVE PLASTICS MATERIALS AND PROCESS FOR THEIR PRODUCTION

Franz G. Reuter, Lemförde, and Tankred Menzel, Bad Essen, both of Fed. Rep. of Germany, assignors to Reuter Technologie GmbH, Lemförde, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,487
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—511 **13 Claims**

1. A method of producing a thermoplastically further processable, electrically conductive plastic material from polymers and electrically conductive particles, comprising the steps of (1) mixing an aqueous dispersion of a thermoplastic synthetic resin with an aqueous dispersion of the electrically conductive particles, (2) spreading out the resulting mixture in a thin layer on a substrate, (3) subsequently evaporating water from the mixture at a temperature above the softening point of the synthetic resin, and (4) subsequently removing the formed electrically conductive plastic material layer from the substrate.

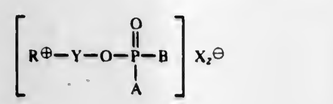
4,233,192

DETERGENT COMPOSITIONS

Martin K. O. Lindemann, Bridgewater, and Robert J. Verdicchio, Succasunna, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

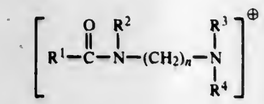
Filed Nov. 30, 1978, Ser. No. 965,463
Int. Cl.[2] C11D *3/36, 7/36*
U.S. Cl. 252—545 **10 Claims**

1. A detergent and cleansing composition wherein the active ingredient consists essentially of from about 1 to 20% by weight of the total composition of a compound selected from the group consisting of a phosphobetaine of the formula

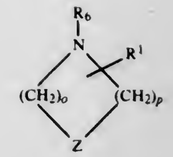


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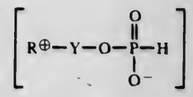
wherein
A is selected from O^-, OM, and $-O-Y-R^+$;
B is selected from O^- and OM';
X^- is an anion;
z is an integer from 0 to 2;
with the proviso that only one of A and B can be O^- and z is of a value necessary for charge balance;
R is an amidoamine reactant moiety of the formula



wherein
R^1 is alkyl, alkenyl, alkoxy, or hydroxyalkyl of from 5 to 22 carbon atoms each, or aryl or alkaryl of up to 20 carbon atoms;
R^2 is hydrogen or alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each or cycloalkyl of up to 6 carbon atoms, or polyoxyalkalene of up to 10 carbon atoms;
R^3 and R^4, which may be the same or different, are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl moiety, and polyoxyalkylene of up to 10 carbon atoms; in addition, R^3 and R^4 taken together with the nitrogen to which they are attached, may represent an N-heterocycle structure, in which the Y radical is bonded to a ring atom of said N-heterocycle other than the nitrogen of the R moiety;
n is an integer from 2 to 12;
or R is an N-heterocyclic radical of the formula



wherein
Z is N, S or O;
o is an integer from 0 to 3;
p is an integer from 1 to 3; provided that the sum of o+p is from 3 to 4;
R^1 is defined as before and is linked to a ring carbon atom; and
R_6 is alkyl of from 2 to 6 carbon atoms;
Y is alkylene of up to 12 carbon atoms;
M and M', which may be the same or different, are (a) hydrogen, (b) an organic radical selected from alkyl or hydroxyalkyl of up to 6 carbon atoms, polyhydroxyalkyl of up to 10 carbon atoms, glyceryl, cycloalkyl of up to 6 carbon atoms, aryl or arylalkyl of up to 10 carbon atoms, or (c) a salt radical selected from alkali metals, alkaline earth metals, and mono-, di- or triethanolamine, provided that when either M or M' is an organic radical (b), the other M and M' must be hydrogen or a salt radical (c);
or a phosphitaine of the formula



wherein R and Y are as defined above.

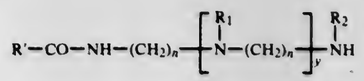
4,233,193

SALTS OF POLYMERIC BASIC AMIDES

Richard Hochreuter, Oberwil, and James R. Runyon, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 777,469, Mar. 14, 1977, Pat. No. 4,139,689, which is a continuation of Ser. No. 596,286, Jul. 16, 1975, abandoned, which is a continuation of Ser. No. 333,485, Feb. 20, 1973, abandoned. This application Oct. 18, 1978, Ser. No. 952,298
Int. Cl.[3] C08F *8/32*
U.S. Cl. 260—18 N **14 Claims**

1. A water dispersible polymeric amide salt produced by reacting, at a temperature above 100° C., (1) a polymer containing carboxyl groups and selected from the group consisting of oxidized polyethylene having a molecular weight from 700 to 7000 and an acid number from 10 to 120 and copolymers formed by copolymerizing ethylene and an unsaturated aliphatic carboxylic acid of 3 to 8 carbon atoms, which copolymers have a molecular weight of from 1000 to 6000, an acid number of 20 to 100 and a molecular proportion of acid component in the range 0.2 to 24% with (2) a polyamine of the formula,



in which
R_1 and R_2 are each, independently, hydrogen or unsubstituted alkyl of 1 to 3 carbon atoms,
R' is a linear or branched unsubstituted alkyl or alkenyl radical of 11 to 21 carbon atoms,

n is an integer 2 or 3, and
y is an integer from 1 to 3
and reacting the resulting polymeric basic amide with an inorganic or organic acid suitable for salt formation.

4,233,194

WATER-DISPERSED FILM-FORMING LACQUER CONTAINING AIR-DRYING ALKYD RESINS AND AN ETHYLENE OXIDE ADDUCT OF AN UNSATURATED ALIPHATIC-SUBSTITUTED PHENOL

Helmut Eschwey, Düsseldorf-Bearath, Fed. Rep. of Germany; Joachim Gallnke, deceased, late of Langenfeld, Fed. Rep. of Germany (by Renate Gallnke nee Jansen, heir), and Norbert Wiemers, Monheim-Baumberg, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGAA), Düsseldorf-Holthausen, Fed. Rep. of Germany

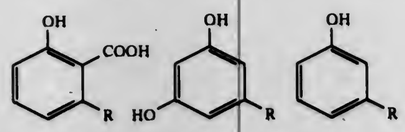
Filed Dec. 4, 1978, Ser. No. 966,367

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1977, 2754091

Int. Cl.³ B32B 9/00, 17/10; C09D 3/64

U.S. Cl. 260—22 A **9 Claims**

1. An aqueous-dispersed film-forming vehicle suitable for lacquers and lacquer binding agents comprising a content of:
(a) at least one water-insoluble air-drying alkyd resin;
(b) at least one nonionic surfactant consisting essentially of an adduct of ethylene oxide onto an aliphatic-substituted phenolic compound selected from the group consisting of cardanols having the following formulae:



where R is a mixture of $C_{15}H_{31}$, $C_{15}H_{29}$, $C_{15}H_{27}$ and $C_{15}H_{25}$, said adduct containing 5 to 40 ethylene oxide units per mol of the phenolic compound; and
(c) an aqueous dispersion medium.

4,233,195

METALLIC PRINTING INKS AND METALLIZED PAPERS PRINTED THEREWITH

W. Ralph Mills, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 26, 1979, Ser. No. 15,409

Int. Cl.³ C09C 1/62, 3/10; C09D 11/10

U.S. Cl. 260—23 S **17 Claims**

1. A metallic printing ink comprising a thermoplastic resin selected from the group consisting of substituted styrene copolymer resins, chlorinated rubber, and styrene resins; a leafing grade aluminum paste; and a solvent selected from the group consisting of toluene, methyl ethyl ketone, methyl isobutyl ketone, and mixtures thereof, said printing ink being applicable to coated papers and to uncoated papers and to plastics by printing processes to provide a brilliant finish after heat treatment at about 300° F.; and said ink being further characterized by being capable of drying to a non-tacky state when exposed to temperatures in the range of between about 150° and 200° F. for a period of from about 1 to about 3 seconds, and by said thermoplastic resin being sufficiently soft as to permit leafing of said leafing grade paste when said ink is applied as a printed coating on a paper base and said paper base is then passed over a roller heated to a temperature of between about 200° and about 400° F. for about 0.5 seconds of contact with said roller.

4,233,196

POLYESTER AND POLYESTERAMIDE COMPOSITIONS

Bobby J. Sublett, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,226

Int. Cl.³ C08J 3/02; C08G 63/68

U.S. Cl. 260—29.2 N **14 Claims**

1. A textile fiber sizing composition comprising an aqueous dispersion containing from about 0.1 to about 50% by weight, based on the combined weight of polymer and water, of a linear, water-dissipatable polymer having carbonyloxy linking groups in he linear molecular structure wherein up to 80% on the linking groups may be carbonylamido linking groups, the polymer having an inherent viscosity of at least about 0.1 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 gram of polymer in 100 ml. of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole percent) to hydroxy and amino equivalents (100 mole percent), the polymer comprising the reaction products of (a), (b), and (c) from the following components or ester forming or ester-amide forming derivatives thereof;
(a) at least one difunctional dicarboxylic acid;
(b) from about 4 to about 25 mole percent, based on a total of all acid, hydroxyl and amino equivalents being equal to 200 mole percent, of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to aromatic nucleus wherein the functional groups are hydroxy, carboxyl or amino; and
(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two $-CH_2-OH$ groups of which from about 0.1 to less than 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula:

$$H+OCH_2\text{-}CH_2\rightarrow_n OH$$

n being an integer of between 2 and about 500, and with the proviso that the mole percent of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range.

4,233,197

WATER-BORNE COATING FOR METAL SURFACES

John K. Howell, Jr., North Branch, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 818,184, Jul. 22, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,193

Int. Cl.² C08L 61/20, 63/00

U.S. Cl. 260—29.4 R **7 Claims**

1. An aqueous composition suitable for use in forming a protective coating on a metal surface, comprising:
(a) an epoxy resin having an average molecular weight of about 900 to 2,900 and about 2.7 to 11.6 hydroxyl equivalents per mole;
(b) melamine-formaldehyde resin alkylated with at least one alcohol of from 1 to 4 carbon atoms in a weight ratio of epoxy resin:melamine-formaldehyde resin of from 2:1 to 20:1;
(c) an acid catalyst which is an ammonium salt of an anion of the formula:

$$R-O+CH_2CH_2O\rightarrow_m SO_3^-$$

wherein R is an alkyl or alkyl aryl group of at least 10 carbon atoms and containing a saturated alkyl portion and m is in the range of about 4 to 30 in an amount sufficient to effect cross linking of the epoxy resin and melamine-formaldehyde resin;
(d) a block copolymer of general formula

$$HO(CH_2CH_2O)_x(CHCH_2O)_y(CH_2CH_2O)_zH$$
$$\quad\quad\quad

essentially of contacting the liquid mixture, either prior to or after separation therefrom of the precipitated salt produced by the reaction, with at least about 5 parts by weight based on the weight of the catalyst present in the liquid mixture, of an adsorbent containing or capable of absorbing at least 1% by weight of water so strongly that it cannot be removed either by drying over concentrated sulfuric acid or by drying at 110° C. and can only be partially removed by drying at 200° C. under vacuum (about 1 millibar), and then separating the adsorbent with catalyst adsorbed thereon from the liquid mixture.

4,233,203

MOLDABLE THERMOSETTING PHENOL-ALDEHYDE RESIN COMPOSITIONS AND PROCESS FOR MAKING THE COMPOSITIONS

Walter G. Baumgardt, Tonawanda; John J. Ondesko, North Tonawanda, and Bernard K. Zyaman, Snyder, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,552
Int. Cl.[2] C08K 3/22, 3/36
U.S. Cl. 260—38 **10 Claims**

1. A phenol-aldehyde resin molding composition capable of forming a nodular or flake product comprising from about 15 to about 60 percent by weight phenol-aldehyde resin, from about 3 to about 20 percent by weight of processed mineral fiber processing aid, and from about 20 to about 70 percent by weight filler material.

4,233,204

AMINE-PROMOTED, PEROXIDE-CURED POLYESTER COMPOSITION

Peter A. Rubel, Concord, Mass., assignor to Rule Industries, Gloucester, Mass.

Filed Jan. 22, 1979, Ser. No. 5,400
Int. Cl.[3] C08K 3/22, 9/04
U.S. Cl. 260—40 R **18 Claims**

1. In a process for amine-promoting a peroxide cure of a polyester laminating resin composition, the improvement which comprises adding to said composition an effective quantity of amine promoter having a vapor pressure of less than 1 mm mercury at 20° C. while maintaining said amine promoter in intimate contact on a quantity of hydrated filler, said quantity of filler being from 7 to 50 times the weight of said amine promoter.

4,233,205

MODIFIED POLYURETHANE LIQUID POLYMER COMPOSITIONS

James M. O'Connor, Clinton, and Willie J. Sessions, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 26, 1979, Ser. No. 23,870
Int. Cl.[3] C08G 18/32; C08K 3/36
U.S. Cl. 260—40 TN **26 Claims**

1. A polyurethane liquid polymer composition comprising a urethane oligomer, a polyfunctional mercaptan monomer, a heat activated free radical generating catalyst, and a filler, said urethane oligomer having a final free NCO content from 0 to about 20 percent and being prepared by reacting
(a) an isocyanate-terminated prepolymer having a final free NCO content ranging from about 0.1 to about 30 percent which is the product of reacting
(1) an organic diisocyanate with
(2) an aliphatic polyol having
(i) an average equivalent weight of about 300 to about 4,000,
(ii) an average functionality of about 2 to about 3, and
(iii) said aliphatic polyol is selected from the group consisting of aliphatic polyether polyols, aliphatic polyester polyols and mixtures thereof, with
(b) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of
(1) unsaturated acrylates and
(2) unsaturated amides.

4,233,206

PROCESS FOR THE PRODUCTION OF COLORED POLYOLEFIN MOLDED ARTICLES AND COLORANTS USED THEREIN

Hiromitsu Katsura; Morihiko Endo, and Takashi Kanno, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,267
Claims priority, application Japan, Nov. 20, 1974, 49-132715
Int. Cl.[2] C08K 5/11, 5/12
U.S. Cl. 260—42.21 **14 Claims**

1. A process for the production of a colored polyolefin molded article comprising adding at least one pigment to a polyolefin to form a mixture and molding the mixture in a mold to produce the colored polyolefin molded article,
characterized by the fact that said pigment comprises a compound represented by the following general formula [I]

$$D\text{-}[CH_2O.OC\text{—}R]_n \qquad [I]$$

wherein D is the residue of an organic pigment, R is a substituted or non-substituted alkyl, alkenyl or aryl group having up to 20 carbon atoms, and n is an integer of from 1 to 4.

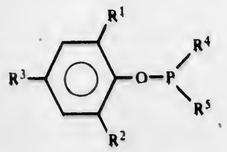
4,233,207

HYDROLYTICALLY STABLE ORTHO-ALKYLATED PHENYL PHOSPHONITES AND STABILIZED COMPOSITIONS

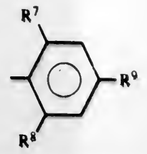
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 882,725, Mar. 2, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,665
Int. Cl.[3] C08K 3/32; C08L 23/32; C07F 9/02, 9/48
U.S. Cl. 260—45.7 P **20 Claims**

1. A compound of the formula



wherein
R^1 is branched alkyl of 3 to 8 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl,
R^2 is alkyl of 1 to 18 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl.
R^3 is hydrogen, alkyl of 1 to 18 carbon atoms, carboalkoxy of 2 to 19 carbon atoms, carboalkoxyalkyl of 3 to 24 carbon atoms, carbophenoxy, carbophenoxyalkyl of 8 to 16 carbon atoms; or said carbophenoxy or said carbophenoxyalkyl with the phenoxy substituted with 1 to 3 alkyl groups with 1 to 8 carbon atoms in each alkyl group,
R^4 is alkyl of 1 to 18 carbon atoms, phenyl or phenyl substituted by 1 to 3 alkyl groups with 1 to 8 carbon atoms in each alkyl group,
R^5 is halogen, —XH or —XR^6,
X is O or S,
R^6 is phenyl, substituted by alkyl, having the formula



R^7 is hydrogen, branched alkyl of 3 to 18 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl,
R^8 is hydrogen, alkyl of 1 to 18 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl, and
R^9 is hydrogen, alkyl of 1 to 18 carbon atoms, carboalkoxy of 2 to 19 carbon atoms, carboalkoxyalkyl of 3 to 24 carbon atoms, carbophenoxy, carbophenoxyalkyl of 8 to 16 carbon atoms; or said carbophenoxy or said carbophenoxyalkyl with the phenoxy substituted with 1 to 3 alkyl groups with 1 to 8 carbon atoms in each alkyl group.

11. A composition of matter comprising an organic polymer subject to oxidative, thermal or actinic degradation stabilized with from 0.01 to 5% by weight of a compound according to claim 1.

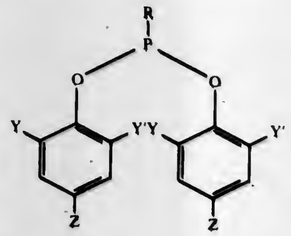
4,233,208

POLYMER COMPOSITIONS STABILIZED WITH HINDERED PHENYL SECONDARY PHOSPHITES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 661,585, Feb. 26, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 923,836
Int. Cl.[3] C08K 5/51, 5/52
U.S. Cl. 260—45.8 NT **26 Claims**

1. Compositions comprising a polymer normally subject to deterioration stabilized with
(a) 0.005 to 5% of a stabilizer having the formula



(I)

wherein
R is hydroxy or chlorine,
Y and Y' are independently alkyl having from 1 to 12 carbon atoms or aralkyl having from 7 to 12 carbon atoms, and
Z is independently hydrogen, halogen, alkyl having from 1 to 12 carbon atoms or aralkyl having from 7 to 12 carbon atoms.

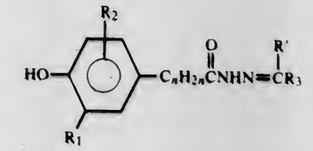
4,233,209

HINDERED PHENOL HYDRAZONES AND COMPOSITIONS STABILIZED THEREWITH

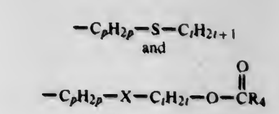
Martin Dexter, Briarcliff Manor, and David H. Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 839,683, Oct. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 756,030, Dec. 30, 1976, abandoned. This application Nov. 15, 1978, Ser. No. 960,979
Int. Cl.[3] C08K 5/36; C07C 103/30; C08K 5/30; C07C 103/58
U.S. Cl. 260—45.85 E **16 Claims**

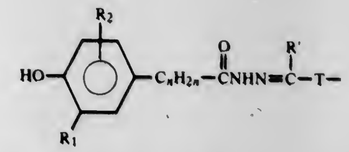
1. A hindered phenol hydrazone of the formula



wherein
R_1 is hydrogen of a straight or branched chain alkyl of 1 to 8 carbon atoms,
R_2 is straight or branched chain alkyl of 1 to 8 carbon atoms,
n is an integer of 1 to 5,
R^1 is hydrogen or alkyl of 1 to 8 carbon atoms,
R_3 is an alkyl of 1 to 18 carbon atoms, phenyl or phenyl substituted with 1 to 3 alkyl groups of 1 to 4 carbon atoms, or selected from an interrupted alkyl group of the formulae



where p and t are independently integers of 1 to 18, R_4 is an alkyl group of 1 to 17 carbon atoms or an olefinic group of the formula $-(CH_2)-CH=CH(CH_2)_yCH_3$ where z and y are independently integers of 1 to 12, or R_3 is the group



where T is a direct bond, alkylene of 1 to 6 carbon atoms, phenylene, alkylene interrupted with sulfur or oxygen of the formula $-C_aH_{2a}-X-C_aH_{2a}-$ where X is sulfur or oxygen and a is an integer of 1 to 6.

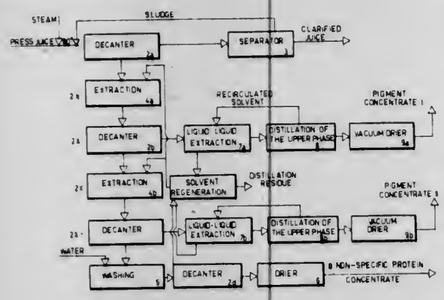
13. A polymer composition comprising a polymer selected from the group consisting of polymonoolefin resins and diene rubbers stabilized against thermal and oxidative degradation by incorporation therein of 0.01 to 5% by weight of a compound of claim 1.

4,233,210

PROCESS FOR PREPARING NON-SPECIFIC PROTEIN CONCENTRATE AND OF OTHER FODDER ADDITIVES HAVING A BIOLOGICAL ACTIVITY

Lehel Koch, Budapest, Hungary, assignor to Vepex Fövallalkozasi Iroda Rt, Tatabanya, Hungary

Continuation of Ser. No. 786,822, Apr. 12, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 974,022
Claims priority, application Hungary, Jun. 30, 1976, LI 296
Int. Cl.³ A23J 1/14
U.S. Cl. 260—112 R **4 Claims**



1. A process for preparing a plant protein concentrate which comprises

(a) pressing a green plant material to provide a press cake and pressed juices;

(b) precipitating a protein fraction by heating the pressed juices at about 80° C.;

(c) extracting in a multi-step manner the protein fraction containing 1.5 to 2 times more water than its dry weight twice with at least 5 times more ethyleneglycolether or diethyleneglycolether than its dry weight;

(d) drying the extracted protein fraction after washing it with water to obtain a protein concentrate;

(e) distilling the aqueous ethyleneglycolether or ethylenediglycolether phase obtained from the above extraction, and

(f) isolating a pigment concentrate containing lipids, chlorophyll, xanthophyll and carotenoids by mixing a residue from the distillation of step (e) with the press cake of step (a).

4,233,211

FINELY POWDERED FIBROIN AND PROCESS FOR PRODUCING SAME

Koichiro Ohtomo, Takatsuki, and Yukio Horikawa, Matsubara, both of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Spun Silk, Ltd., Nagano, both of, Japan

Filed Sep. 28, 1979, Ser. No. 79,863
Claims priority, application Japan, Nov. 13, 1978, 53-139973
Int. Cl.³ C07G 7/00; A23J 1/10
U.S. Cl. 260—123.7 **12 Claims**

1. A fine powder of regenerated fibroin in nonfibrous and particulate form which has an average molecular weight of not less than 50,000, a degree of molecular orientation equal to not greater than one-half that of natural silk thread, particle diameters of from 1 to 100μ, and a bulk density of from 0.1 to 0.7 g/cm^3 as measured in the dry state and which contains at least 50% by weight of hot-water-insoluble fibroin having the β-configuration.

4,233,212

PROCESS FOR PRODUCING A FINE POWDER OF SILK FIBROIN

Kiyoshi Otoi, Maruko, and Yukio Horikawa, Matsubara, both of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Spun Silk, Ltd., Nagano, both of, Japan

Filed Sep. 28, 1979, Ser. No. 79,864
Claims priority, application Japan, Apr. 17, 1979, 54-47382
Int. Cl.³ C07G 7/00
U.S. Cl. 260—123.7 **11 Claims**

1. A process for producing a fine powder of silk fibroin in nonfibrous and particulate form which has an average molecular weight of not less than 50,000, a degree of molecular orientation equal to not greater than one-half that of natural silk thread, particle diameters of from 1 to 100μ, and a bulk density of from 0.1 to 0.7 g/cm^3 as measured in the dry state and which contains at least 50% by weight of hot-water-insoluble fibroin having the β-configuration, the process comprising the steps of dissolving a degummed silk material in at least one solvent selected from the group consisting of an aqueous cupriethylenediamine solution, an aqueous ammoniacal solution of cupric hydroxide, an aqueous alkaline solution of cupric hydroxide and glycerol, an aqueous lithium bromide solution, an aqueous solution of the chloride, nitrate or thiocyanate of calcium, magnesium or zinc, and an aqueous sodium thiocyanate solution; adding a coagulating salt to the resulting aqueous silk fibroin solution having a silk fibroin concentration of from 3 to 20% by weight to coagulate and precipitate the silk fibroin; dehydrating and drying the gel so formed; and then pulverizing the resulting powder.

4,233,213

PROCESS FOR THE CONTINUOUS INDIRECT DIAZOTIZATION OF AROMATIC AMINES

Kurt Breig; Georg Dehmel, both of Cologne, and Norbert Hamm, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 939,153
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741925
Int. Cl.³ C07C 113/00
U.S. Cl. 260—141 **7 Claims**

1. A process for the continuous indirect diazotization of an aromatic amine which comprises mixing an aromatic amine with water and an excess of nitrite in a receiving zone in which no diazotization occurs, primarily feeding the mixture from the receiving zone to a diazotization vessel thereafter reacting the resulting mixture in the diazotization vessel with a mineral acid, withdrawing a component stream of the mixture of amine, water and nitrite from the receiving zone into an analyser, the residence time of the component stream in the analyser being shorter by a factor of at least 3 than the residence time of the mixture in the diazotization vessel, and adding additional nitrite to the receiving zone in an amount determined by the amount of amine present in the mixture which is monitored in the analyser.

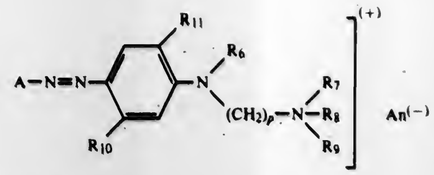
4,233,214

CATIONIC AZO DYESTUFFS WITH A HYDROXYALKYLATED AMMONIUM GROUP

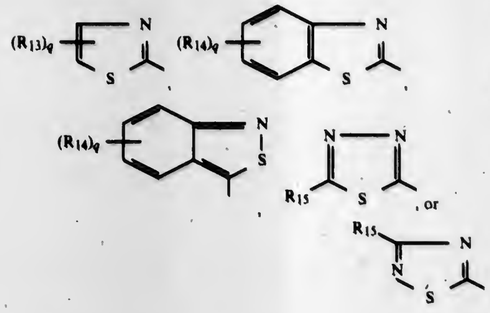
Günther Boehmke, Opladen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 445,833, Feb. 26, 1974, Pat. No. 4,036,826. This application Jun. 30, 1976, Ser. No. 701,420
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1973, 2309528
Int. Cl.³ C07C 107/04; C09B 44/02
U.S. Cl. 260—158 **2 Claims**

1. Cationic azo dyestuff of the formula



wherein A is



in which

R_{13} is C_1–C_5-alkyl, phenyl, cyano, nitro or carbomethoxy,

R_{14} is C_1–C_5-alkyl, C_1–C_4-alkoxy, phenoxy, nitro, carbomethoxy, chloro, or bromo;

R_{15} is hydrogen; C_1–C_5-alkyl; C_1–C_4-alkoxy; phenoxy; cyclohexyl; phenyl; phenyl substituted by methyl, ethyl, methoxy, ethoxy, nitro, chlorine or acetylamino; benzyl; methylmercapto; ethylmercapto; phenylmercapto; benzylmercapto; dimethylamino; diethylamino; methylsulphonyl; ethylsulphonyl; or phenylsulphonyl; and

q is 0, 1 or 2;

and wherein

R_6 is methyl, ethyl, propyl or butyl;

R_7 is methyl, ethyl, propyl or butyl;

R_8 is methyl, ethyl, propyl or butyl;

R_9 is 2-hydroxypropyl, 2-hydroxybutyl, 2-hydroxyethylphenyl, 2-hydroxy-3-methoxy-propyl, 2-hydroxy-3-chloropropyl, 2-hydroxy-3-ethoxy-propyl, 2-hydroxy-3-propoxy-propyl, 2-hydroxy-3-allyloxy-propyl, 2-hydroxy-3-butoxy-propyl, 2-hydroxy-3-phenoxy-propyl or 2-hydroxy-3-benzoyl-propyl;

R_{10} is hydrogen; methyl; ethyl; propyl; butyl; chloro; bromo; methoxy; ethoxy; propoxy; acetylamino; propionylamino; or methylsulphonylamino;

R_{11} is hydrogen, methyl, ethyl, propyl, butyl, chloro, bromo, methoxy, ethoxy or propoxy;

p is 2 or 3; and

$An^{(-)}$ is an anion.

4,233,215

AZIRIDINYL QUINONE ANTITUMOR AGENTS

John S. Driscoll; A. Hameed Khan, both of Rockville, and Feng-Te Chou, Bethesda, all of Md., assignors to United States of America, Washington, D.C.

Division of Ser. No. 758,812, Jan. 12, 1977, Pat. No. 4,146,622. This application Oct. 24, 1978, Ser. No. 954,218
Int. Cl.² C07D 295/12
U.S. Cl. 260—239 EQ **11 Claims**

1. 2,5-di(2-methylaziridinyl)-3,6-bis(methylamino)-1,4-benzoquinone.

2. 2,5-diaziridinyl-3,6-diamino-1,4-benzoquinone.

3. 2,5-diaziridinyl-3,6-bis(methylamino)-1,4-benzoquinone.

4. 2,5-diaziridinyl-3,6-bis(ethylamino)-1,4-benzoquinone.

5. 2,5-diaziridinyl-3,6-bis(propylamino)-1,4-benzoquinone.

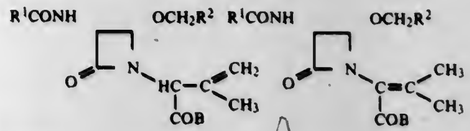
4,233,216

AZETIDINONE DERIVATIVES AND PRODUCTION THEREOF

Shoichiro Uyeo; Mitsuru Yoshioka; Teruji Tsuji, all of Osaka; Ikuo Kikkawa, and Wataru Nagata, both of Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 875,907, Feb. 7, 1978, abandoned. This application Dec. 6, 1978, Ser. No. 967,007
Claims priority, application Japan, Feb. 8, 1977, 52/13452
Int. Cl.² C07D 205/08, 403/12, 417/12, 409/12
U.S. Cl. 260—239 A **12 Claims**

1. A compound of the formula:



wherein

R^1 is C_{1-5} alkyl, phenoxy-C_{1-3} alkyl, phenyl-C_{1-3}- alkyl, phenyl, tolyl, methoxyphenyl, chlorophenyl, nitrophenyl, hydroxyphenyl, acetoxyphenyl, acetamidophenyl, thienyl or furyl;

R^2 is ethynyl, 2-bromoethynyl, acetoxyacetyl, (1-methyl-tetrazol-5-yl)thioacetyl, (2-methyl-1,3,4-thiadiazol-5-yl)thioacetyl, 1-methylene-2-acetoxyethyl, 1-methylene-2-(1-methyltetrazol-5-yl) thioethyl, 1-methylene-2-(2-methyl-1,3,4-thiadiazol-5-yl)-thioethyl or 1-methoxycarbonylmethylene-2-(1-methyl-tetrazol-5-yl) thioethyl;

and B is hydroxy, C_{1-4} alkoxy, phenyl-C_{1-3} alkoxy, diphenyl-C_{1-3} alkoxy, phenoxy, indanyloxy, naphthoxy, tri-C_{1-3} alkylsilyloxy, C_{1-3} alkoxy di-C_{1-3} alkylsilyloxy, tri-C_{1-3} alkylstannyloxy, di-C_{1-3} alkylhydrazino, alkali metal oxy, magnesium oxy, calcium oxy, aluminum oxy, tri-C_{1-3} alkylammonium oxy or bicyclohexylammonium oxy.

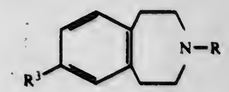
4,233,217

SUBSTITUTED 1,2,4,5-TETRAHYDRO-3H, 3 BENZAZEPINES

Bola V. Shetty, Rockville, Md., assignor to Peanwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 747,151, Dec. 3, 1976, abandoned, which is a continuation of Ser. No. 523,092, Nov. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 241,091, Apr. 4, 1972, abandoned, which is a continuation of Ser. No. 711,897, Mar. 11, 1968, abandoned. This application May 21, 1979, Ser. No. 41,575
Int. Cl.³ A61K 31/55; C07D 223/16
U.S. Cl. 260—239 BB **2 Claims**

1. A compound of the formula



wherein R is cycloalkylmethyl of 4 to 6 carbons and R^3 is hydroxy or methoxy.

4,233,218
PYROLYSIS OF N-SUBSTITUTED-1-CYCLOHEXENE-1,2-DICARBOXIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 935,201, Aug. 21, 1978, Pat. No. 4,193,924, which is a division of Ser. No. 802,168, May 31, 1977, Pat. No. 4,125,536, which is a division of Ser. No. 603,221, Aug. 8, 1975, Pat. No. 4,056,542, which is a division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application Sep. 18, 1979, Ser. No. 76,708

Int. Cl.³ C07D *487/04, 487/10*

U.S. Cl. 260—326 C **3 Claims**

1. The process for preparing N,N'-dialkyl or diphenyl-pyromellitdiimides and the dimers of N-alkyl or phenyl-1,3-butadiene-2,3-dicarboximides, which comprises pyrolyzing N-phenyl- or N-alkyl-1-cyclohexene-1,2-dicarboximides under pyrolysis conversion conditions,

wherein said pyrolysis conversion conditions include elevated temperatures in the range of about 500° C. to 1000° C., reduced pressure, and short contact time, effective for said pyrolysis.

4,233,219
SYNTHESIS OF 2,2,2-TRICHLORO-1-(N-HYDROCARBONPYRRYL-2)-ETHANOL

Michael J. Dagani, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 9, 1979, Ser. No. 28,317

Int. Cl.³ C07D *207/30*

U.S. Cl. 260—326.5 R **14 Claims**

1. In a process of preparing 2,2,2-trichloro-1-(N-hydrocarbonpyrryl-2)-ethanol by mixing and reacting essentially equimolar quantities of chloral and N-hydrocarbonpyrrole in a liquid reaction system containing a protonic acid added in the form of an organic acid, the improvement pursuant to which

(a) the reaction is performed in a methylene chloride reaction medium containing protonic acid added in the form of a carboxylic acid whose acidic dissociation constant is below about 6.3×10^{-5} (at 25° C.) and

(b) the relative amounts of the chloral, N-hydrocarbonpyrrole and methylene chloride reaction medium are proportioned so as to result in the formation of a solution of 2,2,2-trichloro-1-(N-hydrocarbonpyrryl-2)-ethanol in the reaction medium having to concentration in the range of about 1 to about 8 molar.

4,233,220
IMIDYL-BENZENE-DICARBOXYLIC AND -TRICARBOXYLIC ACID DERIVATIVES

Vratislav Kvita, Muttenz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

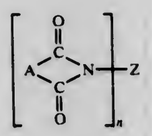
Division of Ser. No. 696,348, Jun. 15, 1976, Pat. No. 4,132,716. This application Oct. 16, 1978, Ser. No. 951,432

Claims priority, application Switzerland, Jun. 18, 1975, 7953/75

Int. Cl.³ C07D *403/02, 405/02*

U.S. Cl. 260—326.26 **4 Claims**

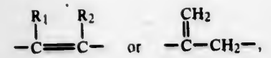
1. An imidyl-benzenedicarboxylic acid compound of the formula I



(I)

wherein

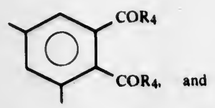
A denotes



R_1 and R_2 independently of one another denote hydrogen, chlorine or bromine,

n denotes the number 2,

Z denotes the formula



and R_4 denotes hydroxyl, phenoxy, phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy with 1 to 18 carbon atoms or an $-O^-M^+$ group, in which M^+ represents an alkali metal cation, a trialkylammonium cation with 3 to 24 carbon atoms or a lower alkyl quaternary ammonium cation; or the two R_4 groups conjointly denote the —O— grouping.

4,233,221
ETHYLENE CARBONATE PROCESS

Dale A. Raines, Wheatridge, Colo., and Oliver C. Ainsworth, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1979, Ser. No. 87,841

Int. Cl.³ C07D *317/38*

U.S. Cl. 260—340.2 **7 Claims**

1. An integrated process for making ethylene carbonate by (1) reacting ethylene with oxygen over a silver catalyst to produce ethylene oxide, (2) contacting the product gases from said reaction with ethylene carbonate to absorb ethylene oxide and carbon dioxide, (3) stripping said ethylene oxide and carbon dioxide from the said ethylene carbonate absorbent by contacting with an inert gas, (4) reacting said ethylene oxide and carbon dioxide over an anion exchange resin to form ethylene carbonate and (5) recovering said ethylene carbonate.

4,233,222
CYCLOPENTYLACETIC ACID DERIVATIVES

Hiromi Shimomura, Nishinomiya; Akihiko Sugie, Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

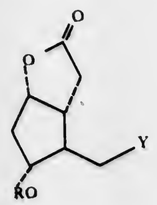
Division of Ser. No. 911,039, May 30, 1978. This application May 15, 1979, Ser. No. 39,215

Claims priority, application Japan, May 31, 1977, 52-64217; Sep. 6, 1977, 52-107642

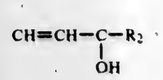
Int. Cl.³ C07D *307/93*

U.S. Cl. 260—343.3 P **1 Claim**

1. A compound of the formula



wherein R is hydrogen or hydroxy-protecting group and Y is formyl, CH=CHCOR₂ or



(wherein R_2 is C_{4-8} alkyl).

4,233,223
PREPARATION OF 3,3-BIS-(4-DIMETHYLAMINOPHENYL)-6-DIMETHYLAMINOPHTHALIDE

Walter Seibert, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 8, 1979, Ser. No. 64,759

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835450

Int. Cl.² C07D *307/88*

U.S. Cl. 260—343.4 **8 Claims**

1. In a process for the preparation of 3,3-bis-(4-dimethylaminophenyl)-6-dimethylaminophthalide (crystal violet lactone) by oxidizing 2-(4,4'-bis-dimethylaminobenzhydryl)-5-dimethylaminobenzoic acid in aqueous alkaline solution at from 0° to 100° C. and at a pH of from 8 to 12, the improvement that the oxidation is carried out with a water-soluble ferricyanide salt or in the presence of a ferricyanide.

4,233,224
CORIOLIN DERIVATIVES

Yuya Nakayama, Omiya; Mamoru Kunishima, Tikorozawa; Akira Matsuda, Omiya, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

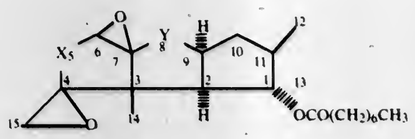
Filed May 23, 1979, Ser. No. 41,904

Claims priority, application Japan, May 29, 1978, 53-63321

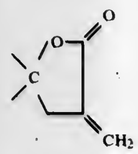
Int. Cl.³ C07D *493/20, 493/22*

U.S. Cl. 260—343.6 **6 Claims**

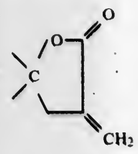
1. A coriolin derivative represented by the general formula:



wherein one of X and Y is



and the other is >C OH, >C=O or



4,233,225
2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-6,9α-EPOXYMETHANO-5,6-DIDEHYDRO-PGF₁ COMPOUNDS

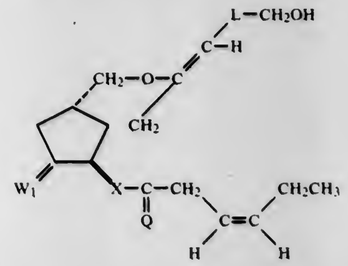
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,392, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 16, 1979, Ser. No. 67,494

Int. Cl.³ C07D *311/02*

U.S. Cl. 260—345.2 **13 Claims**

1. A 5E compound of the formula



wherein W_1 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, α—CH_2OH:β—H;

wherein L is

(1) $-(CH_2)_d-C(R_2)_2$,

(2) $-CH_2-O-CH_2-Y-$, or

(3) $-CH_2CH=CH-$,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,

wherein Q is oxo, α—H:β—H, α—OH:β—R_8 or α—R_8-:β—OH

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4)—CH_2CH_2—;

including the lower alkanoates thereof.

4,233,226
NOVEL HEXAHYDROBENZOPYRAN DERIVATIVE AND METHOD OF PREPARING THE SAME

Makoto Takeda; Hiroshi Iwane, both of Ami, and Takashi Hashimoto, Tokyo, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

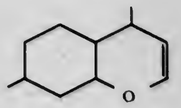
Filed Aug. 24, 1979, Ser. No. 69,407

Claims priority, application Japan, Aug. 24, 1978, 53-103322

Int. Cl.³ C07D *311/74*; C11B *9/00*

U.S. Cl. 260—345.2 **1 Claim**

1. 4*a*,5,6,7,8,8*a*-hexahydro-4,7-dimethyl-4H-1-benzopyran of the formula:



4,233,227
PHTHALIC ANHYDRIDE FORMATION AND SEPARATION

Hobe Schroeder, Warreaville, and David A. Palmer, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 22,431, Mar. 2, 1979, abandoned. This application Oct. 5, 1979, Ser. No. 82,069
Int. Cl.³ C07D 307/89
U.S. Cl. 260—346.7 4 Claims

1. A method for obtaining a partially purified phthalic anhydride product from the liquid effluent containing from 70 up to 92% o-phthalic acid, from 1.5 up to 21% water, from 0.3 up to 13% benzoic acid and/or acetic acid by weight and impurities boiling above and below the boiling point of phthalic anhydride which are oxygen containing aromatic compounds including precursors of o-phthalic acid as well as compounds containing cobalt, manganese; or bromine derived from the catalysis used for the preparation of such liquid effluent by the neat air oxidation of liquid xylene at a temperature of from 150° C. up to 230° C. under a gauge pressure of from 17 up to 30 kg/cm^2; which method comprises the steps of continuous in situ dehydration of o-phthalic acid to phthalic anhydride and flash evaporation of it from said liquid effluent at a pressure of from 760 mm Hg down to 40 mm Hg and a temperature of from 180° C. up to 250° C. leaving a fluid residue fraction containing materials boiling above said anhydride; continuous removal of the vapor fraction and the liquid residue fraction as separate streams from said dehydration-evaporation; continuous removal of heat from the vapor fraction to cool it to a temperature below the boiling temperature of phthalic anhydride but above the dew point of water whereat partially purified phthalic anhydride condenses to the liquid state, and the continuous separation of uncondensed vapors from the liquid partially purified phthalic anhydride condensate.

4,233,228
PURIFICATION OF TETRAHYDROFURAN

Herbert Mueller, Frankenthal, and Otto H. Huchler, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,805
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748788
Int. Cl.³ C07D 307/08
U.S. Cl. 260—346.11 4 Claims

1. A process for purifying tetrahydrofuran which comprises: intimately mixing the tetrahydrofuran to be treated at from room temperature to the boiling point of the tetrahydrofuran with a bleaching earth containing less than 3% by weight of water for from 3 minutes to 12 hours, and thereafter separating the bleaching earth from the tetrahydrofuran, whereby the carbonyl number, the bromine number and the peroxide content of the tetrahydrofuran are reduced.

4,233,229
PREPARATION OF SALT-FREE N-ACYL TAURINES

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,284
Int. Cl.² C07C 143/90
U.S. Cl. 260—401 11 Claims

1. A process for preparing an N-acyl taurine substantially free of alkali metal chloride comprising reacting, in a C_{1-4} alkanol medium initially containing no more than about 15% by weight of water, at temperatures ranging from about 30° C. up to reflux, 1 mole of a C_{6-22} carboxylic acid chloride with 1 mole of a taurine salt of the formula

$$HNR^1—CHR^2—CHR^2—SO_3M$$

wherein

R^1 is H or a C_{1-6} hydrocarbon radical,
R^2 is independently H, methyl or ethyl, and
M is alkali metal,

in the presence of about 1 mole of alkali metal hydroxide, separating the precipitated alkali metal chloride from the alkanolic reaction mixture while maintaining the temperature thereof high enough to solubilize the N-acyl taurine reaction product, and then cooling the reaction medium low enough to precipitate the desired N-acyl taurine.

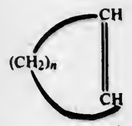
4,233,230
PROCESS FOR PREPARING OLEFINS BY METATHESIS OF CYCLIC OLEFINS WITH ACYCLIC OLEFINS

Jean Otton, Ecully, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed May 4, 1978, Ser. No. 902,709
Claims priority, application France, May 6, 1977, 77 13804; Apr. 24, 1978, 78 11986
Int. Cl.³ C07C 67/343
U.S. Cl. 260—410.9 R 22 Claims

1. A process for preparing olefins which comprises, successively, the steps of:

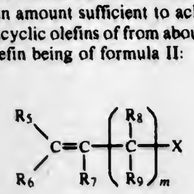
(a) first introducing into a reactor (i) a cyclic olefin of formula I:



(I)

wherein

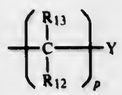
n represents a whole number from 2 to 12, and an acyclic olefin in an amount sufficient to achieve a molar ratio of cyclic to acyclic olefins of from about 0.5 to about 2.0, said acyclic olefin being of formula II:



(II)

wherein

R_5 represents hydrogen, methyl, ethyl or the group:



wherein

R_{12} and R_{13} are the same or different from each other and each represents hydrogen or alkyl containing 1 to 5 carbon atoms;

Y represents halogen; an acyloxy group $R_{14}—CO—O—$ wherein R_{14} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenylalkyl containing 7 to 12 carbon atoms, or an oxycarbonyl group $R_{15}—O—CO—$, wherein R_{15} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenylalkyl containing 7 to 12 carbon atoms;

p represents a whole number from 1 to 12 except when Y is an acyloxy group $R_{14}—CO—O—$ wherein P is from 2 to 12;

R_6 and R_7 are the same or different from each other and each represents hydrogen methyl or ethyl;

R_8 and R_9 are the same or different from each other and each represents hydrogen or alkyl containing 1 to 5 carbon atoms;

X represents halogen; an acyloxy group $R_{10}—CO—O—$

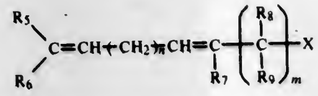
wherein R_{10} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenyl alkyl, containing 7 to 12 carbon atoms; or an oxycarbonyl group $R_{11}—O—CO$, wherein R_{11} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenyl alkyl, containing 7 to 12 carbon atoms;

m represents a whole number from 1 to 12 except when X is an acyloxy group $R_{10}—CO—O$ wherein m is from 2 to 12, and optionally (ii) a suitable solvent;

(b) then introducing into the reactor (i) a solution or suspension of a tungsten oxide salt wherein all or part of the oxygen atoms are replaced by halogen when the solvent is omitted from step (a), and (ii) said tungsten oxide salt being optionally in solid form when a solvent is present in step (a);

(c) after the reaction mixture from step (b) has become a homogeneous solution, adding thereto an organic-tin compound reducing agent and reacting said cyclic and acyclic olefins at a suitable temperature between about −20 and about 300° C.; and

(d) recovering a compound of formula III:



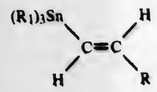
wherein R_5, R_6, R_7, R_8, R_9, n, m, and X are as defined above.

4,233,231
NOVEL VINYL-STANNYL DERIVATIVES

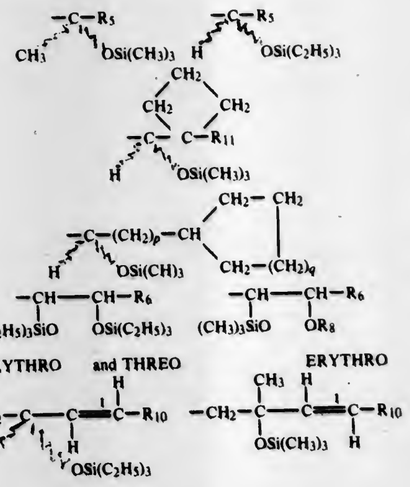
Middleton B. Floyd, Jr., Suffern; Charles V. Grudzinskas, Nyack, both of N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 22, 1977, Ser. No. 853,941
Int. Cl.³ C07F 7/22
U.S. Cl. 260—429.7 21 Claims

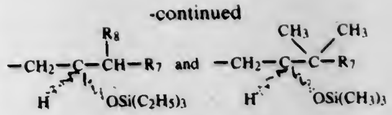
1. A compound of the formula:



wherein R_1 is selected from the group consisting of C_1-C_5 alkyl; R is selected from the group consisting of



-continued



wherein R_5 is selected from the group consisting of C_4-C_7 alkyl, R_6 is selected from the group consisting of C_5-C_6 alkyl R_7 is selected from the group consisting of C_2-C_5 alkyl, R_8 is methyl or ethyl, R_{10} is selected from the group consisting of C_1-C_4 alkyl, R_{11} is selected from the group consisting of C_3-C_6 alkyl, benzyl, 2-butyne and 2-butene, n is the integer 1 or 2, p is the integer 1 or 2, and q is the integer 1 or 2.

4,233,232
MANUFACTURE OF ESTERS

Michael S. Howarth, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 13, 1978, Ser. No. 951,260
Claims priority, application United Kingdom, Nov. 28, 1977, 49349/77
Int. Cl.³ C07C 67/02
U.S. Cl. 260—465 D 7 Claims

1. A process for the preparation of esters of m-phenoxybenzyl alcohol and its α-cyano and α-ethinyl derivatives with carboxylic acids which comprise mixing a methyl or ethyl ester of the carboxylic acid, m-phenoxybenzyl alcohol or its α-cyano or α-ethinyl derivative and a tetra-aryl titanate as catalyst, and heating the mixture at a temperature such that the methanol or ethanol are removed by distillation as it is formed, wherein said carboxylic acid is selected from the group consisting of

2,2-dimethyl-3-(2',2'-dimethylvinyl) cyclopropanecarboxylic acid;
2,2-dimethyl-3-(2',2'-dichlorovinyl) cyclopropanecarboxylic acid;
2,2-dimethyl-3-(2'-ethylvinyl) cyclopropanecarboxylic acid;
2,2-dimethyl-3-(2',2'-dibromovinyl) cyclopropanecarboxylic acid;
2,2-dimethyl-3-(2'-chloro-2'-trifluoromethylvinyl) cyclopropanecarboxylic acid; and
2,2-dimethyl-3-(2',2'-bis(trifluoromethyl)vinyl) cyclopropanecarboxylic acid.

4,233,233
PROCESS FOR THE PREPARATION OF 2-OXOIMINOPHENYLACETONITRILE

Horst Schröer, Prairie Village, Kans.; Karl Goliasch, Berg. Gladbach, and Uwe Beck, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 3, 1979, Ser. No. 35,755
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825565
Int. Cl.³ C07C 121/78
U.S. Cl. 260—465 E 11 Claims

1. In the preparation of 2-oximinophenylacetonitrile by reacting benzyl cyanide with an alkyl nitrite in the presence of a base, the improvement which comprises employing an inorganic base as the base, effecting the reaction in an aqueous solution of an alcohol, and after the reaction has ended acidifying the reaction mixture and isolating the 2-oximinophenylacetonitrile therefrom.

4,233,234

CONTINUOUS MANUFACTURE OF AN AQUEOUS SOLUTION OF A SALT OF AN ALKANEDICARBOXYLIC ACID AND AN ALKANEDIAMINE

Rudi-Heinz Rotzoll, Limburgerhof; Paul Duffner; Ernst Dietl, both of Ludwigshafen; Georg Pilz, Neustadt, and Gerhard Thiel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,925

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728818

Int. Cl.³ C07C *87/14*

U.S. Cl. 260—501.2 **8 Claims**

1. A continuous process for preparing an aqueous solution of a salt of an alkanedicarboxylic acid having 6 to 12 carbon atoms and an alkanediamine having 6 to 12 carbon atoms which comprises reacting the particular alkanedicarboxylic acid with the particular alkanediamine in an aqueous solution of the salt to be prepared by (1) recycling an aqueous solution of said salt from a first mixing zone through a transport zone and then a second mixing zone back to said first mixing zone, the amount of salt solution circulated per hour being from 40 to 80 times the amount contained in said first mixing zone, (2) introducing an aqueous solution of said alkanedicarboxylic acid and less than the equivalent amount of said alkanediamine in liquid form into said recycling salt solution at a location between said first and second mixing zones, (3) introducing an additional amount of said alkanediamine in liquid form into said recycling salt solution at a location after said second mixing zone, the amount of alkanedicarboxylic acid and the total amount of alkanediamine introduced being approximately equivalent, (4) maintaining the aqueous solution at a temperature in the range of 90° C. to 102° C., and (5) removing aqueous salt solution from the first mixing zone at a rate corresponding to the rate at which it is formed.

4,233,235

METHOD FOR MAKING DIPEROXYACIDS

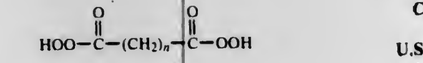
James B. Camden, Germantown, Tenn., and Mark L. McCarty, Loveland, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 895,411, Apr. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 829,310, Mar. 31, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,393

Int. Cl.³ C07C *179/10, 179/15*

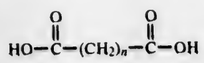
U.S. Cl. 260—502 R **10 Claims**

1. A continuous process for making diperoxyacids of the formula



wherein n is from about 6 to about 14, said diperoxyacids having a crystalline form and an average crystal size substantially greater than about 19 microns, comprising:

(a) continuously adding to a stirred reactor of temperature from about 15° C. to about 45° C. the following materials:
(1) hydrogen peroxide;
(2) water;
(3) sulfuric acid; and
(4) a dibasic acid of the formula



wherein n is from about 6 to about 14;

(b) continuously withdrawing from the reactor diperoxyacid product formed as a result of the oxidation of the dibasic acid;

(c) filtering the diperoxyacid product; and

(d) washing the diperoxyacid product with water and drying it;

wherein the inlet flow rates to the reactor of sulfuric acid, hydrogen peroxide and water are sufficient to maintain a liquid concentration of about 60% to about 80% sulfuric acid, about 0.5% to about 15% hydrogen peroxide, and about 5% to about 39.5% water in the reactor.

4,233,236

SEPARATION OF SULPHONIC ACIDS FROM THE MEDIUM IN WHICH THEY ARE PREPARED

Rene Kern, Savigny-sur-Orge, and Daniel Augustin, Massy, both of France, assignors to ATO Chimie, Paris, France

Filed Dec. 26, 1978, Ser. No. 972,726

Claims priority, application France, Dec. 28, 1977, 77 39485

Int. Cl.³ C07C *139/00, 143/24*

U.S. Cl. 260—504 S **12 Claims**

1. Process for the separation of sulfonated paraffins from the aqueous reaction mixture in which they are produced by sulfonation of paraffins, said reaction mixture containing sulfuric acid, unsulfonated paraffins and a hydrocarbon solvent for said sulfonated and unsulfonated paraffins which is capable of forming azeotropic mixture with water which comprises: partially neutralizing the sulfuric acid present in the reaction mixture to form bisulfate; subjecting the reacting mixture to a distillation to remove at least a substantial part of the water in the form of azeotropic mixture with the hydrocarbon; allowing the remaining material to separate into two layers, and separating the bottom layer, which contains bisulfate, from the upper sulfonic acid containing layer.

4,233,237

2-ALKOXYALKOXY-5-AMINOBENZENESULFONIC ACID

Tooru Harada, and Shinsaku Fujita, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

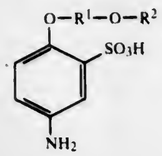
Filed Feb. 21, 1979, Ser. No. 13,752

Claims priority, application Japan, Feb. 20, 1978, 53-18373

Int. Cl.³ C07C *143/64*

U.S. Cl. 260—509 **9 Claims**

1. A compound of the formula:



(I)

wherein R^1 represents an alkylene group having 2 or more carbon atoms and R^2 represents an alkyl group provided that the two oxygen atoms in the —O—R^1—O—R^2 moiety are not connected to the same carbon atom in R^1.

4,233,238

PROCESS FOR PREPARING THIOUREA DIOXIDE

Osami Ohura, and Osamu Fujimoto, both of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,788

Claims priority, application Japan, Jul. 25, 1978, 53-89984

Int. Cl.³ C07C *145/00*

U.S. Cl. 260—513.7 **7 Claims**

1. A process for preparing thiourea dioxide characterized in that in the production of thiourea dioxide by the reaction of thiourea and hydrogen peroxide in an aqueous solvent, the filtrate after separation of the crystals of thiourea dioxide after reaction is treated with both an anion exchange resin and a cation-exchange resin to remove side reaction products and impurities contained therein and then is used again as a reaction solvent in said process.

4,233,239

UREADIACETOACETAMIDO COMPOUNDS

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 942,189, Sep. 14, 1978. This application Aug. 13, 1979, Ser. No. 65,857

Int. Cl.³ C07C *127/00*

U.S. Cl. 564—57 **6 Claims**

1. bis 1,3(1-acetoacetamide-2,2,4-trimethylhexamethylene-6-ureylene)3-methylene-3,5,5-trimethylcyclohexylene.

4,233,240

STABILIZATION OF ACRYLAMIDE SOLUTIONS

William F. Linke, and William F. Maraluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 14, 1977, Ser. No. 768,248

Int. Cl.³ C08K *3/10*

U.S. Cl. 564—4 **1 Claim**

1. In storing acrylamide aqueous solution in a closed container without a continuous supply of oxygen to said solution, using cupric ion present as a copper salt in said solution to inhibit polymerization of acrylamide in said solution during storage, the improvement wherein the concentration of cupric ion is in the range from about 0.5 to about 10 parts copper per million parts acrylamide in said solution.

4,233,241

DIPHENYLAMINES N-MONOSUBSTITUTED IN THE 4'-POSITION AND THE USE THEREOF IN DYE COMPOSITIONS FOR KERATINIC FIBERS

Gregoire Kalopissis, Neuilly-sur-Seine; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oréal, Paris, France

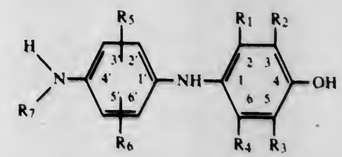
Continuation of Ser. No. 884,817, Mar. 9, 1978, abandoned, which is a continuation of Ser. No. 743,497, Nov. 19, 1976, abandoned, which is a division of Ser. No. 551,627, Feb. 21, 1975, Pat. No. 4,008,043. This application Apr. 19, 1979, Ser. No. 31,634

Claims priority, application Luxembourg, Feb. 22, 1974, 69457

Int. Cl.³ C07C *103/375*

U.S. Cl. 564—221 **3 Claims**

1. Diphenylamine of the formula:



wherein

R_1 and R_4 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1-6 carbon atoms, lower alkoxy having 1-6 carbon atoms, amino, N-lower alkyl amino wherein the alkyl moiety has 1-6 carbon atoms, N-lower hydroxy alkyl amino wherein the alkyl moiety has 1-6 carbon atoms and acylamino wherein the acyl moiety has 2-7 carbon atoms, with at least one of R_1 and R_4 being said acylamino;

R_2 and R_3 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1-6 carbon atoms, lower alkoxy having 1-6 carbon atoms and acylamino wherein the acyl moiety has 2-7 carbon atoms;

R_5 and R_6 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1-6 carbon atoms and lower alkoxy having 1-6 carbon atoms with the proviso that when both R_5 and R_6 are other than hydrogen at least one of R_5 and R_6 occupies a position meta to —NHR_7; and

R_7 represents a member selected from the group consisting of hydroxy alkyl having 1-6 carbon atoms, amino alkyl having 1-6 carbon atoms, mono alkyl amino alkyl wherein each alkyl moiety has 1-6 carbon atoms and dialkyl amino alkyl wherein each alkyl moiety has 1-6 carbon atoms.

4,233,242

PROCESS FOR PRODUCING KETAZINE BY REACTING A KETONE WITH AMMONIA AND A PEROXIDE

Nobuyuki Nagato, Wako, and Yuichi Sugiyama, Tokyo, both of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

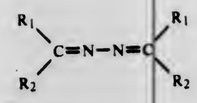
Filed Apr. 6, 1979, Ser. No. 27,895

Claims priority, application Japan, Apr. 13, 1978, 53-42647; Apr. 13, 1978, 53-42648

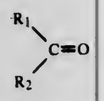
Int. Cl.³ C07C *109/12, 109/14, 109/16, 119/00*

U.S. Cl. 564—249 **10 Claims**

1. In a process for producing a ketazine having the formula



wherein R_1 represents alkyl group having 1 to 4 carbon atoms and R_2 represents (i) an alkyl group having 1 to 4 carbon atoms or (ii) phenyl or phenyl substituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or halogen, and R_1 and R_2 together with the carbon atom to which they are both bonded form a ring, by reacting an aliphatic or aromatic ketone having the formula:



wherein R_1 and R_2 are as defined above, with ammonia and a peroxide compound or compounds, at a temperature of from 0° to 120° C., in liquid phase, the improvement wherein silica, at least one palladium compound or a mixture thereof is used as a catalyst.

4,233,243

Patent Not Issued For This Number

4,233,244

NOVEL TECHNIQUE FOR REACTING VINYL CYCLOHEXENE WITH NITROBENZENE IN THE PRESENCE OF A HYDROGEN-TRANSFER CATALYST

John A. Patterson, Fishkill, N.Y.; Wheeler C. Crawford, Houston, and James R. Wilson, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,590
Int. Cl.³ C07C 85/11
U.S. Cl. 564—423 **15 Claims**

1. The method which comprises

passing a charge stream containing vinyl cyclohexene and $R'NO_2$ into contact with a catalytic amount of, as catalyst, at least one acetylacetonate of a Group VIII metal, thereby forming product streams containing $R'NH_2$ wherein R' is alkyl, cycloalkyl, aralkyl, aryl or alkaryl; and

recovering said product stream containing $R'NH_2$.

4,233,245

PREPARATION OF TRIS(HYDROXYMETHYL)AMINOMETHANE

Jean Bourguignon, Isneauville; Marcel-Xavier Sion, Lewarde, and Michel Moreau, Rouen, all of France, assignors to Societe Chimique de La Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Jan. 25, 1979, Ser. No. 6,794
Claims priority, application France, Jan. 25, 1978, 78 01965
Int. Cl.³ C07C 85/11
U.S. Cl. 564—506 **7 Claims**

1. in a process of preparing tris(hydroxymethyl)aminomethane in crystalline form separated directly by cooling of the reaction medium, the process comprising formylation followed by hydrogenation, the improvement wherein nitromethane and formaldehyde, in polyoxymethylene or solid form, are reacted to effect said formylation in a molar ratio on the order of 1:3 in a concentrated alcohol medium of 2 to 5% mixture of methylene chloride in methanol, in the presence of 1 to 10 milliequivalents per mole of nitromethane of a basic catalyst in solid form, selected from sodium or potassium, with agitation for a period between 2 and 36 hours at a temperature below 55° C.; and the product of the formylation is acidified with concentrated acid to a pH between 4.5 and 5.5, the resultant acidified nitroalcohol is diluted with methanol containing 2 to 5% methylene chloride, and is then catalytically hydrogenated on Raney nickel at a hydrogen pressure of 30 to 60 bars at a temperature of 40 to 47° C.

4,233,246

MANUFACTURE OF ALIPHATIC HYDROXYCARBONYL COMPOUNDS ETHERIFIED WITH ALIPHATIC GROUPS

Christian Dudeck, Limburgerhof; Gunter Lehmann, Ludwigshafen; Norbert Petri, Frankenthal; Hans Diem, Mannheim; Werner Fliege, Otterstadt; Bernd Meissner, Heidelberg; Karl-Heinz Ross, Mutterstadt, and Wolfgang Muehlthaler, Hemsbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,416
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758124; Apr. 12, 1978, 2815752
Int. Cl.³ C07C 45/38
U.S. Cl. 568—402 **12 Claims**

1. A process for the preparation of an aliphatic hydroxycarbonyl compound etherified with an aliphatic group, by catalytic oxidation of an etherified hydroxyalcohol in the presence of a metal catalyst, wherein an aliphatic hydroxyalcohol, etherified with an aliphatic group, is oxidized with an oxygen-containing gas, at from 450° to 700° C., in the presence of a catalyst arranged according to particle size in an upper or front region, middle region and a lower or rear region which have a total thickness of from 5 to 100 millimeters and comprise:

(a) at least three layers of silver crystals of different particle size, with at least one of the layers of silver crystals constituting the lower or rear region of the catalyst from which the oxidized mixture is discharged containing particles of size from 1 to 2.5 mm and constituting from 30 to 85 percent by weight of the catalyst, at least one of the layers of silver crystals constituting the middle region of the catalyst containing particles of size from 0.75 to 1 mm and constituting from 2 to 30 percent by weight of the catalyst and at least one of the layers of silver crystals constituting the upper or front region of the catalyst facing the mixture to be oxidized containing particles of size from 0.2 to 0.75 mm and constituting from 8 to 50 percent by weight of the catalyst, and at least one layer of copper crystals arranged above or below one of said layers of silver crystals and containing particles of size from 0.2 to 0.75 mm and constituting from 1 to 40 percent by weight of the catalyst, or

(b) at least three layers of silver crystals of different particle size, with at least one of the layers of silver crystals constituting the lower or rear region of the catalyst from which the oxidized mixture is discharged containing particles of size from 1 to 2.5 mm and constituting from 30 to 85 percent by weight of the catalyst, at least one of the layers of silver crystals constituting the middle region of the catalyst containing particles of size from 0.75 to 1 mm and constituting from 2 to 30 percent by weight of the catalyst and at least one of the layers of silver crystals constituting the upper or front region of the catalyst facing the mixture to be oxidized containing particles of size from 0.2 to 0.75 mm and constituting from 8 to 50 percent by weight of the catalyst, and at least one layer of copper crystals arranged above or below one of said layers of silver crystals containing particles of size from 0.2 to 0.75 mm and constituting from 0.5 to 40 percent by weight of the catalyst, and at least one layer of catalyst particles comprising from 70 to 99 percent by weight of copper, from 0.9 to 20 percent by weight of tin and from 0.1 to 10 percent by weight of phosphorus, based on the total weight of these elements in these particles, with these layers of catalyst particles containing particles of size from 0.2 to 0.75 mm and constituting from 0.5 to 10 percent by weight of the catalyst, or

(c) at least three layers of silver crystals of different particle size, with at least one of the layers of silver crystals constituting the lower or rear region of the catalyst from which the oxidized mixture is discharged containing particles of size from 1 to 2.5 mm and constituting from 30 to 85 percent by weight of the catalyst, at least one of the layers of silver crystals constituting the middle region of the catalyst containing particles of size from 0.75 to 1 mm and constituting from 2 to 30 percent by weight of the catalyst and at least one of the layers of silver crystals constituting the upper or front region of the catalyst facing the mixture to be oxidized containing particles of size from 0.2 to 0.75 mm and constituting from 13 to 68 percent by weight of the catalyst.

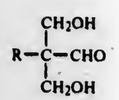
4,233,247

PROCESS FOR THE PREPARATION OF 2,2-DIMETHYLOLALKANALS

Otto Immel, and Hans-Helmut Schwarz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,218
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714516
Int. Cl.³ C07C 47/26
U.S. Cl. 568—464 **11 Claims**

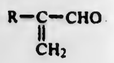
1. A process for the preparation of a 2,2-dimethylolalkanal of the formula



(I)

wherein R denotes an unsubstituted straight chain or branched alkyl radical with up to 15 carbon atoms or a C_1 to C_4 alkoxy substituted straight or branched alkyl radical with up to 15 carbon atoms,

which comprises contacting a 2-alkylacrylaldehyde of the formula



(II)

wherein R has the meaning indicated above, with formaldehyde in the presence of water and a hydroxide or carbonate of an alkali metal or alkaline earth metal, a tertiary amine or a basic ion exchanger employing a molar ratio of 2-alkylacrylaldehyde to formaldehyde of 1:8 to 1:30 and a temperature in the range of −10° C. to 100° C.

4,233,248

PROCESS FOR OXIDATION OF METHANOL TO FORMALDEHYDE WITH NITROUS OXIDE

V. N. Mallikarjuna Rao, and Stanislaw B. Ziemecki, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 21, 1979, Ser. No. 13,122
Int. Cl.³ C07C 47/052, 45/29
U.S. Cl. 568—487 **12 Claims**

1. The process of making formaldehyde which comprises continuously passing, for a contact time of 0.001 to 0.2 second, a gaseous mixture of methanol and nitrous oxide in a methanol to nitrous oxide mole ratio of 0.5 to 4.0, over a metallic silver, metallic silver: gold alloy, or metallic silver: copper alloy catalyst bed which is either unsupported or supported and contains at least about 3 weight percent silver metal, wherein the silver alloy present contains at least 2.5 mole percent silver maintained at a temperature of 475° to 675° C.

4,233,249

METHOD FOR THE PREPARATION OF ALKALI METAL SALTS OF DINITROMETHANE

Vytautos Grakauskas, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 26, 1979, Ser. No. 33,608
Int. Cl.³ C07C 76/02
U.S. Cl. 568—926 **5 Claims**

1. A method for synthesizing the alkali metal salts of dinitromethane which comprises the steps of

(A) effecting a reaction between methyl malonate and a nitrating agent to produce methyl dinitroacetate; and

(B) reacting the resulting methyl dinitroacetate reaction product with an aqueous solution of an alkali metal hydroxide at a temperature of from about 65° C. to 85° C. for a period of time sufficient to produce an alkali salt of dinitromethane.

4,233,250

PROCESS FOR SYNTHESIZING THE ALKALI METAL SALTS OF DINETROMETHANE

Vytautos Grakauskas, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 26, 1979, Ser. No. 33,610
Int. Cl.³ C07C 76/02
U.S. Cl. 568—926 **4 Claims**

1. A process for preparing the alkali metal salts of dinitromethane which comprises the steps of

(A) effecting the nitration of methyl cyanooximinoacetate to produce methyl cyanodinitroacetate;

(B) effecting the hydrolysis of the resulting cyanodinitroacetate to produce dinitroacetonitrile;

(C) effecting the neutralization of said dinitroacetonitrile with an alkali metal hydroxide to produce the corresponding alkali metal salt of cyanodinitromethide; and

(D) effecting the saponification of said cyanodinitromethide salt with an aqueous solution of an alkali metal hydroxide at a temperature and for a time period sufficient to produce the corresponding alkali metal salt of dinitromethane.

4,233,251
PROCESS FOR PREPARING HEXACHLOROCYCLOPENTADIENE

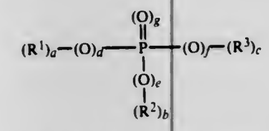
Glendon D. Kyker, Glen Ellyn, and Kalidas Paul, Bolingbrook, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 18, 1979, Ser. No. 49,854
Int. Cl.[3] C07C 23/08
U.S. Cl. 570—220 10 Claims

1. A process for the production of hexachlorocyclopentadiene comprising the steps of:

(a) reacting liquid cyclopentadiene and chlorine at a temperature of from about 0 to about 100 degrees centigrade until a minimum of four chlorine atoms has been added per mole of cyclopentadiene to form a first-stage product;

(b) heating the resultant liquid reaction product of step (a) in a second stage at a temperature of from about 140 degrees centigrade to below about 200 degrees centigrade with chlorine in the presence of from about 0.0001 percent to about 1.0 percent (by weight) of a phosphorus compound until the reaction products of step (a) contain an average of about 6 chlorine atoms per molecule, based on cyclopentadiene starting material, wherein said phosphorus compound is



wherein a, b, c, d, e, f, and g are integers independently selected from the group consisting of 0 and 1, and R^1, R^2, and R^3, are independently selected from the group consisting of hydrogen, hydroxyl, fluorine, chlorine, bromine, iodine, alkyl containing from about 1 to 12 carbon atoms, phenyl, and halophenyl;

(c) vaporizing and heating the resulting reaction products of step (b) in a third stage in the presence of chlorine to a temperature of above 450 degrees centigrade until at least a major portion of said products are converted to hexachlorocyclopentadiene; and

(d) recovering therefrom hexachlorocyclopentadiene.

4,233,252
BUTADIENE CHLORINATION PROCESS

Terry W. Redwine, La Place, La., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 9, 1977, Ser. No. 823,096
Int. Cl.[3] C07C 21/09
U.S. Cl. 570—231 9 Claims

1. An improved process for the continuous chlorination in vapor phase of butadiene to a mixture of dichlorobutenes, the process comprising the following steps:

1. premixing chlorine with a portion of the total butadiene, the mole ratio of butadiene to chlorine in the mixture being at least 3:1 but no more than 30:1, and the temperature of the mixture being at least 90° C. but no more than 200° C.;
2. continuously introducing the chlorine-butadiene mixture at one end of a tubular reactor maintained above 90° C., while introducing the remainder of butadiene into the reactor at at least one point downstream from the injection point of the chlorine-butadiene mixture, the temperature of butadiene at each injection point being lower than the temperature of the reacting mixture at that point, both the temperature and the volume of this additional butadiene being adequate to prevent the internal temperature in the reactor from exceeding about 250° C. or falling downstream from any butadiene injection point below about 130° C.; and
3. recovering dichlorobutenes from the reactor effluent.

4,233,253
METHOD FOR THE PREPARATION OF METAL SALTS OF PHOSPHORUS ACID ESTERS

Glen R. Hoff, Naperville, Ill., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 972,822
Int. Cl.[3] C07F 9/09
U.S. Cl. 260—987 8 Claims

1. A process for the preparation of metal salts of phosphorus acid esters useful in the preparation of alpha-olefin polymerization catalyst components comprising reacting, under substantially anhydrous conditions, (1) at least one anhydrous divalent magnesium, calcium, manganese or iron salt of a monocarboxylic acid selected from the group consisting of aliphatic acids of 2 to about 20 carbon atoms, aromatic acids of 7 to about 12 carbon atoms, and aliphatically-substituted aromatic acids and aryl-substituted aliphatic acids of 8 to about 20 carbon atoms; and (2) at least one trialkyl orthophosphate having 1 to about 6 carbon atoms per alkyl radical in amounts such that a phosphorus acid ester salt having at least one phosphorus acid ester group bonded to metal through oxygen is formed, and at a temperature such that the divalent metal salt of a monocarboxylic acid and the trialkyl orthophosphate will react without substantial decomposition of the trialkyl orthophosphate.

4,233,254
PROCESS FOR GRANULATING METAL SULFIDE POWDERS

Haruki Sato, and Yoshio Kawasumi, both of, Urawa, Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,649
Claims priority, application Japan, Jan. 9, 1978, 53/530
Int. Cl.[3] B01J 2/10
U.S. Cl. 264—37 15 Claims

1. A process for granulating metal sulfide powders, which comprises the steps of

(a) adding and mixing a solution of thermosetting resin in a volatile organic solvent, as a binder, to a metal sulfide powder as the starting material,

(b) forming the mixture obtained in the step (a) into granules by a granulator,

(c) drying the granules at a temperature below the hardening temperature of said thermosetting resin,

(d) sieving the dried granules for classification and recovering the granules within desired limits of particle size,

(e) recycling the fines after the sieve classification to the granulator with the addition of said volatile organic solvent, and

(f) heating and curing said granules within the desired limits of particle size.

4,233,255
METHOD FOR CONTROLLING THE THICKNESS OR WEIGHT OF EXTRUDED STOCK

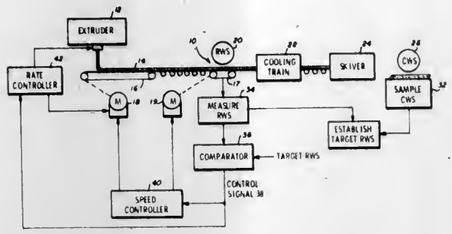
William S. Moon, San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Nov. 29, 1978, Ser. No. 964,502
Int. Cl.[3] B29F 3/02
U.S. Cl. 264—40.4 2 Claims

1. In a process comprising an extruder, having a rate of extrusion, a continuous sheet length of elastomeric extrusion, a first variable speed take-away conveyor belt to convey the extrusion as it exits the extruder, a second variable speed conveyor belt for varying the thickness or weight of the extrusion after leaving the first conveyor belt, a running-weigh-scale to measure the weight per unit area of the continuous extrusion after said extrusion commences to be conveyed by said second conveyor, and an a priori determined targeted running-weigh-scale value; a method of controlling the thickness or weight of the extruded elastomer comprising the steps of:

measuring the weight value of the extrusion at the running-weigh-scale;

comparing the targeted running-weigh-scale value to said measured value to obtain a control signal; and



adjusting the difference in speed between said first conveyor belt and said second conveyer belt in response to said control.

4,233,256
PROCESS FOR INJECTION MOLDING SINTERABLE CARBIDE CERAMIC MATERIALS

Roger W. Ohnsorg, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 864,415, Dec. 27, 1977, Pat. No. 4,144,207.
This application Dec. 18, 1978, Ser. No. 970,702
Int. Cl.[3] C04B 33/32, 35/64
U.S. Cl. 264—44 7 Claims

1. A process for producing a sintered carbide ceramic article comprising the steps of:

a. forming a homogeneous mixture containing from about 65 to about 86 percent by weight of a sinterable carbide ceramic material; from about 0.2 to about 0.5 percent by weight of a sintering aid of boron or beryllium selected from the group of elemental beryllium, beryllium compounds, elemental boron, boron compounds, or mixtures thereof; from about 14 to about 30 percent by weight of a mixture of thermoplastic resin and at least one oil or wax having a lower volatilizing temperature than said resin; and a carbon source material sufficient to provide from about 0.5 to about 5.0 percent by weight excess carbon,

b. injection molding said mixture to produce a molded product,

c. removing said thermoplastic resin by baking said molded product at a temperature between about 450° C. and about 1000° C. to produce a porous baked product, consisting of ceramic material, sintering aid and excess carbon,

d. sintering said baked product at a temperature between about 2000° C. and about 2200° C. to produce a sintered product.

4,233,257
METHOD OF MAKING A LIQUID JUNCTION FOR A REFERENCE ELECTRODE

Hiroshi Maruyama, and Masashi Watanabe, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Division of Ser. No. 705,284, Jul. 14, 1976, abandoned. This application May 2, 1978, Ser. No. 902,836
Claims priority, application Japan, Jul. 14, 1975, 50-85944
Int. Cl.[3] B29F 5/02; G01N 27/30
U.S. Cl. 264—113 6 Claims

1. A method of forming a liquid junction for a reference electrode comprising:

forming a first support layer of polytetrafluoroethylene alone in a mold;

compressing said first support layer;

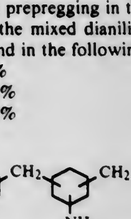
forming a second liquid junction layer on top of said compressed first layer, said second layer comprising one material selected from the group consisting of:

a mixture of a polytetrafluoroethylene and an inactive particulate substance

a mixture of polytetrafluoroethylene and an electro-chemically inactive salt, and

a mixture of polytetrafluoroethylene, an inactive particulate substance, and an electro-chemically inactive salt;

compressing said second liquid junction layer;



forming a third support layer of polytetrafluoroethylene alone on top of said compressed second liquid junction layer;

compressing said third support layer; and

sintering said three compressed layers.

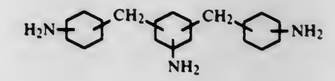
4,233,258
METHOD FOR PREPARING ADDITION TYPE POLYIMIDE PREPREGS

Terry L. St. Clair, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

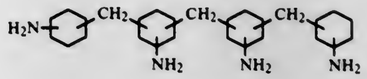
Division of Ser. No. 839,963, Oct. 6, 1977, Pat. No. 4,166,170.
This application Feb. 13, 1979, Ser. No. 11,737
Int. Cl.[3] B32B 27/12
U.S. Cl. 264—137 5 Claims

1. A method for preparing a novel addition type polyimide prepreg comprising the steps of reacting equimolar quantities of benzophenonetetracarboxylic acid dianhydride and norbornene dicarboxylic acid anhydride in an excess of absolute ethanol while heating to 50°-60° C. until solution occurs, cooling the resulting solution of ethylesters to room temperature and adding the cooled solution to a vessel containing an equimolar solution of mixed dianilines, stirring the combined solution for approximately one hour to obtain a homogeneous ester-acid polyimide prepolymer adaptable for "hot-melt" prepreg applications as a liquid resin system, and including the further steps of applying the liquid resin system onto fibers after heating the resin to 50°-70° C. to lower the resin viscosity adqequately to permit prepregging in the absence of a carrier solvent and wherein the mixed dianilines are the isomers of methylenedianilines and in the following percentages:

o,o'—MDA—3.20%
o,p'—MDA—15.70%
p,p'—MDA—66.00%



4.50% (all isomers)



10.60% (all isomers).

4,233,259

METHOD OF AND APPARATUS FOR PRODUCING PROFILED STRANDS FROM ELASTOMERIC MATERIAL

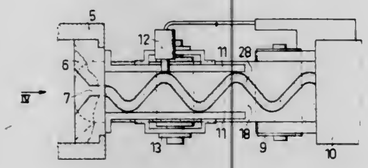
Udo Pietratus, Northeim, and Fritz Röthemeyer, Isernhagen, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 16, 1978, Ser. No. 951,638

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746201

Int. Cl.³ D01D *5/20*; B29D *7/00*

U.S. Cl. 264—167 **13 Claims**



1. A method of continuously producing a profiled strand from elastomeric material, especially an undulated edge, for a wavy-edge conveyor belt, comprising a linear base and a ridge placed on the base, which includes in combination therewith the step of:

extruding elastomeric material in the form of the desired profiled strand while concurrently imparting different flow velocities to said elastomeric material at different portions of the cross section of said strand so that at least one portion of said strand changes direction in tapering pockets along its length.

4,233,260

PROCESS FOR THE MANUFACTURE OF BRUSHES

Etienne, Y. G. J. d'Argembeau, 14 Rue de Belle-Vue, B-1050Brussels, Belgium

Filed Feb. 22, 1979, Ser. No. 13,995

Claims priority, application Luxembourg, Feb. 28, 1978, 79138

Int. Cl.³ B29D *31/00*

U.S. Cl. 264—243 **7 Claims**



1. A process for the continuous manufacture of tooth brushes comprising a bristle or pile carrying head and a handle integral with said head, said process comprising:

drawing substantially parallel and continuous monofilament or polyfilament yarns from supply means in a substantially vertical direction so as to entirely cross at least one mold cavity having the shape of two of said brush handles and heads placed back to back so as to project outside two opposite sides of said mold in a direction substantially perpendicular to said mold cavity at a part of said cavity having said shape of two brush heads placed back to back;

injecting a synthetic liquid or pasty thermoplastic or thermohardening material into said mold cavity so as to cause said parts of said parallel yarns crossing said mold cavity to be embedded into said synthetic material, to thereby form molded double brush blanks placed back to back having said yarns protruding from said two opposite sides;

removing said double brush blanks after said synthetic material has been at least sufficiently hardened in said mold cavity to maintain its molded shape;

dividing said molded double brush blanks into individual brush blanks by cutting them along the longitudinal axis of said double brush blanks; and

cutting said projecting yarns of each individual brush blank at a desired length so as to obtain completed individual brushes.

4,233,261

METHOD AND DEVICE FOR MANUFACTURING INFORMATION CARRIERS

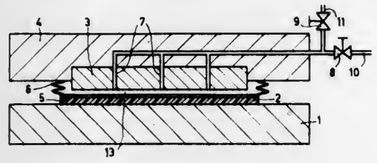
Andries Mijnheer, Eindhoven, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,505

Claims priority, application Netherlands, Sep. 28, 1977, 7710555

Int. Cl.² B29C *17/00*

U.S. Cl. 264—293 **4 Claims**



1. A method of manufacturing information carriers from a thermoplastic material, comprising first bringing a relatively thin die into contact with a relatively thick surface heated to a temperature slightly above the melting temperature of a solid thermoplastic substrate while maintaining said die spaced from said substrate, then maintaining the contact between the heated surface and the die and the spatial separation between the die and the substrate for a time sufficient to permit the die to acquire the temperature of the heated surface, then separating the die from the heated surface with an insulating layer of gas, and finally pressing the die against the thermoplastic substrate immediately thereafter by means of pneumatic pressure derived from said gas.

2. A device for manufacturing record carriers from a solid thermoplastic material, comprising a relatively thin information carrying die, a relatively thick block positioned in opposed relationship to said die and heated to a temperature slightly higher than the melting temperature of the thermoplastic material, means to position and support said thermoplastic material on a side of the die opposite and spaced from said block, and pressing means for alternately moving the die into a position spaced from said thermoplastic material and abutting the block and for thereafter moving the die to an alternate position spaced from the block and in contacting relationship with said thermoplastic material and for providing an insulting gas layer between the die and the block when the die is in the alternate position.

4,233,262

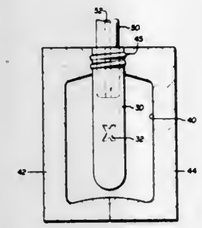
METHOD OF FORMING BLOWN POLYETHYLENE TEREPHTHALATE CONTAINERS

Nicholas J. Curto, Monroe, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 789,483, Apr. 21, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,511

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—509 **8 Claims**



1. In a method of forming a blown shape of polyethylene terephthalate having an exterior intaglio surface design, the steps of:

forming a blowable preform of polyethylene terephthalate having an exterior intaglio surface design defined by adjacent thick and thin wall portions destined to form the intaglio design in the blown container;

enclosing the blowable preform within a blow mold cavity having a smooth wall portion;

thermally conditioning the preform to a temperature in a range where the material is susceptible to strain hardening;

introducing blow fluid under pressure into the interior of the preform and thereby (1) expanding the preform outwardly to conform to said cavity, including contacting both the thick and thin wall portions of said design with said blow mold cavity wall portion, (2) strain hardening the preform, and (3), proportionately expanding the thick and thin portions of said design; and thereafter venting fluid under pressure from the interior of said blown shape to allow removal from the mold of the blown shape having said exterior intaglio surface design.

4,233,263

METHOD OF MAINTAINING BACTERIAL STERILITY IN URINE DRAINAGE BAGS

Anthony J. Schaeffer, Western Springs, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Apr. 2, 1979, Ser. No. 25,753

Int. Cl.³ A01N *59/00*; A61B *19/00*; A61L *2/18*; A61M *27/00*

U.S. Cl. 422—28 **7 Claims**

1. The method of maintaining bacterial sterility in a urine drainage bag of a closed urinary drainage system, wherein urine is collected in said bag for several hours and then emptied therefrom, consisting essentially of introducing into said bag before each period of urine collection from 15 to 60 milliliters of an aqueous solution of hydrogen peroxide (H_2O_2) containing from 0.025 to 0.035 grams of H_2O_2 per milliliter.

4,233,264

APPARATUS FOR PRODUCING A GASEOUS HYDROCARBON/AIR MIXTURE AND FOR THE CATALYTIC OXIDATION OF THIS MIXTURE

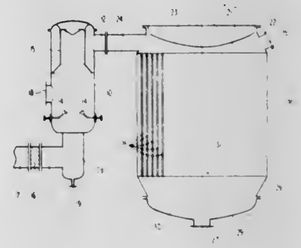
John H. Maude, Cologne; Lothar Sterck, Hürth, and Alfred Vilshöfer, Elsdorf, all of Fed. Rep. of Germany, assignors to Davy International AG, Frankfurt, Fed. Rep. of Germany

Filed Oct. 12, 1978, Ser. No. 950,794

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745765

Int. Cl.³ B01J *3/04, 10/00, 8/06*; G05B *9/00*

U.S. Cl. 422—117 **11 Claims**



1. Apparatus for forming a gaseous hydrocarbon/air mixture and for subsequently catalytically oxidizing said mixture, said apparatus comprising an evaporator having an air inlet pipe on the inflow side of said evaporator, an outlet pipe for said mixture on the outflow side of said evaporator and at least one injection nozzle positioned between said inlet and outlet pipes suitable for injecting hydrocarbon into said evaporator, and a shell-and-tube reactor comprising a plurality of parallel, externally cooled, catalyst-filled tubes, a hood on the upstream side of the tubes and a hood on the downstream side of the tubes, said hood on the downstream side being substantially convex-shaped as viewed from the exterior of said reactor and said hood on the upstream side being substantially concave-shaped as viewed from the exterior of said reactor such that the volume of the upstream hood is substantially reduced compared with the volume of an outwardly curved hood, said upstream hood being in communication with the outlet pipe of said evaporator.

4,233,265

LIQUID POLYMER HYDRATION

Kenneth E. Gasper, Overland Park, Kans., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 961,310, Nov. 16, 1978, Pat. No. 4,201,867. This application Jul. 25, 1979, Ser. No. 60,558

Int. Cl.³ B01F *5/00, 15/02*

U.S. Cl. 422—135 **4 Claims**

1. An apparatus for the hydration of liquid polymers comprising:

(a) first and second packed mixing columns, said columns made of oxidizing agent-inert plastic material, and said columns having walls defining a confined space for fluid flow in an overall mean flow direction approximately parallel to said walls;

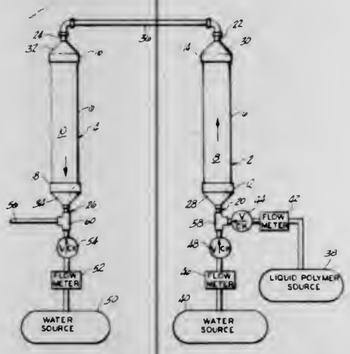
(b) two reducing couplings for each of said columns, one of said couplings being located at one end of said column and attached to said walls to form an inlet and the other of said couplings being located at the other end of said column and attached to said walls of said column to form an outlet, said couplings having surfaces which reduce the cross-sectional area of said confined space defined by said column walls, said coupling surfaces forming an angle of at least 110° with said column walls;

(c) said outlet of said first mixing column connected to said inlet of said second mixing column by means of a reducing passageway; the ratio of the average cross-sectional areas

between said confined spaces defined by said column walls and said confined space defined by the reducing passageway walls is from about 4:1 to about 20:1,

(d) a first check valve connected to said inlet of said first mixing column;

(e) a liquid polymer source;



(f) a metering means connecting said first check valve to liquid polymer source;

(g) a second check valve connected to said inlet of said first mixing column;

(h) a water source; and

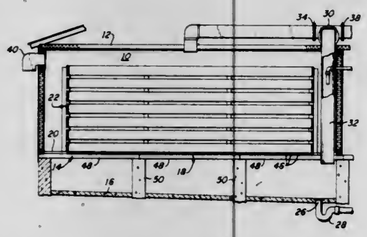
(i) a second metering means connecting said second check valve with said water source.

4,233,266

BULK PASTEURIZATION OF MUSHROOM COMPOST

David A. Kummer, P.O. Box 271, Elburn, Ill. 60119

Filed Sep. 18, 1978, Ser. No. 943,135
Int. Cl.[3] B01J *19/00*; C05F *11/08*; C12M *1/04*
U.S. Cl. 422—184 2 Claims



1. Apparatus for use in the bulk pasteurization and aeration of mushroom compost, comprising

an enclosed room having a chamber therein,

a floor spaced from the bottom of said room to provide a space below said floor,

said floor having an imperforate peripheral portion surrounding a central perforate portion,

an upright perforate wall extending upwardly from said floor in surrounding relationship with said central perforate portion,

said wall being spaced from the sides of said room to provide a space within said room surrounding said wall,

the imperforate peripheral portion of said floor defining the bottom of said space surrounding said wall and being connected to the sides of said room,

a passageway connected between the top of said chamber and said space below said floor,

blower means connected in said passageway for blowing air from the top of said chamber to said space below said floor and including

a blower having an inlet and an outlet, an inlet duct forming a part of said passageway connected between said chamber and said inlet of said blower, and an outlet duct forming a part of said passageway connected between said outlet of said blower and said space below said floor,

steam emitting means opening into said passageway downstream of said blower means for adding steam to the air blown into said space below said floor,

a fresh-air inlet port opening into said inlet duct, for supplying fresh air to said outlet duct,

valve means mounted between said fresh-air inlet port and a location outside said room for controlling the flow of fresh air into said outlet duct,

valve means mounted in said inlet duct between the inlet of said blower and the interior of said room to control the flow of air from said chamber to said outlet duct,

an open exhaust port carrying gases from said chamber to the ambient,

the bottom of said room sloping downwardly toward a position below said outlet duct and

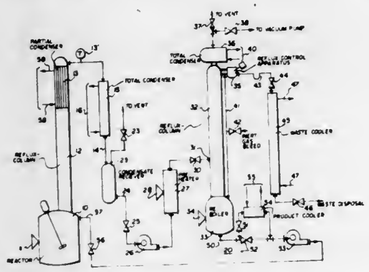
a liquid drain located at the bottom of said room below said outlet duct.

4,233,267

COMBINED BATCH REACTOR SYSTEM AND CONTINUOUS DISTILLATION APPARATUS

Robert J. Coker, Petrolia; Gary W. Bate, Point Edward, and Henk J. Deuzeman, Watford, all of Canada, assignors to Fiberglas Canada Limited, Toronto, Canada

Filed Jan. 18, 1978, Ser. No. 870,519
Claims priority, application Canada, Jan. 18, 1977, 269956
Int. Cl.[3] B01D *3/10*; B01J *14/00*
U.S. Cl. 422—187 8 Claims



1. An apparatus comprising a batch reactor system having a condensate output and a distillation apparatus in fluid communication with the condensate output; the batch reactor system comprising a batch reactor, a reflux column in communication with the batch reactor and a first total condenser for receiving and condensing a vapour effluent containing volatile by-products and reactants from the reflux column; the distillation apparatus comprising:

condensate receiving means including a condensate inlet coupled to said condensate output for receiving and temporarily storing condensate from the first condenser so that the distillation apparatus has operating parameters which are substantially independent of the operating parameters of the batch reactor system;

distillation column means for separating said by-products and reactants, the distillation column means including a reboiler disposed at a low end thereof and a vapour effluent oiutlet at the opposite end; and

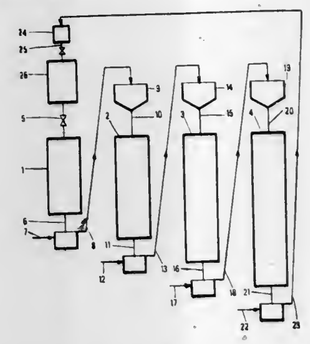
feed preheater means having an inlet in fluid communication with an outlet of said receiver means, evaporator means to vaporize condensate input thereto and an outlet feed in fluid communication with a vapour inlet of the distillation column means, whereby vaporized condensate is continuously separated into volatile by-products at the vapour effluent outlet and volatile reactants in the distillation column means independent of the temperature and pressure conditions in the batch reactor and the rate and composition of effluent from the reflux column.

4,233,268

APPARATUS FOR HYDROCARBON CONVERSION

Roger Boret, Le Pecq; Charles Bronner, Chatou; Roland Huin, Montesson-la-Borde, and Andre Vidal, Le Vesinet, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 741,744, Nov. 15, 1976, Pat. No. 4,133,743, which is a continuation of Ser. No. 589,987, Jun. 24, 1975, abandoned, which is a continuation of Ser. No. 305,797, Nov. 13, 1972, abandoned. This application Dec. 6, 1978, Ser. No. 966,994
Claims priority, application France, Nov. 16, 1971, 71.41069; Feb. 7, 1972, 72.04055; Mar. 13, 1972, 72.08731
Int. Cl.[3] B01J *8/02, 8/12, 23/90*; C10G *11/16*
U.S. Cl. 422—190 2 Claims



1. An apparatus for carrying out a catalytic hydrocarbon conversion process, comprising (a) at least two chambers of unequal volumes, connected in series and placed vertically side by side, each of said chambers containing, when in operation, a moving catalyst bed for carrying out the conversion of hydrocarbons, (b) an accumulator-decantor vessel in which used catalyst accumulates and (c) a fixed-bed regeneration chamber for regenerating used catalyst placed below the accumulator-decantor vessel, said apparatus further comprising:

an inlet connected to the upper part of each catalytic chamber for introducing a charge therein, fresh charge being introduced into the catalytic chamber of the smallest volume,

an outlet connected to the lower part of each catalytic chamber for withdrawing a charge therefrom,

heating means communicating with the outlet of each catalytic chamber, except the chamber of the greatest volume, and with the inlet of the succeeding catalytic chamber for heating the charge withdrawn from the preceding catalytic chamber, before its introduction into the succeeding catalytic chamber,

means for introducing catalyst at the top portion of each catalytic chamber,

means for withdrawing catalyst from the bottom portion of each catalytic chamber,

lift means for conveying catalyst withdrawn from the bottom portion of each catalyst chamber, except the chamber of the greatest volume, to the top portion of the succeeding catalytic chamber,

lift means for conveying catalyst withdrawn from the bottom of the catalytic chamber of the greatest volume to the accumulator-decantor vessel,

means for supplying each lift means with recycle hydrogen for use as the driving fluid for conveying catalyst,

duct means for transferring the catalyst accumulated in the accumulator-decantor vessel to the regeneration chamber,

means for isolating the regeneration chamber from the rest of the apparatus,

means for supporting a fixed catalyst bed in the regeneration chamber,

one or more inlets connected to the regeneration chamber for introduction therein of a gas containing molecular oxygen and an inert gas,

an inlet connected to the regeneration chamber for introducing therein a halogenated compound,

an outlet connected to the regeneration chamber for discharging the gases therefrom,

means for scavenging the regeneration chamber with nitrogen,

means for removing regenerated catalyst from the regeneration chamber,

means for introducing regenerated catalyst into the top portion of the catalytic chamber of the smallest volume, and

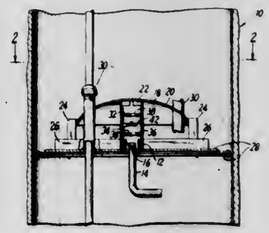
a compartment in which regenerated catalyst is reduced before being introduced into the upper part of the catalytic chamber of the smallest volume.

4,233,269

GAS LIQUID DISTRIBUTOR

Larry A. Kaye, Stanhope, and Robert M. Koros, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 777,028, Mar. 14, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,306
Int. Cl.[3] B01F *3/08*; B01J *12/00, 14/00*
U.S. Cl. 422—207 14 Claims



1. In an upward flow reactor chamber having a chamber wall and an inlet feed conduit located therein which is substantially smaller in its cross-section than the corresponding cross-section defined by said chamber wall and has inlet and upper outlet ends, said inlet end of said inlet conduit receiving an upward directed fluid stream, flow distributor means situated adjacent and downstream of and above said inlet conduit for directing flow in a general direction from said outlet end of said inlet conduit upward into said chamber, wherein the improvement comprises:

quench inlet means extending through said chamber wall and operably associated with said inlet conduit for injecting a quench liquid stream directly into said inlet conduit for upward flow in the same direction as said fluid stream wherein said fluid and quench liquid streams received by said inlet conduit are mixed, horizontal support means extending transversely across the entire cross-section of said chamber and having a single inlet feed opening in which said inlet feed conduit is located, said flow distributor means located downstream of and above proximate the outlet end of said inlet conduit for receiving said fluid and quench liquid streams and including at least a main member having a periphery and bottom surface facing said outlet end of said inlet conduit, said inlet conduit supported so that said outlet end is disposed at least directly adjacent to said bottom surface for directing said upward

flow of said fluid and quench liquid streams from said outlet end thereof against said bottom surface of said flow distributor means, said bottom surface constructed and arranged for cooperation with said upward flow of said streams for directing at least a part of said upward flow around the periphery of said main member into a relatively open flow area within said chamber above said main member, means for supporting said flow distributor means including at least said main member in said chamber in transverse fixed relation relative to said chamber wall, said main member extending transversely for a substantial portion of the cross-section of said chamber and having a greater transverse cross-section than the corresponding cross-section of said outlet end of said inlet conduit, said flow distributor means aiding in the distribution of fluid uniformly over the transverse cross-section of said chamber.

4,233,270

PROCESS AND DEVICE FOR GROWING CRYSTAL

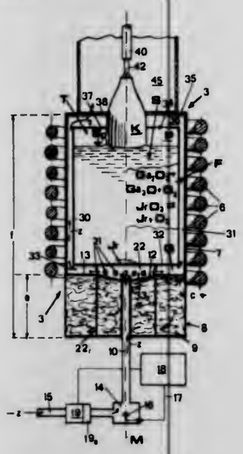
Walter Schmidt, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 820,571, Aug. 1, 1977. This application Oct. 30, 1978, Ser. No. 955,619

Claims priority, application Switzerland, Aug. 5, 1976, 10043/76

Int. Cl.³ B01J *17/18*

U.S. Cl. 422—249 **13 Claims**



1. A device for growing single crystals from a melt in a heated iridium crucible using the Czochralski technique which melt is kept at a temperature substantially above the solidification temperature of said melt in a heated crucible, wherein iridium from said crucible contaminates said melt, which comprises means for cooling at least the bottom of said crucible contacting said melt and the lowest part of the melt resting on the bottom to a temperature above the solidification temperature of said melt but low enough to precipitate said iridium, means for providing an annular space between substantially all of the side walls of said crucible and container for coolant flow in said space, flow distribution means positioned and dimensioned beneath the crucible bottom to provide a greater cooling effect on the bottom of said crucible, said greater cooling effect being sufficient to precipitate said iridium, wherein said cooled region beneath the crucible bottom acts as a nucleation center for precipitation of dissolved iridium and wherein the iridium is precipitated from said region and remains there so that said iridium can no longer enter the crystal, and wherein the service life of the crucible is increased.

4,233,271

ARRANGEMENT FOR THE STERILIZING OF A PACKING MATERIAL WEB

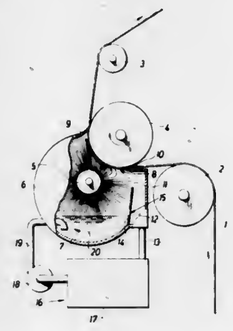
Ernst G. Ernstsson, Staffanstorp, and Alfred Fuchs, Lund, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Apr. 2, 1979, Ser. No. 26,058

Claims priority, application Sweden, Apr. 5, 1978, 7803828

Int. Cl.³ A61L *2/18*; B65B *55/10, 55/24*

U.S. Cl. 422—300 **7 Claims**



1. An arrangement for the sterilizing of a web of packing material which is subsequently formed into packing containers comprising:

a container for a sterilizing liquid, said container having an outer wall, said outer wall having an opening therein;

a rotary brush disposed within said container, means mounting said brush for rotation about an axis, a first portion of said outer wall that is adjacent said opening being closer to said axis than a second portion of said outer wall that is on the opposite side of said opening from said axis, and said outer wall being spaced progressively closer to said axis from said second portion toward said first portion;

said container including a reservoir to receive sterilizing liquid along said second portion; and

means to convey a web of packing material across said opening whereby said rotary brush dips into said reservoir and cooperates with said outer wall to concentrate the flow of sterilizing liquid toward and into contact with said packing material web.

4,233,272

PROCESS FOR SELECTIVE SEPARATION OF URANIUM FROM SOLUTIONS BY MEANS OF AN ION EXCHANGER

Nahit Eresen, Bonn; Klaus Schröer, Bonn-Tannenbusch, and Hans J. Becker, Cologne, all of Fed. Rep. of Germany, assignors to Uranerzbergbau GmbH, Bonn, Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,466

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627540

Int. Cl.² C01G *43/00*

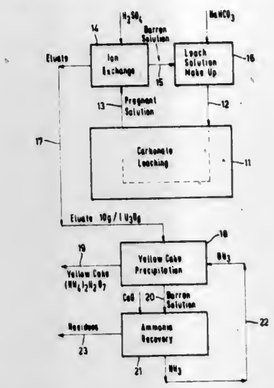
U.S. Cl. 423—7 **8 Claims**

5. A process for obtaining uranium from an ore containing uranium and a material selected from the group consisting of arsenic, copper, molybdenum and lead comprising:

(a) contacting the ore with an acid under oxidizing conditions to thereby form a pregnant liquor containing uranium and the material;

(b) contacting the pregnant liquor with hydrogen sulfide to precipitate a sulfide of the material;

(c) in the absence of an oxidizing step, contacting the hydrogen sulfide treated liquor with a chelate-forming cation exchanger; and



(d) recovering uranium from the chelate-forming cation exchanger.

4,233,273

SELECTIVE EXTRACTION OF IRON AND ALUMINUM FROM ACIDIC SOLUTIONS

Gustavo A. Meyer; Simon O. Fekete, both of Arvada, and Gordon R. Wicker, Lakewood, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 16, 1979, Ser. No. 12,783

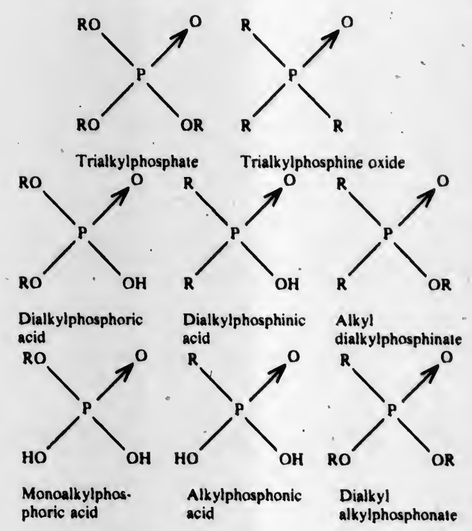
Int. Cl.³ C01F *7/00*; C01G *49/00*

U.S. Cl. 423—112 **9 Claims**

1. A method of selectively extracting trivalent ions of Fe and Al from an acid solution of pH below 4 containing at least one of said ions and also containing at least one of said divalent ions which comprises,

uniformly mixing said solution with a liquid organic extractant comprising by weight about 1% to 40% of an organophosphorus compound and about 5% to 20% of a sulfonic acid dissolved in a water-immiscible organic solvent,

said organophosphorus compound being selected from the group consisting of



where R is a long hydrocarbon selected from the group consisting of n-octyl, 2-ethylhexyl, 3,5,5-trimethylhexyl, 2-ethyl-4-methylpentyl, 2-propyl-4-methylpentyl, octyl-2, diisobutylmethyl, 8-phenylpropyl, phenyl-2-ethylhexyl, n-decyl, n-oxtyl, 2,6,8-trimethylnonyl-4 and 3,9-diethyltridecanol-6,

said sulfonic acid having the general formula



where R is an alkylaromatic hydrcarbon substituent and the mol weight of the sulfonic acid is at least 300

the molar ratio of said sulfonic acid to said organophosphorus compound being 1:4 to 10:1, continuing said mixing for a time sufficient to effect solvent extraction of at least one of said trivalent ions and provide a raffinate impoverished in said trivalent ions and containing at least one of said divalent ions and a loaded extractant containing said trivalent ions,

separating said loaded extractant from said raffinate,

stripping said trivalent ions iron and aluminum from the loaded organic extractant in two stages,

wherein in the first stage the aluminum is selectively stripped by contacting the loaded extractant with a mineral acid of concentration ranging from about 2 N to 6 N while leaving substantially all of the trivalent iron in the extractant,

and wherein in the second stage, the trivalent iron is stripped from the extractant by contacting it with a mineral acid of concentration greater than that used in the first stage and ranging from about 4 N to 12 N, the organic extractant being regenerated for recycling into the process.

4,233,274

METHOD OF EXTRACTING AND RECOVERING MERCURY FROM GASES

Torkel Allgulin, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 911,817, Jun. 2, 1978, abandoned, which is a continuation of Ser. No. 816,131, Jul. 15, 1977, abandoned, which is a continuation of Ser. No. 723,473, Sep. 14, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,235

Claims priority, application Sweden, Sep. 16, 1975, 7510341

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **12 Claims**

1. A method for extraction and recovery of mercury from gases containing gaseous elementary mercury, which comprises

(a) treating the gas containing mercury with an aqueous solution in a closed circuit, the solution containing 0.1–300

mmol/l mercury(II)-ions and at least double that content of ion or ions selected from the group consisting of chlorine, bromine, iodine, cyanide and rhodanide ions with the ability to form soluble complexes with mercury (II)-ions, whereby the mercury in the gas is absorbed in the solution,

(b) freeing the solution obtained of the mercury absorbed by leading off at least some of the solution, treating the same with a reducing agent and separating precipitated mercury compounds and

(c) after mercury precipitation returning the solution, complex forming ions and mercury (II)-ions to the closed circuit in a quantity sufficient to maintain said concentration in the aqueous solution.

4,233,275

PROCESS AND APPARATUS FOR PURIFYING RAW COAL GAS

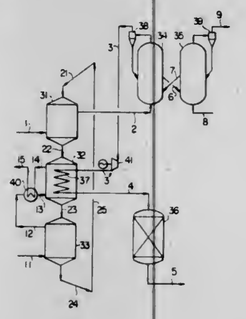
Shoichi Kimura; Toshihiko Takahashi, and Zensuke Tamura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1978, Ser. No. 965,512

Claims priority, application Japan, Dec. 2, 1977, 52-143917; Dec. 26, 1977, 52-156603; Mar. 24, 1978, 53-33102

Int. Cl.³ B01D 53/34

U.S. Cl. 423—230 **16 Claims**



1. A process for purifying a high pressure raw coal gas having a temperature in the range of 800° C. or greater and containing tarry matter, hydrogen sulfide and ammonia, which comprises:

contacting the raw coal gas with solid particles having a lower temperature than the raw coal gas, thereby cooling the raw coal gas to a temperature in the range of 550°–800° C., and thereby simultaneously removing tarry matter from the raw coal gas by condensing and depositing the tarry matter on the solid particles;

thereafter contacting the raw coal gas having a temperature within the range of 550°–800° C., from which the tarry matter has been removed, with solid particles that will absorb hydrogen sulfide to thereby remove the hydrogen sulfide from the raw coal gas;

burning the removed tarry matter to produce heat of combustion;

thereafter heating the raw coal gas, from which the tarry matter and hydrogen sulfide have been removed, to a temperature in the range of 700°–900° C. with the heat of combustion produced by the burning of the removed tarry matter; and

thereafter contacting the raw coal gas at a temperature within the range of 700°–900° C. from which the tarry matter and hydrogen sulfide have been removed, with an ammonia decomposition catalyst to decompose and remove ammonia.

4,233,276

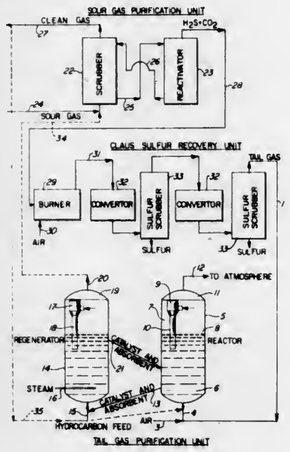
PROCESS FOR THE DESULFURIZATION OF WASTE GASES

Gerard J. D'Souza, Glen Ellyn, and Herschel D. Radford, Flossmoor, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 30, 1979, Ser. No. 25,377

Int. Cl.² B01D 53/34

U.S. Cl. 423—230 **7 Claims**



1. A process for the removal of oxidizable sulfur compounds from a waste gas which process comprises:

(a) mixing a waste gas containing compounds oxidizable to sulfur oxides with molecular oxygen and oxidizing said compounds to sulfur oxides;

(b) contacting said waste gas with a metal oxide absorbent capable of absorbing sulfur oxides, at a temperature of between about 100° C. and 800° C., and absorbing sulfur oxides with said metal oxide absorbent;

(c) simultaneously, in the presence of a hydrocarbon cracking catalyst and at a temperature of between about 375° C. and about 1,200° C., cracking a hydrocarbon, regenerating the spent metal oxide absorbent; and contacting the absorbent with steam to form hydrogen sulfide and separating the hydrogen sulfide from cracked hydrocarbon products.

4,233,277

PREPARING REFRACTORY METAL BORIDE POWDER

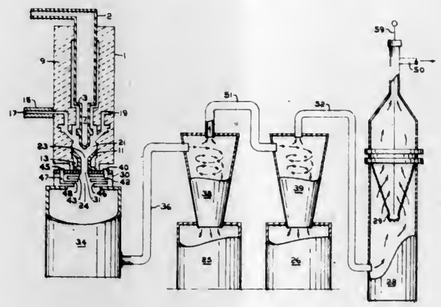
Robert S. Sheppard, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,837

Int. Cl.² C01B 35/04

U.S. Cl. 423—297 **17 Claims**

1. In the process for preparing refractory metal boride powder selected from the borides of the metals titanium, zirconium and hafnium by gas phase reaction of the corresponding metal halide reactant and boron source reactant selected from the group consisting of boron halide and boron hydride in the presence of hydrogen in a reactor wherein said reactants are introduced into a reactant mixing zone through reactant inlet assembly means and reacted within the reactor to form solid refractory metal boride powder and wherein the metal boride powder tends to deposit and accumulate on the surfaces of the assembly means exposed to said reactants, the improvement which comprises establishing a hydrogen-containing gas stream in close proximity to but spaced from the exposed surfaces of the reactant inlet assembly means, introducing boron source reactant mixed with inert carrier gas into said hydrogen-containing gas stream, introducing metal halide reactant and substantially anhydrous hydrogen halide into said hydrogen-containing gas stream upstream of the boron source reactant, the amount of hydrogen halide introduced being sufficient to retard growth of said metal boride powder on said



exposed surfaces of the assembly means, the heat content of the hydrogen-containing gas stream and reactants being sufficient to establish refractory metal boride forming temperatures in said reactor.

4,233,278

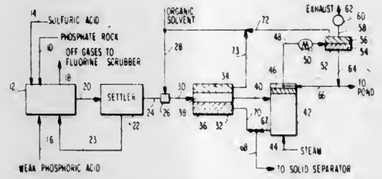
PROCESS FOR PURIFYING CRUDE PHOSPHORIC ACID

Joseph D. Korchnak, Lakeland, Fla., assignor to Davy Powergas Inc., Lakeland, Fla.

Filed Mar. 24, 1978, Ser. No. 889,985

Int. Cl.² C01B 25/22

U.S. Cl. 423—321 S **5 Claims**



1. In a wet process for the production of phosphoric acid of improved purity whereby a phosphoric acid slurry containing both volatizable organic material and non-volatile extractable ingredients from phosphate rock is contacted with a liquid organic extractant which extracts said extractable ingredients, thereby providing an extraction phase, an aqueous acid phase and a phase consisting essentially of a heterogenous mixture of both extraction and acid phases, said heterogenous mixture phase containing both volatizable organic material and bindable non-volatile ingredients; the improvement which comprises:

separating the heterogenous mixture phase from the extraction and acid phases, and treating the separated heterogenous mixture phase under steam-stripping, volatile organic-removing conditions including atmospheric or subatmospheric pressures to steam-strip the mixture so as to provide an overhead containing steam and steam-stripped, volatized organic material, thereby removing volatile organic material from the mixture, and to also thereby bind said bindable non-volatile ingredients to enhance their separation from the heterogenous mixture phase by liquid-solid separation procedures.

4,233,279

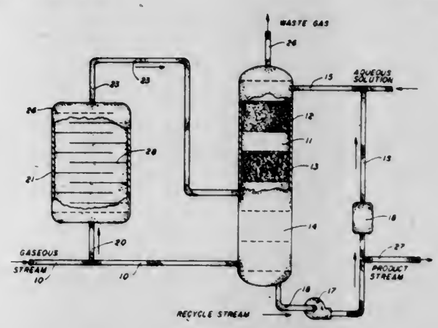
PROCESS FOR THE SYNTHESIS OF AMMONIUM NITRITE

Laszlo J. Balint; Lamberto Crescentini; William B. Fisher, all of Chester, and Muhammad S. Sahli, Richmond, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 881,453, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,526, Apr. 25, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 44,878

Int. Cl.³ C01B 21/50

U.S. Cl. 423—385 **7 Claims**



1. In a process for producing ammonium nitrite by the absorption in a continuous gaseous phase absorption chamber of a gas containing nitric oxide, nitrogen dioxide, oxygen and at least 65 percent by volume of inert gas in an absorption system with an aqueous absorbing solution containing a basically reacting ammonium compound selected from the group consisting of ammonium carbonate, ammonium bicarbonate, ammonium hydroxide and mixtures thereof, employing entering gas with at least 2.0 mol ratio of nitric oxide:nitrogen dioxide and employing absorbing solution having normality of at least 0.1 with respect to the basically reacting ammonium compound, the improvement which comprises:

(a) maintaining the absorption system at a pressure of 5 to 25 psig;

(b) adding supplemental nitrogen dioxide to said gas being absorbed in the absorption system, said supplemental nitrogen dioxide being added to said gas when the absorption of nitrogen oxides is 50 to 99 percent complete based on the nitrogen oxides in the entering gas, said supplemental nitrogen dioxide being added to said gas in amount sufficient to provide a nitrogen dioxide:nitric oxide mol ratio between 1 and 4 in the resulting mixture, whereby nitrogen oxide emission as vent gas from the absorption system is significantly reduced.

4,233,280

MANUFACTURE OF ANHYDROUS HYDROGEN CHLORIDE BY COMBUSTING CHLORINE-CONTAINING ORGANIC SUBSTANCES

Jan Langens, Kalmthout, and Guido Devroe, Kapellen, both of Belgium, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,737

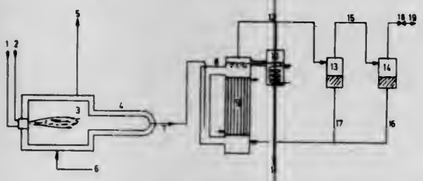
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827761

Int. Cl.³ C01B 7/08

U.S. Cl. 423—481 **3 Claims**

1. A process for obtaining anhydrous hydrogen chloride from chlorine-containing organic residues by combusting these in an oxygen-containing atmosphere and separating the hydrogen chloride from the water formed during combustion, wherein the combustion of the organic residues, in which the

weight ratio of hydrogen and chlorine is greater than 0.028, is carried out in an atmosphere containing more than 80% by volume of oxygen, at pressures of from 1 to 100 bar and at above 2,000° C., the combustion products are cooled to from 200° to 800° C. and are then passed into a first cooling zone which contains a solution of hydrogen chloride in water, the



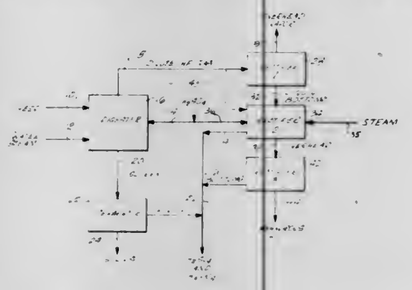
mixture of water, hydrogen chloride and the other combustion products is cooled to from 10° to 80° C., the gaseous mixture which contains hydrogen chloride and carbon dioxide is then discharged from the first cooling zone and cooled to from −40° C. to 0° C. in a second cooling zone, and is separated from the aqueous hydrochloric acid which condenses and is discharged from the second cooling zone.

4,233,281

RECOVERY OF HYDROGEN FLUORIDE FROM METALLIC FLUORIDE SALTS

Ronald J. Hirko, and Harold E. Mills, both of Lake City, Fla., assignors to Occidental Chemical Company, Houston, Tex.

Filed Jun. 9, 1978, Ser. No. 914,130
Int. Cl.[2] C01B 7/19
U.S. Cl. 423—484 **54 Claims**



13. In a method for recovering hydrogen fluoride containing phosphate values, reported by analysis as P_2O_5, from a metallic fluoride salt mixture comprising at least about 7% by weight, on a dry basis, fluorine and analyzing to contain from about 4% to about 25% by weight, on a dry basis, P_2O_5, the method comprising the steps of:

introducing such metallic fluoride salt mixture and sulfuric acid in an amount in excess of that required for reaction with the metallic fluoride salt mixture into a digestion stage maintained at an elevated temperature sufficient for reaction therein of the metallic fluoride salt mixture with sulfuric acid and reacting the sulfuric acid with the metallic fluoride salt mixture to release a gas comprising hydrogen fluoride and phosphate values and produce a slurry comprising a residual liquid including introduced unreacted sulfuric acid and residual solids resulting from reaction of the metallic fluoride salt mixture with sulfuric acid; and

withdrawing the released gas and slurry from the digestion zone, the improvement comprising the steps of:

introducing water to the digestion zone; and

maintaining the concentration of water and sufficient excess unreacted sulfuric acid in the digestion zone such that the released gas comprising hydrogen fluoride withdrawn from the digestion zone is substantially free of phosphate values and has a weight ratio of hydrogen fluoride to P_2O_5 of greater than 100.

4,233,282

MOLTEN SALT SYNTHESIS OF BARIUM AND/OR STRONTIUM TITANATE POWDER

Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,924
Int. Cl.[3] C01G 23/00
U.S. Cl. 423—598 **6 Claims**

1. A process for producing alkaline earth titanate powder which consists essentially of providing particulate TiO_2 in at least stoichiometric amount or particulate precursor therefor, providing particulate alkaline earth oxide in at least stoichiometric amount or particulate precursor therefor, said alkaline earth oxide being selected from the group consisting of BaO, SrO, and mixtures thereof, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said TiO_2 or precursor therefor, said alkaline earth oxide or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said TiO_2, alkaline earth oxide and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said TiO_2 and alkaline earth oxide, maintaining said reaction temperature dissolving and reacting said TiO_2 and alkaline earth oxide in said molten salt and precipitating said alkaline earth titanate, and recovering said precipitated alkaline earth titanate by dissolving said chloride salt and separating said precipitated alkaline earth titanate from the resulting salt solution.

4,233,283

METHOD FOR MANUFACTURE OF IRON OXIDE FLAKES

Kazuaki Ado, Sakai; Soichiro Nobuoka, Toyonaka, and Takashi Asai, Minoo, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 15, 1979, Ser. No. 21,241
Claims priority, application Japan, May 20, 1978, 53-60193
Int. Cl.[3] C01G 49/06
U.S. Cl. 423—633 **4 Claims**

1. In a method for the manufacture of micaceous α-iron oxide by the steps of mixing an aqueous ferric salt solution with an aqueous alkali solution thereby producing an amorphous precipitate and subjecting the precipitate to a hydrothermal treatment at a temperature of more than 150° C. under pressure of more than 5 kg/cm^2, the improvement which comprises the step of adding boric acid or a salt thereof in an amount of 0.1 to 10% by weight, based on the ferric salt computed as an anhydride, prior to the hydrothermal treatment.

4,233,284

STABILIZED RADIOGRAPHIC SCANNING AGENTS

Mahdi B. Fawzi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1978, Ser. No. 892,245
Int. Cl.[2] A61K 29/00, 43/00
U.S. Cl. 424—1 **22 Claims**

21. A method of preparing a stabilized technetium-99m-based scanning agent, comprising codissolving a stabilizing amount of a gentisate stabilizer selected from gentisic acid or a pharmaceutically-acceptable salt or ester thereof with an aqueous solution of radioactive technetium in the +3, +4 or +5 valence state.

4,233,285

MERCAPTOCARBOXYLIC ACID RADIOPHARMACEUTICALS

Harry S. Winchell, Lafayette, and Tz-Hong Lin, Berkeley, both of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Filed May 14, 1973, Ser. No. 359,719
The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.
Int. Cl.[2] A61K 29/00, 43/00
U.S. Cl. 424—1 **9 Claims**

1. A radiopharmaceutical comprising a complex of a mercaptocarboxylic acid chelating agent having at least one carboxylic acid group and at least one mercapto group with a radioactive heavy metal ion produced by reduction with stannous chloride in the presence of the chelating agent wherein said complex is formed at a pH of from about 2 to 4 and the mole ratio of said metal chelating agent to stannous chloride present to reduce such metal ion is about three to one.

4,233,286

LOW AFFINITY IGM-LATEX PARTICLES AND ASSAY THEREWITH FOR IMMUNE COMPLEXES

John F. Soothill, and Roland J. Levinsky, both of London, England, assignors to National Research Development Corporation, London, England

Filed Sep. 9, 1977, Ser. No. 831,872
Claims priority, application United Kingdom, Aug. 31, 1977, 36364/77
Int. Cl.[2] G01N 21/00, 23/00, 31/00, 33/16
U.S. Cl. 424—12 **14 Claims**

1. A method for the estimation of a human immune complex and analysis of an antibody constituent thereof comprising a latex particle agglutination test, in which a sample containing human immune complex is incubated with latex particles coated with low affinity IgM antibodies raised in a non-human animal against said human anitbody constituent.

7. A latex particle product coated with immunoglobulins consisting of low affinity IgM antibodies raised in a non-human animal against a human antibody.

4,233,287

SYNTHETIC RESIN-BASE; ANTIBIOTIC COMPOSITIONS CONTAINING AMINO ACIDS

Dietrich Heusser, and Elvira Dingeldein, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 845,703, Oct. 26, 1977. This application Oct. 9, 1979, Ser. No. 82,455
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651441; Jun. 18, 1977, 2727535
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.[3] A61K 31/78, 9/70; A61F 13/00; A61L 15/03
U.S. Cl. 424—14 **11 Claims**

1. A pharmaceutical composition in the form of individual particles of a base of polymethacrylate, polyacrylate or a mixture thereof, connected together at least partially via filaments or wires, the particles further comprising at least one antibiotic in antimicrobial amounts and an antibiotic-liberating agent wherein the antibiotic-liberating agent consists essentially of at least one amino acid.

4,233,288

GUM EMULSIFIED LIQUID PACKAGE FOR DELIVERING AND PRESERVING LIQUID CONTENT IN THE MOUTH

John A. Cornell, 32nd and Spring Garden Sts., Philadelphia, Pa. 19104

Filed Mar. 12, 1979, Ser. No. 19,639
Int. Cl.[3] A61K 9/68
U.S. Cl. 424—48 **8 Claims**

1. A chewing gum emulsified liquid composition for maintaining and adding to the liquid content in the mouth to ameliorate xerostoma and add mineral salts and water comprising:

from 40 to 62 parts water containing dissolved mineral salts, including sodium, potassium, calcium and magnesium chlorides, and potassium phosphates at a concentration of from 1% to 3% of the water constituting the dispersed phase;

from about 25 to 35 parts hydrophobic chewing gum base selected from the class consisting of gum chicle and SBR synthetic rubber gum as the dispersed phase;

from 2 to 2000 parts per million fluoride ions based on sodium fluoride, stannous fluoride or sodium fluorophosphate;

from about 3 to 6 parts by weight of water soluble carbohydrate sweetener which is dissolved in the mineral salt water solution;

from 1% to 3% glycerine to augment the liquid phase;

an emulsifier in a concentration of 0.1% to 1.0%;

from about 4% to 5% of a finely divided filler selected from the class consisting of cellulose fibrous filler, CMC and calcium phosphate filler.

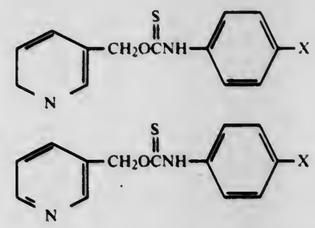
4,233,289

3-PYRIDYLMETHYLTHIOCARBAMATES

Edward E. Kilbourn, Chalfont; Ernest D. Weller, Ambler, and William D. Weir, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 891,581, Jun. 30, 1973. This application Jan. 31, 1979, Ser. No. 8,296
Int. Cl.[3] A01N 431/40; C07D 213/59
U.S. Cl. 424—84 **11 Claims**

1. A rodenticidal composition which comprises an inert carrier and as the active ingredient a compound of the formula



wherein X is cyano, nitro, mercapto, $(C_1\text{-}C_6)$alkylthio, $(C_1\text{-}C_6)$alkylsulfinyl, $(C_1\text{-}C_6)$alkylsulfonyl or $(C_1\text{-}C_6)$alkylsulfamyl; and the strong acid addition salts thereof.

4,233,290

METHOD OF TREATING DOMESTIC ANIMALS

Lorenzo Ferrari; Ernani Dell'Acqua, and Giorgio Quaglia, all of Milan, Italy, assignors to SPA-Societa Prodotti Antibiotici, S.p.A., Milan, Italy

Filed Mar. 1, 1979, Ser. No. 16,616
Int. Cl.[3] A61K 37/48; A23C 9/12
U.S. Cl. 424—94 **10 Claims**

1. A method of treating domestic animals endangered by or suffering from vaccination stress, wherein a member selected from the group consisting of lysozyme and non-toxic salts of lysozyme is administered to a domestic animal endangered by or suffering from vaccination stress in amounts effective to counteract the effects of such vaccination stress.

4,233,291

NOVEL BIOLOGICAL SUBSTANCE FROM A FUNGUS AND THE PROCESS FOR PRODUCING THE SAME

Nicole Simon-Lavoine, Neuilly, and Marcel Forgeot, Paris, both of France, assignors to Science Union et Cie, Suresnes, France

Filed Nov. 27, 1978, Ser. No. 964,071

Claims priority, application France, Nov. 30, 1977, 77 36000

Int. Cl.³ A61K *37/00*; C07C *103/52*; C12P *21/00*

U.S. Cl. 424—177 **17 Claims**

1. A mixture of peptidolic substances obtained from the mycelium of Fusarium equiseti, said mixture being separable into four components by high pressure liquid chromatography, said components being designated A, B, C & D, said mixture, on acidic hydrolysis yielding α-hydroxy iso valeric acid and N-methyl Valine; N-methyl isoleucine and N-methyl allo iso leucine, and on alkaline hydrolysis yielding the lactone of α hydroxy isovaleroyl N-methyl Valine, the lactone of α-hydroxy isovaleroyl N-methyl isoleucine and the lactone of α-hydroxy iso valeroyl N-methyl allo iso leucine.

4,233,292

CYCLOPROPYL SULFONIUM SALTS

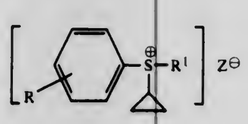
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 7, 1979, Ser. No. 10,016

Int. Cl.³ A61K *31/69, 31/095*; C07C *147/00*

U.S. Cl. 424—185 **3 Claims**

1. A method of treating obesity in a mammal in need of such treatment, which comprises administering to said mammal an obesity treating effective amount of a compound of the formula:



wherein

R is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, halo having an atomic weight of from about 19 to 35 or trifluoromethyl;

R^1 is alkyl having from 1 to 20 carbon atoms; and

Z is BF_4, ClO_4 or SO_3R^2;

wherein R^2 is methyl, phenyl, p-tolyl, or 2-naphthyl.

4,233,293

INSECTICIDAL AND ACARICIDAL O-ALKYL-O-[1-(2-CYANOALKYL)-5-HALO-1,2,4-TRIAZOL(3)YL]-(THIONO)(THIOL)-PHOSPHORIC(-PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Rainer A. Fuchs, Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath-Steinenbrueck, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

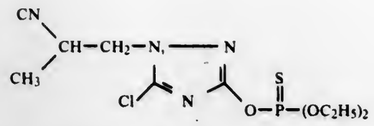
Filed Apr. 26, 1976, Ser. No. 680,408

Claims priority, application Fed. Rep. of Germany, May 14, 1975, 2521400

Int. Cl.³ A01N *57/16, 57/32*; C07F *9/65*

U.S. Cl. 424—200 **3 Claims**

1. The compound O,O-diethyl-O-[1-(2-cyanopropyl)-5-chloro-1,2,4-triazol(3)yl]-thionophosphoric ester of the formula



2. An insecticidal or acaricidal composition containing as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,233,294

METHOD OF COMBATTING *PLUTELLA MACULIPENNIS* WITH O-ISOPROPYL-S-[5-BROMO-PYRIMIDIN-2-YL]-THIONOTHIOL-METHANE-PHOSPHONIC ACID

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

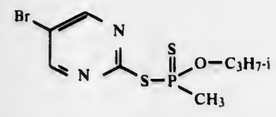
Filed Dec. 21, 1978, Ser. No. 971,780

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801584

Int. Cl.³ A01N *57/16*; C07F *9/65*

U.S. Cl. 424—200 **1 Claim**

1. A method of combating Plutella maculipennis which comprises applying thereto or to a habitat thereof an arthropodicidally effective amount of O-isopropyl-S-[5-bromo-pyrimidin-2-yl]-thionothiol-methane-phosphonic acid ester of the formula



4,233,295

CORTICOSTEROID FORMULATIONS CONTAINING SEBACATE CARRIER

John A. Hill, New Brunswick; Yu-chang J. Wang, and Thomas M. Wong, both of North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 31, 1979, Ser. No. 43,989

Int. Cl.³ A01N *45/00*; A61K *31/56*

U.S. Cl. 424—238 **16 Claims**

1. A steroid composition in the form of an ointment, gel, lotion, cream or solution which is useful in treating dermatitis, consisting essentially of an effective amount of from about 0.001 to about 3% by weight of a corticosteroid and a dialkyl sebacate in an amount of from about 5 to about 75% by weight of the composition, the corticosteroid being dissolved in the dialkyl sebacate.

4,233,296

11β-SUBSTITUTED-$\Delta^{4,9}$-ESTRADIENES

Jean G. Teutsch, Le Blanc-Mesnil, and Daniel Philibert, La Varenne Saint-Hilaire, both of France, assignors to Roussel Uclaf, Paris, France

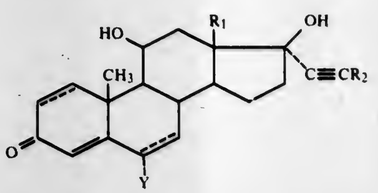
Filed Jan. 6, 1978, Ser. No. 867,485

Claims priority, application France, Jan. 13, 1977, 77 00858

Int. Cl.² A61K *31/58, 31/56*; C07J *17/00, 1/00*

U.S. Cl. 424—241 **32 Claims**

1. A compound of the formula



wherein R_1 is linear or branched alkyl of 1 to 12 carbon atoms, unsaturated alkyl of 2 to 8 carbon atoms optionally substituted with a member selected from the group consisting of alkylthio of 1 to 4 carbon atoms and halogens aryl of 6 to 12 carbon atoms and aralkyl of 7 to 13 carbon atoms optionally substituted with at least one member of the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, halogen and $-CF_3$ and a heterocycle selected from the group consisting of thienyl, isothienyl and furyl, R_2 is alkyl of 1 to 4 carbon atoms, R_3 is selected from the group consisting of hydrogen, hydroxy, acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, alkoxy of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 18 carbon atoms and R_4 is selected from the group consisting of hydrogen, hydroxy, alkyl and alkoxy of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms and acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, with the proviso that R_4 is not hydrogen when R_1 is allyl, R_2 is methyl and R_3 is hydroxy.

15. A progestomimetic composition comprising a progestomimetically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

29. A method of inducing progestomimetic activity in warm-blooded animals comprising administering to warm-blooded animals a progestomimetically effective amount of at least one compound of claim 1.

4,233,297

NOVEL Δ^4-ANDROSTENES

Jean G. Teutsch, Pantin, and Roger Deraedt, Les Pavillons-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 27, 1979, Ser. No. 52,489

Claims priority, application France, Jul. 13, 1978, 78 20971

The portion of the term of this patent subsequent to Sep. 18, 1996, has been disclaimed.

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—243 **30 Claims**

1. Δ^4-androstenes of the formula

wherein R_1 is alkyl of 1 to 3 carbon atoms, Y is selected from the group consisting of hydrogen, fluorine and methyl, R_2 is selected from the group consisting of saturated and unsaturated alkyl of 1 to 12 carbon atoms, $-CF_3$, aryl of 6 to 12 carbon atoms and aralkyl of 7 to 12 carbon atoms and the dotted lines in the A and B rings indicate the optional presence of one or two double bonds in the 1(2) and 6(7) positions with the proviso that when R_1 is methyl, R_2 is saturated or unsaturated alkyl and the B ring is saturated, Y is methyl.

22. A method of treating inflammation in warm-blooded animals comprising administering to warm-blooded animals an anti-inflammatorily effective amount of at least one compound of claim 1.

4,233,298

ESTERS OF P-CARBONYLPHENOXY-ISOBUTYRIC ACIDS

Andre Mieville, Lausanne, Switzerland, assignor to Orchimed SA, Switzerland

Division of Ser. No. 600,127, Jul. 29, 1975, Pat. No. 4,058,552, which is a continuation-in-part of Ser. No. 326,188, Jan. 24, 1973, Pat. No. 3,907,792, which is a continuation-in-part of Ser. No. 8,071, Feb. 2, 1970, Pat. No. 3,914,286. This application Sep. 1, 1977, Ser. No. 829,964

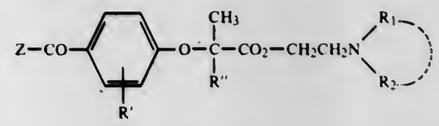
Claims priority, application Switzerland, Jan. 31, 1969, 1517/69; Aug. 28, 1969, 13022/69

Int. Cl.³ C07C *93/20, 147/07, 149/43*; C07D *295/14*

U.S. Cl. 424—244 **11 Claims**

1. A novel ester of p-carbonylphenoxy-isobutyric acid selected from the group consisting of

(a) compounds of the formula



wherein

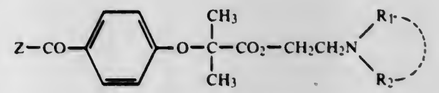
R' is H, CH_3, C_6H_5, SCH_3, OCH_3, or SO_2CH_3;

R'' is CH_3 or C_2H_5;

Z is a phenyl group substituted by one halogen atom and NR_1R_2 is $N(CH_3)_2$, $N(C_2H_5)_2$, morpholino, piperidino, hexamethylenimino or pyrrolidino, and

(b) non-toxic acid addition salt thereof.

3. A novel ester of p-carbonylphenoxy-isobutyric-acid having the formula



wherein Z is C_1-C_4 alkyl, phenyl or chlorophenyl and NR_1R_2 is a hexamethylenimino group and non-toxic acid addition salts thereof.

10. A therapeutic composition useful for treating patients in order to reduce their blood cholesterol and lipids content, which comprises, in association with a pharmaceutically acceptable excipient, a therapeutically effective amount of at least a compound according to any one of claims 1, 2, 3 or 6–11.

4,233,299

4-HYDROXY-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE-1,1-DIOXIDES AND SALTS THEREOF

Günter Trummlitz; Wolfhard Engel; Ernst Seeger, and Günther Engelhardt, all of Biberach an der Riss, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Fed. Rep. of Germany

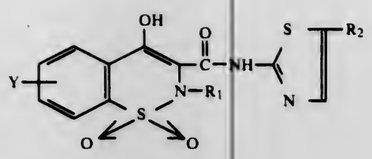
Filed Dec. 6, 1978, Ser. No. 966,963

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756113

Int. Cl.³ C07D *417/12*; A61K *31/38*

U.S. Cl. 424—246 **5 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, methyl or ethyl;

R_2 is methyl, ethyl or n-propyl; and

Y is hydrogen, methyl, methoxy, fluorine or chlorine or a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

5. The method of counteracting inflammation and fever in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antiphlogistic amount of a compound of claim 1.

4,233,300

8H-PYRAZOLO[1,5-A]PYRAZOLO[4',3':5,6]PYRIDO[3,4-E]PYRIMIDINE

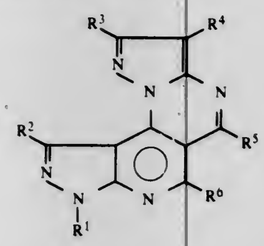
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 679,121, Apr. 21, 1976. This application Nov. 13, 1979, Ser. No. 93,641

Int. Cl.³ C07D *471/22*; A61K *31/415, 31/505*

U.S. Cl. 424—248.4 **10 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, benzoyl or substituted benzoyl wherein the benzoyl substituent is one or two halogens, lower alkyl or trifluoromethyl groups;

R^2 and R^3 each is hydrogen, lower alkyl or phenyl;

R^4 is hydrogen, lower alkyl, phenyl, carboxy or lower alkoxycarbonyl;

R^5 is;



R^6 is hydrogen or lower alkyl;

R^7 and R^8 together with the nitrogen form one of the unsubstituted or substituted heterocyclics pyrrolidino, morpholino, thiamorpholino, piperidino, pyrazolyl, dihydropyridazinyl or piperazinyl wherein the heterocycle substituent is lower alkyl or hydroxy-lower alkyl;

and acid addition salts thereof.

9. A composition comprising about 10 to 300 mg of a compound of claim 1 and a physiologically acceptable carrier therefor.

4,233,301

NOVEL IMIDAZOAZINES AND IMIDAZODIAZINES

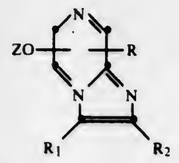
John J. Baldwin, Lansdale, and William C. Lumma, Jr., Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 796,958, May 16, 1977, Pat. No. 4,166,851. This application Dec. 14, 1978, Ser. No. 969,631

Int. Cl.³ A61K *31/415*; C07D *487/04*

U.S. Cl. 424—250 **19 Claims**

1. Compounds having the formula



and pharmaceutically acceptable salts thereof wherein

Z is $-CH_2-CHOR_3-CH_2-NHR_4$ wherein R is H or C_2-C_{12} acyl selected from alkanoyl, benzoyl, naphthoyl, methylbenzoyl and phenylbenzoyl and R_4 is C_1-C_{12}alkyl,

R is H, $-SCF_3$, $-CN$, halogen, C_{1-6}alkyl, NH_2, C_1-C_6 haloalkyl, C_1-C_{12}acyl, of the formula



wherein L is H, alkyl or aryl, phenyl, $-COOR_5$ wherein R_5 is H C_1-C_6alkyl or C_6-C_{12} carbocyclic aryl, $-CONR_6R_7$ wherein R_6 and R_7 when separate, are H or C_1-C_6alkyl and when joined, are $-CH_2-(CH_2)_3-CH_2$, $-CH_2-CH_2-O-CH_2-CH_2-$, $-CH_2-CH_2-NH-CH_2-CH_2-$, or $-CH_2-CH_2-N(CH_3)-CH_2-CH_2-$, $-C_1$-C_6alkylthio, C_1-C_6 alkylsulfinyl or C_1-C_6alkylsulfony, and

R_1 and R_2 when separate are R and

when joined are $-(CH_2)_n-$ wherein n is 3, 4 or 5.

19. A pharmaceutical composition for effecting β-adrenergic blockade containing an effective amount of a compound of claim 1.

4,233,302

AMINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Michael Martin-Smith; Barry J. Price, both of Hertford; John Bradshaw, Ware, and John W. Clitherow, Sawbridgeworth, all of England, assignors to Glaxo Group Limited, London, England

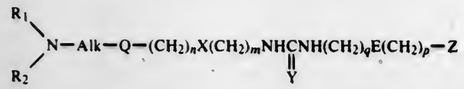
Filed Dec. 18, 1978, Ser. No. 970,534

Claims priority, application United Kingdom, Dec. 23, 1977, 53716/77; Nov. 16, 1978, 44778/78

Int. Cl.³ A61K *31/34, 31/44*; C07D *213/58, 307/54*

U.S. Cl. 424—251 **8 Claims**

1. A compound of the formula (I)



or a physiologically acceptable salt, N-oxide or hydrate thereof, in which Y represents $=O$, $=S$, $=CHNO_2$ or $=NR_3$ where R_3 represents hydrogen, nitro, cyano, lower alkyl, aryl, lower alkyl sulphonyl or aryl sulphonyl; R_1 and R_2, which may be the same or different each represents hydrogen, lower alkyl, cycloalkyl, lower alkenyl, aralkyl, hydroxy, lower trifluoroalkyl, lower alkyl substituted by hydroxy, lower alkoxy, amino, lower alkylamino or lower dialkylamino, or R_1 and R_2 together with the nitrogen atom to which they are attached form a pyrrolidine or piperidine ring;

Q represents a furan ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions;

X represents $-CH_2-$, $-O-$ or $-S-$;

n represents zero, 1 or 2 except that n is not zero when X is $-O-$;

m represents 2, 3 or 4;

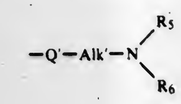
Alk represents a straight chain alkylene group of 1 to 3 carbon atoms;

q represents 2, 3 or 4 or can additionally represent zero or 1 when E is a $-CH_2-$ group;

p represents zero, 1 or 2;

E represents $-CH_2-$, $-O-$ or $-S-$; and

Z represents a phenyl ring optionally substituted by at least one of lower alkyl, hydroxy, lower alkyl hydroxy, amino, lower alkoxy or halo or a furyl, thienyl, pyridyl, imidazolyl, thiazolidinyl, oxazolidinyl or pyrimidinyl ring optionally substituted by lower alkyl optionally substituted by hydroxy or halo or Z represents the group



where Q' represents a 2,5-furan or thiophen ring or 1,3- or 1,4-benzene ring;

Alk' represents any of the groups defined for Alk; and R_5 and R_6, which may be the same or different, each represent any of the groups defined for R_1 and R_2; except that p is not zero when E is oxygen and Q' or Z is a furan or thiophen ring system.

8. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim 1 to relieve said condition.

4,233,303

XANTHINE DERIVATIVES

Sten H. A. M. Bergstrand, Bjärred; Per G. Kjellin, Lund; Carl G. A. Persson, Löberöd, and Lars M. Sorenby

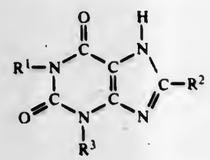
Filed Sep. 29, 1978, Ser. No. 947,002

Claims priority, application Sweden, Oct. 14, 1977, 7711581

Int. Cl.³ C07D *473/08*

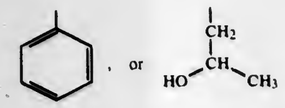
U.S. Cl. 424—253 **12 Claims**

1. A compound of the formula

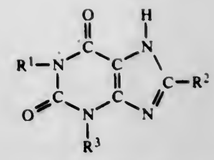


(I)

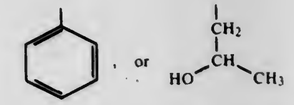
or a physiologically acceptable salt thereof, in which formula R^1 is methyl, ethyl or n-propyl, R_2 is methyl or n-propyl and R_3 is



7. A pharmaceutical preparation comprising as active ingredient an antianaphylactic effective amount of a compound of the formula



or a physiologically acceptable salt or an optical isomer thereof, in which formula R^1 is methyl, ethyl or n-propyl, R^2 is methyl or n-propyl and R^3 is



in association with a pharmaceutically acceptable carrier for use in the treatment of allergy.

4,233,304

PYRIDOXINE DERIVATIVES

Alberto Reiner, Como, Italy, assignor to Crinos Industria Farmacobiologica S.p.A., Italy

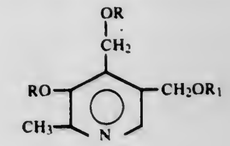
Filed Jul. 3, 1979, Ser. No. 54,613

Claims priority, application Italy, Jul. 31, 1978, 26327 A/78; May 23, 1979, 22932 A/79

Int. Cl.³ C07D *213/30*; A61K *31/44*

U.S. Cl. 424—256 **8 Claims**

1. Pyridoxine derivative of the formula (I)



wherein

each of the R groups represents a hydrogen atom or taken together represent an isopropylidene group and R_1 represents a moiety selected from the group consisting of 2-hydroxybenzoic acid, 4-allyloxy-3-chlorophenylacetic acid, or 2-(4-isobutylphenyl)-propionic acid, and their addition salts with inorganic and organic, physiologically acceptable, acids.

7. Anti-inflammatory pharmaceutical composition for oral, parenteral, rectal administration or for topical application, characterized in that it contains an anti-inflammatory effective amount of at least one derivative of formula (I) according to claim 1, or a physicologically acceptable acid addition salt thereof, combined with conventional pharmaceutical carriers, vehicles, additives, fillers and/or stabilizers.

4,233,305

NOVEL DERIVATIVES OF 2-(4-QUINOLINYLAMINO)-5-FLUORO-BENZOIC ACIDS

Andre Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Les Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Dec. 6, 1978, Ser. No. 966,964

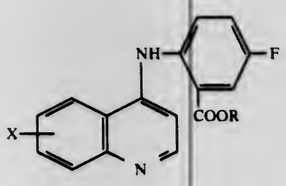
Claims priority, application France, Dec. 15, 1977, 77 37835; Dec. 15, 1977, 77 37836

Int. Cl.³ A61K *31/47*; C07D *215/44*

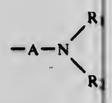
U.S. Cl. 424—258 **21 Claims**

1. A compound selected from the group consisting of 2-(4-

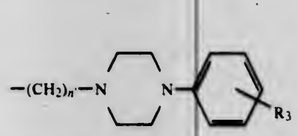
quinolinylamino)-5-fluoro-benzoic acid compounds of the formula



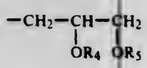
wherein X is selected from the group consisting of chlorine and $-CF_3$ in the 7- or 8-position and R is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbons,



wherein A is branched alkylene of 3 to 5 carbon atoms or $-(CH_2)_n-$ and n is a number of 2 to 5 and R_1 and R_2 are individually alkyl of 1 to 8 carbon atoms or together with the nitrogen atom to which they are attached form a heterocyclic selected from the group consisting of piperidinyl, pyrrolidinyl, morpholinyl and N-piperazinyl optionally substituted on the second nitrogen atoms with alkyl of 1 to 4 carbon atoms,



with R_3 being selected from the group consisting of hydrogen, halogen, $-CF_3$, $-SCF_3$, $-OCF_3$ and alkyl and alkoxy of 1 to 8 carbon atoms in the 2,3- or 4-position, n' is 2 to 5 and



and R_4 and R_5 are both hydrogen or form a ketonide of the formula



and P and Q are alkyl of 1 to 8 carbon atoms, phenylalkyl of 7 to 13 carbon atoms or phenyl, alkali metals, alkaline earth metals, ammonium and non-toxic, pharmaceutically acceptable organic amines and their non-toxic, pharmaceutically acceptable acid addition salts.

8. An analgesic composition comprising an analgesically effective amount of at least one compound of claim 1 and an excipient.

4,233,306

1-IMINOMETHYLENE-SUBSTITUTED 2-(PHENOXY-ALKYL)-2-IMIDOAZOLINE DERIVATIVES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Jozef Drabek, Oberwil, Switzerland; Günter Mattern, Liestal, Switzerland, and Walter Traber, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

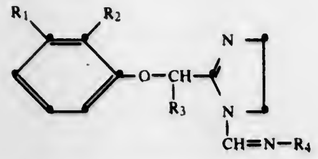
Filed Aug. 3, 1979, Ser. No. 63,239

Claims priority, application Switzerland, Aug. 14, 1978, 8631/78; Mar. 8, 1979, 2250/79; Jul. 3, 1979, 6194/79

Int. Cl.³ C07D *233/22, 401/12, 417/12*

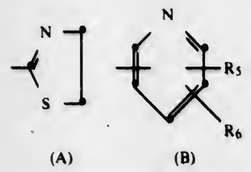
U.S. Cl. 424—263 **10 Claims**

1. A compound of the formula I



(I)

wherein R_1 and R_2 are, independently of each other, chlorine or methyl, R_3 is hydrogen or C_1-C_4-alkyl and R_4 is cyano or a group of the formula A or B



(A) (B)

wherein R_5 and R_6 are, independently of each other, hydrogen or methyl, and the acid addition salts thereof.

4,233,307

SPIRO-4'-PIPERIDINE COMPOUNDS AND THEIR PHARMACEUTICAL COMPOSITIONS

Keiichi Ono, Osaka; Kikuo Sasajima, Saitama; Junki Katsube, Toyonaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

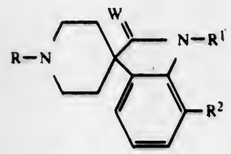
Filed May 30, 1978, Ser. No. 910,537

Claims priority, application Japan, Feb. 13, 1978, 53/15778

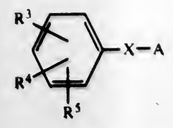
Int. Cl.³ A61K *31/445*; C07D *471/10*

U.S. Cl. 424—267 **12 Claims**

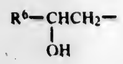
1. A compound of the formula



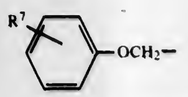
wherein R^1 is a hydrogen atom, a C_1-C_4 alkyl group, a phenyl group, or a phenyl group substituted with a halogen atom, a C_1-C_4 alkyl group or a C_1-C_4 alkoxy group, R^2 is a hydrogen atom, or R^1 and R^2, when taken together, may form a C_1-C_4 alkylene group, W is an oxygen atom or two hydrogen atoms and R is selected from the group consisting of the formula:



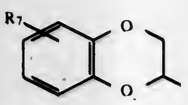
wherein A is a C_1-C_4 alkylene group, X is a carbonyl group, an oxygen atom, a single bond linkage, the formula >CH—OH or the formula —CH=CH— and R^3, R^4 and R^5 are each independently hydrogen, methyl, ethyl, isopropyl, butyl, methoxy, ethoxy, isopropoxy, halogen, hydroxy or benzyloxy, provided that when any one of R^3, R^4 and R^5 is benzyloxy, the other two are hydrogen, and the formula:



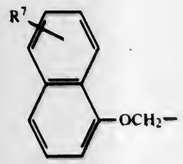
wherein R^6 is a group of the formula:



wherein R^7 is a hydrogen atom, a halogen atom, a nitrile group, a C_1-C_4 alkyl group, a C_1-C_4 alkoxy group or a hydroxy group,



wherein R^7 is as defined above, or



wherein R^7 is as defined above, and the non-toxic pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition comprising at least one compound as claimed in claim 1 and their pharmaceutically acceptable salts, in an amount which is anti-hypertensively effective or effective as a central nervous system depressant and at least one pharmaceutically acceptable diluent or carrier.

4,233,308

MICROBICIDAL COMPOSITIONS

Walter Kunz, Oberwil, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Adolf Hubele, Magden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

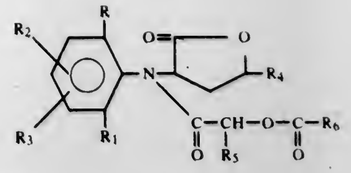
Filed Jan. 25, 1979, Ser. No. 6,398

Claims priority, application Switzerland, Jan. 28, 1978, 931/78

Int. Cl.³ C07D *307/32*; A61K *31/335*

U.S. Cl. 424—279 **9 Claims**

1. A compound of the formula I



(I)

in which

R is C_1-C_4-alkyl, C_1-C_4-alkoxy or halogen,

R_1 is hydrogen, C_1-C_3-alkyl, C_1-C_4-alkoxy or halogen,

R_2 is hydrogen, C_1-C_3-alkyl or halogen,

R_3 is hydrogen or methyl, with the total number of C atoms of the substituents R, R_1, R_2, and R_3 in the phenyl ring not exceeding 8,

R_4 and R_5 independently of one another are hydrogen or methyl, and

R_6 is a C_1-C_4-alkyl group unsubstituted or substituted by halogen, thiocyano, cyano, C_1-C_4-alkoxy or C_1-C_4-alkylthio, or R_6 is a C_2-C_5-alkenyl or C_3-C_7-cycloalkyl group each unsubstituted or mono- or polysubstituted by halogen, or R_6 is a phenyl or benzyl group each unsubstituted or substituted by halogen, nitro, C_1-C_4-alkyl or C_1-C_4-alkoxy, or R_6 is a furan, or tetrahydrofuran group unsubstituted or substituted by methyl.

5. A phytomicrobicidal composition which comprises as active ingredient an effective phytomicrobicidal amount of a compound of the formula I according to claim 1, together with a suitable carrier therefor.

9. A process for controlling phytopathogenic fungi, which process comprises application of a phytopathogenic fungicidally effective amount of a compound of the formula I of claim 1 to the plants or to a locus liable to be infected by such fungi.

4,233,309

NOVEL 1-SUBSTITUTED-3-ACYLPYRROLE DERIVATIVES, PLATELET AGGREGATION INHIBITORS CONTAINING THEM, AS ACTIVE INGREDIENTS, AND PROCESSES FOR PRODUCTION OF SAID DERIVATIVES

Toshio Tanaka; Akira Otsu; Seizi Kurozumi, all of Hino, and Toshio Wakabayashi, Tama, all of Japan, assignors to Teijin Limited, Osaka, Japan

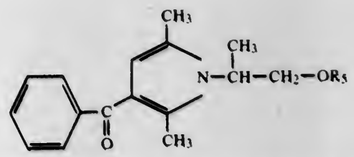
Filed Dec. 4, 1978, Ser. No. 966,050

Claims priority, application Japan, Dec. 6, 1977, 52-145702; Jan. 10, 1978, 53-801

Int. Cl.³ C07D *207/00*; A61K *31/40*

U.S. Cl. 424—270 **3 Claims**

1. 1-Substituted-3-benzoylpyrrole derivatives of the formula



(I)

wherein R_5 represents a hydrogen atom or a lower alkyl group with 1 to 4 carbon atoms.

3. A platelet aggregation inhibiting agent comprising an effective amount of the 1-substituted-3-acylpyrrole derivative of claim 1 and a pharmaceutically acceptable carrier or diluent.

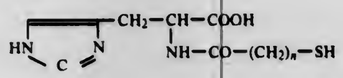
4,233,310

ANTIARTERIOSCLEROTIC N-(MERCAPTOACYL)-HISTIDINES

Tadashi Fujita, Sakai; Masayuki Oya, Osaka; Toshio Watanabe, Suita, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 24, 1977, Ser. No. 771,839
Claims priority, application Japan, Mar. 16, 1976, 51/28839
Int. Cl.³ A61K 31/415; C07D 233/64
U.S. Cl. 424—273 R **9 Claims**

7. An antiarteriosclerosis composition containing an effective amount of N-(mercaptoacyl)-histidine represented by formula (I) wherein n is 1 or 2



and a pharmacetical carrier.

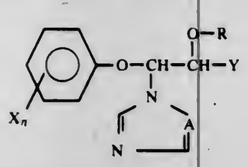
4,233,311

ANTIMICROBIAL AGENTS AND THEIR USE

Wolfgang Kramer; Karl H. Büchel; Manfred Plempel, and Ingo Haller, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,900
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720868
Int. Cl.³ A61K 31/41, 31/415, 31/555
U.S. Cl. 424—273 R **14 Claims**

1. A pharmaceutical composition containing as an active ingredient on antimycotically effective amount of a compound which is an azolyl ether of the following formula, or its salt or a metal complex thereof



(I)

in which

A is a CH group,

R is alkyl, alkenyl or alkinyl, each having up to 4 carbon atoms, phenyl or benzyl, each being optionally mono- or poly-substituted by halogen, cyano, nitro, alkyl having from 1 to 4 carbon atoms, alkoxy-carbonyl having from 1 to 4 carbon atoms in the alkyl moiety, and halogenoalkyl having up to 2 carbon atoms and up to 3 halogen atoms,

X is halogen, alkyl, alkoxy, alkylthio, alkylsulphonyl, halogenoalkyl or alkoxycarbonyl, each having up to 4 carbon atoms in the alkyl moiety, nitro, cyano, or phenyl, phenoxy or phenylthio, each optionally substituted by halogen, cyano, nitro or halogenoalkyl having up to 2 carbon atoms and up to 3 halogen atoms,

Y is a straight-chain or branched alkyl having from 1 to 9 carbon atoms and optionally mono- or poly-substituted by halogen, hydroxyl, cyano, —CO—OR¹ wherein R¹ is alkyl having from 1 to 4 carbon atoms, —CO—NR²R³ wherein R² and R³ are the same or different and each is hydrogen, alkyl having from 1 to 4 carbon atoms, or phenyl optionally substituted by halogen, —O—CO—R⁴ wherein R⁴ is alkyl having from 1 to 18 carbon atoms, halogenoalkyl having from 1 to 4 carbon atoms and from 1 to 3 halogen atoms, phenyl or benzyl each optionally mono- or poly-substituted by halogen or cycloalkyl having 5 or 6 carbon atoms; or phenyl optionally mono- or poly-substituted by halogen, and

n represents an integer having a value of from 0 to 5, in admixture with a solid, liquid or liquefied gaseous diluent.

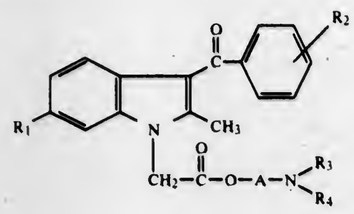
4,233,312

ESTERS OF INDOLE-1-ACETIC ACID AND ANALGESIC USE THEREOF

Andre Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 758,633, Jan. 12, 1977, Pat. No. 4,105,777, This application May 9, 1978, Ser. No. 904,328
Int. Cl.³ A61K 31/40; C07D 209/20
U.S. Cl. 424—274 **11 Claims**

1. A compound selected from the group consisting of indoles of the formula



wherein R_1 is selected from the group consisting of hydrogen halogen, $-CF_3$, alkyl of 1 to 8 carbon atoms and alkoxy of 1 to 8 carbon atoms, R_2 is in the 2, 3 or 4 position and is selected from the group consisting of halogen, $-CF_3$ and alkyl, alkoxy and alkylthio of 1 to 8 carbon atoms, A is selected from the group consisting of branched alkylene of 3 to 5 carbon atoms and $-(CH_2)_n-$ and n is a number of 2 to 5 and R_3 and R_4 taken together with the nitrogen atom form a heterocyclic ring selected from the group consisting of piperidinyl, pyrrolidinyl, morpholinyl, piperazinyl and N-alkylpiperazinyl with 1 to 4 alkyl carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,233,313

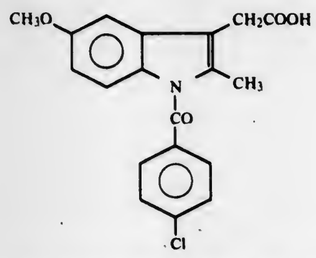
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,509
Int. Cl.² A61K 31/40, 31/165
U.S. Cl. 424—274 **2 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) from about 0.13 to 0.27 mg/kg of body weight of a 1-(p-chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid compound, said compound being selected from 1-(p-chlorobenzoyl-5-methoxy-2-methylindole-3-acetic acid having the formula



and (b) and therapeutically acceptable salts thereof, and

(2) from about 3.8 to 7.5 mg/kg of body weight of acetaminophen.

4,233,314

ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,510
Int. Cl.² A61K 31/19, 31/165
U.S. Cl. 424—317 **7 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary active agent from about 1.4 to 2.5 mg/kg of body weight of an α-methyl-3-phenoxy-benzeneacetic acid compound, said compound being selected from (a) α-methyl-3-phenoxybenzeneacetic acid represented by the formula



and (b) non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent, from 3.8 to 7.5 mg/kg of body weight of acetaminophen.

4,233,315

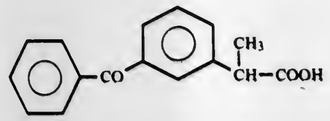
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,512
Int. Cl.² A61K 31/19, 31/165
U.S. Cl. 424—317 **8 Claims**

5. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary active agent from about 0.2 to 0.83 mg/kg of body weight of a m-benzoylhydratropic acid compound selected from the group consisting of (a) m-benzoylhydratropic acid having the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 2.8 to 7.5 mg/kg body weight of acetaminophen.

4,233,316

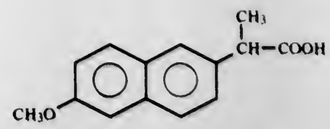
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,519
Int. Cl.² A61K 31/19
U.S. Cl. 424—317 **7 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 1.4 to 2.1 mg/kg of body weight of a 6-methoxy-α-methyl-2-naphthaleneacetic acid compound, said compound selected from (a) 6-methoxy-α-methyl-2-naphthaleneacetic acid having the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 1.9 to 7.5 mg/kg of body weight of acetaminophen.

4,233,317

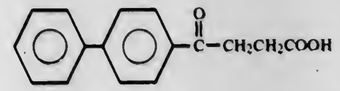
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,520
Int. Cl.² A61U 31/19, 31/165
U.S. Cl. 424—317 **8 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 2.2 to 7.2 mg/kg of body weight of a 3-(4-biphenylylcarbonyl) propionic acid compond, said compound selected from (a) 3-(4-biphenylylcarbonyl) propionic acid represented by the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 1.9 to 7.5 mg/kg of body weight of acetaminophen.

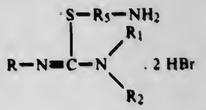
4,233,318

BIOCIDAL ISOTHIOUREA COMPOUNDS

Llewellyn W. Fancher, and Don R. Baker, both of Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

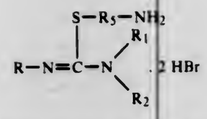
Continuation of Ser. No. 815,975, Jul. 15, 1977, abandoned. This application Mar. 22, 1979, Ser. No. 22,755
Int. Cl.³ C07C 123/00; C07D 213/74; A01N 43/40, 47/42
U.S. Cl. 424—326 **60 Claims**

1. A compound having the general structural formula



wherein R is a straight or branched chain alkyl radical containing 5 to 20 carbon atoms; R_1 is selected from the group consisting of alkyl containing 1 to 20 carbon atoms and alkenyl containing 2 to 6 carbon atoms; R_2 is hydrogen or alkyl containing 1 to 10 carbon atoms; and R_5 is divalent alkylene containing 2 to 6 carbon atoms.

30. A method of controlling a microorganism selected from bacteria and fungi which comprises applying to the locus where such control is desired an effective amount of a compound having the general structural formula



wherein R is a straight or branched chain alkyl radical containing 5 to 20 carbon atoms; R_1 is selected from the group consisting of alkyl containing 1 to 20 carbon atoms and alkenyl containing 2 to 6 carbon atoms; R_2 is hydrogen or alkyl containing 1 to 10 carbon atoms; and R_5 is divalent alkylene containing 2 to 6 carbon atoms.

4,233,319

LOW DENSITY CHEWING GUM PRODUCT AND METHOD OF MAKING THE SAME

Douglas P. Fritz, and Ronald J. Elias, both of Mountaintop, Pa., assignors to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,335
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 **21 Claims**

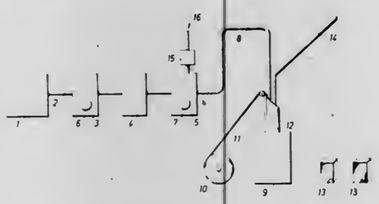
1. The method of manufacturing a low density chewing gum product which comprises the steps of:
heating a chewing gum composition to cause the same to liquefy;
gasifying said molten gum mass to homogeneously introduce thereinto a gaseous component and reduce the density of said mass;
introducing said gasified mass into a mold;
introducing said gasified and molten mass in said mold to a vacuum environment to cause said mass to expand; and
maintaining said mass in said expanded condition in said vacuum environment until the same becomes shape-retaining at ambient conditions of temperature and pressure.

4,233,320

METHOD FOR STERILIZING, HOMOGENIZING AND PACKAGING PROTEIN CONTAINING FOOD

Jose R. Monaco, Santiago, Chile, and Hans A. Rausing, Lund, Sweden, assignors to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland

Filed Jan. 23, 1979, Ser. No. 5,909
Claims priority, application Sweden, Jan. 23, 1978, 7800776
Int. Cl.³ A23B *4/00*; A22C *25/20*
U.S. Cl. 426—7 **12 Claims**



1. A method for treating and packaging a food product containing proteins comprising:
(a) providing a raw product containing proteins;
(b) reducing the raw product to a plurality of particles having a size smaller than 5 mm. to change the raw product to a homogenous fluid or semifluid form;
(c) sterilizing the raw product thereby at least partly causing the proteins to coagulate;
(d) cooling the at least partly coagulated sterilized raw product to below the coagulating temperature;
(e) homogenizing the cooled product to fluid or semifluid form; and
(f) packing the sterilized, homogenized product under aseptic conditions into bacteriaproof packages and allowing the packed product to thicken to solid or semisolid form.

4,233,321

WHITE PAN BREAD AND ROLL PROCESS AND PRODUCT

Sylvester F. Zenner, Memphis, Tenn., and Daniel C. Stanberry, Mission Viejo, Calif., assignors to Patent Technology, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 834,808, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 722,218, Sep. 10, 1976, abandoned. This application Oct. 25, 1978, Ser. No. 954,644
Int. Cl.³ A21D *13/00, 15/00*
U.S. Cl. 426—19 **5 Claims**

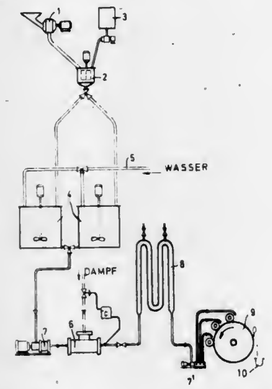
1. In a process for preserving the freshness of white pan bread or rolls for prolonged periods of time while simultaneously maintaining and improving volume, appearance and other desired characteristics of said products, said process employing standard formulations of essential dough ingredients including flour, water, leavening, 6 to 13% sugar and 2.5 to 8% shortening on the weight of the flour, the improvement comprising the steps of employing lactose as a replacement for 10 to 50% by weight of the sugar content and 10 to 50% by weight of the shortening content in such a standard formulation, thereafter mixing the formula ingredients including said replacement lactose to form a dough, dividing the dough into units for baking, and baking said units to provide white pan bread and rolls which exhibit desired characteristics of "freshness" for periods of time at least 50 to 100% longer than white pan bread and rolls prepared with said standard formulation without said replacement lactose, and which also exhibit substantially increased volumes and improved external appearance scores as compared to said standard formulation bread and rolls.

4,233,322

MANUFACTURING OF INSTANT PRODUCTS FROM LEGUMES

Hartwig Fritze, Weingarten, Fed. Rep. of Germany, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed May 16, 1978, Ser. No. 906,610
Claims priority, application Switzerland, May 25, 1977, 006433/77
Int. Cl.³ A23L *1/20*
U.S. Cl. 426—46 **9 Claims**



1. A process for manufacturing a powdered, instant soup or puree product for human consumption from pulse vegetables comprising the steps of
a. finely milling whole pulse seeds under dry conditions to such extent that the exosperm parts are disintegrated and are indiscernible and inseparable from the flour parts;
b. mixing said finely milled pulse material with water and α-amylase to form a suspension; and
c. continuously conveying said suspension successively through a short, intensive heating phase wherein boiling of the suspension is effected in a time period on the order of seconds so as to effect rapid hydrolysis without destroying the natural taste of the pulse material and without deactivating the α-amylase, a longer reaction phase having a duration on the order of minutes wherein decomposition of starch in the pulse material by the α-amylase continues without further heating, and a drying phase wherein the suspension is dried and the α-amylase is deactivated,
d. the α-amylase being active throughout the entire period between its introduction and the drying phase and serving to convert a portion of the starch in the pulse material to maltose and thereby eliminate the bitter, raw taste of the pulse.

4,233,323

METHOD FOR TENDERIZING AND/OR PASTEURIZING MEAT

Boris Sway, 7201 W. Aracoma Dr., Cincinnati, Ohio 45237, and Walter C. Reiman, 175 Tamworth Rd., Troy, Ohio 45373

Continuation-in-part of Ser. No. 761,482, Jan. 24, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,823
Int. Cl.² A23L *3/28*
U.S. Cl. 426—55 **11 Claims**

8. A method of tenderizing retail cuts of fresh, wrapped meat, which comprises the steps of:
(a) wrapping the meat in a moisture-impervious film which is substantially pervious to ultraviolet rays in the 2600 to 3000 A° range;
(b) placing the wrapped meat within a closed chamber;
(c) subjecting the outer surfaces of said meat to ultraviolet rays until from 55% to 95% of the aerobic and anaerobic bacteria of the surface of the meat adjacent the film have been killed;
(d) terminating exposure of the wrapped meat to said ultraviolet rays before a color change occurs in the outer surfaces of the meat;
(e) permitting the natural enzymes within the meat to continue to break down the connective tissue thereof in the absence of ultraviolet rays while maintaining the temperature of the meat at a level which does not exceed the temperature attained during its exposure to the ultraviolet rays;
resubjecting the outer surfaces of the meat to ultraviolet rays while the meat is at a temperature naturally obtained from step (e) to kill most of the surface bacteria that are reproduced thereon during step (e) from surface bacteria remaining after step (c), without lowering the temperature of the meat; and
(g) repeating steps (c), (d), (e) and (f) until the wrapped meat has attained the desired degree of tenderization.

4,233,324

ISOLATED SOY PROTEIN COMPOSITION

Felix A. Jehle, Brooklyn, N.Y., and Fawzy Ali, Roselli Park, N.J., assignors to International Vitamin Corp., Union, N.J.

Filed May 30, 1978, Ser. No. 910,308
Int. Cl.³ A23J *3/00*
U.S. Cl. 426—96 **2 Claims**

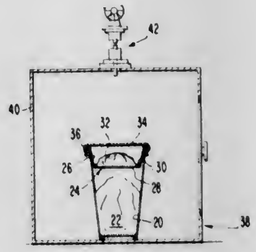
1. A composition consisting essentially of isolated soy protein particles and a coating thereon of from 0.5 to 3.0 percent by weight of silicon dioxide, and from 0.1 to 3.0 percent by weight of ammoniated glycyrrhiza, said ammoniated glycyrrihiza being effective to conceal the taste of said soy protein particles but being present in insufficient amount to cause a licorice taste.

4,233,325

ICE CREAM PACKAGE INCLUDING COMPARTMENT FOR HEATING SYRUP

Gary Slangan, Fuchu, and Masaaki Tsuashima, Fujisawa, both of Japan, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 13, 1979, Ser. No. 75,028
Int. Cl.³ B65D *85/78, 25/08*; B65B *29/08, 25/22*
U.S. Cl. 426—107 **9 Claims**



1. A food package comprising a container having two compartments arranged vertically, a first lower compartment and a second upper compartment slidably and snugly and fixedly fitting into the upper portion of the first lower compartment, said first lower compartment having first totally enclosing substantially vertically juxtaposed side walls and a substantially flat bottom portion around the outer edge of which said side walls are connected, and frozen ice cream resting on said bottom portion, said first side walls having an upper edge, and resting firmly on said upper edge and snugly and fixedly fitting against the inner portion of said side walls, said second upper compartment comprising second side walls and a substantially flat bottom being in a plane substantially parallel to the bottom portion of said first lower compartment and spaced from the ice cream therebelow, said second side walls being of such dimensions as to fit snugly and fixedly against the inner portion of said first side walls of said first compartment, said bottom of said second upper compartment being constructed of a microwave-resistant metal foil material and located on the upper surface of said bottom of said second upper compartment, a frozen syrup composition, said bottom of said second upper compartment being manually puncturable; and covering said second compartment, and supported on the upper edge of said second side walls, a microwave-permeable transparent lid having a diameter minutely greater than the outer diameter of said second upper compartment, said transparent lid being substantially totally permeable to the passage of microwave energy, the dimensions of said first compartment and of said second compartment being such that conveniently consumable portions of syrup and ice cream are contained within said compartments, the volume of said ice cream being less than the internal volume of said first compartment, so that when microwave energy is generated from a location directly above said food package and in a direction substantially perpendicular to the metal foil microwave-resistant bottom of said second upper compartment, said frozen syrup melts and becomes fluid, and of such a low viscosity that it will flow as a result of the force of gravity either: (i) through a manually created orifice in said metal foil microwave-resistant bottom or (ii) by means of manually pouring the syrup from said second upper compartment into said first lower compartment.

4,233,326

PACKAGE FOR INDIVIDUALLY WRAPPED STRIP-SHAPED PIECES OF CHEWABLE AND EDIBLE ARTICLES

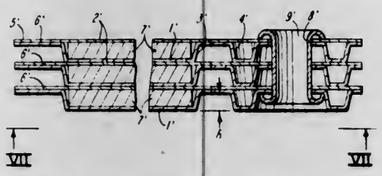
Klaus A. Sontag, Überseering 25, 2000 Hamburg 60, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 855,930, Nov. 29, 1977, abandoned. This application Jan. 18, 1979, Ser. No. 4,584

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654179; May 26, 1978, 7815738[U]

Int. Cl.[2] **B65D** *85/62, 83/08, 75/32*

U.S. Cl. 426—115 **3 Claims**



1. A package having strips of chewing gum, sweets, food, and other chewable or edible articles held individually in relatively flat elongated closed packets arranged one above the other; each of said packets comprising a lower foil portion and a thinner upper foil portion substantially covering said lower foil portion; said lower foil portion having a pan shaped depression located at one end of the packet and a continuous closed depression enclosing an undepressed portion of said lower foil portion and located at the other end of said packet and connected to said pan shaped depression by another undepressed portion of the lower foil portion; said upper foil portion being sealed to the lower foil portion at the undepressed portions of the lower portion; the upper foil portions of each packet sealed over the pan shaped depression forming sealed chambers with said articles contained therein; the upper foil portion and the lower foil portion being unsealed at the edge of the packet adjacent the pan shaped depression thus forming a flap for tearing open the sealed chambers; said continuous depression surrounding a hole in the undepressed portion of said lower portion having a rivet or pin forming an axis passing therethrough with said rivet or pin including means so that all the packets are held together one above the other yet are capable of being pivoted selectively in a fan-like manner; said undepressed portion connecting the pan shaped depression and said continuous depression and the upper foil portion which overlies it being perforated for removal of the pan shaped depression from said continuous depression and said rivet or pin; the pan shaped depression and the continuous depression being of equal depth so that the continuous depressions act as spacer bodies along said rivet or pin so that satisfactory pivoting of the packets are possible even when a portion of the packet formed by the pan shaped depression and its overlying upper foil portion is removed.

4,233,327

PROCESS FOR PRODUCING INSTANT-COOKING RICE

Momofuku Ando, Osaka; Junichi Minami, Tondabayashi; Mitsumune Takata, Kusatsushi; Fumio Ohnishi, Osaka, and Shunichi Kawamoto, Kusatsushi, all of Japan, assignors to Momofuku Ando, Osaka, Japan

Continuation of Ser. No. 765,000, Feb. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 609,728, Sep. 2, 1975, abandoned. This application Jun. 26, 1978, Ser. No. 918,920

Claims priority, application Japan, Sep. 5, 1974, 49/102637; Sep. 30, 1974, 49/112989

Int. Cl.[2] **A23L** *1/18*

U.S. Cl. 426—242 **5 Claims**

1. A process for preparing instant-cooking rice consisting essentially of the steps of:

(a) soaking rice in water or seasoning liquid so that its water content is 20–35% by weight;

(b) mixing the soaked rice with 0.1–1.0% by weight of a surfactant, edible oil or talc;

(c) completely gelatinizing the soaked rice with steam at a temperature of 100°–140° C.;

(d) reducing the moisture content of the gelatinized rice to 25–35% by weight by exposing it to air at a temperature of 40°–120° C.;

(e) pressing the reduced-moisture containing gelatinized rice between rolls spaced from 0.1–1.0 mm apart without producing cracks and fissures therein;

(f) drying the pressed rice to 8–25% by weight be exposing it to air at a temperature of 20°–100° C.;

(g) aging the dried rice in a closed chamber at a temperature of 15°–35° C. for at least 30 minutes to equalize the moisture distribution within the grains; and

(h) puffing the aged rice with hot air at a temperature of 160°–450° C.

4,233,328

EDIBLE MATERIALS COLORED WITH POLYMERIC YELLOW COLORANT

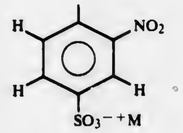
Daniel J. Dawson, Los Altos; Keaneth M. Otteson, San Bruno, and Roman Davis, Palo Alto, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 786,310, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 748,575, Dec. 8, 1976, abandoned. This application Oct. 4, 1978, Ser. No. 948,465

Int. Cl.[2] **A23L** *1/275*

U.S. Cl. 426—250 **19 Claims**

1. A colored edible material comprising an edible material in intimate admixture with a color-imparting concentration of a water-soluble polymeric yellow colorant comprising a non-chromophoric organic backbone of molecular weight of from 1000 to 200,000 having covalently attached thereto through amine groups a plurality (n) in the range of from 10 to 2000, of chromophore units of the structure



wherein M^+ is a pharmacologically acceptable cation.

4,233,329

CONCENTRATED ACID SWELLING OF COLLAGEN IN PREPARATION OF EDIBLE COLLAGEN CASING

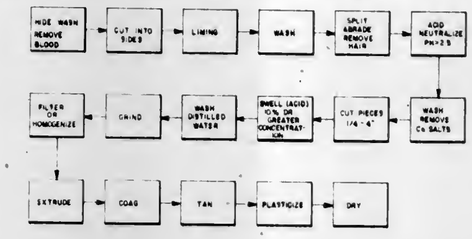
Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Continuation of Ser. No. 561,117, Mar. 25, 1975, abandoned, which is a continuation of Ser. No. 347,293, Apr. 2, 1973, abandoned. This application Oct. 18, 1976, Ser. No. 733,559

Int. Cl.[3] **A22C** *13/00*

U.S. Cl. 426—277 **8 Claims**

1. A process of producing an edible tubular collagen casing from animal hide collagen which comprises the steps, in sequence, of cutting collagen splits which have been derived from limed hides exposed to substantial liming into small pieces, contacting the collagen pieces with an aqueous solution of a non-toxic acid having a concentration of 10–45% by weight and a dissociation constant in water of about 1×10^{-6} to 1×10^{-3}, at a pH of 1.5–3.5 for a time sufficient to effect substantially complete swelling of the collagen, grinding the collagen pieces into successively smaller particles until a pulp of swollen collagen is formed, forming a slurry containing about 2–8% by weight collagen pulp, extruding the slurry in



tubular form, coagulating, tanning and drying the casing thus formed to obtain the tubular casing.

4,233,330

CAKE PROCESS AND PRODUCT

Sylvester F. Zenner, Memphis, Tenn., and Daniel C. Stanberry, Mission Viejo, Calif., assignors to Patent Technology, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 834,808, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 722,218, Sep. 10, 1976, abandoned. This application Oct. 25, 1978, Ser. No. 954,646

Int. Cl.[3] **A21D** *13/08, 15/00*

U.S. Cl. 426—321 **6 Claims**

1. In a process for preserving the freshness of standard yellow, white or devil's food cakes for prolonged periods of time while simultaneously maintaining and improving volume, appearance and other desired characteristics of said cake products, said process employing standard formulations of essential cake mix ingredients including flour, water, leavening, and 24 to 32% sugar and 8 to 13% shortening on the weight of the flour, the improvement comprising the steps of employing lactose as a replacement for10 to 35% by weight of the sugar content and 10 to 35% by weight of the shortening content in said standard cake mix formulations, thereafter mixing the formula ingredients including said replacement lactose to form a batter, forming the batter into at least one unit for baking, and baking said unit to provide a cake product which exhibits desired characteristics of "freshness" for periods of time at least 100% and ranging up to 400% longer than yellow, white and devil's food cakes prepared with said standard formulation mixes without said replacement lactose, and which also exhibit substantially increased volumes and improved external appearance scores as compared to said standard formulation cakes.

4,233,331

METHOD OF SECURING OPENER KEY TO A CONTAINER USING ORIENTED POLYPROPYLENE FILM WITH SOLVENTLESS ACRYLIC ADHESIVE

Harold C. Lemke, Grayslake, and Stanley E. Rohowetz, Barrington, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 31, 1978, Ser. No. 929,489

Int. Cl.[3] **B65B** *55/02, 61/18;* **B32B** *31/00;* **B29C** *27/20*

U.S. Cl. 426—407 **5 Claims**

1. A method of securing a key for opening a sealed container to a portion of the container at high speed wherein the key includes a working end and an operating end with a middle portion therebetween said method being continuous and comprising:

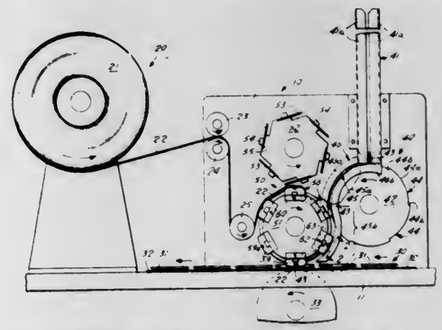
(a) providing a container end for hermetically closing a container for carrying food stuff to the exclusion of environs which would taint and spoil the food stuff, said container end having a surface adequate for supporting the key, and said container including a portion which is key openable for removal of the food stuff;

(b) dispensing a strip of flexible polymeric oriented polypropylene film which carries a solventless acrylic adhesive layer which when heated becomes stickier on one surface thereof;

(c) placing a key across said adhesive layer for carrying same in the plane of the adhesive to form an assembly thereof;

(d) orienting a surface of the key adequate for supporting the key adjacent to and parallel with the support surface of the container;

(e) applying the tape and key assembly, at over 100 per minute, with the solventless acrylic adhesive surface of the polypropylene strip across the end surface of the container over and above the shank of the key for securing the oriented key to the container surface in a manner



which permits removal of the key by subjection of the interface between the key and the container to tensile and bending loadings but which resists disorientation of the key responsive to shear loads between the key and the surface;

(f) filling the container with the food stuff and hermetically sealing it; and

(g) autoclaving at a sterilizing temperature the sealed container and key combination in order to sterilize the food stuff without degradation to the surface of the strip or the interface but with selected shrinkage to draw the key and end into more intimate engagement and increasing the stickiness of the adhesive layer.

4,233,332

USE OF BICYCLIC NITROGEN-CONTAINING DERIVATIVES AS FLAVORING INGREDIENTS

Ivon Flament, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

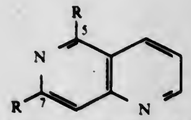
Filed Mar. 1, 1979, Ser. No. 16,405

Claims priority, application Switzerland, Mar. 16, 1978, 2863/78

Int. Cl.[3] **A23L** *1/231*

U.S. Cl. 426—537 **3 Claims**

1. A process for enhancing, improving or modifying the organoleptic properties of materials selected from foodstuffs and beverages, which process comprises the step of adding thereto a small but flavouring effective amount of a compound of formula



[(1)]

wherein each of symbols R represents a lower alkyl radical or a hydrogen atom or one of them a lower alkyl radical and the other a hydrogen atom, to impart a gustative note of animal or burnt character to said foodstuff or beverage.

4,233,333

4,5-DIMETHYL-THIENO[3,2-d]ISOTHIAZOLO-3(2H)-ONE-1,1-DIOXIDES, COMPOSITIONS, AND METHODS OF USE AS A SWEETENER

Günter Trummlitz; Ernst Seeger, and Wolfhard Engel, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 952,958
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749640; Sep. 9, 1978, 2839266
Int. Cl.[3] A23G *1/236*; C07D *275/00*
U.S. Cl. 426—548 3 Claims

1. 4,5-Dimethyl-thieno[3,2-d]isothazole-3(2H)-one-1,1-dioxide or a non-toxic salt thereof formed with an inorganic or organic base.

3. The method of sweetening foods and beverages which composes adding thereto an effective sweetening amount of a compound of claim 1.

4,233,334

METHOD OF MAKING A BEVERAGE COMPOSITION

Joseph L. Owades, Boston, Mass., assignor to Norman P. Soloway, Amherst, N.H., a part interest

Continuation-in-part of Ser. No. 798,923, May 20, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,812
Int. Cl.[2] A23L *2/00*
U.S. Cl. 426—590 11 Claims

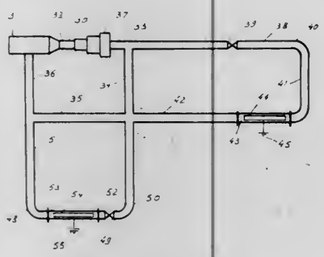
1. In a method of manufacturing fruit flavored, dry powdered beverage mix adapted to be reconstituted in water, admixing with said dry powdered mix at least about 0.7 weight percent of dry beaten cellulose pulp of Canadian Standard freeness of less than about 500, said dry cellulose pulp being derived by beating cellulose in water to said degree of freeness, removing excess water, and drying the resulting beaten pulp in contact with a particulate edible solid.

4,233,335

ELECTROSTATIC COATING METHOD

Vladimir N. Etlin, 7403 Lisle Ave., Falls Church, Va. 22043

Division of Ser. No. 741,893, Nov. 15, 1976, Pat. No. 4,170,194. This application Mar. 6, 1979, Ser. No. 17,838
Int. Cl.[3] B05D *1/04*
U.S. Cl. 427—27 2 Claims



1. The method of coating an object with electrostatically charged powder comprising the steps of:

providing a continuously open closed circuit conduit loop including a high velocity blower operatively associated therewith;

establishing an enlarged conduit section in said loop whereby to increase turbulence of said powder to be circulated through said loop by use of said high velocity blower to thereby provide said powder with an electrostatic charge;

providing at least one branch conduit to establish a second loop selectively communicated with the first recited loop;

positioning said object in said branch conduit;

establishing said powder circulation until the powder acquires a substantial electrostatic charge;

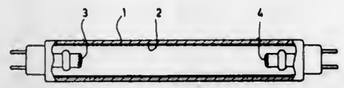
communicating said branch conduit with the first recited loop whereby to effect flow therethrough of the charged powder and coating of the article.

4,233,336

METHOD OF APPLYING LUMINESCENT MATERIAL TO A GLASS SUPPORT

Josephus A. Verdult, and Lambertus W. J. Manders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 868,803, Jan. 12, 1978, abandoned, which is a continuation of Ser. No. 729,951, Oct. 6, 1976, abandoned. This application Jun. 25, 1979, Ser. No. 51,490
Claims priority, application Netherlands, Oct. 17, 1975, 7512188
Int. Cl.[3] B05D *3/02*; C09K *11/465*; H01J *61/44*; B05D *7/22*
U.S. Cl. 427—67 4 Claims



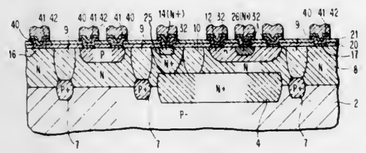
1. A method for applying a coating of luminescent material to a glass surface which comprises the steps of: providing a luminescent material which consists of granular particles, each individual particle being homogeneous throughout the extent thereof, some of said granular particles being yttrium oxide activated by trivalent europium; providing a solution which consists of water and an alginate and which contains at least 0.5% of alginate relative to the weight of said luminescent material; mixing said solution and said luminescent material to obtain a stable suspension, coating the glass surface with said suspension and then heating said suspension sufficiently to burn off said alginate.

4,233,337

METHOD FOR FORMING SEMICONDUCTOR CONTACTS

Jules D. Friedman, Mahopac, and Lumdas H. Saraf, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1978, Ser. No. 901,902
Int. Cl.[2] H01L *29/48*, *21/441*
U.S. Cl. 427—84 10 Claims



1. A method for selectively forming conductive contacts to impurity regions of a semiconductor substrate through a set of openings in a mask disposed atop said substrate comprising:

forming a protective layer of silicon dioxide within said set of openings;

removing said protective layer from a first subset of said openings while protecting a second subset of said openings, so as to expose a first subset of impurity regions;

depositing a first metallic silicide conductive contact material in said first subset of exposed impurity regions;

removing said protective layer by dip etching from said second subset of openings so as to expose a second subset of impurity regions without applying a resist layer atop said first contact material; and

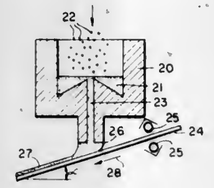
depositing a second conductive contact material in said first and second subsets of impurity regions.

4,233,338

PROCESSES FOR DEPOSITION OF THIN FILMS OF CRYSTALLINE SILICON ON GRAPHITE

Jean Ricard, Grenoble, and Charles Excoffon, Vaulnaveys le Bas, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jul. 24, 1978, Ser. No. 926,879
Claims priority, application France, Aug. 31, 1977, 77 26402
Int. Cl.[2] H01L *21/36*
U.S. Cl. 427—85 10 Claims



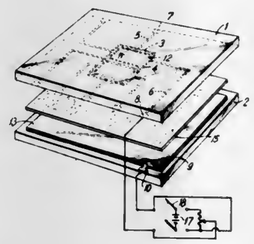
1. A process for providing crystalline silicon coatings on graphite substrates, which process comprises maintaining molten silicon material in a crucible having in its lower region a capillary conduit with a substantially vertical axis, the length of the capillary being at least equal to the retention height of the molten silicon material in the capillary to form a pendant drop at the bottom of the capillary; bringing a graphite substrate into contact with the drop of molten silicon material formed at the bottom of the capillary; moving the substrate at a selected speed in a direction which is at an angle of from 0° to about 60° with the horizontal, whereby molten silicon material flows downwardly through the capillary onto the substrate to form a thin film thereon; and periodically removing the crystalline silicon-coated substrate so formed.

4,233,339

METHOD FOR MAKING ELECTROCHROMIC FILMS HAVING IMPROVED ETCH RESISTANCE

Marshall Leibowitz, Ridgefield, Conn.; Richard Crandall, and Brian Faughnan, both of Princeton, N.J., assignors to Timex Corporation, Waterbury, Conn.

Filed Oct. 23, 1978, Ser. No. 953,716
Int. Cl.[3] G02F *1/01*
U.S. Cl. 427—108 9 Claims



1. A method for improving the resistance of electrochromic material to the degrading effects, such as etching, resulting from contact with electrolyte means associated with electrochromic displays, comprising the steps of:

(a) forming an amorphous, water-bearing film of electrochromic material of selected thickness, said film having electrochromic properties suitable for display purposes but having a free surface susceptible to etching by said electrolyte means;

(b) subjecting the film to a heat treatment at a selected high temperature at least equivalent to the crystallization temperature of said electrochromic material for a selected short time of sufficient duration so as to cause crystallization through at least the free surface portion of the film thickness but of insufficient duration to cause substantial loss of water from said film,

whereby crystallization of at least said free surface portion substantially increases resistance of the film to etching while retention of water in the film preserves the electrochromic properties for display purposes.

4,233,340

PROCESS FOR PREPARING INSOLUBLE ELECTRODE

Shunjiro Saito; Kazuhide Aue; Makoto Kobayashi, and Akio Nakamura, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,659
Claims priority, application Japan, Dec. 2, 1977, 52-144751
Int. Cl.[3] B05D *5/12*
U.S. Cl. 427—125 8 Claims

1. A process for preparing an insoluble electrode for electrolysis which comprises:

(a) coating a conductive substrate with a coating composition selected from the group consisting of:

i. a slurry of palladium oxide in a solvent containing a platinum compound, which can be thermally decomposed to form platinum metal, and

ii. a solution of a platinum compound, which can be thermally decomposed to form platinum metal, in a solvent;

(b) baking the substrate treated by step (a);

(c) coating the substrate treated by step (b) with a coating composition selected from the group consisting of said coating composition (a)(i) and said coating composition (a)(ii); wherein the coating composition used in step (c) is different from that used in step (a);

(d) baking the substrate treated by step (c); and

(e) repeating steps (a) to (d) two or more times.

4,233,341

PROCESS FOR PREPARING PACKAGING MATERIAL SUITABLE FOR SAUSAGE CASINGS AND ARTICLES MANUFACTURED THEREFROM

Klaus-Dieter Hammer, Mainz; Günter Gerigk, Oberursel, and Wolfgang Klendauer, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 668,973
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1975, 2512994
Int. Cl.[2] B29D *9/08*; A22C *13/02*
U.S. Cl. 427—230 24 Claims



8. Process for the preparation of a sausage casing, comprising the steps of:

coating the inside surface of a tube comprised of cellulose hydrate with a surface layer of a vinylidene chloride-containing copolymer, said cellulose hydrate being in a gelled condition and said vinylidene chloride-containing copolymer being applied directly to said inside surface in the form of an aqueous dispersion, said copolymer comprising from about 84 to 92% by weight of vinylidene chloride and from about 8 to 15% by weight of a mixture of co-

polymerizable monomers comprised of an α,β-unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and mixtures thereof, and an ester of said carboxylic acid selected from the group consisting of acrylic acid esters, methacrylic acid esters and mixtures thereof, a major portion of said monomer mixture being comprised of said ester, said copolymer having been produced by copolymerization of a mixture of said vinylidene chloride and said copolymerizable monomers, the refractive index of said copolymer being substantially independent of temperature between about 40° C. and 80° C.;

a 1% by weight solution of said copolymer in tetrahydrofuran having a specific viscosity of at least about 1.8 and a 2% by weight solution of said copolymer in tetrahydrofuran having a specific viscosity of at least about 3; adjusting the water content of the coated tube to a predetermined value; aging the coated tube; and gathering the aged tube to form a shirred tube.

4,233,342

METHOD FOR VAPOR-COATING TURBINE BUCKETS

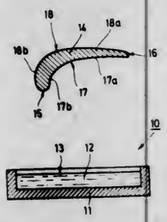
Hans Aichert; Walter Dietrich, both of Hanau am Main; Otto-Horst Hoffmann, Rodenbach; Friedrich Stark; Langenselbold, and Herbert Stephan, Bruchköbel, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 21, 1978, Ser. No. 962,836

Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821118

Int. Cl.² B23K *35/12*

U.S. Cl. 427—251 **5 Claims**



1. Method for vacuum depositing corrosion-and oxidation-resistant alloy coatings on all sides of curved turbine buckets having leading edges and trailing edges, with simultaneous rotation of the turbine buckets about their longitudinal axes in the vapor stream above a vapor source which comprises non-uniformly rotating the turbine buckets with respect to speed of rotation to vary the time of stay of each element of the surface above the vapor source during a 360° rotation such that it is shortest when the leading edges and trailing edges are pointing towards the vapor source and longest when the concave and convex flanks are presented to it.

4,233,343

THREE-DIMENSIONAL DECORATIVE SURFACE

John C. Barker, Cowansville, and Ivan P. McLaughlin, Dunham, both of Canada, assignors to J. J. Barker Company Limited, Quebec, Canada

Filed Aug. 10, 1978, Ser. No. 932,548

Int. Cl.³ B41M *3/00*

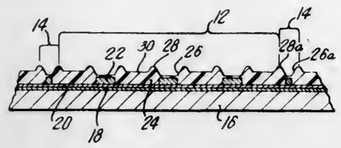
U.S. Cl. 427—264 **12 Claims**

1. A method of producing an article having a three-dimensional patterned surface comprising:

coating a flat surface of a substrate with a coloured printable base;

printing on said printable base a pattern composed of lines of a wet ink composition free of silicone oil;

applying to said printable base, over the pattern of wet ink lines, a liquid top coat composition of a resinous film forming material in a volatile organic solvent; said wet ink composition and said liquid top coat composition having differing surface tension properties such that said liquid top coat composition will retract from said wet ink lines;



allowing said liquid top coat composition to retract from the wet ink lines to form ridges of the liquid top coat composition adjacent the wet ink lines, and subsequently;

drying and baking the substrate to dry said ink lines and fix said liquid material as a hard resinous top coat defining a contour of valleys, hills and plains, said top coat remaining on the printed pattern in a thickness less than 1 mil.

4,233,344

METHOD OF IMPROVING THE ADHESION OF ELECTROLESS METAL DEPOSITS EMPLOYING COLLOIDAL COPPER ACTIVATOR

William Brasch, Commack, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,392

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—304 **5 Claims**

1. A method for promoting and improving the adhesion of an electroless metal deposit to the metal portion and a non-conductive portion which comprises treating the composite substrate with a copper type colloidal system to cause activation of the non-conductive portion thereof for electroless metal deposition, and thereafter treating the activated substrate, including the metal portions thereof, with an adhesion promoter compound selected from hydrazine hydrate, ammonium persulfate, or alkali hydroxide prior to the step of electroless deposition.

4,233,345

THIN-SKIN STABILIZATION OF PADS OF FLUFFED PULP

Robert T. Elias, Downers Grove, and Dennis C. Holtman, Orland Park, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 943,277, Sep. 18, 1978, abandoned. This application Apr. 23, 1979, Ser. No. 32,181

Int. Cl.² B05D *3/00, 3/12*

U.S. Cl. 427—325 **9 Claims**

1. A method for stabilizing a high loft, low density air laid pad of short length fibers which comprises pretreating a surface of said pad with a light spray, at a level not higher than about 15 cc per sq. meter and not higher than about 5% of the weight per unit area of said pad of a solution of a coagulating material for a resin dispersion while maintaining substantially the entire interior of said pad dry, applying said resin dispersion to said pretreated surface thereby causing coagulation of said dispersion and limiting its penetration to the interior of said pad whereby a reinforcing layer is obtained on said pad while maintaining substantially its original high loft and absorptive capacity.

4,233,346

METHOD AND APPARATUS FOR APPLYING A PLURALITY OF SUPERPOSED LAYERS TO A WEB BY CURTAIN COATING

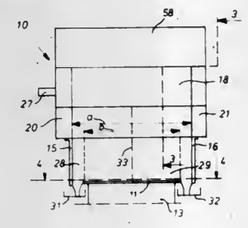
Jacques G. Kerkhofs, Diepenbeek, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Feb. 26, 1979, Ser. No. 15,147

Claims priority, application United Kingdom, Mar. 1, 1978, 811578

Int. Cl.² B05D *1/30*

U.S. Cl. 427—345 **13 Claims**



1. In a method of applying to a travelling web a plurality of layers of at least one flowable composition, comprising moving said web along a predetermined pathm, delivering such flowable compositions to a plurality of slot-like orifices to form a plurality of distinct flowing layers of such compositions, flowing said layers into face to face contact with one another to form a composite layer and delivering said composite layer as a free-falling curtain onto said web at a locus extending transversely of said path, said curtain being held in said locus by adherent contact of its lateral edges with curtain guides, said curtain falling on said moving web, the improvement wherein at least one of said plurality of layers has a width greater than the width of the web, and at least one of said plurality of layers has a width smaller than the overall width of the curtain whereby at least one but not all of said plurality of layers are in adherent contact with the curtain guides.

4,233,347

PROCESS FOR REINFORCING STRUCTURALLY FRAGILE INORGANIC FABRICS

Hong S. Lim, Agoura; Howard H. Rogers, Culver City, and Scott A. Verzwyvelt, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 2, 1978, Ser. No. 948,119

Int. Cl.³ B05D *3/00, 1/18, 3/02*; H01M *2/16*

U.S. Cl. 427—352 **10 Claims**

1. A process for reinforcing a porous fragile inorganic fabric to increase its mechanical strength without inhibiting the flow of gases there through or decreasing the wettability of said fabric comprising the steps of:

(a) first providing an impregnation solution of a thermosetting polymer and a strongly polar solvent;

(b) immersing said fabric in said solution until said fabric is saturated with said solution;

(c) removing said saturated fabric from said solution and blotting to remove excess solution from said fabric;

(d) causing said polymer to precipitate inside of the pores of said fabric from said solution, by treating said impregnated fabric with a hot liquid extractant characterized by exhibiting the property of being miscible with said polar solvent and immiscible with said polymer, thereby forming polymer particles about the fibers of said fabric which reinforce but do not coat said fabric; and

(e) removing said particle reinforced cloth from said liquid extractant and exposing said cloth to the drying action of hot air until dry.

4,233,348

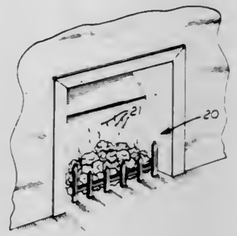
IMITATION COAL AND METHOD OF MAKING SAME

Nigel A. Corry, 38 Arthog Rd., Hale, Cheshire, England

Filed Apr. 4, 1979, Ser. No. 26,948

Int. Cl.² B44F *9/00*

U.S. Cl. 428—15 **7 Claims**



1. An imitation coal element comprising: a raw ceramic bulk fibre mass which has been moistened with a heat-settable stiffening agent, squeezed into its desired coal lump shape and baked to set it into the desired shape of lump which has subsequently been coloured black by a two-stage colouring process each stage of which consists in impregnating the shaped mass with a black metallic oxide/colloidal sodium silicate impregnant and then baking the impregnated mass.

4,233,349

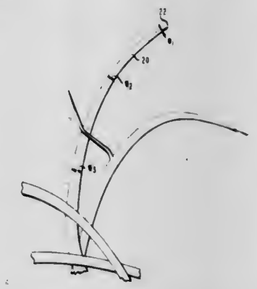
SUEDE-LIKE PRODUCT AND PROCESS THEREFOR

Donald O. Niederhauser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 26, 1979, Ser. No. 23,967

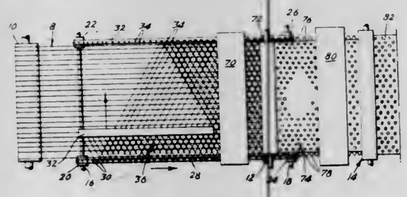
Int. Cl.² B32B *3/02*

U.S. Cl. 428—92 **18 Claims**



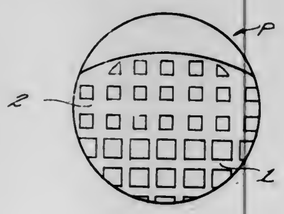
1. A suede-like fabric structure including a ground fabric comprising discrete fibrils, said fibrils extending as fibril ends from said ground fabric at randomly spaced points of attachment to form one surface of the suede-like fabric having a density of from about 5000 to about 100,000 fibril ends per square centimeter, the majority of said fibril ends being tapered and having an average tip width of less than 10μ when measured a distance of about 2μ from the terminal point of said fibril ends, said fibril ends tapering to said tip width from a greater trunk width, the average trunk width being about 1.5 to 10× greater than said average tip width when measured a distance of about 100μ from the terminal point of said fibril ends.

4,233,350
FORMAMINOUS SHEET
Frank L. Shiflet, Waynesboro, Va., assignor to Hopeman Brothers, Inc., Waynesboro, Va.
Continuation-in-part of Ser. No. 787,838, Apr. 15, 1977, Pat. No. 4,126,725, which is a continuation-in-part of Ser. No. 627,750, Oct. 31, 1975, Pat. No. 4,033,084. This application Oct. 19, 1978, Ser. No. 952,726
The portion of the term of this patent subsequent to Nov. 20, 1995, has been disclaimed.
Int. Cl.[3] B32B *5/12*
U.S. Cl. 428—110 4 Claims



1. In a high-pressure decorative laminate comprising a plurality of layers and adhesive means rigidly securing said layers together, a foraminous steel sheet located between two adjacent layers of said plurality and comprising three overlying groups of parallel steel filaments, the filaments in each group being non-parallel to the filaments in each of the other groups, the intersections of said filaments being flattened to an extent such that said sheet has a substantially uniform thickness except at the locations of its openings and in the immediate vicinity thereof, in which at least part of the adhesive means securing said two adjacent layers together extends through the openings in said foraminous sheet.

4,233,351
CERAMIC HONEYCOMB STRUCTURE
Kazunari Okumura, Kariya; Shinichi Yamamoto, Takahama, and Zituo Suzuki, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed May 15, 1979, Ser. No. 39,442
Claims priority, application Japan, May 18, 1978, 53-59589
Int. Cl.[2] B32B *3/12*
U.S. Cl. 428—116 6 Claims



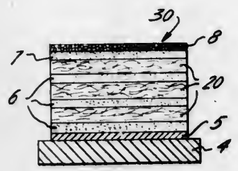
1. In a ceramic honeycomb structure provided with a plurality of open passages extending therethrough in an axial direction thereof and defined by thin walls of said structure
the improvement wherein:
the wall thickness of at least one part of walls of said structure which define said open passages formed in an annular portion along an outer peripheral surface of said structure is formed larger than that of the other open passages formed in portions other than said annular portion.

4,233,352
POLYESTER FILM AND METHOD OF MANUFACTURE THEREOF
Masaaki Ono, Otsu; Kazuo Okabe, Kyoto, and Yasuki Miura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Filed Jan. 9, 1979, Ser. No. 2,230
Claims priority, application Japan, Jan. 9, 1978, 53-518
Int. Cl.[3] H01F *10/02*
U.S. Cl. 428—141 39 Claims



1. A polyester film at least one surface of which is covered with worm-like nodules containing a mixture of an essentially water soluble polymer having a molecular weight of about 10,000–2,000,000 and at least one water emulsifiable polymer selected from the group consisting of (A) polysiloxane having a molecular weight of about 30,000–300,000 and (B) styrene butadiene rubber having a molecular weight of about 20,000–1,000,000, the weight ratio of said water soluble polymer to said water emulsifiable polymer in the mixture being about 1–100:5–50.

4,233,353
HIGH-STRENGTH BUILT-UP ROOFING USING IMPROVED GLASS FIBER MATS
Alfredo A. Bondoc, Middlesex; V. Robert Canfield, Martinsville, and B. Randall Ziegler, Freehold, all of N.J., assignors to GAF Corporation, New York, N.Y.
Filed May 16, 1979, Ser. No. 39,575
The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.
Int. Cl.[3] B32B *5/22, 17/02*
U.S. Cl. 428—141 6 Claims

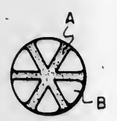


1. A built-up roofing system comprising:
(a) multiple plies of high-strength built-up roofing membranes comprising:
(a') a high strength glass fiber mat which is formed from bundles of glass fibers by the wet-laid process, said fibers having a length of about 1¾ to 3 inches and a diameter of about 8 to 20 microns, comprising:
(i) a plurality of individual filament glass fibers comprising about 20% to 60% by weight of the fibrous material in said mat,
(ii) a plurality of extended glass fiber elements comprised of longitudinally connected fibers said elements there having a length which is greater than the length of the fibers in said element, and a diameter which is non-uniform, being greater in the mid-portion thereof than at its ends, said elements comprising about 40% to 80% by weight of the fibrous material in said mat,
both said individual filament fibers and said extended fiber elements being substantially randomly oriented and uniformly dispersed throughout said material, and,
(iii) a binder substance to hold said fibrous material together, and,
(b') saturant asphalt impregnated in said mat, and
(b) adhesive asphaltic coatings between said membranes.

4,233,354
PRINTED POLYESTER FILMS
Kinji Hasegawa, Sagamihara; Yukio Mitsuishi, Machida, and Shigeyoshi Masuda, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Aug. 22, 1978, Ser. No. 935,850
Claims priority, application Japan, Aug. 30, 1977, 52-103170
Int. Cl.[2] B32B *5/16, 27/36*
U.S. Cl. 428—195 9 Claims

1. A printed polyester film comprising
(I) a biaxially oriented polyester film which is a blend of (1) a polyethylene glycol containing polyester with (2) a polyester comprising at least 80% by weight, based on the entire structural units, of ethylene terephthalate units, said blend containing from 2.1% to 5% by weight of the blend of said polyethylene glycol having a molecular weight in the range of from 10,000 to 100,000 and having a density in the range of from 1.392 g/cm^3 to 1.403/cm^3, and
(II) a printed layer formed by a printing ink containing a cellulose derivative as a binder, said printed layer being applied to at least a part of the surface of the film (I).

4,233,355
SEPARABLE COMPOSITE FIBER AND PROCESS FOR PRODUCING SAME
Yoshiaki Sato, and Hajime Arai, both of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Filed Mar. 6, 1979, Ser. No. 17,949
Claims priority, application Japan, Mar. 9, 1978, 53/26981; Sep. 14, 1978, 53/112379
Int. Cl.[3] D03D *15/00*
U.S. Cl. 428—224 12 Claims



1. A separable unitary composite fiber having a substantially uniformly shaped transverse cross-section along its length, said composite fiber being comprised of at least two different polymer components, one of which is soluble in a given solvent and the other of which is relatively insoluble in the given solvent, a plurality of segments of said relatively insoluble polymer component being isolated from each other by the intervening soluble polymer component in the transverse cross-section of the composite fiber,
said soluble polymer component being a polyester comprised of 80 to 97% by mole of ethylene terephthalate units and 3 to 20% by mole of ethylene 5-sodium-sulfoisophthalate units, and said relatively insoluble polymer component being a fiber-forming polymer selected from the group consisting of polyester and polyamide.

4,233,356
MATERIAL FOR WATERPROOFING BRIDGE DECKS AND THE LIKE
Melvin J. Jacobs, Sharon, Mass., assignor to Triram Corporation, Framingham, Mass.
Division of Ser. No. 803,789, Jun. 6, 1977, Pat. No. 4,151,025.
This application Mar. 8, 1979, Ser. No. 18,838
Int. Cl.[2] E01D *19/12*
U.S. Cl. 428—244 7 Claims

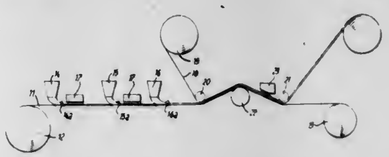


1. A membrane for use in waterproofing bridge decks or the like, comprising
(a) a first ply of a cured flexible elastomer, defining one side of said membrane,
(b) a second ply of an uncured flexible elastomer, defining the opposite side of said membrane, and
(c) a third ply of flexible fabric of open mesh weave laminated between said first and second plies,
(d) said second ply being a soft, uncured, form stable elastomer adapted to flow when heated.

4,233,357
LAMINATED INSULATING BOARD
Rodney Taylor, Broadway; Robert J. Pragnell, and John P. Sheppard, both of Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, London, England
Filed Sep. 6, 1979, Ser. No. 73,026
Int. Cl.[2] B32B *5/18*
U.S. Cl. 428—245 5 Claims

1. A laminated insulating board comprising an insulating core of foamed phenol-formaldehyde resin which has a closed cell content of at least 85% and on least one face of said core a glass fibre woven or non-woven cloth or tissue laminated to the core with a water-based natural rubber latex adhesive, the laminate having a water absorption of not more than 10% v/v, a thermal conductivity (k-value) of less than 0.035 W/m°C., a flexural strength of at least 50×10^4 N/m^2, a tensile strength of at least 30×10^4 N/m^2, a compressive strength of at least 20×10^4 N/m^2 and a delamination peel strength of at least 200 N/m at room temperature.

4,233,358
METHOD FOR THE PRODUCTION OF WATERPROOF AND LIKE FABRICS
Norman Jones, Blackburn, and Peter Dawson, Darwen, both of England, assignors to Clemead Limited, England
Filed Feb. 21, 1979, Ser. No. 13,169
Claims priority, application United Kingdom, Oct. 13, 1978, 40583/78
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—246 14 Claims



9. A waterproof stretchable coated textile fabric produced by the method comprising the steps of:
(a) applying plural layers of coating material to an elongate, flexible carrier element having a release capability in relation to the coating material, the respective formulations of the successive layers and the application thereof

to the immediately preceding layer existing on the carrier element being such that a given coating layer will fuse with the free surface and immediately adjacent parts of such preceding layer;

(b) contacting a surface of a length of a textile fabric formed wholly of continuous filament synthetic yarns with said layers of coating material on said carrier element, and

(c) tensioning a run of said carrier element carrying said layers and a textile fabric run so that said textile fabric run is also tensioned, the tensioning of said carrier element run creating laminating pressure between said textile fabric run and carrier element run so that said layers are transferred to the textile fabric and said layers and textile fabric are laminated together to form a laminate.

4,233,359

LEATHERY SHEET MATERIAL AND PROCESS FOR THE PREPARATION THEREOF

Masahisa Mimura, Mihara; Isamu Nakano, Takehara; Nobuo Okawa, Mihara, and Atsushi Tanaka, Fuchu, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 8, 1978, Ser. No. 958,906
Claims priority, application Japan, Nov. 8, 1977, 52-133084
Int. Cl.³ B32B *27/40*
U.S. Cl. 428—254 **11 Claims**

1. A leathery sheet material having excellent flexibility, antistatic properties and soil resistance which comprises (1) a fibrous mat and (2) a polyurethane composition applied all over said mat in an amount of 10 to 80% by weight based on the total weight of said mat and said polyurethane composition, said polyurethane composition containing 0.1 to 5.0% by weight of a surface active agent based on said polyurethane composition, said surface active agent having a molecular weight of 2,500 to 30,000 and comprising 30 to 80% by weight of a hydrophilic component based on said surface active agent and a hydrophobic component, both the components being combined by a urethane bond and/or an amide bond, said hydrophilic component comprising polyethylene oxides and said hydrophobic component comprising a member selected from the group consisting of (a) polyalkylene oxides excepting polyethylene oxides, (b) aliphatic polyesters and (c) mixtures thereof.

4,233,360

NON-ANTIGENIC COLLAGEN AND ARTICLES OF MANUFACTURE

Edward E. Luck, and John R. Daniels, both of Menlo Park, Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Division of Ser. No. 744,536, Nov. 24, 1976, Pat. No. 4,140,537, which is a continuation of Ser. No. 624,678, Nov. 22, 1975, abandoned. This application Sep. 25, 1978, Ser. No. 945,723
Int. Cl.² B32B *5/26*; A61L *15/04*; C08L *89/06*
U.S. Cl. 428—310 **5 Claims**

1. A method for preparing an atelopeptide collagen burn dressing comprising a laminate of a foam and a film which comprises:

lyophilizing a dispersion of fibers of atelopeptide collagen to form a foam;

cross-linking said foam;

applying an aqueous dispersion of a mixture of cross-linked and non-cross-linked atelopeptide collagen to said foam to form a laminate; and

dehydrating said laminate, wherein said dispersion of fibers of atelopeptide collagen is prepared by inducing slow desolubilization of atelopeptide collagen from an aqueous solution of atelopeptide collagen while subjecting said solution to mild shear force, whereby fibers of atelopeptide collagen are formed having a mean diameter of at least about 500 nm and appearing as a rope-like structure in a scanning electron micrograph.

4,233,361

PANEL AND METHOD FOR THE PREPARATION THEREOF

Duane A. Fultz, Westeville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 27, 1978, Ser. No. 928,482
Int. Cl.² B32B *3/26, 5/18, 19/02, 27/42*
U.S. Cl. 428—313 **6 Claims**

1. A composite synthetic resinous foam panel, the foam panel having at least first and second generally opposed major surfaces, the resinous panel comprising a plurality of expanded multicellular synthetic resinous thermoplastic particles, the particles having a density of from about one-half to two pounds per cubic foot, the synthetic resinous thermoplastic particles being generally encapsulated within a matrix of a resole resin foam, the resole resin foam having a bulk density in the interstitial spaces between the synthetic resinous particles of from about two to six pounds per cubic foot, an expanded glass in particulate form encapsulated within portions of the resole resin foam disposed adjacent the major surfaces of the panel.

4. The panel of claim 1 wherein an aluminum sheet is disposed on and adhered to at least one major surface thereof.

4,233,362

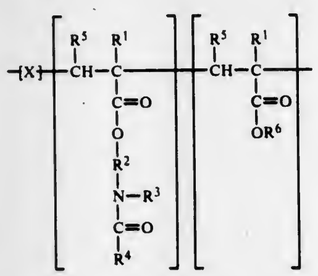
WATER-SOLUBLE AIR-OXIDIZING ACRYLIC COATINGS

Ronald W. Novak, Hatfield, and Benjamin B. Kine, Elkins Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,587, Mar. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,507, Dec. 17, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,717
Int. Cl.² B05D *3/02*; B32B *17/10, 19/04, 15/08*
U.S. Cl. 428—332 **26 Claims**

1. In a method of coating an article with a paint containing an aqueous alkaline solution of an addition polymer solubilized in said solution by a volatile amine or ammonia, said solubilized polymer having the structure:

I



wherein

R^1 is H, a lower alkyl radical having one to five carbon atoms, halogen, —CN, or —CH_2COOR, —COOR, or —CH_2COOH, R being a lower alkyl radical having from one to eight carbon atoms;

R^2 is $(CR^7_2)_n$ wherein R^7 is —H or —CH_3 and n is 1 or 2;

R^3 is H, or a lower alkyl radical having from one to 8 carbon atoms;

R^4 is an unsaturated, air-curable alkyl radical;

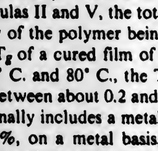
R^5 is H, —COOH, —$CONH_2$, or —COOR, wherein R is as above;

R^6 is H, or an aliphatic or cycloaliphatic radical having from one to 20 carbon atoms; and

X is optional and when present is derived from at least one vinyl monomer different than the residues depicted;

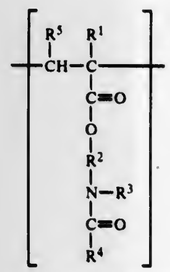
the units in brackets being in any order, portions of the R^6 radicals being as hereinafter defined in units of the formula:

II



R^6 being H in a sufficient number of units of Formula II to provide the polymer with a carboxy content of 0.5–6 meq/g. of polymer, the quantity of carboxy groups being sufficient, when in the form of salt groups with said amine or ammonia, to confer water solubility upon the polymer, the amount of carboxy-containing units of Formula II wherein R^6 is H being between 5 and 40 parts by weight of the total polymer; optionally a portion of the radical R^6 in the units of Formula II being at least one aliphatic or cycloaliphatic radical and being selected so that the units are derived from at least one ester which when homopolymerized gives a high molecular weight polymer having a T_g of between −80° C. and 120° C., said ester units forming up to 90 parts by weight of the polymer; the polymer having between about 5 and 60 parts by weight of units of the formula:

V



wherein R^1, R^2, R^3, R^4, and R^5 are as identified above, any balance of the polymer being the units of —X— of addition polymerized ethylenically unsaturated monomers other than said units of Formulas II and V, the total parts of all said units being 100, the Mv of the polymer being between about 5,000 and 200,000, the T_g of a cured film of the polymer being between about −20° C. and 80° C., the Tukon Hardness of the cured film being between about 0.2 and about 15, in which the composition optionally includes a metal compound drier in an amount up to 0.5%, on a metal basis, of the total polymer weight in the composition, applying a thin uniform coating of the aqueous solution to a substrate, and drying and curing said coating in the presence of air.

10. An article of manufacture prepared by the method of claim 1, 2, 3, 4, 5, 6, 7, 8, or 9, in which the cured coating is from 0.1 mil to 10 mils in thickness, the Tukon hardness of the cured film being between about 0.2 and about 15.

4,233,363

POLYESTER DRAW-TEXTURING FEED YARNS

Albert Cemel; Castulo Chaban, Jr., both of Chattanooga, Tenn., and Albert Z. Fresco, Martinsville, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1979, Ser. No. 17,072
Int. Cl.² D02G *3/00*
U.S. Cl. 428—373 **5 Claims**



1. A draw-texturing feed yarn with the improvement, whereby the feed yarn may be draw-textured to provide a textured yarn for making fabric having a fine uniform heather appearance, that the yarn comprises polyester spin-oriented filaments (a) of one type having affinity for one class of dyestuffs, and (b) of another type having affinity for a different class of dyestuffs, that the degree of component mixing (DCM) of the different types of filaments is at least 50%, and that the stress ratio (SR) of the different types of filaments is about 0.8 to about 1.2.

4,233,364

ANCHORING FIBRE FOR USE IN CONCRETE

Rudolphus A. F. J. van Thiel, Beek en Donk, Netherlands, assignor to Van Thiel's Draadindustrie (Thibodraad) B.V., Beek en Donk, Netherlands

Continuation-in-part of Ser. No. 927,953, Jul. 25, 1978, abandoned. This application May 15, 1979, Ser. No. 39,211
Int. Cl.² D02G *3/00*
U.S. Cl. 428—399 **11 Claims**



1. An anchoring fibre of metal for use in concrete comprising a longitudinally extending cylindrical body, said fibre having means thereon to resist pull-out thereof from the concrete, said means comprising the end portions of the fibre being flattened, and a projection on a said flattened end portion, said projection extending transversely of the axis of said body.

4,233,365

FREE FLOWING PARTICLES OF ELASTOMERIC MATERIAL AND METHOD

Rudolph F. Karg, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corp., Baton Rouge, La.

Division of Ser. No. 791,696, Apr. 28, 1977, Pat. No. 4,183,887. This application Apr. 6, 1979, Ser. No. 27,983
Int. Cl.² B32B *5/16*
U.S. Cl. 428—404 **6 Claims**

1. Free flowing particles of elastomeric material comprising particles of elastomeric material, a porous network of fibrilated synthetic resinous material on the surface of the elastomeric particle, and finely divided solid particles of partitioning agent entrapped for retention by the fibrilated synthetic resinous network to maintain separation for free flow of the elastomeric particles.

4,233,366

SILANE COATED SILICATE MINERALS AND METHOD FOR PREPARING SAME

Thomas E. Sample, Jr., and John M. Horn, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 772,380, Feb. 28, 1977, Pat. No. 4,137,367, which is a continuation-in-part of Ser. No. 637,339, Dec. 3, 1975, abandoned, which is a continuation of Ser. No. 513,984, Oct. 11, 1974, abandoned. This application Oct. 23, 1978, Ser. No. 954,389

Int. Cl.[2] B32B 5/16

U.S. Cl. 428—405 5 Claims

1. A composition of matter consisting of a phyllosilicate mineral including a superficial octahedral layer of magnesium oxide that has been processed by the steps of:

(a) etching said mineral with an acid;

(b) arresting such etching process when said superficial layer has been solubilized; and

(c) subsequently reacting the etched phyllosilicate with an organo-silane.

4,233,367

COEXTRUDED MULTILAYER FILM

William G. Ticknor, Appleton, and Arnold R. Rein, Menasha, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jan. 6, 1977, Ser. No. 757,140

Int. Cl.[3] B32B 27/08

U.S. Cl. 428—476.3 11 Claims

1. A process for producing a multilayer film, comprising: coextruding nylon and a chemically modified polyolefin selected from the group consisting of ethylene vinyl acetate polymer, high density polyethylene and rubber modified high density polyethylene, each chemically modified by the provision of functional groups to the polymer which have a strong affinity for nylon and which will form a strong bond to nylon under heat and pressure of coextrusion.

5. A multilayer film comprising: a coextrusion of nylon and a chemically modified polyolefin selected from the group consisting of ethylene vinyl acetate polymer, high density polyethylene, and rubber modified high density polyethylene, each chemically modified by the provision of functional groups to the polymer which have a strong affinity for nylon and which will form strong bonds to nylon under the heat and pressure of coextrusion.

4,233,368

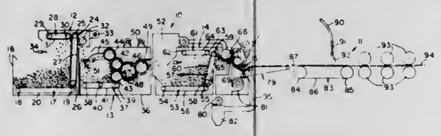
METHOD FOR THE PRODUCTION OF GLASS FIBER-REINFORCED GYPSUM SHEETS AND GYPSUM BOARD FORMED THEREFROM

Donald O. Baehr, Arlington Heights, and David G. Izard, Hoffman Estates, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,776

Int. Cl.[3] B28B 3/00; B32B 9/04; C04B 43/02

U.S. Cl. 428—538 32 Claims



17. A cementitious construction sheet having reinforcing fibers dispersed therein, said sheet being the product formed by the method which comprises:

(a) mixing together in a moving air current generated by an air blower a substantially dry water-settable calcium sulfate hemihydrate in finely particulate form with reinforcing glass fibers,

(b) providing a foraminous moving surface,

(c) depositing the mixture of calcium sulfate hemihydrate and glass fibers on said foraminous surface to form a sheet,

(d) applying water over the sheet,

(e) permitting the calcium sulfate hemihydrate to set, and

(f) drying said sheet to remove any excess water.

4,233,369

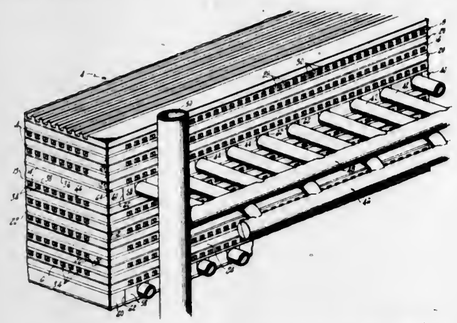
FUEL CELL COOLER ASSEMBLY AND EDGE SEAL MEANS THEREFOR

Richard D. Breault, Coventry; Richard J. Roethlein, Stafford Springs, and Joseph V. Congdon, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1979, Ser. No. 88,994

Int. Cl.[3] H01M 8/04

U.S. Cl. 429—26 3 Claims



1. An electrochemical cell stack comprising first and second fuel cells separated by a cooler assembly, each cell comprising a pair of electrodes spaced apart with a matrix layer disposed therebetween for retaining electrolyte, each electrode including a gas porous substrate having a flat first side facing said matrix layer and a second side facing away from said matrix layer said second side including ribs which define grooves therebetween extending across said substrate for carrying reactant gas during cell operation, said cooler assembly comprising a top and a bottom gas impervious graphite plate, said plates spaced apart with a gas porous, graphitized, resin bonded, carbon fiber tube holder disposed therebetween, each of said plates having first and second oppositely facing surfaces, said holder having a bottom surface contiguous with and resin bonded to said first surface of said bottom plate and a top oppositely facing surface contiguous with said first surface of said top plate, a plurality of parallel channels in said top surface of said holder, said channels extending across the length of said holder and parallel to said grooves in one of said electrodes, said cooler assembly including tubes disposed in said channels and passing through said holder for carrying a coolant into heat exchange relationship with said cells, said channels having a depth which is substantially the same as the full thickness of said holder and as the outer diameter of said tubes, said cooler assembly also including gas seal means disposed between said plates along each edge of said holder parallel to said channels to prevent gas leakage from said holder through said edges.

4,233,370

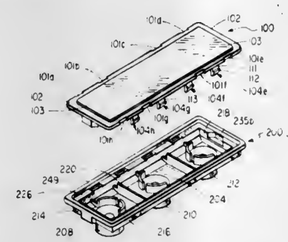
SNAP-THROUGH ANTI-IGNITION VENT CAP FOR LEAD ACID STORAGE BATTERIES

Joseph I. Heiser, Wyomissing Hills, and Edgar M. Erb, Lancaster, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 879,461, Feb. 21, 1978, which is a division of Ser. No. 744,647, Nov. 24, 1976, Pat. No. 4,086,395, which is a continuation-in-part of Ser. No. 593,546, Jul. 7, 1975, abandoned. This application Apr. 30, 1979, Ser. No. 34,416

Int. Cl.[3] H01M 2/12

U.S. Cl. 429—82 4 Claims



1. A vent cap for use on an electric storage battery to sealingly engage the openings of said battery and to vent battery gases to the atmosphere, said vent cap comprising:

(a) a bottom member adapted to sealingly fit into said openings in said battery and to communicate the interior of said battery to the atmosphere, said bottom member having at least one slot through the underside thereof and an annular sidewall;

(b) a top member fitted within said annular sidewall and snap-fitted through said slot in said bottom member, said top member having at least one prong member extending downward therefrom through said slot, and said prong member being narrower than said slot, whereby at least one first slit is formed between said slot and said prong on the underside of said bottom member;

(c) said top member further having at least one indentation in the circumference thereof adjacent said annular sidewall, whereby a second slit is formed between said top member and said bottom member.

4,233,371

METHOD FOR THE MANUFACTURE OF AN ELECTROCHEMICAL CELL OR BATTERY AND BATTERY MADE BY THE METHOD

Antoon Dorrestijn, Grevenbicht, Netherlands, assignor to Electrochemische Energieconversie N.V., Mol, Belgium

Filed Sep. 10, 1979, Ser. No. 74,099

Claims priority, application Netherlands, Sep. 13, 1978, 7809298

Int. Cl.[3] H01M 6/46

U.S. Cl. 429—152 12 Claims



1. A method for the manufacture of an electrochemical cell or battery, consisting of a stack of plate-shaped elements, including at least two electrode elements, each of which consists of a sheet or plate of electrode material which is mounted in a frame made of an electrically insulating fibrous-web material impregnated with a thermosetting synthetic material, which elements, prior to setting, are stacked to form a package of the desired composition in such a way that gas or liquid chambers are formed between the elements, after which the stack is subjected to a compression molding operation at a temperature causing the thermosetting synthetic material to polymerize, thus forming the stack into a coherent block, wherein the improvement comprises the steps of employing a first compression molding operation stage wherein the individual plate-shaped elements are manufactured by placing a sheet of electrode material in a press mold between frame sections made of electrically insulating fibrous web impregnated with a non-polymerized thermosetting synthetic material and heating the assembly under pressure for a relatively short primary time at a relatively low primary temperature, at which temperature the thermosetting synthetic material flows well, but polymerizes only to a minor degree at most, after which the resulting plate-shaped elements, together with any other cell or battery components, are stacked into a package of the desired composition, which package in a second compression molding operation stage is formed into a coherent block by compressing it for a relatively long secondary time and at a relatively high secondary temperature, at which the thermosetting synthetic material sets.

12. An electrochemical cell or battery constructed in accordance with claim 1 or 2.

4,233,372

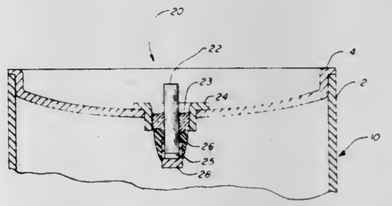
HERMETIC SEAL FOR ELECTROCHEMICAL CELL

Per Bro, Andover, and George Wallis, Lexington, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 9, 1979, Ser. No. 37,556

Int. Cl.[3] H01M 2/00

U.S. Cl. 429—174 21 Claims



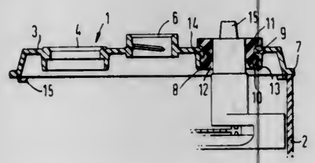
1. An electrochemical cell comprising a container closed with an hermetic seal, said seal comprising a first metal member separated from a second metal member and sealed thereto by a glass member, said first and second metal members being electrically insulated from each other by said glass member, characterized in that said second metal member is chemically incompatible with components of said cell, and said second metal member is mechanically and electrically connected to a third metal member, chemically compatible with components of said cell, and exposed thereto, said third metal member being electrically connected to an electrode of said cell to provide electrical continuity between said electrode and said second metal member and said seal further including means for sealingly enclosing substantially all of the surfaces of said second metal member which are exposed within said cell container.

4,233,373

CELL CASING AND GROMMET THEREFORE

Ian Meyler-Warlow, and Graham H. Law, both of Redditch, England, assignors to Heatherbourne Plastics Limited, England

Filed Apr. 11, 1979, Ser. No. 29,252
Claims priority, application United Kingdom, Apr. 12, 1978, 14339/78
Int. Cl.[3] H01M 2/30
U.S. Cl. 429—181 2 Claims



1. An electric cell comprising a casing having a bottom, side walls and a top, said top having an inner and an outer surface, a plurality of holes in the top, a terminal post protruding through each hole, an inclined surface on the outer surface of the top and about each hole, a planar surface portion on the inner surface of the top about each hole and extending substantially perpendicular to the axis of the respective hole, and a grommet located in each hole sealing between the respective terminal post and the top, the grommets each including a body, an opening through the body through which the respective terminal post passes, and a peripheral groove about the body defining spaced first and second peripheral lips, said first peripheral lip engaging on the planar surface portion of the inner surface of the top, said second peripheral lip engaging on the outer surface of the top, said opening including a cylindrical portion aligned with said second peripheral lip merging into a portion of increased width aligned with the first peripheral lip, and said first peripheral lip tapering away from the peripheral groove thereby providing an annular inwardly-inclined surface, the inwardly-inclined surface on the first peripheral lip during fitting cooperating with the inclined surface on the top to facilitate insertion of the grommet, and the portion of the opening of increased width permitting the first peripheral lip to flex inwardly so as to engage the planar surface on said inner surface of the top.

4,233,374

DOUBLE CHROMATE COMPOSITIONS FOR USE AS POSITIVE ACTIVE MATERIAL IN BATTERIES

André Lecerf, Pace, France, assignor to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Continuation-in-part of Ser. No. 952,089, Oct. 17, 1978, Pat. No. 4,184,016. This application Apr. 13, 1979, Ser. No. 30,051
Claims priority, application France, Feb. 14, 1979, 79 03772; Apr. 2, 1979, 79 08198
Int. Cl.[3] H01M 6/14
U.S. Cl. 429—194 7 Claims



1. A composition comprising a double chromate of bismuth taken from the group consisting of $AgBi(CrO_x)_2$, $AgBi(Cr_2O_7)_2$, $TlBi(CrO_4)_2$, and $TlBi(Cr_2O_7)_2$, where x is equal to or greater than 3.7 and less than 4.

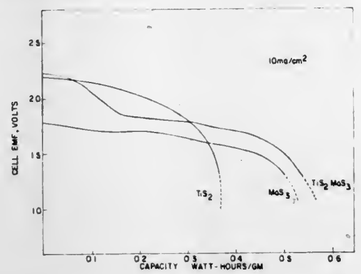
2. A battery having a positive electrode, a negative electrode selected from the group consisting of alkaline metals and alkaline earth metals and a nonaqueous electrolyte, wherein the positive electrode comprises as active material a double chromate of bismuth taken from the group consisting of $AgBi(CrO_x)_2$, $AgBi(Cr_2O_7)_2$, $TlBi(CrO_4)_2$, and $TlBi(Cr_2O_7)_2$, where x is equal to or greater than 3.7 and less than 4.

4,233,375

HIGH ENERGY DENSITY PLURAL CHALCOGENIDE CATHODE-CONTAINING CELL

M. Stanley Whittingham, Fanwood, and Allan J. Jacobson, Princeton, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 2, 1979, Ser. No. 63,107
Int. Cl.[3] H01M 6/14
U.S. Cl. 429—194 31 Claims



1. An electric current producing cell, comprising:
(a) an anode having as its anode-active material one or more metals selected from the group consisting of the Periodic Table Group IA metals, Group IB metals, Group IIA metals and Group IIB metals;
(b) a cathode having as its cathode-active material a mixture containing:
(i) one or more cathode-active, high energy density chalcogenide compounds selected from the group consisting of VS_a, VO_a, partially substituted analogs of VS_a, C_xS, MoO_z and MoS_z, wherein a is a numerical value of about 1.8 to about 2.7, wherein x is a numerical value of about 4 to about 16, wherein z is a numerical value of about 2.5 to about 3.5; and
(ii) one or more cathode-active, high rate, high conductivity chalcogenide compounds selected from the group consisting of TiS_y, $TiSe_y$ and VSe_y, wherein y is numerical value of about 1.8 to about 2.2; and
(c) an electrolyte which is chemically inert with respect to said anode and said cathode and which permits the migration of ions between said anode and said cathode.

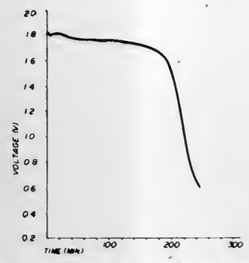
4,233,376

MAGNESIUM-LITHIUM ALLOY

James T. N. Atkinson, Kingston, and Maheswar Sahoo, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 30, 1979, Ser. No. 8,690
Claims priority, application Canada, Feb. 14, 1978, 297104
Int. Cl.[3] H01M 6/04
U.S. Cl. 429—199 6 Claims

1. An electrical battery comprising an anode, a manganese dioxide cathode and an aqueous magnesium perchlorate electrolyte, wherein the anode is made of a magnesium-based alloy, the alloy consisting essentially of 6–13%/w of lithium,



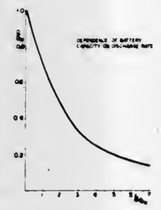
0–1.5%/w of aluminum, the balance being magnesium and impurities.

4,233,377

ELECTRICAL STORAGE DEVICE

Rudolph R. Haering, 647 Croydon Pl., Vancouver, B.C., and James A. R. Stiles, 4133 Fairway Pl., North Vancouver, B.C., both of Canada

Filed Jul. 6, 1978, Ser. No. 922,199
Claims priority, application Canada, Jul. 14, 1977, 282696
Int. Cl.[3] H01M 4/58
U.S. Cl. 429—218 17 Claims



1. A battery comprising:
(a) an anode consisting essentially of a material selected from the group consisting of lithium and magnesium,
(b) a cathode consisting essentially of a layered transition metal dichalcogenide which has been pretreated by intercalating a relatively small amount of a suitable selected dopant having a relatively large atomic molecular or ionic radius with respect to the radius of cations migrating to and intercalating in the cathode during discharge of the battery, so as to permit more rapid intercalation of the cathode by said cations, said layered transition metal dichalcogenide being selected from the group consisting of molybdenum disulphide and titanium disulphide, said dopant being selected from the group consisting of sodium, potassium, cesium and rubidium, and
(c) a suitable selected liquid electrolyte in which the migration of said cations occurs during discharge of the battery.

4,233,378

PROCESS FOR MANUFACTURE OF POSITIVE ELECTRODE FOR LITHIUM/METAL SULFIDE SECONDARY CELL

Louis A. Joo', and Frederick C. Miller, both of Johnson City, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Continuation of Ser. No. 838,757, Oct. 3, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,571
Int. Cl.[2] H01M 4/36
U.S. Cl. 429—220 5 Claims

1. In a positive electrode for a high-temperature secondary electrochemical cell which uses a positive electrode, a lithium or lithium alloy negative electrode, a molten salt electrolyte containing lithium ions, and a porous separator, and wherein the active material of said positive electrode is a metal sulfide or a metal oxide or mixture thereof 100% of which passes through a 100 mesh per inch screen, and being selected from the group consisting of the sulfides and oxides of iron, copper, cobalt, and nickel deposited within a preformed solid continuous carbonaceous matrix selected from the group consisting of: graphite felts; carbon fiber felts; and carbonaceous foams with a void volume of from 50 to 95%, the improvement wherein said active material is bonded in place in said preformed matrix by the carbonized residue of a high carbon yield resin.

4,233,379

SEPARATOR FOR STARVED ELECTROLYTE LEAD/ACID BATTERY

Stephen E. Gross; Clifford W. Cain, Jr., both of Littleton; Paul D. Bilawsky, Lakewood, and Norman B. Scheffel, Parker, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 19,805, Mar. 12, 1979, abandoned. This application May 17, 1979, Ser. No. 39,708
Int. Cl.[3] H01M 2/16
U.S. Cl. 429—247 12 Claims

1. A composition, useful as a separator material in starved electrolyte lead/acid batteries, which comprises a mixture of 30% to 80% by weight of expanded perlite and 20% to 70% by weight of glass fiber, said glass fibers having diameters in the range of from about 0.3 to about 1.0 micrometers and said perlite having particle sizes in the range of from about 3 to about 100 micrometers.

4,233,380

PROCESS FOR SHAPING A THERMOPLASTIC LAYER

Roland Moraw, and Günther Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 588,564, Jun. 19, 1975, abandoned, which is a continuation of Ser. No. 341,335, Mar. 15, 1973, abandoned. This application May 3, 1978, Ser. No. 902,538
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1972, 2212968
Int. Cl.[2] G03G 16/00; G03H 1/04
U.S. Cl. 430—2 6 Claims



1. A process for recording a phase hologram in the form of a relief structure of an optical image on a recording material composed of a photoconductive thermoplastic recording layer and an electrically non-conductive transparent flexible base layer comprising
placing the flexible recording material which is separated by an intermediate layer on a planar, transparent, rigid base on the surface of which latter is disposed an electrically conductive layer, which is grounded,
electrostatically charging the photoconductive thermoplastic layer, whereby said flexible recording material is firmly and immovably electrostatically attracted onto said rigid base, the electrostatic attraction being effected by said electrostatic charging;
holographically exposing the charged flexible recording material on the rigid base with interference patterns of light of said optical image; and
softening by heat at least the surface of the charged and exposed flexible recording material on said rigid base by application of a voltage to opposite edges of the electrically conductive layer of said rigid base to thereby deform

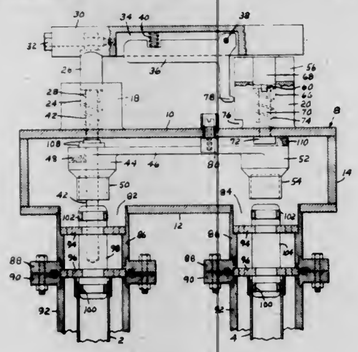
said photoconductive thermoplastic recording layer to said relief structure.

4,233,381

METHOD AND APPARATUS FOR INCREASING THE APPARENT RESOLUTION OF DEVELOPED ELECTROPHOTOGRAPHICALLY REPRODUCED IMAGES

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Nov. 9, 1978, Ser. No. 958,979
Int. Cl.[2] G03G *13/22*
U.S. Cl. 430—33 **3 Claims**



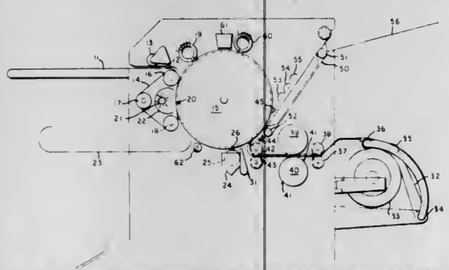
1. In a method of electrophotography in which a photoconductor is charged in a charging step, subjected to a light and shape image of a document to be copied to produce a latent electrostatic image of the document on the surface of the photoconductor in an exposing step, the latent electrostatic image is developed by a liquid-carried toner to provide a visible image on the photoconductor in a development step, and the visible image is transferred to a carrier sheet after it has been developed in a transferring step, the improvement comprising flooding the front of the visible electrostatic image with blanket light to increase the apparent resolution of the developed image before it is transferred to a carrier sheet and then practicing the transferring step.

4,233,382

ELECTROSTATIC TRANSFER OF MAGNETICALLY HELD TONER IMAGES

Donald W. Edwards, Wilmington, and Emery J. Gorondy, Rockland, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 767,511, Feb. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 672,551, Mar. 31, 1976, abandoned. This application Oct. 27, 1978, Ser. No. 955,506
Int. Cl.[2] G03G *19/00*
U.S. Cl. 430—39 **18 Claims**



1. A process comprising bringing a substrate capable of maintaining an electrostatic charge into superposed position and intimate contact with an image of uncharged toner particles which have an electrical conductivity of less than about 1×10^{-13} mho/cm magnetically adhered to an electrically conductive magnetic imaging member having a resistivity of less than about $1\times10^{+9}$ ohm-cm which is adapted to dissipate an electric charge, and applying an electric field at this position whereby said toner particles adhere to said substrate upon separation of said substrate from said electrically conductive magnetic imaging member.

4,233,383

TRIGONAL SELENIUM PHOTOCONDUCTIVE ELEMENT

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1979, Ser. No. 43,066
Int. Cl.[3] G03G *5/04*
U.S. Cl. 430—58 **16 Claims**



8. An imaging member comprising a charge generation layer comprising a particulate photoconductive material comprising trigonal selenium dispersed in an organic resinous binder, said trigonal selenium containing a mixture of alkaline earth metal selenite and alkaline earth metal carbonate of from about 0.01 to about 12.0 percent total weight based on the weight of trigonal selenium wherein the ratio of the selenite to carbonate ranges from 90 to 10 parts by weight to 10 to 90 parts by weight and a contiguous charge transport layer, said photoconductive material exhibiting the capability of photogeneration of charge carriers and injection of said charge carriers and said charge transport layer being substantially nonabsorbing in the spectral region at which the photoconductive material generates and injects photo-generated charge carriers but being capable of supporting the injection of photogenerated charge carriers from said photoconductive material and transporting said charge carriers through said charge transport layer.

4,233,384

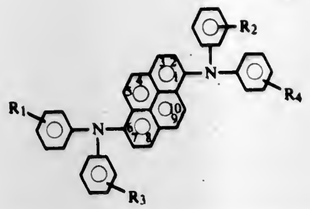
IMAGING SYSTEM USING NOVEL CHARGE TRANSPORT LAYER

S. Richard Turner; John F. Yanus, both of Webster, and Damodar M. Pai, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1979, Ser. No. 34,817
Int. Cl.[3] G03G *5/04*
U.S. Cl. 430—59 **6 Claims**



1. An imaging member comprising a charge generation layer comprising a layer of photoconductive material and in contact therewith a charge transport layer of a polycarbonate resin material having dispersed therein from about 25 to about 75 percent by weight of one or more compounds having the general formula:



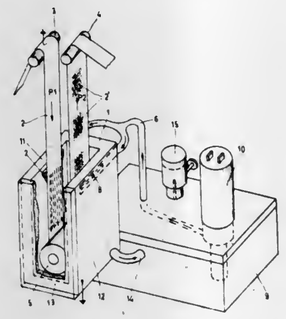
wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, an ortho, meta or para alkyl group having from 1to about 4 carbon atoms, an ortho, meta or para halogen atom, a para phenyl group and combinations thereof, at least two of the four N substituents must in turn be substituted with said alkyl group, said halogen atom or said para phenyl group or a combination of these substituents, said photoconductive layer exhibiting the capability of photogeneration of holes and injection of said holes and said charge transport layer being substantially nonabsorbng in the spectral region at which the photoconductive layer generates and injects photogenerated holes, but being capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said charge transport layer.

4,233,385

METHOD AND APPARATUS FOR LIQUID ELECTROSTATIC DEVELOPMENT OF CHARGE IMAGES ON A TAPE-LIKE RECORD CARRIER

Hans-Dieter Hinz, Tornesch; Ulf Rothgordt, Norderstedt, and Franz Schinke, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,502
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641026
Int. Cl.[2] G03G *103/10*
U.S. Cl. 430—117 **3 Claims**



1. A method of electrostatic development of electrostatic charge images impressed on a surface of a smooth, tape-like record carrier in a liquid, by guiding the carrier through a developer tank through which developer liquid is continuously flowing, comprising:

spraying a first flow of developer liquid against the surface of the record carrier on which the charge image is formed so as to form a first uniform flow zone,

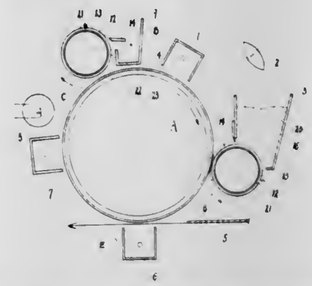
spraying a second flow of developer liquid against the surface of the record carrier on which the charge image is formed so as to form a second uniform flow zone, the liquid in said first and second flows flowing toward each other on said surface, and the liquid in said first and second flow zones flowing on said surface to a common turbulent flow zone at the meeting of the two uniform flow zones.

4,233,386

METHOD OF REMOVING RESIDUAL TONER FROM SURFACE OF PHOTOCONDUCTIVE MEMBER FOR USE IN ELECTROSTATIC COPYING APPARATUS OF THE TRANSFER TYPE

Tatsuo Aizawa; Nobuhiko Kozuka, both of Osaka, and Yuji Hasegawa, Hyogo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 14, 1978, Ser. No. 942,379
Claims priority, application Japan, Sep. 19, 1977, 52-112830
Int. Cl.[3] G03G *13/14, 15/00, 15/06*
U.S. Cl. 430—125 **4 Claims**



1. In an electrostatic copying process of the type including providing a photoconductive member having a photoconductive surface over a conductive base, sensitizing said photoconductive surface by charging said photoconductive surface to a given polarity, exposing the thus charged surface to an optical image and thereby forming an electrostatic latent image on said photoconductive surface, developing said electrostatic latent image by means of a singlecomponent magnetic toner including toner particles which are polarizable in an electric field, such that said toner particles are polarized in accordance with charges forming said electrostatic latent image and are deposited on said surface by an electrostatic attraction force between said toner particles and said surface to thereby form a toner image on said surface, transferring said toner image to a copy paper, and thereafter cleaning from said surface any residual toner particles remaining after said transfer, the improvement wherein said cleaning comprises:

subjecting said surface and said residual toner particles to a charge of the same polarity as said given polarity, thereby increasing the charge of said given polarity on outer portions of said residual toner particles and on portions of said surface not covered by said residual toner particles, and thereby inducing in said conductive base a charge of the opposite polarity from said given polarity;

uniformly exposing said surface, simultaneously with or after said step of subjecting, and thereby neutralizing said charge of said given polarity on said portions of said surface not covered by said residual toner particles with said charge of opposite polarity in said conductive base;

whereby there is achieved an electrical neutralization over the entire area of said surface and said residual toner particles and a reduction of said electrostatic attraction force between said residual toner particles and said surface; and

removing said residual toner particles from said surface by brushing said surface with a magnetic brush formed of a single-component magnetic toner including toner particles which are polarizable in an electric field, and magnetically attracting to said magnetic brush said residual toner particles from said surface against the reduced electrostatic attraction force therebetween, while preventing

polarization of said toner particles forming said magnetic brush due to said electrical neutralization.

4,233,387

ELECTROPHOTOGRAPHIC CARRIER POWDER COATED BY RESIN DRY-MIXING PROCESS

Joseph Mammino, Penfield; Timothy F. Johnson; David W. Walters, both of Williamson, and Steven R. Perez, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1979, Ser. No. 17,229
Int. Cl.[3] G03G 9/10; B05D 7/00
U.S. Cl. 430—137 14 Claims

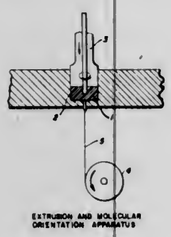
1. The process of preparing coated carrier particles useful in electrostatographic developer mixtures for the development of electrostatic latent images, said process comprising the steps of mixing low density, porous, magnetic or magnetically-attractable metal carrier core particles having a gritty, oxidized surface and a surface area of at least about 200 cm^2/gram and up to about 1300 cm^2/gram of said carrier particles with from between about 0.05 percent and about 3.0 percent by weight based on the weight of the coated carrier particles, of particulate thermoplastic resin material having a particle size of between about 0.1 micron and about 30 microns, dry-mixing said carrier core particles and said thermoplastic resin material until said thermoplastic resin material adheres to said carrier core particles by mechanical impaction or electrostatic attraction, heating the mixture of carrier core particles and thermoplastic resin material to a temperature of between about 320° F. and about 650° F. for between about 120 minutes and about 20 minutes so that said thermoplastic resin material melts and fuses to said carrier core particles, cooling the coated carrier particles, and classifying said coated carrier particles to the desired particle size.

4,233,388

METHOD FOR MAKING TONER PARTICLES

Richard F. Bergen, Ontario, and Charles L. Beatty, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 18, 1979, Ser. No. 40,333
Int. Cl.[3] G03G 9/16
U.S. Cl. 430—137 10 Claims



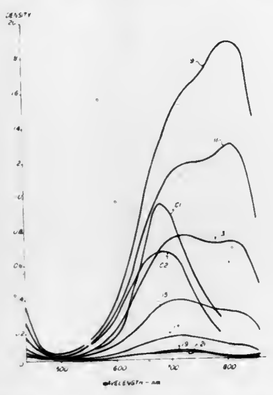
6. A process for preparing electrostatographic toner particles having improved mechanical properties and controlled particle size and particle size distribution comprising forming a blend comprising a molten mass of low molecular weight polymers and a colorant selected from the group consisting of pigments and dyes, extruding said blend to provide molecular orientation to said polymers, drawing said blend during cooling and solidification of said polymers to form a film or fiber thereof, and passing said film or fiber through embossed rollers to cut said film or fiber into discrete particles having a particle size of between about 1 micron and about 30 microns.

4,233,389

FLUORINATED 1-HYDROXY-2-NAPHTHAMIDE COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Jose M. Fernandez, Rochester; Robert G. Cameron, Spencerport, and Edward J. Walsh, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

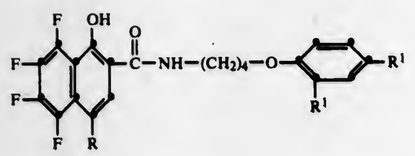
Continuation-in-part of Ser. No. 928,756, Jul. 27, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 59,818
Int. Cl.[3] G03C 7/24, 1/40
U.S. Cl. 430—140 17 Claims



1. In a silver halide photographic element comprising a support and, coated thereon, at least one layer unit which comprises a photographic silver halide emulsion layer and coupler solvent particles dispersed in a photographically useful amount in said emulsion layer or in an adjacent hydrophilic colloid layer,

the improvement wherein

said coupler solvent particles are comprised of a combination, capable of permitting the formation of a microcrystalline dye, of a coupler solvent and a coupler of the formula



wherein

R is a coupling-off group and

R^1 is an alkyl group of from 1 to 6 carbon atoms.

4,233,390

LITHOGRAPHIC PRINTING PLATE HAVING DUAL PHOTOSENSITIVE LAYERING

Paul Jargiello, Orange, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 839,967, Oct. 6, 1977, abandoned. This application Jul. 20, 1979, Ser. No. 58,976
Int. Cl.[2] G03C 1/52, 1/76, 1/68
U.S. Cl. 430—156 7 Claims

1. A lithographic printing plate capable of development with an aqueous alkali developer which comprises a sheet substrate having coated thereon a light-sensitive, lithograhically suitable, water-soluble diazo composition, said diazo composition having coated thereon a lithographically suitable photopolymerizable composition, which photopolymerizable composition

comprises the admixture of, in percent by weight of the photopolymerizable composition:

(a) an acrylonitrile butadiene styrene resin in an amount of from 2% to 25%; and

(b) one or more resins selected from the group consisting of solid acrylic, polyurethane and polyamide resins in an amount of from 4% to 50%; and

(c) cellulose acetate phthalate in an amount of from 4% to 50%; and

(d) one or more ethylenically unsaturated monomeric or oligomeric compounds having on the average, more than one double bond, and being capable of forming a high polymer by free radical addition photopolymerization, in an amount of from 20% to 60%; and

(e) a photoinitiator capable of generating free radicals in an amount of from 0.5% to 45%; and

(f) p-phenol sulfonic acid sodium salt in an amount of from 0.4% to 5%.

4,233,391

WATER DEVELOPABLE PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING PHOSPHINE ACTIVATORS AND SAPONIFIED POLYVINYL ACETATE

Sakuo Okai, Carlsbad, and Koichi Kimoto, Oceanside, both of Calif., assignors to Napp Systems (USA) Inc., San Marcos, Calif.

Continuation-in-part of Ser. No. 941,519, Sep. 9, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 70,190
Int. Cl.[3] G03C 1/68
U.S. Cl. 430—281 17 Claims

1. A photopolymerizable composition for water developable printing plates which can be exposed and developed without pre-exposure conditioning comprising:

a. about 0.1 to 3.0 parts by weight of the total composition of a monomer component including at least one water-soluble, monofunctional unsaturated ethylenic monomer, or the combination of said monofunctional monomer and at least one polyfunctional unsaturated ethylenic monomer, said monomers capable of forming a polymer by photoinitiated polymerization in the presence of a polymerization initiator activatable by actinic light:

b. about 0.1 to 3.0 parts by weight of the total composition of a polymer component including a partially saponified, water-soluble, polyvinyl acetate polymer compatible with said monomer component containing both acetyl and hydroxy groups, and having a polymerization degree of about 300 to 2,000 and a saponification degree of about 65 to 99 mole percent;

c. about 0.001 to 0.3 parts by weight of the total composition of a photopolymerization initiator compatible with said monomer component and said polyvinyl acetate polymer, and activatable by actinic light; and,

d. about 0.001 to 0.3 parts by weight of the total composition of an activator including a phosphine derivative described by the formula:



wherein any of X, Y and Z are hydrogen, halogen, alkyl, alkoxy, aryl, vinyl or allyl and at least one of X, Y and Z is aryl.

4,233,392

LIGHT-SENSITIVE MATERIAL FOR TANNING DEVELOPMENT COMPRISING PRETREATED CARBON

Horst Friedel, Neu Isenburg, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1979, Ser. No. 31,977
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 2832530
Int. Cl.[2] G03F 7/02; G03C 1/40
U.S. Cl. 430—264 12 Claims

1. In a light-sensitive material for tanning development consisting of a support, an unhardened or only slightly hardened gelatin-containing silver halide emulsion layer and, if desired, an auxiliary layer, wherein at least one layer contains a carbon black participating in forming an image, the improvement comprising employing a carbon black pretreated with at least two water-miscible compounds which have a higher affinity for carbon black than gelatin, said compounds being selected from at least two of the following compound classes,

(a) Poly-N-vinyl lactams

(b) Polyalkylene oxide derivatives

(c) Low volatility water-miscible compounds containing at least two OH groups

(d) Polyalkylene oxides with a molecular weight of at least 400.

4,233,393

SILVER HALIDEPHOTOSENSITIVE MATERIAL

Keisuke Shiba, and Nobuyuki Kita, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 807,612, Jun. 17, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,228
Claims priority, application Japan, Jun. 18, 1976, 51-71845
Int. Cl.[2] G03F 7/02
U.S. Cl. 430—265 12 Claims

1. A process of preparing a printing plate which comprises the steps of

(1) imagewise exposing a silver halide photosensitive material comprising a support having a hydrophilic surface, a silver halide photosensitive emulsion layer on said surface and synthetic resin layer on said emulsion layer, with the synthetic resin being substantially insoluble in water, with the synthetic resin layer being permeable to water and an alkaline solution and with the synthetic resin being at least one of a polymer and oligomer, and being selected from the group consisting of polyesters, polyamides, phenolaldehyde resins, polyurethanes, epoxy resins, silicone resins, polyamines, polystyrenes, polyacrylates, polyvinyl acetate, hydroxypropyl methyl cellulose and hexahydrophthalate.

(2) tanning developing said exposed photosensitive material, and then

(3) washing-off said tanning developed photosensitive material with water to remove non-tanned area of said emulsion layer and synthetic resin layer on said area to reveal the hydrophilic surface of the support, thereby to form a printing plate.

4,233,394

METHOD OF PATTERNING A SUBSTRATE

John N. Helbert, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1979, Ser. No. 51,263
Int. Cl.[3] B05D 3/06
U.S. Cl. 430—270 4 Claims

1. Method of patterning a substrate, said method including the steps of:

(A) dissolving polymethacrylonitrile in a spinning solvent that will dissolve the polymer and form a viscous solution,

(B) applying the solution to the surface of the substrate to

form a smooth, uniform resist film of at least 3,000 angstroms in thickess,
(C) heating the resist film,
(D) exposing the region of the resist film to be patterned to ionizing radiation until the dissolution rate of the irradiated region of the resist film is greater than 5 times the dissolution rate of the unirradiated region of the resist film, and
(E) developing the exposed regions of the resist to the substrate in a developer selected from the group consisting of a 3 to 4 mixture of acetonitrile and toluene.

4,233,395

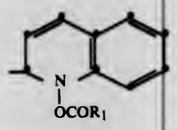
PHOTOPOLYMERIZABLE TRANSFER MATERIAL

Kurt Klüpfel, Wiesbaden-Sonnenberg, and Heide Sprengel, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Germany, Fed. Rep. of Germany

Continuation of Ser. No. 802,410, Jun. 1, 1977, abandoned, which is a continuation of Ser. No. 621,578, Oct. 10, 1975, abandoned. This application Jan. 17, 1979, Ser. No. 4,124
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1974, 2448850
Int. Cl.[2] G03C *1/63, 1/78*
U.S. Cl. 430—271 **13 Claims**

1. In a photopolymerizable transfer material comprising a flexible base, and a thermoplastic photopolymerizable copying layer, said layer comprising
(a) a thermoplastic polymeric binder,
(b) a photopolymerizable acrylic or methacrylic ester which boils at a temperature of at least 100° C. and which contains at least one terminal, ethylenically unsaturated group, and
(c) a photoinitiator activatable by actinic radiation, weight, based on the weight of the non-volatile components of the layer, of an adhesion-imparting substance effective to improve adhesion to copper or copper-alloys evenly distributed in the photopolymerizable copying layer and/or havng said adhesion-imparting substance in a separate, homogeneous, coherent layer on top of said copying layer on the opposite side of said flexible base, said adhesion-imparting substance having the formula

$$HS-CH_2-(CH)_n-R_2$$
$$\quad\quad\quad



R_3 = hydrogen, halogen, alkyl, alkoxy

and 1 to 20 g of a polysaccharide which being free of carboxyl groups does not react with said quick-acting hardener and which is a linear polymer in which either

(1) at least one third of the monosaccharide units have a 1-2-bond and the remaining monosaccharide units have a 1-4-bond or

(2) substantially all the monosaccharide units have a 1-4 bond and at least 50% of the hydroxyl group of the monosaccharide units are acetylated or replaced by an OSO_3Me group, wherein Me denotes an alkali metal whereby the carboxyl activity of said hardener has an onset subsequent to the application of the composition to the gelatin containing layer.

4,233,399

PHOTOGRAPHIC ELEMENTS CONTAINING AMINO-SUBSTITUTED HYDROXY-PYRIDONES

Rainer Kitzing, Ingatestone; John G. V. Scott, Chelmsford; Terence C. Webb, Witham, and Graham Evans, Galleywood, all of England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

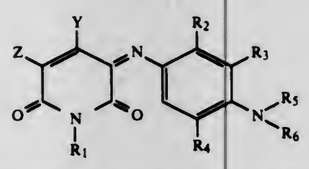
Division of Ser. No. 879,425, Feb. 21, 1978, Pat. No. 4,182,886. This application May 8, 1979, Ser. No. 37,071

Claims priority, application United Kingdom, Mar. 3, 1977, 8924/77

Int. Cl.[2] G03C *1/84*

U.S. Cl. 430—510 11 Claims

1. Light-sensitive photographic material which comprises in at least one layer thereof a dyestuff of the general formula



wherein R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 to 6 carbon atoms each in the alkyl and the alkoxy radical, phenyl, benzyl, β-phenylethyl or cyclohexyl, R_2 is hydrogen, chloro, alkyl, hydroxyalkyl or alkoxy each of 1 to 6 carbon atoms, R_3 is hydrogen, alkyl or alkoxy of 1 to 6 carbon atoms, R_4 is hydrogen or alkyl of 1 to 6 carbon atoms, R_5 and R_6 are hydrogen, alkyl or hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 to 6 carbon atoms each in the alkyl and the alkoxy radical, carboxyalkyl with 1 to 3 carbon atoms in the alkyl radical, β-methylsulphonamidoethyl or sulpho-n-butyl, R_5 and R_6 and the nitrogen atom to which they are attached are piperidine, morpholine, piperazine or pyrrolidine, Y is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxy, —$COOR_{11}$ or —$COONR_{11}R_{12}$ and Z is —CN, —$COOR_{11}$ or —$CONR_{11}R_{12}$, wherein R_{11} and R_{12} are hydrogen or alkyl of 1 to 3 carbon atoms.

4,233,400

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING TETRAZOLIUM COMPOUNDS

Mitsuto Fujiwhara; Syunji Matsuo; Toyoaki Masukawa; Yutaka Kaneko, and Mikio Kawasaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-muromachi, Japan

Continuation of Ser. No. 818,507, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 710,385, Aug. 2, 1976, abandoned. This application Mar. 2, 1979, Ser. No. 16,988

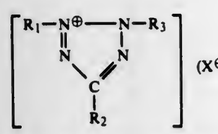
Claims priority, application Japan, Aug. 2, 1975, 50-94295

Int. Cl.[3] G03C *1/02*

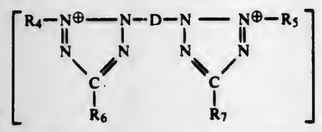
U.S. Cl. 430—523 10 Claims

1. A light-sensitive silver halide photographic material which consists essentially of a support, at least one hydrophilic colloidal layer coated thereon containing silver halide grains having an average grain size of from 0.05 to 1.5 $\mu$and at least 75% of which grains being within a range of from 0.6 to 1.4 times said average grain size, and a tetrazolium compound selected from the group consisting of a compound of formulae [I], [II] or [III]:

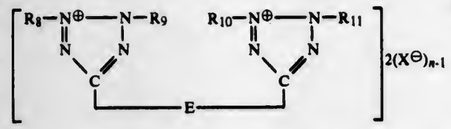
[I]



[II]



[III]



wherein R_1, R_3, R_4, R_5, R_8, R_9, R_{10} and R_{11} each represent an aryl group or a heterocyclic group; R_2, R_6 and R_7 each represents an aryl group, a heterocyclic group, an alkyl group, hydroxyl, carboxyl or the salt thereof, an amino group, mercapto, nitro or hydrogen; D represents a divalent aromatic group; E represents an alkylene group, an arylene group or an aralkylene group; X is an anion; said heterocyclic group being selected from the group consisting of a thiadiazolyl group, a benzothiadiazolyl group, an oxazolyl group, a pyrimidinyl group, a pyridyl group and a 2,5-dimethylthiazolyl group; and n is 1 or 2, provided that the compound forms an intramolecular salt when n is 1.

10. A light-sensitive silver halide photographic material according to claim 1 wherein the light-sensitive silver halide photographic material further comprises an outermost gelatin protective layer having a thickness of from 0.1 to 10 μ on the hydrophilic colloidal layer.

4,233,401

ANTIENZYME HOMOGENEOUS COMPETITIVE BINDING ASSAY

Robert A. Yoshida, Mountain View, and Edward T. Maggio, Redwood City, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Jul. 14, 1977, Ser. No. 815,487

Int. Cl.[2] G01N *31/14, 33/16*

U.S. Cl. 435—7 23 Claims

1. A method for determining the presence in a sample of an analyte which is a member of an immunological pair consisting of ligand and ligand receptor which comprises:

combining in an aqueous medium:

(A) said sample;

(B) enzyme-bound-ligand which retains a substantial proportion of its activity when bound to receptor;

(C) ligand receptor, when ligand is the analyte, wherein said receptor is capable of specifically binding to said ligand and said enzyme-bound-ligand; and

(D) enzyme inhibitor, of at least about 2,000 molecular weight wherein said inhibitor is impeded from inhibiting said enzyme-bound-ligand, when receptor is bound to enzyme-bound-ligand; and

determining the enzymatic activity in said medium as compared to the enzymatic activity in a medium having a known amount of analyte.

4,233,402

REAGENTS AND METHOD EMPLOYING CHANNELING

Edward T. Maggio, Redwood City, Calif.; Richard L. Wife, Sittingbourne, England, and Edwin F. Ullman, Atherton, Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Apr. 5, 1978, Ser. No. 893,650

Int. Cl.[2] C12Q *1/66*

U.S. Cl. 435—7 44 Claims

1. A method for determining the presence of an analyte in a sample suspected of containing said analyte, said analyte being a member of a specific binding pair consisting of ligand and antiligand, wherein the amount of a detectable signal is a function of the amount of analyte in an assay medium, said detectable signal being produced by having three primary reagents:

(A) reactant label conjugate consisting of a reactive organic compound conjugated to a member of said specific binding pair which interacts with a signal mediator precursor to produce a signal mediator;

(B) signal producing label conjugate, which consists of a compound which is a component of a detectable signal producing system conjugated to a member of said specific binding pair, wherein the amount of signal produced is affected by the localized concentration of said signal mediator, with the proviso that said signal producing label and said reactant label may be bonded to the same molecular member of said specific binding pair to produce a single reagent which is a reactant label-signal producing label conjugate; and

(C) signal mediator precursor, which is an unconjugated compound which interacts with said reactant label to produce said signal mediator which is said precursor in an electronically excited state or a reaction product of said signal mediator precursor and said reactant label, with the proviso that when said reactant label and said signal producing label are both the same enzyme, said signal mediator precursor has a plurality of substituents having bonds cleavable by said enzyme and said signal mediator is at an intermediate level of substitution by said substituents.

wherein the average spatial proximity in said assay medium of said reactant label and said signal producing label is affected by the concentration of analyte in said medium and the bringing together of said reactant label conjugates and said signal producing label conjugates or a plurality of reactant label-signal producing label conjugates by means of the binding together of said ligand or ligand analog and antiligand brings said reactant labels and said signal producing labels into a microenvironment, so as to create a localized concentration of signal mediator differing from the concentration of signal mediator in the mass of said assay medium;

said method comprising:

combining in an aqueous assay medium:

(A) said sample;

(B) said reactant label conjugate;

(C) said signal producing label conjugate; with the proviso that both said reactant label conjugate and signal producing label conjugate may be replaced with reactant label-signal producing label conjugate;

(D) said signal mediator precursor with the proviso that when said reactant label and said signal producing label are both the same enzyme, said signal mediator precursor is employed having at least two substituents having covalent bonds cleaved by said enzyme;

(E) any auxiliary reagents necessary for the reaction of said reactant label and said signal producing label; and

(F) poly(ligand analog), when said ligand is monoepitopic and monolabel-monoligand is employed as one of said conjugates; and

determining the resulting detectable signal as compared to the detectable signal from an assay medium having a known amount of analyte.

4,233,403

AMYLASE ASSAY

Robert C. Menson, Newport Beach, Calif.; Venkatachalam Narayanswamy, and Richard C. Burns, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

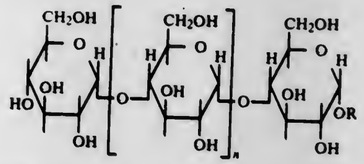
Continuation-in-part of Ser. No. 704,976, Jul. 13, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,669

Int. Cl.[3] C12Q *1/40*

U.S. Cl. 435—22 15 Claims

1. A method for the rapid determination of the amylase content of a sample comprising the amylase content of a sample comprising the steps of:

(a) adding to a solution containing a measured amount of the sample a defined polysaccharide substrate having the following formula:



where n is 2, 3, or 4, and R is a substituted aromatic radical which, as a detached aglycone, exhibits a different spectral absorbance than the substrate;

(b) adding a maltase to the solution; and

(c) monitoring the spectral absorbance of the solution.

4,233,404

METHOD FOR TESTING FOR THE PRESENCE OF PATHOGENS

Robert E. Baier, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 9, 1979, Ser. No. 92,796

Int. Cl.[3] C12Q *1/24*

U.S. Cl. 435—30 3 Claims

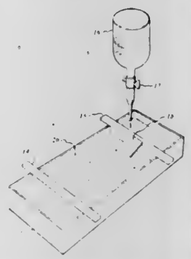
1. A method for detecting and concentrating airborne and waterborne pathogens including the steps of:

providing an air/water interface having a relatively large surface area;

contacting the air/water interface with the fluid to be tested so as to minimize agitation of the air/water interface;

after a sufficient time, reducing the area of the air/water

interface so as to concentrate pathogens collected at the air/water interface into a concentrate; and



removing the concentrate from the air/water interface for analysis.

4,233,405

PROCESS FOR SPRAY DRYING ENZYMES

Clifford E. Neubeck, Hatboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 10, 1979, Ser. No. 83,449
Int. Cl.³ C12N *9/98*
U.S. Cl. 435—187 **10 Claims**

1. A process for the preparation of a spray-dried enzyme composition which comprises: concentrating a liquid enzyme solution by ultrafiltration; adding to said concentrate water-insoluble salts, optionally in presence of water, insoluble suspenders and thickeners, intimately mixing the concentrate composition, and spray-drying the concentrate composition at air inlet temperatures from about 150° C. to about 180° C. and air outlet temperatures from about 65° C. to about 90° C.

4,233,406

PROCESS FOR THE ENZYMATIC TREATMENT OF WASTE WATER OF WHEAT STARCH PLANTS

Andras J. Wieg, Amsterdam, Netherlands, and Günther Jäckering, Hamm, Fed. Rep. of Germany, assignors to Naarden International N.V., Naarden-Bussum, Netherlands and Altenburger Maschinen KG Jaeckering & Co., Hamm, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,077
Claims priority, application Netherlands, Oct. 12, 1977, 7711211
Int. Cl.² C13L *1/00*
U.S. Cl. 435—275 **13 Claims**

1. A process for the purification of waste water of a plant for the production of wheat starch wherein said waste water is subjected, in any sequence, to treatment steps comprising:
(a) a heat treatment followed by the separation of the solid substance; and
(b) a treatment of said waste water with one or more of the enzymes α-amylase, cellulase, and hemicellulase and, optionally, with one or more of the enzymes glucoamylase, and α-glucanase.

4,233,407

APPARATUS FOR THE CONTINUOUS STERILE FERMENTATION

Dieter Seebeck, Wiesbaden; Jens A. Schildmann; Reinhard Weisrock, both of Nieder-Olm, and Julius Koch, Eltville, all of Fed. Rep. of Germany, assignors to Peter Eckes, Nieder-Olm, Fed. Rep. of Germany

Continuation of Ser. No. 738,404, Nov. 3, 1976, abandoned. This application Nov. 15, 1978, Ser. No. 960,893
Int. Cl.² C12B *1/00*; C12C *11/00*; C12G *1/00*
U.S. Cl. 435—311 **2 Claims**

1. Apparatus for continuously fermenting solutions under sterile conditions comprising a closed upright slender fermentation tower having a hollow interior, a lower end, and an enlarged upper end section, said lower end having connected thereto an inlet means for introducing unfermented feed solution into the lower end, a sterile gas inlet means fitted with a membrane filter and sintered candle means to bubble sterile gas into the lower end and a steam inlet means connected via a sampling means to sterilize the lower end and the sampling means by supplying steam thereto; said upper end section having connected thereto an outlet means for product discharge, a sterile gas inlet means fitted with a membrane filter to introduce sterile gas into the upper end section, a steam inlet means to sterilize the upper end section by supplying steam thereto, a gas exhaust outlet means fitted with a membrane filter and a pressure regulating means for maintaining excess pressure in the tower, and said tower having over its length, between the lower end and upper end section, a plurality of steam inlet means connected via a sampling means for supplying steam to sterilize the length of the tower between the lower end and upper end sections and to sterilize the sampling means.

4,233,408

POLYURETHANE FOAMS FROM POLYESTER PRECURSOR DERIVED FROM ADIPIC ACID PROCESS WASTE

Kenneth P. Satterly, Chadds Ford, Pa., and Frank E. Livingston, Cardiff, Del., assignors to Witco Chemical Corporation, New York, N.Y.

Filed May 7, 1979, Ser. No. 36,952
Int. Cl.³ C08G *18/14*, *18/42*
U.S. Cl. 521—172 **9 Claims**

1. A process for making polyurethane comprising reacting an organic polyisocyanate with a polyester polyol prepared by:
a. oxidizing cyclohexane to form cyclohexanone, cyclohexanol and a non-volatile residue;
b. separating out the non-volatile residue;
c. reducing the water content of the residue to about less than 15% by weight;
d. reacting the recovered residue from (c) with an esterifying polyol to form a polyester polyol.

4,233,409

POLYMERIC BLEND

Charles W. Bulkley, East Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 5, 1979, Ser. No. 55,202
Int. Cl.³ C08F *41/12*
U.S. Cl. 525—71 **12 Claims**

1. A polymeric blend composition comprising:
A. a first ABS type polyblend prepared by polymerizing a solution of a first conjugated diene rubber dissolved in alkenyl aromatic and alkenyl nitrile monomers, having first grafted conjugated diene rubber particles with a particle size of about 0.7 to 10 microns, said first diene rubber particles having present about 1 to 5 parts of a monoalkenyl aromatic-alkenyl nitrile copolymer as grafted and occluded copolymer, said first polyblend having a rubber moiety present in an amount of about 1 to 15% by weight based on said first ABS polyblend,
B. a second ABS type polyblend prepared by polymerizing alkenyl aromatic and alkenyl nitrile monomers in the presence of a second conjugated diene rubber dispersed as rubber particles in an aqueous latex, having second grafted conjugated diene rubber particles with a particle size of about 0.01 to 0.50 microns, said second diene rubber particles being grafted with said copolymer as a superstrate in an amount of about 0.10 to 2.5 parts per part of diene rubber, said second polyblend having a rubber moiety present in an amount of about 2 to 50% by weight of said second ABS polyblend,
C. a grafted conjugated diene rubber terpolymer said diene rubber grafted with alkenyl aromatic and alkyl alkacrylate monomers and a rubber moiety of about 10 to 70% by weight,
D. a block copolymer rubber of conjugated diene and alkenyl aromatic monomers, said diene monomer being present in at least 55% by weight of said copolymer, and
E. a matrix copolymer of said alkenyl aromatic and alkenyl nitrile monomers, said polymeric blend having by weight, 10 to 15 parts of (A), 35 to 50 parts of (B), 3 to 15 parts of (C), 5 to 20 parts of (D), and 15 to 25 parts of (E), and having improved ductility at low temperatures.

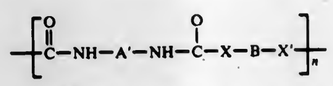
4,233,410

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

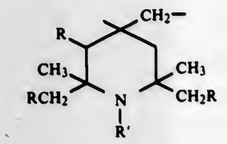
Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 962,564
Claims priority, application Switzerland, May 11, 1976, 5890/76
Int. Cl.³ C08L *75/02*
U.S. Cl. 525—123 **10 Claims**

1. A polyurea of the general formula Ia,

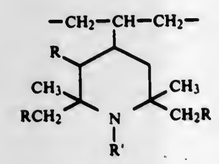


in which n represents a value from 2 to about 50, A' is alkylene with 2–12 C atoms, arylene with 6–12 C atoms, 4,4'-dicyclohexylenemethane or a radical -phenylene-Z^4-phenylene- in which Z^4 is $-CH_2-$, $>C(CH_3)_2$, $-O-$ or $-SO_2-$, X and X' are NY and Y represents hydrogen, alkyl with 1–18 C atoms, cycloalkyl with 5–12 C atoms or aralkyl with 7–11 C atoms, and B is one of the radicals XXXI to XXXIX,

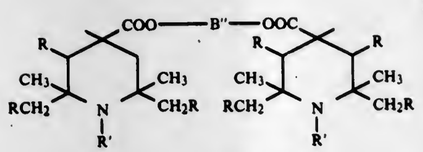
XXXI



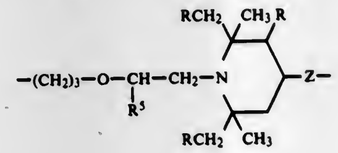
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XXXIII

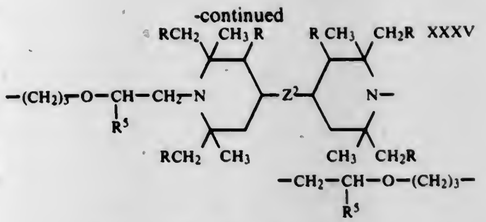


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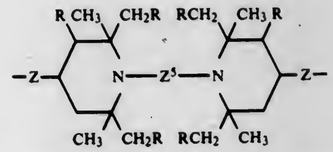


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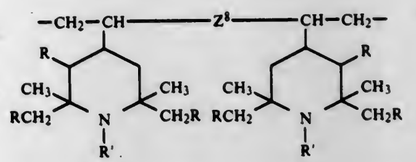
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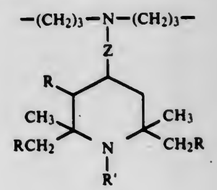
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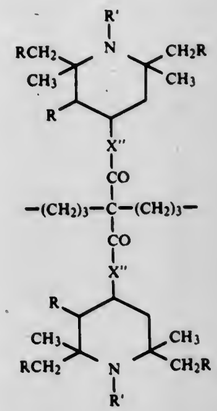
XXXVII



XXXVIII



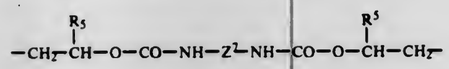
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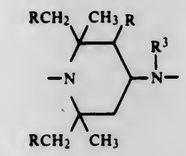
in which R represents hydrogen or alkyl with 1–5 C atoms, R' is hydrogen, alkyl with 1–12 C atoms, allyl, benzyl, acetyl, acryloyl or crotonyl, Z is a direct bond or $-CH_2CH_2-$ or $-OCH_2CH_2CH_2-$, Z^2 is one of the radicals $-N(R'')-$, $-NR^3-CO-NR^3-$, $-NR^3-CO-CO-NR^3-$, $NR^3-CO-Z^3-CO-NR^3-$, alkylene with 4–10 C atoms, p-xylylene,



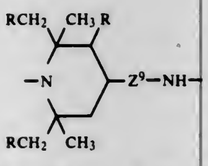
—O-alkylene-O— with 1-10 C atoms, —O-alkenylene-O— with 4-8 C atoms or —O-xylylene-O—, wherein R'' is alkanoyl with 1-8 C atoms or alkenoyl with 3-5 C atoms, R^3 is hydrogen, alkyl with 1-12 C atoms, cyclohexyl, benzyl or aryl with 6-14 C atoms and Z^3 is alkylene with 1-10 C atoms or phenylene, B'' is alkylene with 2-12 C atoms, alkenylene with 4-8 C atoms, xylylene or hexahydroxylylene, cyclohexylene or a radical of the formula $—CH_2CH_2OCH_2CH_2—$ or $—CH_2CH_2O$-phenylene-$OCH_2CH_2—$, R^5 is hydrogen, methyl or phenyl, Z^5 represents alkylene or alkenylene with 4-8 C atoms, p-xylylene or a group of the formula



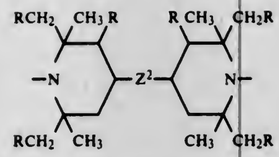
wherein Z^7 is alkylene with 2-12 C atoms, arylene with 6-12 C atoms, 4,4'-dicyclohexylenemethane or a radical —phenylene-Z^4-phenylene, Z^7 is alkylene or alkenylene with 4-8 C atoms or p-xylylene, X'' is oxygen or NH and Z^8 is alkylene with 1-6 C atoms or phenylene or in formula Ia —X—B—X'— is one of the groups of the formulae XLI to XLIII



XLI



XLII



XLIII

in which R^3 is hydrogen, alkyl with 1-12 C atoms, cyclohexyl, benzyl, or aryl with 6-14 C atoms and Z^9 is $—CH_2CH_2—$ or $—OCH_2CH_2CH_2—$.

4,233,411

CATIONIC POLYMERIC COMPOSITION FOR IMPARTING WET AND DRY STRENGTH TO PULP AND PAPER

Edward G. Ballweber, Glenwood; Roger H. Jansma, Park Forest, and Kenneth G. Phillips, River Forest, all of Ill., assignors to Nalco Chemical Co., Oak Brook, Ill.

Continuation-in-part of Ser. No. 957,952, Nov. 6, 1978. This application May 10, 1979, Ser. No. 37,797

Int. Cl.³ D21H 3/52; C08L 33/26

U.S. Cl. 525—155 **4 Claims**

1. A composition for imparting wet and dry strength to paper fiber which comprises a blend of (1) polyacrylamide 40-95% by weight; (2) a cationic regulator selected from the group consisting of a low molecular weight dimethyl amine epichlorohydrin copolymer, a low molecular weight ethylene dichloride ammonia condensation polymer, and polyvinyl benzyl trimethyl ammonium chloride polymer in the amount of 4-14% by weight; and (3) glyoxal 2-50% by weight, and which is utilized in a dosage of 0.2-5% based on dry weight of fiber.

4,233,412

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

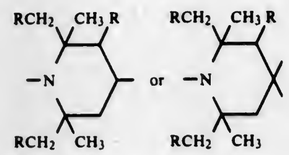
Continuation-in-part of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,446

Claims priority, application Switzerland, May 11, 1976, 5890/76

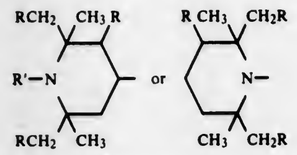
Int. Cl.³ C08G 63/02

U.S. Cl. 525—167 **20 Claims**

1. A polyester, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1-5 C atoms and R' denotes hydrogen, alkyl with 1-12 C atoms, alkenyl with 3-8 C atoms, alkinyl with 3-6 C atoms, aralkyl with 7-12 C atoms, alkanoyl with 1-8 C atoms or alkenoyl with 3-5 C atoms, and copolymers thereof with polyalkylpiperidine-free components.

4,233,413

RESIN COMPOSITION WITH LOW SHRINKAGE

Noboru Monma; Iwao Maekawa, both of Hitachi; Tutomu Sarudate, Juomachi; Hidetaka Sato, and Isao Uchigasaki, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Nov. 28, 1978, Ser. No. 964,169

Claims priority, application Japan, Nov. 29, 1977, 52-143064

Int. Cl.² C08L 67/06

U.S. Cl. 525—168 **11 Claims**

1. A resin composition having low shrink properties which comprises

(A) 25 to 45 parts by weight of an unsaturated polyester containing tricyclo(5,2,1,$0^{2,6}$)dec-4-el-8 or 9-yl groups, alpha, betaunsaturated dibasic acid residues, and glycol residues as structural units, said unsaturated polyester being obtained by reacting, in equimolar amounts, dicyclopentadiene with an alpha, beta-unsaturated dibasic acid or by reacting, in equimolar amounts, dicyclopentadiene with an alpha, beta-unsaturated dibasic acid anhydride and water at 150° C. or lower to yield a partially esterified dicyclopentadienecarboxylic acid, which is further reacted with at least one polyhydric alcohol.

(B) to 40 to 60 parts by weight of one or more polymerizable monomoers having one or more polymerizable double bonds in the molecule, and

(C) 4.5 to 15 parts by weight of a polystyrene.

4,233,414

POLYHYDRIC PHENOL COESTER STABILIZERS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 740,110, Nov. 9, 1976, Pat. No. 4,174,297. This application May 29, 1979, Ser. No. 43,019

Int. Cl.³ C08L 69/00, 67/02, 27/06

U.S. Cl. 525—146 **16 Claims**

1. A stabilized synthetic resin composition comprising a synthetic resin and 0.01 to 5% by weight of the resin of a coester, having a molecular weight between 700 and about 10,000 measured by a vapor pressure method, of at least one polyhydric phenol, having 2 to 3 phenolic hydroxyl groups and 1 to 3 benzenoid rings, with carbonic acid and an aliphatic dicarboxylic acid having 4 to 10 carbon atoms and not more than one thioether sulfur atom, in which the molar proportions of carbonic acid to aliphatic dicarboxylic acid range from 19:1 to 1:19.

4,233,415

COATING COMPOSITION CATALYZED WITH PHOSPHONIC ACID DERIVATIVE-#2

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1979, Ser. No. 93,430

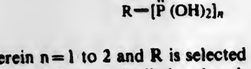
Int. Cl.³ C08L 37/00

U.S. Cl. 525—161 **16 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendent epoxy functionality, having a number average molecular weight (Mn) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing gylcidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing hydroxy functionality, with the total of said gylcidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) A reactive catalyst comprising at least one phosphonic acid derivative having the formula:



wherein n=1 to 2 and R is selected from the group consisting of alkyl, cycloalkyl and aryl radicals;

(C) an amine-aldehyde resin crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (Mn) of between about 150 and about 6000,

said phosphonic acid derivative being included in said composition in an amount sufficient to provide between about 0.8 and about 1.4 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine-aldehyde resin crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen cross-linking functionality for each equivalent of hydroxy functionality included in said composition as a group on an initial component thereof or generated in situ or as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,233,416

THERMOPLASTIC HIGH ACRYLONITRILE RESINS

George A. Kuhar, Greensburg, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 888,884, Mar. 21, 1978, abandoned, which is a continuation of Ser. No. 822,102, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 672,360, Mar. 31, 1976, Pat. No. 4,110,413, which is a continuation of Ser. No. 553,776, Feb. 27, 1975, abandoned. This application Apr. 16, 1979, Ser. No. 30,592

Int. Cl.³ C08L 35/06

U.S. Cl. 525—234 **1 Claim**

1. A thermoplastic, moldable, high acrylonitrile resin characterized by having a notched Izod impact resistance strength of about 1 to about 3.4 ft./lbs/inch and a heat distortion temperature of about 85° C. to about 105° C. prepared by the method which consists essentially of (I) preparing a suspension polymerization system by charging to a reactor as components, (A) about 90 to 100 parts by weight acrylonitrile, (B) about 0 to about 10 parts by weight styrene, (C) about 150 to about 300 parts by weight water, (D) about 2 to about 20 parts finely divided resin polymer particles having a particle size in the range of about 30 to about 300 U.S. Standard mesh to act as both (1) a polymeric suspending aid and nuclei for formation of high acrylonitrile resin during the subsequent polymerization in which a chemical interaction takes place which binds said suspending aid into the matrix of the high acrylonitrile polymer product and (2) a processing aid as a dispersion with the high acrylonitrile polymer product, (E) free radical initiator and, optionally, (F) minor amount of suspending agent, (II) free radical polymerizing said acrylonitrile, and styrene if used, onto said finely divided resin polymer particle suspending aid, where said resin polymer suspending aid is an acrylonitrile/-butadiene/styrene resin and (III) recovering and drying the resultant resin product.

4,233,417

WET STRENGTH POLYMERS

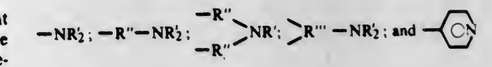
Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1979, Ser. No. 21,414

Int. Cl.³ C08F 8/18; C08C 19/12

U.S. Cl. 525—359 **7 Claims**

1. A process for the production of a water soluble, cationic, thermosetting polymeric wet strength additive which comprises reacting, in an aqueous medium maintained at a temperature of 20° C. or less, an epihalohydrin and a polymer comprising a backbone formed of repeating segments at least 10% of which comprise an amine group and/or partial salts thereof substantially all of said amine groups being tertiary amine groups pendant from the polymer backbone and having a structure selected from the group consisting of



wherein

R' is selected from the group consisting of methyl and, where the nitrogen atom bears two R' groups, these together with the nitrogen can form a heterocyclic radical;

R'' is a divalent radical and R''' is a trivalent radical;

the unattached bond in each amine structure being attached directly to a carbon atom of the polymer backbone;

the ratio of epihalohydrin groups to tertiary amine groups reacted being not less than the transition ratio for the reaction conditions selected.

4,233,418

PROCESS FOR PREPARING RUBBER-MODIFIED STYRENE COPOLYMERS BY SUSPENSION COPOLYMERIZATION

Willy F. R. Lingier, Beersel; Emmanuel Lanza, Brussels, and William J. I. Bracke, Hamme, all of Belgium, assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed May 31, 1978, Ser. No. 911,101
Int. Cl.[3] C08F 6/00; C08J 3/00
U.S. Cl. 525—243 48 Claims

1. A process for the production of rubber-modified vinyl aromatic copolymers having improved surface appearance and impact properties by suspension copolymerization, consisting essentially of the steps of:

(a) forming an aqueous suspension of an admixture of polymerizable materials comprising vinyl aromatic monomer and rubbery polymer;

(b) suspension polymerizing said admixture of polymerizable materials at a temperature between about 60° and 150° C. to a residual monomer content less than about 2% by weight to produce a rubber-modified vinyl aromatic copolymer comprising polymerized monomer dispersed in a gel-containing rubber phase;

(c) recovering beads of said copolymer containing crosslinked rubber and having a high macrogel content from said suspension; and

(d) causing phase inversion of said copolymer by melt extruding said copolymer under extrusion conditions having a shear force sufficient to induce phase inversion and produce a substantially gel-free rubber-modified vinyl aromatic copolymer comprising a continuous phase of polymerized vinyl aromatic monomer in which grafted rubbery polymer is homogeneously dispersed therethrough.

4,233,419

METHOD FOR PREVENTING PLASTICIZER BLEEDING ON POLYVINYL CHLORIDE SHAPED ARTICLES

Michihiko Asai, Fujisawa; Yoshio Suda, Hachioji; Kiyoshi Imada, Omiya; Susumu Ueno, and Hirokazu Nomura, both of Ibaragi, all of Japan, assignors to Agency of Industrial Science and Technology and Shin-Etsu Chemical Co., Ltd., both of, Japan

Filed Jun. 22, 1979, Ser. No. 51,150
Claims priority, application Japan, Jun. 26, 1978, 53-77295
Int. Cl.[2] C08L 27/22; C08K 5/54
U.S. Cl. 525—288 7 Claims

1. A method for preventing bleeding of a plasticizer on the surface of a shaped article of a plasticized polyvinyl chloride resin which comprises the steps of

(a) blending from 0.1 to 20 parts by weight of an organosilane compound represented by the general formula

$$CH_2{=}CR^1{-}CO{-}O{-}(CH_2)_a Si(R^2)_b(OR^3)_{3-b}$$

in which R^1 and R^3 are each a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, R^2 is a monovalent hydrocarbon group, a is an integer from 1 to 6 inclusive and b is a number of 0, 1 or 2, with 100 parts by weight of a polyvinyl chloride resin prior to fabrication of the resin into a shaped article,

(b) fabricating the polyvinyl chloride resin admixed with the organosilane compound into a shaped article, and

(c) subjecting the shaped article to a treatment with low temperature plasma of a gas.

4,233,420

PROCESS FOR PRODUCING CURABLE COATING RESINS

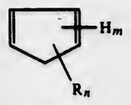
Shozo Tsuchiya, Tokyo; Hideo Hayashi; Makoto Sasaki, both of Yokohama; Kiyoshi Goto, and Kazuyoshi Ihida, both of Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd. and Toyo Ink Manufacturing Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 860,367, Dec. 14, 1977, Pat. No. 4,176,146.
This application Apr. 18, 1979, Ser. No. 30,971
Claims priority, application Japan, Dec. 22, 1976, 51-153436
Int. Cl.[3] C08F 8/04
U.S. Cl. 525—310 6 Claims

1. A process for preparing a radiation or heat curable coating resin (III) comprising the steps of:

hydrogenating selectively the double bonds of a hydroxyl group-containing resin (I) produced by reacting

(A) a compound selected from the group consisting of five-membered cyclic compounds having unsaturated conjugated double bonds and being represented by the following general formula



wherein R is an organic residue having 1 to 3 carbon atoms, and m and n are each an integer and are 6 in total, and Diels-Alder's reaction products of the five-membered cyclic compound, with

(B) at least one member selected from the group consisting of 2-hydroxyethyl (meth)acrylate and 2-hydroxypropyl (meth)acrylate, to obtain a hydrogenated hydroxyl group-containing resin (II) and then

esterifying the thus obtained resin (II) with at least one member selected from the group consisting of acrylic and methacrylic acids thereby to obtain the radiation or heat curable coating resin (III).

4,233,421

FLUOROELASTOMER COMPOSITION CONTAINING SULFONIUM CURING AGENTS

Allan T. Worm, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

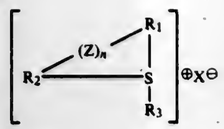
Filed Feb. 26, 1979, Ser. No. 15,171
Int. Cl.[3] C08F 8/40, 8/34, 14/22
U.S. Cl. 525—343 7 Claims

1. An admixture curable in reactive association with an inorganic acid acceptor to product a cured elastomer and comprising the following components:

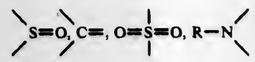
(a) an elastomeric copolymer of vinylidene fluoride and at least one terminally unsaturated fluoromonolefin containing at least one fluorine atoms substituent on each double bonded carbon atom, each cabon atom of said fluoromonoolefin being substituted only with fluorine, chlorine, hydrogen or lower fluoroalkyl or fluoroalkoxy radical, at least 10 percent of the chain carbon atoms of said copolymer being $-CH_2-$ units;

and as co-curatives for said copolymer:

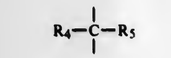
(b) at least one triorgano sulfonium compound in which at least one sulfur atom is covalently bonded to three organic moieties having 1 to 20 carbon atoms by means of carbon-sulfur covalent bonds and is ionically associated with an anion, wherein the sulfonium compound is an aromatic sulfonium salt of the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of aromatic groups having 4 to 20 carbon atoms and alkyl radicals having 1 to 20 carbon atoms; wherein at least one of R_1, R_2, and R_3 is aromatic; wherein Z is selected from the group consisting of oxygen, sulfur,



where R is aryl or acyl, a carbon-to-carbon bond, or



where R_4 and R_5 are selected from the group consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, and an alkenyl radical having 2 to 4 carbon atoms; n is 0 or 1; and X is an anion, and

(c) at least one aromatic polyhydroxy compound.

4,233,422

PROCESS FOR STABILIZING ACETAL CARBOXYLATE POLYMERS USING DIALKYL SULFATE

David R. Dyroff, Creve Coeur, and Gary J. Lynch, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 24, 1979, Ser. No. 78,274
Int. Cl.[3] C08G 6/00; C08L 61/02
U.S. Cl. 525—398 8 Claims

1. In a process for preparing an acetal carboxylate polymer wherein an ester of glyoxylic acid and a polymerization initiator are brought together under polymerization conditions, and a chemically stable end group is added to the termini of the resulting polymer to stabilize the polymer against rapid depolymerization in alkaline solution, the improvement which comprises adding to the resulting polymer a sufficient amount of an alkali metal hydride and a dialkyl sulfate having 1 to about 20 carbon atoms in each alkyl group to add to the termini of the resulting polymer an alkyl group derived from the dialkyl sulfate.

4,233,423

STABILIZATION OF POLYMERIC ACETAL CARBOXYLATES USING AN ACETAL

David R. Dyroff, Creve Coeur; Gary J. Lynch, St. Louis County, and Victor D. Papanu, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 5, 1979, Ser. No. 91,656
Int. Cl.[3] C08G 6/00; C08L 61/02
U.S. Cl. 525—398 8 Claims

1. In a process for preparing an acetal carboxylate polymer wherein a glyoxylate ester and a polymerization initiator are brought together under polymerization conditions, and a chemically stable end group is added to the termini of the resulting polymer to stabilize the polymer against rapid depolymerization in alkaline solution, the improvement which comprises contacting the resulting polymer in the presence of an acid catalyst with a sufficient amount of an acetal having the formula:



wherein R is hydrogen or alkyl having from 1 to about 6 carbon atoms, and R^1 and R^2 are individually an alkyl having from 1 to about 6 carbon atoms, to stabilize the resulting polymer against rapid depolymerization in alkaline solution, and an agent to remove liberated alcohol.

4,233,424

PROCESS FOR THE PRODUCTION OF BEAD POLYMERS

Carlhans Süling, Odenthal; Gerhard Balle, Leverkusen; Michael Walkowiak, Cologne, and Hans-Hermann Schulz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,980
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719149
Int. Cl.[3] C08L 75/00
U.S. Cl. 525—440 17 Claims

1. A two-phase bead polymer having an average bead diameter of 10 to 120μ and comprising:

(A) 88 to 99.5% by weight of a polymer of polymerized units of at least one methacrylic acid ester containing from 1 to 10 carbon atoms in the aliphatic, saturated alcohol component, the methacrylic ester polymer optionally containing up to 30% by weight of copolymerized units of at least one monomer selected from acrylic acid esters containing from 1 to 10 carbon atoms in the aliphatic saturated alcohol component, hydroxyalkyl esters of methacrylic acid containing from 2 to 4 carbon atoms in the alkyl group, styrene, vinyl acetate, (meth)acrylamide, (meth)acrylic acid and/or itaconic acid, and

(B) 0.5 to 12% by weight of a linear polyurethane produced by polyaddition of

(a) one or more substantially linear bifunctional hydroxyl compounds having a molecular weight of from 400 to 6000 and a glass transition temperature of $\leqq -20°$ C. and selected from polyesters, polyethers, polyacetals, polycarbonates, polyester amides and polyamides,

(b) one or more aliphatic or cycloaliphatic diisocyanates,

(c) one or more bifunctional hydroxyl compounds having a molecular weight of $\leqq 400$, and

(d) a saturated or olefinically unsaturated compound monofunctionally reactive to isocyanates.

4,233,425

ADDITION POLYMERIZABLE POLYETHERS HAVING PENDANT ETHYLENICALLY UNSATURATED URETHANE GROUPS

Nancy B. Tefertiller; Kenneth A. Burdett, and Robert F. Harris, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1978, Ser. No. 961,000
Int. Cl.[2] C08L 75/08
U.S. Cl. 525—455 9 Claims

1. An addition polymerizable polyether having a polyether backbone bearing at least one pendant group which is an oxycarbonylamino aliphatic ester of an α,β-ethylenically unsaturated carboxylic acid.

4,233,426

CHANNEL SEALANT COMPOSITIONS

Warren R. Griffin, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 830,227, Sep. 2, 1977, Pat. No. 4,185,041. This application Apr. 4, 1979, Ser. No. 26,866

Int. Cl.³ C08L 83/08, 71/04

U.S. Cl. 525—477 **15 Claims**

1. A channel sealant composition consisting essentially of (1) a non-crosslinked, hydrocarbon fuel-resistant, elastomeric mastic having the consistency of a caulking compound, said elastomeric mastic comprising an elastomer selected from the group consisting of fluorosilicone and cyanosilicone elastomers and (2) an extrusion-inhibiting amount of vulcanized elastomeric particles of irregular shape and having sharp edges and angular surfaces, the particles being formed from a vulcanizate of a hydro-carbon fuel-resistant elastomer selected from the group consisting of fluorosilicone and cyanosilicone elastomers, said vulcanizate having a tensile strength of at least 1000 psi and a hardness of at least 80 Shore A points.

4,233,427

ELASTOMERIC ORGANOPOLYSILOXANE BLOCK COPOLYMERS AND NON-ELASTOMERIC ORGANOSILICIC COPOLYMER BLOCKS THEREFOR

Michel Bargain, and Christian Prud'Homme, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jan. 16, 1979, Ser. No. 3,885

Claims priority, application France, Jan. 16, 1978, 78 01048

Int. Cl.³ C08G 77/42, 77/20, 77/12

U.S. Cl. 525—478 **34 Claims**

1. A thermoplastic, crystalline block copolymer comprising a plurality of recurring units selected from the group consisting of those of the structural formulae F_1 and F'_1, and combinations thereof:

$$F_1:\text{-}\!\!+\!\!A[SiR_2(GSiR_2)_aASiR_2G'SiR_2A]_pSiR_2(GSiR_2)_aASiR_2(OSiR_2)_n\!\!+\!\!\text{-}$$

and

$$F'_1:\text{-}\!\!+\!\!A[SiR_2G'SiR_2ASiR_2(GSiR_2)_aA]_pSiR_2G'SiR_2ASiR_2(OSiR_2)_n\!\!+\!\!\text{-}$$

in which the symbols A, which are identical, represent linear or branched chain alkylene radicals having from 2 to 6 carbon atoms, or cyclohexylene radicals;

the symbols R, which are identical or different, represent alkyl and halogenoalkyl radicals having from 1 to 5 carbon atoms, cycloalkyl and halogenocycloalkyl radicals having from 3 to 8 carbon atoms, aryl and halogenoaryl radicals having from 6 to 8 carbon atoms or cyanoalkyl radicals having from 3 to 4 carbon atoms;

the symbols G, which are identical, represent linear or branched chain alkylene radicals having from 1 to 8 carbon atoms, divalent organic radicals corresponding to the formula $F_2:\text{-}\!\!+\!\!(CH_2)_xQTQ(CH_2)\!\!+\!\!\text{-}_x$, in which the symbols Q, which are identical, represent one of the groups —O— and —OCO—, the —OCO— being bonded to T by the —CO— radical, the symbol T represents a monocyclic, divalent hydrocarbon radical having from 6 to 8 carbon atoms, or a divalent organic radical which has from 10 to 22 carbon atoms and consists of 2 hydrocarbon rings which are fused to one another or bonded together by a valence bond or by one of the groups of the formulae —O—, $-CH_2-$, $-C(CH_3)_2-$ and $-Si(R')\!\!+\!\!_2$, wherein R' is an alkyl radical having from 1 to 3 carbon atoms, and the symbols x, which are identical, represent 1, 2 or 3, or divalent hydrocarbon radicals corresponding to the formula $F_3:\text{-}\!\!+\!\!(CH_2)_bT(CH_2)_b\!\!+\!\!\text{-}$, in which the symbol T has the meaning given for the formula F_2 and the symbols b, which are identical, represent 0 or 1;

the symbols G', which are identical, have the meaning given above for G, except that they do not correspond to the formula F_2;

the symbols a, which are identical, represent 0 or 1;

the symbol p represents any number ranging from 1 to 120; and

the symbol n represents any number ranging from 1 to 1,500.

4,233,428

PRIMER COMPOSITIONS FOR SILICONE RUBBER COMPOSITIONS

Isao Endo, Oota, Japan, assignor to General Electric Company, Waterford, N.Y.

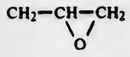
Filed Dec. 4, 1978, Ser. No. 966,244

Int. Cl.³ C08L 63/02, 63/04, 83/06

U.S. Cl. 525—507 **18 Claims**

1. A primer composition for a silicone rubber composition comprising,

(a) 100 parts by weight of epoxy resin containing more than 2 radicals expressed by the formula



within each molecule;

(b) from 50 to 500 parts by weight of a silane containing an amino group expressed by the formula $R^1CH_2CH_2CH_2Si(OR^2)_3$ wherein R^1 is a nitrogen-containing group selected from the class consisting of substituted or unsubstituted amino groups expressed by $Q_2{}^1N$ and $Q_2{}^2N(CH_2)_2NH$ wherein Q^1 and Q^2 are groups selected from the class consisting of a hydrogen atom and an alkyl radical respectively, and R^2 is a monovalent hydrocarbon group;

(c) from 30 to 500 parts by weight of an organic silicon compound containing the group expressed by the formula $R_2{}^3NOSi\equiv$ wherein R^3 is a group selected from the class consisting of a hydrogen atom and a monovalent hydrocarbon group with no aliphatic unsaturation;

(d) from 100 to 1000 parts by weight of a mercapto-containing silane expressed by the formula $HS(CH_2)_aSi(OR^4)_3$ wherein a has a value of either 2 or 3, and R^4 is a monovalent hydrocarbon group; and

(e) an organic solvent.

4,233,429

PROCESS FOR REMOVING VOLATILES EVOLVED FROM PLASTIC MELTS

Werner Hoerauf; Guenter Valentin, both of Ludwigshafen; Robert Kegel, Frankenthal, and Helmut Kuhn, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,848

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734946

Int. Cl.³ C08G 69/14

U.S. Cl. 526—71 **4 Claims**

1. In a process for removing volatile constituents which are evolved from a plastic melt when said melt is extruded from apparatus having means to melt said plastic through a heated extrusion die orifice and which escape into open air surrounding said extrusion die orifice, the improvement wherein the volatile constituents are drawn off immediately as they are evolved together with said air surrounding said extrusion die orifice through at least one suction orifice located in the immediate neighborhood of said die orifice and wherein the air drawn off and the volatile constituents therein are heated immediately after entering said suction orifice by the means used to melt said plastic melt.

4,233,430

ANTI-SOLAR ACRYLAMIDE DERIVATIVE POLYMERS, METHOD OF MAKING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME

Bernard Jacquet, Antony; Christos Papantoniou, Epinay-sur-Seine; Pierre Dufaure, and Claude Mahieu, both of Paris, all of France, assignors to L'Oreal, Paris, France

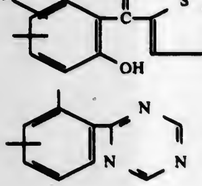
Division of Ser. No. 715,565, Aug. 18, 1976, which is a continuation-in-part of Ser. No. 374,058, Jun. 27, 1973, Pat. No. 3,980,617. This application May 1, 1979, Ser. No. 35,009

Claims priority, application France, Jun. 26, 1973, 73 23254; Jul. 29, 1976, 76 23174

Int. Cl.² A61K 7/44, 7/42

U.S. Cl. 526—259 **11 Claims**

1. Anti-solar polymer having in the macromolecular chain from 10–100 percent by weight of units of the formula



wherein F is selected from the group consisting of



(1)

(2)

(3)

wherein R is selected from the group consisting of hydrogen and CH_3 and R_1 is selected from the group consisting of CH_3 and OCH_3

(4)

(5)

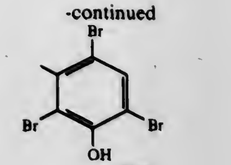
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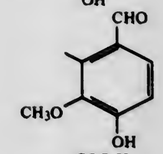
and from 90–0 percent by weight of units derived from an ethylenically unsaturated monomer,

said polymer having an average molecular weight between about 2,000–1,000,000.

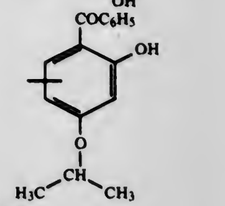
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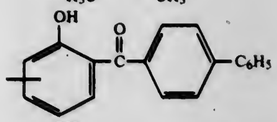
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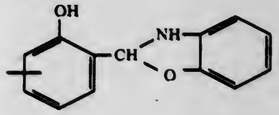
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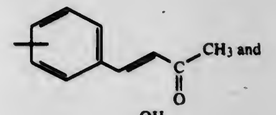
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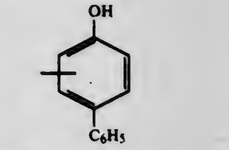
(11)



(12)



(13)



(14)

4,233,431

POLYCONDENSATES CONTAINING HYDROXYQUINOLINE END GROUPS, THEIR USE FOR THE PREPARATION OF POLYMERS CONTAINING METALS AND METAL CONTAINING POLYCONDENSATES

Karsten Idel, Krefeld; Hugo Vernaleken, Krefeld-Bockum; Dieter Freitag, Krefeld, all of Fed. Rep. of Germany; Günther Reiff, Santa Maria, Brazil, and Hans Rudolph, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

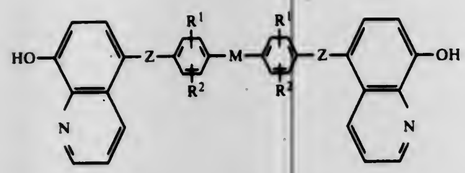
Continuation of Ser. No. 549,282, Feb. 12, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,133

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407308; Feb. 15, 1974, 2407309

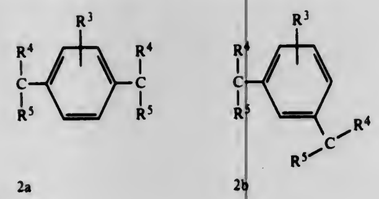
Int. Cl.² C08L 63/62

U.S. Cl. 525—462 **19 Claims**

1. Polycondensates of the formula

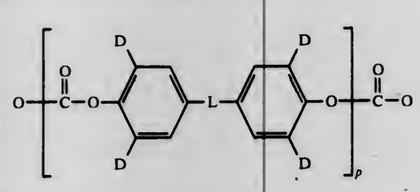


wherein
R^1 and R^2 are identical or different and denote hydrogen, (C_1-C_4)-alkyl, phenyl or halogen and Z is CH_2, CH—CH_3, an isoalkylidene radical with 3 to 5 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 15 carbon atoms, or a radical of the formula

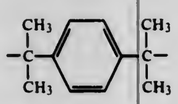


2a 2b

in which
R^4, R^5 and R^3 are identical or different alkyl radicals with 1 to 5 carbon atoms, and
wherein
M is a polycarbonate segment of the formula



wherein
D is chlorine, bromine, hydrogen or C_1-C_4 alkyl,
L is a single bond, C_1-C_5 alkylene, C_2-C_5-alkylidene, C_5-C_{15} cycloalkylene, C_5-C_{15} cycloalkylidene or a radical of the formula



and p is an integer between 2 and 50.

4,233,432

DICYCLOPENTADIENE POLYESTER RESINS

Omer E. Curtis, Jr., Morristown, N.J., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 824,898, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 709,085, Jul. 27, 1976, abandoned. This application May 10, 1979, Ser. No. 37,616
Int. Cl.[2] C08G 63/52
U.S. Cl. 528—298 **9 Claims**

1. Method for preparing an unsaturated polyester comprising the steps of:
(a) reacting about 100 moles of a polycarboxylic acid component containing at least about 25 moles maleic acid with about 50 to about 200 moles of dicyclopentadiene at a temperature of about 90° C. to about 150° C. for a sufficient period of time to provide a reaction product comprising at least 25 mole % half maleic ester of dicyclopentyl alcohol;
(b) further reacting the reaction product of step (a) with about 25 to about 100 moles of a polyol or mixture of polyols per 100 moles of polycarboxylic acid in step (a), at a temperature of at least about 180° C. until the acid number of the resultant unsaturated polyester is less than about 55.

4,233,433

PROCESS FOR PRODUCING MOLDED ARTICLES FROM POLYLAURYLLACTAM ACTIVATED ANIONIC POLYMERIZATION

Werner Hartmann, Immenstaad, Fed. Rep. of Germany, assignor to Harwe AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 579,620, May 21, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 811,057
Int. Cl.[3] C08G 69/18
U.S. Cl. 528—326 **6 Claims**

1. In a process for producing a molded article of a polylauric lactam by activated anionic polymerization of at least one corresponding monomeric lactam wherein a catalyst and an activator are separately added to a first lactam melt and second lactam melt, while both melts are protected by an inert gas, and which melts are thereafter fed to a mixing zone by separate conveyor tube systems being at substantially the same temperature as the melts, and from the mixing zone into a mold, the improvement which comprises:
(a) adding to the first lactam melt contained in a first vessel at lest one polymerization catalyst for the lactam with agitation and maintaining the mixture of the lactam melt and added catalyst under agitation at a first temperature in the range from about 167.5° C. and about 169.5° C., and at a temperature deviation tolerance of about ±1° C. for said first temperature;
(b) adding, following the addition of the catalyst to the first lactam melt, at least one activator for the polymerization of the lactam to the second lactam melt under agitation and maintaining the mixture of the second lactam melt and activatoor stirred at a second temperature which is lower than the temperature of the first melt and within a temperature range of from about 164° C., and about 166° C., and at a temperature deviation tolerance of about ±1° C. for said second temperature;
(c) pumping the first and second melts at about the melt temperatures by respective first and second gear pumps to a mixing zone through respective first and second essentially straight conveyor tube systems having an angle of incline to the horizontal plane of a maximum of about 10°, each conveyor tube having a volume at least one-third greater than the volume conveying capacity of the gear pump to which said tube is coupled;
(d) combining and mixing the melts in a mixing zone maintained between about 170 and about 175° C. to initiate a polymerization reaction;
(e) injecting the melt from the mixing zone into a mold for the molded article to form the article with attendant release of gas; and
(f) returning at least part of the released gas to at least one of the mixing vessels by the conveyor tube systems.

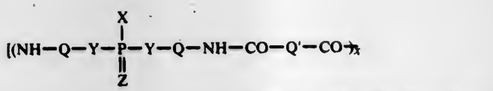
4,233,434

POLYAMIDE FROM AROMATIC PHOSPHORUS CONTAINING DIAMINE

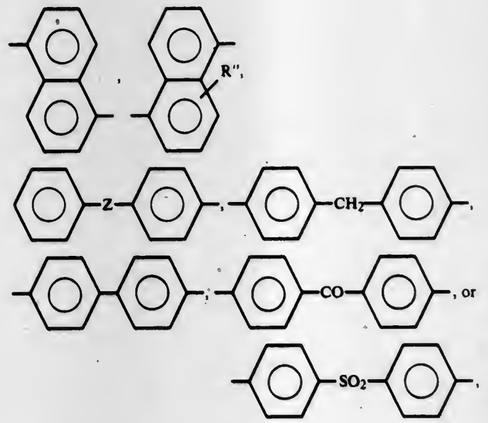
Menahem A. Kraus, 14 Mordei Hagetaot St.; Moshe A. Frommer, 2a Eisenberg St., both of Rehovot; Mara Nemas, 28 Tamar St., Neve Monoson, and Rodika Gutman, 77 Hashiloah St., Kiryat Sharet, all of Israel

Continuation-in-part of Ser. No. 652,812, Jan. 27, 1976. This application May 9, 1978, Ser. No. 904,286
Claims priority, application Israel, Jan. 27, 1975, 46510; Jul. 15, 1975, 47709
Int. Cl.[3] C08G 69/42
U.S. Cl. 528—337 **19 Claims**

1. A polymer consisting essentially of the following repeating unit:



wherein
X designates —NHAr, N(R)Ar, —NRR', NHR, —OR, —OAr, or SR,
Y designates —O—, —NH—, —S—, or —N(CH_3)—,
Z designates =O or =S,
Q, Q' and Q'' designate p-C_6H_4, m-C_6H_4, R''C_6H_3,



which
Q, Q', and Q'' may be identical or different,
Ar designates —C_6H_5, or RC_6H_4,
R designates —CH_3, C_2H_5, or —n—C_3H_7,
R' designates —CH_3, C_2H_5, or —C_3H_7, and
R'' designates —CH_3, —C_2H_5, n—C_3H_7, —OCH_3, —OH, —COOH or —COOR, wherein R is as defined above,
x is an integer of from 1 to 5,
y is zero or an integer of 1 to 5, and
n is an integer of from 50 to 200; wherein the repeating portions within the right-hand parentheses of said repeating unit when y is greater than 1 are alike or different.

4,233,435

POLYESTERIMIDE RESINS AND SYNTHESIS THEREOF

Edith M. Boldebuck, Schenectady, N.Y.; Eugene G. Banucci, Mt. Vernon, Ind., and Martin A. Byrne, Troy, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,939
Int. Cl.[3] C08G 69/26
U.S. Cl. 528—350 **24 Claims**

1. A process for preparing a polyesterimide resin having increased stability against gelation and wherein during the process, sublimation of the lower dialkyl ester of a phthalic acid component is substantially reduced, which process comprises reacting under ester imide resin forming conditions a reaction mixture composition consisting essentially of:
(I) an imide-group-contributing component selected from the group consisting of
(A) both (1) a diamine component and (2) an anhydride component including at least one (a) aromatic carboxylic acid anhydride containing at least one additional carboxylic group, said additional group being esterifiable and substantially non-imidizable, or (b) the corresponding acid thereof containing two-imide-forming vicinal carboxylic groups in lieu of the anhydride group.
(B) the carboxy functional polyimide reaction product of said diamine component and said anhydride component, and
(C) mixtures of (A) above and (B) above;
(II) an ester-group-contributing component comprising
(D) at least one dihydric alcohol containing two esterifiable hydroxy groups,
(E) at least one polyhydric alcohol containing at least three esterifiable hydroxyl groups,
(F) at least one lower dialkyl ester of a phthalic acid component selected from the group consisting of terephthalic acid, isophthalic acid, and mixtures of said acids; and
(G) a saturated aliphatic monohydric alcohol selected from the class consisting of n-hexanol, 2-ethylhexanol, n-nonanol n-decanol, n-dodecanol, 2-butyloctanol, tetradecanol, 2,6,8-trimethylnonane-4-ol, and mixtures thereof, wherein said reaction mixture comprises (a) from about 0.035 to 0.25 mole of the dihydric alcohol, (b) from about 0.025 to 0.15 mole of the polyhydric alcohol, (c) from about 0.03 to 0.18 mole of the lower dialkyl ester, (d) from about 0.1 to 0.2 mole of the aromatic carboxylic acid anhydride containing at least one additional carboxylic group, (e) from 0.05 to 0.10 mole of the diamine component, and from about 1.0 to 20.0 parts of the monohydric alcohol, said amounts being per 100 parts, by weight, of the total weight of the five components (a) through (e) recited herein.

4,233,436

BLOCK POLYMERS OF HYDROXYALKYL PHTHALATE ESTERS AND TETRAHYDROFURAN/ALKYLENE OXIDE COPOLYMERS

Ivan M. Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 12, 1979, Ser. No. 11,717
Int. Cl.[2] C08G 63/06, 63/60; C08L 67/04
U.S. Cl. 528—366 **14 Claims**

1. A linear hydroxyl-terminated block polymer represented by the structure

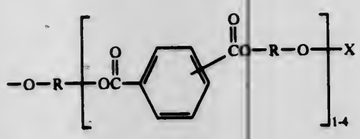
A—B

or

A—B—A

wherein the A block is a copolymer of THF and one or more

alkylene oxides, containing two or three carbon atoms in its oxide ring which block constitutes 30–99% of the weight of the total polymer, and the B block is represented by the structure



wherein

R is $-(CH_2-)_{2\text{-}6}$



where R_1 and R_2 can be the same or different and can be hydrogen or a linear or branched alkyl radical of 1–6 carbon atoms and

X is hydrogen when the block polymer is in the A—B configuration, and absent when the block polymer is in the A—B—A configuration, which block constitutes 1–70% of the weight of the total polymer,

the polymer having a number average molecular weight of 500–20,000.

4,233,437

CONTINUOUS PROCESS FOR THE REMOVAL OF MONOMERIC IMPURITIES FROM AQUEOUS DISPERSIONS OF HOMO- AND COPOLYMERS OF VINYL CHLORIDE

Josef Kalka, Herten; Bernhard Heutschel, and Jürgen Ziebarth, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

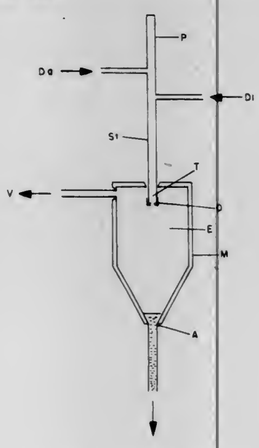
Continuation of Ser. No. 694,342, Jun. 9, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 881,933

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526728

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.³ C08F 6/16, 14/06

U.S. Cl. 528—500 **4 Claims**



1. In a continuous process for removing monomeric impurites from an aqueous dispersion of homopolymers or copolymers of vinyl chloride having a surface tension below 60 dyn/cm. by treatment with steam while avoiding foam formation by a rapid lowering of the pressure at high flow velocities, the improvement which comprises:

(a) continuously mixing said dispersion in a flow pipe with steam at a temperature of 120°–143° C. and corresponding steam pressure of 1950–3930 millibars for an average residence time of about 0.01-5 seconds;

(b) continuously passing the resultant admixture from said flow pipe at a velocity of at least 30 meters per second directly to a degasification vessel having a pressure of 133–660 millibars; and

(c) continuously recovering a stable polymer dispersion containing less than 20 p.p.m. residual monomer impurities therefrom.

4,233,438

HETEROPOLYSACCHARIDE BIOPOLYMER

Philip A. Myers, Windlesham, and David J. Westlake, Woking, both of England, assignors to The British Petroleum Company Limited, England

Filed Jul. 27, 1977, Ser. No. 819,579

Claims priority, application United Kingdom, Jul. 29, 1976, 31639/76

Int. Cl.³ C08B 37/00; C07H 1/08

U.S. Cl. 536—1 **1 Claim**

1. A polyanionic heteropolysaccharide biopolymer having molecular weight in the range of 5.0×10^5 to 2.0×10^8 when measured by gel permeation chromatography and comprising the saccharide residues glucose, fucose, mannose, galactose and uronic acid in the following proportions based on weight of total saccharide content: from 38 to 48% glucose; from 11 to 20% fucose; from 7 to 21% mannose; from 11 to 18% galactose and from 10 to 20% uronic acid.

4,233,439

GLUCOPYRANOSIDO-1,6-MANNITOL, A PROCESS FOR PRODUCING THE SAME AND ITS USE AS A SUGAR SUBSTITUTE

Hubert Schiweck, Obrigheim; Georg Steinle, Grünstadt; Lütz Müller; Wolfgang Gau, both of Wuppertal, and Mohammad Munir, Obrigheim, all of Fed. Rep. of Germany, assignors to Süddeutsche Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 888,024, Mar. 20, 1978, which is a division of Ser. No. 682,667, May 3, 1976, Pat. No. 4,117,173. This application Mar. 16, 1979, Ser. No. 21,252

Claims priority, application Fed. Rep. of Germany, May 6, 1975, 2520173

Int. Cl.³ C07H 15/00, 17/00

U.S. Cl. 536—4 **3 Claims**

1. A process for producing glucopyranosido-1,6-mannitol, comprising hydrogenating neutral aqueous solutions of isomaltulose having an isomaltulose content of greater than 50% by weight in the presence of a hydrogenation catalyst under a hydrogen pressure of from 30 to 100 kg/cm² at a temperature of from 100° to 130° C. for a time sufficient to complete hydrogenation; thereafter cooling the hydrogenated solution to cause said glucopyranosido-1,6-mannitol to crystallize as a first substance from said solution and separating the glucopyranosido-1,6-mannitol from the resulting suspension.

4,233,440

TRIAZOLYL-STILBENES

Alfons Dorlars, Leverkusen, and Otto Neuner, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

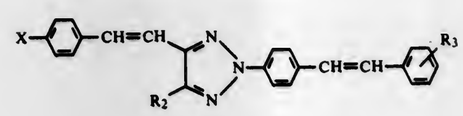
Continuation of Ser. No. 894,556, Apr. 7, 1978, abandoned, which is a continuation of Ser. No. 419,665, Nov. 28, 1973, abandoned. This application Apr. 23, 1979, Ser. No. 32,255

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1972, 2258276

Int. Cl.³ C07D 249/06

U.S. Cl. 542—458 **12 Claims**

1. A triazolyl-stilbene of the formula



wherein

R_2 is H or Cl,

R_3 is p—CN, o—CN, p—$COOCH_3$ or p—$COOC_2H_5$, and

X is H, Cl, $COOCH_3$ or $COOC_2H_5$.

4,233,441

COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER 4-ACRYLOXYBENZAL-3-ALKYL-2 N-BENZOTHIAZOLOAZINES

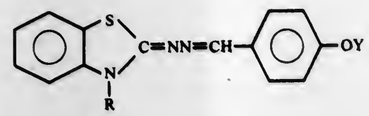
Bruce A. Gruber, Worthington, Ohio, and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 31, 1979, Ser. No. 90,046

Int. Cl.³ C07D 277/82

U.S. Cl. 542—419 **7 Claims**

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where

R is alkyl C_1–C_6; and

Y is a copolymerizable radical selected from acryloyl C_3–C_{12}, alkylacryoyl C_3–C_{12}, acryloxyalkyl C_3–C_{12}, acryloxyhydroxyalkyl C_3–C_{12}, and alkylacryloxyhydroxyalkyl C_3–C_{12}.

4,233,442

COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER 4-ALLYLOXYBENZAL-3'-ALKYL-2'-BENZO-THIAZOLOAZINES

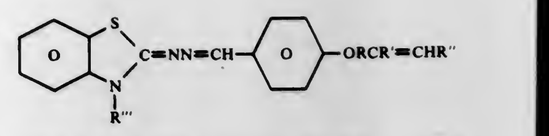
Bruce A. Gruber, Worthington, Ohio, and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 31, 1979, Ser. No. 90,047

Int. Cl.³ C07D 277/82

U.S. Cl. 542—419 **10 Claims**

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where

R is alkylene, C_1–C_{10}, oxyalkylene, C_1–C_{10} alkyleneoxyalkylene, C_1–C_{10}, phenylene, C_1–C_{10}, unsubstituted or substituted with hydroxy;

R′ and R″ are independently hydrogen or alkyl, C_1–C_6; and

R‴ is alkyl C_1–C_6.

4,233,443

NOVEL RADIATION SENSITIVE COMPOUNDS AND RADIATION SENSITIVE COMPOSITIONS CONTAINING THE SAME

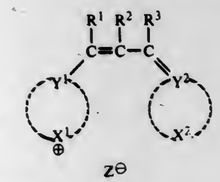
Constantine C. Petropoulos, Webster; George A. Reynolds, and James A. VanAllan, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 813,371, Jul. 6, 1977, Pat. No. 4,173,473. This application Mar. 26, 1979, Ser. No. 24,280

Int. Cl.² C07C 407/06, 407/10

U.S. Cl. 542—454 **8 Claims**

1. A pyrylium-type salt having the formula:



wherein:

each of X^1 and X^2, which may be the same or different, represents oxygen, sulfur, or selenium;

each of Y^1 and Y^2, which may be the same or different, represents the atoms necessary to complete a heterocyclic unsaturated ring nucleus having 6 or 10 ring atoms including a selenium, sulfur or oxygen hetero ring atom and 5 or 9 carbon ring atoms;

each of R^1, R^2, and R^3, which may be the same or different, represents hydrogen, halogen, cyano, nitro, alkyl having 1 to about 4 carbon atoms in the alkyl group, or aryl, with the proviso that at least one of R^1, R^2, or R^3 represents phenyl or alkoxyphenyl; and

$Z^\ominus$ represents an anionic function.

4,233,444

CONTINUOUS PROCESS FOR THE PRODUCTION OF MONOALKALI METAL CYANURATES

David F. Doonan, and Kurt H. Moller, both of Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 2, 1979, Ser. No. 54,334

Int. Cl.³ C07D 251/32

U.S. Cl. 544—192 **12 Claims**

1. A continuous process for producing a monoalkali metal cyanurate which comprises:

(a) continuously feeding cyanuric acid and continuously feeding an aqueous solution of an alkali metal hydroxide to a first reactor,

(b) continuously reacting said cyanuric acid and said aqueous solution of alkali metal hydroxide to produce a first slurry comprised of cyanuric acid and a monoalkali metal cyanurate,

(c) continuously conveying a portion of said first slurry to a second reactor,

(d) continuously admixing said portion of said first slurry to further react said cyanuric acid with alkali metal hydroxide to produce a second slurry comprised of said monoalkali metal cyanurate, and recovering said monoalkali metal cyanurate.

4,233,445

7-(SUBSTITUTED)-7H-PYRROLO[3,2-f]-QUINAZOLINE-1,3-DIAMINES

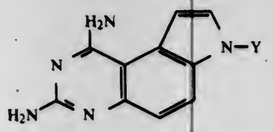
Kurt W. Ledig, deceased, late of Philadelphia, Pa., and by David R. Howes, Executor, Baltimore, Md., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 920,083, Jun. 28, 1978. This application Jul. 5, 1979, Ser. No. 54,737

Int. Cl.[2] C07D *487/04*

U.S. Cl. 544—250 **3 Claims**

1. A compound of the general formula:



or a non-toxic acid addition salt thereof, wherein:

Y is $-CH_2R$ or $-R^1$

wherein:

R is 4-hydroxyphenyl;

and

R^1 is 4-carbamoylphenyl.

4,233,446

5-CHLORO-7,8-DIHYDRO-7-OXO-PYRIDO[2,3-D]PYRIMIDINE-6-CARBOXYLIC ACID DERIVATIVES

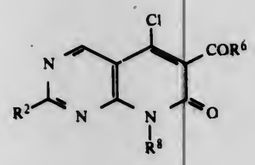
Anthony C. Scotese, King of Prussia; Robert L. Morris, Devon, and Arthur A. Santilli, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 31,256, Apr. 18, 1979. This application Oct. 29, 1979, Ser. No. 89,065

Int. Cl.[3] C07D *471/04*; A61K *31/505*

U.S. Cl. 544—279 **4 Claims**

1. A compound of the formula:



in which

R^2 is hydrogen, hydroxy, alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, phenyl, 4-methoxyphenyl, 4-chlorophenyl, 1-pyrrolidinyl or methylphenylamino;

R^6 is alkoxy of 1 to 6 carbon atoms;

and

R^8 is hydrogen, alkyl of 1 to 6 carbon atoms, 2-alkoxyethyl of 3 to 6 carbon atoms, allyl, propargyl, phenyl, 4-methoxyphenyl, 4-chlorophenyl, benzyl, 4-methoxybenzyl, 4-chlorobenzyl, 4-(4-morpholinyl)-phenyl or piperonyl.

4,233,447

PROCESS FOR PURIFYING TRIETHYLENEDIAMINE

Edward C. Y. Nieh, and Kenneth P. Keating, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,098

Int. Cl.[3] C07D *487/00*

U.S. Cl. 544—352 **1 Claim**

1. An improved process for directly recovering a substantially pure triethylenediamine solute in a 1,4-butanediol solution from a crude aqueous triethylenediamine reaction product mixture obtained from a liquid phase process for the preparation of triethylenediamine comprising the steps of admixing said 1,4-butanediol with said crude triethylenediamine reaction product mixture to form a crude triethylenediamine reaction product-1,4-butanediol admixture; heating said admixture under conditions such that water and other lower boiling impurities are removed and heating the resultant bottoms to produce a codistillate of a substantially pure triethylenediamine solute in liquid 1,4-butanediol solution.

4,233,448

3-METHOXYCARBONYL-2-(2-THIENYL)-8-AZABICYCLO[3.2.1]OCTANE-8-ACETAMIDE AND SALTS THEREOF

Robert L. Clarke, Bethlehem, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 41,907, May 24, 1979, which is a division of Ser. No. 894,894, Apr. 10, 1978, Pat. No. 4,179,567. This application Oct. 26, 1979, Ser. No. 88,537

Int. Cl.[3] C07D *471/08*

U.S. Cl. 546—125 **1 Claim**

1. (exo,exo)-3-Methoxycarbonyl-2-(2-thienyl)-8-azabicyclo[3.2.1]octane-8-acetamide; or a pharmaceutically acceptable acid-addition salt thereof.

4,233,449

1-(8-METHYL-2-PHENYL(OR THIENYL)-8-AZABICYCLO[3.2.1]OCTAN-3-YL) ETHANONE

Robert L. G. Clarke, Delmar, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 41,907, May 24, 1979, which is a division of Ser. No. 894,894, Apr. 10, 1978, Pat. No. 4,179,567. This application Oct. 26, 1979, Ser. No. 88,538

Int. Cl.[3] C07D *471/08*

U.S. Cl. 546—125 **3 Claims**

1. (exo,exo)-1-(8-Methyl-2-Ar-8-azabicyclo[3.2.1]-octan-3-yl)ethanone, wherein Ar is phenyl or 2-thienyl; or a pharmaceutically acceptable acid-addition salt thereof.

4,233,450

PREPARATION OF OXAZOLIDINE-2,4-DIONES

Herbert Scholz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

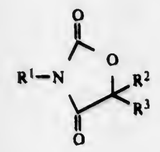
Filed May 18, 1979, Ser. No. 40,282

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827414

Int. Cl.[3] C07D *263/44*

U.S. Cl. 548—226 **4 Claims**

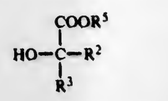
1. A process for the preparation of an oxazolidine-2,4-dione of the formula



where R^1 is aryl of 6 to 12 carbon atoms which is unsubstituted or substituted by one or more halogen atoms, methyl or methoxy, R^2 is hydrogen, methoxymethyl, alkyl of 1 to 4 carbon atoms or vinyl and R^3 has the same meanings as R^2 and in any particular compound R^2 and R^3 may be identical or different, wherein a urea derivative of the formula

$$R^1—NH—CO—NH—R^4$$

where R^1 has the above meanings and R^4 has the same meanings as R^1 or is hydrogen, and in any particular compound R^1 and R^4 may be identical or different, is reacted with a 2-hydroxy-carboxylic acid ester of the formula



where R^5 is alkyl of 1 to 10 carbon atoms or cyclohexyl, at from 100° to 250° C.

4,233,451

PROCESS FOR MAKING IMIDAZOLINIUM SALTS

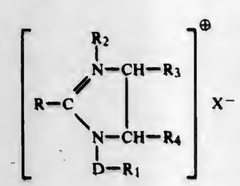
Hans J. Pracht, Sycamore Township, Hamilton County, and Joseph P. Nirschl, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 708,980, Jul. 27, 1976, Pat. No. 4,127,489, which is a continuation-in-part of Ser. No. 687,951, May 20, 1976, abandoned. This application Oct. 20, 1978, Ser. No. 953,065

Int. Cl.[3] C07D *233/24*

U.S. Cl. 548—354 **18 Claims**

1. In a process for making quaternary imidazolinium salts having the following structure:



wherein R and R_1 are aliphatic groups having from about 10 to about 22 carbon atoms, R_2 is an alkyl or aralkyl group having from 1 to about 8 carbon atoms, R_3 and R_4 are hydrogen, hydroxy, short chain alkyl having from 1 to about 4 carbon atoms or hydroxy short chain alkyl having from 1 to about 4 carbon atoms, X is an anion and D is:

wherein n is a number from 1 to about 6; said process comprising the following steps:

A. Forming a mixture of an acylating or esterifying agent having an aliphatic hydrocarbon group containing from about 10 to about 22 carbon atoms associated with each acyl group and an alkylene or polyalkylene polyamine having two or three amino groups, one of which is a primary or secondary amino group in the 2 position with respect to a primary amino group, the molar ratio of acyl groups to primary amine and hydroxyl groups being from about 0.33:1 to about 1.5:1,

B. Reacting the mixture of step A for a period of from about 3 to about 24 hours at a temperature of from about 100° C. to about 250° C. and then drawing a vacuum of from about 0.4 mm mercury to about 10 mm mercury for from about 1 to about 8 hours to form an imidazoline product in a mixture with starting materials and intermediates;

D. Treating the mixture of step B with an alkylating agent in an amount such that the molar ratio of alkylating agent to imidazoline is at least 1:1;

the improvement wherein, between said steps B and D, a step C is performed as follows:

C. Treating the imidazoline product mixture of step B with an alkoxylating agent, comprising an alkylene oxide selected from ethylene oxide, propylene oxide, butylene oxide, glycide, and cyclohexane oxide, in an amount equal to from about 1% to about 5% by weight of the imidazoline product mixture while maintaining the temperature at from about 80° C. to about 140° C. for a period of from about 0.5 to about 8 hours;

whereby to form a composition comprising quaternary imidazolinium salts which are essentially free of primary and secondary amines, amine salts and alkoxylated imidazolinium salts.

4,233,452

DERIVATIVES OF GLYCOLIC AND GLYOXYLIC ACID AS INHIBITORS OF GLYCOLIC ACID OXIDASE

Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, and Clarence S. Rooney, Worcester, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 950,753, Oct. 11, 1978. This application May 3, 1979, Ser. No. 35,753

Int. Cl.[3] C07D *333/24*; A61K *31/38*

U.S. Cl. 549—79 **1 Claim**

1. 5-Benzylthien-2-ylglyoxylic acid.

4,233,453

15-DEOXY-16-HYDROXY-16-ALLENYL PROSTANE DERIVATIVES OF THE E AND F SERIES

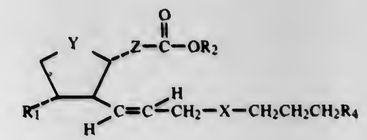
Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1979, Ser. No. 46,512

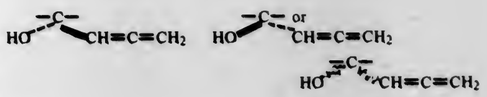
Int. Cl.[3] C07L *177/00*

U.S. Cl. 560—121 **4 Claims**

1. An optically active compound of the formula:



wherein X is



Y is:



R_1 is hydrogen or hydroxyl;

R_2 is hydrogen or C_1 to C_6 alkyl;

R_4 is hydrogen, C_1 to C_3 alkyl, or chlorine;

Z is

cis
$-CH_2-CH=CH(CH_2)_p-$

wherein p is 2 to 5, and the racemic mixture thereof; and when R_1 is hydrogen, the pharmaceutically acceptable salts thereof.

4,233,454

CYCLOPENTANE ACETIC ACID DERIVATIVES

Keith B. Mallion, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

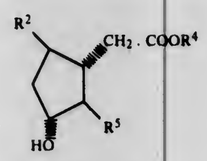
Continuation of Ser. No. 844,388, Oct. 21, 1977, abandoned. This application Sep. 10, 1979, Ser. No. 73,876

Claims priority, application United Kingdom, Nov. 16, 1976, 47663/76; Dec. 8, 1976, 51195/76

Int. Cl.³ C07C *69/738, 69/708, 59/80;* C07D *213/64*

U.S. Cl. 560—122 **3 Claims**

1. A cyclopentane derivative of the formula:



III

wherein R^2 is halogen, R^4 is hydrogen or 1–4C alkyl and R^5 is di(1–4Cor a radical of the formula:



IV

wherein R^1 is 4–7C alkyl, phenoxymethyl or phenoxymethyl substituted in the phenyl part by halogen or trifluoromethyl, or 2-pyridyloxymethyl or 2-pyridyloxymethyl substituted in the pyridyl part by halogen.

4,233,455

PREPARATION OF DIESTERS OF OLEFINICALLY UNSATURATED 1,2 AND/OR 1,4-DIOLS

Hans-Martin Weltz, Bad Duerkheim; Juergen Hartig, Gruenstadt, and Laszlo Marosi, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 26,995

Claims priority, application Fed. Rep. of Germany, May 11, 1978, 2820519

Int. Cl.³ C07C *67/055*

U.S. Cl. 560—244 **3 Claims**

1. A process for the preparation of diesters of olefinically unsaturated 1,2- and/or 1,4-diols by reacting a diolefin selected from the group consisting of 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene and a 1,3-pentadiene with oxygen and a fatty acid in the gas phase or liquid phase over a solid catalyst which contains palladium and/or platinum and copper in a reduced form on a solid carrier, said catalyst having been obtained by the reduction of compounds, applied to a carrier, of platinum and/or palladium and of copper, and heating at 400° C. or above.

4,233,456

PROCESS FOR THE MANUFACTURE OF OPTICALLY ACTIVE, OPTIONALLY SUBSTITUTED 2-AMINO-2-PHENYLACETIC ACID

Horst Schmand, Bad Nenndorf, and Wolfgang Dannenberg, Wunstorf, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

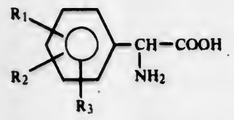
Filed Aug. 28, 1978, Ser. No. 937,093

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2738934

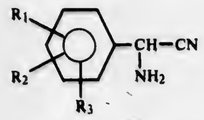
Int. Cl.³ C07B *19/00*

U.S. Cl. 562—401 **9 Claims**

1. A process for the manufacture of an optically active optionally substituted 2-amino-2-phenylacetic acid of the formula



wherein R_1, R_2 and R_3, which are identical or not all the same, are hydrogen, halogen, hydroxy, alkyl, acyl or alkoxy, which consists essentially of reacting a DL-2-amino-2-phenyl-acetonitrile of the formula



with an approximately equimolar amount of L(+)-tartaric acid in the presence of at least one alkanol of from 1 to 5 carbon atoms at a temperature of from 0° to 50° C.; stirring the reaction mixture for 2 to 120 hours at a temperature of from 0° to 50° C., thereby bringing about asymmetrical transformation; separating the crystallized transformation product; hydrolyzing same by a treatment with an acid; and isolating the optically active 2-amino-2-phenylacetic acid form.

4,233,457

PROCESS FOR PREPARING INDENYL ACETIC ACIDS

Robert F. Czaja, Scotch Plains, and Edward J. J. Grabowski, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 17, 1979, Ser. No. 39,709

Int. Cl.³ C07C *147/14*

U.S. Cl. 562—428 **4 Claims**

1. An improved process for the preparation of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenyl-acetic acid which comprises heating an anhydrous solution of 5-fluoro-2-methyl-1-(p-methylthiobenzyl)indenylidene-3-acetic acid in contact with anhydrous hydrogen bromide, wherein the molar ratio of 5-fluoro-2-methyl-1-(p-methylthiobenzyl)indenylidene-3-acetic acid to hydrogen bromide is between 1 to 0.1 and 1 to 0.5, and the temperature is maintained between 50°–100° C. in a sealed container, to produce 5-fluoro-2-methyl-1-(p-methylthiobenzyledene)indenyl-3-acetic acid, and submitting said indenyl-3-acetic acid to oxidation.

4,233,458

PROCESS FOR PREPARING N,N-DIMETHYLAMINOBENZOIC ACIDS

John H. Bright, Kendall Park, N.J., and Joseph L. Schmitt, Jr., Bethel, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 28, 1978, Ser. No. 928,950

Int. Cl.³ C07C *99/00*

U.S. Cl. 562—458 **10 Claims**

1. A process for the manufacture of 3-dimethylaminobenzoic acid which comprises (1) a first step of reacting a methanolic solution of one molar proportion of 3-nitro-benzoic acid with three molar proportions of hydrogen under superatmospheric pressure and at a temperature of about 10°–100° C. in the presence of an effective amount of palladium metal catalyst and optionally from about 0.1 to 5.0 percent by weight, based on the weight of the nitrobenzoic acid of acetic acid; (2) a second step of adding thereto about two molar proportions of formaldehyde and reacting the resulting mixture with an additional two molar proportions of hydrogen under superatmospheric pressure at a temperature of about 15°–100° C.; (3) filtering the resulting methanolic solution of 3-dimethylaminobenzoic acid from the catalyst and recovering 3-dimethylaminobenzoic acid therefrom.

4,233,459

CONTINUOUS MANUFACTURE OF ANTHRANILIC ACID

Gerhard Kilpper, Battenberg, and Johannes Grimmer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,829

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1978, 2815522

Int. Cl.² C07C *99/00, 99/12*

U.S. Cl. 562—458 **15 Claims**

1. A process for the continuous manufacture of anthranilic acid by reacting an alkali metal phthalamate, phthalimidate, or a mixture thereof, with a hypohalite in an aqueous medium in a reaction tube, wherein, during the reaction forming the anthranilic acid or after completion of the reaction,

(1) in a first step, the anthranilic acid so obtained is treated with reducing agents which are not alkali metal dithionite or alkali metal formaldehyde-sulfoxylates and

(2) in a second step the treated anthranilic acid is then further treated with an alkali metal dithionite, an alkali metal formaldehyde-sulfoxylate or a mixture thereof.

4,233,460

ALKOXYALKANOIC ACID PREPARATION

Carl L. Willis, and Lynn H. Slaugh, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 3, 1979, Ser. No. 35,871

Int. Cl.² C07C *51/26*

U.S. Cl. 562—537 **3 Claims**

1. A process for preparing an alkoxyalkanoic acid of the formula:

$$RO(CH_2CHR'O)_nCH_2CO_2H$$

wherein R is an alkyl group of 1 to about 22 carbon atoms, R' is hydrogen or methyl or a mixture thereof (on the individual molecule) and n is an integer of from 1 to about 12 by reacting the corresponding alkoxyalkanol with tertiary butyl hydroperoxide and an alkali metal hydroxide in the liquid phase at a temperature of about 20° to about 100° C. in the presence of a catalytically effective amount of palladium metal while maintaining during the reaction an excess of the alkali metal hydroxide.

4,233,461

PROCESS FOR PREPARING COLORLESS METHIONINE

Toshio Kawabata, and Toshio Ishiyama, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 27, 1979, Ser. No. 24,462

Claims priority, application Japan, Apr. 3, 1978, 53/39598

Int. Cl.³ C07C *149/247*

U.S. Cl. 562—554 **10 Claims**

1. A process for preparing colorless methionine from the aqueous solution of alkali salts of methionine prepared by hydrolysis of 5-(β-methylmercaptoethyl)-hydantoin with an alkali, which comprises treating the said solution with a reducing sulfur compound before or during neutralizing the said solution with an acid ,and thereafter collecting colorless methionine from the resulting decolorized solution of methionine, the reducing sulfur compound being sulfur dioxide, monosulfites, disulfites, bisulfites, thiosulfates, dithionites or a mixture thereof.

4,233,462

PEROXYGEN COMPOUNDS

Robert C. P. Cubbon, Kingsley; John E. Braid, Croft, Nr. Warrington; Alfred E. Oates, Luton, and Ronald Preston, Eccleston, all of England, assignors to Laporte Chemicals Limited, England

Continuation of Ser. No. 48,531, Jun. 22, 1970, abandoned, which is a division of Ser. No. 660,199, Aug. 14, 1967, Pat. No. 3,787,503. This application Sep. 26, 1974, Ser. No. 509,715

Claims priority, application United Kingdom, Aug. 16, 1966, 36641/66

Int. Cl.³ C07C *179/025*

U.S. Cl. 568—564 **22 Claims**

1. A process for the preparation of a straight or branched chain ketone hydroperoxide of 4 to 6 carbon atoms substituted by alkoxy of 1 to 4 carbon atoms or hydroxy in the position α, β or γ to the ketone peroxide which consists essentially of treating at a temperature not exceeding 35° C. the corresponding ketone with aqueous hydrogen peroxide and a source of hydrogen ions providing 0.0001 to 1.75 gram atoms of hydrogen ion per gram mole of ketone.

18. A process for preparing a peroxide composition, which comprises reacting diacetone alcohol with an aqueous solution of hydrogen peroxide wherein the molar ratio of the ketone alcohol to the hydrogen peroxide is equal to at least about 1:2, at a temperature in the range from about 10°–30° C., in the presence of a source of hydrogen ion providing 0.1 to 50 milligram equivalents of hydrogen ion per mol of diacetone alcohol, and subsequently reducing the residual acidity of the reaction mixture.

4,233,463

PROCESS FOR THE SEPARATION OF 2,4-DINITRO-6-T-BUTYL-3-METHYLANISOLE, REFERRED TO AS MUSK AMBRETTE, FROM THE CRUDE SYNTHESIS MIXTURES IN WHICH IT IS PRESENT

Helene M. Pascal, Le Pontet, and Jean-Marie L. Emeury, Sorgues, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 18, 1978, Ser. No. 970,131

Claims priority, application France, Dec. 29, 1977, 77 39624

Int. Cl.³ C07C *79/35*

U.S. Cl. 568—584 **5 Claims**

1. Process for the separation of 2,4-dinitro-6-t-butyl-3-methylanisole from the crude reaction mixtures obtained by nitrating 6-t-butyl-3 -methylanisole by reaction with a mixture of nitric acid and acetic anhydride wherein water is introduced into the crude reaction mixture in the amount of at least 5% and at most 200% by weight of the nitrating mixture used in the process, in at least two additions, each addition of water

containing no more than 100% by weight of the said nitrating mixture, and prior to each introduction of water, the precipitated product is separated off.

4,233,464

CYCLOHEXENE CAROTINOID INTERMEDIATES

Manfred Baumann, Mannheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

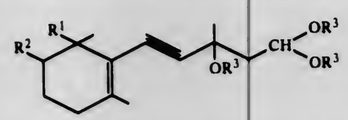
Filed Apr. 12, 1978, Ser. No. 895,629

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717502

Int. Cl.³ C07C *43/303*

U.S. Cl. 568—591 **3 Claims**

1. A cyclohexene derivative of the general formula I



I

wherein R^1 and R^2 are hydrogen or methyl, and R^3 is alkyl of 1 to 4 carbon atoms.

4,233,465

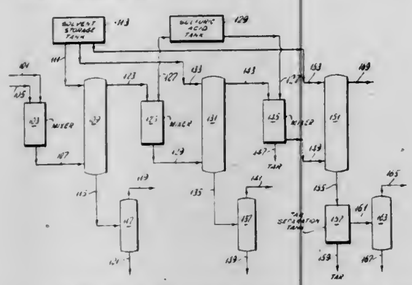
FRACTATION OF OIL OBTAINED BY PYROLYSIS OF LIGNOCELLULOSIC MATERIALS TO RECOVER A PHENOLIC FRACTION FOR USE IN MAKING PHENOL-FORMALDEHYDE RESINS

Robert M. Gallivan, Erie, Pa., and Peter K. Mattschei, Plainsboro, N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 918,040, Jun. 22, 1978. This application Nov. 29, 1978, Ser. No. 964,470

Int. Cl.² C07C *37/20, 37/28*

U.S. Cl. 568—727 **13 Claims**



1. A method of recovering a phenolic fraction from distillate oil obtained by pyrolysis of lignocellulosic waste materials, and making phenol-formaldehyde resins therefrom which comprises:

(a) mixing said oil with a base selected from the group consisting of sodium hydroxide, potassium hydroxide and ammonium hydroxide to obtain a mixture having a pH in the range of from about 11 to about 13;

(b) contacting said mixture, in a first extraction zone, with a solvent selected from the group consisting of ether, methylene chloride, chloroform, butanol and hydrocarbons, wherein the volumetric flow rates of the solvent to said mixture is from about 3:1 to about 1:1 to thereby selectively extract the neutral fraction of said oil;

(c) removing a first extract and a first raffinate from said first extraction zone and recovering the neutral fraction from said first extract;

(d) mixing said first raffinate with a mineral acid or carbon dioxide until the pH of said raffinate is lowered to the range of from about 7.5 to about 9.0 and contacting the resulting mixture with said solvent in a second extraction zone, wherein the volumetric flow rates of the solvent to said mixture is from about 3:1 to about 1:1, to thereby selectively extract the phenolic fraction of said oil;

(e) removing a second extract containing said phenolic fraction, and a second raffinate from said second extraction zone,

(f) recovering said phenolic fraction from said second extract, and

(g) reacting said phenolic fraction with formaldehyde in the presence of a metal hydroxide catalyst until the viscosity of the resulting phenol-formaldehyde resin reaches from about 500 cps to about 1000 cps.

4,233,466

HOMOLOGATION PROCESS FOR THE PRODUCTION OF ETHANOL FROM METHANOL

Rocco A. Fiato, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 91,241

Int. Cl.³ C07C *29/32*

U.S. Cl. 568—902 **12 Claims**

1. In a substantially solvent free process of producing ethanol from the reaction of methanol, hydrogen and carbon monoxide wherein the reaction is catalyzed by cobalt, ruthenium, an iodine promoter, and a phosphine ligand of the formula



wherein P is phosphorus and R_1, R_2 and R_3 when taken individually are monovalent alkyl having from 1 to 20 carbon atoms; aryl, aralkyl or alkaryl having from 6 to 10 ring carbon atoms; or cycloalkyl having from 5 to 8 ring carbon atoms; and when any two taken together are a divalent alkylene having from 2 to 6 carbon atoms; the improvement comprising maintaining the phosphine to halide mole ratio at from 1:0.36 to 1:5 while the phosphine to cobalt mole ratio exceeds 1.5:1, whereby the activity, stability and selectivity to ethanol formation of the catalyst are increased.

4,233,467

DEHYDRATION OF α-METHYLBENZYL ALCOHOLS TO FORM MONOVINYLIDENE AROMATIC MONOMERS

Junior J. Lamson, Bay City; Richard H. Hall, Midland; Edward Stroiwas, Merrill, and Larry D. Yats, Clare, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 817,937, Jul. 22, 1977, Pat. No. 4,150,059, which is a continuation-in-part of Ser. No. 601,946, Aug. 4, 1975, Pat. No. 4,049,736, which is a continuation-in-part of Ser. No. 39,889, May 22, 1970, abandoned. This application Mar. 12, 1979, Ser. No. 19,945

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.² C07C *15/00, 15/10*

U.S. Cl. 585—437 **5 Claims**

1. A process for preparing a monovinylidene aromatic monomer by dehydrating α-methylbenzyl alcohol which comprises a dehydration step of contacting the alcohol in vapor phase with a dehydration catalyst consisting essentially of silica gel in the form of a divided solid having a surface area of at least about 300 m^2/g, said dehydration step being carried out at temperatures from about 200° to about 510° C., and a step of subjecting the product of the dehydration step to simple distillation to obtain styrene in purity greater than 99 mole percent which styrene contains less than 1 mole percent of ethylbenzene impurity.

4,233,468

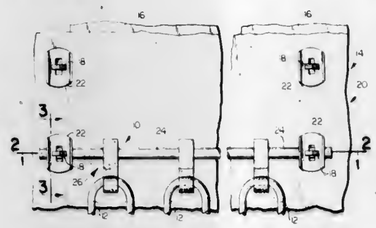
HOLDER ATTACHMENT FOR USE WITH FURNACE HARDWARE

John A. Northup, Jr., 134 Main St., Unionville, Conn. 06085

Filed Dec. 1, 1978, Ser. No. 965,525

Int. Cl.³ H05B *3/66*

U.S. Cl. 13—25 **7 Claims**



1. A holder attachment for a heat containment system having a wall, a plurality of studs attached to the wall and projecting therefrom, at least one layer of lining material impaled on the studs, and a plurality of anchor washers, each of said washers received and retained on an associated one of the studs, the studs and the anchor washers securing said lining material to the wall, said holder attachment comprising a support member having spaced apart holes for receiving associated studs therethrough, said support member adapted to be received on the associated studs between the lining material and the anchor washers on the associated studs, at least one attaching member having means for attaching an article thereto, and means for securing said one attaching member to said support member.

4,233,469

CONDUIT BUSHING

Theodore W. Steppe, P.O. Box 46, Kennedy, N.Y. 14747

Filed Feb. 13, 1979, Ser. No. 12,051

Int. Cl.³ H02G *3/04*; H01B *17/58*

U.S. Cl. 174—83 **1 Claim**



1. A conduit bushing comprising,

an annular, internally threaded member having a first end and a second end,

circumferentially spaced axially extending ribs on the outer periphery of said member,

an outwardly directed flange on said member at said first end thereof extending outward and overlying the ends of said axially extending ribs and integrally attached to said ribs,

an inwardly directed flange on said member at said second end thereof,

said member being divided along a diameter thereof into a first half and a second half,

said first half and said second half each having a first end and a second end,

an integral hinge connecting said first end of said first half to said first end of said second half,

first latch means comprising a strap having an opening therein integrally connected to said second end of said first half end extending therefrom and overlying said second end of said second half,

second latch means comprising a male lug fixed to said second end of said second half,

said opening in said strap being adapted to receive said male lug for holding said first half and said second half together, and

said strap having an outer surface disposed substantially flush with the outer periphery of said outwardly directed flange.

4,233,470

RESTORATIVE MATERIAL FOR ANTIOXIDANT DEPLETED POLYOLEFIN INSULATION

Frederick R. Wight, Jr., West Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 6, 1979, Ser. No. 55,277

Int. Cl.³ H01B *7/28*

U.S. Cl. 174—120 C **8 Claims**

1. A method of protecting polyolefin insulation on an electrical conductor comprising the step of externally applying a protective material to said insulation, with said protective material comprising a stabilizer material that migrates into said insulation, the method characterized in that said stabilizer material comprises a first antioxidant selected from the group consisting of: tetrakis [methylene 3-(3',5'-di-t-butyl-4'-hydroxyphenyl) propionate] methane; thio-diethyl-bis (3,5-di-tert-butyl-4-hydroxy hydrocinnamate); and octadecyl 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl) propionate; and a second antioxidant consisting of: tris (3,5-di-tert-butyl-4-hydroxyphenyl) tricarbonamide; and a peroxide decomposer selected from the group consisting of: tetrakis (nonylphenyl) polypropyleneglycol 425 diphosphite, dilauryl thiodipropionate, and pentaerythritol hexyl thiodipropionate.

4,233,471

AUTOMATIC TELECOMMUNICATION EXCHANGE SYSTEM

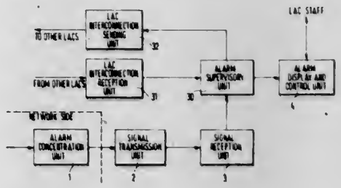
John A. W. Butcher, Stansted, and Michael A. Salino, Hatfield, both of England, assignors to Standard Telephones and Cables Limited, London, England

Filed Dec. 27, 1978, Ser. No. 973,695

Claims priority, application United Kingdom, Jan. 3, 1978, 00040/78

Int. Cl.³ H04B *1/72*; H04J *3/14*

U.S. Cl. 178—69 G **4 Claims**



1. A centralized alarm reporting system for a data handling system having a plurality of nodes, comprising:

a plurality of alarm concentration means, each of said plurality of alarm concentration means having connections to a corresponding one of said nodes for detecting alarm status information of a plurality of points;

a plurality of signal transmission means each comprising first receiving means for receiving said alarm status informa-

tion from a corresponding one of said alarm concentration means, a plurality of first storing means each adapted to store said alarm status information from said plurality of points, means for scanning said plurality of first storing means and for generating message characters, each of said message characters being representations of the alarm status information stored in one of said plurality of first storing means, means for generating information identifying the node providing said received alarm status information, and means for forming messages, each of said messages comprising said identifying information and said characters generated during a scan of said first storage means;

a plurality of signal reception means each adapted for receiving and storing said messages from at least one of said plurality of signal transmission means, said signal reception means comprising receiving means for receiving said messages, first memory means for storing at least a portion of each received message, and means for reading and transmitting information stored in said first memory means in response to a request signal; and

alarm supervisory means including means for generating said request signal and retrieving said information from said signal reception means, second memory means for storing said retrieved information, means for comparing said retrieved information with information stored in said second memory means, and means responsive to said comparing means for amending the contents of said second memory means when said retrieved information is not identical to information stored in said second memory means.

4,233,472

LOUDSPEAKER COMBINATION, COMPRISING A PLURALITY OF DYNAMIC LOUDSPEAKERS, WHICH ARE ARRANGED ADJACENT EACH OTHER IN SUBSTANTIALLY ONE CONTINUOUS PLANE

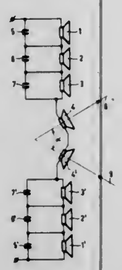
Derk Kleis, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,361

Claims priority, application Netherlands, Jul. 26, 1977, 7708256

Int. Cl.³ H04R 5/02

U.S. Cl. 179—1 GA **6 Claims**



1. A loudspeaker system comprising, a pair of input terminals, a plurality of dynamic loudspeakers arranged in sections with the loudspeakers adjacent each other in substantially one continuous plane and all sections connected in series across said input terminals, a plurality of capacitors, means connecting a capacitor in shunt with each loudspeaker section but one so as to form respective low-pass filters with the respective impedances of the loudspeaker sections, said low-pass filters having different cut-off frequencies to provide progressive muting of the loudspeaker sections as the frequency increases, and said one loudspeaker section comprises at least two loudspeakers with the axes thereof diverging relative to each other.

4,233,473

COMPREHENSIVE AUTOMATIC MOBILE RADIO TELEPHONE SYSTEM

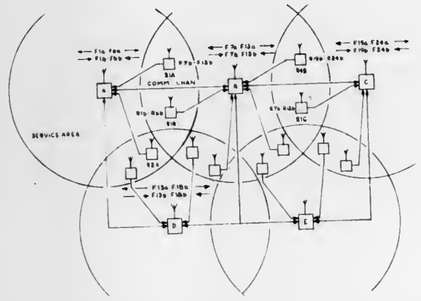
Edward G. Frost, 12000 Old Georgetown Rd., Rockville, Md. 20852

Division of Ser. No. 780,915, Mar. 24, 1977, Pat. No. 4,112,257. This application Aug. 31, 1978, Ser. No. 938,397

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.³ H04M 7/04

U.S. Cl. 179—2 EB **8 Claims**



1. In a communications system of the type wherein movable subscriber radio receiver stations are capable of receiving coded radio transmissions indicating that a particular subscriber station is being called, wherein each of plural geographically-spaced base stations has a different plurality of subscriber stations assigned thereto and is capable of receiving calls for its assigned subscriber stations from a public telephone system and transmitting said coded radio transmissions for the called subscriber station throughout a geographic area served by that base station, a method permitting subscriber stations to be called via said coded radio transmissions when roaming outside the geographic area served by the home base station to which said subscriber stations are assigned but with a geographic area served by another remote base station, said method comprising the steps of:

(a) upon a roaming subscriber station entering a geographic area served by a remote base station, sending a registration signal to said remote base station identifying the roaming subscriber station and its home base station;

(b) in response to receiving said registration signal at said remote base station, signalling the home base station of said roaming subscriber station that the roaming subscriber station is located in the geographic area served by said remote base station;

(c) storing at said home base station, in response to said signalling from said remote base station, location data indicating that said roaming subscriber station is located in said geographic area served by said remote base station;

(d) in response to receiving a call at said home base station for said roaming subscriber station, determining from said stored location data the geographic area in which said roaming subscriber station is located and transferring said call to said remote base station serving the determined geographic area; and

(e) at said remote base station, in response to transfer of a call thereto for said roaming subscriber station, transmitting said coded radio transmissions for said roaming subscriber station throughout the geographic area served by said remote base station.

4,233,474

TELEPHONE TRANSMITTER AMPLIFIER

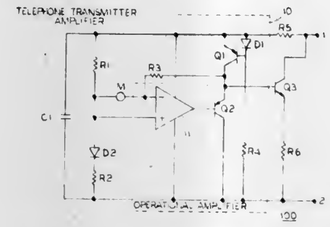
Eiso Hishizuma; Akinobu Tomimori, and Hiroshi Hara, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,361

Claims priority, application Japan, Jan. 10, 1978, 53-1757; Jan. 10, 1978, 53-1758; Feb. 1, 1978, 53-10957

Int. Cl.³ H04M 1/60

U.S. Cl. 179—81 B **9 Claims**



1. A telephone transmitter amplifier comprising a microphone means, an operational amplifier means including a differential amplifier, said microphone means being coupled to an input of said differential amplifier, a grounded collector PNP (or NPN) transistor connected to the output terminal of said differential amplifier and a first constant-current circuit means connected to the emitter of said PNP (or NPN) transistor, an output stage amplifier including a grounded emitter NPN (or PNP) transistor circuit having its base directly connected to the output terminal of said operational amplifier, a smoothing circuit means for smoothing a voltage supplied from a telephone line, and a voltage-divider circuit means for dividing the output voltage of said smoothing circuit to establish preset operating points for said operational amplifier and said output stage amplifier, output terminals of said output stage amplifier being connected in common to input terminals of said smoothing circuit means.

4,233,475

TELEPHONE STATION WITH AUTOMATIC SWITCH-OVER BETWEEN PULSE CODE DIALLING AND MULTIFREQUENCY CODE DIALLING

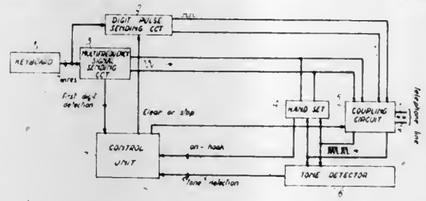
Bernard G. Roche, 13, rue de Bourgogne, (22300) Lannion, France

Filed Mar. 5, 1979, Ser. No. 17,335

Claims priority, application France, Mar. 8, 1978, 78 06683

Int. Cl.³ H04M 1/50

U.S. Cl. 179—84 VF **6 Claims**



1. A telephone station connected to a telephone network by a telephone subscriber's line adapted for automatic switching between pulse code dialling and frequency code dialling comprising:

a keyboard with a plurality of keys;

means controlled by said keyboard for generating call digit pulse trains which are associated with the keyboard keys respectively;

means controlled by said keyboard for generating call digit multifrequency signals which are associated with said keyboard keys respectively;

an audio circuit for said telephone station;

a coupling circuit for connecting said generating means and the telephone station audio-circuit to said telephone line;

means for blocking pulse train transmission from said pulse train generating means and simultaneously releasing multifrequency signal transmission from said multifrequency signal generating means or vice versa;

said telephone network including supervisory signal generating means;

means for detecting supervisory signals which are transmitted from said telephone network and which indicate start the of various call phases in setting up a telephone communication;

said detecting means controlling said blocking and releasing means in response to detection of each of said supervisory signals so that only said multifrequency signal generating means transmits over said telephone line only the multifrequency signal associated with the first key of a dialling call pulse whose beginning is indicated by the detection of a corresponding supervisory signal; and

said detecting means thereafter controlling said blocking and releasing means in response to further detection of said corresponding supervisory signal, so that only said pulse train generating means transmits over said telephone lint the pulse train associated with said first key and then said pulse trains associated with the subsequent keys of said call dialling pulses and in response to the non-detection of said corresponding supervisory signal so that only said multifrequency signal generating means transmits over said telephone line said multifrequency signals associated only with said subsequent keys.

4,233,476

MOVING COIL TYPE CARTRIDGE

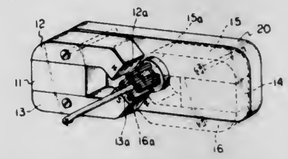
Isamu Ikeda, 3-17, Oyamadai 1-chome, Setagaya-ku, Tokyo, Japan

Filed Jan. 2, 1979, Ser. No. 4

Claims priority, application Japan, Mar. 27, 1978, 53-35127

Int. Cl.³ H04R 9/16

U.S. Cl. 179—100.41 D **3 Claims**



1. In a moving coil type of cartridge for reproduction of sound on stereo discs in which the groove undulates in two lateral directions, the combination comprising a base member, magnetic means on the base member defining four substantially flat pole faces arranged in square configuration facing mutually inwardly to define a central space and with their adjacent edges slightly spaced from one another, the pole faces comprising first and second opposed pairs, means including permanent magnets for magnetizing the first and second pairs of pole faces so that the opposed pole faces are of the same polarity and so that adjacent pole faces are of opposite polarity with the lines of flux flowing through the pole faces from one pole face to the next being generally perpendicular to the face, a first coil in the central space having its axis parallel to the first pair of pole faces and having the turns thereof spaced along and lying closely adjacent such pole faces for acting upon by the flux flowing therethrough, a second coil in the central space having its axis parallel to the second pair of pole faces and having the turns thereof spaced along and lying closely adjacent such pole

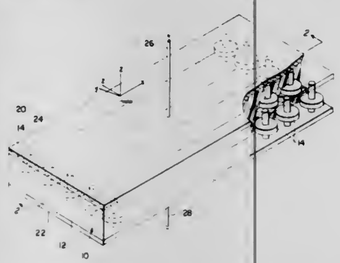
faces for acting upon by the flux flowing therethrough, the axes of the coils being at right angles to one another and the coils being physically coupled so that they together substantially form a square prism, a shank of non-magnetic material arranged along a central axis which is substantially perpendicular to both of the coil axes, the coils being secured to the shank, a stylus at the end of the shank for engaging the groove in the disc, and means for resiliently supporting the shank on the base member so that movements of the stylus in the two lateral directions cause axial movements of the coils in respective directions for cutting of the lines of flux at the respective pairs of pole pieces with the result that the coils produce respective output voltage waves representative of the undulations of the groove.

4,233,477

FLEXIBLE, SHAPEABLE, COMPOSITE ACOUSTIC TRANSDUCER

Roy W. Rice, Alexandria, and Robert C. Pohanka, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1979, Ser. No. 8,028
Int. Cl.³ H01L *41/10*; H04R *17/00*
U.S. Cl. 179—110 A **9 Claims**



1. A flexible, shapeable, composite acoustic transducer which comprises:
a flexible polymer;
a plurality of polarized and electroded electroacoustic wafers assembled within said polymer in an x-y plane,
each of said wafers being oriented with its line of polarization in the same direction as those of the others and all having their positive poles on the same side of the x-y plane;
electrically conductive foils on opposite surfaces of said polymer;
means providing a conductive path between opposite faces of each of said electroacoustic wafers and each of said conductive foils; and
electrical leads electrically secured to each of said foils for conducting an electrical signal to or from said wafers.

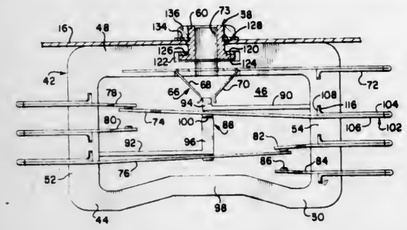
4,233,478

CIRCUIT TRANSFER APPARATUS

John M. Stahl, Downers Grove, and Robert W. DeRoss, Cicero, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 12, 1977, Ser. No. 823,921
Int. Cl.² H01R *33/30*; H05B *9/06*
U.S. Cl. 200—51.09 **20 Claims**

1. A jack for regulating the time and temperature responsive control circuits of a microwave oven, comprising:
housing means including an orifice for receiving a temperature probe plug therein;
temperature-sensing circuit contact means for electrically engaging said plug within said housing means;
time and temperature responsive control circuit contact means including a plurality of first and second contact members disposed within said housing means, said first contact members being electrically engageable with selected second contact members; and
means for electrically isolating said first contact members from one another and including means for translating the



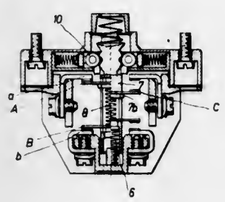
insertion and withdrawal movements of said plug into and from said housing means into movements of said first contact members to selectively engage various second contact members to transfer between the control circuits of the oven.

4,233,479

SWITCH

Wolfgang Karpe; Johannes Kluge, both of Wetter, and Klaus-Dieter Oemus, Hemer, all of Fed. Rep. of Germany, assignors to Mannesmann Demag AG, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 25,933
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2815493
Int. Cl.³ H01H *15/18, 3/12, 13/04*
U.S. Cl. 200—77 **8 Claims**



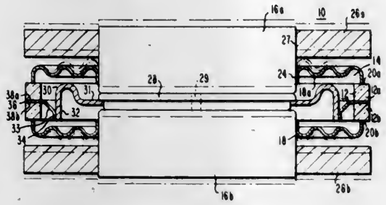
1. A stepped push button switch, comprising
(a) a housing body;
(b) a switch contact carrier displaceable in said body;
(c) a push button engaging said carrier;
(d) return spring means for maintaining said carrier in off position; the improvement characterized by
(e) a plurality of axially spaced notches on said carrier;
(f) spring biased lock-in elements for engaging sequentially said notches on said carrier;
(g) an initial stress spring disposed between said push button and said carrier;
(h) a top cover plate for said body;
(i) a bore in said cover plate for receiving said push button;
(j) opposed grooves in said body at right angles to the axis of said contact carrier and on eacn side thereof;
(k) a U-shaped guide disposed in each said groove;
(l) the legs of each U-shaped guide forming slots for receiving said lock-in elements;
(m) the springs of said lock-in elements received in said U-shaped guides;
(n) a thrust bearing disposed between each said lock-in element and its respective spring; and
(o) pegs disposed on each said thrust bearing and the opposed wall of each said groove for receiving each end of the said springs of said lock-in elements.

4,233,480

LOW VOLTAGE VACUUM SWITCH WITH THREE INTERNAL CONTACTS INCLUDING A CENTER FLOATING CONTACT

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,092
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



1. A direct current, low voltage vacuum switch which is operable to carry a high continuous current of several thousand amperes and to interrupt this arc current formed when the switch contacts are opened at a low dc voltage across the switch which extends the arc voltage above which the arc current would normally be sustained in vacuum between a single pair of spaced apart contacts, which switch comprises a hermetically sealed envelope having a central annular insulating portion, opposed thin flexible corrugated annular members extending inward from the central annular insulating portion in a direction transverse to the axis of the central annular insulating portion, movable high current carrying cylindrical conductive end contacts sealed to the inner annular edge of the thin flexible corrugated annular members, the improvement wherein a center contact is disposed within the hermetically sealed envelope between the opposed end contacts which are axially movable to and from contact with the center contact, which center contact is supported from the central annular insulating portion and electrically isolated from the opposed cylindrical end contacts in the open switch position where the end contacts are moved in opposed axial directions, and wherein the center contact is supported from the annular insulating portion by a central arc shield member disposed about the arc paths between the contacts and the annular insulating portion, with a thermally expansive support means connected between the annular insulating switch portion and the central arc shield member.

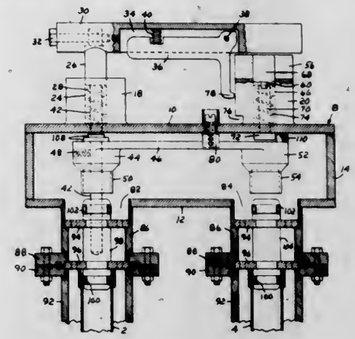
4,233,481

MECHANICAL TRANSFER SWITCH

Jack L. Kruger, P.O. Box 215, Goffstown, N.H. 03045

Filed Mar. 29, 1979, Ser. No. 25,275
Int. Cl.² H01H *3/00*
U.S. Cl. 200—153 D **14 Claims**

1. A switch for use in R F transmission, said switch comprising
a first supporting plate,
a shaft extending through said first plate and mounted thereon for rotative and axial movement,
a handle fixed to said shaft on one side of said plate,
a rigid conductive bar associated with said shaft on the other side of said plate whereby movement of said handle will cause corresponding movement of said bar,
spaced electrical connectors on said bar,
a second supporting plate fixedly spaced from said first plate,
a plurality of cooperating electrical terminals mounted on said second plate and electrically insulated therefrom,
said cooperating terminals located on said second plate to receive said bar connectors when said connectors are first aligned with said terminals by suitable rotation of said handle and said connectors are than caused to engage said terminals by movement of said handle toward said first plate, whereby the circuit between a selected pair of terminals can be closed and



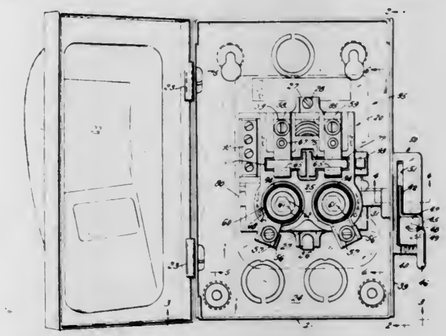
means for preventing movement of said bar and connectors toward said second plate except when the bar connectors are aligned with two of said cooperating terminals.

4,233,482

ENCLOSED FUSED DISCONNECT SWITCH

Bernard DiMarco; Ralph C. Clement, and Charles W. Parmenter, all of Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 28, 1977, Ser. No. 772,441
Int. Cl.³ H01H *1/42*
U.S. Cl. 200—163 **15 Claims**



1. Electric switch apparatus, comprising:
an insulating base, said insulating base including a front and a back connected by opposite first and second sides and opposed first and second ends; confronting closely-spaced, generally parallel first and second stationary contact jaws, a U-shaped movable contact including, in cross-section, relatively long first and second arms connected at their first ends by a relatively short web and extending rearward from the latter, an insulating carrier to which said movable contact is mounted, said carrier being movable between circuit opened and circuit closed positions; in said circuit closed position said movable contact being disposed in the space between said jaws with said first and second arms in engagement with the respective first and second jaws; in said circuit opened position said movable contact disengaged from said jaws; said contact jaws having the surfaces thereof, opposite those surfaces engaged by the contact arms, disposed adjacent to surfaces of said base; a line terminal at said first end and a load terminal at said second end, circuit means connected between said terminals, said circuit means including said

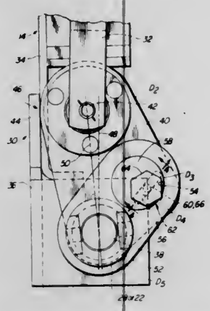
movable contact and said jaws, said base also including guide channels wherein said carrier is mounted for front to rear movement between said circuit opened and said circuit closed positions, respectively, and an over-center spring powered operating means on said base for moving said carrier in said channels, said operating means including an operating lever having a shaft section and a tongue extending transverse to said shaft section through an aperture in said carrier, said lever being seated in aligned bearing formations in said sides of said base.

4,233,483

APPARATUS FOR CONNECTING A SWITCH OPERATOR TO A SWITCH

Edward J. Rogers, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Apr. 4, 1979, Ser. No. 26,849
Int. Cl.³ H01H 25/00, 1/50
U.S. Cl. 200—337 **9 Claims**



1. Apparatus for locking a first rotatable member to a second rotatable member so that the members rotate coaxially together about a common axis, the members being locked together while they are in independent, predetermined angular positions about the axis whereat their relative angular orientation is unpredictable and random; the apparatus comprising:

an elongated slot formed through the second member;

a hole formed through the first member so as to generally overlie and encompass the slot when the members are in their predetermined positions;

a tapered disk having an off-center aperture therethrough, the disk being insertable into the hole and rotatable until the aperture is visually observed to overlie and be aligned with the slot; and

connecting means insertable through the aligned aperture and slot for pulling the first member and the disk toward the second member to lock the members together so that they are coaxially rotatable together and to jam the disk into the hole to prevent rotation therein.

4,233,484

HIGH FREQUENCY CURRENT WELDING OF METAL STRIP TO A METAL PART

Humfrey N. Udall, Darien, Conn., assignor to Thermatool Corp., Stamford, Conn.

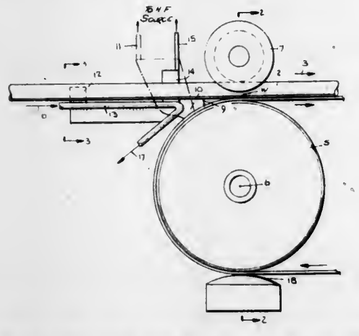
Filed Dec. 7, 1978, Ser. No. 967,112
Int. Cl.³ B23K 31/06
U.S. Cl. 219—67 **19 Claims**

1. A method for welding a thin, flexible, metal strip to a metal part along a line extending longitudinally of the strip using high frequency electric current to heat the surfaces of the part and the strip to be joined to welding temperature, said strip having a face between its longitudinal edges which is large in width relative to its thickness and having a thickness which permits it to undulate in a direction perpendicular to said face in the absence of support therefor, and said part having a longitudinal surface portion which is narrower than said face, said method comprising:

continuously advancing said metal part toward a weld point;

continuously advancing said strip toward said weld point and into contact with said part at said weld point and with said face thereof facing said portion of said part and, in advance of said weld point, maintaining the strip spaced from said part so that a narrow V-shaped gap is present between said strip and said portion of said part in advance of said weld point;

supplying high frequency electric current to said part and said strip at points thereon in advance of said weld point by means of a first contact engaging said part at a first point which is in advance of said weld point and which is at the upstream end of one side of said gap, a second contact engaging said strip at a second point which is in



advance of said weld point and which is at the upstream end of the other side of said gap to heat the portions of the surfaces of the strip and the part which are nearest each other to welding temperature by the time they reach said weld point;

constraining said strip to a fixed path which is said other side of said V-shaped gap from said second point to said weld point by engaging said strip from said second point to adjacent said weld point and at the side thereof opposite to said face with a rigid member having the path shape of said other side of V-shaped gap and applying a force to said strip directed so as to maintain said strip against said member and to substantially prevent movement of said strip toward or away from said metal part during its passage from said second point to said weld point; and

pressing said strip and said portion of said part together at said weld point to form a weld therebetween.

4,233,485

PROCESS FOR ELECTRICAL DISCHARGE MACHINING OF CYLINDRICAL WORK

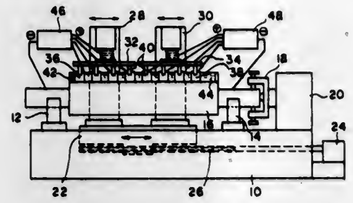
Kunihiko Sato, Owari-Asahi; Tetsuro Urata; Tetsuhiro Asamoto, both of Nagoya; Kobun Asakawa, Fukuyama; Takeo Uebayashi, Fukuyama, and Mitugi Kawano, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 920,989
Int. Cl.³ B23P 1/12
U.S. Cl. 219—69 M **5 Claims**

1. In an electrical discharge machining process for giving a satiny finish to the outer surface of a cylindrical work, wherein a plurality of head columns is disposed with a predetermined interval between adjacent head columns, each of said head columns having mounted thereon a plurality of electrodes arranged at an equal pitch to face the cylindrical work rotated at a constant speed, the improvement comprising the steps of:

controlling the feeding of said electrodes toward the work-

ing surface of said cylindrical work separately for each of the head columns; and



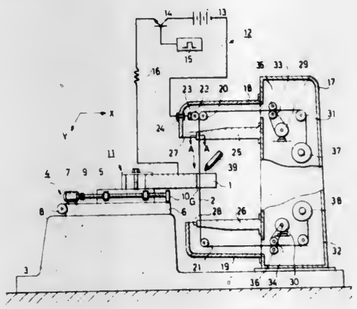
reciprocally and continuously feeding said head columns transversely at a constant speed over a distance equal to the mounting pitch of said electrodes along the axis of rotation of said cylindrical work.

4,233,486

TRAVELING-WIRE ELECTRICAL DISCHARGE MACHINE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Filed Dec. 21, 1978, Ser. No. 971,820
Claims priority, application Japan, Dec. 26, 1977, 52-155676; Jan. 5, 1978, 53-30
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W **5 Claims**



1. A traveling-wire electrical discharge machine for electroerosively machining a workpiece located in a machining region with a condinuous elongate electrode, said machine comprising: a single column mounted on a machine base; supply reel means mounted on said column for feeding said continuous elongate electrode; takeup reel means mounted on said column for collecting said continuous elongate electrode; a pair of first arms individually mounted to said column and supporting at their respective end portions a pair of first guide sections for spanning said continuous elongate electrode therebetween across said machining region and for guiding said continuous electrode from said supply reel means toward said machining region and for guiding said spanned electrode toward said takeup reel, respectively;

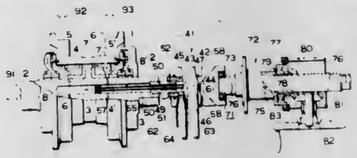
means for advancing said continuous electrode and transporting it through said machining region; a pair of second arms mounted individually to said column and supported independently of said first arms by said single column between said first arms and supporting at their respective end portions a pair of second wire guide sections spacedly positioned between said first wire guide sections across said machining region for guiding said spanned electrode precisely in line with a cutting section across a machining gap in said machining region.

4,233,487

METAL BUILD-UP APPARATUS WITH IMPROVED COOLING MEANS

Yasumitsu Moriki; Izumi Takahashi; Masahiro Sakurai, and Hidehiro Shimizo, all of Tokyo, Japan, assignors to Maruma Jyusharyo Kabushikigaisha, Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,840
Claims priority, application Japan, Jun. 23, 1978, 53/87268[U]
Int. Cl.³ B23K 9/32
U.S. Cl. 219—76.11 **2 Claims**



1. A cooling apparatus in a re-building welding machine for track rollers, said apparatus comprising:

a track roller shaft,

a lubrication oil passage bore extending axially in said shaft and opening at one end thereof,

said track roller shaft further comprising axially spaced, radial oil passage branch bores opening to said axial bore, and being in fluid communication with the track roller at their radial outboard ends,

a first contact joint,

means for coupling said first contact joint to the open end of said track roller shaft,

said first contact joint having cooling medium inlet and outlet ports formed therein;

a second contact joint for cooperative axial contact with said first contact joint;

plunger means for rotatably and axially movably supporting said second contact joint to effect contact between said first and second contact joints;

an intake tube having at its end a valve body sealably fitted to the inner surface of said oil passage bore when said first contact joint is coupled to the open end of said shaft, said intake tube being connected to said first contact joint in communication with said inlet port;

said first contact joint including an intake/exhaust sleeve including an intake terminal and an exhaust terminal in respective communication with said inlet and outlet ports, and wherein the length of said intake tube is such that when said first contact joint is coupled to the open end of said shaft, said valve body is positioned within said oil passage bore between said radial oil passage branch bores; whereby cooling medium may be fed through said intake terminal by means of said intake/exhaust sleeve and circulated through said track roller for cooling of said track roller during welding rebuilding.

4,233,488

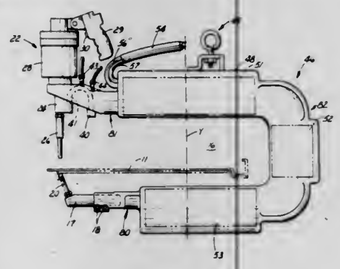
DEEP THROAT RESISTANCE WELDER

Charles A. Schwartz, 24545 Brydes, Beachwood, Ohio 44122

Filed Nov. 23, 1977, Ser. No. 854,333
Int. Cl.³ B23K 9/28, 11/24
U.S. Cl. 219—89 **6 Claims**

1. An electrical, resistance-type welding machine comprising, a generally U-shaped body having an upper elongated body member, a lower elongated body member in transversely spaced-apart relationship to said upper body member, and an intermediate elongated body member in electrical communication intermediate said upper and lower body members, said upper, lower and intermediate body members formed as a unitary, physically U-shaped integral structure; each of said body members having a first end and a second end;

a first electrode near said first end of said upper body member;
a second electrode near said first end of said lower body member,
said first and second electrodes being oppositely disposed relative to one another for welding;
each body member comprising at least one linear tranformer each such linear transformer having an elongated digitated secondary with terminals near the ends thereof and, associated with said secondary, a primary coil having a predetermined multiplicity of turns;
each linear transformer forming a part of its respective body member so as to function as a structural part thereof and having its secondary electrically connected in series to each other;



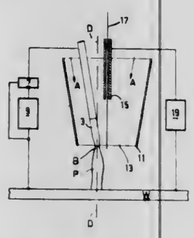
the primary coil of each linear transformer positioned adjacent to its respective digitated secondary;
cooling passages within each said secondary and within each of said body members, said passages being sealingly connected in open fluid communication with each other to provide a cooling path for coolant;
said linear transformers together comprising at least 20 percent of the curvilinear length of said U-shaped body;
movement means to effect movement of said first and second electrodes relative to one another; and
power supply means remote from said welding machine including electrical conductor means for supplying power from said power supply means to each of said linear transformers.

4,233,489

METHOD OF AND DEVICE FOR PLASMA MIG-WELDING

Wilhelmus G. Essers, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 558,018, Mar. 13, 1975, abandoned. This application Apr. 10, 1978, Ser. No. 894,756
Claims priority, application Netherlands, Mar. 25, 1974, 7403866
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 P **2 Claims**



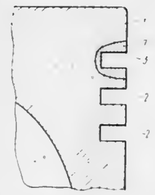
1. A method of plasma-MIG welding, which comprises flowing a thermally ionizable gas past a non-consumable electrode through a non-constricting nozzle toward a workpiece; initially establishing a plasma arc between said non-consumable electrode and said workpiece to initiate and sustain a plasma flow extending through the nozzle along a non-deviated direct path from the non-consumable electrode to the workpiece; initially feeding a consumable electrode through the nozzle toward the workpiece along a path generally parallel to the direct path of said plasma flow but laterally spaced and separated from the same; and thereafter striking a MIG-arc between the consumable electrode and the workpiece, the resulting MIG-arc thereby laterally displaying the plasma flow from its initial direct path and drawing the same to said MIG-arc to substantially concentrically surround the latter, a slight constriction of said laterally displaced plasma flow being simultaneously effected by said MIG-arc, said slight constriction being caused solely by said MIG-arc.

4,233,490

METHOD OF REINFORCING ALUMINIUM ALLOY PISTON RING GROOVE

Alexandr N. Shalai, ulitsa Budapeshtskaya, 98, korpus, 3, kv. 88; Mikhail D. Nikitin, Novoizmailovsky prospekt, 27, kv. 52; Nikolai I. Zakharov, ulitsa Avtovskaya, 2, kv. 112, all of Leningrad, and Anatoly P. Bratchenko, ulitsa Kievskaya, 3b, kv. 39, Michurinsk Tambovskoi oblasti, all of U.S.S.R.

Filed Jun. 20, 1979, Ser. No. 50,468
Int. Cl.[3] B23K 9/00; B23P 15/10
U.S. Cl. 219—121 P **7 Claims**



1. A method of reinforcing an aluminium alloy piston ring groove, wherein an annular wear-resistant weld is formed by fusing the piston body to a certain depth around the periphery thereof in the zone where a ring groove is to be cut, with simultaneous introduction of an alloying addition into the molten piston alloy, whereupon the ring groove is cut in the periphery of said weld.

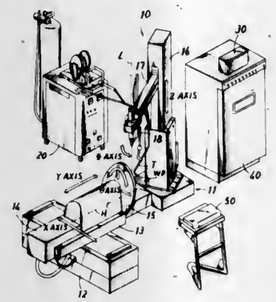
4,233,491

METHOD AND APPARATUS FOR CONTROLLING INCREMENT TYPE POSITION CONTROL APPARATUS

Shigeo Maruyama; Yuji Nishikaichi; Shigeki Fujinaga, and Tatsuya Miura, all of Nishinomiya, Japan, assignors to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed Jun. 26, 1978, Ser. No. 919,174
Int. Cl.[3] B23K 9/12; G05B 19/00
U.S. Cl. 219—125.1 **39 Claims**

12. An incremental type position control apparatus for controlling the position of an object being controlled through comparison of data concerning the present position of the object being controlled and data concerning a next commanded position, comprising:
means for providing a command signal for calibrating data concerning an origin position;
displacement means responsive to said command signal, for controllably displacing the object being controlled in a direction toward the origin position so as to pass said origin position;
means for stopping the object being controlled when the object being controlled passes said origin position;
said displacement means being responsive to said stopping and said displacement means displacing the object being controlled so as to pass said origin position for a second time; and
means for resetting the data concerning the present position of the object being controlled to an initial condition in dependence upon the data concerning the origin position when the object being controlled passes said origin position for the second time.



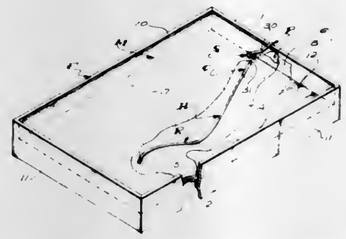
15. An incremental type position control apparatus in accordance with claim 12, wherein said position control apparatus comprises an automatic welding apparatus, comprising a welding torch and a workpiece, and wherein the object being controlled comprises at least one of said welding torch and workpiece.

4,233,492

WATER BED WITH HEATER

James P. McMullan, 2630 Seaman Ave., El Monte, Calif. 91733; Rudy E. Lindsay, and Jerry E. Land, both of Garden Grove, Calif., assignors to James P. McMullan, El Monte, Calif.

Filed Oct. 19, 1979, Ser. No. 86,281
Int. Cl.[3] H05B 3/00
U.S. Cl. 219—217 **9 Claims**



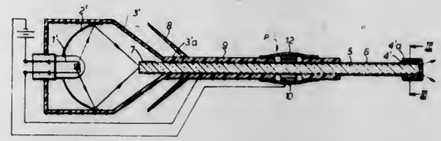
1. In combination, a flotation mattress for water beds comprising a water-proof bladder of flexible plastic sheet material having flat, horizontal top and bottom walls, vertical side and end walls and an elongate tubular filler neck with an inner end fixedly related with an opening in one wall of the mattress and extendable outwardly therefrom and having an open outer end, a volume of water within and slackily filling the mattress, an elongate flexible electric heater with an elongate flexible power supply section with a pair of longitudinally extending electrically insulated power lines and having inside and outside portions, said outside portion having an outer free end connected with an electric power supply, a filler neck engaging plug on the power section between the inside and outside portions thereof and engaged in the outer open end portion of the stem with said inside portion extending longitudinally through the stem and into the mattress, an elongate temperature responsive control section with inner and outer ends, means sealingly coupling the outer end of the control section with the inner end of said inside portion and positioned in the water within the mattress, an elongate flexible electric heater section with inner and outer ends positioned within and extending about the interior of the mattress and within the water therein, said heater section has an elongate electrically insulated resistance element extending longitudinally from its outer end to its inner end and thence to its outer end, means sealingly coupling the inner end of the control section with the outer end of the heater section, said control section including an elongate tubular metal heat conducting body normally in heat conducting contact with the water in the mattress, a normally closed temperature responsive switching device with a pair of terminals positioned within the body in heat conducting contact therewith with one terminal connected with one end of the resistance element and the other terminal connected with one of said power lines and means in the body connecting the other end of the resistance element with the other power lines said power supply and heater sections including flexible ground lines extending longitudinally therethrough and means in the body connecting said ground lines.

4,233,493

APPARATUS FOR APPLYING INTENSE LIGHT RADIATION TO A LIMITED AREA

Günther Nath, 21 Speyererstrasse, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 578,416, May 19, 1975, abandoned. This application Dec. 9, 1977, Ser. No. 859,143
Claims priority, application Fed. Rep. of Germany, May 21, 1974, 2424726; Mar. 13, 1975, 2511037
Int. Cl.[3] H05B 3/02; A61N 5/06; F21V 9/00
U.S. Cl. 219—354 **36 Claims**



1. Apparatus for applying intense light radiation to a limited area, particularly blood or tissue coagulation apparatus for application to living tissue by direct contact of the apparatus therewith, said apparatus comprising
an incandescent lamp emitting intense radiation high in infrared content and forming a light radiation source;
a housing enclosing said light source;
means defining a light exit surface on said housing from which the radiation produced by said source emerges;
a light guide means associated with said housing in light-conducting relation to said source and providing said means defining said light exit surface;
and an application element having a surface for directly contacting said tissue and consisting of a material transparent to infrared radiation emitted by said source; said contacting surface of said application element being formed by a polymeric material consisting essentially of carbon and fluorine; of Teflon ETFE, Teflon PFA, Teflon FEP, Teflon PTFE; or a polymer comprising as main constituents carbon, fluorine and hydrogen,
said application element being applied to said light guide means with said contacting surface covering said light exit surface thereby permitting direct application of the radiation from said source through the light guide means and the application element to the tissue, the contacting surface portion of said application element covering said exit surface and adapted to contact the tissue being at least 0.1 mm in thickness and being essentially stiff and non-pliable.

4,233,494

THROUGHFLOW ELECTRIC HEATER FOR FLUIDS SUCH AS AIR

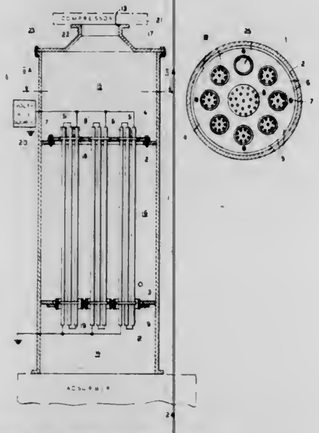
Rudolf Pawlik, Wofratshausen, and Walter Fierlbeck, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,672

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732133

Int. Cl.[3] H05B *3/02*; F24H *3/04*

U.S. Cl. 219—382 2 Claims



1. An electrical fluid heater comprising:
a cylindrical housing;
a plurality of mutually parallel, open-ended, electrically conductive resistive-heating tubes within said housing;
a removable cover member provided with a fluid inlet, the cover member forming one end of said housing, and a fluid outlet at the other end of said housing;
a carrier plate within said housing, being provided with a plurality of openings, the carrier plate extending approximately over the entire cross section and being removably and in an essentially fluid-tight way mounted to the inner wall of the housing, thereby defining a first or antechamber with said cover member and the inner wall of said housing at said one end;
a plurality of holder plates equal in number with said openings in said carrier plate, each opening receiving in an easily removable and nearly fluid-tight manner one holder plate, each holder plate being formed from an electrically nonconductive refractory material and provided with a number of bores each receiving in a tight-fitting manner one of said tubes, the tubes received by the bores of one holder plate forming a group, the totality of groups constituting said plurality of tubes;
a support plate within said housing provided with openings equal in number with the openings in said carrier plate, the support plate being mounted in a nearly fluid-tight manner to the inner wall of said housing, thereby defining a second or buffer chamber with the carrier plate and the inner wall of the intermediate portion of said housing and a third or exit chamber with the inner wall of said other end of said housing, each opening of the support plate receiving one of said groups of tubes, each group being engaged in an electrically insulating heat-resistant spacer arranged within the respective opening of the support plate;
a flow path for the fluid to be heated defined by said fluid inlet, said antechamber, said tubes, said exit chamber and said fluid outlet, the tubes extending from the antechamber through said holder plates, said buffer chamber and the openings in said support plate to the exit chamber;
a voltage source connected across the tubes; and
a fluid source communicating with said fluid inlet for introducing thereinto a stream of fluid to be heated by said tubes upon passing therethrough to said fluid outlet.

4,233,495

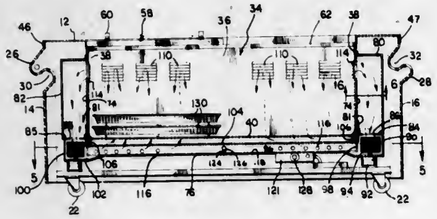
FOOD WARMING CABINET

John R. Scoville, Butler, and Richard W. Gigandet, Fort Wayne, both of Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Dec. 15, 1978, Ser. No. 969,814

Int. Cl.[3] F24C *7/10, 15/32*

U.S. Cl. 219—386 11 Claims



1. A food warming cabinet comprising:
an upwardly opening well having a pair of side walls, a pair of end walls and a bottom,
a housing connected to said well and surrounding the well on the sides, ends and bottom thereof and being spaced from the well so as to form a substantially enclosed air chamber immediately adjacent the side and end walls and the bottom of said well,
a plurality of inlet louvers in one of said pair of walls and a plurality of outlet louvers in the other of said pair of walls providing communication between said air chamber and the interior of said well,
heating element means within said air chamber positioned beneath said well bottom so as to radiate heat upwardly to said well bottom,
a thermally conductive baffle plate positioned between said heating element means and said well bottom, and
a pair of blower means located at opposite ends of said air chamber for drawing air from the interior of said well through said outlet louvers and blowing the air across said heating element means in respective streams inpinging on each other in said air chamber beneath said well bottom, and causing the air heated by the heating element means to flow through the portion of the air chamber laterally adjacent said well and through said inlet louvers into the interior of said well.

4,233,496

APPARATUS FOR REMOVAL OF RESIDUES BY MEANS OF PYROLYSIS

Werner Weber, Emmenbrucke, and Hubert Rustler, Lucerne, both of Switzerland, assignors to Viscosuisse S.A., Emmenbrucke, Switzerland

Filed Jun. 28, 1978, Ser. No. 919,895

Claims priority, application Switzerland, Aug. 12, 1977, 9891/77

Int. Cl.[3] H05B *1/00*

U.S. Cl. 219—390 5 Claims

1. An apparatus for the removal by means of pyrolysis of residues from equipment used in polymerization and treatment of synthetic materials, comprising a slightly inclined substantially horizontal tubular heating chamber means for sealing against the introduction of gases, including a drain and collecting receptacle at the lower lying end of the heating chamber for collecting melted effluent residues, an outlet vent for removing distilled gases from the heating chamber, means associated with said outlet vent for burning the distilled gases, a valve-controlled air inlet at the higher end of the heating chamber, and heating means surrounding the heating chamber for controlling the temperature therein.



4,233,497

ELECTRIC HEATING ELEMENT

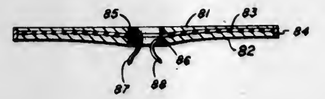
Herman H. Lowell, 2808 Harris Ave., Wheaton, Md. 20902

Filed Dec. 4, 1978, Ser. No. 966,214

Int. Cl.[3] H05B *3/00*

U.S. Cl. 219—468 19 Claims





1. An electric heating element, comprising:
a resistive electrical conductor geometrically configured about a central point and having uniform resistivity;
said conductor including radial dimensions in a first plane including said central point;
said conductor including a varying thickness perpendicular to said first plane; and
wherein said thickness of said conductor at a given radius from said central point varies inversely with the square of the ratio of said given radius to a reference radius, at a reference point within said radial dimensions of said conductor.

4,233,498

POWER CONTROL FOR APPLIANCE USING HIGH INRUSH CURRENT ELEMENT

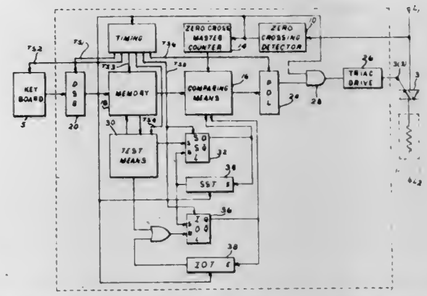
Thomas R. Payne, Louisville, Ky., and Alfred L. Baker, Longmount, Colo., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1979, Ser. No. 8,356

Int. Cl.[3] H05B *1/02, 3/68*

U.S. Cl. 219—490 27 Claims

1. A heating apparatus comprising a heating element, power control means having a plurality of operator selectable power level settings including an OFF setting for controlling the power output of said element, said element characterized by a relatively fast thermal response whereby application of power thereto at a predetermined level results in an almost immediate visible glow from said element, and means for applying power to said element at said predetermined level for a preselected time prior to energizing said element at an operator selected power level.



4,233,499

CONVEYOR CONTROL APPARATUS

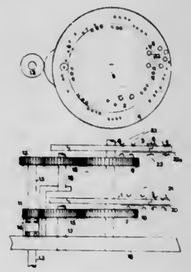
John A. Formby, Stratford-Upon-Avon, England, assignor to John Formby & Company Limited, Birmingham, England

Filed Mar. 7, 1979, Ser. No. 18,274

Claims priority, application United Kingdom, Mar. 7, 1978, 08953/78

Int. Cl.[3] G06M *7/00*; B65G *43/00*

U.S. Cl. 235—92 MP 13 Claims



1. A conveyor control apparatus, comprising:
a rotary mechanical means for generating a first set of electrical signals, a second set of electrical signals, and a third set of electrical signals in correlation with the movement of a conveyor having a plurality of on-loading stations and a plurality of off-loading stations;
a counting means for counting said first set of electrical signals;
a decoding means responsive to said counting means for producing electrical outputs;
a gate means responsive to the coincidence of said electrical outputs and said second set of electrical signals;
said counting means and said decoding means including reset means responsive to said third set of electrical signals;
on-loading control indicator means responsive to said gate means;
off-loading indicator means responsive to said gate means;
said on-loading control indicator means associated with said plurality of on-loading stations whereby each member of said plurality of on-loading stations may receive a sequence of signals by which the effective times of on-loading may be indicated in order that consignments on-loaded at such times may reach their respective ones of said off-loading stations during periods of activation of said off-loading indicator means; and said off-loading indicator means associated with said plurality of off-loading stations

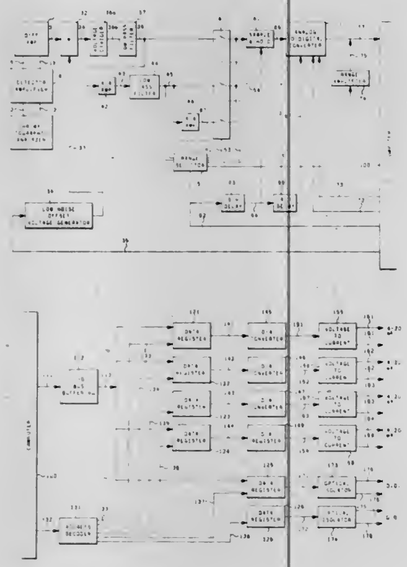
whereby each member of said plurality of off-loading stations may receive a sequence of signals by which the effective times of off-loading may be initiated.

4,233,500

METHOD AND APPARATUS FOR PROVIDING A DIGITAL OUTPUT IN RESPONSE TO AN ANALOG INPUT AND FOR PROVIDING AN ANALOG OUTPUT IN RESPONSE TO A DIGITAL INPUT

Leroy D. Cordill, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 7, 1977, Ser. No. 840,425
Int. Cl.[2] G06F *3/05, 15/46;* H03K *13/09*
U.S. Cl. 235—310 **47 Claims**



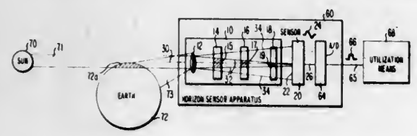
1. Apparatus comprising:
means for producing a first analog signal;
means for producing an offset voltage signal;
means for combining said first analog signal and said offset voltage signal to produce a second analog signal;
first amplifier means;
means for providing said second analog signal as an input to said first amplifier means to thereby establish an amplified second analog signal having a first predetermined relationship to said second analog signal;
an analog-to-digital converter means;
means for establishing a third analog signal representative of the highest voltage level desirable as an input signal into said analog-to-digital converter means;
means for comparing said amplified second analog signal to said third analog signal and for providing said amplified second analog signal as an input signal to said analog-to-digital converter means to be converted into a first digital signal if the voltage level of said amplified second analog signal does not exceed the voltage level of said third analog signal;
means for providing said second analog signal as an input signal to said analog-to-digital converter means to be converted into a first digital signal if the voltage level of said amplified second analog signal exceeds the voltage level of said third analog signal, said offset voltage signal having a voltage level which will reduce the voltage level of said first analog signal to enable said amplified second analog signal to be provided as an input to said analog-to-digital converter means if the difference between the voltage level of said first analog signal, multiplied by the amplification factor of said first amplifier means, and the voltage level of said third analog signal does not exceed the maximum available absolute voltage level of said offset voltage signal multiplied by the amplification factor of said first amplifier means.

4,233,501

INTERFERENCE SUPPRESSION FOR IMAGING OPTICAL SYSTEMS

John A. Strother, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 19, 1978, Ser. No. 926,085
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **6 Claims**



1. An optical imaging apparatus for selectively reducing by a predetermined amount the flux density of radiation in the visible, near-ultraviolet and near-infrared portions of the electromagnetic spectrum from a relatively small very bright object within a larger scene that is less bright, comprising:
a. lens means for imaging radiating objects into an image plane, said lens means having an exit pupil to receive and pass radiation, said exit pupil having an aperture diameter greater than the diameter of the image of said very bright object appearing in said image plane;
b. radiation detecting means responsive to radiation passing through said lens means, said radiation detecting means being positioned at said image plane of said lens means; and
c. filter means including one or more filter elements positioned between said image plane and said lens means responsive to a predetermined level of flux density in the visible and near-ultraviolet portions of the electromagnetic spectrum to reduce in the portion only of said filter element exposed to said predetermined level of light the flux density of radiation of said very bright object.

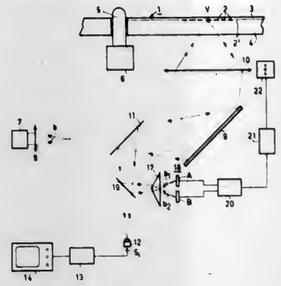
4,233,502

OPTO-ELECTRONIC FOCUSSING ERROR DETECTION ARRANGEMENT

Gijsbertus Bouwhuis, and Teunis J. Hazerdonk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,432
Claims priority, application Netherlands, Apr. 14, 1978, 7803969
Int. Cl.[2] G01D *1/36*
U.S. Cl. 250—204 **2 Claims**

1. An improved opto-electronic focussing error detection arrangement for detecting, in an optical imaging system, a deviation between a radiation reflecting surface and a focussing plane of an objective system, in particular for use in an apparatus for reading a record carrier with an optical radiation-reflecting information structure and an apparatus for optically writing information in a record carrier, which focussing error detection arrangement comprises a beam-splitting element disposed in the path of a radiation beam which is reflected by said surface and, disposed behind the beam-splitting element, a radiation-sensitive detection system which comprises two detectors each associated with one of the subbeams formed by the beam-splitting element, the outputs of the detectors being connected to the inputs of an electronic circuit in which a focussing-error signal is derived from the detector signals, wherein the detectors are disposed in a plane in which the reflected beam is focussed if the said deviation is zero, that each detector takes the form of a grating and comprises at least three radiation-sensitive strips, that said electronic circuit



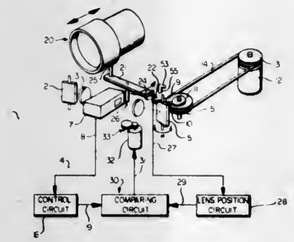
moreover derives a positional-error signal from the detector signals, and that each detector is connected to a separate selection device which effectively divides the detector into two detector sections, the bounding line of the detector sections being adjustable depending on the positional error signal which is applied to a control input of the selection circuit.

4,233,503

AUTOMATIC FOCUS ADJUSTING SYSTEM

Koji Saito, Sayama, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Tokyo, Japan

Filed Mar. 5, 1979, Ser. No. 17,637
Int. Cl.[3] G03B *13/20*
U.S. Cl. 250—204 **19 Claims**



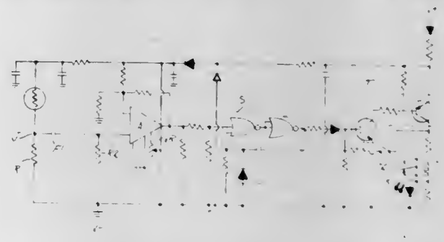
1. In an optical instrument having an adjustment mechanism for adjusting the focus of an objective lens and an automatic focusing system in which a scanner driver oscillates a scanning reflector about an axis for imaging a subject on a sensor, and in which a fixed reflector images the subject on the sensor for generating at least a pair of control signals during each complete oscillatory scan of the reflector when spatial image correlation occurs, and including control circuitry for selectively energizing the adjustment mechanism in response to the control signals, the improvement comprising:
means receiving the control signals for generating a distance signal representative of the interval between said control signals;
means for monitoring the position of the lens and the position of the scanning reflector so as to develop first and second lens position signals indicative of the position of the lens relative to the position of the scanning reflector during the forward and return scans of the scanning reflector;
means receiving the lens position signals for generating a focus signal indicative of the interval between said first and second lens position signals; and
means for comparing the ratio of the distance signal and the focus signal to a predetermined ratio and for automatically adjusting the position of the lens until the ratio of the distance signal to the focus signal is substantially equal to said predetermined ratio.

4,233,504

APPARATUS FOR DETECTING THE PASSAGE OF GLOWING EMBERS

Rudolph W. Kalns, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed Aug. 3, 1978, Ser. No. 930,606
Int. Cl.[3] H01J *40/14*
U.S. Cl. 250—214 RC **3 Claims**



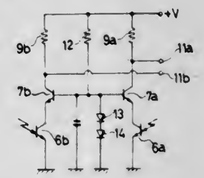
1. A duct system comprising an opaque wall portion and a detector for detecting a single glowing ember travelling through said opaque wall portion, said detector comprising a photo-resistive cell connected in series with a resistor across a voltage supply, the voltage at the junction between the cell and resistor varying as a function of the resistance of the cell, said junction being coupled to the input of an AC responsive device through a differentiator, whereby an ember moving through the field of view of the photo-resistive device causes a drop in resistance of the cell to cause a voltage change at the junction, the input and output of said AC responsive device being proportional to the rate of change of said voltage change at the junction, and means responsive to an output of said AC responsive device above a predetermined magnitude to actuate an alarm.

4,233,505

LIGHT RECEIVING CIRCUIT HAVING FAST RESPONSE TIME AND A STABLE OUTPUT WAVEFORM

Reisuke Sato, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,379
Claims priority, application Japan, Aug. 24, 1977, 52/101249
Int. Cl.[3] H01J *40/14*
U.S. Cl. 250—214 R **5 Claims**



1. A light receiving dicruit, comprising:
(a) an active device having an emitter, a base and a collector, a first constant voltage source continuously applied to said base, and a second constant voltage source continuously applied to said collector through a first resistance to thereby provide a continuous reverse bias at the junction of said collector and said base;
(b) a light responsive switching device having a variable

resistance and having a first lead and a second lead, said first lead connected to electrical ground and said second lead connected to said emitter of said active device;

(c) whereby the bias voltage at the junction of said emitter and said base of said active device is a function of the value of said first resistance, said second voltage source and said variable resistance, and is forward biased when the level of light on said light responsive switching device reaches a predetermined level, said active device thereby conducting current through said first resistance, said active device and said light responsive device when said predetermined level is reached;

(d) wherein said predetermined level produces a small change in said variable resistance of said light responsive switching device, and

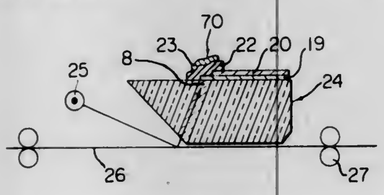
(e) whereby the magnitude of the voltage across said light responsive switching device need only drop from approximately the magnitude of said first constant voltage source to just below the magnitude of said first constant voltage source to cause said conduction of said active device.

4,233,506

PHOTO-SENSOR

Hideaki Yamamoto; Makoto Matsui, both of Hachioji; Toshihisa Tsukada, Tokyo; Yoshizumi Eto, Sagamihara; Tadaaki Hirai, Koganei, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed May 5, 1978, Ser. No. 903,161
Claims priority, application Japan, May 13, 1977, 52-54284
Int. Cl.[2] G02B 5/14
U.S. Cl. 250—227 **22 Claims**



1. A photo-sensor comprising a predetermined substrate, a bundle of optical fibers which is disposed in said substrate and which extends from a first surface to a second surface of said substrate, and an array of photosensitive elements which is integrated onto said substrate, said photosensitive elements having photosensitive parts on an end face of said optical fibers at said first surface of said substrate, an

end face of said optical fibers at said second surface of said substrate serving as an information reading surface

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4,233,507

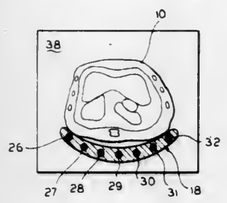
COMPUTER TOMOGRAPHY TABLE CONTAINING CALIBRATION AND CORRELATION SAMPLES

Donald J. Volz, Mukwonago, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed May 7, 1979, Ser. No. 36,816
Int. Cl.[3] A61B 6/00; G12B 13/00
U.S. Cl. 250—252 **7 Claims**

1. A table top positioned on a base for supporting a patient between a radiation source and a radiation detector of a computed tomography system, said table top comprising:

a supporting surface which is translatable in the longitudinal direction of the tomography system, and at least one uniform sample of reference material disposed longitudinally within said table top, said reference material having properties which correspond to a known radiation attenuation coefficient.

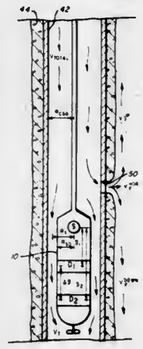


4,233,508

WATER INJECTION PROFILING

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,708
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—259 **20 Claims**



1. A method for determining the characteristics of flow of injection water in and beyond a known size cased well borehole having casing perforations at one or more levels within the well comprising the following steps:

(a) providing a well tool having a source of radiation and at least two detectors longitudinally spaced from said source and each other, and having flowmeter means;

(b) positioning said well tool below a level of casing perforation with said radiation source above said detectors;

(c) operating said flowmeter means to monitor fluid flow within said casing below said perforation level, and generating signals indicative of the linear velocity of said fluid flow;

(d) irradiating the borehole environs, including injection water being forced into the borehole, by radiation from said radiation source;

(e) detecting radiation from the activated injection water by operation of said detectors and generating signals representative thereof;

(f) distinguishing count rate data from at least one of said detectors according to two energy ranges of detected radiation;

(g) combining said count rate data and said linear flow velocity obtained by operation of said flowmeter means according to a first predetermined relationship to derive an indication of the linear flow rate of said activated injection water downwardly behind said casing below said perforation level;

(h) positioning said well tool above said level of casing perforation with said radiation source below said detectors, and repeating steps (d) through (f); and

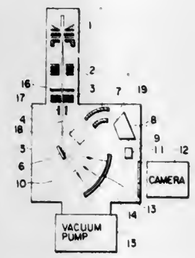
(i) combining said count rate data according to a second predetermined relationship to derive an indication of the linear flow rate of said activated injection water upwardly behind said casing above said perforation level.

4,233,509

ION-ELECTRON ANALYZER

Hifumi Tamura, Hachioji, and Tohru Ishitani, Sayama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 1, 1979, Ser. No. 8,258
Claims priority, application Japan, Feb. 3, 1978, 53-10444
Int. Cl.[3] G01M 23/00
U.S. Cl. 250—306 **12 Claims**



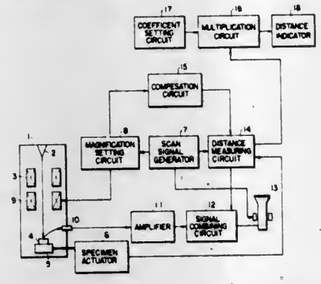
1. An ion-electron analyzer comprising means for producing a combined primary electron beam and negative primary ion beam from the same source of charged particles and for simultaneously bombarding a specimen in vacuum with said combined beam, means for forming an electron diffraction pattern utilizing electrons reflected by said specimen as a result of the bombardment of said specimen by said primary electron beam, and means for analyzing the masses of the secondary ions produced by said specimen as a result of the ion bombardment of said specimen by said negative primary ion beam.

4,233,510

SCANNING ELECTRON MICROSCOPE

Seisiro Sato, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 5, 1978, Ser. No. 966,607
Claims priority, application Japan, Dec. 5, 1977, 52-145040
Int. Cl.[2] G01M 23/00
U.S. Cl. 250—311 **10 Claims**



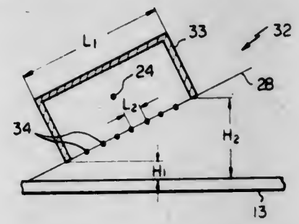
1. A scanning electron microscope comprising means for generating an electron beam; means for scanning a specimen with the electron beam so as to obtain an information signal characteristic of the specimen from said specimen; means for displaying an image of the specimen on the basis of the information signal; means for setting a magnification of the image; means for indicating first and second marks of variable positions on the display means in a manner to be superposed on the image; and means for calculating a distance between first and second points on the specimen corresponding respectively to the first and second marks on the basis of the magnification and positions of said first and second marks, the calculation means including means for multiplying the calculated value of the distance between the first and second points by a predetermined constant so as to compensate for a possible error in the magnification setting.

4,233,511

SCOROTRON CHARGING APPARATUS

Masahide Harada, and Mansbu Mochizuki, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,900
Claims priority, application Japan, Mar. 24, 1978, 53-32972
Int. Cl.[3] H01T 19/04
U.S. Cl. 250—325 **7 Claims**



1. A corona charging apparatus for applying an electrostatic charge to a surface which is moved relative to the apparatus including a corona discharge electrode, characterized by comprising:

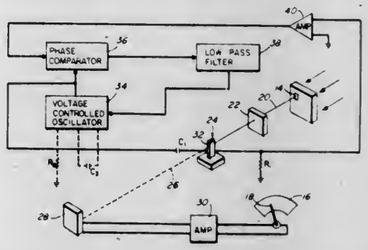
a plurality of parallel wires disposed between the electrode and the surface and extending perpendicular to a direction of movement of the surface relative to the apparatus, a spacing between the wires and the surface progressively increasing in said direction of movement.

4,233,512

THERMOMETER FOR REMOTELY MEASURING TEMPERATURE

Robert E. Rupert, South Dennis, Mass., assignor to Norman C. Anderson, Chatham, Mass.

Filed Oct. 2, 1978, Ser. No. 947,391
Int. Cl.[3] G01J 1/00; G01K 1/00; H03B 5/30
U.S. Cl. 250—338 **6 Claims**



1. An instrument for measuring the temperature of an object by means of the infrared radiation emitted therefrom, comprising

(a) a radiation detector adapted to generate an electrical output in response to radiation impinging thereon,

(b) means for forming and directing a beam of radiation against said detector,

(c) temperature indicating means connected to said detector

for converting the electrical output of said detector into a display representative of the temperature of said object,

(d) beam modulating means disposed in the path of said beam for converting said beam into a series of pulses when vibrated in and out of said path,

(e) said modulating means including a piezoelectric reed element adapted to vibrate when subjected to driving signals at a frequency related to the resonant frequency of said element, and,

(f) phase locked loop oscillator circuit means connected to said reed element for operating said reed,

(g) said element adapted to generate a reference signal when vibrated whereby said reference signal functions to lock said circuit means at the resonant frequency of said element.

4,233,513

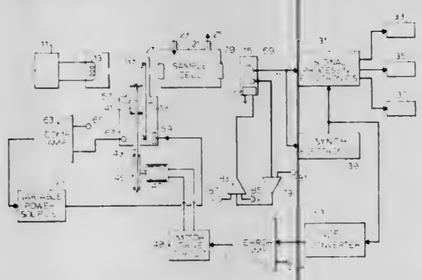
GAS ANALYZER

William L. Elder, Richmond; Kevin G. Williams, Pinole, and Irvin G. Burough, Walnut Creek, all of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Filed Oct. 5, 1978, Ser. No. 948,674

Int. Cl.² G01J *1/00*; G01N *21/26*

U.S. Cl. 250—343 **9 Claims**



1. A gas analyzer comprising, a sample cell for containing gas to be analyzed, means for producing and directing infrared energy through said sample cell, means for detecting the infrared energy passing through said sample cell and producing an electrical signal representative thereof, means coupled to said detecting means for processing the electrical signal to produce an output indicating the concentration of the constituents of the gas in said sample cell, a rotary filter wheel for successively and repetitively positioning at least one filter in the path of the infrared energy, a housing enclosing said filter wheel exclusive of said sample cell and said detecting means, means for maintaining the temperature in said housing at a substantially constant level, said signal processing means including means for compensating the output thereof for variation in the absorption characteristic of gas with temperature.

4,233,514

SOLID STATE RADIATION DETECTOR AND ARRAYS THEREOF

Jack D. Kingsley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,545

Int. Cl.² G01T *1/22*, *1/24*

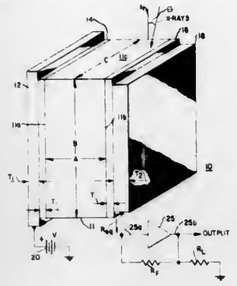
U.S. Cl. 250—370 **29 Claims**

1. A solid state radiation detector, comprising:

a layer having first and second opposed surfaces, said layer being of a photoconductive material characterized by a change in the electrical conductance between said first and second opposed surfaces responsive to absorption of radiation quanta within said layer;

a first electrode fabricated upon the first layer of said surface;

a second electrode fabricated upon the second surface of said layer; and



a film fabricated between at least one of said first and second layer surfaces and the associated one of said first and second electrodes, of a material selected to reduce the dark current of the photoconductor material of said layer.

4,233,515

INSTRUMENT FOR DETERMINING THE RADIATION PARAMETERS OF A FOCUSED CHARGED-PARTICLE BEAM AND METHOD

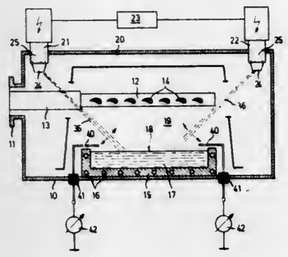
Walter Dietrich, Hanau am Main, and Herbert Stephan, Bruchköbel, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 964,091

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831602

Int. Cl.² G01K *1/08*

U.S. Cl. 250—397 **15 Claims**



1. Device for determining the beam parameters of a focused beam of charged particles guided periodically over a target surface in electron beam melting wherein the target is the surface of a melt in an evaporation crucible, which comprises at least one probe means positioned in front of the target surface in the direction of the beam within the beam trace and in the marginal area of the crucible, said probe means being connected to an electrical display instrument for displaying the detected parameters relating to the beam with respect to the marginal area of the crucible.

4,233,516

X-RAY IMAGE DETECTION APPARATUS

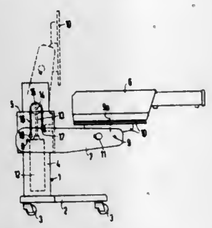
Wulf Trepte, Holmbodavägen, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 745,557, Nov. 29, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,667

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557810

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—444 **1 Claim**



1. In x-ray image detection apparatus including a wheeled undercarriage, a vertical column supported by said undercarriage, a mounting block carried on said column for vertical movement relative thereto, an image detector mechanism having a radiation receiving side and means for mounting said image detector mechanism on said mounting block, an improvement wherein: said mounting means comprises an elongated carrier arm with first and second ends, first pivot means for connecting said first end of said carrier arm to said mounting block for pivotal movement of said carrier arm about a horizontal axis between horizontal and substantially vertical positions, second pivot means for mounting said image detector mechanism on said second end of said carrier arm for pivotal movement of said image detector mechanism about a horizontal axis between horizontal and vertical positions, and means interconnecting said first and second pivot means for effecting first and second pivotal movements of said image detector mechanism from a horizontal position, with the radiation receiving side oriented upwardly to receive vertically, downwardly directed radiation, and with the carrier arm in a horizontal position, to a vertical position, with the radiation receiving side oriented vertically and away from the vertical column to receive horizontally directed radiation, and with the carrier arm in a substantially vertical position behind the image detection apparatus; during said first pivotal movement, said image detector mechanism rotates essentially ninety degrees in a first rotational direction and moves upwardly simultaneously while said carrier arm rotates upwardly through an angle of no more than ninety degrees in a direction opposite said first rotational direction, during said second pivotal movement, said image detector mechanism rotates essentially ninety degrees in a direction opposite said first rotational direction and moves downwardly simultaneously while said carrier arm rotates downwardly through said angle in said first rotational direction.

4,233,517

APPARATUS FOR INTERNAL IRRADIATION

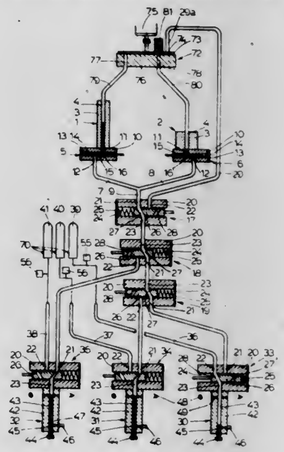
Eric van't Hooft, Dekkershoe 7, Leersum, Netherlands

Continuation-in-part of Ser. No. 823,864, Aug. 11, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,055

Int. Cl.² G21F *5/02*

U.S. Cl. 250—497 **8 Claims**

1. Apparatus for internal irradiation, comprising a plurality of neutral balls, a plurality of radioactive balls, said neutral balls having the same diameter as said radio-active balls, a distributor for composing a contiguous ball row out of the said neutral and radio-active balls, an applicator tube adapted to be introduced into a body cavity and provided with an internal channel having a narrow end portion parssing through a shoulder into the remaining wider portion of said internal channel, said narrow end portion having substantially the same length as said ball row and being adapted to admit the same, a final ball having a larger diameter than the said radio-active and neutral balls, so that it is not admitted by said narrow end portion, intermediate container means in said distributor for adding said final ball to said ball row at the end thereof, pneumatic means for transferring said ball row and said added final ball from said intermediate container means to said applicator



tube in such manner that said added final ball is arrested by the shoulder and is pressed against said shoulder so as to keep the balls of said ball row in the right places during the irradiation, said pneumatic means being further used to return said ball row and said final ball to said intermediate container means after the termination of the irradiation, an adjustable pressure switch connected to the wider portion of said applicator tube, said pressure switch determining whether pneumatic pressure is sufficient to keep the associated final ball pressed against the associated shoulder.

4,233,518

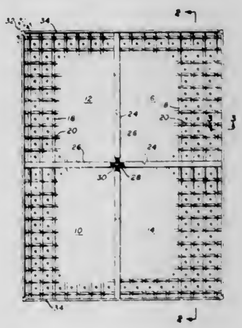
FUEL STORAGE RACK

Sean Auyeung, Windsor, and William W. Etzel, East Hartland, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 6, 1978, Ser. No. 958,289

Int. Cl.² G21F *5/00*

U.S. Cl. 250—507 **4 Claims**



1. A fuel storage rack for the storage of nuclear fuel assem-

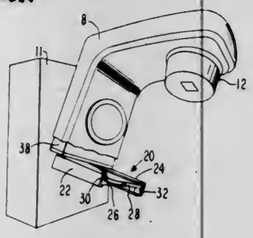
blies in a pool of water comprising: a rectangular pool having four walls; four grids, each formed of fixedly connected cross members and positioned in the four quadrants of the pool; means for supporting each grid at an upper elevation permitting grid expansion movement with respect to the walls; means for supporting fuel to be stored within said grids, located at a lower elevation; means for supporting each grid at the two adjacent walls, while permitting expansion of the grid parallel to at least one wall; means for restraining horizontal motion of each of said grids, said means operative to restrain in both directions perpendicular to each wall while permitting expansion parallel to each wall.

4,233,519

RADIATION THERAPY APPARATUS HAVING RETRACTABLE BEAM STOPPER

George L. Coad, Lafayette, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 18, 1979, Ser. No. 49,837
Int. Cl.[3] G21F 5/04; G21K 1/02
U.S. Cl. 250—514 20 Claims



1. Radiation therapy apparatus comprising a radiation source, support means for rotating said radiation source about a target area, beam stopper means retractably attached to said support means and positionable to receive radiation passing through the target area, said beam stopper means including first and second arms pivotally attached to said support means, third and fourth arms pivotally attached to said first and second arms, respectively, a beam stopper, means for attaching said third and fourth arms to said beam stopper, and drive means coupled to one of said arms whereby said arms rotate and said beam stopper translates linearly.

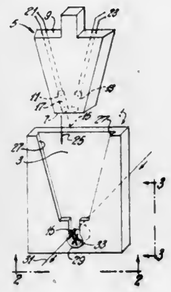
4,233,520

ELECTRO OPTICAL CONTROL TO DETECT A FILAMENT PASSING THROUGH A GUIDE EYE AND USING A LIGHT EMITTING DIODE

Sheldon A. Canfield, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 7, 1978, Ser. No. 940,068
Int. Cl.[3] G01N 21/06
U.S. Cl. 250—561 8 Claims

1. An apparatus for detecting a continuous filamentary material comprising a means for guiding said material along a primary direction of travel, an optical sensor having a light source and light detector, said means for guiding said material constraining the movement of the said material in a direction generally transverse to its primary direction of travel, said sensor having an area of focus and said sensor being placed adjacent said material and with the said area of focus of the said sensor being substantially at the outer limit of said constrained transverse movement, said detector sensing light from said source reflected from said material when said material enters said area of focus as said material moves within its said transverse direction, and wherein said sensor is substantially insensitive to said reflected light outside the said focus.

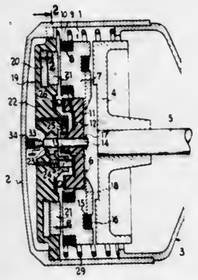


4,233,521

ELECTRIC INERTIA-TYPE STARTER DEVICE FOR A HEAT ENGINE

Rene Pouget, Levallois, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Mar. 1, 1978, Ser. No. 882,465
Claims priority, application France, Mar. 2, 1977, 77 06080
Int. Cl.[3] H02K 7/00
U.S. Cl. 290—38 B 13 Claims



1. An electric inertia-type starter device for a heat engine, comprising an electric motor including a stator and a rotor which define therebetween a planar airgap, said rotor having a high mechanical inertia and acting as a flywheel, a member for connection to the driving shaft of the heat engine, and releasable clutch means for temporarily coupling the rotor to said member, said rotor having an outside diameter substantially equal to the outside diameter of said member.

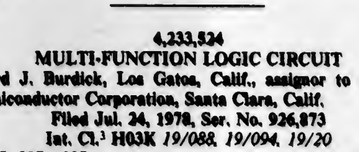
4,233,522

CAPACITIVE TOUCH SWITCH ARRAY

William L. Grummer, Cheshire, and Hendrik B. Hendriks, Becket, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1978, Ser. No. 956,278
Int. Cl.[2] H01H 35/00
U.S. Cl. 307—116 22 Claims

1. A capacitive touch switch array, comprising:
(a) an array of touch sensitive switch cells each including a first pair of series capacitors and a second pair of series capacitors,
(b) a signal source coupled to said first and second pair of series capacitors,
(c) first signal detection circuit means, said first pair of series capacitors coupling the signal from said signal source to said first signal detection circuit means,
(d) second signal detection circuit means, said second pair of series capacitors coupling the signal from said signal source to said second signal detection circuit means, and



(e) touch means associated with each switch cell for providing capacitive coupling of the junctions of each pair of series capacitors of a selected switch cell to ground for actuating said selected switch cell and varying the signal coupled by the first and second pair of series capacitors of said selected switch cell to said first and second signal detection circuits means.

4,233,523

PRESSURE SENSITIVE DEVICE

Lars Jarder, 41 Lomvaegen, Solleatuna, Sweden (S-191 56), and Bengt Ahlstroem, 2A Malmvaegen, Solleatuna, Sweden (S-191 61)

Filed Jan. 22, 1979, Ser. No. 5,468
Claims priority, application Sweden, Jan. 31, 1978, 7801148
Int. Cl.[2] H01H 36/00
U.S. Cl. 307—119 5 Claims

1. A pressure-sensitive device capable of responding electrically to applied mechanical forces, said device comprising: a body of a flexible, non-conductive material; at least one electrically conductive loop which has opposite ends thereto and is embedded in the said body; a reactance-dependent detecting circuit which is connected to the said loop ends externally of said body and is sensitive to the inductive reactance of the said loop; and a screen of electrically conductive material incorporated in said body and extending alongside the said loop; said body being deformable on application of mechanical forces thereto so as to cause the inductive reactance of the loop to change.

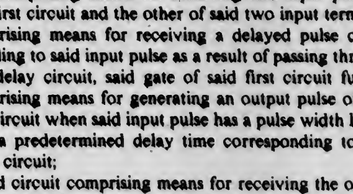
4,233,524

MULTI-FUNCTION LOGIC CIRCUIT

Edward J. Burdick, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 24, 1978, Ser. No. 926,873
Int. Cl.[3] H03K 19/088, 19/094, 19/20
U.S. Cl. 307—205 11 Claims

1. A multi-function logic circuit for simultaneously receiving data logic signals and control logic signals for performing selectable logical operations on said data logic signals in response to said control logic signals, and for generating output logic signals representing the result of said logical operation, comprising: first, second, third, and fourth switching means, each of said switching means having an input terminal, an output terminal, and a control terminal for switching data logic signals applied to said input terminal to said output terminal in response to control logic signals applied to said control terminal, said input terminals and said control terminals of said first and second switching means being cross-coupled together and coupled to respective input leads for receiving said data logic signals, said output terminals of said first and second switching means being coupled respectively to said input terminals of said third and fourth switching means, said output terminals of said third and fourth switching means being coupled to an output lead for generating said output logic signals thereon, and said control terminals of said third and fourth switching means being coupled to respective control leads for receiving said control logic signals.



4,233,525

ELECTRONIC CIRCUIT FOR USE IN A DIGITAL CIRCUIT WHICH PREVENTS PASSAGE OF PULSES HAVING A PULSE WIDTH NARROWER THAN A PREDETERMINED VALUE

Yukio Takahashi, Kawasaki, and Kazuhiro Toyoda, Yokohama, both of Japan, assignors to Fujitsu Limited, Japan

Filed Mar. 17, 1978, Ser. No. 887,920
Claims priority, application Japan, Mar. 17, 1977, 52-29466
Int. Cl.[3] H03K 5/01, 5/159, 9/08
U.S. Cl. 307—234 21 Claims

1. An electronic circuit for use in a digital circuit to prevent the passage of pulses having pulse width narrower than a predetermined value and for preserving the pulse width of transmitted pulses, said electronic circuit comprising:
a first circuit for receiving an input pulse, said first circuit comprising a delay circuit and a first gate having two input terminals, one of said two input terminals of said first gate comprising means for receiving said input pulse to said first circuit and the other of said two input terminals comprising means for receiving a delayed pulse corresponding to said input pulse as a result of passing through said delay circuit, said gate of said first circuit further comprising means for generating an output pulse of said first circuit when said input pulse has a pulse width larger than a predetermined delay time corresponding to said delay circuit;
a second circuit comprising means for receiving the output pulse of said first circuit and for forming a pulse having a pulse width which is substantially the same as that of said input pulse of said first circuit when said input pulse has a pulse width larger than that corresponding to said predetermined delay time, said means of said second circuit comprising:
a second gate, and a group of first delay gates connected in series, the total delay time of said group of first delay gates being substantially the same as said predetermined width value, and the output of said first circuit and of each said first delay gates being input to said second gate.

4,233,526

SEMICONDUCTOR MEMORY DEVICE HAVING MULTI-GATE TRANSISTORS

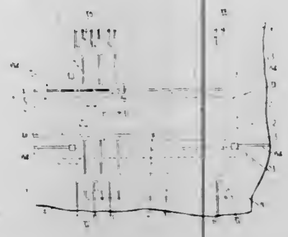
Yukinori Kurogi, and Kiyoshi Sugibuchi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,960

Claims priority, application Japan, Apr. 8, 1977, 52-40522; May 30, 1977, 52-63506; May 30, 1977, 52-63507

Int. Cl.³ H03K *5/00;* **H01L** *29/78, 27/02;* **G11C** *11/34*

U.S. Cl. 307—238 **12 Claims**



1. A semiconductor memory device comprising; a first semiconductor region of one conductivity type; a plurality of memory transistors formed in said first semiconductor region and arranged in parallel with each other, each of said memory transistor including a pair of source and drain regions of an opposite conductivity type formed in a major surface of said first semiconductor region, a gate insulating layer formed on said major surface between said source and drain regions, a plurality of gate electrodes formed on said gate insulating layer and laterally separated from each other, and a plurality of opposite conductivity type regions formed in said first semiconductor region under the respective intervals between adjacent gate electrodes; an isolation region surrounding said first semiconductor region to prevent parasitic current flow to or from said first semiconductor region through said isolation region; a plurality of gate wiring layers provided to interconnect said gate electrodes of different transistors; and a plurality of switching transistors located outside said isolation region, each said switching transistor being electrically connected at its drain region to said source region of each said memory transistor, respectively.

4,233,527

CHARGE INJECTION DEVICE OPTO-ELECTRONIC SENSOR

Rudolf Koch, Munich, and Hans-Joerg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 16, 1976, Ser. No. 696,478

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527626

Int. Cl.³ H03K *3/42;* **H01L** *29/78, 27/14, 31/00*

U.S. Cl. 307—311 **5 Claims**



1. An opto-electronic sensor comprising:

a doped semiconductor substrate;

at least one light-permeable electrically insulating layer carried on said substrate;

a matrix of electrodes arranged in lines and columns on said insulating layer, the electrodes of a respective line electrically connected together;

a plurality of buried channels, each below a respective column electrode in said substrate and doped oppositely to said substrate and each having a capacitance;

a voltage amplifier including an input connected to said buried channels and including an input capacitance which is less than the capacitance of an individual buried channel and an input resistance such that the time constant of the input resistance and the capacitance of the respective buried channel is greater than 10 nsec;

a plurality of on-off switches interposed between said buried channels and said amplifier; and

an additional on-off switch connecting said input of said amplifier to an external terminal contact.

4,233,528

SAMPLE-AND-HOLD CIRCUIT WITH CURRENT GAIN

John G. Hogeboom, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 23, 1978, Ser. No. 953,452

Int. Cl.³ G11C *27/02;* **H03K** *17/56*

U.S. Cl. 307—353 **8 Claims**



1. A sample-and-hold circuit for receiving a signal, for charging a storage means to a voltage level representative of the magnitude of said signal, for selectively maintaining the charge on said storage means for a given period of time, and suitable for LSI (large scale integration) implementation, said sample-and-hold circuit comprising:

an input electrode for receiving said signal;

an output electrode for connection to said storage means;

a gate electrode for receiving a control signal which controls the alternating of said circuit between a sample mode and a hold mode;

a variable impedance device, responsive to the signal appearing on said input electrode, for controlling the flow of current into said storage means via said output electrode;

switch means, responsive to said gate electrode, for altering said sample-and-hold circuit between the sample mode of operation and the hold mode of operation, said switch means having a first state and a second state, said first state allowing biasing currents to be applied to said variable impedance device for energizing said device into a quiescent state of conduction, said second state removing bias from said variable impedance device so that said variable impedance device is in the non-conducting state, and said storage means is isolated from any conducting portion of said circuit, so that said storage means maintains its charge for said given period of time; and

wherein said variable impedance device is a bipolar transistor, wherein said biasing currents are controlled by insulated gate field effect transistors, wherein said switch means comprise both a bipolar transistor and insulated gate field effect transistors, and wherein said given period of time is at least 124 micro-seconds.

4,233,529

TRANSISTORS POWER STAGES

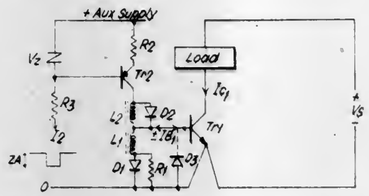
Reginald H. Whitlock, Rugeley, England, assignor to Thorn Automation Limited, Rugeley, England

Filed Feb. 22, 1978, Ser. No. 879,880

Claims priority, application United Kingdom, Feb. 28, 1977, 8294/77

Int. Cl.³ H03K *17/80*

U.S. Cl. 307—414 **12 Claims**



1. A transistor power switching stage and driver circuit comprising a driver transistor having first and second output electrodes and a control electrode, a power transistor having first and second output electrodes and a control electrode, a switching control circuit connected to the control electrode of said driver transistor, first and second magnetically coupled inductors connected in series electrically to said second output electrode of said driver transistor, a connection between the junction of said series-connected inductors and the control electrode of said power transistor, and at least one diode connected between said second output electrode of said driver transistor and said control electrode of the power transistor.

4,233,530

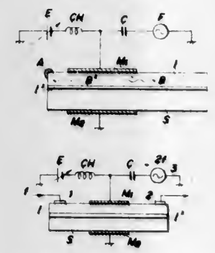
ELASTIC SURFACE WAVE DEVICE

Nobuo Mikoshiba, Sendai, and Shoichi Minagawa, Ageo, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,826

Int. Cl.² H03F *7/00*

U.S. Cl. 307—424 **4 Claims**



1. An elastic surface wave device, comprising: a laminate composed of a semiconductor layer, a piezoelectric material layer, and a protective film layer interposed therebetween; a first electrode on a surface of said piezoelectric material layer; a d.c. bias voltage source connected to said first electrode; a pumping power source connected to said first electrode; and a second electrode on a surface of said semiconductor layer for ohmic contact therewith.

4,233,531

ASSEMBLING AND ENERGIZING COMPACT MOTORS

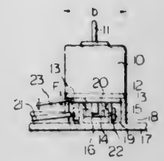
Hideharu Nakano, Omihachiman, and Shinichi Sakata, Hikone, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 31, 1978, Ser. No. 929,227

Claims priority, application Japan, Jul. 30, 1977, 52-92693; Jul. 30, 1977, 52-92694

Int. Cl.² H02K *15/00*

U.S. Cl. 310—42 **18 Claims**



1. A device for simultaneously achieving a mechanical engagement of a motor with a housing of an instrument for containing said motor to utilize its rotation output and an electric connection for feeding power to the motor, comprising

power feeding means consisting of a pair of motor input terminals connected to an exciting coil of the motor and projected at one end out of the motor body and a pair of current source power feeding terminals fixed engageably in contact with said motor input terminals in the positions on the inner surface of the housing to which the motor should be fitted and connected to power feeding wires,

means for fixing a motor in the direction of projecting motor power feeding terminals consisting of a first engaging element on the motor side for defining a first distance along the projecting direction of said motor input terminals at least on the same surface of the motor out of which said motor input terminals project and a first engaging element on the housing side arranged on the inner surface of the housing adjacent said current source power feeding terminal, and engageable with said first engaging element on the motor side for defining a second distance of substantially the same value as said first distance in the same direction as said first distance, and

means for preventing rotations of the motor in said rectangularly intersecting direction consisting of a second engaging element on the motor side having at least one engaging surface extending at least in the direction of intersecting at right angles with the projecting direction of said motor input terminals at least on the same surface of the motor out of which said motor input terminals project and a second engaging element on the housing side engageably arranged on the engaging surface with said second engaging element on the motor side,

wherein the terminals and engaging elements on the motor and housing sides of said power feeding, fixing and rotation preventing means are brought into an engageable relation with each other by the movement of the motor fitting position of said housing in the direction of projecting the motor input terminals.

4,233,532

MODULAR DYNAMOELECTRIC MACHINE

Ernie B. Esters, 15915 Rutherford, Detroit, Mich. 48227

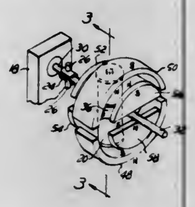
Filed Jul. 10, 1978, Ser. No. 923,175

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—46 **10 Claims**

1. A dynamoelectric machine comprising a housing, a shaft assembly rotatably supported in said housing, a winding mounted on said shaft assembly for rotation therewith, a magnetic field stator having six independent field elements dis-

posed in said housing, said stator comprising a first pair of diametrically disposed field elements, and two pairs of laterally disposed flat field elements, each of said pairs of laterally disposed field elements being supported on opposite lateral sides of said winding, and said field elements being arranged such that one end of said winding is at a given moment within



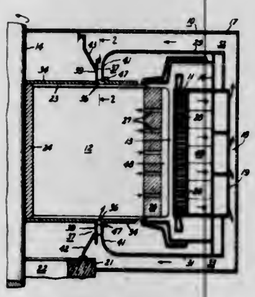
a magnetic field of a given polarity while the other end of said winding is within a magnetic field of an opposite polarity, a commutator mounted on said shaft for rotation therewith, wiring means connecting said winding to said commutator, and brush means each connected to a terminal and engaged with said commutator.

4,233,533

ROTOR RIM-VENTILATED GENERATOR WITH TURNING VANES FOR ROTOR INLET COOLANT GAS

Harold Lown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,684
Int. Cl.³ H02K 9/00
U.S. Cl. 310—59 7 Claims



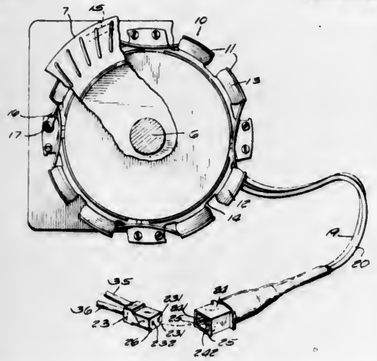
1. A rotor rim-ventilated generator having a stator member, a rotor member concentric therewith and a gap between said rotor and stator members, means connected to said rotor member for driving said rotor member, said stator member having windings thereon and said stator member and the rim of said rotor member each having ventilation ducts extending therethrough in the generally radial direction for the passage of cooling gas, the improvement comprising means effective during operation for simultaneously admitting coolant gas flow to said rotor member and turning said gas flow in the direction of rotor rotation, said admitting and turning means being stationary and being disposed adjacent each of the two generally planar walls of said rotor member radially inward of said rotor rim in flow communication with the radially inner end of the rotor rim ventilation ducts.

4,233,534

CONNECTIONS FOR SMALL ENGINE AUXILIARY ELECTRICAL SYSTEM

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation-in-part of Ser. No. 835,448, Sep. 22, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,054
Int. Cl.³ H02K 11/00
U.S. Cl. 310—71 10 Claims



1. In combination with an internal combustion engine of the type adapted to power a machine and to provide a source of energization for auxiliary electrical equipment on the machine comprising an a.c. load circuit and one requiring unidirectional current, said engine having permanent magnet means carried by a part of the engine that rotates when the engine is running and a pair of alternator windings mounted on the engine body for cooperation with the permanent magnet means, one end of one alternator winding being connected with an a.c. lead, one end of the other alternator winding being connected with a d.c. lead, and the other ends of the alternator windings being grounded to the engine body, means on the engine providing for connection of said leads with the machine load circuits and for rectification of current to be fed to the d.c. load circuit, the last mentioned means comprising:

A. a plug element of a quick-disconnect connector comprising male and female elements, each of which has a pair of terminal members that are cooperable with the terminal members of the other plug element, one of said plug elements having a body portion, the a.c. lead being secured to one of the terminal members of the body portion;

B. a diode having a pair of oppositely projecting terminal conductors,

(1) one of said terminal conductors being connected to the d.c. lead, and

(2) the other of said terminal conductors being connected to the other of said pair of terminal members of said plug element to dispose the diode and its adjacent portion of the d.c. lead in projecting relation to said body portion and alongside the a.c. lead;

C. a first length of heat shrunken plastic tubing extending from said body and snugly embracing the diode and a substantial length of the d.c. lead adjacent to the diode; and

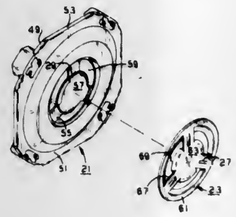
D. a second length of heat shrunken plastic tubing snugly embracing said body portion of said plug element and extending a substantial distance therefrom in snugly surrounding relationship to the diode, substantial portions of the a.c. and d.c. leads, and the first length of heat shrunken plastic tubing, and cooperating with said first length of tubing to insulate and protect the diode and its connections and to form a rigid, sturdy, unified assembly with the diode, said plug element and adjacent portions of said leads.

4,233,535

PRIME MOVER HAVING A LEAKAGE FLUX CONDUCTING DEVICE SECURED THERETO

Michael R. Barone, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 15, 1978, Ser. No. 886,672
Int. Cl.³ H02K 1/12
U.S. Cl. 310—256 12 Claims



1. In a prime mover having a stationary assembly with at least a pair of opposite pole winding means adapted for excitation to establish a magnetic field therebetween, a rotatable assembly coupled in magnetic relation with the stationary assembly, at least one non-ferrous end plate having a pair of opposite faces and disposed in journaling engagement with the rotatable assembly, means arranged on one of the opposite faces of the end plate for providing a short-circuiting path to conduct leakage flux emanating from the magnetic field upon the establishment thereof generally across the one opposite face of the end plate between the at least winding means pair with the path providing means remaining unsaturated by the conducted leakage flux, means in the path conducting means for the passage therethrough of ambient air past the end plate into cooling relation with the rotatable assembly and the stationary assembly, and means for securing the path providing means in a preselected assembly position on the one opposite face of the end plate; the improvement comprising a plurality of abutment surfaces on the one opposite face of the end plate, and the securing means including a plurality of generally elongate deformable fingers lanced from the path providing means, each of said fingers of said plurality thereof having a pair of opposite end portions interposed between a pair of opposite side edges with one of said opposite end portions being respectively integral with the path providing means and the other of said opposite end portions arranged so as to be respectively urged into gripping engagement with said abutment surfaces of said plurality thereof in response to the deformation of said fingers upon the disposition of the path providing means in its preselected assembly position on the one opposite face of the end plate, and said fingers respectively having a length between said opposite end portions predeterminately greater than the width between said opposite side edges so as to predeterminately limit the force exerted by the deformation of said fingers in order to grippingly engage said other end portions thereof with said abutment surfaces and thereby prevent the displacement of the path providing means for its preselected assembly position on the one opposite face of the end plate.

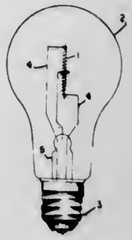
4,233,536

INCANDESCENT LAMP GETTER

John F. Waymouth, Marblehead; Edmund M. Passmore, Gloucester, and George L. Duggan, Bedford, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1978, Ser. No. 970,294
Int. Cl.³ H01K 1/56
U.S. Cl. 313—174 3 Claims

1. An incandescent lamp comprising a glass envelope having a gas fill, a tungsten filament within the envelope, and getter means disposed within the envelope, said getter means comprising carbon and a gas in elemental form, said gas in elemental form being present in a quantity which enhances the getter-ing effect of the carbon by reacting therewith to transfer and retain the carbon in a gaseous phase, the quantity of carbon being greater than about 30 parts per million of the weight of



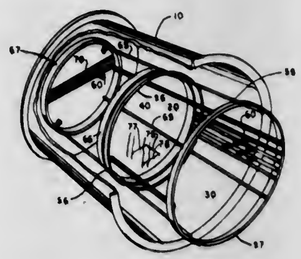
the filament, said gas in elemental form being hydrogen and said quantity thereof being greater than 30 parts per million of the filament weight.

4,233,537

MULTICUSP PLASMA CONTAINMENT APPARATUS

Rudolf Limpaecher, 45 Parsonage La., Topsfield, Mass. 01983

Filed Sep. 18, 1972, Ser. No. 290,076
The portion of the term of this patent subsequent to Aug. 11, 1994, has been disclaimed.
Int. Cl.² H01J 17/26
U.S. Cl. 313—231.3 16 Claims



1. Plasma containing apparatus comprising,

(a) a container vacuum tight to maintain the plasma pressure,

(b) a plasma chamber within said container,

(c) said chamber having magnetic multipole ion reflecting walls made up of an array of at least thirty magnetic poles of alternating sign, and

(d) means for injecting electrons into said chamber in sufficient quantity to maintain the resulting plasma at a substantial negative potential.

4,233,538

LUMINESCENT LEAD-ACTIVATED ALKALINE EARTH METAL RARE EARTH METAL BORATES AND MERCURY VAPOR DISCHARGE LAMP CONTAINING THE SAME

Willebrordus H. M. M. van de Spijker, and Willem L. Konijnendijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,244
Claims priority, application Netherlands, Apr. 20, 1978, 7804197
Int. Cl.³ C09K 11/46
U.S. Cl. 313—486 10 Claims

1. A luminescent lead-activated alkaline earth metal rare earth metal borate having a hexagonal crystal structure and a composition defined by the formula

$Me_{1-p}Pb_pLa_{1-x-y}Y_xGd_yBO_4$,

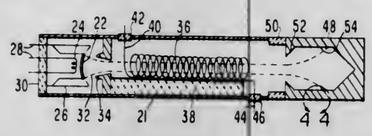
wherein Me represents strontium and/or calcium, where $0.005 \leqq p \leqq 0.30$ and $0 \leqq x \leqq 0.1$, and wherein $0 \leqq y \leqq 0.5$ when at least 75 mole% of Me is Ca and $0 \leqq y \leqq 0.1$ when less than 75 mole% of Me is Ca and exhibiting an emission maximum of 465–470 nm.

4,233,539

ELECTRON TUBE WITH REDUCED SECONDARY EMISSION

Louis R. Falce, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 5, 1979, Ser. No. 17,316
Int. Cl.³ H01J *23/08*
U.S. Cl. 315—5.38 **6 Claims**



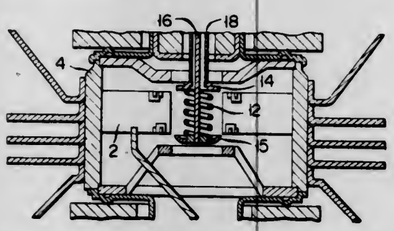
1. An electron tube comprising a copper electrode capable of collecting free electrons, at least a portion of the collecting surface of said electrode being coated with a layer of material of the class consisting of aluminum boride, aluminum carbide and boron carbide.

4,233,540

MAGNETRON FOR MICROWAVE OVEN

Norio Tashiro, Yokohama, and Hirokazu Takahashi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 9, 1979, Ser. No. 3,426
Claims priority, application Japan, Jan. 18, 1978, 53/3797
Int. Cl.³ H01J *25/50*
U.S. Cl. 315—39.51 **6 Claims**



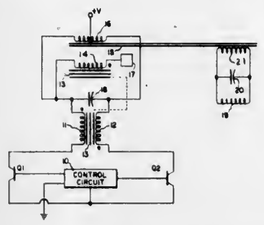
1. A magnetron for a microwave oven comprising a hollow cylindrical anode having a plurality of strapped anode vanes and a cathode including a coiled filament disposed coaxially with the hollow cylindrical anode, the ratio of the thickness d of said filament in the axial direction of the cathode to the pitch p of turns of the coiled filament in the axial direction of the cathode being 0.3 or less, said magnetron suppressing noise generation in the frequency range of approximately 0.5 to 1.5 Mhz.

4,233,541

START WINDING FOR SOLENOIDAL ELECTRIC FIELD DISCHARGE LAMPS

Armand P. Ferro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1979, Ser. No. 42,217
Int. Cl.³ H01J *11/00, 65/04*
U.S. Cl. 315—70 **8 Claims**



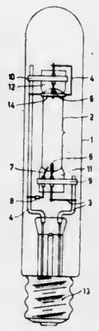
1. A solenoidal electric field lamp apparatus comprising:
a light-transmissive evacuable envelope containing an ionizable gaseous medium and having a phosphor disposed on said envelope for absorption of electromagnetic radiation at a first optical frequency from said medium and reradiation of electromagnetic radiation at a second optical frequency;
a magnetic lamp core electromagnetically coupled to said medium, said core having a conductive winding thereon;
an electronic ballast circuit for supplying radio frequency energy;
means for providing ballast reactance for said ballast circuit;
a transformer having a core, a primary winding electromagnetically coupled to said ballast circuit and a secondary winding coupled to said lamp core; and
a start winding disposed on a magnetic core and connected to act as an autotransformer with said transformer secondary winding and being futher connected to a starting electrode disposed proximal to said gaseous medium.

4,233,542

HIGH-PRESSURE DISCHARGE LAMP

Franciscus M. P. Oostvogels; Gustaaf Melis, and Aime P. A. M. Van Laarhoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,369
Claims priority, application Netherlands, Nov. 7, 1977, 7712215
Int. Cl.³ H01J *7/44, 13/46*
U.S. Cl. 315—73 **2 Claims**



1. A high pressure discharge lamp which comprises: a sealed vacuum-tight light-pervious lamp envelope, a sealed vacuum-tight light-pervious elongated discharge vessel disposed in said envelope, the space between said envelope and said vessel being evacuated or containing a non-oxidizing gas atmosphere, said lamp further including first and second elongated electrodes disposed in spaced relation from each other within said vessel with the axis of each electrode and said vessel generally parallel, an ionizable fill disposed within said vessel, respective electrical current conductors extending through the wall of said lamp envelope and through the wall of said discharge vessel to said electrodes, and an oxidation-sensitive metal foil which fractures on oxidation connected electrically in series with one of the current conductors, said metal foil being disposed adjacent said first electrode and at least partly intermediate said first electrode and said metal foil being disposed adjacent a portion of said wall of said vessel enclosed by planes disposed in normal relationship to the axis of said first electrode of the axial extremities of said first electrode and also in the immediate proximity of the wall of said discharge vessel.

4,233,543

INTERNAL SHUNT FOR SERIES CONNECTED LAMPS

Robert L. Hickok, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,056
Int. Cl.³ H01K *1/70*
U.S. Cl. 315—75 **19 Claims**



1. An internal shunt for series connected lamps having at least two inner lead wires comprising:
a first flat strip of aluminum foil having an oxide coating on at least one side thereof;
a second strip of aluminum foil having an oxide coating on at least one side thereof and indentations on said at least one side thereof for receiving said lead wires; and
said first and second strips in combination surround a portion of both of said wires and are individually positioned approximately parallel to each other on opposite sides of said lead wires, the oxide coating on each strip being in contact with both led wires, and said strips being bonded together adjacent the ends thereof and at a location intermediate said lead wires, and the bonding of the strips being so spaced from said lead wires to thereby avoid damaging said oxide coatings at said lead wires.

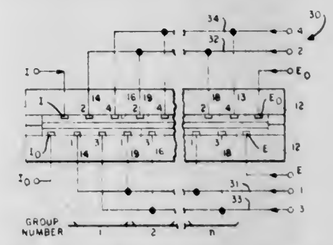
4,233,544

INPUT-KEEP ALIVE ARRANGEMENT FOR PLASMA CHARGE TRANSFER DEVICE

William E. Coleman, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed May 9, 1979, Ser. No. 37,586
Int. Cl.³ H05B *41/30*
U.S. Cl. 315—169.2 **9 Claims**

6. A method of entering information into and erasing information in a plasma gas transfer device having a first pair of electrodes for entering information in the form of charges into an adjacent array of charge transfer electrodes and a second pair of electrodes adjacent the array for removing charge information from the device, each of the first and second pairs and the charge transfer electrodes being covered by dielectric material and thereby isolated from the gas, comprising:
selectively applying voltages across a first cell having walls defined by the dielectric material covering one of the first pair of electrodes and an adjacent one of the array of charge transfer electrodes to discharge gas within the first cell and thereby selectively input charge to the array;
repetitively applying voltages across a second cell having walls defined by the dielectric material covering the first pair of electrodes to ionize the gas proximate the second cell and thereby facilitate discharge within the first cell;



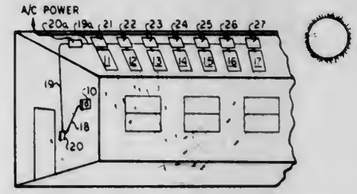
selectively applying synchronous voltages to the array of charge transfer electrodes to transfer the charge along the array; and
selectively applying voltages across a third cell having walls defined by the dielectric material covering the second pair of electrodes for receiving the charge from the array and, by selective ionization of the medium based upon the applied voltage and the charge state, terminating charge transfer.

4,233,545

AUTOMATIC LIGHTING CONTROL SYSTEM

Lee R. Webster, and Gary J. Woods, both of 1670 Highway AIA, Satellite Beach, Fla. 32937

Filed Sep. 18, 1978, Ser. No. 942,977
Int. Cl.² H01J *40/14*
U.S. Cl. 250—214 AL **13 Claims**



1. An illumination control apparatus for controlling the flow of electrical energy from a source thereof to a plurality of lighting modules for supplementing natural illumination so as to maintain a desired level of total illumination within an interior space, said illumination control apparatus comprising in combination:
a plurality of power controllers each interposed between the source of electrical energy and one of the lighting modules, with each of said power controllers regulating the flow of electrical energy therethrough responsive to receiving a corresponding power control signal;
a photosensitive detector for generating an illumination signal representative of the total effective level of natural and artificial illumination within the interior space;
illumination limit means coupled to said photosensitive detector for generating an error signal at an output thereof responsive to said illumination signal deviating outside an acceptable illumination range defined between an upper illumination limit and a lower illumination limit;

clock means for generating a periodic clock signal; and

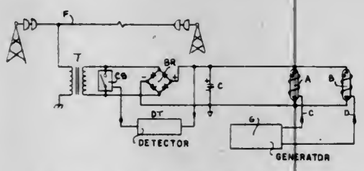
shift register means operatively coupled to said clock means, to said output of said illumination limit means and to each of said power controllers, with said shift register means for generating, responsive to receiving said clock signal and said error signal, appropriate ones of said power control signals so as to change the illumination of selected ones of the lighting modules, thereby adjusting the total illumination level to be within said acceptable illumination range.

4,233,546

STROBOSCOPIC BEACONS FED FROM A CAPACITIVE SOURCE

Raymond Berthiaume, Ste-Julie, Canada, assignor to Hydro-Quebec, Quebec, Canada

Filed Sep. 18, 1978, Ser. No. 943,476
Claims priority, application Canada, Apr. 26, 1978, 302066
Int. Cl.[2] H05B *41/34*
U.S. Cl. 315—241 R **15 Claims**



1. A system for feeding flash-tubes of beacons with the capacitive energy extracted from an insulated section of an overhead wire of an AC power transmission line, comprising:

means for transforming said capacitive energy from the overhead wire into a DC voltage to feed at least one of said flash tubes;

regulation means coupled in shunt to said transforming means for controlling the DC voltage supply to said flash-tubes, regulation means comprising a switching circuit for relating said DC voltage according to a predetermined value and a detection circuit operative to control actuation of said switching circuit when said predetermined DC voltage value is reached; and

means for generating at a predetermined frequency pulses for firing said at least one flash-tube when said flash-tube is under said DC voltage regulated by said regulation means.

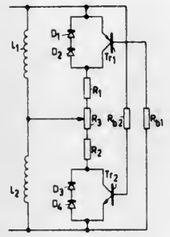
4,233,547

COLOR TELEVISION DISPLAY DEVICE COMPRISING A DEFLECTION COIL UNIT PROVIDED WITH A DEFLECTION COIL FOR THE VERTICAL DEFLECTION AND DEFLECTION COIL UNIT FOR SUCH A DISPLAY DEVICE

Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,596
Claims priority, application Netherlands, Jul. 31, 1978, 7808044
Int. Cl.[3] H01J *29/70, 29/76*
U.S. Cl. 315—368 **10 Claims**

1. A color television display device comprising a color picture display tube and a deflection coil unit provided with a deflection coil for deflecting into the vertical direction the electron beams generated in the display tube, the coil being divided into two series-interconnected coil halves and being connected to a deflection current generator for generating a sawtooth deflection current flowing in operation through the deflection coil halves and having a trace and a retrace which reverses its direction at approximately the center instant of the trace period and further provided with an adjustable balancing resistor in a parallel branch which produces a correction circuit which flows through the deflection coil halves, wherein said device further comprises means for decreasing, during the trace period of the deflection current, the voltage present in operation across the parallel branch including said balancing



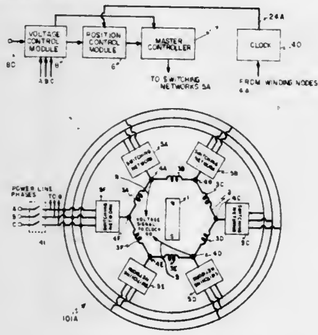
resistor by a constant voltage in such a way that the voltage across said parallel branch is more decreased after said center instant than before and that the correction current at and about said center instant is substantially zero.

4,233,548

VARIABLE SPEED ELECTRONIC MOTOR

James L. Kirtley, Jr., Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 20, 1978, Ser. No. 898,264
Int. Cl.[3] H02K *29/02*; H02P *5/16*
U.S. Cl. 318—138 **23 Claims**



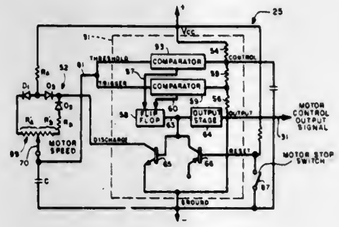
1. A variable speed electronic motor for connection to a power source that comprises, in combination: a rotor; an armature winding; semiconductor switching means to connect between the power source and the armature winding, the semiconductor switching means comprising semiconductor switches connected in pairs in which one semiconductor switch of each pair is operable to carry current to the winding and the other semiconductor switch of each pair is operable to carry current from the winding; position control module means to provide a position control signal; voltage control module means to provide a voltage control signal; and control means connected to control the semiconductor switching means, said control means comprising an electrical gating module connected to control each semiconductor switch of each pair, each gating module including a logic gate and signal transfer means connected to transfer control information to the associated semiconductor switch from the logic gate, the logic gate being connected to receive the position control signal and the voltage control signal and being operable to combine the two signals to form a composite signal output that is fed as a control signal to said associated semiconductor switch to control the speed of the motor and the amount of electric energy transferred thereto said logic gate being a gate that provides said composite signal output only when both the position control signal and the voltage control signal are present as inputs to the logic gate.

4,233,549

SPEED AND TORQUE CONTROL FOR FRACTIONAL HORSEPOWER MOTORS

Kamalakar D. Dighe, Laurel, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 8, 1978, Ser. No. 967,862
Int. Cl.[3] H02P *5/16*
U.S. Cl. 318—317 **5 Claims**



1. A motor speed control system for supplying power from an electrical power source to an electric motor, comprising, in combination:

a capacitor having one terminal connected to a plane of reference potential;

a source of unidirectional current of relatively constant voltage;

means including a capacitor charge circuit serially comprising a first resistor, a first diode, and a second resistor connected between said current source and the remaining terminal of said capacitor, for periodically charging said capacitor;

means including a capacitor discharge circuit serially comprising a third resistor, a fourth resistor, and a second diode connected between the remaining terminal of said capacitor and said plane of reference potential for periodically discharging said capacitor;

timing circuit means serially included in said capacitor discharge circuit between said second diode and said plane of reference potential, and including a voltage capacitor responsive to the voltage level across said capacitor for periodically rendering said discharge circuit operative to discharge said capacitor;

electronic switch means serially connected between the electrical power source and the electric motor and responsive to said timing circuit for applying pulses to said motor having a repetition rate and duty cycle dependent on the charging and discharging of said capacitor;

means including a diode connected between the juncture of said first resistor and said first diode, and the juncture of said second diode and said timing circuit for disabling said capacitor charge circuit upon operation of said capacitor discharge circuit; and

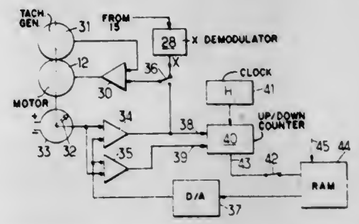
said second and third resistors comprising respective sections of a potentiometer having a user-adjustable tap connected to said capacitor whereby the duty cycle of the pulses applied to said electric motor are varied without varying the frequency thereof for smooth speed control of the motor over a wide range of speeds.

4,233,550

NUMERICALLY CONTROLLED MACHINE TOOLS PARTICULARLY STITCHING OR PRICKING MACHINES

Henri Berger, Triel sur Seine, France, assignor to Societe d'Applications Generales d'Electricite et de Mechanique (SAGEM), Paris, France

Filed Jul. 26, 1978, Ser. No. 928,019
Claims priority, application France, Jul. 29, 1977, 77 23477
Int. Cl.[3] G05B *19/10*
U.S. Cl. 318—568 **6 Claims**



1. In a numerically controlled machine tool for storing a digital record of a pattern and effecting a mechanical operation on work pieces according to the stored pattern, the combination of:

a work piece support table,

a head carrying a tool for carrying out said mechanical operation,

first and second drive means for effecting relative movement of said table and head along a first and a second coordinate axes, respectively,

first and second transducer means for providing electrical signals representative of the amount of movement of said first and second drive means, respectively,

an optical follower carried by said head in an invariable position with respect to said tool, said follower being constructed for receiving the image of said pattern as represented by a linear drawing and for automatically controlling said first and second drive means for said follower to follow said pattern,

digital memory means,

analog digital conversion means for conversion of analog electrical signals into or from digital signals storable in said memory means,

and switch means having a first and a second condition, which, in one condition, route the signals from said transducer means to said conversion means and memory means for digital storage of the pattern followed by said optical follower and, in the other condition, cause control of the drive means by the signals stored in digital form in the memory means through said transducer means and conversion means, whereby the linearity defects of said transducer means and conversion means are compensated.

4,233,551

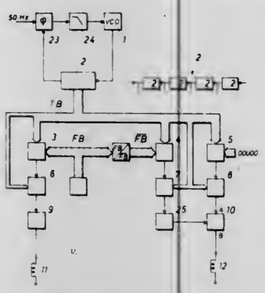
CONTROL CIRCUIT FOR AN A.C. MOTOR

Axel Jensen, Bjerringbro, and Niels Molgaard, Silkeborg, both of Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Jun. 1, 1978, Ser. No. 911,511
Claims priority, application Denmark, Jun. 3, 1977, 2465/77
Int. Cl.[3] H02P *5/28*
U.S. Cl. 318—909 **4 Claims**

1. A control circuit for an A.C. motor with at least two sets of windings, and having a device controlling the power supply to the windings, comprising: a dividing circuit with a counter connected to a source of voltage through a voltage-controlled oscillator and transmitting a bit pattern corresponding to the instantaneous phase of the voltage of said source, the bit pattern corresponding to the maximum counting corresponds to

90°, binary comparator units receiving the bit pattern through a data bus for comparison with both a preselected phase in the form of a bit pattern and a bit pattern corresponding to a phase symmetrical with respect to the maximum value of the voltage, control means and trigger circuit therefor, said second bit pattern being the complement to the preselected bit pattern,



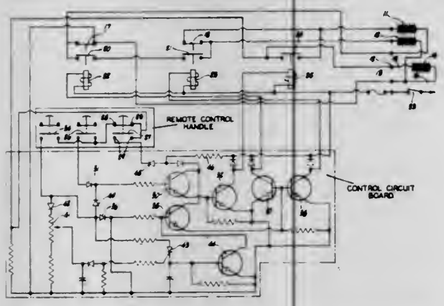
each comparator unit at bit pattern identity transmitting a signal for said trigger circuit for said control means, said control means controlling power supply for individual windings, and a switch-off circuit, one of said control means stopping the power supply to a winding before the zero cross-over of the voltage of said source by said switch-off circuit.

4,233,552

VEHICLE-STARTING CIRCUIT WITH EXCESSIVE VOLTAGE DETECTION

Dale M. Baumbach, Sugar Land, Tex., assignor to Associated Equipment Corporation, St. Louis, Mo.

Filed Jun. 28, 1978, Ser. No. 920,003
Int. Cl.³ H02J 7/00
U.S. Cl. 320—7 **8 Claims**



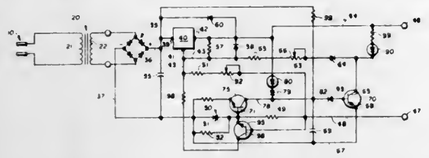
1. A vehicle-starting circuit with excessive voltage detection, comprising:
(a) a pair of starting batteries, and a stalled vehicle battery,
(b) a battery switch means including:
1. a first battery switch means normally connecting the starting batteries in parallel, and
2. a second battery switch means operatively connecting or disconnecting the starting batteries to the stalled vehicle battery,
(c) a first control means for actuating the second battery switch means, and connected to the second battery switch means for connecting the starting batteries in parallel to the stalled vehicle battery,
(d) a second control means connected to the first battery switch means for actuating the first battery switch means to one position for series connection when the second control means is "on" and for allowing the first battery switch means to return to normal position for parallel connection when the second control means is "off," and
(e) voltage-detecting means connected to the starting batteries and the second control means for turning the second control means "off," if actuated.

4,233,553

AUTOMATIC DUAL MODE BATTERY CHARGER

Luther T. Prince, Jr., Minneapolis; Wilbur J. Hampel, Spring Park, and Michael A. Boot, Minneapolis, all of Minn., assignors to Ault, Inc., Minneapolis, Minn.

Filed May 10, 1978, Ser. No. 904,517
Int. Cl.³ H02J 7/04
U.S. Cl. 320—23 **9 Claims**



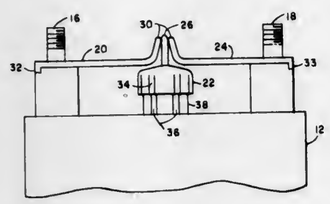
1. An automatic dual mode battery charging circuit comprising, rectifying means adapted to be connected to an alternating current source of power, an adjustable voltage regulator connected to said rectifying means and having an output circuit adapted to be connected to a battery to be charged; a voltage controller connected to the voltage regulating means to set the level of voltage output of the voltage regulating means between two modes of operation, said voltage controller including a pair of parallel selectively connected variable resistance circuits, each of which has a separate adjustable resistor to adjust the current output of the voltage regulator for each of the two modes of operation, each circuit of which is connected to an input of the voltage regulator; and current detector means connected between the rectifying means and the battery and sensing charging current flowing through the battery, said current detector means being connected to the voltage controller to change the operation of the voltage regulating means between the two modes of operation.

4,233,554

VENT ACTUATED SHORTING SWITCH

James N. Ellis, Chatsworth, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 5, 1979, Ser. No. 27,203
Int. Cl.³ H02J 7/00; H01H 35/38
U.S. Cl. 320—46 **2 Claims**



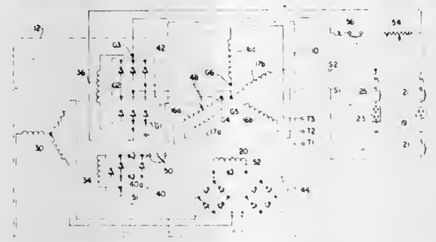
1. A vent actuated shorting switch comprising: a container having a pressure release opening therein and first and second electrical terminals thereon, first and second electrical conductive extensions projecting from respective of said first and second electrical terminals, respective projecting ends of said extensions being adjacent and positioned above said pressure release opening, a cap moveably disposed and covering said pressure release opening for moving toward and repositioning adjacent said projecting ends of said conductor extensions in response to excessive pressure within said container being released and an electrical conductor fixedly attached to said cap for contacting said conductive extensions and providing electrical connection therebetween in response to said repositioning of said cap adjacent said extensions, said pressure release opening being defined by a protruding neck, said neck having a plurality of ridges on the outer surface thereof, and said cap being slidably disposed on said neck and having a plurality of grooves on the inside thereof for guiding the direction of sliding movement of said cap toward said extensions.

4,233,555

ALTERNATING CURRENT GENERATOR FOR PROVIDING THREE PHASE AND SINGLE PHASE POWER AT DIFFERENT RESPECTIVE VOLTAGES

Lawrence R. Roche, Le Center, Minn., assignor to Dyna Technology, Inc., Minneapolis, Minn.

Filed Apr. 5, 1979, Ser. No. 27,409
Int. Cl.³ H02P 9/10
U.S. Cl. 322—25 **15 Claims**



1. A brushless dynamo electric machine for generating single phase and three phase alternating current output power at a substantially constant voltage level without requiring a voltage regulator, comprising:
a generator with a stator having a single phase and a three phase winding and a rotor having a field winding;
an exciter including a rotor winding, a control field winding and a compounding field winding;
first circuit means including first rectifier means for energizing said control field winding of the exciter responsive to the voltage of said three phase generator stator winding;
second circuit means including second rectifier means connected in series with said generator stator windings and the load on said generator for energizing said compounding field winding of the exciter in proportion to the amplitude of current in said generator stator winding;
rotary rectifier means connected to energize said rotor field winding with a D.C. voltage related to the A.C. voltage of said exciter rotor winding; and
means for adjusting the degree of energization of said exciter compounding field winding by said second circuit means in dependence upon whether the single phase or three phase alternating current output signal is being supplied to the load on said generator.

4,233,556

VOLTAGE REGULATOR, PARTICULARLY FOR AUTOMOTIVE USE

Karl Nagel, Gemaringen, Fed. Rep. of Germany, and Gerhard Conzelmann, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,026
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738897
Int. Cl.³ H02P 9/30
U.S. Cl. 322—28 **20 Claims**

1. Voltage regulator, particularly for automotive use, for a dynamo electric generator (A) adapted for operation under variable speed conditions and for connection to a field winding (23) of the generator (A) and control of the energization thereof, comprising
means (C,12) connected to the generator (A) and furnishing an instantaneous voltage signal representative of the output voltage of the generator:
a reference source (R,40) providing a reference voltage;
a differential amplifier (10) having the instantaneous voltage signal and the reference voltage connected thereto;
a capacitor (13);
means (16, 35) supplying a charge current to the capacitor;
means (15) draining discharge current from the capacitor;
said capacitor charge current supply means (16, 35) and discharge current drain means (15) being connected to and controlled by said difference amplifier (10) in accordance with the relative values of said instantaneous voltage signal and said reference voltage;

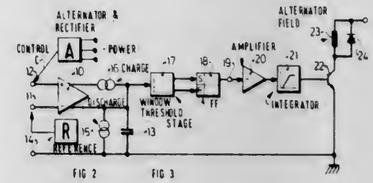


FIG 2 FIG 3

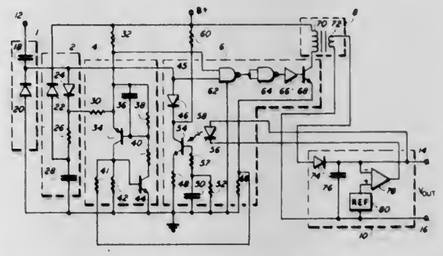
a high-and-low discriminator (17) connected to and controlled by the voltage across said capacitor;
and means (19, 20, 21, 22) controlling current flow to the field (23) of the dynamo electric generator under control of the output of the discriminator with respect to the relationship of the voltage across the capacitor to threshold levels of the discriminator by controlling the flow of current, or interruption of current, in accordance with the respective voltage levels across the capacitor and the high-and-low response levels of the discriminator, said capacitor (13) thereby simultaneously filtering or smoothing the control operation of the regulator while establishing the voltage levels controlling change-over of response of the discriminator.

4,233,557

SWITCHING POWER SUPPLY

Jade H. Alberkrack, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

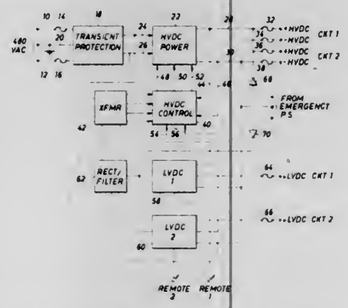
Filed Sep. 12, 1979, Ser. No. 74,833
Int. Cl.³ G05F 1/58
U.S. Cl. 323—9 **9 Claims**



1. A switching type power supply for receiving a fixed frequency pulse train at its input and generating therefrom an output voltage, comprising:
first means having a variable resistance for differentiating said fixed frequency pulse train to produce a differentiated pulse train;
a Schmidt NAND gate having first and second inputs and an

output, said first input coupled to said first means for receiving said differentiated pulse train;
switching means coupled to the output of said NAND gate;
a transformer having primary and secondary windings, said primary winding coupled to said switching means and inducing a voltage across said secondary winding;
second means coupled to said secondary winding for generating said output voltage;
a source of a reference voltage;
third means for comparing said reference voltage with said output voltage and for generating a signal indicative of the difference therebetween;
fourth means coupled to said first means and said third means and responsive to said signal for varying the resistance of said first means; and
fifth means coupled to said switching means and to the second input of said NAND gate for controlling passage of said differentiated pulse train through said NAND gate.

4,233,558
REGULATED DUAL DC POWER SUPPLY
Robert F. Gaertner, San Marcos, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 22, 1978, Ser. No. 944,731
Int. Cl.[3] H02P 13/26; H05F 1/64
U.S. Cl. 323—17 **9 Claims**

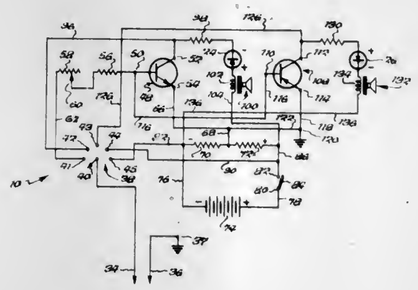


1. A power supply for providing both regulated low voltage dc and regulated high voltage dc from a common high voltage ac source, comprising
(1) at least one low voltage switching regulator, including
a rectifier connected to the ac source voltage to produce a low unregulated dc voltage,
semiconductor switching means connected to said rectifier to produce a switched output therefrom,
storage means connected to said switching means for maintaining the output therefrom at a regulated dc level during periods of switch off of said semiconductor switching means,
drive means for turning said semiconductor switching means on and off at a constant high frequency rate, and
duty cycle determining means connected to the output of said semiconductor switching means and to said drive means for varying the ratio of on to off of said semiconductor switching means in accordance with the amplitude variation from a predetermined level for said output to provide duty cycle regulation thereof;
(2) a phase-controlled high voltage bridge regulator, including
a high voltage rectifying bridge network having power switching semiconductors in at least two legs thereof, the phase timing of supply gate voltages to said semiconductors with respect to the occurrence of the cycles in the ac source determining the dc output from said bridge network,
control means for producing respective gate voltages to said power switching semiconductors during alternate half cycles of the ac source voltage, said control means comprising
means for sampling a portion of the high voltage dc to be regulated and developing an error voltage that said portion of the high voltage deviates from a predetermined value,
trigger means connected to the ac source voltage for creating a trigger voltage with the occurrence of each half cycle thereof,
timer means connected to said trigger means producing an output following the occurrence of a trigger from said trigger means,
a controllable time constant network connected to said timer means and to said sampling means for creating a threshold voltage to said timer means at a time dependent on the amplitude of said error voltage,
first logic means operably connected to the ac source voltage for producing a first polarity output corresponding to positive half cycles thereof and a second polarity output corresponding to negative half cycles thereof and to the output of said timer means to produce a first timing output during said first polarity and a second timing output during said second polarity output, and
output means connected to receive each of said first and second timing outputs and producing said supply gate voltages; and
(3) second logic means operably connected to the output of said semiconductor switching means of said low voltage switching regulator and to said trigger means of said high voltage regulator to inhibit said trigger voltage therefrom when the output from said semiconductor switching means is below a predetermined level and hence to inhibit the output from said high voltage regulator until there is an output from said low voltage regulator larger than a predetermined minimum level.

4,233,559
QUICKLY PERFORMED MEASURING METHOD FOR ASCERTAINING THE CONCENTRATION OF THE POLAR COMPONENTS IN A MATERIAL OTHERWISE MAINLY NON-POLAR
Heinz Hoberg, Aachen-Laurensberg, and Albert Klein, Walhorn-Belgien, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany
Filed Feb. 28, 1979, Ser. No. 16,063
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1978, 2808739
Int. Cl.[3] G01R 27/04
U.S. Cl. 324—58.5 A **16 Claims**

1. In a method of ascertaining the concentration of a polar component of an otherwise non-polar or negligibly polar material, the step of using a microwave waveguide to transmit electromagnetic waves through a sample of the material and measuring the transmission delay of the thusly transmitted electromagnetic waves, the frequency of the electromagnetic waves not exceeding a predetermined upper limit, the upper limit being the lower one of two frequencies, one frequency being the frequency at which the dielectric constant of the polar component exceeds that of the remaining, non-polar or negligibly polar component of the material, the other frequency being the dipole-relaxation frequency f_o of the polar component, wherein $f_o = \frac{1}{2\pi\tau}$, τ being the dipole-relaxation time-constant of the polar component.

4,233,560
ELECTRICAL APPARATUS FOR TESTING VOLTAGE, POLARITY AND CONTINUITY
Orman L. Bleaman, 69 Drexel Rd., Buffalo, N.Y. 14214
Filed Aug. 24, 1978, Ser. No. 936,351
Int. Cl.[3] G01R 19/14, 31/02
U.S. Cl. 324—133 **8 Claims**



1. Apparatus for testing electrical voltage and polarity comprising:
(a) a pair of input probe terminals adapted to be connected to two points having a voltage therebetween to be tested, one of said terminals being connected to an electrical ground or reference of said apparatus;
(b) a source of direct voltage having a reference terminal connected to said ground or reference of said apparatus, a relatively positive terminal and a relatively negative terminal;
(c) an NPN transistor having base, collector and emitter terminals, said emitter terminals being connected to said reference terminal of said source;
(d) first visual indicating means comprising a light-emitting diode having an anode and a cathode, means for connecting said cathode to said collector of said NPN transistor and means for connecting said anode to said relatively positive source terminal;
(e) a PNP transistor having base, collector and emitter terminals, said emitter terminal being connected to said reference terminal of said source;
(f) second visual indicating means comprising a light-emitting diode having an anode and a cathode, means for connecting said anode to said collector of said PNP transistor and means for connecting said cathode to said relatively negative source terminal; and
(g) means for connecting the other of said input probe terminals to each of said bases of said NPN and PNP transistors comprising variable resistance means connected between said other input terminal and said base terminals of said transistors for varying the range of magnitudes of voltage which can be tested;
(h) whereby said apparatus distinguishes between an alternating voltage and a direct voltage across said probe input terminals with both of said light-emitting diodes being energized if said voltage is alternating and with only one of said light-emitting diodes being energized if said voltage is direct, the particular one determined by the polarity of the direct voltage.

4,233,561
AUTOMATIC IMPEDANCE MATCHING CONDUIT LOCATOR
Merrill K. Haddon, 13545 SW. Village Glean, Tigard, Oreg. 97223, and Clifford H. Moulton, 4175 SW. Dogwood La., Portland, Oreg. 97225
Continuation of Ser. No. 814,151, Jul. 11, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,294
Int. Cl.[3] G01V 3/08; G05F 1/24; H03H 7/38
U.S. Cl. 324—326 **2 Claims**



1. In apparatus for coupling an electrical search signal to a concealed electrically conductive element for the purpose of assisting in locating the same
a pair of output terminals operatively connectable to such an element,
electrical signal-producing means including transformer means having primary and secondary sides, with said primary side being operatively connected to a signal generator and with said secondary side being operatively connected to said terminals for supplying a search signal thereto,
current-monitoring means operatively connected to said primary side for monitoring the level of primary-side current, said current monitoring means including filter circuit means constructed to allow such monitoring only of currents having a frequency substantially the same as the fundamental frequency of said signal generator,
changeable-condition impedance-adjusting means operatively connected to said secondary side, changeable to adjust, to different selected amounts within a preselected range, the output impedance of said secondary side as coupled to said terminals, said impedance-adjusting means including, for defining said range and said selected impedance amounts, a digital bidirectionally gatable up/down counter which is gated in response to selected changes in the level of primary-side current monitored by said current-monitoring means, with different counts stored in said counter effecting different output impedance amounts within said range, and
means operatively interconnecting said current-monitoring means and said counter, whereby the level of monitored primary-side current is effective to change the count stored within said counter so as to produce an output impedance amount within said preselected range which accommodates maximum output-current flow from said secondary side through said terminals.

4,233,562

APPARATUS AND METHOD FOR MONITORING WEB CONDUCTIVITY

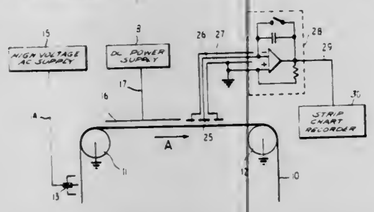
Anthony R. Blythe, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 7, 1979, Ser. No. 18,244

Claims priority, application United Kingdom, Nov. 8, 1978, 43733/78

Int. Cl.³ G01N *27/60*

U.S. Cl. 324—455 **10 Claims**



1. A method of assessing the electrical conductivity of a surface of a moving web comprising feeding the web in a forward direction, generating an electrical field by supplying a high voltage to an electrode extending in said forward direction and disposed adjacent the web, exposing said surface of the moving web to said electrical field so as to induce a redistribution, in a direction transverse to said forward direction, of the electrical charges present on that surface, whereby an electrical field signal is generated by the redistributed surface charges of opposite polarity to that of the electrode, and monitoring said electrical field signal.

4,233,563

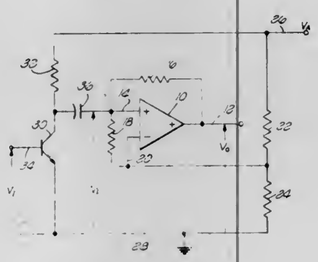
FREQUENCY SELECTIVE HYSTERESIS COMPARATOR

William A. Schanbacher, 347 S. Glasgow, Inglewood, Calif. 90301

Filed Sep. 6, 1978, Ser. No. 940,072

Int. Cl.³ H03K *9/06, 9/08, 5/08*

U.S. Cl. 328—138 **5 Claims**



1. A circuit, comprising:

(a) hysteresis comparator means for wave shaping a pulse train signal wherein the hysteresis loop transfer function of said comparator means has an input comparison region of a selected width whereby any signal driving said comparator and having a peak-to-peak amplitude less than said selected width of said input comparison region is not transmitted by said comparator, wherein said hysteresis comparator means comprises:

(1) a high gain differential amplifier having inverting input means, non-inverting input means, and output means;

(2) positive feedback resistor means coupled between said output means and said non-inverting input means;

(3) input resistor means coupled between said non-inverting input means and said inverting input means; and

(4) voltage divider means for providing a bias voltage to said inverting input means;

(b) means for applying an input signal to said comparator; and

(c) a differentiating network connected between said means for applying an input signal to said comparator and an input circuit for said comparator, wherein said differentiating network comprises:

(1) a capacitor coupled in series between said means for applying an input signal and said input circuit for said comparator, wherein said capacitor has a capacitance selected to cause said input circuit to function as a passive element differentiating network, wherein a relatively low frequency component of said input signal is attenuated relative to a pulse train signal component of said input signal, and wherein said pulse train signal component has a selected repetition rate at least as great as the frequency of said relatively low frequency component.

4,233,564

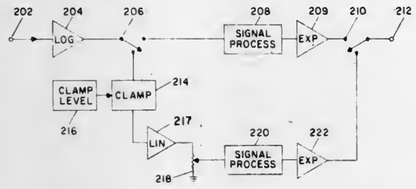
APPARATUS FOR CHANGING THE SCALE OF A LOGARITHMIC SIGNAL

Sheldon J. Kerbel, Merrick, N.Y., assignor to Hazeltine Corporation, Greenlawn, Nebr.W YORK

Division of Ser. No. 818,773, Jul. 25, 1977, Pat. No. 4,158,859. This application Sep. 5, 1978, Ser. No. 939,757

Int. Cl.³ H03K *5/08; G06G 7/24*

U.S. Cl. 328—145 **3 Claims**



1. Apparatus for modifying the scale of a supplied logarithmic signal having a reference level, comprising:

means for generating a clamping signal having a selected voltage level;

a clamping circuit for clamping the level of said logarithmic signal to the level of said clamping signal;

and means for linearly modifying the amplitude of said clamped logarithmic signal thereby to generate an output logarithmic signal having a different logarithmic scale than said supplied logarithmic signal.

4,233,565

METHOD AND APPARATUS FOR A PSK SIGNAL DETECTOR

Stanley J. Chmura, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 920,439, Jun. 29, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,494

Int. Cl.³ H04L *27/22*

U.S. Cl. 329—50 **15 Claims**

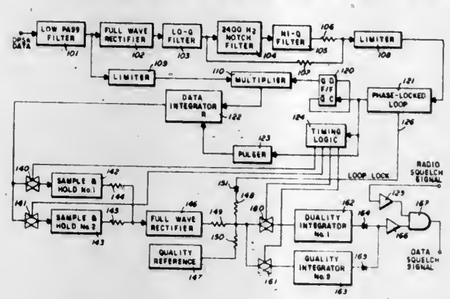
4. A method for detecting the presence of a phase-shift-keyed (PSK) data signal serially transmitted by a data clock signal having a predetermined bit frequency, and encoded on a carrier signal having a predetermined carrier frequency, wherein N half-cycle intervals of the carrier signal are provided for each data bit, said method comprising the steps of:

(a) recovering the carrier signal from the PSK data signal;

(b) cross-correlating the carrier signal and PSK data signal over each of the N half-cycle intervals to provide corresponding correlation signals;

(c) combining the N consecutive correlation signals and a reference signal to provide a combined signal for each data bit interval;

(d) integrating the combined signal during successive half-cycle intervals separated by one data bit interval, for a



predetermined time interval that is at most a half-cycle interval, to provide N quality signals; and

(e) providing an indication that the PSK data signal is present when the magnitude of at least one of the quality signals is greater than a predetermined magnitude.

4,233,566

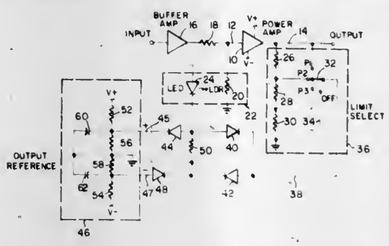
DISTORTION FREE POWER LIMITING AND CLIPPING PREVENTION CIRCUIT

Mioljub Nestorovic, Edmonds, Wash., assignor to Technical Audio Products Corporation, Redmond, Wash.

Filed Oct. 23, 1978, Ser. No. 953,754

Int. Cl.³ H03F *17/00*; H03G *3/20*

U.S. Cl. 330—59 **13 Claims**



1. In an amplifier for increasing the amplitude of an input signal in order to generate a relatively high amplitude output signal, said amplifier being powered by a DC power supply generating a DC supply voltage from an AC power input in which the magnitude of said supply voltage may vary to some extent responsive to variations in the voltage of said power input and the magnitude of said output signal in order to establish a clipping level for said amplifier, a circuit for limiting the level of said output signal to an output level which is a function of the magnitude of said supply voltage, comprising:

a voltage controlled attenuator connected to the input of said amplifier for reducing the amplitude of the input signal responsive to an attenuator control signal;

reference means for providing a preselected output reference which is a function of the magnitude of said supply voltage and of the clipping level of said amplifier such that said output reference corresponds to the maximum voltage of said output signal which varies in accordance with the variation of the supply voltage for said amplifier; and

comparator means receiving the output of said amplifier and said output reference for generating said control signal responsive to a predetermined percentage of said output signal reaching said output reference as said output signal approaches said clipping level whereby said amplifier may produce the maximum available power without clipping as the maximum available power varies.

4,233,567

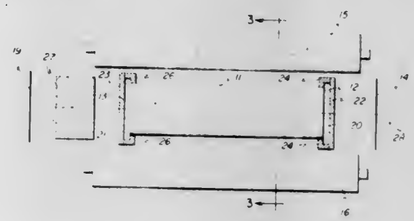
FACE-COOLED LASER DEVICE HAVING INCREASED ENERGY STORAGE AND OUTPUT

Joseph P. Chernoch, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 818,725, Jul. 25, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,045

Int. Cl.² H01S *3/045*

U.S. Cl. 331—94.5 P **27 Claims**



1. A face-cooled solid rod laser comprising:

a pair of aligned mirrors defining an optical resonant cavity therebetween;

a rod of optically active laser material disposed within said cavity and optically aligned with said mirrors and adapted, when irradiated with optical pumping radiation, to emit coherent radiation at a predetermined optical wavelength, said rod having a longitudinal axis and opposite end faces that are substantially parallel so as to permit passage of radiation along said axis;

means for optically pumping said rod situated alongside at least a portion of the longitudinal surface of said rod; and

means for maintaining said end faces at a predetermined temperature differential to establish a thermal gradient parallel to said longitudinal axis.

4,233,568

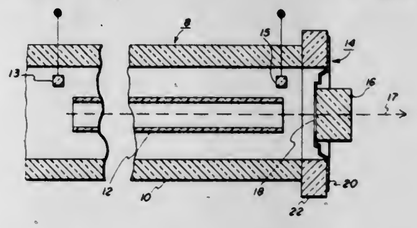
LASER TUBE MIRROR ASSEMBLY

Randolph W. Hamerdinger, and Robert C. McQuillan, both of Glendora, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,396

Int. Cl.² H01S *3/08*

U.S. Cl. 331—94.5 D **30 Claims**



1. An internal mirror type laser tube having an active medium contained in an elongated envelope and means for mounting a mirror to each end of the envelope, said mounting means comprising a metal member having an aperture formed therein, a mirror comprising a glass substrate having a reflecting layer formed on one surface thereof, and bonding means comprising a glass solder for bonding said glass substrate to said metal member in a manner whereby said reflecting layer is aligned

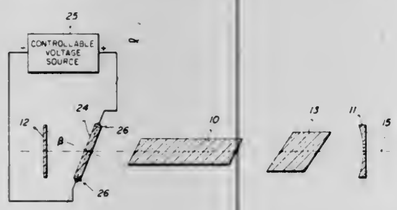
with said aperture, the glass substrate, bonding means and the metal member having co-efficients of thermal expansion which are substantially equal.

4,233,569

HIGH POWER LASER WITH TUNING AND LINE NARROWING CAPABILITY

Yung S. Liu, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,605
Int. Cl.[2] H01S *3/10*
U.S. Cl. 331—94.5 C **21 Claims**



1. A high power, Q-switched, tunable laser comprising:
an optically-resonant cavity having reflector means at either end thereof;
an active medium comprising neodymium-doped glass disposed within said cavity so as to emit optical energy in a direction normal to the reflecting surface of each of said reflector means;
an electro-optical phase-shifting cell disposed within the cavity in the path of the emitted optical energy; and
a birefringent filter situated within the cavity and having at least one face substantially at the Brewster angle with respect to the path of optical energy emitted from the active medium, said birefringent filter having refractive indices along mutually perpendicular α, β and γ directions and being cut with its β axis normal to said one face and being rotatable about said β axis.

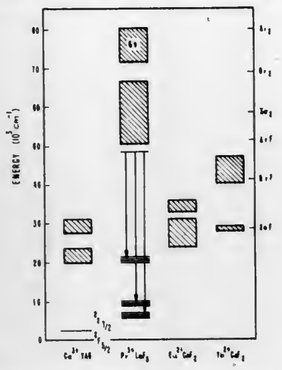
4,233,570

TUNABLE, RARE EARTH-DOPED SOLID STATE LASERS

John L. Emmett, Pleasanton; Ralph R. Jacobs, Livermore; William F. Krupke, Pleasanton, and Marvin J. Weber, Danville, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,633
Int. Cl.[3] H01S *3/16*
U.S. Cl. 331—94.5 F **7 Claims**

1. A method for producing tunable laser light in the visible and ultraviolet, the method comprising the steps of:
exciting a rare gas-halogen gas or rare gas dimer so that the gas emits radiation at a wavelengths substantially below $\lambda = 4500$ A;
directing a portion of the emitted radiation to a solid matrix which is doped by rare earth ion in a fraction 0.1-2.0% numerical density;
causing a substantial number of rare earth ions in the dopant to be excited into a 5d spectroscopic level of the ions by absorption of the emitted radiation;
allowing the excited rare earth ions to decay non-radiatively to an energy level substantially at the lower end of the 5d band that has a radiative lifetime exceeding 65 nsec.;
allowing the excited rare earth ion to decay radiatively from its position substantially at the lower end of the 5d absorption band, with the emission radiation at a wavelength in the wavelength region 1700 A $< \lambda <$ 5200 A.

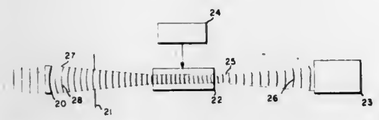


4,233,571

LASER HAVING A NONLINEAR PHASE CONJUGATING REFLECTOR

Victor Wang, Oxnard Beach, and Amnon Yariv, San Marino, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 27, 1978, Ser. No. 945,986
Int. Cl.[3] H01S *3/10*
U.S. Cl. 331—94.5 C **9 Claims**



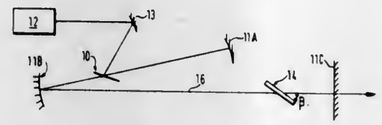
1. A laser, comprising:
a nonlinear phase conjugate reflecting means for providing light which is the phase conjugate of light incident thereupon;
partially transmissive reflecting means for transmitting a portion and reflecting a portion of the light incident thereupon;
a lasing medium disposed between said partially transmissive reflecting means and said nonlinear phase conjugate reflecting means, the combination thereof forming a laser resonator;
excitation means coupled to said lasing medium for exciting said laser medium and inducing laser operation; and
an aperture stop configured and disposed within said laser resonator adjacent to said partially transmissive reflecting means so as to create a reference for the phase conjugating process and restrict laser operation to a single lasing mode irrespective of phase aberrations within said laser resonator.

4,233,572

DYE LASER TUNER

Eugene G. Arthurs, Killearn, By Glasgow, and Anthony F. Purdie, Glasgow, both of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Nov. 16, 1978, Ser. No. 962,570
Claims priority, application United Kingdom, Apr. 1, 1978, 12840/78
Int. Cl.[3] H01S *3/081, 3/10*
U.S. Cl. 331—94.5 M **7 Claims**



1. A laser including a lasing medium which lases over a relatively wide band of wavelengths,
means effecting strong linear polarisation in one plane of the intracavity light beam,
and means of tuning the output wavelength of the laser, said tuning means comprising a wedged plate made of birefringent material located to intercept the beam of intracavity light, said plate having its incident surface oriented with respect to the incident light beam such that within the plate at the point of incidence the projection onto the plane normal to the light beam path of the normal from the incident plate surface is at an angle ϕ, substantially equal to an odd multiple of 45°, to the projection of the optic axis of the plate onto said plane and, the nominal plate thickness and the angle γ between the light beam path within the plate and the optic axis of the plate are such that the free spectral range of the plate is greater than the bandwidth of lasing wavelengths, and at one wavelength within the lasing bandwidth the components of incident-light along the fast and slow axes of the birefringent material have a relative retardation equal to an integral multiple of 2π,
and a linear translator drivingly connected to the tuning means so that the thickness of the plate traversed by the intracavity beam of light may be varied without alteration of the angles ϕ and γ whereby to effect tuning of the output wavelength of the laser within the lasing bandwidth.

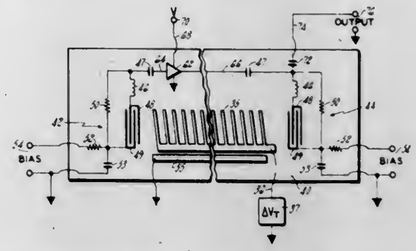
4,233,573

CARRIER CONCENTRATION CONTROLLED SURFACE ACOUSTIC WAVE VARIABLE DELAY DEVICES

Thomas W. Grudkowski, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1979, Ser. No. 11,612
Int. Cl.[3] H01L *41/04*; H03B *5/32*; H03H *9/25, 9/42*
U.S. Cl. 331—107 A **6 Claims**

1. An improved surface acoustic wave variable delay line comprising:
a piezoelectric and semiconductive substrate;
a rectifying contact disposed on a surface of said substrate;
a pair of acoustoelectric transducers disposed on said substrate at opposite ends of said contact for launching and detecting piezoelectric surface acoustic waves in said substrate beneath and contact at frequencies within a design range of frequencies;
a source of variable voltage connected to said contact for altering the concentration of carriers in said substrate, whereby variations in said voltage alter the potential and velocity of the surface acoustic wave in said substrate; in which the improvement comprises:



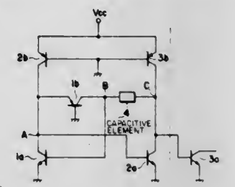
said rectifying contact being segmented, to thereby provide control over carrier concentration between and beneath the segments.

4,233,574

OSCILLATION CIRCUIT

Kenji Kaneko, Hachioji, and Takahiro Okabe, Hinodemachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 6, 1978, Ser. No. 922,370
Claims priority, application Japan, Jul. 15, 1977, 52-84278; Mar. 24, 1978, 53-33051; May 19, 1978, 53-66547[U]
Int. Cl.[3] H03B *5/36*; H03K *3/282*
U.S. Cl. 331—108 D **14 Claims**



1. A circuit comprising an amplifier having a first transistor which has a first load transistor connected to a collector thereof, a second transistor which has a second load transistor connected to a collector thereof, means for transmitting a collector output of said first transistor to a base of said first transistor, means for transmitting a collector output of said first transistor to a base of said second transistor, an input terminal connected to a base of said first transistor, and a first output terminal connected to a collector of said second transistor, further comprising a capacitive element which is connected between said input terminal and said first output terminal, so that a collector output of said second transistor is fed back to a base of said first transistor so that said circuit operates as an oscillator, wherein means for making a collector current of said second transistor and a collector current of said second load transistor substantially equal, thereby to shorten the oscillator start-up time.

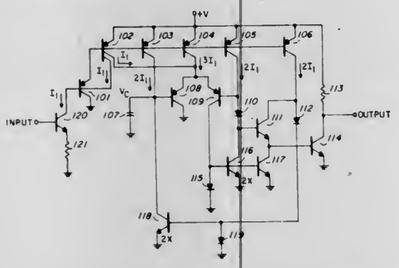
12. A circuit according to claim 9, wherein a current injected from the emitter to the base of said first load transistor is different from that of said second load transistor.

4,233,575

WIDE FREQUENCY RANGE CURRENT-CONTROLLED OSCILLATOR

Ronald H. Chapman, Wheaton, Ill., and Kenneth A. Hansen, Bedford, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 951,094, Oct. 13, 1978, abandoned.
This application Apr. 30, 1979, Ser. No. 34,303
Int. Cl.[2] H03K *3/26*
U.S. Cl. 331—111 **11 Claims**



1. A current-controlled oscillator for providing a digital output signal that is frequency controllable by an input control current, said current-controlled oscillator comprising:

timing-capacitor means for storing a timing-capacitor voltage;

current source means coupled to the timing capacitor means and the input control current for providing a first current having a predetermined magnitude dependent on the magnitude of the input control current;

differential voltage comparator means having first and second inputs, the second input coupled to the junction of the timing-capacitor means and the current source means for comparing the timing-capacitor voltage with the voltage at the differential-comparator first input and providing an output signal when the magnitude of the timing-capacitor voltage is greater than the magnitude of the voltage at the differential-comparator first input;

switchable current mirror means coupled to the junction of the timing-capacitor means and the current source means for sinking when enabled a second current having a magnitude that is related to the magnitude of the first current by a predetermined factor greater than one; and

switchable reference voltage means having first and second reference voltages, the first reference voltage greater than the second reference voltage, said switchable reference voltage means coupling the first reference voltage to the differential-comparator first input, disabling the switchable current mirror means to charge the timing capacitor means and providing a predetermined second state of the digital output signal when the differential-comparator output signal is not present, and coupling the second reference voltage to the differential-comparator first input, enabling the switchable current mirror means to discharge the timing capacitor means and providing a predetermined first state of the digital output signal when the differential-comparator output signal is present.

4,233,576

AUTOMATIC POLARIZATION DECOUPLING NETWORK

Guy M. Pelchat, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed May 16, 1978, Ser. No. 906,687
Int. Cl.[2] H01P *1/16*; H04B *1/10*
U.S. Cl. 333—16 **11 Claims**

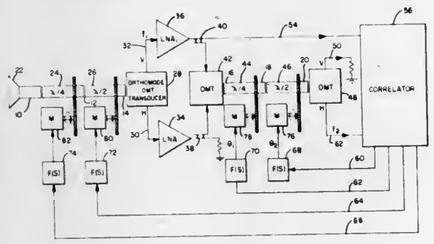
1. An automatic polarization decoupling network for reestablishing the orthogonality of at least a first and second originally orthogonally polarized transmitted signals which are cross-coupled comprising:

input means for receiving said first and second transmitted signals;

first means, coupled to said input means, for linearizing said first signal and rotating said linearized first signal to a predetermined reference direction;

first separator means, coupled to said first means, for separating the energy in said two signals which is polarized in said predetermined reference direction from the energy in said two signals polarized in a direction orthogonal to said predetermined reference direction, said energy polarized in said predetermined reference direction and said direction orthogonal to said predetermined reference direction being applied to first and second lines, respectively;

combining means, coupled to said first and second lines, for recombining at least part of the energy of said first and second lines;



second means, coupled to said combining means, for linearizing said second signal and rotating said linearized second signal to a direction orthogonal to said predetermined reference direction;

second separator means, coupled to said second means, for separating the energy in said two signals which is polarized in said predetermined reference direction from the energy in said two signals polarized in a direction orthogonal to said predetermined reference direction, said energy polarized in said predetermined reference direction being applied to a third line; and

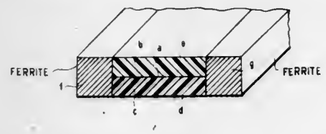
correlator means, coupled to said second line and said third line, for appropriately correlating the signals on said second line and said third line and generating a plurality of control signals for controlling the linearization and rotation of said first and second signals in said first and second linearizing and rotating means.

4,233,577

FLAT TRANSMISSION PATH FOR COMMUNICATION SYSTEM

Dalmazio Raveglia; Carlo Lonati, both of Milan, and Giancarlo Macchi, Arzago D'Adda, all of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jun. 11, 1979, Ser. No. 47,586
Claims priority, application Italy, Jun. 12, 1978, 24464 A/78
Int. Cl.[3] H01P *5/12, 3/00*; H01B *11/00*
U.S. Cl. 333—136 **5 Claims**



1. A transmission path for a communication system operating with pulsed signals, comprising:

a flat elongate inner conductor and two flat elongate outer conductors bracketing said inner conductor, said inner and outer conductors being substantially coextensive in width, the effective thickness of each of said conductors in a common transverse plane being at most on the order of magnitude of the penetration depth of an alternating current at a frequency in the kHz range;

two dielectric layers of substantially the same width as said conductors and of greater thickness than the latter separating said inner conductor from said outer conductors, thereby forming with said conductors a stack of substantially rectangular cross-section; and

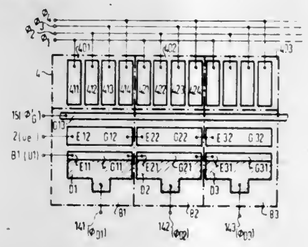
ferromagnetic elements alongside said stack for maintaining the lines of force of a magnetic field, generated by said pulse signals, substantially parallel to said conductors at the minor sides of said cross-section.

4,233,578

TRANSVERSAL FILTER

Karl Knauer, Kirchseeon, and Hans-Jörg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,780
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813971; Mar. 31, 1978, 2813972; Mar. 31, 1978, 2813997; Mar. 31, 1978, 2813998
Int. Cl.[2] H03H *7/28*; H03K *5/156*; G11C *19/28*
U.S. Cl. 333—165 **8 Claims**



1. A transversal filter comprising:

a doped semiconductor substrate;

an analog charge transfer device multistage shift register integrated on said substrate and including a transfer channel, a plurality of inputs and an output, each of said stages including a plurality of shift electrodes for receiving respective repetitive shift pulses; and

a plurality of evaluation circuits assigned to said shift register inputs and each including

a zone, separated on said substrate from like zones, and doped opposite to the doping of said substrate,

a respective electrical terminal for said oppositely doped zone for receiving first pulse voltages at a pulse repetition rate higher than the shift pulse repetition rate,

a first input gate and a second input gate, one of said input gates connected to receive an input signal and the other input gate connected to receive a constant DC voltage, and

a transfer gate directly adjacent said transfer channel and an electrical terminal connected thereto for receiving second voltage pulses.

4,233,579

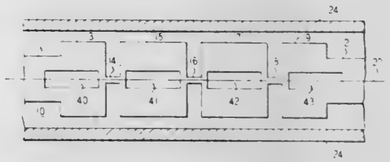
TECHNIQUE FOR SUPPRESSING SPURIOUS RESONANCES IN STRIP TRANSMISSION LINE CIRCUITS

Eric R. Carlson, Fair Haven; Martin V. Schneider, Holmdel, and Ralph F. Trambarulo, Red Bank, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 6, 1979, Ser. No. 45,992
Int. Cl.[3] H01P *1/203, 3/08*
U.S. Cl. 333—204 **7 Claims**

1. A strip transmission line circuit comprising a layer of an electrically conductive material which is deposited on a dielectric substrate (10), the layer being fabricated into a predetermined pattern of various width sections along a longitudinal axis (20) thereof to form various circuit elements which includes a wide section that forms a capacitive element (13, 15, 17 or 19)

CHARACTERIZED IN THAT



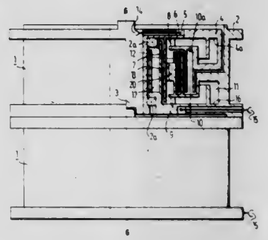
the wide section forming the capacitive element comprises an aperture (40, 41, 42 or 43) having dimensions which cause transverse resonances that may be excited in the strip transmission line circuit to be displaced outside a desired frequency band of interest.

4,233,580

ROTATING COUPLER FOR TRANSMITTING HIGH FREQUENCY ENERGY

Leo Treczka, Munich, and Georg Spinner, Feldkirchen-Westerham, both of Fed. Rep. of Germany, assignors to Spinner GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,849
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653209; Nov. 23, 1976, 2653210
Int. Cl.[3] H01P *1/06, 7/06*
U.S. Cl. 333—261 **18 Claims**



1. A rotary coupler for coupling two relatively rotating circuits, said rotary coupler comprising:

first means defining a free inner space which permits connection leads to pass therethrough;

said rotary coupler having its rotational axis extending lengthwise through said iner space; and

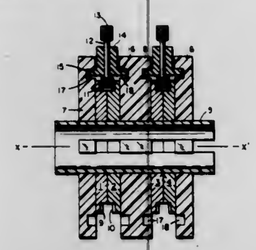
second means defining a resonant circuit disposed outside of said inner space and including folded resonant spaces, one of said folded resonant spaces being for energy transmission, and at least one of said folded resonant spaces being equal to between one-fourth and one-half, inclusive, of the principal wavelength to be transmitted via said rotary coupler.

4,233,581

MECHANISM FOR STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES

Claude Beaucamp, Montville, France, assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 21, 1979, Ser. No. 22,533
Claims priority, application France, Mar. 24, 1978, 78 08743
Int. Cl.[3] H01F 7/00
U.S. Cl. 335—212 6 Claims



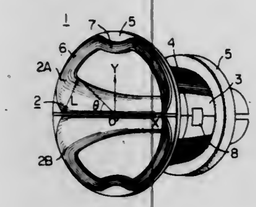
1. An improved color television picture tube static convergence device having a mounting sleeve for attachment to the neck of said tube, having at least one pair of magnetic rings rotatably mounted on said sleeve, each of said magnetic rings constructed and assembled with bevel gears located on their periphery facing each other, and having a rotatable rod radially directed with one end of said rod affixed to a knob and the other end of said rod affixed to a pinion engaged in said bevel gears of said magnetic rings, the improvement comprising non-rotatable non-magnetic rings mounted on said sleeve on either side of said pair of magnetic rings, each of said non-magnetic rings being provided with at least one circular groove located near the periphery of said ring on at least one side of said ring, a guide-member having bent ledges affixed thereto at least one point on each side thereof, said guide-member slidably mating with said grooves, said guide member being provided with a hole rotatably positioning said rod and pinion with respect to said bevel gears.

4,233,582

DEFLECTION YOKE FOR USE WITH WIDE ANGLE DEFLECTION SYSTEM

Masayuki Abe, Yokohama, and Yuji Fujihira, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1978, Ser. No. 910,345
Claims priority, application Japan, Aug. 24, 1977, 52-101432
Int. Cl.[3] H01F 5/00
U.S. Cl. 335—213 14 Claims



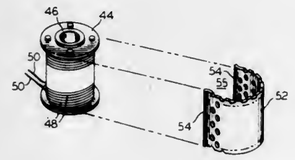
1. In a deflection yoke for use with a picture tube of a television receiver set comprising a cylindrical core, a vertical deflection coil toroidally wound around said core, and a pair of saddle-type horizontal deflection coils disposed to extend through said core, each of said horizontal coils having a winding width for producing a pincushion shaped deflection field at a front side of the yoke near a face plate of said picture tube due to passage of current through the horizontal coils so that a vertical pincushion distortion on the face plate is reduced and arched front and rear fringes on the front side near the face of said picture tube and on a rear side far from the face plate, respectively, the improvement wherein the front fringe on the front side of each of said horizontal deflection coils is so shaped that a center portion of said front fringe is so deformed that a distance between the center portion of said front fringe and a center axis of said deflection yoke is shorter than distance between any portion other than said center portion of the front fringe and said center axis, whereby a secondary harmonic distortion of the vertical pincushion distortion is reduced.

4,233,583

FLUX SHIELDED SOLENOID

William G. Novacek, South Egremont, Mass., assignor to Bicron Electronics Company, Canaan, Conn.

Filed Sep. 22, 1978, Ser. No. 944,793
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—236 4 Claims



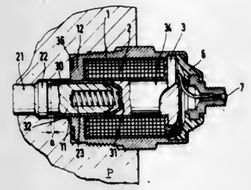
1. In a solenoid assembly the combination comprising:
a. a coil including leads and a winding connected electrically between said leads for flow of current through said winding to produce a magnetic field when a potential difference is impressed across said leads, said winding having a longitudinally extending interior surface circumscribing an interior flux path and also having an exterior surface including two end surfaces and a longitudinal outer surface extending longitudinally between said end surfaces;
b. a ferromagnetic armature supported for longitudinal movement relative to one of said ends of said coil in response to magnetic flux produced by said coil, said armature including an elongated ferromagnetic bar extending longitudinally of said coil and biased to a first position in which it is partially inserted into the interior flux path of said coil, current greater than predetermined minimum causing enough force to be applied to said bar to move it from said first position to a second position in which it is further inserted into the interior flux path of said coil;
c. a bracket including a body portion and first and second arm portions extending transversely from opposite ends of said body portion, said body portion lying in a plane extending generally longitudinally of the axis of said coil, said arm portions extending over said end surfaces of said coil, said bar extending from said interior flux path of said coil beyond the plane of a first of said end surfaces of said coil when said armature is in said first position;
d. an actuating door pivotally mounted on said bracket, extending over said first end surface of said coil, and connected to the part of said bar extending beyond the plane of said first surface for pivotal movement of said door when said armature moves between said first position and said second position;
e. a ferromagnetic collar substantially surrounding said longitudinal surface of said coil to provide a high-permeability flux path exterior to and longitudinal of said coil; and
f. a thermosetting synthetic resin member extending about said longitudinal surface of said coil, said resin member encasing at least a portion of said collar and being bonded thereto.

4,233,584

FLUID-SEALED, ELECTROMAGNETIC VALVE OPERATING STRUCTURE, PARTICULARLY FOR COMBUSTION ENGINE FUEL INJECTION SYSTEM

Paul Füssner, Sindelfingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,116
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1978, 7809106[U]
Int. Cl.[3] H01H 7/08
U.S. Cl. 335—260 7 Claims



1. Fluid-sealed, electromagnetic positioning device, particularly for use as an electromagnetic valve operator suitable in a fuel injection system of an internal combustion engine having
a housing (1);
a solenoid coil (2) positioned in the housing and formed with a central, tubular opening;
a magnetic core element (34) having a portion extending across said opening;
a magnetic armature (32) longitudinally movable in said opening;
a sealing sleeve (30) extending into the tubular opening to seal the interior of the solenoid against fluid, the flow of which is to be controlled, and to guide the longitudinal movement of the armature,
a closed bottom (31) formed on the sealing sleeve and positioned in close engagement with the inner face of the portion of the core (34) extending across said opening;
and an abutment (22) formed on the armature (32), said abutment being positioned beyond the end of the sleeve (30), the length of the sleeve and the position of the abutment being matched with respect to the length of travel of the armature (32) upon energization of the solenoid coil (2) to provide for a gap between the abutment (22) and the end of the sleeve (30) and maintenance of a gap between the end of the armature and the portion (34) of the core extending across the opening which is determined by the thickness of the closed bottom (31) of the sleeve to prevent sticking of the armature to the core and damage to the end of the sleeve (30) facing said abutment (22).

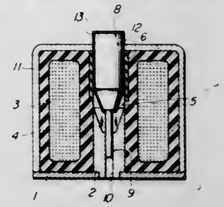
4,233,585

PLUNGER TYPE ELECTROMAGNET

Shun-ichiro Sugimoto, and Hisazi Shinoki, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 8, 1979, Ser. No. 18,735
Claims priority, application Japan, Mar. 10, 1978, 53-26560
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—262 2 Claims

1. A plunger type electromagnet comprising:
a plunger body slidingly moved by an electromagnetic force; and
a guide for guiding said plunger body in its sliding movement; wherein the improvement resides in applying a resin coat to a surface of said plunger body which surface is brought into sliding contact with said guide, and in using a resinous material for forming at least a portion of said



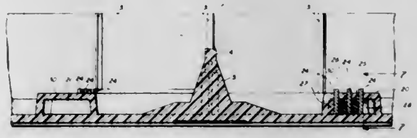
guide which portion is brought into sliding contact with said plunger body.

4,233,586

DISK PACK BOTTOM COVER WITH MAGNETIC LATCH

Roy Kaplow, Newton; David E. Butz, Littleton, and Alan L. Stenfors, Scituate, all of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Jan. 8, 1979, Ser. No. 1,596
Int. Cl.[3] H01F 3/00, 7/02
U.S. Cl. 335—303 11 Claims



1. A magnetically latched bottom cover for a disk pack container, the cover being of the type constructed of a non-magnetic material and having a floor from which a central post extends upwardly, the improvement comprising:
(1) an annular retaining ring of non-magnetic material, the retaining ring surrounding the central post and being attached to the floor of the cover, the retaining ring providing a channel therein, and the retaining ring having parallel elongate slots extending therethrough to the channel,
(2) a plurality of parallel elongate plates disposed in the annular channel and extending through the parallel slots,
(3) a permanent magnet situated in the channel between two adjacent parallel plates whereby the plates act as magnetic poles of opposite polarity, and
(4) means associated with the pole plates whereby the pole pieces are prevented from being pulled through the slots and the pulling forces are transmitted to the retaining ring and therethrough to the bottom cover.

4,233,587

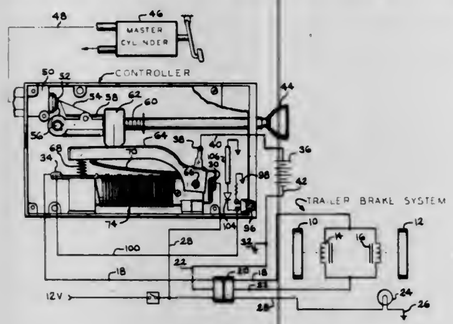
ELECTRIC BRAKING SYSTEM

Robert F. Augustine, Greendale, Wis., assignor to Kelsey Hayes Co., Romulus, Mich.

Filed Aug. 25, 1978, Ser. No. 937,009
Int. Cl.[3] H01C 10/16
U.S. Cl. 338—96 18 Claims

1. A controller for an electric braking system and the like comprising: a longitudinally extending electrical resistor element having an electrically conductive surface, a longitudinally extending contact element supported for initial contact at one end of said electrically conductive surface and for progressive contact thereafter along the electrically conductive surface toward the other end, first electrical terminal means connected to said longitudinally extending contact and second electrical terminal means connected to said other end of said

electrical resistor element, said electrically conductive surface having alternate plateaus and valleys which cause said contact



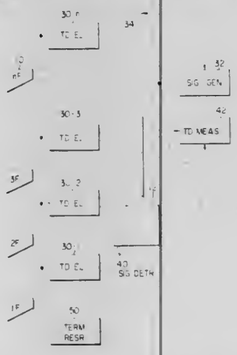
element to successively engage the plateau areas of said electrically conductive surface and bridge across said valleys.

4,233,588

ELEVATOR POSITION DETECTOR

Tsuyoshi Satoh, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1979, Ser. No. 34,008
Claims priority, application Japan, May 29, 1978, 53/63995
Int. Cl.[2] G08B *21/00*; B66B *3/02*
U.S. Cl. 340—21 **3 Claims**



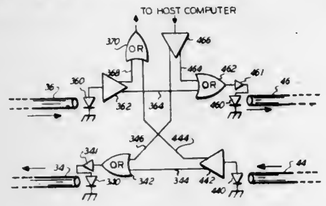
1. An elevator position detector device comprising, a hoistway, a plurality of landing floors disposed at equal intervals beside said hoistway, an elevator car for traveling in either of an upward and a downward direction within said hoistway and selectively stopping at said landing floors, a signal transmission line disposed along said hoistway, a signal generator for transmitting a signal to said signal transmission line, a plurality of signal delay elements disposed within said hoistway one for each landing floor and connected in a cascade manner to said signal generator through said signal transmission line to be successively applied with said signal, each of said signal delay elements being located at a position where a time delay corresponding to the associated landing floor is imparted to said signal passed therethrough, a signal detector disposed on said elevator car to detect said signal on said signal transmission line, and delay time measurement means connected to both said signal generator and said signal detector to measure a time delay of said signal detected by said signal detector with respect to signal delivered by said signal generator from which said detected signal results, thereby to determine a position of said elevator car.

4,233,589

ACTIVE T-COUPLER FOR FIBER OPTIC LOCAL NETWORKS WHICH PERMITS COLLISION DETECTION

Eric G. Rawson, Saratoga, and Robert M. Metcalfe, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1979, Ser. No. 43,391
Int. Cl.[2] H04Q *9/00*; H04B *9/00*
U.S. Cl. 340—147 R **7 Claims**



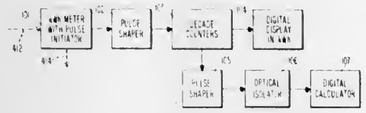
1. An active T-coupler for fiber optic communication networks wherein the improvement is characterized by:
- input detection means (**360, 440**) for each of a plurality of input fiber optic data busses (**36, 44**) each for generating electrical signals upon receipt of light signals on the related one of said input fiber optic data business,
- means (**362, 442, 370**) coupled to said input detection means for transmitting said received signals to a utilization device and further output circuitry,
- means (**466, 462, 342**) coupled to said utilization device for receiving signals generated by said utilization device, and
- output generation means (**340, 341, 460, 461**) for each of a plurality of output fiber optic data busses (**34, 46**) coupled to said input detection means for any and all related input data bus or busses and said means for receiving signals generated by said utilization device, each for generating light signals in response to said signals generated by said utilization device or to be repeated as light signals in response to the electrical signals from said input detection means as related to said input fiber optic data busses.

4,233,590

SUPPLEMENTAL ENERGY REGISTER

Robert F. Gilkeson, 1084 Broadview Rd., Wayne, Pa. 19087, and John B. Blose, 2195 Winding Way, Broomall, Pa. 19008

Division of Ser. No. 798,943, May 20, 1977. This application Feb. 27, 1978, Ser. No. 881,580
Int. Cl.[2] G08G *19/16*; G01R *21/06*
U.S. Cl. 340—870.04 **8 Claims**



1. In a local energy consumer network, apparatus for evaluating cumulative energy consumption and the net cost thereof, comprising:
- (a) metering means, in circuit with said network, for detecting consumption of successive specified increments of energy, said in circuit metering means providing successive pulses as indicative of current flow;
- (b) pulse shaper means, responsive to said in circuit metering means, for generating an actuating pulse of predetermined duration, upon detection of each said successive pulse provided by said in circuit metering means;
- (c) counter means incremented upon each occurrence of a said actuating pulse from said pulse shaper means;

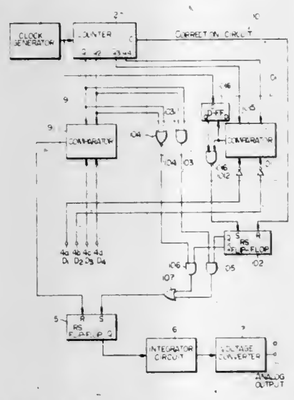
- (d) means, responsive to said counter means, for producing control pulses in respective response to each said specified increment of said counter means;
- (e) calculator display means, calibrated at a prevailing rate of cost per said specified increment, for presenting cumulative energy cost increments; and
- (f) electrically isolating coupling means, responsive to said means for producing control pulses, for incrementing said calculator display means by one of said cost increments per each said control pulse.

4,233,591

DIGITAL-TO-ANALOG CONVERTER OF THE PULSE WIDTH MODULATION TYPE

Toshinori Murata; Shigeo Matsuura; Hiroshi Miyamoto, and Eisaku Akutsu, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 19, 1978, Ser. No. 916,565
Claims priority, application Japan, Jun. 20, 1977, 52-72055
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 DA **26 Claims**



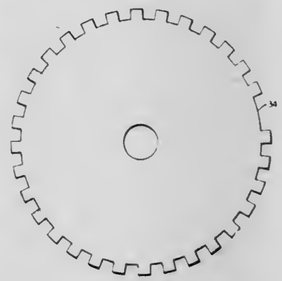
1. A digital-to-analog converter of the pulse width modulation type comprising a clock pulse generator; a counter of plural-bit capacity coupled to the output of said clock pulse generator for counting the output clock pulses therefrom and for producing a carry-out signal when the count content of said counter becomes zero;
- input terminals for the supply of input digital data bits to be converted into an analog signal provided in number corresponding to the bit capacity of said counter;
- a flip-flop having a set input, a reset input and an output terminal; an integrator connected to the output terminal of said flip-flop for integrating the pulse widths of the output signal from said flip-flop;
- wherein the bits of said counter are classified into two groups of a predetermined number of more significant bits and of the remaining number of less significant bits, while the digital input data bits are classified correspondingly into two groups of a predetermined number of more significant bits and of the remaining number of less significant bits;
- first means coupled between said less significant bit terminals of said counter, said digital data input terminals for said more significant bits and said reset input for controlling said flip-flop to divide the counting cycle period of said counter into 2^m elementary sub-periods, where m represents the number of said less significant bits at said digital data input terminals and to allocate a certain number of pulses to each of said elementary sub-periods in dependence on the data value of said more significant bits at said digital data input terminals; and second means connected to the more significant and less significant bit terminals and the carry-out output terminal of said counter, to said digital data input terminals for said less significant bits and to the set input of said flip-flop for controlling the setting of said flip-flop to provide the pulses in said elementary sub-periods under the control of said first means and to provide additional correction elementary pulses to said flip-flop to be allocated to selected ones of said elementary sub-periods in dependence on the data value of said less significant bits of said digital input data.

4,233,592

METHOD FOR DETECTION OF THE ANGULAR POSITION OF A PART DRIVEN IN ROTATION AND INSTRUMENTATION USING IT

Claude Leichle, Le Pecq, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 4, 1978, Ser. No. 966,217
Claims priority, application France, Dec. 2, 1977, 77 36283
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 P **9 Claims**



1. A method of detecting the angular position of a part driven in rotation, integral with a disk provided on its periphery with a succession of mechanically identical teeth and notches and having one tooth removed to constitute an absolute reference, comprising the steps of:
- locating a position sensor next to the periphery of the disk to detect the passage of the teeth and notches;
- opertating a pulse generator at a frequency F;
- resetting a counter-store to zero each time the position sensor detects the passage from a notch to a tooth;
- accumulating in the counter-store the pulses of frequency F when a tooth is passing the position sensor;
- emptying the counter-store at the frequency F/2 when a notch is passing the position sensor;
- detecting the natural passage of the counter-store through the value zero, this instant corresponding to the falling edge of the absent tooth; and
- modifying at said instant the state of a flip-flop.

4,233,593

CAPACITIVE TOUCH CONTROL AND DISPLAY

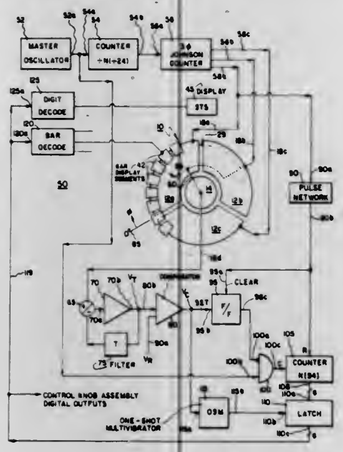
John E. Bigelow, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 879,368, Feb. 21, 1978, Pat. No. 4,158,216. This application Jun. 12, 1978, Ser. No. 914,373
Int. Cl.[2] G06F *3/02*; H01H *19/00*
U.S. Cl. 340—365 C **13 Claims**

11. A capacitive control assembly for use on a solid panel having front and rear surfaces, comprising:
- a plurality (M) of input electrodes disposed about a common center and fabricated upon said panel rear surface; the centers of adjacent input electrodes separated from one another by an angle about said common center substantially equal to (360/M) degrees, where M is an integer greater than one;
- a movable electrode positioned adjacent to said panel front

surface and rotationally alignable to overlap one portion of at least one of said input electrodes to vary the electrical capacitance between said movable electrode and those of said plurality of input electrodes overlapped by said movable electrode;

means connected to each of said plurality of input electrodes and to said movable electrode for recognizing a change in differential capacitance between the movable electrode and each of the plurality of input electrodes to determine the rotational position of said movable electrode with respect to a reference point;



means magnetically attachable to and detachable from said panel front surface for supporting said movable electrode at a fixed distance parallel to said panel front surface during rotation of said movable electrode; and

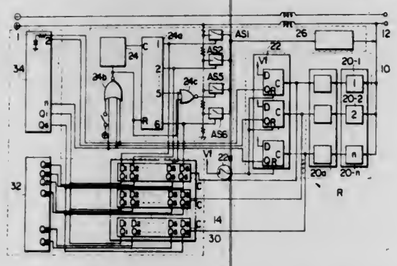
a disk electrode positioned upon said panel rear surface and within the annulus formed by said plurality of input electrodes, said disk electrode being capacitively coupled to said movable electrode through said supporting means and directly coupled to said capacitance recognizing means.

4,233,594

FIRE DETECTION AND OBSERVATION SYSTEM

Takeshi Tanigawa, Machida, and Yukio Yamauchi, Kawasaki, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,954
Claims priority, application Japan, May 18, 1978, 53/59092
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—525 **5 Claims**



1. A fire observation system capable of detecting the break of a fire at a place and searching the development of fire at the place and at an area surrounding the place, said system comprising

a central receiving device including

a means having three output stages and forming detection mode changing signals so as to substantially feed three kinds of output, said three output stages comprising a first output stage for feeding first detection mode changing signals to detect an extent of relatively small quantity of matter, a middle output stage for feeding middle detection mode changing signals to detect an extent of reference quantity of matter, and a second output stage for feeding second detection mode changing signals to detect an extent of relatively large quantity of matter,

a plurality of AND means having at least two input terminals and an output terminal, and feeding the values of impressed detection mode changing signals by impressing the output of detection mode change signal forming means to one of input terminals and applying a signal to the remaining input terminal, and

a display means having the output values of AND means applied thereto and displayed therein; and

a plurality of remote fire detectors including

a plurality of fire detecting means for detecting a matter and feeding an electrical signal corresponding to the quantity of matter detected,

fire signal output means equal in number to said fire detecting means and to which the electrical signals of fire detecting means and the detection mode changing signals are impressed to feed controlled outputs under the output requirement determined by these electrical signals and detection mode changing signals, and

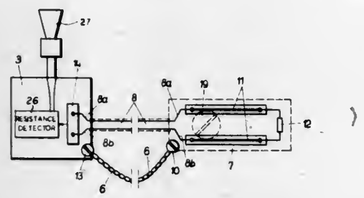
intrinsic signal feeding means receiving the outputs of fire signal output means to form an intrinsic signal allotted to each of fire detecting means and supplying the intrinsic signal to the remaining input terminal of AND means corresponding to the fire detecting means.

4,233,595

CHAIN-TYPE DOOR LATCH AND ALARM

Franz J. Landkammer, Neu-Anspach, Fed. Rep. of Germany, assignor to Christoph Emmerich KG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,923
Int. Cl.[3] G08B *13/06*
U.S. Cl. 340—542 **13 Claims**



1. A door latch and alarm apparatus comprising:

a door-mounted support;

a doorjamb-mounted support;

a relatively inextensible and flexible element anchored to said door support and having a free end provided with an end piece receivable in said doorjamb support;

latch means including key-operable mechanism on said doorjamb support for releasably securing said end piece thereto, whereby the door can open a limited distance from the doorjamb before said element becomes taut and impedes further opening;

circuit means including a pair of conductors extending between said door support and said end piece and a relatively fragile connector in said end piece forming a closed conductive path with said conductors, said connector being so much weaker than said element that when same is stressed beyond a certain limit said connector interrupts said path before said element breaks; and

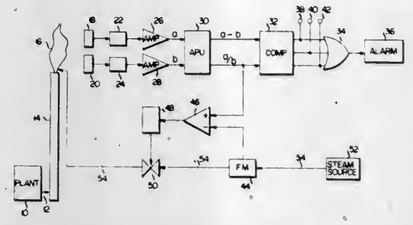
alarm means on said door-support connectable to said conductors for emitting an alarm when said path is interrupted.

4,233,596

FLARE MONITORING APPARATUS

Hiroo Okamoto, Tokyo, and Shunsaku Nakauchi, Mitaka, both of Japan, assignors to Showa Yuka Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1978, Ser. No. 933,869
Claims priority, application Japan, Aug. 24, 1977, 52-101363
Int. Cl.[2] F23N *5/08*; G01J *1/18*
U.S. Cl. 340—578 **3 Claims**



1. A flare monitoring apparatus comprising:

a means for measuring a first emissive power of infrared radiation emitted from a flare at a first wave length which a peak of emissive power due to a resonance infrared radiation from a specified gas contained in a flue gas in the flare exists and a second emissive power of infrared radiation emitted from the flare at a second wave length at which no peak of emissive power due to a resonance infrared radiation exists;

a means, responsive to said measuring means, for calculating the ratio or difference between said first and second emissive powers and for producing signals corresponding respectively to said ratio and difference and representing a burning state of the flare including the generation of black smoke in the flare, excessiveness of the flare and the extinguishment of the flare;

a means for detecting the burning state of the flare including a comparator which receives said signals from said calculating means for producing an output signal when said signals exceed or fall below predetermined reference levels; and

an alarm for receiving said output signal from said detecting means and producing an alarm;

wherein the generation of black smoke in the flare is detected based on said ratio, and the excessiveness of the flare and the extinguishment of the flare are detected based on said difference.

4,233,597

DEVICE INDICATING A STATE DUE TO THE PRESSURE MODIFICATION

Gerhard Kurz, Industriestrasse, 7261 Althengstett, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,426
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712201
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—626 **6 Claims**

1. An apparatus for indicating pressure variations caused by the accumulation of dust in a vacuum cleaner, said apparatus comprising:

a housing having two hollow ends and an intermediate chamber portion having an outer periphery smaller than the outer periphery of at least one of said hollow ends therebetween;

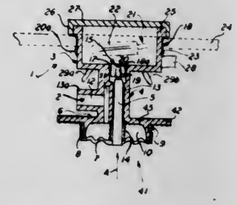
a diaphragm directly secured over a first hollow end of said housing to form a first chamber;

a lamp disposed in a second hollow end of said housing;

switching means disposed within said intermediate chamber, said switching means comprising a contact element secured to said housing adjacent said second hollow end and a contact pin slidably mounted in the housing and having one end connected to the diaphragm and its other end adjacent the contact element;

means for resiliently urging said contact pin away from said contact element;

means for adjustably varying the position of the contact element with respect to the contact pin, said adjustable varying means being accessible from the second hollow end of the housing;



said housing being insertable into a receiving opening of the vacuum cleaner such that the lamp remains exposed exteriorly of the vacuum cleaner and the adjustable varying means is accessible from the exterior of the vacuum cleaner;

said chamber portion having an outwardly extending conduit including a port being connected to a pressure source in the vacuum cleaner which in conjunction with the pressure exteriorly of the diaphragm, is indicative of the pressure variations of the vacuum cleaner, and further having a fluid passageway adjacent said intermediate chamber connecting said conduit to said first chamber, and

electrical circuit means for illuminating said lamp upon contact of said contact pin with the contact element.

4,233,598

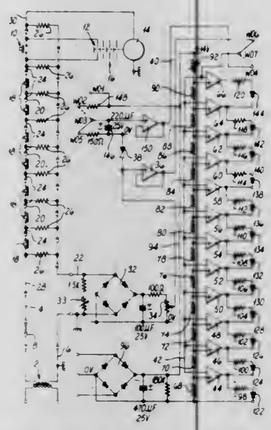
EMERGENCY STOP CIRCUIT MONITORING SYSTEM

Robert J. Green, and Gerald A. Hales, both of Deptford, England, assignors to Molins Limited, England

Filed Aug. 18, 1978, Ser. No. 934,884
Claims priority, application United Kingdom, Aug. 30, 1977, 36119/77
Int. Cl.[3] G08B *25/00*
U.S. Cl. 340—652 **8 Claims**

1. A monitoring system for use with a power supply line including a series of sections in which open circuit conditions may occur, said monitoring system comprising: a plurality of monitoring impedances each having one side connected to a different section of the supply line; a common monitoring line connected in parallel to said sections of said supply line; the other side of each monitoring impedance being connected to the monitoring line; summing means connected to the monitoring line for summing the currents in the monitoring impedances and for producing an analogue voltage proportional to the sum of the said currents; comparator means adapted to compare the said analogue voltage with a plurality of preset

reference voltages; and indicator means connected to the said comparator means so as to provide an indication of the level of



the analogue voltage and thus the position of the supply interruption.

4,233,599

MALFUNCTION DETECTOR FOR SPEED SENSORS

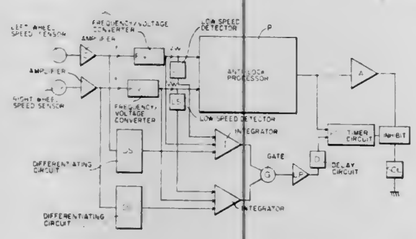
Malcolm Brearley, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 28, 1979, Ser. No. 16,351

Claims priority, application United Kingdom, Feb. 28, 1978, 07794/78

Int. Cl.³ G08B *21/00*; B60Q *1/00*

U.S. Cl. 340—679 **14 Claims**



8. Means for monitoring operation of a speed sensor that generates a pulse signal with a repetition frequency related to the speed being sensed, the means comprising a convertor for deriving an analogue speed signal from said pulse signal, integrating means for integrating said analogue speed signal in the periods between successive pulses of said pulse signal so as to obtain a separate integrated sum for each period, and comparison means for comparing the integrated sum obtained from said integrating means for each period with a reference value corresponding to a limit for normal generation of pulses so that a warning signal is produced if said integrated sum exceeds said reference.

4,233,600

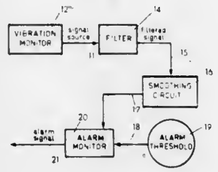
METHOD AND SYSTEM FOR DETECTING PLATE CLASHING IN DISC REFINERS

James H. Rogers, Beaconsfield, and Donald J. Butler, Grand Falls, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Filed Jun. 7, 1978, Ser. No. 913,409

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—683 **10 Claims**



1. A refiner plate clash detection system comprising:

(a) means for receiving a first signal having a significant increase in level at at least one distinct predetermined frequency related to the clash and the characteristics of the discs of the refiner,

(b) filter means having a passband matched to pass said distinct frequency of said signal to provide a filtered output signal in which the center frequency of the passband of the filter is determined by the formula

$$f_o = n \Sigma_R$$

wherein

f_o is the center frequency (expressed in Hertz) of said passband

n = the number of segments at a given radius, per single disc and

Σ_R = the sum of the rotational rates (expressed in Hertz) of the two discs enclosing a given refining volume,

(c) means for smoothing said filtered signal,

(d) means for establishing a threshold level,

(e) comparator means for receiving said smoothed signal and for comparing it with said threshold level and for providing an output signal of predetermined form, upon said smoothed signal's exceeding said threshold level, and

(f) means for receiving said output signal for generating an alarm operation signal in response thereto.

4,233,601

DISPLAY SYSTEM

Harold C. A. Hankins, Glossop; Gordon Hughes, Macclesfield, and Robert W. Laker, Polegate, all of England, assignors to International Computers Limited, London, England

Filed Mar. 31, 1978, Ser. No. 892,206

Claims priority, application United Kingdom, Apr. 4, 1977, 14122/77

Int. Cl.² G06F *3/14*

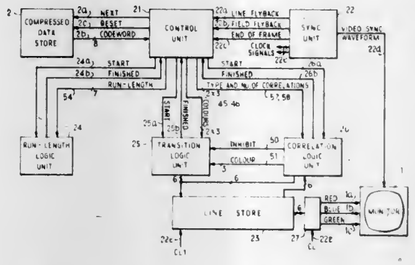
U.S. Cl. 340—703 **6 Claims**

1. Decoding apparatus for providing a drive output for a display device arranged to produce a display formed of a plurality of image elements scanned in a predetermined sequence, in a plurality of display lines, each element having a selected one of at least three possible image display values dependent on the drive output, the apparatus comprising:

means for receiving each of a sequence of code elements, in turn, forming a coded representation of a display line, the sequence of code elements defining the display values of the image elements in the sequence in which they are scanned and comprising at least one first code element associated with an image group, said image group consisting of N sequentially occurring image elements, N being an integer greater than one but less than the number of

image elements in a display line, said first code element indicating the display value of each of the N image elements of said image group and at least one second code element indicating only the number of image groups in a segment of M image groups, where M is an integer, and the display value of all image elements in the segment being the same and equal to the display value of the image element immediately preceding said segment, whereby a run of any number of image elements of the same display value, whether or not the transitions bounding the run are aligned with the boundaries between code elements, may be defined by a first code element defining at least the first two image elements of the run followed by at least one second code element and, if required, another first code element defining at least the final image element of the run;

means for decoding each code element, before the receipt of the following code element, to produce a control output indicating, for each individual image element of the display line, the display value of that element, which means comprises first decoding means responsive to the receipt of each first code element for causing the control output to indicate the display value of each of the individual image elements of the image group represented by that first code element, means for storing, at the completion of the decoding of each code element to produce the said control output, an indication of the display value of the final image element of those so far decoded into the control output, and second decoding means responsive to the receipt of each second code element and to the indication of a display value stored in the said storing means at that time for causing the control output to indicate the same display value of each individual image element in the segment of M image groups indicated by that second code element, which display value is that stored in the said storing means;



and means for converting the said control output into a drive output for the display.

4,233,602

MULTI-MATRIX DISPLAY SYSTEM HAVING MATRIX DISPLAY PANEL WITH UNCROSSED CONNECTIONS ON SUBSTRATES

Hisao Hanmura, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 891,036

Claims priority, application Japan, Mar. 30, 1977, 52/34438; Feb. 8, 1978, 53/12453

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—752 **5 Claims**

1. In a multi-matrix display system having a matrix display panel, said matrix display panel comprising:

picture elements arranged in the form of a matrix having a plurality of rows and columns;

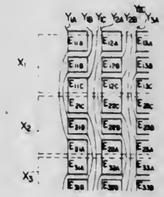
a plurality of row electrodes each commonly connected to at least two columns of said picture elements;

a plurality of column electrodes arranged transversely to each of said row electrodes; and

a display material electrically excitable and arranged between said row electrodes and said column electrodes for constituting said picture elements to be displayed when said row and column electrodes are selectively energized;

means for controlling the brightness of each of said picture elements by selectively applying a signal related to a level of desired brightness between a corresponding row electrode and one or more corresponding column electrodes, including means for sequentially scanning said row electrodes and means for varying said brightness signal in accordance with an applied video signal;

n rows of said picture elements being arranged to face each row of said row electrodes, and each column of said plurality of picture elements being provided with n column



electrodes, where n is an integer of at least 2, and in front of any adjacent two rows of said row electrodes, a first one of each of said n column electrodes connects a picture element of a first row facing one of the row electrodes with a picture element of an nth row facing the other of the row electrodes, a second one of each of said n column electrodes connects a picture element of a second row facing the one of the row electrodes with a picture element of an (n−1) the row facing the other of the row electrodes, and an nth one of each of said n column electrodes connects a picture element of an nth row facing the one of the row electrodes with a picture element of a first row facing the other of the row electrodes.

4,233,603

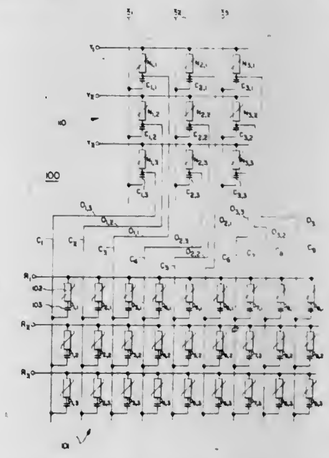
MULTIPLEXED VARISTOR-CONTROLLED LIQUID CRYSTAL DISPLAY

Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,223

Int. Cl.² G06F *3/14*

U.S. Cl. 340—783 **44 Claims**



1. A multiplexible matrix reflective display, comprising:

a plurality of substantially parallel and substantially transparent elongated and continuous column electrodes arranged spaced each from the others in a first direction in a first plane, each of said column electrodes adapted for having a column driving voltage coupled thereto;

a plurality of reflective and substantially flat coplanar rear cell electrodes arranged spaced each from the others in a matrix extending in both said first direction and in a second direction, substantially transverse to said first direction, in a second plane parallel to, and spaced behind, said first plane;

a plurality of substantially parallel row electrodes arranged spaced each from the others in said second direction and with only one of the row electrodes positioned substantially parallel to an associated row of said rear cell electrodes, each of said row electrodes adapted for having a row driving voltage coupled thereto;

a layer of optically active material positioned as the only element between said first and second planes, said layer having a matrix therein of cells each defined by the registration of one of said plurality of column electrodes and one of said plurality of rear cell electrodes; the optically active material in each cell respectively absorbing therein and transmitting therethrough light entering said cell responsive to the magnitude of the voltage between the portions of the column and rear cell electrode defining said cell being respectively less than and at least equal to a preselected voltage magnitude;

a member of an electrically non-linear resistive material, positioned substantially parallel to the plane of at least said optically active layer and substantially covering the entire area of and in registration with said optically active layer, said member having a matrix of positions defined thereon with each position forming a passive, monotonic non-linear resistance element in correspondence to one display cell of the display cell matrix, said material having a preselected break-down voltage below which break-down voltage substantially no current flows through said material and above which break-down voltage substantial amounts of current can flow therethrough and with a voltage drop across said member being substantially equal to said break-down voltage; and

means for coupling each matrix position of said member between an associated rear cell electrode defining a matrix cell and the row electrode associated with that rear cell electrode;

each matrix cell absorbing light incident thereon if the magnitude of a total driving voltage coupled between the column and row electrodes defining that cell in the display cell matrix is less than the sum of the break-down voltage of the non-linear material and the preselected voltage magnitude for the optically active material layer; each matrix cell always reflecting light incident thereon if the magnitude of the total driving voltage coupled between said column and row electrodes defining that cel of said display cell matrix is greater than the sum of said break-down voltage and the preselected voltage magnitude for the optically active material layer.

4,233,604

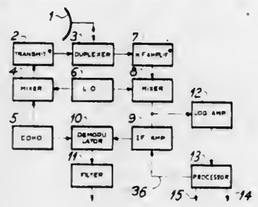
RECEIVER WITH FIXED-ECHO SUPPRESSOR

Guy Lepère, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 27, 1978, Ser. No. 963,989
Int. Cl.³ G01S *7/34*
U.S. Cl. 343—7 AG **8 Claims**

1. In a radar system comprising a signal receiver with a main channel, feeding a fixed-echo suppressor of limited dynamic range, and with an ancillary channel of extended dynamic range, said channels receiving incoming echo signals from a rotating antenna periodically emitting outgoing pulses, said main channel including amplitude-adjusting means responsive to a control signal from said ancillar channel,

the improvement wherein said ancillary channel comprises logical circuitry responsive to synchronization and antenna-position signals for dividing the area swept by the radar into a predetermined number of range-and-azimuth cells each encompassing a plurality of pulse-repetition cycles, first integrating means controlled by said logical circuitry for averaging the amplitudes of said incoming echo signals



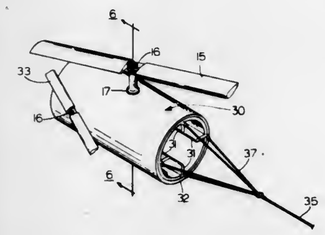
over each one of said cells, second integrating means in cascade with said first integrating means for averaging over at least one antenna revolution the mean amplitude values thus obtained for each cell to generate a resulting amplitude value, and evaluating means downstream of said second integrating means for deriving said control signal from said resulting amplitude value.

4,233,605

HELICOPTER RADAR DECOY

John R. Coleman, Westminster, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 15, 1979, Ser. No. 12,574
Int. Cl.³ H01Q *15/18*
U.S. Cl. 343—18 D **6 Claims**



1. A Doppler radar decoy comprising:

(a) a body portion including a disk and keel member depending therefrom;

(b) rotor shaft means mounted on said body portions; and

(c) rotor means including an internal retro-directive spar mounted to rotate on said shaft means.

4,233,606

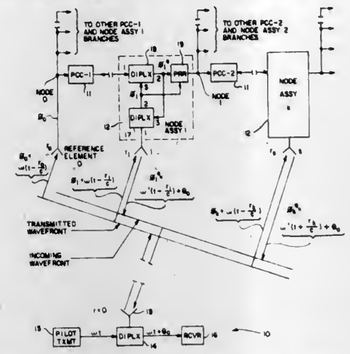
FREQUENCY TRANSLATING PHASE CONJUGATION CIRCUIT FOR ACTIVE RETRODIRECTIVE ANTENNA ARRAY

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Ralph C. Chernoff, Los Angeles, Calif.

Filed Dec. 29, 1978, Ser. No. 974,471
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 TD **14 Claims**

1. In an active retrodirective array of antenna elements, a separate frequency shifting phase conjugation means associated with and coupled to each element by a transmission line for receiving a signal of phase ϕ_1 from the associated element over said transmission line and transmitting to the associated

element a signal of conjugate phase ϕ_1^* equal to $R(2\phi_o-\phi_1)$ where ϕ_o is a signal of reference phase from a chosen element



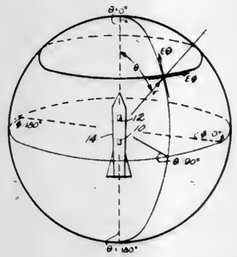
of said array, R is the reciprocal of 1-2/n and n is an integer equal to or greater than 4.

4,233,607

APPARATUS AND METHOD FOR IMPROVING R.F. ISOLATION BETWEEN ADJACENT ANTENNAS

Gary G. Sanford; Robert E. Munson, and Thomas A. Metzler, all of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 28, 1977, Ser. No. 846,347
Int. Cl.² H01Q *1/38*
U.S. Cl. 343—700 MS **20 Claims**



1. A system of antenna arrays having improved r.f. isolation therebetween, said system comprising:

a first antenna array and connected first r.f. feedline disposed at a first location for transmitting r.f. energy from an r.f. source according to a predetermined three-dimensional first radiation pattern;

a second antenna array and connected second r.f. feedline disposed at a second location for receiving r.f. energy according to a predetermined three-dimensional second radiation pattern such that some r.f. energy from said first antenna array is undesirably received by said second antenna array; and

first and second additional r.f. radiating element means, each being connected to the respectively corresponding said first and second feedlines and disposed at the respectively corresponding one of said first and second locations,

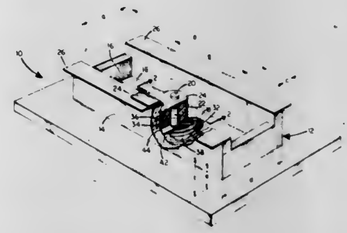
said first and second additional r.f. radiating element means being connected to transmit or receive r.f. energy of a predetermined magnitude and phase so as to substantially cancel said r.f. energy undesirably received by said second antenna array.

4,233,608

BROADBAND ANTENNA ELEMENT

Robert L. Moran, Rand, Colo., and Francis J. O'Hara, Bedford, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1976, Ser. No. 727,731
Int. Cl.³ H01Q *21/00*
U.S. Cl. 343—728 **2 Claims**



1. An antenna element, suitable for operation over greater than an octave band of frequencies, comprising:

(a) a waveguide section having a rectangular cross-section defined by opposing pairs of narrow and broad walls dimensioned to support the TE_{10} mode above a cutoff frequency within the band of operating frequencies, a first end of said waveguide section being terminated in a short circuit and a second end of said waveguide section being terminated in an open circuit for radiating radio frequency energy; and

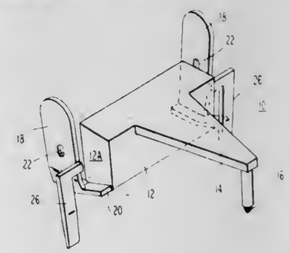
(b) a loop radiator disposed within said waveguide section adjacent the second end thereof, said loop radiator exciting the TE_{10} mode within said waveguide section at frequencies greater than the cutoff frequency of said waveguide section and said loop radiator further being the principal source of radiation at frequencies below the cutoff frequency of the waveguide section.

4,233,609

DISPOSABLE INSTRUMENT PEN WITH INTEGRAL SPRING MEMBER

James R. Hubbard, Moorestown, N.J., assignor to Graphic Controls Corporation, Cherry Hill, N.J.

Filed Jun. 7, 1978, Ser. No. 913,320
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 A **7 Claims**



1. Disposable instrument marker pen having a body member which houses an ink reservoir and a writing nib extending from said housing, said pen including a deflectable elastic member integrally formed with said pen and constructed from the same material as said pen body, said elastic member adapted to maintain said pen in relatively fixed position relative to a mating means with which said pen is adapted to mate by reason of deflection of said deflectable elastic member by said mating means, said mating means comprising a pen carriage assembly, and wherein said elastic member comprises a pair of wing

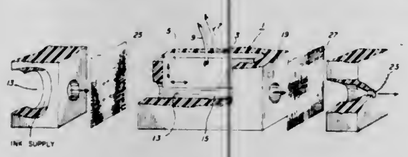
members, said carriage assembly comprising a generally "U" shaped member having a pair of upstanding mounting members defining the two upstanding legs of said "U" shape and wherein said wing members are resiliently fitted between said upstanding mounting members to maintain said pen in a relatively fixed position relative to said carriage assembly.

4,233,610

HYDRODYNAMICALLY DAMPED PRESSURE PULSE DROPLET EJECTOR

Kenneth H. Fischbeck, Dallas; Stig-Göran Larsson, and S. Bertil Sultan, both of Carrollton, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 18, 1979, Ser. No. 49,269
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **2 Claims**



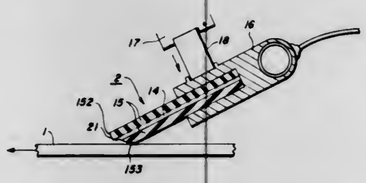
1. A pulsed pressure drop ejecting apparatus wherein a transducer (1) is utilized to compress liquid (13) in a channel (15) to express a droplet from an orifice (23) upon application of a signal to the transducer (1), the improvement comprising the addition of at least one energy dissipative element (25, 27) in the channel (15) so as to achieve simultaneous acoustic impedance matching and near critical hydraulic damping.

4,233,611

RECORDING HEAD FOR ELECTROSTATIC PRINTING APPARATUS

Keita Nakano, Yokohama, and Yasuo Shibata, Atsugi, both of Japan, assignors to Rank Xerox Limited, London, England

Filed Dec. 7, 1978, Ser. No. 967,199
Claims priority, application Japan, Oct. 14, 1977, 52-122322
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **15 Claims**



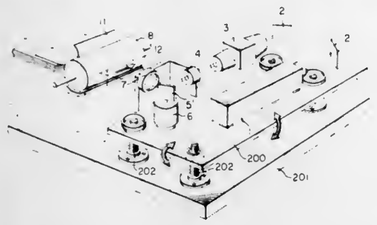
1. An electrostatic printing apparatus comprising
a recording medium having a charge retentive surface for forming an electrostatic latent image,
means for developing the electrostatic latent image formed on the recording medium,
a support material,
means for transferring the developed electrostatic latent image to the support material,
an array of marking electrodes disposed adjacent the recording medium for selectively charging the charge retentive surface, and
a flexible insulator supporting the marking electrodes, the insulator adjoining the recording medium whereby to uniformly space the array of electrodes from the recording medium.

4,233,612

IMAGE INFORMATION ELECTROSTATIC RECORDING DEVICE

Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki; Taisuke Tokiwa, Yokohama; Kazuo Kawakubo, Hino; Fujio Iwatate, Tokyo, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,126, Jul. 8, 1975, abandoned. This application May 1, 1978, Ser. No. 901,788
Claims priority, application Japan, Jul. 10, 1974, 49-79475; Aug. 22, 1974, 49-96500; Sep. 14, 1974, 49-106342; Oct. 14, 1974, 49-117892; Dec. 17, 1974, 49-144727
Int. Cl.³ G03G *15/00*
U.S. Cl. 346—160 **48 Claims**



1. An image information recording device which comprises in combination:
a. an He-Ne gas laser oscillator for generating a laser beam modulated by an image information signal;
b. a photosensitive body consisting essentially of an insulating layer, a photoconductive layer and an electrically conductive substrate, said photoconductive layer comprising cadmium sulfide (CdS);
c. deflection means to cause said laser beam to scan on said photosensitive body;
d. optical means to focus said modulated and deflected laser beam on said photosensitive body;
e. means to input said image information signal to said laser oscillator in synchronism with said deflection means;
f. means for uniformly applying a first charge to said photosensitive body;
g. means for imparting a second charge to said photosensitive body simultaneously with scanning said photosensitive body with said modulated and deflected laser beam to form an image pattern; and
h. means to effect overall exposure of said photosensitive body after the simultaneous application of the second charge and said modulated and deflected laser beam on said photosensitive body to form a high contrast electrostatic latent image.

4,233,613

COMPOUND SEMICONDUCTOR WAFER

Kiyoshi Morimoto, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Aug. 31, 1978, Ser. No. 938,977
Claims priority, application Japan, Sep. 6, 1977, 52-106232
Int. Cl.² H01L *33/00*
U.S. Cl. 357—16 **12 Claims**



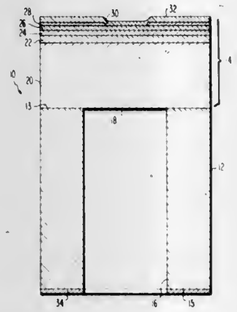
1. A compound semiconductor wafer comprising a substrate of a IV-group element semiconductor having a predetermined conductivity type, an epitaxial layer formed by epitaxially growing on said substrate a compound semiconductor having the same conductivity type as the substrate by an ion beam deposition process or a cluster ion beam process, said compound semiconductor being selected from a group of compound semiconductors comprising both binary and ternary III-V semiconductor compounds; and a compound semiconductor layer having a conductivity type opposite to that of said epitaxial layer and formed on said epitaxial layer so as to form a PN junction with said epitaxial layer.

4,233,614

LIGHT EMITTING DIODE

Dan Botez, Trenton; Michael Ettenberg, Freehold, and Henry Kressel, Elizabeth, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 6, 1979, Ser. No. 18,055
Int. Cl.³ H01L *33/00*
U.S. Cl. 357—17 **6 Claims**



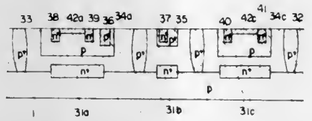
1. A light emitting semiconductor device comprising
a body of semiconductor material on a substrate of a semiconductor material, said body including a window layer adjacent to said substrate, and layers of opposite conductivity type on said window layer with the layer adjacent said window layer being a recombination region in which light can be generated, said window layer being of a material which is transparent to said generated light and having a thickness of between 15 and 30 microns, and
said substrate having an opening therethrough to said window layer.

4,233,615

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Toyoki Takemoto, Yahata; Tadao Komeda, Yamatotakada; Haruyasu Yamada, and Michihiro Inoue, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 10, 1978, Ser. No. 933,045
Claims priority, application Japan, Aug. 25, 1977, 52-102427
Int. Cl.² H01L *29/80, 29/78*
U.S. Cl. 357—22 **25 Claims**



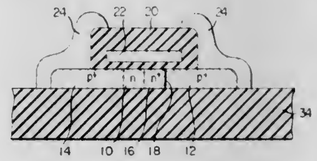
1. A semiconductor integrated circuit device having on a monolithic substrate:
a junction-type field effect transistor comprising:
a gate region of a first conductivity type,
a source region and drain region which are both formed apart from each other in said gate region and of a second conductivity type that is opposite to said first conductivity type,
a surface channel region of said second conductivity type and lower resistivity, and formed shallower than said source region and said drain region in a manner to connect said source region and said drain region,
an impurity doped surface region of said first conductivity type, higher impurity concentration and a shallower depth than said surface channel region and formed in said surface channel region apart at least from said drain region, and
an insulating film completely covering said impurity doped surface region; and
at least one other semiconductor device.

4,233,616

SEMICONDUCTOR NON-VOLATILE MEMORY

Mikio Kyomasu, and Yoshiharu Nakao, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,950
Claims priority, application Japan, Jun. 8, 1977, 52-68217
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **6 Claims**



1. A semiconductor non-volatile memory unit composed of at least one memory cell comprising a semiconductor layer of a first type conductivity, said memory cell having a separately provided pair of semiconductor regions of the opposite type conductively disposed in a spaced relationship with at least a portion of said semiconductor layer therebetween to form a gate region therebetween, an electrically insulating film disposed on said gate region for performing a storing operation by having an electric charge accumulated therein, and means for providing a pn junction with only one of said pair of semiconductor layers and for providing no pn junction with the other of said pair of semiconductor layers, said means comprising a separately provided single highly doped semiconductor region of the first conductivity type disposed to form said pn junction with one of said pair of semiconductor regions and to be separate from the other of said pairs of semiconductor regions, said pn junction being located only within said gate region.

4,233,617

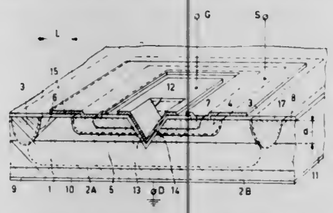
FIELD EFFECT TRANSISTOR WITH INSULATED GATE ELECTRODE

Francois M. Klaassen, and Johannes A. Appels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1979, Ser. No. 4,003
Claims priority, application Netherlands, Jul. 24, 1978, 7807834
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **8 Claims**

1. A field effect transistor with insulated gate electrode having a semiconductor body, said semiconductor body having first and second surfaces, oppositely located, comprising:
an island-shaped first region of a first conductivity type which adjoins said first surface;
a first zone of the second conductivity type within said

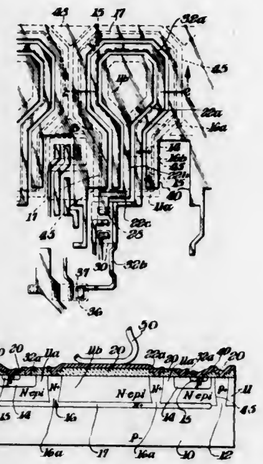
island shaped first region and likewise adjoining said first surface;
a second region of the second conductivity type which surrounds said first region and forms a pn junction therewith and adjoins said oppositely located second surface;
a groove in said first surface and extending through said first zone and said first region into said second region;
the wall of said groove being coated with an electrically insulating layer;
a gate electrode on said layer;
said first zone and said second region being provided with connection conductors associated with the source and drain electrodes of said field effect transistor;
a third region of said second conductivity type extending from said first surface to said second region;
said first region forming with said underlying second region



a first pn junction extending substantially parallel to said first surface and bounded laterally at least partly by said third region of the second conductivity type which extends from the first surface down to the second region and forms with the first region a second pn junction having a lower breakdown voltage than said first pn junction;
a fourth region of said first conductivity type adjoining said first surface present in said first region separating said first region and said first zone from each other and having a higher doping concentration than the first region; and
the doping concentration and the thickness of said first region being so small that when applying a voltage in reverse direction between said first and said second regions, the depletion zone of said transistor extends from said first pn junction up to said first surface throughout the thickness of said first region at a voltage which is lower than the breakdown voltage of said second pn junction.

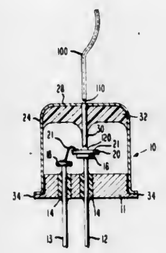
4,233,618
INTEGRATED CIRCUIT WITH POWER TRANSISTOR
Robert C. Genesi, Sterling, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Filed Jul. 31, 1978, Ser. No. 929,759
Int. Cl.³ H01L 29/72, 27/02, 27/04
U.S. Cl. 357—35 **12 Claims**

1. An integrated semiconductor circuit having a high-current power transistor comprising:
(a) a semiconductor substrate of one conductivity type;
(b) an epitaxial layer of the opposite conductivity type on said substrate;
(c) a closed annular isolation-wall region of said one type being formed in said epitaxial layer, said wall region extending through said epitaxial layer from the outer surface thereof to the interface between said epitaxial layer and said substrate, defining within said epitaxial layer a pocket-region;
(d) an annular strip region of said one type being formed in said pocket region, extending from said surface only part way through said epitaxial layer, and being spaced inwardly from said wall region to serve as the base region of said transistor;
(e) an elongated region of said opposite type being formed within and along said strip region and extending to said surface to serve as the emitter of said transistor;
(f) a collector contact plug region of said opposite conductivity type being formed in a central portion of said pocket, being spaced inwardly from said annular strip region, extending from said surface through said epitaxial layer, and having at the periphery thereof a substantially greater electrical conductivity than that of the immediately adjacent portion of said pocket region;
(g) a metal collector-termination pad overlying and contacting said plug region at said surface, the periphery of said metal pad being substantially coincident with said periphery of said underlying plug region, said collector-termina-



tion pad having an area no smaller than 10^4 square microns;
(h) one metal layer contacting at said surface said elongated emitter region substantially along the entire length thereof; and
(i) another metal layer contacting at said surface said base strip region essentially along the entire length thereof, said another layer lying between and being spaced from said collector termination pad and said one metal layer.

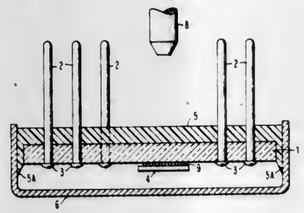
4,233,619
LIGHT DETECTOR HOUSING FOR FIBER OPTIC APPLICATIONS
Paul P. Webb, Beaconsfield, and Robert J. McIntyre, Pointe-Claire, both of Canada, assignors to RCA Corporation, New York, N.Y.
Filed Oct. 30, 1978, Ser. No. 955,628
Claims priority, application Canada, Aug. 17, 1978, 309545
Int. Cl.² H01L 23/02, 27/14
U.S. Cl. 357—74 **8 Claims**



1. In a light detector housing comprising
a header,
electrodes which are inserted through said header,

a light detector having a light sensitive surface mounted on one of said electrodes,
means for electrically connecting said light detector to said electrodes,
a cap bonded to said header which encloses said light detector, and
a window in said cap opposite to said light sensitive surface whereby light from an external light source impinging on said window enters said housing and impinges on said light sensitive surface,
the improvement which consists essentially of a light pipe inserted through an opening in said cap, bonded to said cap and extending from the outer surface of said cap toward said light sensitive surface whereby light from an external light source which impinges on said light pipe is transmitted toward said light sensitive surface with reduced spreading of the light beam.

4,233,620
SEALING OF INTEGRATED CIRCUIT MODULES
Russell E. Darrow, Newark Valley; Irving Memis, Vestal, and Richard M. Poliak, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 27, 1979, Ser. No. 16,034
Int. Cl.³ H01L 23/10
U.S. Cl. 357—74 **22 Claims**

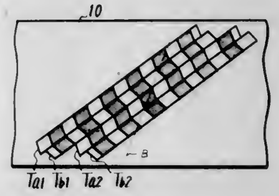


1. An integrated circuit module containing a substrate having electrically-conductive pins protruding therefrom, and having attached to the backside thereof at least one integrated circuit chip wherein the improvement comprises providing a hermetical seal of the backside of the substrate contained within a cap with a composition over the substrate and a portion of the height of the pins containing:
(A) about 51.4 to about 60.6% by weight of an epoxy of at least about 95% of which being a diglycidyl ether of bisphenol A and epichlorohydrin, having an epoxy equivalent weight of about 180 to about 210 and a viscosity of about 6,500 to about 22,500 centipoise at 25° C.;
(B) about 39 to about 48% by weight of a hardener and flexibilizer portion containing
(1) about 15 to about 49% by weight of an anhydride hardener for said epoxy wherein said anhydride is selected from the group of nadic methyl anhydride, hexahydrophthalic anhydride, tetrahydrophthalic anhydride or mixtures thereof;
(2) about 40 to about 85% by weight of a polyglycol flexibilizer represented by the formula:

$$HO—R—O—[—R—O—]_nR—OH$$

wherein R is a divalent saturated aliphatic hydrocarbon moiety selected from the group of ethylene, propylene, butylene, and mixtures thereof; and wherein n is 0 or an integer such that the molecular weight of said flexibilizer in conjunction with the amount employed is such that the viscosity of the hardener and flexibilizer portion is about 900 to about 2500 centipoise at 25° C.;
(3) 0.1 to about 1% by weight of a tertiary amine curing agent for the epoxy; and
(4) 0 to minor amounts of acid resulting from hydrolysis of said anhydride; wherein said minor amount is such that the acid number of the hardener and flexibilizer portion does not exceed about 4.0 mg KOH/gram; and wherein the amounts of B(1), B(2) and B(3) and B(4) are based upon the total of B(1), B(2), B(3) and B(4) of the hardener and flexibilizer portion; and
(C) 0 to about 0.6% by weight of a coloring agent.

4,233,621
METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A COLOR-ALIGNED LINE-SEQUENTIAL COLOR VIDEO SIGNAL
Kazuo Yamagiwa, Tokyo, and Toshihiko Numakura, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 15, 1978, Ser. No. 960,838
Claims priority, application Japan, Nov. 21, 1977, 52-139622
Int. Cl.² H04N 5/79
U.S. Cl. 358—8 **31 Claims**

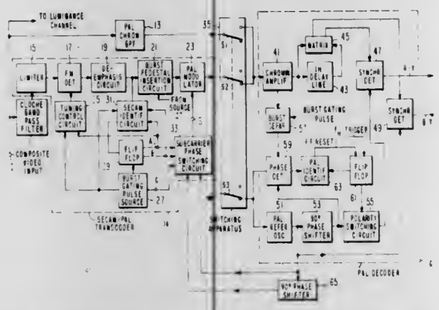


1. A method of recording and reproducing in successive parallel tracks on a record medium a periodic information signal having information contained in successive line intervals, a predetermined number of line intervals being included in a field interval and a predetermined number of field intervals being included in a frame interval, said method comprising delaying alternate ones of said frame intervals by a time delay equal to an odd multiple of a line interval; adding an identifying signal to said video signal to identify the delayed and undelayed frame intervals; supplying, in sequence, the delayed and undelayed frame intervals of said periodic information signal together with said identifying signal to a recording transducer for recording in successive parallel tracks on said record medium; reproducing the recorded periodic information signal together with said identifying signal from successive parallel tracks to recover the delayed and undelayed frame intervals alternatively; identifying the delayed and undelayed frame intervals; and delaying the undelayed frame intervals by a time delay equal to said odd multiple of a line interval, thereby recovering said periodic information signal which is undelayed in successive frame intervals relative to each other.

4,233,622
SECAM-PAL CONVERTER
Willem H. Groeneweg, Ottenbach, Switzerland, assignor to RCA Corporation, New York, N.Y.
Filed Jan. 5, 1979, Ser. No. 1,166
Claims priority, application United Kingdom, Jan. 9, 1978, 658/78
Int. Cl.³ H04N 9/42
U.S. Cl. 358—11 **6 Claims**

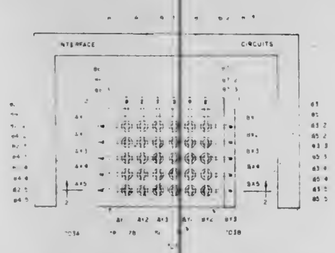
1. Apparatus for converting chrominance information encoded in SECAM fashion to a chrominance signal suitable for application to a PAL decoder, said chrominance information appearing during image portions of successive line intervals, said image portions of said line intervals following blanking portions thereof; said apparatus comprising:
frequency discriminator means, responsive to said chrominance information encoded in SECAM fashion, for sequentially developing, during image portions of successive line intervals, respective first and second color-difference signals;
a source of oscillations of a frequency corresponding to the standard PAL color subcarrier frequency; and

means, responsive to the output of said frequency discriminator means and the output of said source of oscillations, for developing an output chrominance signal comprising (a), during alternate line intervals, oscillations of said PAL color subcarrier frequency, having a first phase and modulated in amplitude in accordance with said first color-difference signal, and immediately preceded by substantially constant amplitude bursts of oscillations of said PAL color



subcarrier frequency and of said first phase, and (b), during intervening line intervals, oscillations of said PAL color subcarrier frequency, having a second phase differing from said first phase by 90° and modulated in accordance with said second color-difference signal, and immediately preceded by substantially constant amplitude bursts of oscillations of said PAL color subcarrier frequency and of a third phase differing from said first phase by 180°.

4,233,623
TELEVISION DISPLAY
Thomas J. Pavliscak, 2 S. 454 Seneca Dr., Wheaton, Ill. 60187
Continuation-in-part of Ser. No. 788,517, Apr. 18, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,740
Int. Cl.[2] H04N *9/30*
U.S. Cl. 358—59 **44 Claims**



4. A single substrate X-Y electrodes matrix multiple gaseous discharge panel television device comprising:

an electrically non-conducting bottom substrate having a top and bottom surface;

a first array of parallel X-axis electrodes secured to the top surface of the substrate;

a first dielectric portion secured to the top surface of the substrate in overlaying relation to the parallel electrodes of the first array;

a second array of parallel Y-axis electrodes secured in overlaying relation to the first dielectric layer and physically separated by the first dielectric portion from the first array of X-axis electrodes, each Y-axis electrode of the second array being transverse to each X-axis electrode of the first array, the electrodes of each array being in a cross-over relation to the electrodes of the other array so as to define a panel matrix containing a multiplicity of X-Y gas discharge cell sites;

a further dielectric portion secured in overlaying relation to the second array of Y-axis electrodes;

a viewing top envelope transparent to visible light secured to the bottom substrate, said envelope being spaced above the second dielectric layer and discharge sites to provide an enclosed chamber for a gaseous medium;

a gaseous medium confined within the chamber;

the electrodes of at least one array being physically interrupted along one axis so as to divide the panel matrix into at least two distinct sections of gas discharge cells;

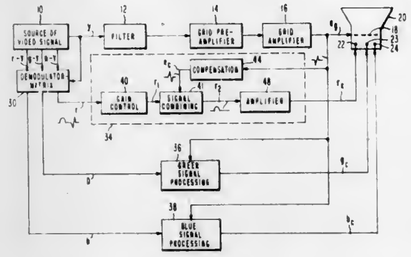
means for applying a trigger voltage pulse to each gas discharge cell site to initiate a sequence of gas discharge at each cell site;

means for applying a different maintain voltage pulse wave form to each distinct panel matrix section, the magnitude of each maintain voltage pulse being insufficient either to initiate a gas discharge at a cell site or to sustain a sequence of gas discharges at a cell site of relatively constant intensity for an indefinite length of time, the magnitude of each maintain voltage pulse being sufficient to support a sequence of diminishing gas discharges for a finite number of cycles, said gas discharges having been initiated by a trigger voltage pulse;

means for synchronizing the different maintain voltage wave forms applied to each distinct panel matrix section such that a trigger pulse can be applied to one distinct panel matrix section during the write cycle of the maintain voltage applied to that matrix section while the maintain voltage applied to another distinct panel matrix section is being restored to the write cycle whereby each distinct panel matrix section is addressed in real time response to a television video signal.

7. The television display device of claim 4 wherein a triad of different phosphors are provided at every three consecutive discharge sites in the direction of the panel width, the gas discharge at each of the three consecutive sites exciting a different phosphor which emits light of a different primary color (red, blue, or green).

4,233,624
COMBINED KINESCOPE GRID AND CATHODE VIDEO DRIVE SYSTEM
Werner Hinn, Zollikerberg, and Jürg Hinderling, Winterthur, both of Switzerland, assignors to RCA Corporation, New York, N.Y.
Filed Jul. 2, 1979, Ser. No. 53,908
Claims priority, application United Kingdom, Jul. 6, 1978, 29089/78
Int. Cl.[3] H04N *9/20*
U.S. Cl. 358—65 **13 Claims**



1. In a system for processing a color image representative video signal containing low and high frequency components, said system including a kinescope having an electron gun assembly comprising first and second intensity control electrodes for reproducing an image in response to video signals

applied to said electrodes, a kinescope driver amplifier arrangement comprising:

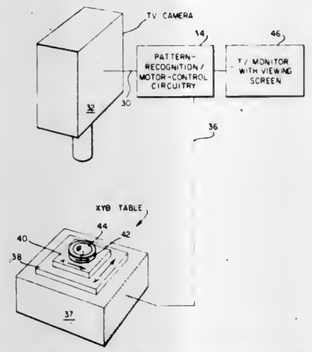
means for passing selected high frequency components of said video signal above a given frequency;

first amplifier means responsive to said selected high frequency components for supplying amplified, selected high frequency components to said first kinescope electrode;

means for combining said selected high frequency components and said color representative video signal including said low and high frequency components, with a sense to significantly attenuate said high frequency component of said video signal at an output of said combining means; and

second amplifier means responsive to output signals from said combining means for supplying amplified video signals to said second kinescope electrode.

4,233,625
TELEVISION MONITORING SYSTEM FOR AUTOMATICALLY ALIGNING SEMICONDUCTOR DEVICES DURING MANUFACTURE
Norman G. Altman, Stamford, Conn., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Nov. 3, 1978, Ser. No. 957,488
Int. Cl.[3] H04N *7/00*; G01B *11/00, 9/00*; G06K *9/00*
U.S. Cl. 358—101 **27 Claims**



1. For use in a system for aligning successive like semiconductor configurations, each characterized by a set of perpendicularly intersecting visual elements, said system comprising table means for adjustably carrying and optically presenting any one of said semiconductor configurations, drive means for causing said table motions in X, Y, and θ directions, television camera means directed toward said table means for viewing any one of said semiconductor configurations on said table means, said television camera means being characterized by a raster of scan lines and producing pattern recognition signals corresponding to said scan lines, and television monitor means characterized by a raster of scan lines for displaying a representation of any one of said semiconductor configurations being carried on said table means:

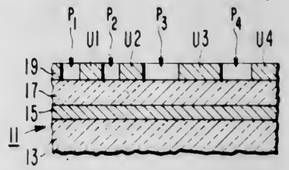
(a) electronic control means operatively connected between said television camera means and said table means and between said television camera means and said television monitor means;

(b) said electronic control means including memory means for storing representations of said pattern recognition signals;

(c) manual supervision means for energizing said drive means in order to align a set of perpendicularly intersecting visual elements on a reference one of said semiconductor configurations, thereby generating reference pattern recognition signals and storing reference representations thereof in said memory means; and

(d) automatic supervision means for comparing pattern recognition signals generated from a semiconductor configuration to be aligned on said table means and reference pattern recognition signals corresponding to said reference representations in said memory means, thereby energizing said drive means for aligning said set of perpendicular elements on said semiconductor configuration to be aligned.

4,233,626
PLAYBACK INFORMATION RECORD USING PHASE CANCELLATION FOR READING
Alan E. Bell, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.
Division of Ser. No. 782,035, Mar. 28, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,725
Int. Cl.[2] H04N *5/76*; G11B *7/24*; G01D *15/34*
U.S. Cl. 358—128.5 **6 Claims**



1. An information record, for use in playback apparatus employing a playback beam of light of a given frequency; said record comprising:

a substrate having a light reflective surface;

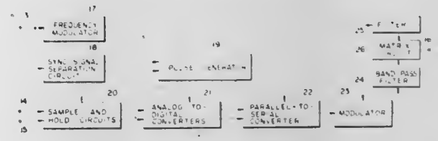
a layer of light transparent material overlying said reflective surface; and

a layer of light reflective material, having an information track formed therein, overlying said light transparent layer;

wherein said information track comprises a succession of spaced pits and intervening land areas with variations in the spacing between successive pit edges representative of recorded information; and

wherein the thickness of said layer of light transparent material in those layer regions occupied by said pits is such as to introduce a phase change of approximately $(2K+1)\,\pi$ radians between portions of said beam which respectively fall on said pits and said intervening land areas at said given frequency, where k is zero or any integer.

4,233,627
SIGNAL MULTIPLEXING SYSTEM
Yasumasa Sugihara, Kawasaki, Japan, assignor to The General Corporation, Kanagawa, Japan
Filed Aug. 8, 1978, Ser. No. 931,916
Claims priority, application Japan, Aug. 9, 1977, 52/95224
Int. Cl.[2] H04N *7/04*
U.S. Cl. 358—143 **6 Claims**



1. In a system for multiplexing a frequency modulated composite television video signal and a PCM multiplexed audio signal composed of pulse code modulated time division multiplexed audio signals, wherein the PCM multiplexed audio signal has a frame repetition frequency or sampling frequency f_s which is related to the horizontal sync frequency f_H of the composite video signal by the following expression:

$f_x = f_h = (n/m)$

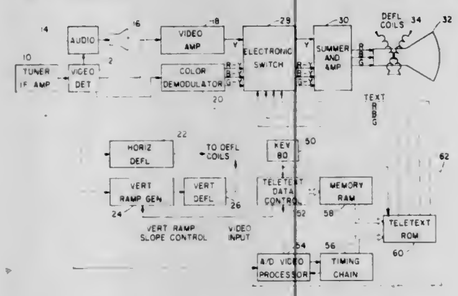
where m represents a selected integer which represents a divisor of number of scanning lines per frame of the composite video signal and n represents a selected positive integer: means for multiplexing the PCM multiplexed audio signal with the composite video signal in a manner such that the start of the initial frame has a given timing relationship relative to the vertical sync signal of a selected one of an odd- and even-numbered field of the composite video signal.

4,233,628

NTSC RECEIVER USEABLE WITH TELETEXT/VIEWDATA INFORMATION

Walter S. Ciciora, Park Ridge, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 11, 1979, Ser. No. 2,523
Int. Cl.³ H04N 7/08, 3/22
U.S. Cl. 358—147 **13 Claims**



1. An NTSC television receiver capable of normally displaying approximately 200 horizontally lines of video information per field including;

signal synthesis means for generating Teletext video information from coded digital signals received during the vertical intervals of normal television broadcast signals, said Teletext information having a format embracing approximately 240 horizontal scan lines per field; and

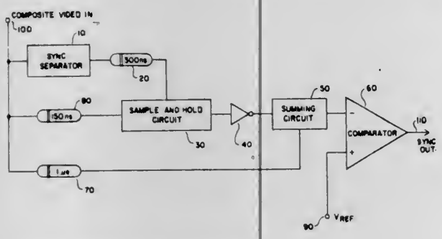
raster control means for altering the raster of said television receiver to display more than the normal number of horizontal lines and thereby enable direct use of said Teletext information.

4,233,629

SYNC SEPARATOR WITH A LOOK-AHEAD CLAMP

Birney D. Dayton, Nevada City, Calif., assignor to The Grass Valley Group, Grass Valley, Calif.

Filed Feb. 5, 1979, Ser. No. 9,194
Int. Cl.³ H04N 5/08
U.S. Cl. 358—153 **23 Claims**



1. A sync separator comprising:

first means for separating a sync signal from an input composite video signal;

first means for receiving and delaying said input composite video signal;

a sample-and-hold circuit coupled to said first separating means and said first receiving and delaying means, the output of said sample-and-hold circuit being a sample of said delayed composite video signal;

second means for receiving and delaying said input composite video signal coupled to a summing point;

an inverter coupled to receive and invert said sample, the output of said inverter being coupled to said summing point; and

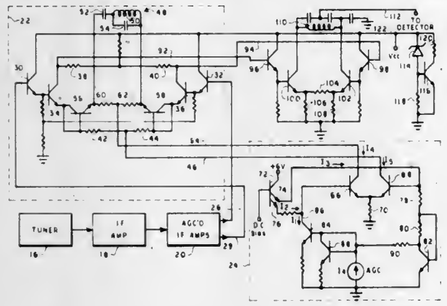
second means for separating a sync signal coupled to receive the output of said summing point.

4,233,630

CIRCUIT FOR MODIFYING THE IF RESPONSE OF A TELEVISION RECEIVER

Roy F. Baker, Franklin Park, and Frank Banach, Oak Lawn, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 4, 1979, Ser. No. 72,397
Int. Cl.³ H04N 5/21
U.S. Cl. 358—167 **10 Claims**



1. In a television receiver having an IF section which processes IF signals having a picture carrier component and which substantially determines the IF frequency response of the receiver under normal signal conditions, a circuit for modifying the IF frequency response under low level signal conditions, comprising:

an amplifier having an IF signal input and a load impedance across which the IF signal is amplified;

a first selectable gain-degeneration impedance having a relatively constant impedance at IF frequencies, including the frequency of the picture carrier;

a second selectable gain-degeneration impedance having a relatively lower impedance at the frequency of the picture carrier, said degeneration impedances being coupled to said amplifier such that the amplifier's gain is dependent on the ratio of its load impedance to the selected degeneration impedance and such that each of said first and second impedances is selectable in response to a current being steered therethrough; and

means responsive to the receiver receiving a relatively high level television signal for steering current through said first degeneration impedance so as to effect wideband gain of said amplifier, and responsive to the receiver receiving a relatively low level television signal for steering current through said second degeneration impedance so as to effect increased gain at the frequency of the picture carrier,

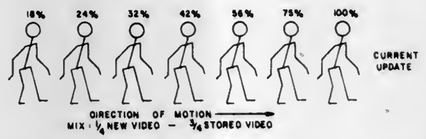
whereby the receiver's IF frequency response is substantially unaltered when high level television signals are received and the frequency response is altered when low level television signals are received so as to provide increased gain at the frequency of the picture carrier.

4,233,631

TELEVISION SYSTEM FOR DISPLAYING AND RECORDING PATHS OF MOTION

Henry W. Mahler, Newtown, Conn., assignor to CBS Inc., New York, N.Y.

Filed Oct. 4, 1978, Ser. No. 948,362
Int. Cl.³ H04N 5/22
U.S. Cl. 358—182 **8 Claims**



1. Apparatus for generating from arriving television signals, video signals for displaying simultaneously a succession of images of an object moving in an otherwise substantially static scene, said apparatus comprising:

storage means for storing a reference field of video representing said scene at an operator controllable start time;

means for comparing picture elements of selectable time-separated subsequently arriving television fields with corresponding picture elements of said reference field;

means operative in response to detection of differences between corresponding picture elements of said subsequently arriving fields and said reference field for tagging and storing those picture elements of said subsequently arriving fields that caused the detected difference;

means for successively mixing in synchronism with the arrival of selected subsequently arriving television fields previously tagged and stored picture elements that caused detected differences with corresponding picture elements of each of the said selectable subsequently arriving fields and producing a resultant signal containing a controllable fractional amplitude portion of the previously stored picture elements and a controllable fractional amplitude portion of corresponding picture elements of each of the selectable subsequently arriving fields and storing the resultant signal with said previously tagged and stored picture elements; and

means connected to receive said tagged and stored picture elements and said subsequently arriving video fields for continuously providing for display, following the said start time, output video signals representing said scene with the substitution therein of those picture elements representing a controllable number of images of said moving object preceding the current image thereof, and in which said images progressively decrease in intensity in the direction toward the earlier image positions of the moving object.

4,233,632

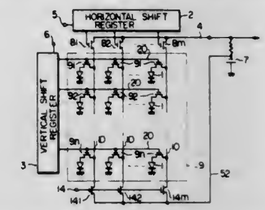
SOLID STATE IMAGE PICKUP DEVICE WITH SUPPRESSED SO-CALLED BLOOMING PHENOMENON

Toshiyuki Akiyama, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 26, 1978, Ser. No. 954,863
Claims priority, application Japan, Nov. 7, 1977, 52/148311[U]; May 19, 1978, 53/66554[U]; Jun. 23, 1978, 53/85372[U]
Int. Cl.³ H04N 3/12
U.S. Cl. 358—212 **6 Claims**

1. A solid state image pickup device including a plurality of photo-electric elements arrayed in a matrix-like configuration, vertical switching elements each associated with each of said photo-electric elements for reading out electric charge stored therein, a vertical scanning circuit for supplying control pulses to control terminals of said vertical switching elements, common vertical output conductors each for connecting together output terminals of those of said vertical switching elements which are arrayed on the same column of said matrix-like configuration, horizontal switching elements for read out connected to respective one ends of said vertical output conductors, and a horizontal scanning circuit for supplying control pulses to the control terminals of said horizontal switching elements, further including:

means for removing surplus electric charges at said photo-electric elements by varying potential at the control terminals of said vertical switching elements during a blanking period.

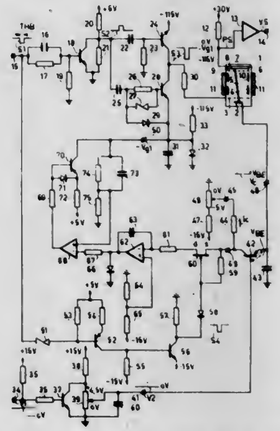


4,233,633

TELEVISION PICK-UP DEVICE SUITABLE FOR A DISCONTINUOUS RECORDING OF INFORMATION DURING CONTINUOUS OPERATION

Rudolf Kemner, and Rudy R. Cramer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,604
Claims priority, application Netherlands, Jun. 5, 1978, 7806074
Int. Cl.³ H04N 5/34, 5/32
U.S. Cl. 358—221 **6 Claims**



1. A television pick-up device suitable for a discontinuous recording of information during continuous operation, the device comprising a pick-up tube having a cathode for generating an electron beam, a control electrode for controlling the electron beam current strength, and a target plate which is scanned line-by-line and field-by-field by the electron beam by means of deflection means, wherein the pick-up device further comprises a supply circuit coupled to the cathode of the pick-up tube, said supply circuit having means for providing a first voltage level to the cathode when information is being recorded by said pick-up device, and a second voltage level to

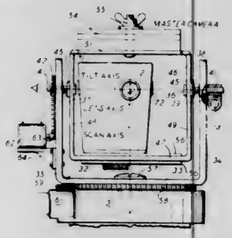
the cathode when information is not being recorded, said second voltage level being higher than said first voltage level, whereby said second voltage level prevents said target plate from becoming more negative when information is not being recorded.

4,233,634

VIDEO CAMERA WITH ADJUSTABLE MOUNT AND COUNTERBALANCE

Jay W. Adams, 937 E. Groton Dr., Burbank, Calif. 91504

Filed Jun. 22, 1979, Ser. No. 51,019
Int. Cl.[3] H04N *5/24, 5/26*
U.S. Cl. 358—229 **10 Claims**



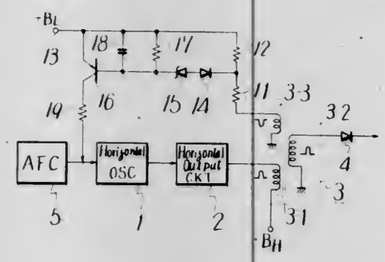
1. A camera support for a video camera having a lens axis and color receptors axes intersection point and comprising a vertical axis pivot for said support, a camera cradle, means for securing said camera to said cradle, means for horizontally adjusting said cradled camera with respect to said support such that a vertical axis pivot extension passes through said camera axes intersection point, transversely aligned horizontal cradle mount pivots on said camera support, transversely spaced pivot receivers on said cradle, means for adjusting said cradle vertically with respect to said mount pivots such that a horizontal pivot axis extension passes through said camera axes intersection point, and bias means for counterbalancing said camera with respect to said transversely aligned horizontal pivots.

4,233,635

HIGH VOLTAGE LIMITING CIRCUIT FOR A TELEVISION RECEIVER

Masao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 966,128
Claims priority, application Japan, Dec. 7, 1977, 52/164302[U]
Int. Cl.[3] H04N *5/68*; H01J *29/70*
U.S. Cl. 358—243 **5 Claims**



1. A high voltage limiting circuit for a television receiver comprising:

a horizontal oscillator for providing an output pulse having a frequency controlled by an automatic frequency control voltage;

an output circuit driven by said output pulse from said horizontal oscillator to provide an output pulse signal;

a fly-back transformer having a primary winding receiving said output pulse signal from said output circuit, a secondary winding and a tertiary winding;

a high voltage rectifying circuit connected to said secondary winding of said fly-back transformer;

a source of a reference potential;

a voltage divider connected between said tertiary winding and said source of reference potential;

a constant voltage device; and

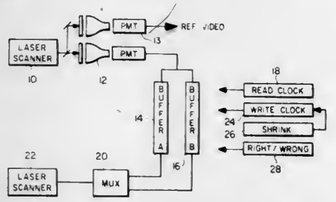
a transistor having an emitter connected to said source of reference potential, a base connected to said voltage divider through said constant voltage device and a collector connected to add a voltage to said automatic frequency control voltage controlling said frequency of said horizontal oscillator; said tertiary winding of said fly-back transformer being wound to produce a negative pulse and said reference potential being a positive voltage whereby the added voltage is effective to control the frequency of said horizontal oscillator so as to reduce a high voltage obtained at said high voltage rectifying circuit when a voltage of said negative pulse exceeds a predetermined value.

4,233,636

OPTICAL READ-WRITE SYSTEM WITH ELECTRONICALLY VARIABLE IMAGE SIZE

Steven K. Harbaugh, El Toro, and Gary H. Hoogerbrugge, Placentia, both of Calif., assignors to Eocom Corporation, Irvine, Calif.

Filed Jul. 3, 1978, Ser. No. 921,763
Int. Cl.[3] H04N *1/02*
U.S. Cl. 358—287 **13 Claims**



1. An optical read-write system for scanning an object and reproducing an image which may vary in size from said object comprising:

first laser means for linearly scanning an object at a scan rate and a photo multiplier tube for generating an electrical image signal for each scan,

means for generating a read clock signal having a read frequency and generating a write clock signal having a write frequency, said means for generating a read clock signal and a write clock signal including

a source of a reference signal,

a phase comparator for receiving said reference signal and a feedback signal and producing a control voltage based on a comparison of said reference signal and said feedback signal,

a voltage controlled oscillator having a control terminal, means connecting said control voltage from said phase comparator to said control terminal whereby said oscillator generates a pulse signal at a frequency dependent on said control voltage,

pulse removal means connected to receive said oscillator signal and controllable to produce an output signal in which a variable number of pulses of said oscillator signal may be removed,

frequency divider means connected to receive said output signal from said pulse removal means and produce a divider output signal at a frequency lower than said oscillator signal frequency,

means for applying said divider output signal to said phase comparator as said feedback signal, said write clock signal being derived from said oscillator signal and said read clock signal being derived from said output signal produced by said pulse removal means,

means for storing said electrical image signal at said read frequency in synchronization with the scan of said means for optically scanning, and

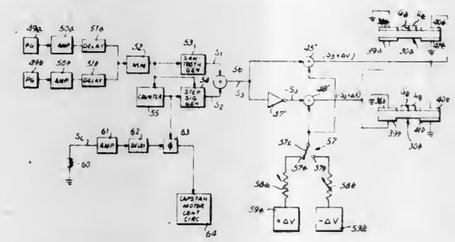
second laser means for receiving said stored electrical image signal and linearly scanning at said scan rate for displaying an image at said write frequency.

4,233,637

ROTATING MAGNETIC HEAD PIEZO-ELECTRIC ASSEMBLY AND DRIVE CIRCUITRY FOR VIDEO TAPE RECORDER

Yukio Kubota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1979, Ser. No. 3,974
Claims priority, application Japan, Jan. 17, 1978, 53-2710
Int. Cl.[3] G11B *21/10, 21/18*
U.S. Cl. 360—10 **12 Claims**



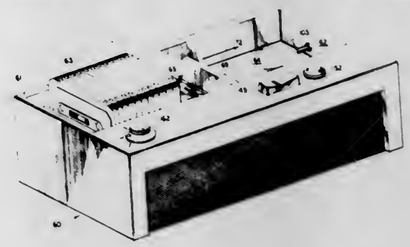
1. The combination of a magnetic head assembly comprising piezo-electric support means of elongated plate-like configuration having opposed major surfaces and being supported at one end, a magnetic head mounted on said support means adjacent the other end thereof, and pairs of first and second electrodes secured on said opposed major surfaces, respectively, and extending in the direction between said one and other ends of the support means with said pair of electrodes being parallel and spaced from each other in the direction transverse to said direction between the ends; and drive circuit means for applying selectively varied voltages across said first and second electrodes of said pairs and by which said piezo-electric support means is selectively made to flex for deflecting said head in a direction substantially normal to the plane of said plate-like support means and for varying the azimuth angle of said head, said drive circuit means including means connecting said first electrode of one of said pairs and said second electrode of the other of said pairs to ground, a source of a variable control voltage, means for providing a reversed polarity replica of said variable control voltage, means for providing each of said variable control voltage and said reversed polarity replica thereof with a selectively varied D.C. voltage bias, and means for applying said variable control voltage with said D.C. voltage bias and said reversed polarity replica with said D.C. voltage bias to said second and first electrodes, respectively, of said one pair and said other pair, respectively, of the electrodes.

4,233,638

CASSETTE SUBSTITUTION APPARATUS

Fred C. Bolick, Jr.; Theodore Titus, IV, and Said Mohammadioun, all of Altanta, Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Continuation of Ser. No. 753,361, Dec. 22, 1976, abandoned, which is a division of Ser. No. 554,476, Mar. 3, 1975, Pat. No. 4,024,354, which is a continuation of Ser. No. 327,501, Jan. 29, 1973, abandoned. This application Jan. 22, 1979, Ser. No. 5,089
Int. Cl.[3] G11B *19/00, 15/18*; H04M *11/10*
U.S. Cl. 360—92 **2 Claims**



1. Cassette recording apparatus having a plurality of operational modes for causing tape movement in a cassette in a recording interrelationship with a transducer, one of said plurality of operational modes being a recording mode of operation for causing tape movement in response to a selectively operable tape forward signal, wherein the improvement comprises:

a first means for sensing a predetermined amount of remaining tape available for recording in a first cassette in recording interrelationship with said transducer when said cassette recording apparatus is in a recording mode of operation for causing tape movement; and

a second means operative in response to said first means for substituting a second cassette for said first cassette a predetermined period of time after said first means senses said predetermined amount of remaining tape available for recording;

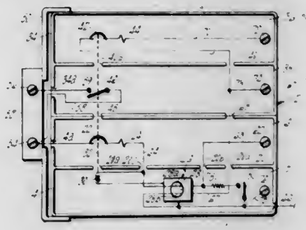
wherein said second means is operative independently of the presence or absence of said tape forward signal subsequent to said first means sensing said predetermined amount of remaining tape.

4,233,639

APPARATUS AND SYSTEM FOR PROTECTING POWER DISTRIBUTION CIRCUITS AGAINST GROUND FAULTS

Keith W. Klein, Simsbury; Joseph M. Palmieri, and Gregory C. Eckart, both of Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,228
Int. Cl.[3] H02H *3/347*
U.S. Cl. 361—44 **8 Claims**



1. A ground fault circuit interrupting (GFCI) device for utilization in a system protecting an electrical power distribu-

tion circuit against ground faults, said GFCI device comprising, in combination:

A. a first circuit breaker including:
(1) a molded case,
(2) first breaker contacts disposed in said first breaker molded case and serially connected in a first breaker internal pole circuit extending between first and second externally excessible GFCI device terminals,
(3) a trip solenoid disposed in said first breaker molded case and electrically connected with said first breaker pole circuit,
(4) a ground fault module electrically connected with said first breaker pole circuit and said solenoid, said module disposed in said first breaker molded case and including a differential current transformer having first and second primary windings, said first primary winding serially connected in said first breaker pole circuit, said module operable to initiate actuation of said solenoid in response to an imbalance in the currents flowing in said first and second differential transformer primary windings;

B. a second circuit breaker having
(1) a molded case ganged together in side-by-side relation with said first breaker molded case,
(2) second breaker contacts disposed in said second breaker molded case and serially electrically connected with said second differential transformer primary winding in a second breaker internal pole circuit extending between said first and second breaker molded cases from a third externally excessible GFCI device terminal to a fourth externally excessible GFCI device terminal, said second breaker pole circuit also connected to said module, and
(3) a switch disposed in said second breaker molded case and electrically connected in series between said first GFCI device terminal and a fifth externally excessible GFCI device terminal;

C. an internal common trip bar extending between said first and second breaker molded cases, said common trip bar operatively coupling said trip solenoid with said first and second breaker contacts and said switch such that actuation of said solenoid trips said first and second breaker contacts open and actuates said switch;

D. a sixth externally excessible GFCI device terminal electrically connected to said second breaker pole circuit at a point intermediate said second breaker contacts and said second differential transformer primary winding.

4,233,640

GROUND FAULT APPARATUS AND PROTECTION SYSTEM

Keith W. Klein, Simsbury; Joseph M. Palmieri, and Gregory C. Eckart, both of Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,229
Int. Cl.³ H02H 3/347
U.S. Cl. 361—44 **11 Claims**

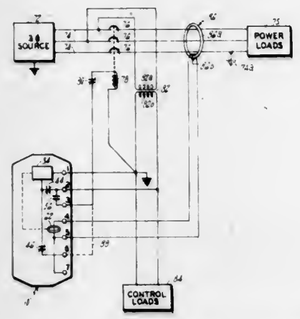
1. A ground fault circuit interrupting (GFCI) device for use in a system protecting power distribution circuits against ground faults, said GFCI device comprising, in combination:

A. a molded case consisting of base and a cover;

B. a switch operating mechanism mounted within said case, said switch operating mechanism including
(1) a movable contact carrier biased toward an open circuit position,
(2) a spring biased reset operator mounted for protrusion through an opening in said cover,
(3) a latch conditioned by depression of reset operator to engage said carrier pursuant to positioning the latter to its closed circuit position, and
(4) a solenoid operable upon electrical energization to disengage said latch from said carrier, whereupon said carrier springs to its open circuit position.

C. a first switch consisting of a first stationary contact mounted within said case and a first movable contact mounted by said carrier, said first stationary and movable contacts being engaged while said carrier is in its closed circuit position and disengaged while said carrier is in its open circuit position;

D. a ground fault module mounted within said case, said module including
(1) a current transformer having at least one primary winding, and
(2) electronic means responsive to a net primary current excitation of said transformer for initiating energization of said solenoid pursuant to unlatching said carrier for movement to its open circuit position;



E. a normally open second switch disposed within said case in a position to be engagably actuated to its closed condition by said carrier in moving to its open circuit position; and

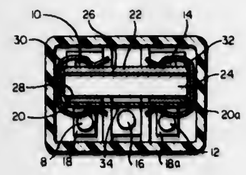
F. an externally accessible terminal board carried by said case and including
(1) a first terminal internally wired to said module,
(2) a second terminal internally wired to said solenoid and said module through said first switch,
(3) a third terminal internally wired to said second terminal through said second switch,
(4) a fourth terminal, and
(5) a fifth terminal internally wired to said fourth terminal through said one transformer primary winding.

4,233,641

LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Apr. 6, 1979, Ser. No. 27,680
Int. Cl.³ H02H 3/22
U.S. Cl. 361—119 **6 Claims**



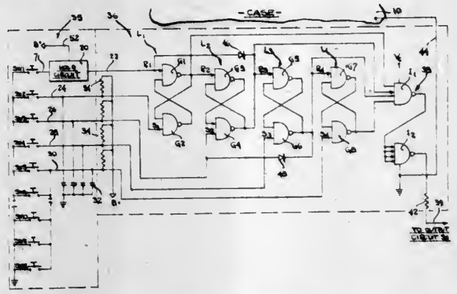
1. A line protector comprising an insulating base, line pins projecting through said base for connection to a line to be protected, and a terminal for connection to ground; a surge voltage arrester of the semi-conductor type that has a resistance that decreases as increasing voltage is applied thereacross and which heats excessively in an overcurrent surge condition on the protected line, said arrester comprising opposed surfaces forming terminal portions one of which is in electrical connection with said ground terminal, the other terminal portion being in electrical connection with the line pins, and means forming a normally open shunt circuit between said opposed terminals but operable to close and thereby ground the line in the event of a surge condition on the line that causes said overcurrent condition, said shunt circuit comprising resilient electrically conductive means biased toward at least one of said terminal portions, a dielectric member in thermally conducting relation with said surge arrester, said resilient means being prevented from contacting said one terminal portion by said dielectric member except when an overcurrent condition that heats the semi-conductor a sufficient amount to melt said dielectric member.

4,233,642

SAFETY INTERLOCK SYSTEM

Thomas R. Ellsberg, 6339 Coldwater Canyon, North Hollywood, Calif. 91606

Continuation-in-part of Ser. No. 866,287, Jan. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 709,314, Jul. 28, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,359
Int. Cl.³ H01H 47/32
U.S. Cl. 361—172 **41 Claims**



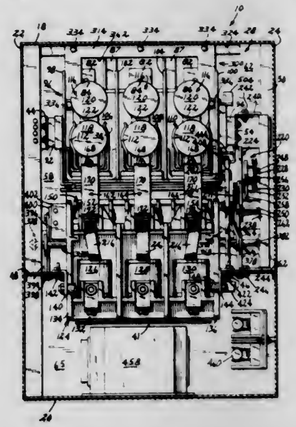
1. A safety interlock system to prevent theft or unauthorized removal of a vehicle having an engine system for powering said vehicle with an electrical component forming part of the engine system, said interlock system comprising:
(a) a plurality of manually operable switch elements, each representing a separate indicium of a code for energizing said interlock system to enable operation of said vehicle when a plurality of said switch elements have been actuated in proper sequence to conform to the preestablished sequence of indicia of said code,
(b) means operatively associated with said switch elements to generate an electrical signal in response to actuation of said switch elements,
(c) a plurality of electronic latches, each of said latches being connected in operative relation to certain of said switch elements and in such arrangement that said latches are switched to a proper state to generate an enabling signal in response to said electrical signals only when said switch elements are operated in proper sequence to conform to the preestablished sequence of indicia of said code,
(d) a solid state circuit component associated with the electrical component and being connected to the output of said latches, and being operable in response to said enabling signal to thereby permit operation of said electrical component, and
(e) a locking circuit operatively connected to the output of said latches and operating in conjunction with an electrically operable lock release mechaniam located to permit locking and opening of an access means to a compartment of said vehicle, said locking circuit generating a signal to actuate said lock release mechanism and permit opening of said access means when an enabling signal is generated and to prevent opening of said access means when said enabling signal is not generated.

4,233,643

ELECTRICAL POWER SWITCHING APPARATUS WITH SLIDING FUSE DRAWER AND INTERLOCK SYSTEM

James R. Iverson, Fridley, and Derrick N. Alcock, Bloomington, both of Minn., assignors to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Nov. 22, 1978, Ser. No. 963,162
Int. Cl.³ H02B 1/04
U.S. Cl. 361—344 **55 Claims**



1. A switching apparatus for use in an electrical control device comprising:
a housing having a switching section and a bus section, said bus section having at least one bus member for supplying incoming electrical current;
a fuse chassis attached to said housing for reciprocal movement into and out of the switching section of said housing;
means holding at least one fuse in said fuse chassis;
a contactor mechanism supported in the switching section of said housing forward of said bus section and vertically away from said fuse chassis for connecting and disconnecting flow of current from said at least one bus member to an electrically actuated device, said contactor mechanism being movable between an activated and a deactivated position wherein current is capable of flowing from said at least one bus member to the electrically activated device in said activated position but not in said deactivated position;
first connector means for connecting a first end of said at least one fuse to said at least one bus member, said first connector means including a discrete bus contact connected to said at least one bus member and a first descrete fuse contact engaging a first end of said at least one fuse, said first fuse contact being located at the rearward end of said fuse chassis;
second connector means for connecting a second end of said at least one fuse to said contactor mechanism, said second connector means including a second discrete fuse contact for engaging a second end of said at least one fuse and a discrete contactor contact for connecting said second fuse contact to said contactor mechanism;
a door attached to a front face of said housing for pivotal motion between an open and a closed position; and
means for moving said fuse chassis between an engaged position and an isolated position, said first and second connector means connecting said at least one fuse between said at least one bus member and said contactor mecha-

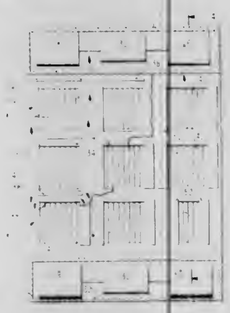
nism in said engaged position and said at least one fuse being disconnected from both said at least one bus member and said contactor mechanism in said isolated position, said fuse chassis moving means being actuated from outside said housing.

4,233,644

DUAL-PULL AIR COOLING FOR A COMPUTER FRAME

Un-Pah Hwang, and Robert E. Simons, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,998
Int. Cl.³ H05K 7/20
U.S. Cl. 361—384 **11 Claims**



1. Air cooling structure including a column of integrated circuit modules comprising:

a heat sink attached to each module and extending from the top side thereof and having air outlets at opposite ends thereof;

a cover plate having openings therein indexed with each of said heat sinks to allow air to pass through the openings into the heat sinks;

an air flow guide located at the air outlet sides of said heat sinks extending from said cover plate into said heat sink to approximately the halfway point to provide a vertical impinging air flow pattern which yields a high heat transfer coefficient;

air distribution ducts connected to the opposite outlet sides of each of said heat sinks thereby providing a dividing of the flow across each heat sink;

a pair of air moving devices, one located at one end of said air distribution ducts and the other at the other end of said air distribution ducts, each pulling air through said modules.

4,233,645

SEMICONDUCTOR PACKAGE WITH IMPROVED CONDUCTION COOLING STRUCTURE

Demetrios Balderes, Wappingers Falls; John R. Lynch, Hopewell Junction, and Robert A. Yacavonis, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

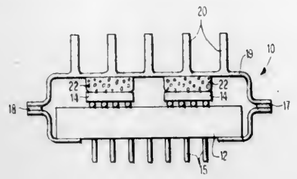
Filed Oct. 2, 1978, Ser. No. 947,788
Int. Cl.³ H05K 7/20
U.S. Cl. 361—385 **1 Claim**

1. In a semiconductor device package having a substrate, at least one semiconductor device mounted on the top surface of the substrate, a heat sink having a surface in spaced relation to the top surface of the substrate, the improvement comprising,

at least one heat transfer member positioned between said device and said surface of said heat sink,

said heat transfer member comprised of a porous block of material, and

a heat conductive non-volatile low viscosity, high surface tension, liquid permanently retained within said block of material and in contact with said device by capillary action,



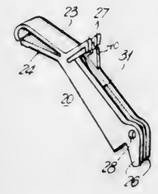
said heat transfer member operative to transfer heat by conduction from said device to said heat sink without changing phase.

4,233,646

LATCHING LEVER FOR PRINTED CIRCUIT BOARDS

Ernest C. Leung, Ottawa, and Isaac R. Revah, Willowdale, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 30, 1979, Ser. No. 61,689
Claims priority, application Canada, Jun. 29, 1979, 330868
Int. Cl.³ H05K 1/18
U.S. Cl. 361—399 **9 Claims**



1. A latching lever for use with an object for aiding the entry of said object into a mating apparatus, for securing said object in said mating apparatus, and for aiding the removal of said object from said mating apparatus, said latching lever characterized by:

a body portion for pivotal connection to said object, about a pivot point;

a hooked portion, flexibly mounted to said body portion, and projecting therefrom at the end of said body portion remote from said pivot point, for engaging a projection attached to said object;

an actuating member, solidly connected to said hooked portion and protruding therefrom, for moving said hooked portion relative to said body portion, so as to selectively disengage said hooked portion from said projection;

a stop portion, solidly connected to said body portion and protruding therefrom, located adjacent said actuating member, but spaced therefrom so as to provide a limit to the movement of said actuating member.

4,233,647

PHOTOGRAPHIC ACCESSORY APPARATUS

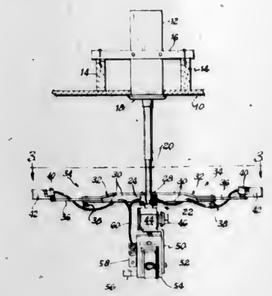
Axel B. Andersen, 1923 Morena Blvd., San Diego, Calif. 92110

Filed Aug. 25, 1978, Ser. No. 936,752
Int. Cl.³ G03B 15/02
U.S. Cl. 362—16 **6 Claims**

1. A photographic accessory assembly for illuminating an area to be photographed, said accessory comprising:

(a) a mounting means;

(b) a directional high intensity light source mounted on said mounting means and directed substantially away from said area to be photographed;



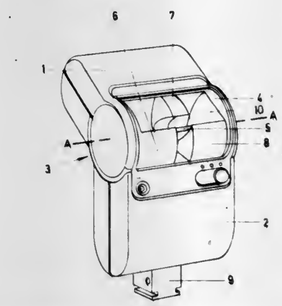
(c) a reflective light diffusion screen mounted adjacent said high intensity light source and angled to reflect diffused light from said source onto said area to be photographed.

4,233,648

ADJUSTABLE DIRECT AND BOUNCE PHOTOFLASH UNIT

Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 26, 1979, Ser. No. 33,537
Claims priority, application Fed. Rep. of Germany, May 19, 1978, 7815176[U]
Int. Cl.³ G03B 15/02
U.S. Cl. 362—17 **3 Claims**



1. Flash illumination apparatus usable selectively for full or variably partial direct illumination comprising, in combination:

a casing consisting of two box-like bodies having the same rectangular cross-sectional dimensions, pivoted one on the other on an axis parallel to the width dimension of said bodies lying on the median plane of both of them;

a flash tube centered on said axis running substantially across said casing;

a cylindrical transparent window of variable width having a cylindrically formed sheet of transparent material mounted on one of said bodies and fitted in an opening and a mounting in both of said bodies so as to maintain a window centered on said flash tube over a range of relative positions of said two bodies obtainable by pivoting one on the other;

a mounting foot on one of said bodies at the end thereof remote from the connection to the other of said bodies;

a centrally disposed reflector substantially in the shape of a parabolic cylinder having said axis as its focal line and affixed to one of said bodies, and

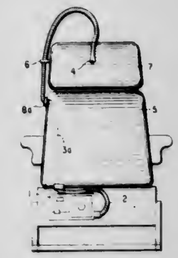
a pair of reflectors located on either side of said central reflector and substantially in the shape of parabolic cylinders having said axis as the respective focal lines thereof, said pairs of reflectors being fixed on the one of said bodies other than the one on which said central reflector is fixed, whereby manual tilting of that one of said bodies other than the one on which foot is affixed determines the amount of deviation of light projected from said flash tube by said pair of reflectors from the light projected by said central reflector when said flash tube is operated.

4,233,649

TREATMENT CHAIR WITH COOL-LIGHT LAMP FOR DENTAL MEDICINAL PURPOSES

Peter Scheer, Wandsbeker Markststr. 91, 2000 Hamburg 70, and Arnold Hamann, 2061 Ahrensfelde4, Westerau-Ahrensfelde, both of Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,811
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 7736502
Int. Cl.² F21V 7/04
U.S. Cl. 362—32 **5 Claims**



1. Lamp assembly for dental-medical and similar purposes including a treatment chair having a first part and a second part movably displaceable relative to said first part, a light source, an elongated flexible glass fiber bundle having a first end and a second end with the first end connected to said light source for transmitting light through said glass fiber bundle, a flexible tubular guide enclosing at least a part of said glass glass fiber bundle between the ends thereof, a light outlet member connected to the second end of said glass fiber bundle for directing the light therefrom, wherein the improvement comprises that said light source is mounted on said treatment chair, said flexible tubular member extending from the second end of said glass fiber bundle, a holder mounted on said tubular guide extending from the second end of said glass fiber bundle and disposed in spaced relation to said light outlet member, said holder being fixed to the second part of said treatment chair so that the part of said tubular guide and said glass fiber bundle therein extending between said holder and said light outlet member is maintained in position relative to said second part even though said second part moves relative to said first part of said treatment chair.

4,233,650

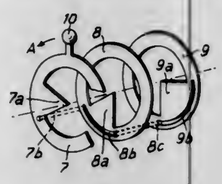
BRIGHTNESS CONTROL FOR FIBER OPTICAL LAMPS

Willi Hagner, Solms, and Horst Frimmel, Hermannstein, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,093
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745397
Int. Cl.³ F21V 7/04; G02B 9/00; F21V 17/02
U.S. Cl. 362—32 **5 Claims**

1. A brightness control device for use with fiber optical lamps which include an optical fiber bundle having a light entrance area and a light source which directs a light beam towards said light entrance area, comprising a diaphragm

arranged unilaterally in the light beam between said light source and said light entrance area, said diaphragm having a



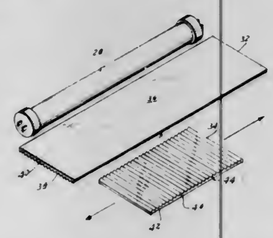
variable size and a shape such that the cross-section of the light entrance area of said fiber bundle is asymmetrically and unilaterally reduced.

4,233,651

WORK AREA LIGHTING SYSTEM

William C. Fabbri, Billerica, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,697
Int. Cl.[3] F21V 5/02, 11/18, 13/04
U.S. Cl. 362—33 5 Claims



1. A work area lighting system for providing a combination of substantially glare-free and non-glare-free light comprising: a housing positioned above said work area, said housing having an open bottom end; an elongated linear light source having a longitudinal axis mounted within said housing; a refractor comprising a pair of superimposed plate members mounted to said housing closing said open bottom end, said refractor having a first refractor plate member substantially co-extensive in length with said light source and a second refractor member shorter in length than said first member along said longitudinal axis whereby substantially all the luminous flux eminating from said light source directed toward said refractors passes through said first refractor plate member but only a portion of the luminous flux passing through said first refractor plate passes through said second refractor plate; and means for selectively positioning said second refractor plate along the light source longitudinal axis; said first refractor member having light incident and emergent surfaces and said light emergent surface having a plurality of spaced prisms extending parallel to the length of said linear light source; and, said second refractor member having light incident and emergent surfaces and said light incident surface having a plurality of spaced prisms extending perpendicular to said linear light source whereby the luminous flux passing through both said refractors is substantially glare-free and the luminous flux passing through only said first refractor is non-glare-free.

4,233,652

AIRCRAFT ILLUMINATION APPARATUS AND OPERATING CIRCUITRY

George J. Oswald, Boise, Id., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Filed Aug. 2, 1977, Ser. No. 821,131
Int. Cl.[3] B64D 47/02
U.S. Cl. 362—63 8 Claims



1. Aircraft landing, take-off, and taxiing illumination apparatus for use in combination with an aircraft having a fuselage, a retractable front landing gear, on openable and retractable front landing gear door located in a forward bottom portion of the fuselage, and an electric power source, comprising,

illumination means including at least one electric light source,

mounting means for mounting such illumination means on an interior portion of such landing gear door, and

electrical circuit apparatus for automatically controlling delivery of load current from such power source to the illumination means when the landing gear door is in the open position and for interrupting load current in such illumination means when the landing gear door is in the closed position,

such circuit apparatus including

power circuit means for carrying such load current,

a control circuit for carrying a control signal without carrying load current, and

switch means for changing state responsive to the opening and retracting of such landing gear door,

the power circuit interconnecting the electrical power source and the illumination means and including means for interrupting load current in the power circuit,

the control circuit intercoupling the switch means and the power circuit and including control means for controlling the means for interrupting load current in the power circuit responsive to the state of the switch means.

4,233,653

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Hermanus M. Jongerius, and Rein W. van der Wolf, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 852,070
Claims priority, application Netherlands, Nov. 19, 1976, 7612881
Int. Cl.[3] F21V 9/16
U.S. Cl. 362—84 1 Claim



1. A low-pressure mercury vapor discharge lamp for cooperation with an associated electrical power supply which comprises: a tubular glass envelope having first and second ends,

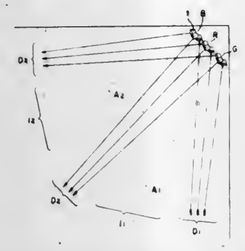
first and second electrodes sealed respectively at said first and second ends of said envelope with connection means extending out of said envelope, an ionizable medium disposed in said tube which includes mercury, a light-transmissive conductive layer disposed on the inside of said glass envelope which is not connected to either electrode, said layer extending over substantially the full axial extent of said envelope and extending over less than the entire extent of the envelope at each axial cross-section, a luminescent coating disposed on said layer, and an amalgam disposed in said tube.

4,233,654

METHOD OF LIGHTING FOR COLORED SHADOWS

Michihiro Tsuchihashi; Masato Saito; Makoto Yamanoshita, all of Amagasaki; Hidetoshi Katsura, Kamakura; Osamu Myodo, Kamakura, and Koichiro Maeyama, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 795,445, May 10, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,177
Claims priority, application Japan, May 25, 1976, 51-60315
Int. Cl.[2] F21V 9/00
U.S. Cl. 362—231 4 Claims



1. A method of obtaining sharply defined and illuminated color shadows, comprising the steps of:

arranging first, second and third light sources in spaced apart relationship;

providing a plurality of closely adjacent color lights in each of said first, second and third light sources, with the color lights in the first light source producing light for yellow to red colors, the color lights in the second light source producing light for green color, and the color lights in the third light source producing light for violet to blue colors; and

orienting the plurality of lights in the first, second and third light sources so that one light from each light source is aimed in a first direction to thereby obtain illumination of an area with light from each of the three light sources, and aiming at least another light from each of the light sources in at least another direction to thereby obtain illuminatin of another area with light from each of the three sources, each such area therefore being illuminated as if by light from a common source and the phenomenon of shadow doubling thus being avoided.

4,233,655

SPOTLIGHT

Francis J. Zelina, Jr., Erie, and John H. Zelina, Jr., Fairview, both of Pa., assignors to Lighting Systems, Inc., Erie, Pa.

Filed Oct. 16, 1978, Ser. No. 947,779
Int. Cl.[3] F21V 17/00
U.S. Cl. 362—259 20 Claims

1. A spotlight (10) comprising,

a housing (11),

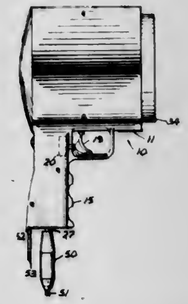
said housing being made of two halves (13,14),

said two halves enclosing a hollow space having an open front end,

a lamp (12) in said hollow space in said housing (11),

a handle (15) having two halves each said half being integrally fixed to said halves of said housing (11),

each of said halves (13,14) having radially inwardly directed circumferentially spaced first leaves (25) adjacent said open end and inwardly directed circumferentially spaced second leaves (24) adjacent said open end and spaced from said first leaves integrally fixed thereto,



said lamp having a generally round shaped rim adjacent said open front end,

said rim being received between the said first leaves and said second leaves (24),

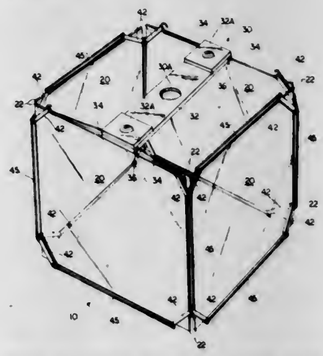
said second leaves providing a shock absorbing means for supporting said lamp whereby damage to said lamp from impact of said housing is minimized.

4,233,656

ASSEMBLABLE LAMP SHADE AND STRUCTURES

Norman S. Shemitz, Milford, Conn., assignor to Shemsafe Incorporated, Milford, Conn.

Filed Oct. 12, 1978, Ser. No. 950,592
Int. Cl.[3] F21V 1/06, 1/12
U.S. Cl. 362—352 19 Claims



1. An improved support system for a lamp shade of the type having a plurality of panels connected together by the support system in a predetermined polyhedral configuration, each of the panels defining a plurality of corners; comprising, a plurality of collars, each collar being adapted to extend around a corresponding one of the panel corners, elastic connecting members connecting at least some of the collars together such that groups of opposing, adjacent collars on juxtaposed panels are connected together at their proximate ends by a said elastic member, and at least some of the said groups of collars are connected to other groups of collars which are spaced from the first group, by tensioned elastic members stretched between the said groups of collars, such that all of the collars are capable of being releaseably held in place on their respective panels, to releaseably hold all of the panels under the tension of

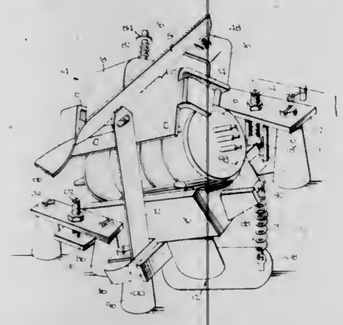
the elastic members in the predetermined polyhedral configuration.

4,233,657

SOURCE LAMP POSITIONING APPARATUS

Charles F. deMey, II, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 2, 1979, Ser. No. 8,916
Int. Cl.[3] F21V *23/04*
U.S. Cl. 362—396 **14 Claims**



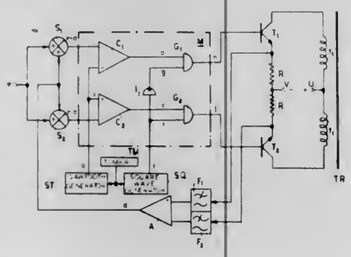
1. In an optical apparatus including a base member, a substantially cylindrical radiation source lamp having a sidewardly projecting cylindrical protrusion, and a holder for adjustably positioning said lamp to direct radiation along a preselected optical axis, the improvement which comprises: first and second pivot members intermediate said base member and holder on an axis of rotation substantially perpendicular to said optical axis; means intermediate said base member and holder defining a linear groove parallel to said axis of rotation and receiving said first and second pivot members therein; means for resiliently urging said holder in a first direction of rotation about said axis of rotation; means for adjustably restraining said holder from rotation in said first direction of rotation; and means for adjustably translating said holder along said axis of rotation by linear relative movement between said groove and said first and second pivot members.

4,233,658

TRANSISTORIZED D-C/A-C CONVERTER

Elio Lupatin, Settimo Milanese, and Luigi Rizzi, Milan, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Feb. 16, 1978, Ser. No. 863,412
Claims priority, application Italy, Dec. 23, 1976, 30814/76
Int. Cl.[3] H02P *13/18*
U.S. Cl. 363—26 **7 Claims**



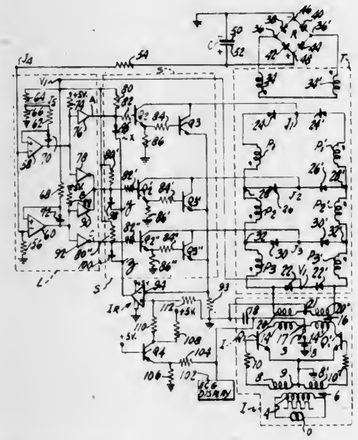
1. A d-c/a-c converter comprising:
a transformer having a secondary winding connected across a load and a primary winding divided into two symmetrical halves;
a pair of transistors each having a base, a collector and an emitter, the collector/emitter path of each transistor being connected between a respective half of said primary winding and a common junction point;
a supply of direct current connected between said junction point and a center tap of said primary winding, thereby forming a pair of substantially identical circuit branches for the energization of said halves upon conduction of the respective transistors;
sensing means connected across symmetrical portions of said circuit branches for producing an unbalance signal in response to an unsymmetrical current component traversing said primary winding;
an adder and a substractor connected in parallel to said sensing means and to a source of reference voltage for producing two control signals varying in opposite senses upon deviations of said unbalance signal from zero;
a first signal generator producing a sawtooth voltage;
a second signal generator producing a square wave with a period twice that of said sawtooth voltage; and
processing means delivering a pair of pulse trains, of a pulse width varying with the sign and the magnitude of said unbalance signal, to the bases of said transistors for alternately saturating said transistors with a relative timing tending to minimize said unsymmetrical current component, said processing means including a pair of comparators in cascade with a pair of logic gates, said comparators having first inputs connected to receive said control signals from said adder and said subtractor, respectively, and further having second inputs connected to receive said sawtooth wave from said first signal generator, said logic gates having input connections with inversion means for respectively receiving said square wave and a complement thereof from said second signal generator.

4,233,659

DEFIBRILLATOR CHARGING CURRENT REGULATOR

Sherman J. Pirkle, Waltham, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 5, 1978, Ser. No. 867,264
Int. Cl.[3] H02P *13/00*
U.S. Cl. 363—134 **3 Claims**



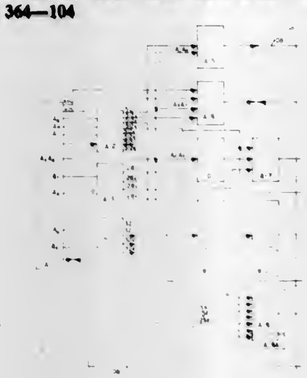
1. The combination of
a battery,
an inverter having an input and an output, said input being coupled to said battery,
a transformer having primary and secondary windings, said primary winding being coupled to said output of said inverter,
a rectifier having an input and an output, said input being coupled to said secondary winding of said transformer,
a capacitor to be charged coupled to the output of said rectifier,
a plurality of variable impedance devices,
switching means coupled to said capacitor for connecting different points on said primary winding through a respective one of said variable impedance devices so as to provide a current return path to said inverter as the voltage across said capacitor increases through pedetermined values,
a resistor connected in series with said variable impedance devices, and
means for varying the impedance of the variable impedance device that is in the current return path in accordance with a comparison between the voltage across said resistor and the voltage of said battery.

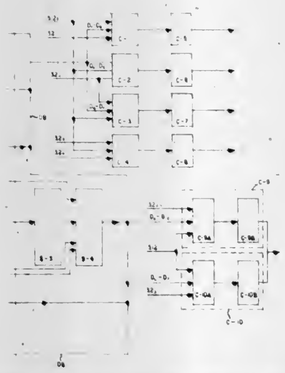
4,233,660

VENDING MACHINE CONTROL SYSTEM

John C. Fagan, Oak Lawn, Ill., assignor to Artag Plastics Corporation, Rosemont, Ill.

Filed Oct. 12, 1978, Ser. No. 950,683
Int. Cl.[3] G06F *15/46*; G07F *5/22, 11/00*
U.S. Cl. 364—104 **5 Claims**





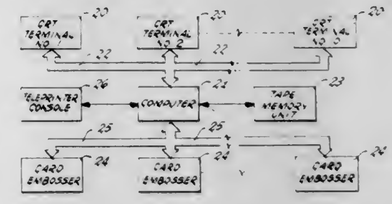
1. A system for controlling the operation sequencing of a machine comprising, actuating signal generating means for generating actuating signals coupled to dispensing actuators for effecting operation of a machine including said actuators operable upon the receipt of an actuating signal to effect the operation thereof, programmable command signal generating means coupled to said actuating signal generating means for coupling command signals thereto for effecting generation of said actuating signals therefrom, condition responsive means coupled to said actuating signal generating means for generating a condition responsive signal thereto, said actuating signal generating means actuable upon receipt of said condition responsive signal and a command signal generated by said programmable command signal generating means to produce said actuating signals responsive to the condition responsive signal for effecting operation of the actuators of said machine, wherein said actuating signal generating means produces an enabling signal coupled to said programmable command signal generating means to effect generation of a command signal therefrom for effecting the generation of said actuating signals, and wherein said condition responsive means comprises a verification signal generating means coupled to said actuating signal generating means and generating a condition responsive verification signal to verify dispensing operation of a machine actuator which has been operated upon receipt of an actuating signal from said actuating signal generating means, and said actuating signal generating means actuable upon receipt of said verification signal to produce an enabling signal coupled to said programmable command signal generating means to effect generation of a command signal resetting said actuating signal generating means to an initial condition.

4,233,661

COMPUTER CONTROLLED REGISTRATION AND INQUIRY SYSTEM

Edgar A. Bolton, 22051 Capistrano La., Huntington Beach, Calif. 92646, and Larry D. Dallen, 4806 Darien St., Torrance, Calif. 90503

Continuation of Ser. No. 443,422, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 278,540, Aug. 8, 1972, abandoned. This application Jul. 31, 1978, Ser. No. 929,100
Int. Cl.[3] G06F *9/00*; B41J *1/54*
U.S. Cl. 364—300 **3 Claims**



1. A method of obtaining and processing information on a multiplicity of registrants to be registered and generating an embossed identification card therefrom comprising the steps of:
intermittently receiving a set of inputted registration data associated with a signal registration from at least one input means;
editing the inputted registration data according to the substeps of:
comparing the format of the inputted data against a predefined format,
observing the stored registration data and replacing the stored registration data which is incorrect with new registration data for obtaining a set of correct registration data;
generating a flag signal when a complete set of correct registration data is stored in the editing means;
utilizing a controller means for:
storing a plurality of sets of correct registrtion data in a first data storage means;
intermittently selecting a set of correct registration data and enabling the transfer of that selected set of correct registration data between the controller means and the editing means;
intermittently selecting one of a plurality of embossing means and enabling the transfer of a first selected por-

tion of a selected set of the correct registration data to the selected embossing means;

intermittently enabling the transfer of the second selected portion of a selected set of correct registration data to a second storage means, all of said transfers occurring according to a programmed priority schedule.

4,233,662
RADIOGRAPHY

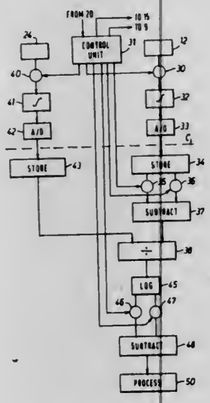
Christopher A. G. LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 781,961, Mar. 28, 1977, Pat. No. 4,114,042, which is a continuation of Ser. No. 609,718, Sep. 2, 1975, Pat. No. 4,038,551, which is a division of Ser. No. 462,104, Apr. 18, 1974, Pat. No. 3,924,129. This application Feb. 13, 1978, Ser. No. 877,228

Claims priority, application United Kingdom, Apr. 25, 1973, 19528/73; Aug. 21, 1973, 39420/73; Oct. 11, 1973, 47507/73

Int. Cl.³ G01N *21/34*

U.S. Cl. 364—414 4 Claims



1. A medical diagnostic X-ray machine comprising:

means for deriving sets of first electrical signals in which each signal is a measure of the attenuation suffered by X-radiation in passing through a patient along a respective one of a multiplicity of substantially coplanar beam paths and the signals of each set are measures of the attenuation along a respective set of said beam paths, each set of beam paths being oriented relative to the patient at a respective angle or mean angle different from that of any other set of beam paths;

means for converting each set of first electrical signals into a respective set of second electrical signals by providing a sequence of weighting factors comprising a central weighting factor and a plurality of other weighting factors symmetrically disposed to either side of said central factor, said other factors being of opposite polarity to said central factor, and accumulating, for each first electrical signal, the products of the last recited first electrical signal times the central weighting factor of the sequence, and the product of each of the other first electrical signals of the same set times respective of said further weighting factors, the weighting factors at least after the first five changing monotonically in amplitude; and

means for providing a matrix of storage locations corresponding to a matrix of elements into which a slice of the patient coinciding with the plane of the beam paths is notionally divided by a rectangular grid and for accumulating in each storage location contributions from those second electrical signals which correspond in position in their respective sets to first electrical signals which are measures of the X-ray attenuation along beam paths passing through the slice element corresponding to the last recited storage location, said last recited contributions being weighted in accordance with the relative dispositions of the last recited storage location and beam paths.

4,233,663
APPARATUS FOR ESTIMATING A NECESSARY AMOUNT OF INK

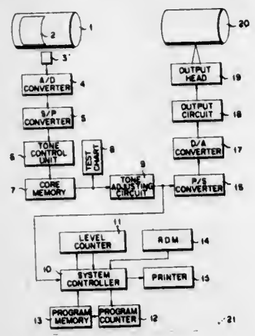
Kazuo Sugawara; Sei Sanada, both of Tokyo, and Yoshiharu Kobayashi, Yokohama, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1978, Ser. No. 968,700

Claims priority, application Japan, Dec. 15, 1977, 52-151033

Int. Cl.³ H04N *1/22*; B41M *1/10*

U.S. Cl. 364—515 5 Claims



1. An apparatus for estimating a necessary amount of ink for printing, comprising:

a photoelectric converter for producing analog signals representing the optical densities of the various parts of an original print;

an A-D converter for converting the analog signals from the photoelectric converter into digital signals representing the optical densities of unit areas of the original print;

a plurality of level counters for classifying the digital signals from the A-D converter into groups of different levels and counting the numbers of digital signals of the respective groups;

calculating means for calculating an amount of ink to apply on a printing plate, based on the counts of each level counter and an amount of ink to apply on each of the unit areas of the printing plate which correspond to the digital signals and for calculating an amount of ink necessary to print one sheet by multiplying a correction coefficient by the amount of ink thus calculated; and

a display device for displaying the amount of ink calculated by the calculating means.

4,233,664
PARTICLE SIZE METER

Pierre-André Grandchamp, Münchenstein, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 749,202, Dec. 9, 1976, Pat. No. 4,158,234. This application Mar. 5, 1979, Ser. No. 17,642

Claims priority, application Switzerland, Dec. 12, 1975, 16146/75; Sep. 23, 1976, 12075/76

Int. Cl.³ G01N *15/02*; G06G *7/48*; G06F *15/20*

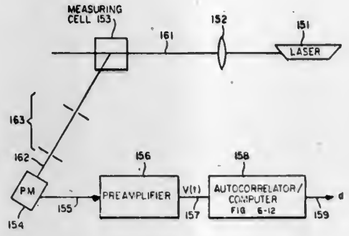
U.S. Cl. 364—555 4 Claims

1. In an apparatus for measuring the size of particles in Brownian motion in suspension in a solvent, the combination comprising:

(a) means for producing a beam of coherent light waves;

(b) a sample cell for containing a quantity of the solvent, said sample cell being interposed along the path of propagation of said beam, so that a portion thereof is scattered by said particles;

(c) energy detector means for detecting energy waves scattered by the particles at a given angle with respect to the beam of coherent light waves, said energy detector means providing a first output signal v(t) corresponding to the variation with time of the intensity of the scattered waves at the given angle; and



(d) electronic circuit means for processing said first output signal v(t) to derive asecond output signal representative of the size of the particles, said electronic circuit means including:

means for processing the first output signal to derive:

a first auxiliary signal corresponding to a first double integral R_1 having the

$$R_1 = \frac{1}{\Delta t} \int_{t_0}^{t_0 + \Delta t} \int_{\tau_a}^{\tau_b} V(t)\, V(t+\tau)\, dt\, d\tau$$

and a second auxiliary signal corresponding to a second double integral R_2 having the general form

$$R_2 = \frac{1}{\Delta t} \int_{t_0}^{t_0 + \Delta t} \int_{\tau_c}^{\tau_d} V(t)\, V(t+\tau)\, dt\, d\tau$$

where the values of τ_a, τ_b, τ_c, τ_d, define integration ranges in the delay-time τ region and where Δt represents an integration range with respect to time from an initial instant t_0, and means for combining the first and second auxiliary signals to derive said second output signal.

4,233,665
DATE DATA PROCESSOR

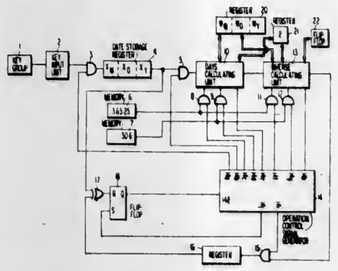
Yukio Maehashi, and Hidetoshi Kosaka, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,129

Claims priority, application Japan, Dec. 20, 1977, 52-153934

Int. Cl.³ G06F *15/02*, *15/20*

U.S. Cl. 364—715 7 Claims



1. A date data processing system comprising first memory means for storing a date to be processed, means for calculating a difference in days from a reference date to said date, means for producing an inversely-calculated date by inversely-calculating a date from said difference in days and said reference date, second memory means for storing said inversely-calculated date, means for comparing the contents of said first memory means with the contents of said second memory means, and wherein said first memory means retains said date to be processed at least until termination of comparison by said comparing means.

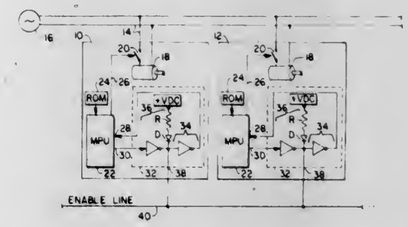
4,233,666
DRIVE POWER SEQUENCING

Per-Erik Walberg, San Jose; Donald F. Johann, Palo Alto, and Charles E. Mendenhall, Campbell, all of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,767

Int. Cl.² G06F *1/00*

U.S. Cl. 364—900 16 Claims



1. In a digital computer information storage and access system having an arbitrary number of independently operative mass storage drives, each drive characterized by an electric motor adapted to operate continuously during data storage and access and further operative to start up in response to a motor start signal, an apparatus for directing the random sequential starting up of all said motors, said apparatus comprising:

a single signal and control line coupled in common to each one of said drives and operative to convey a TRUE-FALSE signal from a central controller having no knowledge of the state of operation of said drives, said TRUE-FALSE signal indicating in a first state the disallowability of a drive to enable a motor start up sequence;

a first circuit means associated with each one of said drives and coupled to said signal and control line for sensing said TRUE-FALSE state signal and conveying said state signal to a third circuit means;

a second circuit means associated with each one of said drives and coupled at a common node with said first circuit means to said signal and control line for overriding said TRUE-FALSE signal to establish said first state on said signal and control line in response to a signal from a third circuit means; and
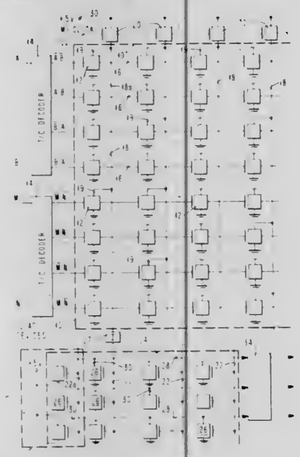
a third circuit means associated with each one of said drives and responsive to said first circuit means of said associated drive for issuing, in response only to a second state of said TRUE-FALSE state signal conveyed to it by said first circuit means, said motor start signal to said motor associated therewith and operative to issue said disallow sequence enable signal to said second circuit means and thereby to cause said second circuit means to override said signal and control line in order to prevent any other motor to start up for the duration of said override signal.

4,233,667

DEMAND POWERED PROGRAMMABLE LOGIC ARRAY

William T. Devine, Ulster Park, and William Gianopulos, West Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,136
Int. Cl.[3] G06F *1/00*; H03K *19/20*
U.S. Cl. 364—900 6 Claims



1. In a programmable logic array of the type which operates on binary data variables in an AND matrix of logic performing elements to generate product terms and supplies them to an OR matrix of logic performing elements which in turn feeds sums of these product terms into a storage means to provide those output signals in various combinations as inputs to the AND array, the improvement comprising:

logic means including at least logic performing elements in the AND matrix to generate a control signal from said binary data variables and powering means responsive to said control signal to conditionally power at least a portion of one of the logic performing parts of the programmable logic array in response to said control signal.

4,233,668

METHOD AND APPARATUS FOR TESTING A MAGNETIC BUBBLE MEMORY

Nakahiko Yamaguchi, Sayama; Susumu Hibi, Fujisawa; Shigeru Yoshizawa, Tokorozawa; Shoji Yoshimoto, and Akira Kobayashi, both of Mobara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed Sep. 29, 1978, Ser. No. 946,864
Claims priority, application Japan, Sep. 30, 1977, 52-117929
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—1 9 Claims

1. A method for testing a magnetic bubble memory comprising the steps of:

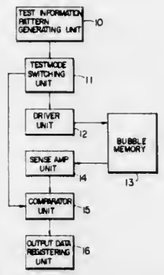
storing a basic pattern [P] represented by binary notation in a first memory unit and storing a test information pattern for determining an arrangement of said basic patterns [P] and complementary patterns $\overline{[P]}$ thereof in a second memory unit;

sequentially reading said basic pattern [P] and said complementary pattern $\overline{[P]}$ in accordance with said test information pattern;

converting said patterns into a logical signal corresponding to binary notation;

generating a magnetic bubble pattern corresponding to said test information pattern in a storage area of said magnetic bubble memory by a driver unit through a test mode switching unit;

converting a magnetic bubble domain train of said magnetic bubble pattern into a logical signal by a magnetic bubble domain detector and an output amplifier unit;



comparing said logical signal corresponding to said magnetic bubble domain train with said logical signal corresponding to said test information pattern by a comparator unit to determine identity or non-identity thereof; and

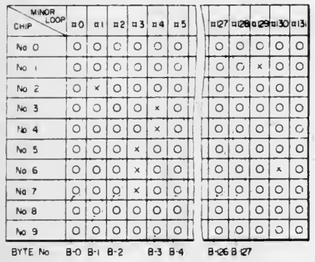
evaluating a memory characteristic of said magnetic bubble memory by the output from said comparator unit.

4,233,669

REDUNDANT BUBBLE MEMORY CONTROL SYSTEM

Kazuo Furukawa, Yokohama, and Sumio Furukawa, Tokorozawa, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed Apr. 19, 1978, Ser. No. 897,692
Claims priority, application Japan, Apr. 20, 1977, 52-44446; Nov. 30, 1977, 52-142759; Nov. 30, 1977, 52-142760
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—15 14 Claims



1. A memory control system comprising:

(a) a memory unit including a plurality of memory chips each having a plurality of information loops which may include one or more defective loops and transfer means for transferring information bits to or from selected ones of said information loops, the number of said memory chips being larger than the number of bits required for unit information;

(b) an additional memory for storing information indicative of normal and defective conditions of said information loops in each of said chips;

(c) control means for activating said transfer means in each of said chips and accessing to one information loop in each of said chips at the same timing to transfer the information bits to or from the information loop group; and

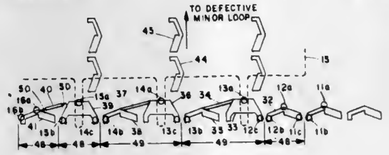
(d) connection control means for reading information stored in said additional memory to determine locations of said defective information loops to identify the defective loops in the information loops of the respective chips accessed by said control means and selecting normal loops which are equal in number to the number of bits required for the unit information, for each information loop group accessed at each timing, when the number of the normal loops other than the defective loops included in said accessed information loop group is equal to or more than said number of bits required for the unit information, to connect the transfer means corresponding to those loops to an external unit.

4,233,670

FAULT TRANSPARENT MAGNETIC BUBBLE MEMORY

George F. Reyling, Jr., Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 11, 1978, Ser. No. 968,172
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—15 9 Claims



1. A fault transparent magnetic bubble memory comprised of;

a plurality of minor loop means for propagating bubbles in parallel therein;

serial-parallel input means for propagating bubbles to said minor loops wherein the serial portion of said serial-parallel means consists of a predetermined number of pairs of single-distance propagation means between each of the parallel inputs;

parallel-serial output means for propagating bubbles from said minor loops wherein the serial portion of said parallel-serial means consists of a predetermined number of pairs of single-distance propagation means between each of the parallel outputs; and

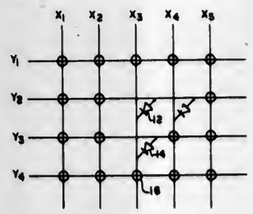
shorting means lying between each of said pairs of single-distance propagation means for converting said pairs into double-distance propagation means, said shorting means also being selectively destructable.

4,233,671

READ ONLY MEMORY AND INTEGRATED CIRCUIT AND METHOD OF PROGRAMMING BY LASER MEANS

Levy Gerzberg; Arnon Gat, both of Palo Alto; Roger Melen, Los Altos Hills, and James F. Gibbons, Palo Alto, all of Calif., assignors to Stanford University, Stanford, Calif.

Filed Jan. 5, 1979, Ser. No. 1,360
Int. Cl.[2] G11C *17/06*
U.S. Cl. 365—105 25 Claims



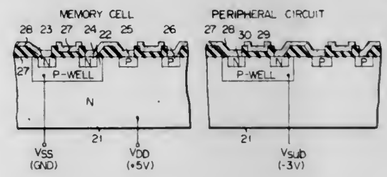
1. A read only memory comprising support means, a first plurality of spaced parallel conductive lines on a surface of said support means, said first plurality of conductive lines including dopants of a first conductivity type, a layer of polycrystalline semiconductor material overlaying said first plurality of conductor lines, said layer of polycrystalline semiconductor material including regions of doped material extending at least partially through said layer, said doped regions including dopants of opposite conductivity type, each of said regions being positioned above one line of said first plurality of conductive lines, and a second plurality of spaced parallel conductive lines on the surface of said layer of polycrystalline semiconductor material, said second plurality of conductive lines being skewed with respect to said first plurality of conductive lines with said regions of doped material provided at crossing points of said first plurality of lines and said second plurality of lines.

4,233,672

HIGH-SPEED SEMICONDUCTOR DEVICE

Yasoji Suzuki, Ayase; Kiyofumi Ochii, Inagi, and Hiroxi Asahi, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1978, Ser. No. 962,222
Claims priority, application Japan, Nov. 21, 1977, 52-139586
Int. Cl.[2] G11C *7/00*
U.S. Cl. 365—181 3 Claims



1. A semiconductor device operated with first, second, and third operating potentials, said semiconductor device comprising:

a semiconductor substrate of a first conductivity type supplied with said first operating potential;

a first well of a second conductivity type formed in said substrate and having a source region and a drain region, both of said first conductivity type, formed therein to form capacitive PN junctions therewith, said first well and said source region formed in said first well being supplied with said second operating potential; and

a second well of said second conductivity type formed in said substrate and having a source region and a drain region, both of said first conductivity type, formed therein of form capacitive PN junctions therewith, said source region formed in said second well being supplied with said second operating potential and said second well being supplied with said third operating potential to make the capacitances of said PN junctions formed in said second well smaller than the capacitances of said PN junctions formed in said first well.

4,233,673

ELECTRICALLY RESETTABLE NON-VOLATILE MEMORY FOR A FUSE SYSTEM

James R. Cricchi, and Gustav Cavar, both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 24, 1970, Ser. No. 49,429
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—184 10 Claims

1. An electrically resettable memory for storing a plural bit data word comprising:

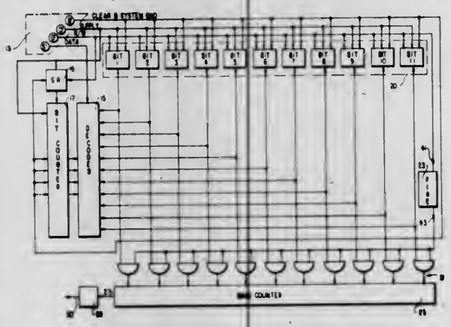
a plurality of memory storage bits, each of said storage bits comprising a variable threshold voltage transistor having a first and a second stable state,

means for applying a negative polarizing voltage to the gate of each of said storage transistors,

memory clearing means for applying a positive polarizing voltage to said storage bits to set said storage bits to a first stable threshold voltage state,

means for supplying a bi-level data signal representing a plural bit data word,

addressing means for sequentially addressing said plurality of storage bits and for coupling the bi-level data signal to the source of said addressed storage bit transistors to enable storage of one of the bi-levels of the data signal such that a negative polarizing voltage is established be-



tween the gate and source thereby setting said addressed transistor to said second stable state, and to enable storage of the other of the bi-levels of the data signal such that a voltage substantially less than the polarizing voltage is established between the gate and source thereby retaining the first stable state of said addressed transistor set by said memory clearing means, and

write means for selectively applying a negative polarizing voltage to an addressed storage bit to set said addressed storage bit to the second stable threshold voltage state in accordance with a predetermined, corresponding data bit.

4,233,674

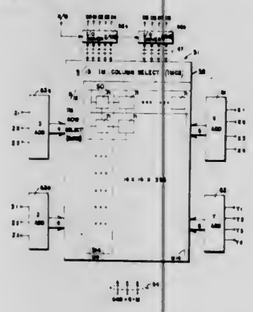
METHOD OF CONFIGURING AN INTEGRATED CIRCUIT

Lewis K. Russell, San Jose, and David Kleitman, Los Altos Hills, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 675,776, Apr. 12, 1976, which is a continuation of Ser. No. 452,195, Mar. 18, 1974, abandoned. This application Aug. 7, 1978, Ser. No. 931,591

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—200 **6 Claims**



1. A method of configuring an integrated circuit, comprising:

(a) providing an array of unconnected semiconductor circuits spaced apart in a semiconductor body;

(b) providing a pattern of conductive paths extending over a substantial portion of the length and breadth of a surface of said body, interlaced between said semiconductor circuits and spaced therefrom;

(c) providing at least partly within said body adjacent to each of said semiconductor circuits and coupled between adjacent semiconductor circuits and adjacent conductive paths semiconductor switching means capable of being switched between high impedance and low impedance state;

(d) testing each one of said semiconductor circuits to determine its operability;

(e) recording the location of each of said semiconductor circuits and assigning an indicator to each location representing the operability or inoperability of each semiconductor circuit so located;

(f) coupling at least some of said operable semiconductor circuits to said conductive paths by causing said semiconductor switching means selectively to assume a low impedance state adjacent to locations where the recording indicates an operable semiconductor circuit, and

(g) decoupling said inoperable semiconductor circuits from said conductive paths by causing said semiconductor switching means to assume a high impedance state at locations where the recording indicates an inoperable semiconductor circuit, wherein the step in (e) includes mapping the cartesian coordinate location of said operable and inoperable circuits,

producing a matrix of nodes located within groupings of adjacent circuits as represented by their cartesian coordinate location,

summing the number of operable circuits in each grouping about a node,

selecting those nodes which have the greater number of operable circuits adjacent thereto, and

utilizing the results of said node selection to perform the step in (f).

4,233,675

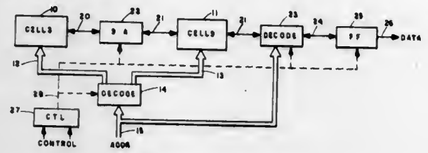
X SENSE AMP MEMORY

Joel A. Karp, Palo Alto; Ilbok Lee, Sunnyvale, and John A. Reed, Los Altos, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 919,993, Jun. 28, 1978, abandoned. This application Jun. 8, 1979, Ser. No. 46,509

Int. Cl.³ G11C *7/00, 7/06*

U.S. Cl. 365—205 **7 Claims**



1. A semiconductor memory comprised of:

a semiconductor substrate;

a column of N sense amplifiers disposed on said substrate where N is any integer; each of said sense amplifiers consisting of only one pair of transistors that are cross-coupled to form a set node, a reset node, and a sense enable node;

2N rows of single transistor memory cells disposed on said substrate on one side of said column of sense amplifiers such that each of said sense amplifiers are respectively aligned with first and second rows thereof, plus another 2N rows of single transistor memory cells disposed on said substrate on the opposite side of said column of sense amplifiers such that each of said sense amplifiers are respectively aligned with third and fourth rows thereof;

2N transistors coupling said first rows to the set node and said third rows to the reset node of the respectively aligned amplifiers in response to one control signal, plus another 2N transistors coupling said second row to the reset node and said fourth row to the set node of the respectively aligned amplifiers in response to another control signal; and

a decoder disposed on said substrate at one end of said another 2N rows of memory cells for selectively reading

data from anyone of said N sense amplifiers and for selectively setting and resetting the sense amplifier to write data into the memory cells connected thereto.

4,233,676

MIXING MECHANISM FOR A MIXING MACHINE

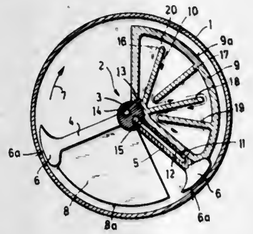
Roland Lücke, and Eberhard Lipp, both of Paderborn, Fed. Rep. of Germany, assignors to Gebruder Lodige Maschinenbau GmbH, Paderborn, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,863

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2802876

Int. Cl.³ B01F *15/06*

U.S. Cl. 366—147 **7 Claims**



1. A mixing mechanism for a mixing machine, comprising a shaft rotatably mounted in an at least partly cylindrical container of the said machine, arms extending radially outwardly from an inner end thereof connected to the shaft to an outer end thereof, mixing tools mounted on the said outer ends of the arms, and plate-like extensions mounted on the rear sides, as viewed in the rotational direction of the mixing mechanism, of at least some of the arms, said mixing tools and extensions being disposed in a helical arrangement relative to said shaft wherein the mixing tools and extensions of adjacent arms are axially spaced and angularly offset from one another, said mixing tools being constructed and arranged upon rotation of said shaft to stepwise axially convey a material being mixed between adjacent extensions with the material being impinged upon the extensions, and at least one of said extensions having a cavity therein which communicates with a circulation system leading through the shaft for circulating a heating or cooling medium, said cavity having an inlet and an outlet which lead into the respective arm or shaft.

4,233,677

AUTOMATIC SYSTEM AND METHOD FOR TESTING MARINE STREAMERS OF SEISMIC EXPLORATION SYSTEMS

Earl J. Brown, Corona, and Swan A. Sie, Placentia, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 21, 1978, Ser. No. 879,540

Int. Cl.³ G01V *1/38*

U.S. Cl. 367—13 **22 Claims**

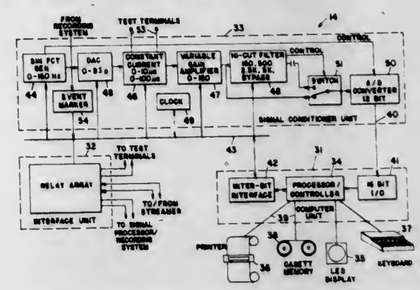
1. A method of testing a marine streamer of a seismic marine exploration system in a passive or a dynamic state, said streamer including a series of hydrophone sections $X_1, X_2, \ldots X_n$, each containing a plurality of hydrophones and being transformer-coupled via a set of marine conductors $N_1, N_2, \ldots N_n$ to a marine streamer test system aboard an exploration boat, comprising the steps of:

(a) driving one of said sections $X_1, X_2, \ldots X_n$ with an analog signal A of known characteristics applied directly to terminals of said one section;

(b) detecting an analog signal B across one of said set of conductors $N_1, N_2, \ldots N_n$ in response to said drive signal A;

(c) converting said signal B to digital values;

(d) automatically performing at least one of a series of test measurements $Z_1, Z_2, \ldots Z_m$ using a programmed digital computer of said marine system aboard said boat to determine field-worthiness of said one section $X_1, X_2, \ldots X_n$;



(e) by means of said digital computer automatically comparing one or more of test measurements $Z_1, Z_2, \ldots Z_m$ with previously stored values $Z'_1, Z'_2, \ldots Z'_m$ so as to determine change in operating characteristics of said sections $X_1, X_2, \ldots X_n$.

4,233,678

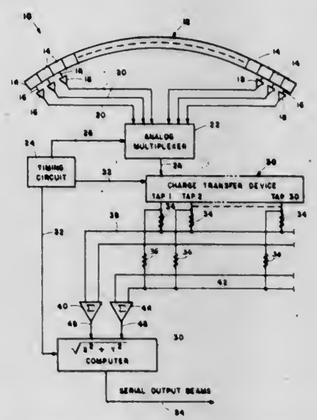
SERIAL PHASE SHIFT BEAMFORMER USING CHARGE TRANSFER DEVICES

Jesse J. Brady, III, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1979, Ser. No. 19,806

Int. Cl.³ G01S *3/80*

U.S. Cl. 367—122 **9 Claims**



1. A sonar beamformer for use with an array comprising a multiplicity of transducer elements for providing electrical analog signals corresponding to acoustic energy impinging thereon, said beamformer comprising:

timing means for generating trains of time related clock signals;

analog multiplexer means, responsive to first clock signals, for scanning said array elements in predetermined order and generating a serialized output of the analog signals thereof;

plural stage means, responsive to second clock signals, for taking analog samples of said multiplexer means output and shifting of said samples to successive stages for parallel read-out of said analog samples;

weighting means, connected to each of said stages, for providing scaled analog samples in accordance with the rela-

tive position of the corresponding elements in the array; and

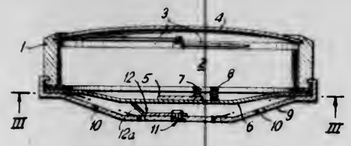
summing means, responsive to said weighted analog samples, for providing summations of said scaled analog samples.

4,233,679

ADJUSTABLE PIEZOELECTRIC TRANSDUCER FOR A WATCH

Jack Schwarzschild, Stamford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sep. 28, 1979, Ser. No. 79,756
Int. Cl.³ G04B *21/10*; G04C *21/38*; G08B *3/00*
U.S. Cl. 368—72 **4 Claims**



1. In a watch having a case containing a movement, a power source, and electric circuitry, a piezoelectric transducer comprising a flexible disc-shaped membrane and a piezoelectric wafer attached thereto, and a caseback enclosing the watch movement within the case, the improvement comprising:

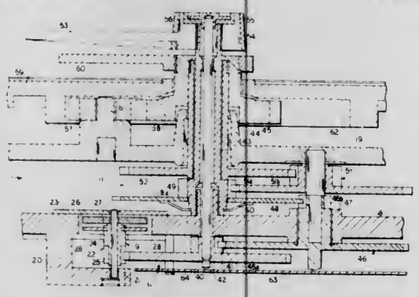
frequency adjustment means disposed within said caseback and accessible from the exterior of the watch case, said frequency adjustment means including a movable element disposed within the watch case and having a portion contacting said membrane, said element being movable so as to contact said membrane at varying radial locations when said frequency adjustment means is actuated outside the watch to change the vibratory characteristics of said piezoelectric transducer.

4,233,680

ELECTRIC CLOCK

Roland Sudler, Frankfurt am Main; Peter Kupferschmidt, and Jean-Francois Schwab, both of Schwalbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,435
Int. Cl.³ G04C *3/00*
U.S. Cl. 368—76 **6 Claims**



1. In an electrical clock with a quartz oscillator, a frequency divider connected to and following the oscillator and an output stage driven by the frequency divider, in the output of the output stage there being disposed a single phase stepping motor acting on a clockwork gear train driving an hour tube and a coaxially mounted minute tube, and a storage battery supplying the operating voltage and a charging circuit for the battery, the improvement wherein

the single phase stepping motor, including an excitation coil, the clockwork gear train and a carrier element form a self-contained construction assembly, as a connectable first component,

a single printed circuit board, the quartz oscillator, the frequency divider, the output stage and the charging circuit being disposed on said single printed circuit board and constitute an electrical assembly, as a connectable second component,

two conducting pins being fastened to said excitation coil and operatively connecting said first component with said second component electrically,

a carrier plate being formed with an opening, said first component and said second component being secured mechanically on said carrier plate,

said hour tube and said minute tube, respectively, extending through said opening,

gearwheels of a switch device as a third component,

bearing means for mounting said gearwheels of the switch device, said bearing means are disposed on a front side of said carrier element, said front side faces away from the clockwork gear train,

said carrier element includes means for mounting said clockwork gear train,

said gearwheels are operatively connected to said hour tube,

said bearing means includes pins formed on said front side of said carrier element, said pins are arranged on a circle concentric to the hour tube,

said gearwheels of the switch device include,

a gear concentrically secured to the hour tube,

an adjustment disc of the switch device having an inner toothing concentric to the hour tube,

a plurality of pinions rotatably disposed on said pins and intermeshing simultaneously with said gear and said inner toothing.

4,233,681

ELECTRONIC TIMEPIECE

Masami Murata, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 29, 1978, Ser. No. 974,467
Claims priority, application Japan, Dec. 29, 1977, 52-159316
Int. Cl.³ G04B *19/06, 19/24*
U.S. Cl. 368—242 **13 Claims**



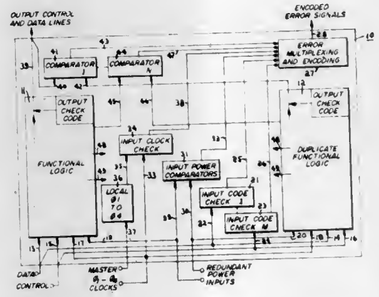
1. Display panel means for an electronic timepiece for displaying information in the form of a plurality of visible indicia, comprising means for flickering at least a selected two of said plurality of indicia, said flickering causing said selected indicia to be alternately visible and invisible, said flickering means being adapted to selectively cause each of at least two of said selected indicia to flicker at a repetition rate different from the repetition rate of the flicker of the other of said at least two of said selected indicia, said flickerings at different repetition rates occurring concurrently on said display panel means for display, said means for flickering including mode signal generating circuits outputting mode signals of different frequencies for flickering each said selected indicia at at least two repetition rates, and further including priority circuits for giving preference to one frequency of said flickering mode signals when more than one flickering mode signal is coincidentally outputted to one of said indicia.

4,233,682

FAULT DETECTION AND ISOLATION SYSTEM

Harris L. Liebergot, Lafayette Hill, and Richard M. Sedmak, Schwenksville, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,838
Int. Cl.³ G06F *11/16*
U.S. Cl. 371—68 **14 Claims**



1. An integrated circuit chip comprising in combination,

(a) a first data processing chain having an input circuit and a first plurality of output circuits spaced at different points along said first data processing chain, at least one of said first plurality of output circuits being an intermediate output circuit,

(b) a second data processing chain having an input circuit and a second plurality of output circuits spaced at different points along said second data processing chain, at least one of said second plurality of output circuits being an intermediate output circuit,

(c) input signal connections for coupling external signals to said chip,

(d) means connecting at least some of said input signal connections to said input circuits of both of said first and second data processing chains,

(e) at least one comparator circuit having a first input circuit permanently coupled to said at least one intermediate output circuit of said first processing chain for receiving signals therefrom, a second input circuit permanently coupled to said at least one intermediate output circuit of said second processing chain for receiving signals therefrom, and an output circuit,

said at least one intermediate output circuit points of said data processing chains being the equivalent to each other along the processing path in each chain, and said comparator producing at its output circuit a first signal indicating the occurrence of an error when the input signals to the said comparator represent different data and producing at its output circuit a second signal when the input signals to the said comparator represent the same data.

4,233,683

CASCADED EQUALIZER TECHNIQUE

Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

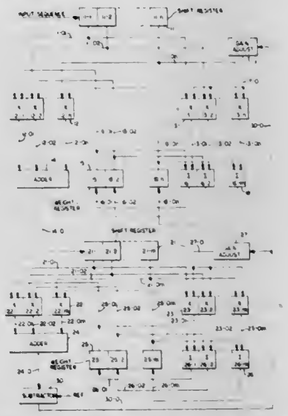
Filed Jan. 31, 1978, Ser. No. 873,912
Int. Cl.³ H03H *7/30*
U.S. Cl. 375—14 **13 Claims**

1. A method for equalizing a sequence of electrical signals subjected to distortion during transmission, comprising the steps of:

providing first and second multistage equalizers having a first prescribed number of stages and a second prescribed number of stages, respectively;

applying said electrical signals to said first multistage equalizer so as to store therein a series of electrical signals of said sequence and producing therefrom a first equalized output representative of a transmitted signal estimate;

storing, in said second multistage equalizer, a series of values corresponding to actual values of electrical signals capable of being transmitted and established in accordance



with a series of first equalized outputs of said first equalizer, and producing therefrom a second equalized output;

comparing said second equalized output with a reference value and generating therefrom an error signal; and

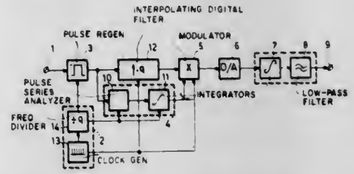
adjusting weighting coefficients of said first and second equalizers in accordance with said error signal.

4,233,684

ARRANGEMENT FOR DECODING A SIGNAL ENCODED BY MEANS OF ADAPTIVE DELTA MODULATION

Ludwid D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,208
Claims priority, application Netherlands, Feb. 21, 1978, 7801909
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—30 **2 Claims**



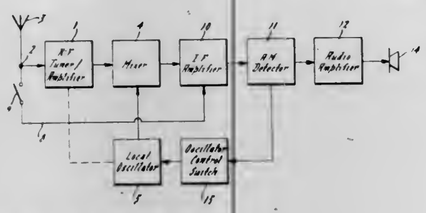
1. An arrangement for decoding a digital signal formed by an analogue data signal encoded by adaptive delta modulation, the arrangement comprising a dynamic expansion circuit having a dynamic control signal generator and a pulse modulator for modulating by the dynamic control signal the digital signal to be decoded, the modulated signal being applied to a converter for reproduction of the analogue data signal, wherein the arrangement further comprises an interpolating digital filter, having a signal-independent pulse response, for interpolating, prior to modulation by the dynamic control signal, the digital signal to be decoded.

4,233,685

RADIO FOR RECEIVING AND REPRODUCING INFORMATION BROADCAST ON THE INTERMEDIATE FREQUENCY

Stephen C. Taylor, Hadleigh, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1979, Ser. No. 97,077
Int. Cl.[3] H04B *1/26*
U.S. Cl. 455—151 3 Claims



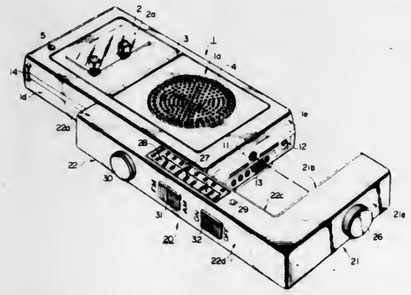
1. A radio receiver comprising:
an antenna;
a radio frequency amplifier for amplifying antenna received radio frequency signals of a selected frequency;
a local oscillator for producing an oscillator signal of a frequency differing from the frequency of the selected radio frequency signals by a predetermined amount;
a mixer for mixing the oscillator signal with the radio frequency signal to produce a radio frequency amplifier derived intermediate frequency signal;
an intermediate frequency amplifier for amplifying the signal from the mixer;
a detector producing audio frequency signals from the amplified signal from the mixer;
wherein the intermediate frequency amplifier is also connected to amplify antenna received radio frequency signals at the intermediate frequency, and said receiver includes means for stopping and starting the production of radio frequency amplifier derived intermediate frequency signals to the intermediate frequency amplifier in response to predetermined signals transmitted at the intermediate frequency.

4,233,686

RADIO TUNER FOR COUPLING WITH TAPE RECORDER

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1979, Ser. No. 31,334
Claims priority, application Japan, Apr. 19, 1978, 53/51486[U]
Int. Cl.[2] H04B *1/08;* G11B *31/00*
U.S. Cl. 455—344 18 Claims



1. A radio tuner, comprising a casing including a pair of casing portions, attaching means for releasably attaching said radio tuner to a tape recorder so that each of said casing portions abuts a corresponding one of a pair of sides of a tape recorder which is releasably attached to said radio tuner by said attaching means, first antenna means housed within one of said pair of casing portions for receiving a first type of radio signal and second antenna means housed within the other of said pair of casing portions for receiving a second type of radio signal.

DESIGNS

NOVEMBER 11, 1980

257,496

VIDEO-TAPE CABINET

Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543

Filed Oct. 5, 1978, Ser. No. 948,812
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

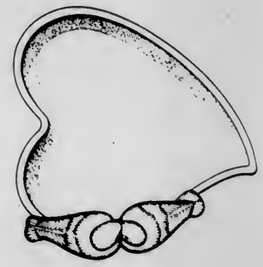


257,498

HEART-SHAPED DISH

Martin J. Waterfield, Birmingham, Mich., assignor to Florists' Transworld Delivery Association, Southfield, Mich.

Filed Jun. 1, 1979, Ser. No. 44,710
Term of patent 7 years
Int. Cl. D07—*01;* D11—*02*
U.S. Cl. D7—5

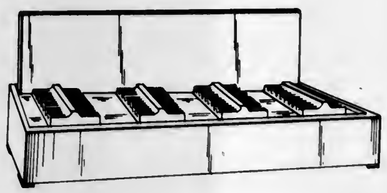


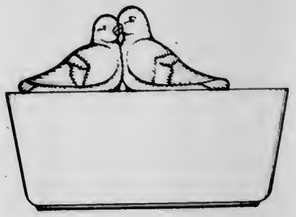
257,497

EYEGLASS DISPLAY HOLDER

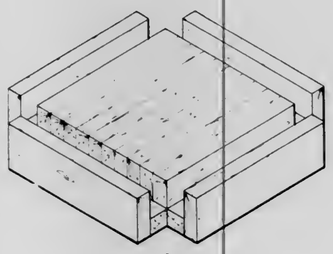
Robert P. Franklin, Lake Hopatcong, and John G. Dewees, Morristown, both of N.J., assignors to Trans-World Manufacturing Corporation

Filed Mar. 12, 1979, Ser. No. 19,857
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



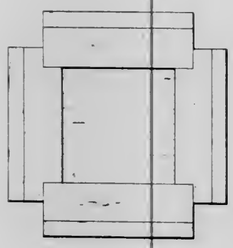


257,499
SNACK BOARD
Stewart D. Rogers, 3516 Euclid, Dallas, Tex. 75250
Filed Jan. 15, 1979, Ser. No. 3,549
Term of patent 14 years
Int. Cl. D07—*99, 04*
U.S. Cl. D7—37



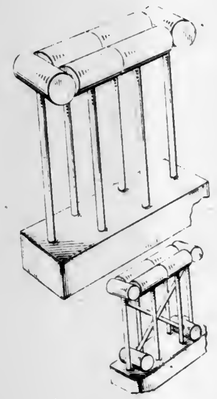
257,500
FROZEN CONFECTION MOLD
Charles A. Lanius, Prarie du Sac, Wis., assignor to Flambeau Products Corporation
Filed Feb. 23, 1979, Ser. No. 14,377
Term of patent 14 years
Int. Cl. D15—*08;* D07—*04*
U.S. Cl. D7—44



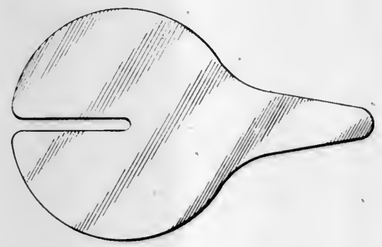




257,501
COMBINED CRAB MALLET SET AND SUPPORT STAND
Stephen J. Evan, 6514 Midra Dr., Lanham, Md. 20801
Filed Aug. 31, 1978, Ser. No. 938,489
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—101



257,502
TOOL USED IN TRANSPLANTING POTTED PLANTS
Charles F. Viel, III, 138 Maple St., Wilmington, Del. 19808
Filed Sep. 1, 1978, Ser. No. 939,140
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—1



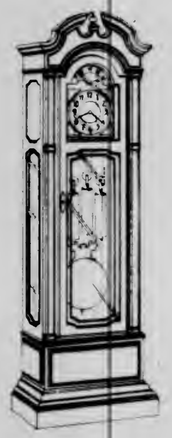
257,503
SINGLE CHANNEL ROLL BAR FOR RETRACTABLE AWNINGS
Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Feb. 1, 1979, Ser. No. 8,321
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—376



257,504
BOTTLE OR SIMILAR ARTICLE
Richard L. Weckman, Perryburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1978, Ser. No. 966,247
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—408

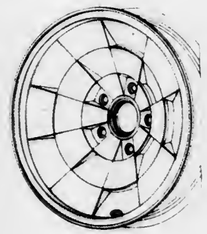


257,505
FLOOR CLOCK
Arthur Umanoff, Ardsley, N.Y., assignor to Howard Miller Clock Company, Zeeland, Mich.
Filed Jan. 9, 1979, Ser. No. 2,063
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—16

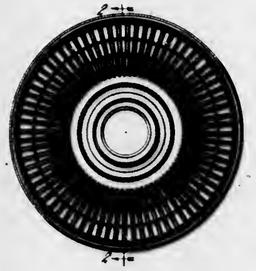


257,506
SPINDLE FOR A LOBSTER TRAP BUOY
Emile Plante, 74 Badgers Island, Kittery, Me. 03904
Filed Sep. 15, 1978, Ser. No. 942,678
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—121

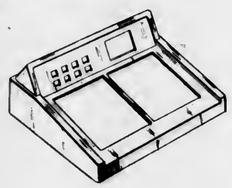
257,507
VEHICLE WHEEL
David S. McIntosh, 30187 Pierce, Southfield, Mich. 48076
Filed May 24, 1979, Ser. No. 42,065
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



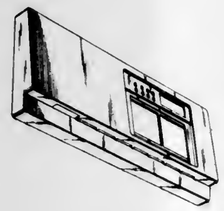
257,508
WHEEL COVER
John R. Schinella, 3317 Green Tree, Bloomfield Hills, Mich. 48013
Filed Sep. 24, 1979, Ser. No. 78,670
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—204



257,509
COMPUTER CONSOLE
Robert S. Fow, Tustin; Michael H. Tooke, Calabasas, and Ronald E. Loosen, Malibu, all of Calif., assignors to Computer Automation, Irvine, Calif.
Filed Jun. 13, 1978, Ser. No. 915,219
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



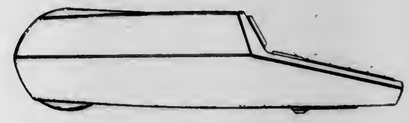
257,510
COMPUTER CONSOLE
Robert S. Fow, Tustin; Michael H. Tooke, Calabasas, and Ronald E. Loosen, Malibu, all of Calif., assignors to Computer Automation, Irvine, Calif.
Filed Jun. 13, 1978, Ser. No. 915,220
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

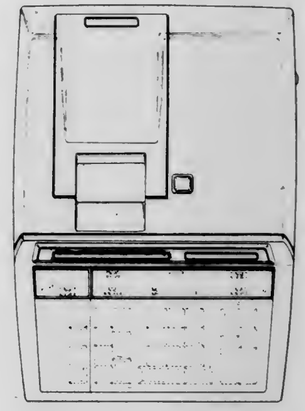


257,511
DRILL TOOL OR THE LIKE
Hajo Zahn, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.
Filed Sep. 8, 1975, Ser. No. 611,034
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D15—139

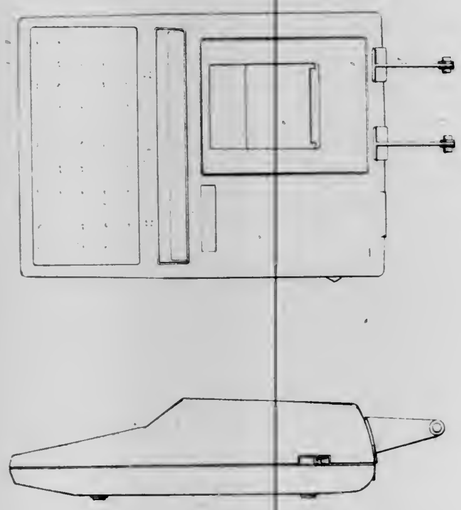


257,512
CALCULATOR CASE
Terry L. Barner, Morris Plains; Stuart D. Leer, Budd Lake, and Myron Beitler, West Orange, all of N.J., assignors to Litton Business Systems, Inc.
Filed May 16, 1978, Ser. No. 906,520
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7





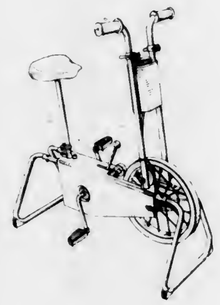
257,513
CASE FOR CALCULATING MACHINE
Joseph Sereika, Stanhope, and Myron Beitler, West Orange, both of N.J., assignors to Litton Business Systems, Inc.
Filed May 24, 1978, Ser. No. 909,280
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



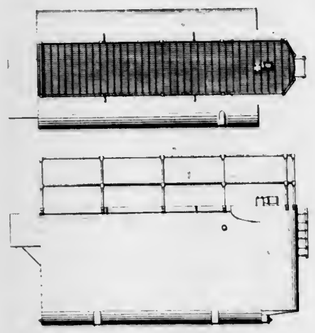
257,514
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-Chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 28, 1978, Ser. No. 964,309
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154



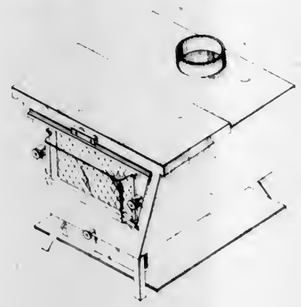
257,515
BICYCLE EXERCISER
Alfred W. Faux, Shelburne, Canada, assignor to Homeware Industries Limited
Filed Jul. 27, 1978, Ser. No. 928,845
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—194



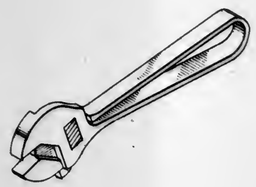
257,516
SEWAGE TREATMENT PLANT OR THE LIKE
James A. Mixon, 5050 Stepp Ave., Jacksonville, Fla. 32216
Filed Mar. 1, 1978, Ser. No. 882,961
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



257,517
COMBINED FIREPLACE AND HEATING STOVE
Edwin S. F. Francis, 3930 Hobbs St., Victoria, British Columbia, Canada
Filed May 16, 1979, Ser. No. 39,501
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



257,518
CLIP
John Herman, 8264 Gould Ave., Los Angeles, Calif. 90046
Filed Oct. 18, 1978, Ser. No. 952,563
Term of patent 14 years
Int. Cl. D27—*02*; D8—*05*
U.S. Cl. D27—02



257,519
GAS-LIGHTER
Lisio Piozner, Pordenone, Italy, assignor to B.P.T. S.p.A., Cinto Caomaggiore, Italy
Filed Mar. 28, 1978, Ser. No. 890,897
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



257,520
ELECTRIC SHAVER
Roland Ullmann, Hausen, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 14, 1978, Ser. No. 970,024
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 738701
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF NOVEMBER, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.I.R. Foundation: *See—*
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AB Asea-Atom: *See—*
Vesterlund, Gunnar, 4,233,086, Cl. 148-6.300.

AB Broderna Kjellstrom: *See—*
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Abe, Masayuki; and Fujihira, Yuji, to Hitachi, Ltd. Deflection yoke for use with wide angle deflection system. 4,233,582, Cl. 335-213.000.

Abolins, Visvaldis; Holub, Fred F.; and Shenian, Popkin R. Flame resistant thermoplastic compositions with well balanced physical properties. 4,233,199, Cl. 260-30.60R.

Aciers et Outillage Peugeot: *See—*
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Acla, Howard L.: *See—*
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Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Flow divider valve. 4,232,701, Cl. 137-101.000.

Adams, Jay W. Video camera with adjustable mount and counterbalance. 4,233,634, Cl. 358-229.000.

Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for manufacture of iron oxide flakes. 4,233,283, Cl. 423-633.000.

Aerojet-General Corporation: *See—*
Wrightson, John M., 4,232,608, Cl. 102-103.000.

Agency of Industrial Science and Technology: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

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Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, 4,233,283, Cl. 423-633.000.

AGFA-Gevaert, A.G.: *See—*
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

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Kerkhofs, Jacques G., 4,233,346, Cl. 427-345.000.

Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., to Allied Chemical Corporation. Mesomorphic isocyanate extended rigid polymers. 4,232,951, Cl. 350-350.00R.

Ahlgren, David T.: *See—*
Remick, David W.; and Ahlgren, David T., 4,232,492, Cl. 52-172.000.

Ahlstroem, Bengt: *See—*
Jarder, Lars; and Ahlstroem, Bengt, 4,233,523, Cl. 307-119.000.

Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, to Leybold-Heraeus GmbH. Method for vapor-coating turbine buckets. 4,233,342, Cl. 427-251.000.

Aigner, Georg, to KDM Elecktronik GmbH. Flowmeter for liquids. 4,232,550, Cl. 73-258.000.

Ainsworth, Oliver C.: *See—*
Raines, Dale A.; and Ainsworth, Oliver C., 4,233,221, Cl. 260-340.200.

Air Products and Chemicals, Inc.: *See—*
Tao, John C., 4,233,038, Cl. 55-33.000.

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Kuki, Nobuyuki, 4,232,892, Cl. 292-347.000.
Maeda, Hiroaki, 4,232,568, Cl. 74-687.000.
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.
Suzuki, Mitsuyuki; and Ohmi, Atsushi, 4,232,518, Cl. 60-535.000.

Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, to Mita Industrial Co., Ltd. Method of removing residual toner from surface of photoconductive member for use in electrostatic copying apparatus of the transfer type. 4,233,386, Cl. 430-125.000.

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Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Slide fastener. 4,232,431, Cl. 24-205.11R.

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Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., 4,233,303, Cl. 424-253.000.

Aktiebolaget Elektrokoppar: *See—*
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Akutsu, Eisaku: *See—*
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Akzona Incorporated: *See—*
Bolick, Virgil T., Jr., 4,232,444, Cl. 29-863.000.
Hof, Craig R.; and Ulin, Roy A., 4,232,552, Cl. 73-356.000.

Alberkrack, Jade H., to Motorola, Inc. Switching power supply. 4,233,557, Cl. 323-9.000.

Albero, Rafael P. Method for printing and flocking fabrics simultaneously. 4,233,027, Cl. 8-488.000.

Albertson, Orris E.: *See—*
Fitch, Elliot B.; and Albertson, Orris E., 4,232,614, Cl. 110-235.000.

Albinger, Rolf. Labelling devices for tape cassettes including an adhesive applying device, label applying device, a pressure device, and a turn over roll. 4,233,105, Cl. 156-559.000.

Alcock, Derrick N.: *See—*
Iverson, James R.; and Alcock, Derrick N., 4,233,643, Cl. 361-344.000.

Aleck, Benjamin J., to Grumman Aerospace Corporation. Thermal emission flaw detection method. 4,232,554, Cl. 73-577.000.

Allais, Andre; Meier, Jean; and Deraedt, Roger, to Roussel Uclaf. Novel derivatives of 2-(4-quinolinylamino)-5-fluoro-benzoic acids. 4,233,305, Cl. 424-258.000.

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Allan, Thomas T., to Flanders Filters, Inc. Self-cleaning fluid sealed air filter. 4,233,044, Cl. 55-355.000.

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Allen, Holless W.; and Allen, Douglas T. Bow string trigger release. 4,232,649, Cl. 124-35.00A.

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Allgulin, Torkel, to Boliden Aktiebolag. Method of extracting and recovering mercury from gases. 4,233,274, Cl. 423-210.000.

Allied Chemical Corporation: *See—*
Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., 4,232,951, Cl. 350-350.00R.
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.
Ratcliffe, Charles T.; and Yardley, James T., 4,233,131, Cl. 204-162.00R.
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., 4,233,146, Cl. 204-255.000.
Stephenson, Robert L., 4,232,882, Cl. 280-804.000.

Altenburger Maschinen KG Jaeckering & Co.: *See—*
Wieg, Andras J.; and Jackering, Gunther, 4,233,406, Cl. 435-275.000.

Altman, Norman G., to Teledyne, Inc. Television monitoring system for automatically aligning semiconductor devices during manufacture. 4,233,625, Cl. 358-101.000.

Aluminum Company of America: *See—*
Brown, Melvin H., 4,232,615, Cl. 110-342.000.

Alvarez-Sabater, Fernando. Gravity-feed rotary tray slide projector. 4,232,953, Cl. 353-111.000.

Aly, Fawzy: *See—*
Jehle, Felix A.; and Aly, Fawzy, 4,233,324, Cl. 426-96.000.

Amancharla, Amareswar, to Baker International Corporation. Wireline releasable seal connector for wellpipe strings. 4,232,888, Cl. 285-18.000.

Amax Inc.: *See—*
Meyer, Gustavo A.; Fekete, Simon O.; and Wicker, Gordon R., 4,233,273, Cl. 423-112.000.

Amerace Corporation: *See—*
Johnson, Glenn W., Jr.; and Heenan, Sidney A., 4,232,979, Cl. 404-16.000.

American Can Company: *See*—
Gallivan, Robert M.; and Mattschei, Peter K., 4,233,465, Cl. 568-727.000.
Lemke, Harold C.; and Rohowetz, Stanley E., 4,233,331, Cl. 426-407.000.
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American Cyanamid Company: *See*—
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Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,233,231, Cl. 260-429.700.
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Linke, William F.; and Marzluff, William F., 4,233,240, Cl. 564-4.000.
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,233,150, Cl. 209-166.000.

American Home Products Corporation: *See*—
Ledig, Kurt W., deceased; and Howes, David R., Executor, 4,233,445, Cl. 544-250.000.
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,233,446, Cl. 544-279.000.

American Optical Corporation: *See*—
Swaminathan, Krishnaiyer; and Sussman, Milton H., 4,232,937, Cl. 350-91.000.

Amtrol Inc.: *See*—
Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., 4,232,704, Cl. 137-218.000.

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Springer, Donald A., 4,232,789, Cl. 206-562.000.

Andersen, Axel B. Photographic accessory apparatus. 4,233,647, Cl. 362-16.000.

Andersen, Niels J., to Cabinplant A/S. Machine for automatically filling cans. 4,232,503, Cl. 53-517.000.

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Miller, J. Wayne; and Anderson, Mark J., 4,233,034, Cl. 44-1.0SR.

Anderson, Norman C.: *See*—
Rupert, Robert E., 4,233,512, Cl. 250-338.000.

Anderson-Shanklin, Gene C., to University of Illinois Foundation. Apparatus and method for determining newborn infant feeding capability. 4,232,687, Cl. 128-777.000.

Anderson, Stanley E.: *See*—
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., 4,232,585, Cl. 91-432.000.

Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, to Momofuku Ando. Process for producing instant-cooking rice. 4,233,327, Cl. 426-242.000.

Andres, Harald: *See*—
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Andros Incorporated: *See*—
Elder, William L.; Williams, Kevin G.; and Burough, Irvin G., 4,233,513, Cl. 250-343.000.

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Enjo, Naonori; and Aomi, Hideki, 4,232,525, Cl. 60-671.000.

Appels, Johannes A.: *See*—
Klaassen, Francois M.; and Appels, Johannes A., 4,233,617, Cl. 357-23.000.

Appleton Papers Inc.: *See*—
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,232,887, Cl. 282-27.500.

Aqua-Retain Valve, Inc.: *See*—
Ray, Robert T., Sr.; and Pickett, Richard G., 4,232,711, Cl. 138-44.000.

Aquila Steel Company, Ltd.: *See*—
Turner, Raymond, 4,232,845, Cl. 248-49.000.

Arai, Hajime: *See*—
Sato, Yoshiaki; and Arai, Hajime, 4,233,355, Cl. 428-224.000.

Arcozzi, Giovanni: *See*—
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, 4,232,666, Cl. 128-203.250.

Arendt, Ronald H., to General Electric Company. Molten salt synthesis of barium and/or strontium titanate powder. 4,233,282, Cl. 423-598.000.

Argus Chemical Corporation: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.

Armstrong, Colin; and Walbridge, Derek J., to Imperial Chemical Industries Limited. Shaped polymeric articles made by two-stage photopolymerization. 4,233,396, Cl. 430-320.000.

Armstrong Cork Company: *See*—
Heckles, John S., 4,233,239, Cl. 564-57.000.

Arndt, Friedrich: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Arnold, Dan M., to Texaco Inc. Water injection profiling. 4,233,508, Cl. 250-259.000.

Artag Plastics Corporation: *See*—
Fagan, John C., 4,233,660, Cl. 364-104.000.

Arthur D. Little, Inc.: *See*—
Teagan, W. Peter, 4,232,656, Cl. 126-420.000.

Arthurs, Eugene G.; and Purdie, Anthony F., to Barr & Stroud Limited. Dye laser tuner. 4,233,572, Cl. 331-94.50M.

Asahi, Hirozi: *See*—
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,233,672, Cl. 365-181.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,232,685, Cl. 128-773.000.

Asai, Masahiro, to Nippondenso Co., Ltd. Ignition system for internal combustion engines with a magneto generator. 4,232,646, Cl. 123-600.000.

Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, to Agency of Industrial Science and Technology; and Shin-Etsu Chemical Co., Ltd. Method for preventing plasticizer bleeding on polyvinyl chloride shaped articles. 4,233,419, Cl. 525-288.000.

Asai, Takashi: *See*—
Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, 4,233,283, Cl. 423-633.000.

Asakawa, Kobun: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Asamoto, Tetsuhiro: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Asano, Shuichi: *See*—
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

ASEA Aktiebolag: *See*—
Wiberg, Karl-Gunnar, 4,233,096, Cl. 156-49.000.

Associated Equipment Corporation: *See*—
Baumbach, Dale M., 4,233,552, Cl. 320-7.000.

Ateya, Antoun I.; and Stryjewski, Walter A., to Eastman Kodak Company. Toner image fusing apparatus. 4,232,959, Cl. 355-3.0FU.

Atkins, Philip A. Canopy frame. 4,232,692, Cl. 135-5.100.

Atkinson, James T. N.; and Sahoo, Maheswar, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Magnesium-lithium alloy. 4,233,376, Cl. 429-199.000.

Atlantic Richfield Company: *See*—
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.

Atlas Copco Aktiebolag: *See*—
Dick, Helmut, 4,232,905, Cl. 299-31.000.
Kimber, Erich V., 4,232,848, Cl. 248-652.000.
Kimber, Erich V.; and Lundstrom, Axel L., 4,232,849, Cl. 248-654.000.
Kimber, Erich V.; and Hokby, Nils, 4,232,850, Cl. 248-654.000.

ATO Chimie: *See*—
Kern, Rene; and Augustin, Daniel, 4,233,236, Cl. 260-504.00S.

Atwater, Stephen K.; and Wolfson, Joseph. Kaleidoscopic toy. 4,232,932, Cl. 350-4.100.

Atwood, Kenton; Wright, James H.; and Merriam, Jay S., to United Catalysts Inc. Catalyst and process for steam-reforming of hydrocarbons. 4,233,187, Cl. 252-466.00J.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Bathelt, Hartmut, 4,232,756, Cl. 180-70.00P.

Aue, Kazuhide: *See*—
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

August Incorporated: *See*—
Fister, Lee H., Jr., 4,232,899, Cl. 297-229.000.

Augustin, Daniel: *See*—
Kern, Rene; and Augustin, Daniel, 4,233,236, Cl. 260-504.00S.

Augustine, Robert F., to Kelsey Hayes Co. Electric braking system. 4,233,587, Cl. 338-96.000.

Ault, Inc.: *See*—
Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., 4,233,553, Cl. 320-23.000.

Auto-Weber GmbH & Co. KG: *See*—
Kijewski, Joachim, 4,232,893, Cl. 294-82.0AH.

Automecha Ltd.: *See*—
Brown, Frank H., 4,232,860, Cl. 271-119.000.

Autovox, SpA: *See*—
Dellantonio, Ezio F., 4,232,560, Cl. 74-10.330.

Auyeung, Sean; and Etzel, William W., to Combustion Engineering, Inc. Fuel storage rack. 4,233,518, Cl. 250-507.000.

B. F. Goodrich Company, The: *See*—
Fisher, John M., 4,233,102, Cl. 156-292.000.

Babbitt, Frederick J.; and Carnine, Daniel K. Energy conservation refrigeration unit. 4,232,529, Cl. 62-160.000.

Babcock & Wilcox Company, The: *See*—
Stump, Paul E., 4,232,541, Cl. 72-283.000.

Backlund, Anders D. Heating and ventilation system. 4,232,821, Cl. 237-2.00B.

Baehr, Donald O.; and Izard, David G., to United States Gypsum Company. Method for the production of glass fiber-reinforced gypsum sheets and gypsum board formed therefrom. 4,233,368, Cl. 428-538.000.

Baffle Stove Company Inc.: *See*—
Frank, Bruce A., 4,232,650, Cl. 126-77.000.

Baier, Robert E., to Calspan Corporation. Method for testing for the presence of pathogens. 4,233,404, Cl. 435-30.000.

Baker, Alfred L.: *See*—
Payne, Thomas R.; and Baker, Alfred L., 4,233,498, Cl. 219-490.000.

Baker, Don R.: *See*—
Fancher, Llewellyn W.; and Baker, Don R., 4,233,318, Cl. 424-326.000.

Baker, Edward B.: *See*—
Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., 4,232,456, Cl. 35-25.000.

Baker International Corporation: *See*—
Amancharla, Amareswar, 4,232,888, Cl. 285-18.000.

Baker, Roy F.; and Banach, Frank, to Zenith Radio Corporation. Circuit for modifying the IF response of a television receiver. 4,233,630, Cl. 358-167.000.

Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG: *See*—
Lange, Karl-Heinz, 4,232,936, Cl. 350-75.000.

Balderes, Demetrios; Lynch, John R.; and Yacavonis, Robert A., to International Business Machines Corporation. Semiconductor package with improved conduction cooling structure. 4,233,645, Cl. 361-385.000.

Baldwin-Gegenheimer GmbH, Firma: *See*—
Waizmann, Franz, 4,232,604, Cl. 101-425.000.

Baldwin, John J.; and Lumma, William C., Jr., to Merck & Co., Inc. Novel imidazoazines and imidazodiazines. 4,233,301, Cl. 424-250.000.

Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., to Allied Chemical Corporation. Process for the synthesis of ammonium nitrite. 4,233,279, Cl. 423-385.000.

Ball Corporation: *See*—
Sanford, Gary G.; Munson, Robert E.; and Metzler, Thomas A., 4,233,607, Cl. 343-700.0MS.

Balle, Gerhard: *See*—
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,233,424, Cl. 525-440.000.

Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., to Nalco Chemical Co. Cationic polymeric composition for imparting wet and dry strength to pulp and paper. 4,233,411, Cl. 525-155.000.

Banach, Frank: *See*—
Baker, Roy F.; and Banach, Frank, 4,233,630, Cl. 358-167.000.

Bando, Seiji; and Sadao, Ebata, to Kawasaki Steel Corporation. Steel stock cooling apparatus. 4,232,853, Cl. 266-114.000.

Banucci, Eugene G.: *See*—
Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., 4,233,435, Cl. 528-350.000.

Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N. Method of introducing powdered reagents into molten metals and apparatus for effecting same. 4,232,854, Cl. 266-266.000.

Barbeau, Dennis E., to Teledyne Industries, Inc. High intensity slinger type combustor for turbine engines. 4,232,526, Cl. 60-745.000.

Barber, S. Morgan. Therapeutic device for a human body. 4,232,662, Cl. 128-71.000.

Barber, William L., executor: *See*—
Maclaren, Owen F., deceased; Barber, William L., executor; and Maclaren, Marie I., executor, 4,232,897, Cl. 297-45.000.

Barbin, William W.: *See*—
Bohm, Georg G. A.; and Barbin, William W., 4,233,013, Cl. 425-174.400.

Bargain, Michel; and Prud'Homme, Christian, to Rhone-Poulenc Industries. Elastomeric organopolysiloxane block copolymers and non-elastomeric organosilicic copolymer blocks therefor. 4,233,427, Cl. 525-478.000.

Barker, John C.; and McLaughlin, Ivan P., to J. J. Barker Company Limited. Three-dimensional decorative surface. 4,233,343, Cl. 427-264.000.

Barone, Michael R., to General Electric Company. Prime mover having a leakage flux conducting device secured thereto. 4,233,535, Cl. 310-256.000.

Barr & Stroud Limited: *See*—
Arthurs, Eugene G.; and Purdie, Anthony F., 4,233,572, Cl. 331-94.50M.

Barry Wright Corporation: *See*—
Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., 4,232,563, Cl. 74-470.000.

Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., to Ceskoslovenska akademie ved. Acousto-optic device. 4,232,952, Cl. 350-358.000.

Bartels, Bruce E., to Wheelabrator Corp. of Canada. Shoe. 4,232,458, Cl. 36-45.000.

Bartholomew, Victor L.; and Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Therapeutic incentive spirometer. 4,232,683, Cl. 128-725.000.

Bartz, Wilfried: *See*—
Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, 4,233,202, Cl. 260-348.360.

BASF Aktiengesellschaft: *See*—
Baumann, Manfred; and Hoffmann, Werner, 4,233,464, Cl. 568-591.000.
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.
Kilpper, Gerhard; and Grimmer, Johannes, 4,233,459, Cl. 562-458.000.
Langens, Jan; and Devroe, Guido, 4,233,280, Cl. 423-481.000.
Mueller, Herbert; and Huchler, Otto H., 4,233,228, Cl. 260-346.110.
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.
Scholz, Herbert, 4,233,450, Cl. 548-226.000.
Seibert, Walter, 4,233,223, Cl. 260-343.400.
Weitz, Hans-Martin; Hartig, Juergen; and Marosi, Laszlo, 4,233,455, Cl. 560-244.000.

Bastek, John J., to Bell Telephone Laboratories, Incorporated. Contact structure for light emitting device. 4,232,440, Cl. 29-590.000.

Bate, Gary W.: *See*—
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,233,267, Cl. 422-187.000.

Bathelt, Hartmut, to Audi NSU Auto Union Aktiengesellschaft. Motor-vehicle drive-shaft assembly. 4,232,756, Cl. 180-70.00P.

Bauch, Tamil D.; and Starr, Hank, to Bauch, Tamil D. Composite construction panel. 4,232,494, Cl. 52-221.000.

Bauer, Harvey E. Tethered top usable in two ways. 4,232,475, Cl. 46-61.000.

Baumann, Manfred; and Hoffmann, Werner, to BASF Aktiengesellschaft. Cyclohexene carotinoid intermediates. 4,233,464, Cl. 568-591.000.

Baumbach, Bertram W., to Reliable Electric Company. Line protector for a communications circuit. 4,233,641, Cl. 361-119.000.

Baumbach, Dale M., to Associated Equipment Corporation. Vehicle-starting circuit with excessive voltage detection. 4,233,552, Cl. 320-7.000.

Baumert, Dietrich: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Baumgardt, Walter G.; Ondesko, John J.; and Zysman, Bernard K., to Hooker Chemicals & Plastics Corp. Moldable thermosetting phenol-aldehyde resin compositions and process for making the compositions. 4,233,203, Cl. 260-38.000.

Baumoel, Joseph. Liquid flow meter. 4,232,548, Cl. 73-861.280.

Baxter Travenol Laboratories, Inc.: *See*—
Dighe, Kamalakar D., 4,233,549, Cl. 318-317.000.
Martin, Jerry D.; Pearson, Stephen J.; Ward, Gary A.; and Winchell, David A., 4,232,721, Cl. 150-0.500.

Bayer Aktiengesellschaft: *See*—
Boehmke, Gunther, 4,233,214, Cl. 260-158.000.
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, 4,233,213, Cl. 260-141.000.
Dorlars, Alfons; and Neuner, Otto, 4,233,440, Cl. 542-458.000.
Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,293, Cl. 424-200.000.
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.
Immel, Otto; and Schwarz, Hans-Helmut, 4,233,247, Cl. 568-464.000.
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.
Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,294, Cl. 424-200.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,233,058, Cl. 71-92.000.
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, 4,233,233, Cl. 260-465.00E.
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,233,424, Cl. 525-440.000.

BBC Brown, Boveri & Company, Limited: *See*—
Behnke, Reinhold; Wagenbach, Wolfgang; and Muller, Erwin, 4,232,925, Cl. 339-31.00R.
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, 4,232,999, Cl. 417-64.000.
Dumont, Willy, 4,232,546, Cl. 73-40.700.

Beall, George H.; Mansfield, Gerald R.; and Schreurs, Jan W. H., to Corning Glass Works. Porous magnetic glass structure. 4,233,169, Cl. 252-62.590.

Beatty, Charles L.: *See*—
Bergen, Richard F.; and Beatty, Charles L., 4,233,388, Cl. 430-137.000.

Beaucamp, Claude, to GTE Products Corporation. Mechanism for static convergence devices for color television picture tubes. 4,233,581, Cl. 335-212.000.

Beavon, David K.; and Mackles, Mark, to Ralph M. Parsons Company, The. Process for removal of carbonyl sulfide in liquified hydrocarbon gases with absorption of acid gases. 4,233,141, Cl. 208-236.000.

Becht, George L.; Melachowski, Jerome A.; and Wolicki, Richard J., to Buffalo Brake Beam Company. Ladder assembly and method of making same. 4,232,760, Cl. 182-194.000.

Bechtel International Corporation: *See*—
Lee, Fred C., 4,232,981, Cl. 405-154.000.

Beck, Gunther: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,233,058, Cl. 71-92.000.

Beck, Uwe: *See*—
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, 4,233,233, Cl. 260-465.00E.

Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., to Amtrol Inc. In line back flow preventer. 4,232,704, Cl. 137-218.000.

Becker, Hans J.: *See—*
Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., 4,233,272, Cl. 423-7.000.

Becker, William J.; Farber, Sheldon; and Hoover, Troy E., to Appleton Papers Inc. Lactone compounds containing an indolizine radical. 4,232,887, Cl. 282-27.500.

Beeghly, Lester R.; and Gilchrist, George E. Water closet ventilating system with vacuum breaker valve. 4,232,406, Cl. 4-213.000.

Behnke, Reinhold; Wagenbach, Wolfgang; and Muller, Erwin, to BBC Brown, Boveri & Company, Limited. High-voltage three phase electrical switch gear. 4,232,925, Cl. 339-31.00R.

Behr, Joseph L., to Emerson Electric Co. Frost detector. 4,232,528, Cl. 62-140.000.

Behrens, Klaus: *See—*
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,232,670, Cl. 128-224.000.

Behrenz, Wolfgang: *See—*
Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,293, Cl. 424-200.000.
Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,294, Cl. 424-200.000.

Behrmann, Alfred E.: *See—*
Koch, Christian; and Behrmann, Alfred E., 4,233,036, Cl. 48-210.000.

Beier, Gerhard; and Matthies, Wolfgang. Sealing carrier pack for cans with beaded edge. 4,232,807, Cl. 224-45.00A.

Beisch, Hans R., to Norris Industries, Inc. Vehicle wheel with wheel cover and retaining clip. 4,232,907, Cl. 301-37.00R.

Bell, Alan E., to RCA Corporation. Playback information record using phase cancellation for reading. 4,233,626, Cl. 358-128.500.

Bell, Richard L.: *See—*
Johnson, Fred J.; and Bell, Richard L., 4,232,816, Cl. 229-33.000.

Bell Telephone Laboratories, Incorporated: *See—*
Bastek, John J., 4,232,440, Cl. 29-590.000.
Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,233,579, Cl. 333-204.000.
Wight, Frederick R., Jr., 4,233,470, Cl. 174-120.00C.

Beloit Corporation: *See—*
Burton, Frank, 4,232,455, Cl. 34-124.000.

Bendix Autolite Corporation: *See—*
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 73-232.00E.

Bendix Corporation, The: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.
Van Siclen, Howard E., Jr., 4,232,647, Cl. 123-478.000.

Benedetto, Kenneth R.; and Linder, Larry J., to KBG Corporation. Angular acceleration sensing apparatus. 4,232,553, Cl. 73-516.0LM.

Beneke, Wolfgang; Teichmann, Paul G.; and Weber, Wilfried, to Trutzschler GmbH & Co. KG. Web guiding device. 4,232,426, Cl. 19-106.00R.

Benham, Judith L., to Minnesota Mining and Manufacturing Company. Liquid crystal compositions including pleochroic dye. 4,232,950, Cl. 350-349.000.

Benin, Joshua, to Du Pont de Nemours, E. I., and Company. Bobbin chuck. 4,232,835, Cl. 242-46.400.

Benner, Harold T., Jr.: *See—*
Dieterlen, Paul E.; and Benner, Harold T., Jr., 4,232,504, Cl. 53-570.000.

Benson, Willard R., to United States of America, Army. Centrifugal ball cam locking device. 4,232,607, Cl. 102-56.00R.

Benton, Stephen L.: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Berber, Viktor A.: *See—*
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

Bergen, Richard F.; and Beatty, Charles L., to Xerox Corporation. Method for making toner particles. 4,233,388, Cl. 430-137.000.

Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, to Chemische Werke Huels Aktiengesellschaft. Process for the purification of epoxy compounds. 4,233,202, Cl. 260-348.360.

Berger, Henri, to Societe d'Applications Generales d'Electricite et de Mechanique (SAGEM). Numerically controlled machine tools particularly stitching or pricking machines. 4,233,550, Cl. 318-568.000.

Bergmann, Ewald: *See—*
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Bergsand, Karl A., to Goteborgs Maskinkonsult AB. Device for treatment of articles with at least one treatment agent. 4,233,084, Cl. 134-67.000.

Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., to Aktiebolaget Draco. Xanthine derivatives. 4,233,303, Cl. 424-253.000.

Bergthaller, Peter: *See—*
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

Bergwerksverband GmbH: *See—*
Hoberg, Heinz; and Klein, Albert, 4,233,559, Cl. 324-58.50A.
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.

Berkshire, David C.: *See—*
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.

Bernardis, Francesco; and Prevignano, Paolo, to Ing. C. Olivetti & C., S.p.A. Ribbon cartridge for printing machines and mechanism for feeding the ribbon. 4,232,976, Cl. 400-196.100.

Berry, Richard L., Jr. Safety fountain head. 4,232,825, Cl. 239-28.000.

Berthiaume, Raymond, to Hydro-Quebec. Stroboscopic beacons fed from a capacitive source. 4,233,546, Cl. 315-241.00R.

Besson, Rene; and Breguet, Jean-Luc, to Ebauches S.A. Method for the display of information. 4,232,464, Cl. 40-451.000.

Bezubik, Slawomir J.; and Laszcz, Stanislaw, to Fabryka Przyrzadow i Uchwytow PONAR-BIAL Zaklad Nr 1-Wiodacy. Machine vise. 4,232,857, Cl. 269-212.000.

Bicron Electronics Company: *See—*
Novacek, William G., 4,233,583, Cl. 335-236.000.

Bierlein, John C.; and Shipek, Edward J., to General Motors Corporation. Bearing having iron sulfur matrix. 4,233,071, Cl. 75-231.000.

Bigelow, John E., to General Electric Company. Capacitive touch control and display. 4,233,593, Cl. 340-365.00C.

Bilawsky, Paul D.: *See—*
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.

Binoche, Michel, to S K M, Societe Anonyme. Method and apparatus for the pneumatic spraying of liquid products. 4,232,824, Cl. 239-8.000.

Birenbaum, Benjamin. Fuel injection system. 4,233,002, Cl. 417-485.000.

Black, Edward D.: *See—*
Comperatore, John A.; Wise, David J.; and Black, Edward D., 4,233,050, Cl. 65-107.000.

Blain, Jean R.: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

Blanc, Jean-Pierre; and Meiller, Francois, to Rhone-Poulenc Industries. Novel sand/silicate compositions for foundry molds/cores. 4,233,076, Cl. 106-38.350.

Blasing, Horst; and Gute, Manfred, to Schering Aktiengesellschaft. Device for the processing of pourable bulk material. 4,233,145, Cl. 204-202.000.

Blatt, Gerald. Arm elevator and sling. 4,232,664, Cl. 128-94.000.

Blatter, Albert: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.

Blenman, Orman L. Electrical apparatus for testing voltage, polarity and continuity. 4,233,560, Cl. 324-133.000.

Bless, Franz: *See—*
Limque, Ferdinand; and Bless, Franz, 4,232,852, Cl. 266-80.000.

Blight, Graham J.: *See—*
Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., 4,232,623, Cl. 114-125.000.

Blose, John B.: *See—*
Gilkeson, Robert F.; and Blose, John B., 4,233,590, Cl. 340-870.040.

Blythe, Anthony R., to Imperial Chemical Industries Limited. Apparatus and method for monitoring web conductivity. 4,233,562, Cl. 324-455.000.

Bodrero, Alberta. Conformable seatback cover. 4,232,898, Cl. 297-219.000.

Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Apparatus for thermally severing glass. 4,232,809, Cl. 225-93.500.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Cationic azo dyestuffs with a hydroxyalkylated ammonium group. 4,233,214, Cl. 260-158.000.

Boehringer Ingelheim GmbH: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, 4,233,299, Cl. 424-246.000.
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, 4,233,333, Cl. 426-548.000.

Boeing Company, The: *See—*
Brown, Robert B., 4,232,515, Cl. 60-204.000.

Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, to Ciba-Geigy Corporation. 1-Iminomethylene-substituted 2-(phenoxy-alkyl)-2-imidoazoline derivatives. 4,233,306, Cl. 424-263.000.

Bohm, Georg G. A.; and Barbin, William W., to Firestone Tire & Rubber Company, The. Apparatus for producing continuous cured rubber strips. 4,233,013, Cl. 425-174.400.

Bohner, Beat: *See—*
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., to General Electric Company. Polyesterimide resins and synthesis thereof. 4,233,435, Cl. 528-350.000.

Bolender, Walter; and Wallner, Ernst, to ER-WE-PA Maschinenfabrik & Eisengiesserei. Rolls of controllable flexure, especially for machines for the production and processing of webs of paper or plastic. 4,233,011, Cl. 425-143.000.

Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, to Lanier Business Products, Inc. Cassette substitution apparatus. 4,233,638, Cl. 360-92.000.

Bolick, Virgil T., Jr., to Akzona Incorporated. Flat cable stripping and terminating technique. 4,232,444, Cl. 29-863.000.

Boliden Aktiebolag: *See—*
Allgulin, Torkel, 4,233,274, Cl. 423-210.000.

Bolton, Edgar A.; and Dallen, Larry D. Computer controlled registration and inquiry system. 4,233,661, Cl. 364-300.000.

Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, to GAF Corporation. High-strength built-up roofing using improved glass fiber mats. 4,233,353, Cl. 428-141.000.

Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, to Ciba-Geigy Corporation. α-Phenoxy-thiolpropionic acids. 4,233,060, Cl. 71-94.000.

Boot, Michael A.: *See—*
Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., 4,233,553, Cl. 320-23.000.

Borden, George W.; Smith, Oliver W.; and Trecker, David J., to Union Carbide Corporation. Ink and coating compositions and method. 4,233,130, Cl. 204-159.230.

Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, to Institut Francais du Petrole. Apparatus for hydrocarbon conversion. 4,233,268, Cl. 422-190.000.

Borg-Warner Corporation: *See—*
Lamarche, Paul E., 4,232,534, Cl. 64-27.00C.
Tuzson, John J., 4,232,770, Cl. 192-41.00R.

Borza, Michele: *See—*
Antonelli, Sergio; and Borza, Michele, 4,233,140, Cl. 208-180.000.

Bost, Charles, to Sentry Controls, Inc. Control system for environmental apparatus. 4,232,819, Cl. 236-47.000.

Botez, Dan; Ettenberg, Michael; and Kressel, Henry, to RCA Corporation. Light emitting diode. 4,233,614, Cl. 357-17.000.

Bottoms, Harry S.; and Heath, Ronald A., to Lucas Industries Limited. Hydraulic gear pump with recesses in non-working gear flanks. 4,233,005, Cl. 418-190.000.

Bourgeous, Clarence G.; and Miller, Oliver G., to Ford Motor Company. Counterweight assembly for a vehicle. 4,232,883, Cl. 280-759.000.

Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, to Societe Chimique de La Grande Paroisse, Azote et Produits Chimiques. Preparation of tris(hydroxymethyl)aminomethane. 4,233,245, Cl. 564-506.000.

Bouwhuis, Gijsbertus; and Hazerdonk, Teunis J., to U.S. Philips Corporation. Opto-electronic focussing error detection arrangement. 4,233,502, Cl. 250-204.000.

Bowen, Willard L., III, to Torrington Company, The. Hollow roller tapered bearing. 4,232,914, Cl. 308-215.000.

Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, to Kennecott Copper Corporation. Method and apparatus for the continuous production of strip. 4,232,727, Cl. 164-76.000.

Bowman, John K.: *See—*
Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., 4,232,704, Cl. 137-218.000.

Boxrud, Phillip E. Equipment trailer. 4,232,879, Cl. 280-656.000.

Bracke, William J. I.: *See—*
Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., 4,233,418, Cl. 525-243.000.

Bradley Corporation: *See—*
Williams, Frank N., 4,232,407, Cl. 4-287.000.

Bradshaw, John: *See—*
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.

Brady, Jesse J., III, to United States of America, Navy. Serial phase shift beamformer using charge transfer devices. 4,233,678, Cl. 367-122.000.

Brady, Thomas E.; and Go, Santos W., to Owens-Illinois, Inc. Apparatus for forming heat treated blown thermoplastic articles. 4,233,022, Cl. 425-525.000.

Braid, John E.: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.

Braitinger, Helmut: *See—*
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Brasch, William, to LeaRonal, Inc. Method of improving the adhesion of electroless metal deposits employing colloidal copper activator. 4,233,344, Cl. 427-304.000.

Bratchenko, Anatoly P.: *See—*
Shalai, Alexandr N.; Nikitin, Mikhail D.; Zakharov, Nikolai I.; and Bratchenko, Anatoly P., 4,233,490, Cl. 219-121.00P.

Braukmann Armaturen AG: *See—*
Braukmann, Bernhard W.; and Vollmer, Rudolf, 4,232,817, Cl. 236-42.000.

Braukmann, Bernhard W.; and Vollmer, Rudolf, to Braukmann Armaturen AG. Adjustment control for a thermostatic valve. 4,232,817, Cl. 236-42.000.

Bravin, Ben, to Dynamex Corporation. Positive self-orienting traverse apparatus in wire take-up machine. 4,232,838, Cl. 242-158.00R.

Brearley, Malcolm, to Girling Limited. Malfunction detector for speed sensors. 4,233,599, Cl. 340-679.000.

Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., to United Technologies Corporation. Fuel cell cooler assembly and edge seal means therefor. 4,233,369, Cl. 429-26.000.

Breault, Richard D.: *See—*
Goller, Glen J.; and Breault, Richard D., 4,233,181, Cl. 252-425.300.

Breguet, Jean-Luc: *See—*
Besson, Rene; and Breguet, Jean-Luc, 4,232,464, Cl. 40-451.000.

Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, to Bayer Aktiengesellschaft. Process for the continuous indirect diazotization of aromatic amines. 4,233,213, Cl. 260-141.000.

Bressani, Raymond. Base for poles. 4,232,846, Cl. 248-158.000.

Briggs & Stratton Corporation: *See—*
Catterson, Robert K., 4,233,043, Cl. 55-315.000.
Tharman, Paul A., 4,233,534, Cl. 310-71.000.

Bright, John H.; and Schmitt, Joseph L., Jr., to American Cyanamid Company. Process for preparing N,N-dimethylaminobenzoic acids. 4,233,458, Cl. 562-458.000.

Brissey, George E.; and Gathers, Glen E., to General Electric Company. Electromagnetically controlled, resettable high-speed shaft disconnect. 4,232,772, Cl. 192-114.00R.

Bristol Myers Co.: *See—*
Nitshke, Norman L., 4,232,669, Cl. 128-218.00N.

British Petroleum Company Limited, The: *See—*
Myers, Philip A.; and Westlake, David J., 4,233,438, Cl. 536-1.000.

Bro, Per; and Wallis, George, to P. R. Mallory & Co. Inc. Hermetic seal for electrochemical cell. 4,233,372, Cl. 429-174.000.

Bronner, Charles: *See—*
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.

Bronnvall, Wolfgang A.: *See—*
Sundin, Anders O.; and Bronnvall, Wolfgang A., 4,233,066, Cl. 75-142.000.

Broughton, Donald R.: *See—*
Russ, Karl J.; and Broughton, Donald R., 4,233,179, Cl. 252-373.000.

Broughton, Michael, to Farrow Irrigation Limited. Liquid sludge disposal. 4,232,826, Cl. 239-112.000.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Rohr, Franz-Josef; and Holick, Hubert, 4,233,142, Cl. 204-195.00S.

Brown, Donald J., to Knox Manufacturing Co. Abrading device. 4,232,487, Cl. 51-425.000.

Brown, Douglas P. Throwing sling. 4,232,648, Cl. 124-5.000.

Brown, Earl J.; and Sie, Swan A., to Chevron Research Company. Automatic system and method for testing marine streamers of seismic exploration systems. 4,233,677, Cl. 367-13.000.

Brown, Frank H., to Automecha Ltd. Paper feeder. 4,232,860, Cl. 271-119.000.

Brown, Melvin H., to Aluminum Company of America. Coal burning method to reduce particulate and sulfur emissions. 4,232,615, Cl. 110-342.000.

Brown, Mortimer, to Nightingale Industries Limited. Modular partition. 4,232,724, Cl. 160-135.000.

Brown, Robert B., to Boeing Company, The. Supersonic cruise airplane and engine. 4,232,515, Cl. 60-204.000.

Brown & Root, Inc.: *See—*
Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., 4,232,623, Cl. 114-125.000.

Brown, William E., to Kaiser Aluminum & Chemical Corporation. Refractory composition for forming a monolithic structure. 4,233,078, Cl. 106-56.000.

Bruce, Arthur P.: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Brunaud, Daniel, to Framatome. Removal of residual stresses in a tube seated in a tube plate. 4,232,442, Cl. 29-727.000.

Bschorr, Oskar, to Messerschmitt-Bolkow-Blohm GmbH. Wide-band vibration damper. 4,232,762, Cl. 188-1.00B.

BSL Corporation: *See—*
Gidge, Kenneth, 4,232,725, Cl. 160-332.000.

Bucalo, Louis. Method for collecting and processing body fluids. 4,232,673, Cl. 128-769.000.

Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.

Buchmann, Hans, to Zuhlke Engineering AG. Apparatus for moving toll bars or the like. 4,232,484, Cl. 49-334.000.

Budyak, Robert J.: *See—*
Burris, Robert E.; and Budyak, Robert J., 4,232,696, Cl. 137-62.000.

Buehler-Miag GmbH: *See—*
Hatje, Erich; and Reinert, Norbert, 4,232,734, Cl. 165-118.000.

Buffalo Brake Beam Company: *See—*
Becht, George L.; Melachowski, Jerome A.; and Wolicki, Richard J., 4,232,760, Cl. 182-194.000.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,233,241, Cl. 564-221.000.

Bukaitz, Finley M., to Kero Metal Products Co., Inc. Prefabricated metal drawer file cabinets or similar articles. 4,232,920, Cl. 312-257.00R.

Bulkley, Charles W., to Monsanto Company. Polymeric blend. 4,233,409, Cl. 525-71.000.

Bumgarner, John C., Sr. Swimming pool deck. 4,232,491, Cl. 52-169.700.

Bunker Ramo Corporation: *See—*
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, 4,232,926, Cl. 339-45.00M.
Otsuki, Tomonari; and Inouye, Hiromasa, 4,232,923, Cl. 339-17.0LC.
Stahl, John M.; and DeRoss, Robert W., 4,233,478, Cl. 200-51.090.

Burdett, Kenneth A.: *See—*
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,233,425, Cl. 525-455.000.

Burdick, Edward J., to National Semiconductor Corporation. Multifunction logic circuit. 4,233,524, Cl. 307-205.000.

Burgess Power Tools Limited: *See—*
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., 4,232,579, Cl. 83-788.000.

Burgin, Charles W., to Morton Machine Works, Incorporated. Process for wetting fiber. 4,232,416, Cl. 8-156.000.

Burke, Noel I., to Tee-Pak, Inc. Concentrated acid swelling of collagen in preparation of edible collagen casing. 4,233,329, Cl. 426-277.000.

Burns, Richard C.: *See—*
Menson, Robert C.; Narayanswamy, Venkatachalam; and Burns, Richard C., 4,233,403, Cl. 435-22.000.

Burough, Irvin G.: *See—*
Elder, William L.; Williams, Kevin G.; and Burough, Irvin G., 4,233,513, Cl. 250-343.000.

Burres, John S. Gang plow hitch. 4,232,876, Cl. 280-412.000.

Burris, Robert E.; and Budyak, Robert J., to Prime Manufacturing Corporation. Drain valve assembly. 4,232,696, Cl. 137-62.000.

Burtis, Kathryn S. Transformable christening bonnet and bride's handkerchief. 4,232,403, Cl. 2-204.000.

Burton, Frank, to Beloit Corporation. Dryer drum condensate removal apparatus. 4,232,455, Cl. 34-124.000.

Buschmann, Gerhard, to Jagenberg-Werke Aktiengesellschaft. Apparatus for pulsewise dispensation of very small amounts of liquid, particularly H_2O_2. 4,232,802, Cl. 222-56.000.

Butcher, John A. W.; and Salino, Michael A., to Standard Telephones and Cables Limited. Automatic telecommunication exchange system. 4,233,471, Cl. 178-69.00G.

Butler, Donald J.: *See—*
Rogers, James H.; and Butler, Donald J., 4,233,600, Cl. 340-683.000.

Butz, David E.: *See—*
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., 4,233,586, Cl. 335-303.000.

Byrne, Martin A.: *See—*
Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., 4,233,435, Cl. 528-350.000.

C.M.L. Costruzioni Meccaniche Liri S.r.l.: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,232,542, Cl. 72-389.000.

C. Reichert Optische Werke, AG: *See—*
Edelmann, Ludwig, 4,232,453, Cl. 34-92.000.

Cabinplant A/S: *See—*
Andersen, Niels J., 4,232,503, Cl. 53-517.000.

Cain, Clifford W., Jr.: *See—*
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.

Cain, Jack C.; and Carlson, Maynard E. Controlled variable radius roll forming apparatus. 4,232,540, Cl. 72-11.000.

Caldwell, Lloyd, to Caldwell, Lloyd. Portable and collapsible seat. 4,232,896, Cl. 297-4.000.

Caldwell, Walter C., to Sun Oil Company (Delaware). Self-aligning-axial shafts-magnetic coupling. 4,232,535, Cl. 64-28.00M.

California Institute of Technology: *See—*
Perkins, Gerald S., 4,232,562, Cl. 74-424.80R.

Calspan Corporation: *See—*
Baier, Robert E., 4,233,404, Cl. 435-30.000.

Camden, James B.; and McCarty, Mark L., to Procter & Gamble Company, The. Method for making diperoxyacids. 4,233,235, Cl. 260-502.00R.

Cameron, Robert G.: *See—*
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., 4,233,389, Cl. 430-140.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Atkinson, James T. N.; and Sahoo, Maheswar, 4,233,376, Cl. 429-199.000.
Clark, Michael N.; and Smith, Donald L., 4,232,843, Cl. 244-3.290.

Canfield, Sheldon A., to Owens-Corning Fiberglas Corporation. Electro optical control to detect a filament passing through a guide eye and using a light emitting diode. 4,233,520, Cl. 250-561.000.

Canfield, V. Robert: *See—*
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,233,353, Cl. 428-141.000.

Canon Kabushiki Kaisha: *See—*
Fukahori, Hidehiko; Iwashita, Tomonori; and Mashimo, Yukio, 4,232,958, Cl. 354-212.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Ikemori, Keiji, 4,232,942, Cl. 350-184.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.
Masuda, Takeshi, 4,232,961, Cl. 355-14.00R.

Caporusso, Alessandro; and Caporusso, Mario, to C.M.L. Costruzioni Meccaniche Liri S.r.l. Portable manually controlled pipe-bending apparatus provided with reversible bending members. 4,232,542, Cl. 72-389.000.

Caporusso, Mario: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,232,542, Cl. 72-389.000.

Carborundum Company, The: *See—*
Ohnsorg, Roger W., 4,233,256, Cl. 264-44.000.

Carl Still, Firma: *See—*
Lemke, Otto; and Krause, Manfred, 4,232,566, Cl. 74-569.000.

Carlin, Joseph T.: *See—*
Tyler, Timothy N.; and Carlin, Joseph T., 4,232,737, Cl. 166-273.000.

Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., to Bell Telephone Laboratories, Incorporated. Technique for suppressing spurious resonances in strip transmission line circuits. 4,233,579, Cl. 333-204.000.

Carlson, Maynard E.: *See—*
Cain, Jack C.; and Carlson, Maynard E., 4,232,540, Cl. 72-11.000.

Carlson Stapler and Shippers Supply, Inc.: *See—*
Russell, B. Carson, 4,232,810, Cl. 227-19.000.

Carlsson, Kaj, to Konetehdas Maskinfabrik NORCAR Ky Kb. Endless track vehicle. 4,232,753, Cl. 180-9.20R.

Carney, Leroy L., to Halliburton Company. Oil well fluids and dispersants. 4,233,162, Cl. 252-8.50C.

Carnine, Daniel K.: *See—*
Babbitt, Frederick J.; and Carnine, Daniel K., 4,232,529, Cl. 62-160.000.

Carr, Donald L.: *See—*
Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L., 4,233,132, Cl. 204-169.000.

Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L. Method and apparatus for producing hydrogen. 4,233,132, Cl. 204-169.000.

Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., to Bendix Corporation, The. Electromagnetic fuel injector. 4,232,830, Cl. 239-585.000.

Cassera, James A.: *See—*
Perrine, Paul M.; and Cassera, James A., 4,232,597, Cl. 99-468.000.

Castleberry, Donald E., to General Electric Company. Multiplexed varistor-controlled liquid crystal display. 4,233,603, Cl. 340-783.000.

Caterpillar Tractor Co.: *See—*
Corrigan, Ara L.; Styck, Wayne G.; and Walden, Gerald M., 4,232,754, Cl. 180-9.500.

Catterson, Robert K., to Briggs & Stratton Corporation. Air cleaner for internal combustion engine. 4,233,043, Cl. 55-315.000.

Cavar, Gustav: *See—*
Cricchi, James R.; and Cavar, Gustav, 4,233,673, Cl. 365-184.000.

CBS Inc.: *See—*
Mahler, Henry W., 4,233,631, Cl. 358-182.000.

Celi, Antonio M., to Wiegand, Karl W. Safety close-off valve arrangement for pipe conduit systems and installations. 4,232,703, Cl. 137-172.000.

Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., to Du Pont de Nemours, E. I., and Company. Polyester draw-texturing feed yarns. 4,233,363, Cl. 428-373.000.

Cementa AB: *See—*
Sandahl, Evert G. I., 4,232,984, Cl. 405-261.000.

Ceskoslovenska akademie ved: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.

Chaban, Castulo, Jr.: *See—*
Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., 4,233,363, Cl. 428-373.000.

Chakrabarti, Paritosh M., to GAF Corporation. Preparation of salt-free N-acyl taurines. 4,233,229, Cl. 260-401.000.

Chalon, Jack; Ramanathan, Sivam; and Turndorf, Herman. Single limb breathing circuit assembly and absorber. 4,232,667, Cl. 128-203.260.

Chambert, Lars A. A. Process and reactor for conducting exothermal reactions in a circulating fluidized bed. 4,232,633, Cl. 122-4.00D.

Chamoulaud, Michel C. Carpet of vegetable matter. 4,232,481, Cl. 47-56.000.

Champion International Corporation: *See—*
Cottrell, Edward D.; and Robbins, Michael B., 4,232,811, Cl. 227-117.000.
Gingerich, David L., 4,232,592, Cl. 493-10.000.

Chapin, Paul D. Combination breech-loading to muzzle-loading firearm converting device and projectile casing. 4,232,468, Cl. 42-77.000.

Chapman, Ronald H.; and Hansen, Kenneth A., to Motorola, Inc. Wide frequency range current-controlled oscillator. 4,233,575, Cl. 331-111.000.

Charbonnages de France: *See—*
Valantin, Alfred A. M., 4,232,911, Cl. 305-16.000.

Chattha, Mohinder S., to Ford Motor Company. Coating composition catalyzed with phosphonic acid derivative-2. 4,233,415, Cl. 525-161.000.

Chemcut Corporation: *See—*
Goffredo, Daniel L., 4,233,106, Cl. 156-627.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, 4,233,202, Cl. 260-348.360.
Kalka, Josef; Hentschel, Bernhard; and Ziebarth, Jurgen, 4,233,437, Cl. 528-500.000.

Chen, Lim B.; and Cher, Lim L., to Cybiotronics Limited. Radiation sensing mobile target game. 4,232,865, Cl. 273-311.000.

Chen, Sow-Mei L.: *See—*
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,233,231, Cl. 260-429.700.

Chen-Yuan, Lee. Two variable flush gate for lavatory reservoir. 4,232,408, Cl. 4-325.000.

Cher, Lim L.: *See—*
Chen, Lim B.; and Cher, Lim L., 4,232,865, Cl. 273-311.000.

Chernoch, Joseph P., to General Electric Company. Face-cooled laser device having increased energy storage and output. 4,233,567, Cl. 331-94.50P.

Chernoff, Ralph C.: *See—*
United States of America, National Aeronautics and Space Administration; and Chernoff, Ralph C., 4,233,606, Cl. 343-100.0TD.

Chervitz, Melvin. Fever thermometer. 4,232,684, Cl. 128-736.000.

Chesler, Ronald B.: *See—*
Dabby, Franklin W.; and Chesler, Ronald B., 4,232,938, Cl. 350-96.200.

Chevron Research Company: *See—*
Brown, Earl J.; and Sie, Swan A., 4,233,677, Cl. 367-13.000.
Lewis, Robert A.; and Honnen, Lewis R., 4,233,168, Cl. 252-51.50A.
Pyle, Walter R., 4,232,715, Cl. 141-1.000.
Simic, Milutin, 4,233,082, Cl. 106-287.230.

Chiba, Takehisa: *See—*
Fujita, Tadashi; Oya, Masayuki; Watanabe, Toshio; and Chiba, Takehisa, 4,233,310, Cl. 424-273.00R.

Chicago Fire Brick Company: *See—*
Rechter, Harold L., 4,233,079, Cl. 106-56.000.

Chin, Joseph T.; Hochhauser, Arthur M.; and McCarthy, John P., to DCA Food Industries, Inc. Food product forming apparatus. 4,233,016, Cl. 425-288.000.

Chinfen, Dennis L. Egg roll extrusion and handling apparatus. 4,233,018, Cl. 425-297.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Chloride Group Limited: *See—*
McWhinnie, John; and Dawson, John L., 4,233,070, Cl. 75-167.000.

Chloride, Incorporated: *See—*
Kalns, Rudolph W., 4,233,504, Cl. 250-214.0RC.

Chmura, Stanley J., to Motorola, Inc. Method and apparatus for a PSK signal detector. 4,233,565, Cl. 329-50.000.

Chmura, William J., to Textron Inc. Powder metallurgy production of spherical articles, such as bearing elements. 4,232,436, Cl. 29-148.40B.

Chopra, Gopal M.: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,233,095, Cl. 149-95.000.

Chou, Feng-Te: *See—*
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, 4,233,215, Cl. 260-239.0EQ.

Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., to Brown & Root, Inc. Apparatus to reduce vessel motions. 4,232,623, Cl. 114-125.000.

Chow, Pel. Process for the manufacture of PNP transistors high power. 4,233,093, Cl. 148-189.000.

Christensen, Earl A. Body massage apparatus. 4,232,661, Cl. 128-33.000.

Christiansen, Jorn U., to Tour & Andersson Aktiebolag. Control unit for starting a climitization procedure in a building. 4,232,818, Cl. 236-46.00R.

Christoph Emmerich KG: *See—*
Landkammer, Franz J., 4,233,595, Cl. 340-542.000.

Chronis, George C. Portion control dressing and food dispenser. 4,232,801, Cl. 222-43.000.

Chugai Denki Kogyo Kabushiki-Kaisha: *See—*
Shibata, Akira, 4,232,812, Cl. 228-3.100.

Chutter, Raymond A., to Procter & Gamble Company, The. Package for antiperspirant/deodorant. 4,232,977, Cl. 401-68.000.

Ciba-Geigy Aktiengesellschaft: *See—*
Dodwell, Geoffrey M.; and Gambles, Norman E., 4,233,074, Cl. 430-535.000.
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,233,399, Cl. 430-510.000.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,233,306, Cl. 424-263.000.
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, 4,233,060, Cl. 71-94.000.
Dexter, Martin; and Steinberg, David H., 4,233,209, Cl. 260-45.85E.
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,233,308, Cl. 424-279.000.
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,233,220, Cl. 260-326.260.
Maier, Ludwig, 4,233,056, Cl. 71-86.000.
Martin, Henry, 4,233,055, Cl. 71-76.000.
Rody, Jean; and Rasberger, Michael, 4,233,410, Cl. 525-123.000.
Rody, Jean; and Rasberger, Michael, 4,233,412, Cl. 525-167.000.
Spivack, John D., 4,233,207, Cl. 260-45.70P.
Spivack, John D., 4,233,208, Cl. 260-45.8NT.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Ciciora, Walter S., to Zenith Radio Corporation. NTSC receiver useable with Teletext/Viewdata information. 4,233,628, Cl. 358-147.000.

Cipriani, Renzo. Safety device for mechanical eccentric cam presses. 4,232,773, Cl. 192-131.00R.

Citizen Watch Co., Ltd.: *See—*
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Claber S.p.A.: *See—*
Roman, Gian F., 4,232,827, Cl. 239-242.000.

Clairol Incorporated: *See—*
Springer, William E., 4,232,454, Cl. 34-97.000.

Clarion Co., Ltd.: *See—*
Mikoshiba, Nobuo; and Minagawa, Shoichi, 4,233,530, Cl. 307-424.000.

Clark, Michael N.; and Smith, Donald L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Molded nozzle for rocket motor. 4,232,843, Cl. 244-3.290.

Clarke, Robert L.; and Daum, Sol J., to Sterling Drug Inc. 3-Methoxycarbonyl-2-(2-thienyl)-8-azabicyclo[3.2.1]octane-8-acetamide and salts thereof. 4,233,448, Cl. 546-125.000.

Clarke, Robert L. G.; and Daum, Sol J., to Sterling Drug Inc. 1-(8-Methyl-2-phenyl(or thienyl)-8-azabicyclo[3.2.1]octan-3-yl) ethanone. 4,233,449, Cl. 546-125.000.

Claxton, William B.: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.

Clayborne, William J.: *See—*
Hauser, Hans; and Clayborne, William J., 4,232,569, Cl. 74-701.000.

Clemead Limited: *See—*
Jones, Norman; and Dawson, Peter, 4,233,358, Cl. 428-246.000.

Clement, Ralph C.: *See—*
DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., 4,233,482, Cl. 200-163.000.

Clitherow, John W.: *See—*
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.

Clokie, Andrew K., to Greenbat, Limited. Traveling yarn dispensers. 4,232,714, Cl. 139-371.000.

Coad, George L., to Varian Associates, Inc. Radiation therapy apparatus having retractable beam stopper. 4,233,519, Cl. 250-514.000.

Coal Industry (Patents) Limited: *See—*
Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., 4,233,357, Cl. 428-245.000.

Cobb, Raymond L., to Phillips Petroleum Company. Pyrolysis of N-substituted-1-cyclohexene-1,2-dicarboximides. 4,233,218, Cl. 260-326.00C.

Codman and Shurtleff, Inc.: *See—*
Dale, William A., 4,232,659, Cl. 128-1.00R.

Cohen, Murray, to Grumman Aerospace Corporation. Double locking device. 4,232,978, Cl. 403-317.000.

Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., to Fiberglas Canada Limited. Combined batch reactor system and continuous distillation apparatus. 4,233,267, Cl. 422-187.000.

Cole, Allan, to E M I Limited. Moving transducer systems. 4,232,556, Cl. 73-626.000.

Coleman, John R., to Northrop Corporation. Helicopter radar decoy. 4,233,605, Cl. 343-18.00D.

Coleman, William E., to NCR Corporation. Input-keep alive arrangement for plasma charge transfer device. 4,233,544, Cl. 315-169.200.

Coles, Robert L. Winged irrigating surgical retractor. 4,232,660, Cl. 128-20.000.

Collagen Corporation: *See—*
Luck, Edward E.; and Daniels, John R., 4,233,360, Cl. 428-310.000.

Collier-Keyworth Company: *See—*
Parker, James A., 4,232,900, Cl. 297-305.000.

Columbus, Richard L., to Eastman Kodak Company. Liquid transport device and method. 4,233,029, Cl. 23-230.00R.

Combustion Engineering, Inc.: *See—*
Auyeung, Sean; and Etzel, William W., 4,233,518, Cl. 250-507.000.
Prohazka, George J., 4,232,636, Cl. 122-479.00R.

Commissariat a l'Energie Atomique: *See—*
Jacquelin, Roland, 4,233,115, Cl. 176-36.00C.

Comperatore, John A.; Wise, David J.; and Black, Edward D., to PPG Industries, Inc. Shaping glass sheets by gravity sag bending followed by blow forming. 4,233,050, Cl. 65-107.000.

Compo Industries, Inc.: *See—*
Willwerth, Charles M.; and Silvia, John P., 4,233,012, Cl. 425-162.000.

Congdon, Joseph V.: *See—*
Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., 4,233,369, Cl. 429-26.000.

Conner, Alvin J., Sr. Non-petroleum based metal corrosion inhibitor. 4,233,176, Cl. 252-392.000.

Conservation Technologies, Inc.: *See—*
Terrell, George C.; and Konnerth, Andrew, III, 4,232,634, Cl. 122-41.000.

Container Corporation of America: *See—*
Johnson, Fred J.; and Bell, Richard L., 4,232,816, Cl. 229-33.000.
Karpinsky, William J., 4,232,591, Cl. 493-314.000.

Continental Group, Inc., The: *See—*
Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., 4,232,717, Cl. 141-179.000.
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,232,622, Cl. 113-121.00C.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Pietratus, Udo; and Rothemeyer, Fritz, 4,233,259, Cl. 264-167.000.

Conwed Corporation: *See—*
Videen, Otis R., 4,232,480, Cl. 47-9.000.

Conzelmann, Gerhard: *See—*
Nagel, Karl; and Conzelmann, Gerhard, 4,233,556, Cl. 322-28.000.

Cook, Sidney F.; and Stolowitz, Mark, to Cook, Sidney F.; and Stolowitz, Mark L. Offshore submarine storage facility for highly chilled liquified gases. 4,232,983, Cl. 405-210.000.

Cooke, Brian A., to Imperial Chemical Industries Limited. Phosphate coating process. 4,233,087, Cl. 148-6.15Z.

Cooke, Claude E., Jr.: *See—*
Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., 4,233,165, Cl. 252-8.55R.

Coombes, Michael: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

Cooper, Carl W. Concrete screed or form support. 4,232,847, Cl. 248-218.400.

Cooper Industries, Inc.: *See—*
Curtiss, George R., 4,232,414, Cl. 51-134.50F.

Copolymer Rubber & Chemical Corp.: *See—*
Karg, Rudolph F., 4,233,365, Cl. 428-404.000.

Cordill, Leroy D., to Phillips Petroleum Company. Method and apparatus for providing a digital output in response to an analog input and for providing an analog output in response to a digital input. 4,233,500, Cl. 235-310.000.

Cornell, John A. Gum emulsified liquid package for delivering and preserving liquid content in the mouth. 4,233,288, Cl. 424-48.000.

Corning Glass Works: *See—*
Beall, George H.; Mansfield, Gerald R.; and Schreurs, Jan W. H., 4,233,169, Cl. 252-62.590.
Dominick, Ellen K.; and Scherer, George W., 4,233,052, Cl. 65-144.000.
Herczog, Andrew, 4,232,676, Cl. 128-303.140.
Sarkar, Arnab, 4,233,045, Cl. 65-3.00A.

Correia, Daniel. Demountable and stackable multipurpose container. 4,232,916, Cl. 312-107.000.

Corrigan, Ara L.; Styck, Wayne G.; and Walden, Gerald M., to Caterpillar Tractor Co. Equalizer bar pad construction. 4,232,754, Cl. 180-9.500.

Corry, Nigel A. Imitation coal and method of making same. 4,233,348, Cl. 428-15.000.

Corvington, Edward J.; and Sitter, Elmer J., to Royal Mark Laminates. Skeletal frame structure with sheet material cover. 4,232,489, Cl. 52-63.000.

Cosden Technology, Inc.: *See—*
Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., 4,233,418, Cl. 525-243.000.

Cottrell, Edward D.; and Robbins, Michael B., to Champion International Corporation. Apparatus for dispensing and inserting sticks. 4,232,811, Cl. 227-117.000.

Cowdery, James R.: *See—*
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,232,779, Cl. 198-472.000.

Cox, Bruce M., to Halliburton Company. Variable ratio intensifier. 4,233,000, Cl. 417-402.000.

Cox, Norman D., to Jefco Laboratories, Incorporated. Exhaust system for smokestack. 4,232,595, Cl. 98-59.000.

Crabbe, Rene: *See—*
Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, 4,233,147, Cl. 204-266.000.

Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., to Burgess Power Tools Limited. Switch actuating assembly for power tools. 4,232,579, Cl. 83-788.000.

Cragoe, Edward J., Jr.: *See—*
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,233,452, Cl. 549-79.000.

Cramer, Rudy R.: *See—*
Kemner, Rudolf; and Cramer, Rudy R., 4,233,633, Cl. 358-221.000.

Crandall, Richard: *See—*
Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, 4,233,339, Cl. 427-108.000.

Crawford, Larry B. Phonograph record album index tabs. 4,232,461, Cl. 40-23.00A.

Crawford, Wheeler C.: *See—*
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,233,244, Cl. 564-423.000.

Crescentini, Lamberto: *See—*
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.

Cricchi, James R.; and Cavar, Gustav, to Westinghouse Electric Corp. Electrically resettable non-volatile memory for a fuse system. 4,233,673, Cl. 365-184.000.

Crinos Industria Farmacobiologica S.p.A.: *See—*
Reiner, Alberto, 4,233,304, Cl. 424-256.000.

Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, to BBC Brown, Boveri & Company, Limited. Superchargers for internal combustion engines. 4,232,999, Cl. 417-64.000.

Crosas, Pedro B. Electromechanical anti-theft system for automobile vehicle. 4,232,758, Cl. 180-287.000.

Crosby, Stephen R.: *See—*
Stellinger, Thomas S.; and Crosby, Stephen R., 4,232,578, Cl. 83-661.000.

Cross, Stephen D., to FMC Corporation. Confection conveyor. 4,232,780, Cl. 198-479.000.

Crump, Charles L. Safety eyewash package and container therefor. 4,232,671, Cl. 128-249.000.

Ctyroky, Jiri: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.

Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, to Laporte Chemicals Limited. Peroxygen compounds. 4,233,462, Cl. 568-564.000.

Cuevas, Ephraim A., to PPG Industries, Inc. Solution mining water soluble salts at high temperatures. 4,232,902, Cl. 299-4.000.

Culkin, John J.: *See—*
Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., 4,233,063, Cl. 75-0.5AA.

Cull, Neville L., to Exxon Research & Engineering Co. Aluminum phosphate-alumina compositions and catalysts comprising the same. 4,233,184, Cl. 252-437.000.

Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased (by Loeffler, Carolyn R., legal representative), to Johns-Manville Corporation. Method and apparatus for manufacturing a laminated shingle. 4,233,100, Cl. 156-260.000.

Curtil, Remi, to Societe d'Etudes de Machines Thermiques S.E.M.T. Method and device for improving the efficiency of internal combustion engines. 4,232,641, Cl. 123-76.000.

Curtis, Omer E., Jr., to United States Steel Corporation. Dicyclopentadiene polyester resins. 4,233,432, Cl. 528-298.000.

Curtiss, George R., to Cooper Industries, Inc. Free-wheeling overspeed grinder device. 4,232,414, Cl. 51-134.50F.

Curto, Nicholas J., to Owens-Illinois, Inc. Method of forming blown polyethylene terephthalate containers. 4,233,262, Cl. 264-509.000.

Cutler, Morris; and Tamarin, Bernard J., to Vacuum Cleaner Corporation of America, The. Retractable cord reel. 4,232,837, Cl. 242-107.000.

Cybiotronics Limited: *See—*
Chen, Lim B.; and Cher, Lim L., 4,232,865, Cl. 273-311.000.

Czaja, Robert F.; and Grabowski, Edward J. J., to Merck & Co., Inc. Process for preparing indenyl acetic acids. 4,233,457, Cl. 562-428.000.

Czernik, Karl: *See—*
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

D G T S.r.l.: *See—*
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, 4,232,666, Cl. 128-203.250.

Dabby, Franklin W.; and Chesler, Ronald B., to Times Fiber Communications, Inc. Telecommunication systems using optical waveguides. 4,232,938, Cl. 350-96.200.

Dace, Marvin H., Jr. Slip pliers with lock. 4,232,573, Cl. 81-405.000.

Dagani, Michael J., to Ethyl Corporation. Synthesis of 2,2,2-trichloro-1-(N-hydrocarbonpyrryl-2)-ethanol. 4,233,219, Cl. 260-326.50R.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.

Daikin Kogyo Co. Ltd.: *See—*
Enjo, Naonori; and Aomi, Hideki, 4,232,525, Cl. 60-671.000.

Dale, William A., to Codman and Shurtleff, Inc. Vein holder assembly. 4,232,659, Cl. 128-1.00R.

Dallen, Larry D.: *See—*
Bolton, Edgar A.; and Dallen, Larry D., 4,233,661, Cl. 364-300.000.

Dampier, William P.: *See—*
Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P., 4,232,523, Cl. 60-641.000.

Danfoss A/S: *See—*
Knudsen, Ole F., 4,233,143, Cl. 204-195.00P.

Daniels, John R.: *See—*
Luck, Edward E.; and Daniels, John R., 4,233,360, Cl. 428-310.000.

Dannenberg, Wolfgang: *See—*
Schmand, Horst; and Dannenberg, Wolfgang, 4,233,456, Cl. 562-401.000.

d'Argembeau, Etienne, Y. G. J. Process for the manufacture of brushes. 4,233,260, Cl. 264-243.000.

Darling & Company: *See—*
Wojcik, Herbert W., 4,232,425, Cl. 17-46.000.

Darms, Roland: *See—*
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,233,220, Cl. 260-326.260.

Darrow, Russell E.; Memis, Irving; and Poliak, Richard M., to International Business Machines Corporation. Sealing of integrated circuit modules. 4,233,620, Cl. 357-74.000.

Dart Industries Inc.: *See—*
Valayil, Silvester P.; and Elias, Moenes L., 4,233,111, Cl. 156-666.000.
Valayil, Silvester P.; and Elias, Moenes L., 4,233,112, Cl. 156-666.000.
Valayil, Silvester P.; and Elias, Moenes L., 4,233,113, Cl. 156-666.000.

Data Packaging Corporation: *See—*
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., 4,233,586, Cl. 335-303.000.

Datwyler, Walter F., Jr.: *See—*
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.

Daum, Sol J.: *See—*
Clarke, Robert L.; and Daum, Sol J., 4,233,448, Cl. 546-125.000.
Clarke, Robert L. G.; and Daum, Sol J., 4,233,449, Cl. 546-125.000.

Dauvergne, Jean L. R., to Societe Anonyme Francaise du Ferodo. Assisted braking device. 4,232,519, Cl. 60-550.000.

Davenport, Gordon H.: *See—*
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Davis, James E., to Proctor & Gamble Company, The. Liquid fabric softener. 4,233,164, Cl. 252-8.800.

Davis, Malcolm J.: *See—*
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.

Davis, Roman: *See—*
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,233,328, Cl. 426-250.000.

Davy International AG: *See—*
Maude, John H.; Sterck, Lothar; and Vilshofer, Alfred, 4,233,264, Cl. 422-117.000.

Davy Powergas Inc.: *See—*
Korchnak, Joseph D., 4,233,278, Cl. 423-321.00S.

Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, to Dynapol. Edible materials colored with polymeric yellow colorant. 4,233,328, Cl. 426-250.000.

Dawson, John L.: *See—*
McWhinnie, John; and Dawson, John L., 4,233,070, Cl. 75-167.000.

Dawson, Peter: *See—*
Jones, Norman; and Dawson, Peter, 4,233,358, Cl. 428-246.000.

Day, Reed H., to Pascal Company, Inc. Dental gingival retraction cord dispenser. 4,232,688, Cl. 132-91.000.

Dayton, Birney D., to Grass Valley Group, The. Sync separator with a look-ahead clamp. 4,233,629, Cl. 358-153.000.

DCA Food Industries, Inc.: *See—*
Chin, Joseph T.; Hochhauser, Arthur M.; and McCarthy, John P., 4,233,016, Cl. 425-288.000.

Dean, George A., to Dean Research Corporation. Accelerating walkway. 4,232,776, Cl. 198-322.000.

Dean Research Corporation: *See—*
Dean, George A., 4,232,776, Cl. 198-322.000.

Dearth, Leonard F.: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Deere & Company: *See—*
Vogelaar, Bernard F.; Warman, Bruce L.; and Nelson, James R., 4,233,040, Cl. 55-269.000.

De Fusco, Joseph, to Gema AG. Atomizer device. 4,232,832, Cl. 239-707.000.

Degel, Josef: *See—*
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.

Dehmel, Georg: *See—*
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, 4,233,213, Cl. 260-141.000.

De Kock, Cornelis, to ITT Industries, Inc. Arrangement for adjusting the damping force of a shock absorber. 4,232,767, Cl. 188-319.000.

Dell'Acqua, Ernani: *See—*
Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, 4,233,290, Cl. 424-94.000.

Dellantonio, Ezio F., to Autovox, SpA. Keyboard for the preselection of electromagnetic signals. 4,232,560, Cl. 74-10.330.

Delmon, Bernard; and Van Houte, Ghislain, to Unibra. Reagent for treating flue gases and method of preparation. 4,233,175, Cl. 252-192.000.

deMey, Charles F., II, to Perkin-Elmer Corporation, The. Source lamp positioning apparatus. 4,233,657, Cl. 362-396.000.

Denefe, John C. Two rail overhead conveyor device. 4,232,424, Cl. 17-24.000.

Denlinger, George W.: *See—*
Nodov, Eugene; Scott, Burton W.; Denlinger, George W.; and Sutera, Richard, 4,232,964, Cl. 355-70.000.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 8H-Pyrazolo[1,5-a]pyrazolo[4',3':5,6]pyrido[3,4-e]pyrimidine. 4,233,300, Cl. 424-248.400.

Deraedt, Roger: *See—*
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,305, Cl. 424-258.000.
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,312, Cl. 424-274.000.
Teutsch, Jean G.; and Deraedt, Roger, 4,233,297, Cl. 424-243.000.

Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P. Solar power plant. 4,232,523, Cl. 60-641.000.

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Stahl, John M.; and DeRoss, Robert W., 4,233,478, Cl. 200-51.090.

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Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,232,779, Cl. 198-472.000.

Designs for Vision, Inc.: *See—*
Feinbloom, Richard E., 4,232,934, Cl. 350-96.200.

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McLaughlin, Robert L.; and Wood, Donald C., 4,233,171, Cl. 252-99.000.
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Detloff, John C., Jr., to General Motors Corporation. Control mechanism for a vehicle ignition lock. 4,232,538, Cl. 70-239.000.

Deuzeman, Henk J.: *See—*
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,233,267, Cl. 422-187.000.

Devine, William T.; and Gianopulos, William, to International Business Machines Corporation. Demand powered programmable logic array. 4,233,667, Cl. 364-900.000.

Devroe, Guido: *See—*
Langens, Jan; and Devroe, Guido, 4,233,280, Cl. 423-481.000.

DeWitt, Merl. Lightweight trailer bed construction. 4,232,884, Cl. 280-785.000.

Dexter, Martin; and Steinberg, David H., to Ciba-Geigy Corporation. Hindered phenol hydrazones and compositions stabilized therewith. 4,233,209, Cl. 260-45.85E.

Dial Manufacturing, Inc.: *See—*
Mangam, William M., Jr.; Willis, John J., Jr.; and Jones, Myron, Jr., 4,232,531, Cl. 62-171.000.

Diamond, Marc. Acoustical stringed musical instrument pick-up. 4,232,582, Cl. 84-267.000.

Di Bari, Leonardo: *See—*
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, 4,232,666, Cl. 128-203.250.

Dick, Helmut, to Atlas Copco Aktiebolag. Tunnelling machine. 4,232,905, Cl. 299-31.000.

Dick, Willy P. A., to Telefonaktiebolaget L M Ericsson. Flame-guard for electrical installations. 4,232,742, Cl. 169-58.000.

Dickerson, Carroll D.; and Stevens, Robert W., to Ford Motor Company. Adjusting sleeve for a wheel assembly. 4,232,880, Cl. 280-661.000.

Diem, Hans: *See—*
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.

Dienes, Edward K.: *See—*
Hausberger, Arthur L.; and Dienes, Edward K., 4,233,180, Cl. 252-373.000.

Dieterlen, Paul E.; and Benner, Harold T., Jr., to R. A. Jones & Co. Inc. Pouch forming and filling mechanism with provision for increasing the capacity of the pouches. 4,232,504, Cl. 53-570.000.

Dietl, Ernst: *See—*
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.

Dietrich-Buchecker, Christiane: *See—*
Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, 4,233,129, Cl. 204-158.00R.

Dietrich, Walter; and Stephan, Herbert, to Leybold-Heraeus GmbH. Instrument for determining the radiation parameters of a focused charged-particle beam and method. 4,233,515, Cl. 250-397.000.

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Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.

Dighe, Kamalakar D., to Baxter Travenol Laboratories, Inc. Speed and torque control for fractional horsepower motors. 4,233,549, Cl. 318-317.000.

DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., to Gould Inc. Enclosed fused disconnect switch. 4,233,482, Cl. 200-163.000.

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Heusser, Dietrich; and Dingeldein, Elvira, 4,233,287, Cl. 424-14.000.

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Eichfeld, Timothy J.; and Disston, Horace C., Jr., 4,232,856, Cl. 269-93.000.

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Wickersham, Price D., 4,232,928, Cl. 339-117.00P.

Doane, Cyril M. Building construction for multiple units having common walls. 4,232,490, Cl. 52-167.000.

Dobie, Michael J.: *See—*
Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., 4,232,777, Cl. 198-404.000.

Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, to Robert Bosch GmbH. Apparatus for detecting pressure fluctuations in the combustion chamber of an internal combustion engine. 4,232,545, Cl. 73-35.000.

Dr. Hans Boeckels GmbH & Co.: *See—*
Muller, Karl-Heinz, 4,232,781, Cl. 198-505.000.

Dodwell, Geoffrey M.; and Gambles, Norman E., to Ciba-Geigy Aktiengesellschaft. Photographic polyester film base with subbing layer containing phosphoric acid derivative. 4,233,074, Cl. 430-535.000.

Dollond & Aitschison (Services) Limited: *See—*
Eadon-Allen, Stuart, 4,232,485, Cl. 51-55.000.

Dominick, Ellen K.; and Scherer, George W., to Corning Glass Works. Carbon coating for a starting member used in producing optical waveguides. 4,233,052, Cl. 65-144.000.

Donahue, Robert L.: *See—*
Grimmer, John E.; and Donahue, Robert L., 4,232,997, Cl. 417-4.000.

Donze, Salvatore H.: *See—*
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Doonan, David F.; and Moller, Kurt H., to Olin Corporation. Continuous process for the production of monoalkali metal cyanurates. 4,233,444, Cl. 544-192.000.

Dorlars, Alfons; and Neuner, Otto, to Bayer Aktiengesellschaft. Triazolyl-stilbenes. 4,233,440, Cl. 542-458.000.

Dorr-Oliver Incorporated: *See—*
Fitch, Elliot B.; and Albertson, Orris E., 4,232,614, Cl. 110-235.000.

Dorrestijn, Antoon, to Electrochemische Energieconversie N.V. Method for the manufacture of an electrochemical cell or battery and battery made by the method. 4,233,371, Cl. 429-152.000.

Dotson, Ronald L.: *See—*
Lynch, Richard W.; Hilliard, Garland E.; and Dotson, Ronald L., 4,233,122, Cl. 204-98.000.

Dow Chemical Company, The: *See—*
Fultz, Duane A., 4,233,361, Cl. 428-313.000.
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,233,467, Cl. 585-437.000.
Raines, Dale A.; and Ainsworth, Oliver C., 4,233,221, Cl. 260-340.200.
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,233,425, Cl. 525-455.000.

Dow, Douglas. Electric motor vehicle. 4,232,755, Cl. 180-65.00R.

Downs, William T.: *See—*
Muller, George H.; and Downs, William T., 4,232,803, Cl. 222-105.000.

Dowzall, Martin E.; and Houssian, Vazgen J., to Letraset International Limited. Apparatus for use in connection with dry transfer lettering and analogous sheets. 4,232,452. Cl. 33-430.000.

Drabek, Jozef: *See—*
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,233,306, Cl. 424-263.000.

Dragerwerk Aktiengesellschaft: *See—*
Schafer, Jurgen, 4,233,190, Cl. 252-475.000.

Dresser Industries, Inc.: *See—*
Sample, Thomas E., Jr.; and Horn, John M., 4,233,366, Cl. 428-405.000.
Williamson, Robert L., 4,232,912, Cl. 308-8.200.

Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, to United States of America, America. Aziridinyl quinone antitumor agents. 4,233,215, Cl. 260-239.0EQ.

D'Souza, Gerard J.; and Radford, Herschel D., to Standard Oil Company (Indiana). Process for the desulfurization of waste gases. 4,233,276, Cl. 423-230.000.

Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Rost, Karl-Heinz; and Muehlthaler, Wolfgang, to BASF Aktiengesellschaft. Manufacture of aliphatic hydroxycarbonyl compounds etherified with aliphatic groups. 4,233,246, Cl. 568-402.000.

Dufaure, Pierre: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,233,430, Cl. 526-259.000.

Duffner, Paul: *See—*
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.

Dufresne, Jacques. Automatic emergency brake. 4,232,768, Cl. 192-2.000.

Duggan, George L.: *See—*
Waymouth, John F.; Passmore, Edmund M.; and Duggan, George L., 4,233,536, Cl. 313-174.000.

Dugle, Thomas E.: *See—*
Orlowski, Gerald J.; and Dugle, Thomas E., 4,232,630, Cl. 119-29.000.

Dumont, Willy, to BBC Brown, Boveri & Company, Limited. Method and apparatus for tube leakage testing. 4,232,546, Cl. 73-40.700.

Duncan, Richard A. Structural and operational improvements for a two row harvester and piler. 4,232,775, Cl. 198-304.000.

Dunn, Edward J., Jr. Method of scavenging steel. 4,233,064, Cl. 75-58.000.

Du Pont de Nemours, E. I., and Company: *See—*
Benin, Joshua, 4,232,835, Cl. 242-46.400.
Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., 4,233,363, Cl. 428-373.000.
Edwards, Donald W.; and Gorondy, Emery J., 4,233,382, Cl. 430-39.000.
Friedel, Horst, 4,233,392, Cl. 430-264.000.
Kinney, George A., 4,233,014, Cl. 425-174.80R.
Menson, Robert C.; Narayanswamy, Venkatachalam; and Burns, Richard C., 4,233,403, Cl. 435-22.000.
Niederhauser, Donald O., 4,233,349, Cl. 428-92.000.
Pfister, Friedrich V., 4,232,434, Cl. 26-86.000.
Rao, V. N. Mallikarjuna; and Ziemecki, Stanislaw B., 4,233,248, Cl. 568-487.000.
Redwine, Terry W., 4,233,252, Cl. 570-231.000.
Robinson, Ivan M., 4,233,436, Cl. 528-366.000.
Stull, John R., 4,232,927, Cl. 339-99.00R.
Yunan, Malak E., 4,232,606, Cl. 102-27.00R.

Duprez, Daniel; and Grand, Michel, to ElfUnion. Catalysts for water dealkylation of aromatic hydrocarbons. 4,233,186, Cl. 252-466.00B.

Dyer, Robert F., to Mattel, Inc. Toy safe with alarm. 4,232,474, Cl. 46-2.000.

Dyna Technology, Inc.: *See—*
Roche, Lawrence R., 4,233,555, Cl. 322-25.000.

Dynamex Corporation: *See—*
Bravin, Ben, 4,232,838, Cl. 242-158.00R.

Dynapol: *See—*
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,233,328, Cl. 426-250.000.

Dyroff, David R.; and Lynch, Gary J., to Monsanto Company. Process for stabilizing acetal carboxylate polymers using dialkyl sulfate. 4,233,422, Cl. 525-398.000.

Dyroff, David R.; Lynch, Gary J.; and Papanu, Victor D., to Monsanto Company. Stabilization of polymeric acetal carboxylates using an acetal. 4,233,423, Cl. 525-398.000.

E M I Limited: *See—*
Cole, Allan, 4,232,556, Cl. 73-626.000.

E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,233,300, Cl. 424-248.400.
Hill, John A.; Wang, Yu-chang J.; and Wong, Thomas M., 4,233,295, Cl. 424-238.000.

Eadon-Allen, Stuart, to Dollond & Aitschison (Services) Limited. Apparatus for polishing curved surfaces. 4,232,485, Cl. 51-55.000.

Earl Enterprises, Inc., The: *See—*
Muelling, Earl L., 4,232,472, Cl. 43-61.000.

Eastes, Walter L., to Owens-Corning Fiberglas Corporation. Method for producing calcium borates. 4,233,051, Cl. 65-134.000.

Eastman Kodak Company: *See—*
Ateya, Antoun I.; and Stryjewski, Walter A., 4,232,959, Cl. 355-3.0FU.
Columbus, Richard L., 4,233,029, Cl. 23-230.00R.
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., 4,233,389, Cl. 430-140.000.
Petropoulos, Constantine C.; Reynolds, George A.; and VanAllan, James A., 4,233,443, Cl. 542-454.000.
Rosenfeld, Robert B., 4,232,555, Cl. 73-606.000.
Sublett, Bobby J., 4,233,196, Cl. 260-29.20N.

Eaton Corporation: *See—*
Migrin, Robert S.; and Olson, Jerry A., 4,232,549, Cl. 73-202.000.

Eaton, Homer L., to Eaton-Leonard Corporation. Method and apparatus for making bent pipe. 4,232,813, Cl. 228-147.000.

Eaton-Leonard Corporation: *See—*
Eaton, Homer L., 4,232,813, Cl. 228-147.000.

Ebauches S.A.: *See—*
Besson, Rene; and Breguet, Jean-Luc, 4,232,464, Cl. 40-451.000.
Gharadjedaghi, Fereydoun; and Le Fur, Bernard, 4,232,946, Cl. 350-320.000.

Eckart, Gregory C.: *See—*
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,639, Cl. 361-44.000.
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,640, Cl. 361-44.000.

Eckes, Peter: *See—*
Seebeck, Dieter; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, 4,233,407, Cl. 435-311.000.

Eckhardt, Wolfgang: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,233,308, Cl. 424-279.000.

Ed. Zublin Aktiengesellschaft: *See—*
Hahn, Volker; and Fastenau, Werner, 4,232,822, Cl. 238-7.000.

Eddy, William R., to Phillips Petroleum Company. Dispensing nozzle. 4,232,629, Cl. 118-669.000.

Edelmann, Ludwig, to C. Reichert Optische Werke, AG. Device for freeze drying and synthetic resin impregnation when necessary of small biological objects for electron microscopic examination. 4,232,453, Cl. 34-92.000.

Edwards, Donald W.; and Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Electrostatic transfer of magnetically held toner images. 4,233,382, Cl. 430-39.000.

Edwards, John V.: *See—*
Steer, Peter L.; and Edwards, John V., 4,232,672, Cl. 128-283.000.

Eggermann, Paul P., to Inseco Associates, Inc. Method and apparatus for installation of quench car track for coke oven batteries. 4,232,823, Cl. 238-7.000.

Eggermont, Ludwid D. J., to U.S. Philips Corporation. Arrangement for decoding a signal encoded by means of adaptive delta modulation. 4,233,684, Cl. 375-30.000.

Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, to Kyoto University, The President of. Device for measuring thermal conductivity of liquids. 4,232,543, Cl. 73-15.00A.

Eichfeld, Timothy J.; and Disston, Horace C., Jr. Work holding table. 4,232,856, Cl. 269-93.000.

Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, to Bendix Autolite Corporation. Method and apparatus for measuring the O_2 content of a gas. 4,233,033, Cl. 23-232.00E.

Elast-O-Cor Products & Engineering Limited: *See—*
Maciorewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,233,160, Cl. 210-512.00M.

Elder, William L.; Williams, Kevin G.; and Burough, Irvin G., to Andros Incorporated. Gas analyzer. 4,233,513, Cl. 250-343.000.

Electric Machinery Mfg. Company: *See—*
Iverson, James R.; and Alcock, Derrick N., 4,233,643, Cl. 361-344.000.

Electrochemische Energieconversie N.V.: *See—*
Dorrestijn, Antoon, 4,233,371, Cl. 429-152.000.

ElfUnion: *See—*
Duprez, Daniel; and Grand, Michel, 4,233,186, Cl. 252-466.00B.

Elias, Moenes L.: *See—*
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Valayil, Silvester P.; and Elias, Moenes L., 4,233,112, Cl. 156-666.000.

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Elias, Robert T.; and Holtman, Dennis C., to Johnson & Johnson Baby Products Company. Thin-skin stabilization of pads of fluffed pulp. 4,233,345, Cl. 427-325.000.

Elias, Ronald J.: *See—*
Fritz, Douglas P.; and Elias, Ronald J., 4,233,319, Cl. 426-5.000.

Ellis, James N., to United States of America, Army. Vent actuated shorting switch. 4,233,554, Cl. 320-46.000.

Ellsberg, Thomas R. Safety interlock system. 4,233,642, Cl. 361-172.000.

Elser, Dieter, to Zahnradfabrik Friedrichshafen AG. Steering control valve for power booster steering mechanisms. 4,232,586, Cl. 91-467.000.

Emerson Electric Co.: *See—*
Behr, Joseph L., 4,232,528, Cl. 62-140.000.

Emeury, Jean-Marie L.: *See—*
Pascal, Helene M.; and Emeury, Jean-Marie L., 4,233,463, Cl. 568-584.000.

Emhart Industries, Inc.: *See—*
Spurr, Robert, 4,233,021, Cl. 425-525.000.

EMI Limited: *See—*
LeMay, Christopher A. G., 4,233,662, Cl. 364-414.000.

Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., to United States of America, Energy. Tunable, rare earth-doped solid state lasers. 4,233,570, Cl. 331-94.50F.

Emslie, Alan E.: *See—*
Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., 4,232,710, Cl. 138-39.000.

Endo, Isao, to General Electric Company. Primer compositions for silicone rubber compositions. 4,233,428, Cl. 525-507.000.

Endo, Morihiko: *See—*
Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, 4,233,206, Cl. 260-42.210.

Endo, Sigeru: *See—*
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Engel, Wolfhard: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, 4,233,299, Cl. 424-246.000.
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, 4,233,333, Cl. 426-548.000.

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Enjo, Naonori; and Aomi, Hideki, to Daikin Kogyo Co. Ltd. Working fluid for Rankine cycle. 4,232,525, Cl. 60-671.000.

Environmental Sciences Associates, Inc.: *See—*
Matson, Wayne R.; and Vitukevich, Ronald, 4,233,031, Cl. 23-230.00B.

Eocom Corporation: *See—*
Harbaugh, Steven K.; and Hoogerbrugge, Gary H., 4,233,636, Cl. 358-287.000.

ER-WE-PA Maschinenfabrik & Eisengiesserei: *See—*
Bolender, Walter; and Wallner, Ernst, 4,233,011, Cl. 425-143.000.

Erb, Edgar M.: *See—*
Heiser, Joseph I.; and Erb, Edgar M., 4,233,370, Cl. 429-82.000.

Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., to Uranerzbergbau GmbH. Process for selective separation of uranium from solutions by means of an ion exchanger. 4,233,272, Cl. 423-7.000.

Ericson, Kurt S. B. Automatic valve device for sanitation waste pipes. 4,232,706, Cl. 137-375.000.

Eriksen, Gunnar, to Thune-Eureka A/S. Stretching machine for treating removable belts supported on rollers. 4,232,435, Cl. 26-106.000.

Ernst, Edwin F. Method of making plastic bag construction in serial roll form. 4,232,589, Cl. 493-223.000.

Ernst Leitz Wetzlar GmbH: *See—*
Hagner, Willi; and Frimmel, Horst, 4,233,650, Cl. 362-32.000.

Ernstsson, Ernst G.; and Fuchs, Alfred, to Tetra Pak International AB. Arrangement for the sterilizing of a packing material web. 4,233,271, Cl. 422-300.000.

Escher Wyss Limited: *See—*
Fritze, Hartwig, 4,233,322, Cl. 426-46.000.

Eschwey, Helmut; Galinke, Joachim, deceased (by Jansen, Renate Galinke nee, heir); and Wiemers, Norbert, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGAA). Water-dispersed film-forming lacquer containing air-drying alkyd resins and an ethylene oxide adduct of an unsaturated aliphatic-substituted phenol. 4,233,194, Cl. 260-22.00A.

Eskofot Research A/S: *See—*
Shelffo, Loren E., 4,232,628, Cl. 118-653.000.

Essers, Wilhelmus G., to U.S. Philips Corporation. Method of and device for plasma MIG-welding. 4,233,489, Cl. 219-121.00P.

Esters, Ernie B. Modular dynamoelectric machine. 4,233,532, Cl. 310-46.000.

Estradier, Francoise: *See—*
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Etablissement Euroburner: *See—*
Piotrowski, Tadeusz, 4,232,733, Cl. 165-89.000.

Ethyl Corporation: *See—*
Dagani, Michael J., 4,233,219, Cl. 260-326.50R.

Etlin, Vladimir N. Electrostatic coating method. 4,233,335, Cl. 427-27.000.

Eto, Yoshizumi: *See—*
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Ettenberg, Michael: *See—*
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Etzel, William W.: *See—*
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Eue, Ludwig: *See—*
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Evans, Graham: *See—*
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Everett Metal Products: *See—*
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Excoffon, Charles: *See—*
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Exxon Production Research Company: *See—*
Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., 4,233,165, Cl. 252-8.55R.

Exxon Research & Engineering Co.: *See—*
Cull, Neville L., 4,233,184, Cl. 252-437.000.
Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., 4,232,710, Cl. 138-39.000.
Kaye, Larry A.; and Koros, Robert M., 4,233,269, Cl. 422-207.000.
Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., 4,233,139, Cl. 208-112.000.
Whittingham, M. Stanley; and Jacobson, Allan J., 4,233,375, Cl. 429-194.000.

Fabbri, William C., to Keene Corporation. Work area lighting system. 4,233,651, Cl. 362-33.000.

Fabrig, Paul, to Womako Maschinenkonstruktionen GmbH. Method and means for manipulating marginally perforated note books prior to introduction of spirals. 4,232,858, Cl. 270-53.000.

Fabryka Przyrzadow i Uchwytow PONAR-BIAL Zaklad Nr 1-Wiodacy: *See—*
Bezubik, Slawomir J.; and Laszcz, Stanislaw, 4,232,857, Cl. 269-212.000.

Fagan, John C., to Artag Plastics Corporation. Vending machine control system. 4,233,660, Cl. 364-104.000.

Fair, James V., to V & W Parts & Machine Shops, Inc. Method for reconditioning an engine head. 4,232,437, Cl. 29-156.40R.

Fairbanks, Norman P.: *See—*
Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., 4,232,995, Cl. 415-172.00A.

Falce, Louis R., to Varian Associates, Inc. Electron tube with reduced secondary emission. 4,233,539, Cl. 315-5.380.

Fancher, Llewellyn W.; and Baker, Don R., to Stauffer Chemical Company. Biocidal isothiourea compounds. 4,233,318, Cl. 424-326.000.

Farber, Sheldon: *See—*
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,232,887, Cl. 282-27.500.

Farmanian, Paul A.: *See—*
Yen, Teh F.; and Farmanian, Paul A., 4,232,738, Cl. 166-274.000.

Farr, Glyn P. R., to Girling Limited. Vehicle load sensing assemblies. 4,232,909, Cl. 303-22.00R.

Farrow Irrigation Limited: *See—*
Broughton, Michael, 4,232,826, Cl. 239-112.000.

Fassbender, Rolf, to Zahnradfabrik Friedrichshafen AG. Control element for auxiliary power steerings. 4,232,584, Cl. 91-418.000.

Fastenau, Werner: *See—*
Hahn, Volker; and Fastenau, Werner, 4,232,822, Cl. 238-7.000.

Faughnan, Brian: *See—*
Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, 4,233,339, Cl. 427-108.000.

Favre, Jean-Paul; Perrin, Joseph; Philbert, Michel; and Surget, Jean, to Office National d'Etudes et de Recherches Aerospatiales (ONERA). Method and an apparatus for measuring the bonding power of an adhesive material. 4,232,559, Cl. 73-827.000.

Fawzi, Mahdi B., to Procter & Gamble Company, The. Stabilized radiographic scanning agents. 4,233,284, Cl. 424-1.000.

Feinbloom, Richard E., to Designs for Vision, Inc. Universal connector assembly particularly adapted for use with fiber optic cables. 4,232,934, Cl. 350-96.200.

Fekete, Simon O.: *See—*
Meyer, Gustavo A.; Fekete, Simon O.; and Wicker, Gordon R., 4,233,273, Cl. 423-112.000.

Fellmann, Ruedi, to Max Langenstein Feld- und Gartengerate. Hand tool with removable extension handle. 4,232,422, Cl. 16-110.00R.

Fenner, Gary W.; and Ragi, Elias G., to Union Carbide Corporation. Method for enhanced heat transfer. 4,232,728, Cl. 165-1.000.

Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., to Eastman Kodak Company. Fluorinated 1-hydroxy-2-naphthamide coupler compositions and photographic elements suited to forming integral sound tracks. 4,233,389, Cl. 430-140.000.

Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, to SPA-Societa Prodotti Antibiotici, S.p.A. Method of treating domestic animals. 4,233,290, Cl. 424-94.000.

Ferro, Armand P., to General Electric Company. Start winding for solenoidal electric field discharge lamps. 4,233,541, Cl. 315-70.000.

Fiato, Rocco A., to Union Carbide Corporation. Homologation process for the production of ethanol from methanol. 4,233,466, Cl. 568-902.000.

Fiberglas Canada Limited: *See—*
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,233,267, Cl. 422-187.000.

Fierlbeck, Walter: *See—*
Pawlik, Rudolf; and Fierlbeck, Walter, 4,233,494, Cl. 219-382.000.

Fink, Herbert; Grumbach, Egon; and Pennewiss, Horst, to Rohm GmbH. Method of sizing textile yarns and sizing agents therefor. 4,233,200, Cl. 260-33.8UA.

Finlay-Maxwell, David, to John Gladstone & Company (Engineering) Limited. Distillation method for solvent recovery. 4,233,120, Cl. 203-2.000.

Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A.; and Barbin, William W., 4,233,013, Cl. 425-174.400.

Firmenich SA: *See—*
Flament, Ivon, 4,233,332, Cl. 426-537.000.

Fischbeck, Kenneth H.; Larsson, Stig-Goran; and Sultan, S. Bertil, to Xerox Corporation. Hydrodynamically damped pressure pulse droplet ejector. 4,233,610, Cl. 346-140.00R.

Fisher, John M., to B. F. Goodrich Company, The. Method of making an inflatable flotation device. 4,233,102, Cl. 156-292.000.

Fisher, William B.: *See—*
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.

Fister, Lee H., Jr., to August Incorporated. Seating unit and method of construction. 4,232,899, Cl. 297-229.000.

Fitch, Elliot B.; and Albertson, Orris E., to Dorr-Oliver Incorporated. Process of incineration with predrying of moist feed using hot inert particulates. 4,232,614, Cl. 110-235.000.

Flagg, Rodger H.: *See—*
Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L., 4,233,132, Cl. 204-169.000.

Flament, Ivon, to Firmenich SA. Use of bicyclic nitrogen-containing derivatives as flavoring ingredients. 4,233,332, Cl. 426-537.000.

Flanders Filters, Inc.: *See—*
Allan, Thomas T., 4,233,044, Cl. 55-355.000.

Flatt, James H., to General Motors Corporation. Dump control for turbine engine gate valve actuator. 4,232,514, Cl. 60-39.250.

Flick, Sally J. Sewing form. 4,232,805, Cl. 223-37.000.

Fliege, Werner: *See—*
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.

Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. Novel vinyl-stannyl derivatives. 4,233,231, Cl. 260-429.700.

Floyd, Middleton B., Jr., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-allenyl prostane derivatives of the E and F series. 4,233,453, Cl. 560-121.000.

FMC Corporation: *See—*
Cross, Stephen D., 4,232,780, Cl. 198-479.000.
Hait, James M., 4,232,705, Cl. 137-899.100.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Re-tightener with pyrotechnic propellant charge for safety-belt automatic wind-up devices. 4,232,836, Cl. 242-107.000.

Foote Mineral Company: *See—*
Koul, Maharaj K., 4,233,065, Cl. 75-134.00S.

Forbom, Arvo: *See—*
Forsback, Torbjorn; and Forbom, Arvo, 4,232,410, Cl. 4-415.000.

Ford Motor Company: *See—*
Bourgeous, Clarence G.; and Miller, Oliver G., 4,232,883, Cl. 280-759.000.
Chattha, Mohinder S., 4,233,415, Cl. 525-161.000.
Dickerson, Carroll D.; and Stevens, Robert W., 4,232,880, Cl. 280-661.000.
Gandhi, Haren S.; and Shelef, Mordecai, 4,233,188, Cl. 252-470.000.
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,232,441, Cl. 29-612.000.
Taylor, Stephen C., 4,233,685, Cl. 455-151.000.

Forgeot, Marcel: *See—*
Simon-Lavoine, Nicole; and Forgeot, Marcel, 4,233,291, Cl. 424-177.000.

Formby, John A., to John Formby & Company Limited. Conveyor control apparatus. 4,233,499, Cl. 235-92.0MP.

Forsback, Torbjorn; and Forbom, Arvo, to Oy Wartsila Ab. Water closet. 4,232,410, Cl. 4-415.000.

Fotis, Peter: *See—*
Hoff, Glen R.; and Fotis, Peter, 4,233,182, Cl. 252-429.00C.
Hoff, Glen R.; and Fotis, Peter, 4,233,253, Cl. 260-987.000.

Fowler, James E.: *See—*
Spaziani, Frederick F.; and Fowler, James E., 4,233,136, Cl. 204-195.00L.

Framatome: *See—*
Brunaud, Daniel, 4,232,442, Cl. 29-727.000.

Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, to Roussel Uclaf. Prodess of preparation of alkyl esters of dl cis chrysanthemic acid. 4,233,129, Cl. 204-158.00R.

Frank, Bruce A., to Baffle Stove Company Inc. Baffled stove. 4,232,650, Cl. 126-77.000.

Franklin, Barbara J., to Texaco Inc. Aqueous polysaccharide-containing fluid having superior filterability and stability and their use in recovering oil. 4,232,739, Cl. 166-275.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,232,610, Cl. 104-3.000.

Freitag, Dieter: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.

Frentrup, Adolf: *See—*
Kempf, Alfons, 4,232,613, Cl. 109-40.000.

Fresco, Albert Z.: *See—*
Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., 4,233,363, Cl. 428-373.000.

Friedberg, Martin F. Sliding fastener. 4,232,429, Cl. 24-205.11R.

Friedberg, Martin F. Device for connecting the ends of a separable zipper. 4,232,430, Cl. 24-205.11R.

Friedel, Horst, to Du Pont de Nemours, E. I., and Company. Light-sensitive material for tanning development comprising pretreated carbon. 4,233,392, Cl. 430-264.000.

Friedman, Jules D.; and Saraf, Lumdas H., to International Business Machines Corporation. Method for forming semiconductor contacts. 4,233,337, Cl. 427-84.000.

Frimmel, Horst: *See—*
Hagner, Willi; and Frimmel, Horst, 4,233,650, Cl. 362-32.000.

Frissora, Joseph R.; and Platt, Michael H., to Owens-Illinois, Inc. Solar energy collection. 4,232,655, Cl. 126-420.000.

Fritz, Douglas P.; and Elias, Ronald J., to Topps Chewing Gum, Incorporated. Low density chewing gum product and method of making the same. 4,233,319, Cl. 426-5.000.

Fritze, Hartwig, to Escher Wyss Limited. Manufacturing of instant products from legumes. 4,233,322, Cl. 426-46.000.

Frommer, Moshe A.: *See—*
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,233,434, Cl. 528-337.000.

Frost, Edward G. Comprehensive automatic mobile radio telephone system. 4,233,473, Cl. 179-2.0EB.

Fruehauf Corporation: *See—*
Ringe, Stephen J., 4,232,891, Cl. 292-218.000.

Fuchigami, Mitsuru, to Mitsubishi Paper Mills, Ltd. Micro-capsules and method for their production. 4,233,178, Cl. 252-316.000.

Fuchs, Alfred: *See—*
Ernstsson, Ernst G.; and Fuchs, Alfred, 4,233,271, Cl. 422-300.000.

Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Insecticidal and acaricidal O-alkyl-O-[1-(2-cyanoalkyl)-5-halo-1,2,4-triazol(3)yl]-(thiono)(thiol)-phosphoric(-phosphonic) acid esters and ester-amides. 4,233,293, Cl. 424-200.000.

Fuel Injection Development Corporation: *See—*
Leshner, Ervin; and Leshner, Michael D., 4,232,643, Cl. 123-440.000.

Fuji Photo Film Co., Ltd.: *See—*
Harada, Tooru; and Fujita, Shinsaku, 4,233,237, Cl. 260-509.000.
Shiba, Keisuke; and Kita, Nobuyuki, 4,233,393, Cl. 430-265.000.
Tada, Sugihiko; and Inukai, Yuzo, 4,233,397, Cl. 430-449.000.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo; and Fujino, Shinichiro, 4,232,955, Cl. 354-51.000.

Fujihira, Yuji: *See—*
Abe, Masayuki; and Fujihira, Yuji, 4,233,582, Cl. 335-213.000.

Fujimoto, Osamu: *See—*
Ohura, Osami; and Fujimoto, Osamu, 4,233,238, Cl. 260-513.700.

Fujinaga, Shigeki: *See—*
Maruyama, Shigeo; Nishikaichi, Yuji; Fujinaga, Shigeki; and Miura, Tatsuya, 4,233,491, Cl. 219-125.100.

Fujino, Shinichiro: *See—*
Numata, Saburo; and Fujino, Shinichiro, 4,232,955, Cl. 354-51.000.

Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, to Toshiba Kikai Kabushiki Kaisha; and Dai Nippon Insatsu Kabushiki Kaisha. Automatic web splicing and feeding apparatus. 4,233,104, Cl. 156-504.000.

Fujita, Shinichi: *See—*
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

Fujita, Shinsaku: *See—*
Harada, Tooru; and Fujita, Shinsaku, 4,233,237, Cl. 260-509.000.

Fujita, Tadashi; Oya, Masayuki; Watanabe, Toshio; and Chiba, Takehisa, to Santen Pharmaceutical Co., Ltd. Antiarteriosclerotic N-(mercaptoacyl)-histidines. 4,233,310, Cl. 424-273.00R.

Fujitsu Limited: *See—*
Kawabe, Yunosuke, 4,233,091, Cl. 148-175.000.
Takahashi, Yukio; and Toyoda, Kazuhiro, 4,233,525, Cl. 307-234.000.

Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material containing tetrazolium compounds. 4,233,400, Cl. 430-523.000.

Fukahori, Hidehiko; Iwashita, Tomonori; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Means for advancing film in cameras held in various film frame orientations. 4,232,958, Cl. 354-212.000.

Fukuhara, Akinobu: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Fultz, Duane A., to Dow Chemical Company, The. Panel and method for the preparation thereof. 4,233,361, Cl. 428-313.000.

Fun-Tech Products Company: *See—*
Orlowski, Gerald J.; and Dugle, Thomas E., 4,232,630, Cl. 119-29.000.

Funada, Fumiaki; and Shimizu, Keiichiro, to Sharp Kabushiki Kaisha. Field effect mode liquid crystal display. 4,232,947, Cl. 350-341.000.

Furukawa, Kazuo; and Furukawa, Sumio, to Nippon Telegraph and Telephone Public Corporation; and Hitachi, Ltd. Redundant bubble memory control system. 4,233,669, Cl. 365-15.000.

Furukawa, Sumio: *See—*
Furukawa, Kazuo; and Furukawa, Sumio, 4,233,669, Cl. 365-15.000.

Furuya, Katusuke: *See—*
Watanabe, Kenkichi; and Furuya, Katusuke, 4,232,690, Cl. 133-8.00R.

Fussner, Paul, to Robert Bosch GmbH. Fluid-sealed, electromagnetic valve operating structure, particularly for combustion engine fuel injection system. 4,233,584, Cl. 335-260.000.

Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi, 4,233,613, Cl. 357-16.000.

G & M Enterprises, Inc.: *See—*
Glenn, Ronnie D.; and Myers, Claude V., 4,232,627, Cl. 440-61.000.

Gaertner, Robert F., to United States of America, Navy. Regulated dual DC power supply. 4,233,558, Cl. 323-17.000.

GAF Corporation: *See—*
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,233,353, Cl. 428-141.000.
Chakrabarti, Paritosh M., 4,233,229, Cl. 260-401.000.
Gruber, Bruce A.; and Lorenz, Donald H., 4,233,441, Cl. 542-419.000.
Gruber, Bruce A.; and Lorenz, Donald H., 4,233,442, Cl. 542-419.000.

Galafassi, Pierre: *See—*
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.

Gali Mallofre, Salvador. System for starting internal combustion engines. 4,232,521, Cl. 60-612.000.

Galimov, Apas G.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Galinke, Joachim, deceased: *See—*
Eschwey, Helmut; Galinke, Joachim, deceased; and Wiemers, Norbert, 4,233,194, Cl. 260-22.00A.

Gallivan, Robert M.; and Mattschei, Peter K., to American Can Company. Fractation of oil obtained by pyrolysis of lignocellulosic materials to recover a phenolic fraction for use in making phenol-formaldehyde resins. 4,233,465, Cl. 568-727.000.

Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., to Exxon Research & Engineering Co. Liquid pipeline extended vane elbow. 4,232,710, Cl. 138-39.000.

Gambardella, Antonio; and Panigada, Marco, to SGS-ATES Componenti Elettronici S.p.A. Passivating bath for semiconductive bodies. 4,233,133, Cl. 204-181.00N.

Gambles, Norman E.: *See—*
Dodwell, Geoffrey M.; and Gambles, Norman E., 4,233,074, Cl. 430-535.000.

Gamell, Joseph A., to Joseph Gamell Industries, Inc. Rotary motor. 4,232,991, Cl. 415-90.000.

Gandhi, Haren S.; and Shelef, Mordecai, to Ford Motor Company. Catalyst for treating exhaust gas from an internal combustion engine. 4,233,188, Cl. 252-470.000.

Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., to Ford Motor Company. Catalyst of rhodium on zirconia. 4,233,189, Cl. 252-472.000.

Garcia, Robert I., to Innovative Chemicals, Inc. Ozone produced by chemonuclear generation. 4,233,126, Cl. 204-157.10H.

Gardiner, Richard G.: *See—*
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.

Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,313, Cl. 424-274.000.

Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,314, Cl. 424-317.000.

Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,315, Cl. 424-317.000.

Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,316, Cl. 424-317.000.

Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,317, Cl. 424-317.000.

Garrett Corporation, The: *See—*
Roberge, Frank L., 4,232,695, Cl. 137-1.000.

Garrod, Norman J. Improvements in and relating to the manufacture of record sleeves. 4,232,593, Cl. 493-224.000.

Garron, Stephen A., to Singer Company, The. One-step buttonholer with hall effect sensor. 4,232,617, Cl. 112-158.00B.

Gary, Fred J. Heat recovery device for use in return air duct of forced air furnace for recovering heat from the flue of such furnace. 4,232,654, Cl. 126-400.000.

Gaschler, Erich, to Volkswagenwerk Aktiengesellschaft. Seal for an eccentric-rotor machine. 4,233,004, Cl. 418-144.000.

Gasper, Kenneth E., to Olin Corporation. Liquid polymer hydration. 4,233,265, Cl. 422-135.000.

Gastaldi, Francesco Saverio Maria. Spray dryer. 4,233,114, Cl. 159-4.00D.

Gat, Arnon: *See—*
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., 4,233,671, Cl. 365-105.000.

Gathers, Glen E.: *See—*
Brissey, George E.; and Gathers, Glen E., 4,232,772, Cl. 192-114.00R.

Gau, Wolfgang: *See—*
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.

Gazuit, Georges, to Goodyear Tire & Rubber Company, The. Isostable tubular tire. 4,232,723, Cl. 152-350.000.

Gea Luftkuehlergesellschaft Happel GmbH & Co.: *See—*
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.

Gebruder Lodige Maschinenbau GmbH: *See—*
Lucke, Roland; and Lipp, Eberhard, 4,233,676, Cl. 366-147.000.

Geil, Ronald J., to Gould Inc. Priming apparatus for liquid ink writing instruments. 4,232,702, Cl. 137-115.000.

Geissler, Udo M., to Patent-Treuhand-Gesellschaft. Adjustable direct and bounce photoflash unit. 4,233,648, Cl. 362-17.000.

Gelfand, Mikhail L.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Gema AG: *See—*
De Fusco, Joseph, 4,232,832, Cl. 239-707.000.

General Battery Corporation: *See—*
Heiser, Joseph I.; and Erb, Edgar M., 4,233,370, Cl. 429-82.000.

General Corporation, The: *See—*
Sugihara, Yasumasa, 4,233,627, Cl. 358-143.000.

General Dynamics Corporation Pomona Division: *See—*
Lair, Clair K., 4,232,605, Cl. 102-8.000.

General Electric Company: *See—*
Arendt, Ronald H., 4,233,282, Cl. 423-598.000.
Barone, Michael R., 4,233,535, Cl. 310-256.000.
Bigelow, John E., 4,233,593, Cl. 340-365.00C.
Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., 4,233,435, Cl. 528-350.000.
Brissey, George E.; and Gathers, Glen E., 4,232,772, Cl. 192-114.00R.
Castleberry, Donald E., 4,233,603, Cl. 340-783.000.
Chernoch, Joseph P., 4,233,567, Cl. 331-94.50P.
Endo, Isao, 4,233,428, Cl. 525-507.000.
Ferro, Armand P., 4,233,541, Cl. 315-70.000.
Grummer, William L.; and Hendriks, Hendrik B., 4,233,522, Cl. 307-116.000.
Hickok, Robert L., 4,233,543, Cl. 315-75.000.
Johnson, Peter D.; and Jones, Charles E., 4,233,023, Cl. 431-362.000.
Kingsley, Jack D., 4,233,514, Cl. 250-370.000.
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,639, Cl. 361-44.000.
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,640, Cl. 361-44.000.
Liu, Yung S., 4,233,569, Cl. 331-94.50C.
Lown, Harold, 4,233,533, Cl. 310-59.000.
Payne, Thomas R.; and Baker, Alfred L., 4,233,498, Cl. 219-490.000.
Pierce, Linden W., 4,232,551, Cl. 73-350.000.
Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., 4,232,995, Cl. 415-172.00A.
Volz, Donald J., 4,233,507, Cl. 250-252.000.

General Foods Limited: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

General Motors Corporation: *See—*
Bierlein, John C.; and Shipek, Edward J., 4,233,071, Cl. 75-231.000.
Detloff, John C., Jr., 4,232,538, Cl. 70-239.000.
Flatt, James H., 4,232,514, Cl. 60-39.250.
Hammer, Ganz G., Jr., 4,233,123, Cl. 204-129.650.
Kimberlin, Dan R., 4,232,571, Cl. 74-878.000.
Reider, Samuel B., 4,232,527, Cl. 60-754.000.
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., 4,232,585, Cl. 91-432.000.

General Solar Energy Corporation: *See—*
Kaplow, Roy; and Lewis, Marvin C., 4,232,731, Cl. 165-48.00S

Genesi, Robert C., to Sprague Electric Company. Integrated circuit with power transistor. 4,233,618, Cl. 357-35.000

Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, to Sanyo Chemical Industries, Limited. Water-glycol hydraulic fluid containing polyoxyalkylene ethers. 4,233,170, Cl. 252-73.000.

Geoffroy, L. E.: *See—*
Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L., 4,233,132, Cl. 204-169.000.

Gerigk, Gunter: *See—*
Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, 4,233,341, Cl. 427-230.000.

Gerritsen, Jan, to U.S. Philips Corporation. Color television display device comprising a deflection coil unit provided with a deflection coil for the vertical deflection and deflection coil unit for such a display device. 4,233,547, Cl. 315-368.000.

Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., to Stanford University. Read only memory and integrated circuit and method of programming by laser means. 4,233,671, Cl. 365-105.000.

Gessford, James D. Solar collector panel. 4,232,658, Cl. 126-441.000.

Gestetner Limited: *See—*
Selman, Thomas G., 4,232,602, Cl. 101-132.000.

Gharadjedaghi, Fereydoun; and Le Fur, Bernard, to Ebauches S.A. Liquid crystal alignment layers. 4,232,946, Cl. 350-320.000.

Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., to Indian Explosives Limited. Method for producing improved gelatine explosive compositions. 4,233,095, Cl. 149-95.000.

Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, to Solvay & Cie. Membrane cell with an electrode for the production of a gas. 4,233,147, Cl. 204-266.000.

Gianopulos, William: *See*—
Devine, William T.; and Gianopulos, William, 4,233,667, Cl. 364-900.000.

Gibbons, James F.: *See*—
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., 4,233,671, Cl. 365-105.000.

Gibson, Peter J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Variable ratio transmission systems. 4,232,570, Cl. 74-866.000.

Gidge, Kenneth, to BSL Corporation. Pass-through weather curtain for garages and the like. 4,232,725, Cl. 160-332.000.

Giessler, Klaus: *See*—
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.

Gigandet, Richard W.: *See*—
Scoville, John R.; and Gigandet, Richard W., 4,233,495, Cl. 219-386.000.

Gilchrist, George E.: *See*—
Beeghly, Lester R.; and Gilchrist, George E., 4,232,406, Cl. 4-213.000.

Gilkeson, Robert F.; and Blose, John B. Supplemental energy register. 4,233,590, Cl. 340-870.040.

Gillette Company, The: *See*—
Lucas, Michael P., 4,232,785, Cl. 206-228.000.

Gingerich, David L., to Champion International Corporation. Envelope forming machine and method. 4,232,592, Cl. 493-10.000.

Gintert, Dean W., to PPG Industries, Inc. Removing fragments of fractured glass sheets during tempering. 4,233,048, Cl. 65-27.000.

Giordano, Giavelli. Machine and service truck assembly for loading, unloading and storing ceramic tiles. 4,232,987, Cl. 414-331.000.

Girling Limited: *See*—
Brearley, Malcolm, 4,233,599, Cl. 340-679.000.
Farr, Glyn P. R., 4,232,909, Cl. 303-22.00R.
Harries, David A., 4,232,520, Cl. 60-550.000.

Glab, Edwin F., to Xerox Corporation. Scanning system. 4,232,960, Cl. 355-8.000.

Glaxo Group Limited: *See*—
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.

Glenn, Ronnie D.; and Myers, Claude V., to G & M Enterprises, Inc. Bracket for elevating and lowering an outboard motor. 4,232,627, Cl. 440-61.000.

Go, Santos W.: *See*—
Brady, Thomas E.; and Go, Santos W., 4,233,022, Cl. 425-525.000.

Goffredo, Daniel L., to Chemcut Corporation. Method for ion control of solutions. 4,233,106, Cl. 156-627.000.

Goldshtein, Boris G.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Goliasch, Karl: *See*—
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, 4,233,233, Cl. 260-465.00E.

Goller, Glen J.; and Breault, Richard D., to United Technologies Corporation. Automated catalyst processing for cloud electrode fabrication for fuel cells. 4,233,181, Cl. 252-425.300.

Goodyear Tire & Rubber Company, The: *See*—
Gazuit, Georges, 4,232,723, Cl. 152-350.000.
Kuhar, George A., 4,233,416, Cl. 525-234.000.

Gordon, Gerald A.: *See*—
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,232,622, Cl. 113-121.00C.

Goren, Yoram; and Springett, Charles, to Sante Fe International Corporation. Column stabilized semisubmerged drilling vessel. 4,232,625, Cl. 114-264.000

Gorondy, Emery J.: *See*—
Edwards, Donald W.; and Gorondy, Emery J., 4,233,382, Cl. 430-39.000.

Goteborgs Maskinkonsult AB: *See*—
Bergsand, Karl A., 4,233,084, Cl. 134-67.000.

Goto, Kenji: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Goto, Kiyoshi: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Gould Inc.: *See*—
DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., 4,233.482, Cl. 200-163.000.
Geil, Ronald J., 4,232,702, Cl. 137-115.000.

Goyat, Eugene, to Goyat, Raymond, a part interest. Production of industrial electrical energy from hydraulic energy. 4,232,524, Cl. 60-647.000.

Goyat, Raymond: *See*—
Goyat, Eugene, 4,232,524, Cl. 60-647.000.

Grabowski, Edward J. J.: *See*—
Czaja, Robert F.; and Grabowski, Edward J. J., 4,233,457, Cl. 562-428.000.

Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A. Instrument for measuring sizes and quantity of particles in fluid medium. 4,232,967, Cl. 356-336.000.

Grakauskas, Vytautos, to United States of America, Air Force. Method for the preparation of alkali metal salts of dinitromethane. 4,233,249, Cl. 568-926.000.

Grakauskas, Vytautos, to United States of America, Air Force. Process for synthesizing the alkali metal salts of dinetromethane. 4,233,250, Cl. 568-926.000.

Grand, Michel: *See*—
Duprez, Daniel; and Grand, Michel, 4,233,186, Cl. 252-466.00B.

Grandchamp, Pierre-Andre, to Hoffmann-La Roche Inc. Particle size meter. 4,233,664, Cl. 364-555.000.

Grant, Louis A.: *See*—
Meyers, Leo J.; and Grant, Louis A., 4,233,119, Cl. 202-241.000.

Grant, Sidney. Processing of sheet material in a liquid bath. 4,232,691, Cl. 134-104.000.

Graphic Controls Corporation: *See*—
Hubbard, James R., 4,233,609, Cl. 346-140.00A.

Grass Valley Group, The: *See*—
Dayton, Birney D., 4,233,629, Cl. 358-153.000.

Grassi, Bruno: *See*—
Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, 4,233,147, Cl. 204-266.000.

Gray, Charles R.; Hazen, John O.; and Kelly, Charles J., to H. H. Robertson Company. Fire-resistant electrical wiring distributing floor structure and method. 4,232,493, Cl. 52-221.000.

Gray, Roy M. Instrument protecting and carrying structure. 4,232,808, Cl. 224-205.000.

Great Lakes Carbon Corporation: *See*—
Joo', Louis A.; and Miller, Frederick C., 4,233,378, Cl. 429-220.000.
Ramsey, David E.; and Grindstaff, Lloyd I., 4,233,148, Cl. 204-291.000.

Greber, Gerd: *See*—
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,233,220, Cl. 260-326.260.

Green, Robert J.; and Hales, Gerald A., to Molins Limited. Emergency stop circuit monitoring system. 4,233,598, Cl. 340-652.000.

Greenbat, Limited: *See*—
Clokie, Andrew K., 4,232,714, Cl. 139-371.000.

Grenoble, Dane C.: *See*—
Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., 4,233,139, Cl. 208-112.000.

Grianti, Francesco: *See*—
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, 4,232,666, Cl. 128-203.250.

Griffin, Warren R., to United States of America, Air Force. Channel sealant compositions. 4,233,426, Cl. 525-477.000.

Grill, Benjamin: *See*—
Sturman, Oded E.; and Grill, Benjamin, 4,232,707, Cl. 137-624.200.

Grimmer, Johannes: *See*—
Kilpper, Gerhard; and Grimmer, Johannes, 4,233,459, Cl. 562-458.000.

Grimmer, John E.; and Donahue, Robert L., to Grimmer Schmidt Corp. Method and apparatus for controlling compressors. 4,232,997, Cl. 417-4.000.

Grimmer Schmidt Corp.: *See*—
Grimmer, John E.; and Donahue, Robert L., 4,232,997, Cl. 417-4.000.

Grindstaff, Lloyd I.: *See*—
Ramsey, David E.; and Grindstaff, Lloyd I., 4,233,148, Cl. 204-291.000.

Groeneweg, Willem H., to RCA Corporation. SECAM-PAL Converter. 4,233,622, Cl. 358-11.000.

Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., to Johns-Manville Corporation. Separator for starved electrolyte lead/acid battery. 4,233,379, Cl. 429-247.000.

Gruaz, Daniel: *See*—
Sicre, Jean-Luc; and Gruaz, Daniel, 4,232,839, Cl. 244-188.000.

Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Copolymerizable, ultraviolet light absorber 4-acryloxybenzal-3-alkyl-2 N-benzothiazoloazines. 4,233,441, Cl. 542-419.000.

Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Copolymerizable, ultraviolet light absorber 4-allyloxybenzal-3'-alkyl-2'-benzothiazoloazines. 4,233,442, Cl. 542-419.000.

Gruber, Roland F. Nozzle arrangement for encapsulating machines. 4,232,829, Cl. 239-433.000.

Grudkowski, Thomas W., to United Technologies Corporation. Carrier concentration controlled surface acoustic wave variable delay devices. 4,233,573, Cl. 331-107.00A.

Grudzinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,233,231, Cl. 260-429.700.

Grumbach, Egon: *See*—
Fink, Herbert; Grumbach, Egon; and Pennewiss, Horst, 4,233,200, Cl. 260-33.8UA.

Grumman Aerospace Corporation: *See*—
Aleck, Benjamin J., 4,232,554, Cl. 73-577.000.
Cohen, Murray, 4,232,978, Cl. 403-317.000.

Grummer, William L.; and Hendriks, Hendrik B., to General Electric Company. Capacitive touch switch array. 4,233,522, Cl. 307-116.000.

Grunder, Werner; and Murbach, Erwin, to Zellweger Uster Limited. Method and an apparatus for continuously monitoring the cross-section of slivers. 4,232,447, Cl. 33-147.00L.

Grundfos A/S: *See*—
Jensen, Axel; and Molgaard, Niels, 4,233,551, Cl. 318-809.000.

GTE Products Corporation: *See*—
Beaucamp, Claude, 4,233,581, Cl. 335-212.000.
Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., 4,233,063, Cl. 75-0.5AA.
Waymouth, John F.; Passmore, Edmund M.; and Duggan, George L., 4,233,536, Cl. 313-174.000.

Gundlach, John A., to Everett Metal Products. Shaker mechanism for a stack of sieve trays. 4,233,151, Cl. 209-319.000.

Gunti, Rolf, to Masyc A.G. Set of components for producing variable load-bearing scaffolds. 4,232,774, Cl. 193-35.00J.

Gureghian, Richard S.: *See*—
Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., 4,232,563, Cl. 74-470.000.

Gute, Manfred: *See*—
Blasing, Horst; and Gute, Manfred, 4,233,145, Cl. 204-202.000.

Gutman, Rodika: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,233,434, Cl. 528-337.000.

H. H. Robertson Company: *See*—
Gray, Charles R.; Hazen, John O.; and Kelly, Charles J., 4,232,493, Cl. 52-221.000.

Haddon, Merrill K.; and Moulton, Clifford H. Automatic impedance matching conduit locator. 4,233,561, Cl. 324-326.000.

Haering, Rudolph R.; and Stiles, James A. R. Electrical storage device. 4,233,377, Cl. 429-218.000.

Hagen, Reinold, to Kautex-Maschinenbau, GmbH. Apparatus for separation of waste material from a moulded article. 4,233,009, Cl. 425-142.000.

Hagner, Willi; and Frimmel, Horst, to Ernst Leitz Wetzlar GmbH. Brightness control for fiber optical lamps. 4,233,650, Cl. 362-32.000.

Hahn, Joachim, to VDO Adolf Schindling AG. Console for holding nautical indicators. 4,232,915, Cl. 312-107.000.

Hahn, Volker; and Fastenau, Werner, to Ed. Zublin Aktiengesellschaft. Method of and arrangement for correcting the height of railway upper structures. 4,232,822, Cl. 238-7.000.

Hait, James M., to FMC Corporation. Automatic rotary irrigation system. 4,232,705, Cl. 137-899.100.

Hales, Gerald A.: *See*—
Green, Robert J.; and Hales, Gerald A., 4,233,598, Cl. 340-652.000.

Hall, Floyd V., to Liggett Group Inc. Apparatus and method for providing a cigarette filter with an aeration groove. 4,232,574, Cl. 82-84.000.

Hall, Richard H.: *See*—
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,233,467, Cl. 585-437.000.

Hallam, Keith J.; and Marsden, Dennis B., to Pullman Incorporated. Car coupling arrangement for railway passenger cars. 4,232,793, Cl. 213-43.000.

Haller, Ingo: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.

Halliburton Company: *See*—
Carney, Leroy L., 4,233,162, Cl. 252-8.50C.
Cox, Bruce M., 4,233,000, Cl. 417-402.000.

Hamann, Arnold: *See*—
Scheer, Peter; and Hamann, Arnold, 4,233,649, Cl. 362-32.000.

Hamerdinger, Randolph W.; and McQuillan, Robert C., to Xerox Corporation. Laser tube mirror assembly. 4,233,568, Cl. 331-94.50D.

Hamm, Norbert: *See*—
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, 4,233,213, Cl. 260-141.000.

Hammann, Ingeborg: *See*—
Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,293, Cl. 424-200.000.
Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,294, Cl. 424-200.000.

Hammel, Harold T.; and Maggert, James E., to University of California, The Regents of the. Continuous method and apparatus for separating solvent from solute. 4,233,153, Cl. 203-10.000.

Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., to Kroger Company, The. Automatic vending machine for delivering containers having edible product therein. 4,232,798, Cl. 221-12.000.

Hammer, Ganz G., Jr., to General Motors Corporation. Method for making an air cooled combustor. 4,233,123, Cl. 204-129.650.

Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, to Hoechst Aktiengesellschaft. Process for preparing packaging material suitable for sausage casings and articles manufactured therefrom. 4,233,341, Cl. 427-230.000.

Hammitt, Frederick G.: *See*—
Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., 4,232,710, Cl. 138-39.000.

Hampel, Wilbur J.: *See*—
Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., 4,233,553, Cl. 320-23.000.

Hamworthy Engineering Limited: *See*—
Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., 4,233,155, Cl. 210-92.000.

Hanaya, Morimasa, to Toyo Pulp Co., Limited. Round log material and method of producing the same. 4,232,720, Cl. 144-309.0AC.

Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., to International Computers Limited. Display system. 4,233,601, Cl. 340-703.000.

Hanley, William F. Portable stage. 4,232,488, Cl. 52-7.000.

Hanmura, Hisao, to Hitachi, Ltd. Multi-matrix display system having matrix display panel with uncrossed connections on substrates. 4,233,602, Cl. 340-752.000.

Hans Grohe GmbH & Co. KG: *See*—
Stahl, Eugen H., 4,233,097, Cl. 156-143.000.

Hansen, Kenneth A.: *See*—
Chapman, Ronald H.; and Hansen, Kenneth A., 4,233,575, Cl. 331-111.000.

Hara, Hiroshi: *See*—
Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, 4,233,474, Cl. 179-81.00B.

Harada, Makoto: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

Harada, Masahide; and Mochizuki, Manabu, to Ricoh Company, Ltd. Scorotron charging apparatus. 4,233,511, Cl. 250-325.000.

Harada, Tooru; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. 2-Alkoxyalkoxy-5-aminobenzenesulfonic acid. 4,233,237, Cl. 260-509.000.

Haraka, Wayne: *See*—
Kolk, Glenn R.; and Haraka, Wayne, 4,232,471, Cl. 43-44.990.

Harbaugh, Steven K.; and Hoogerbrugge, Gary H., to Eocom Corporation. Optical read-write system with electronically variable image size. 4,233,636, Cl. 358-287.000.

Harder, Hans E.: *See*—
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,232,670, Cl. 128-224.000.

Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., to Martin Marietta Corporation. Weapons system simulator and method including ranging system. 4,232,456, Cl. 35-25.000.

Harper, Leslie R.: *See*—
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.

Harries, David A., to Girling Limited. Actuator assemblies for vehicle hydraulic braking systems. 4,232,520, Cl. 60-550.000.

Harrington, Elaine M.; and Menning, Paul C. Adjustable ottoman. 4,232,901, Cl. 297-439.000.

Harris Corporation: *See*—
McRae, Daniel D., 4,233,683, Cl. 375-14.000.
Pelchat, Guy M., 4,233,576, Cl. 333-16.000.

Harris, Jeffrey J.; and Wood, Colin E. C., to U.S. Philips Corporation. Utilizing lead compounds of sulphur, selenium and tellurium as dopant sources. 4,233,092, Cl. 148-175.000.

Harris, Robert F.: *See*—
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,233,425, Cl. 525-455.000.

Harrison, Donald G. Firearm with recoil movement delaying mechanism. 4,232,583, Cl. 89-153.000.

Harrold, Milton C.: *See*—
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Hart, Donald R.: *See*—
Northup, Francis B.; and Hart, Donald R., 4,232,507, Cl. 57-16.000.

Hartig, Juergen: *See*—
Weitz, Hans-Martin; Hartig, Juergen; and Marosi, Laszlo, 4,233,455, Cl. 560-244.000.

Hartl, Johann, to Voest-Alpine Aktiengesellschaft. Tap-hole closing arrangement. 4,232,855, Cl. 266-272.000.

Hartmann, Werner, to Harwe AG. Process for producing molded articles from polylauryllactam activated anionic polymerization. 4,233,433, Cl. 528-326.000.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See*—
Riecker, Johann G.; and Schroter, Horst, 4,233,118, Cl. 202-230.000.

Haruna, Tohru: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.

Harwe AG: *See*—
Hartmann, Werner, 4,233,433, Cl. 528-326.000.

Hascoe, Norman, to Semi-Alloys, Inc. Method and apparatus for fabricating a sealing cover unit for a container for a semiconductor device. 4,232,814, Cl. 228-173.00E.

Hasegawa, Kinji; Mitsuishi, Yukio; and Masuda, Shigeyoshi, to Teijin Limited. Printed polyester films. 4,233,354, Cl. 428-195.000.

Hasegawa, Yuji: *See*—
Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, 4,233,386, Cl. 430-125.000.

Hashimoto, Akihiko; and Koiwai, Tamotsu, to Olympus Optical Co., Ltd. Data recordable camera. 4,232,956, Cl. 354-106.000.

Hashimoto, Noritsugu, to Hitachi Maxell, Ltd. Magnetic recording tape cassette. 4,232,841, Cl. 242-199.000.

Hashimoto, Takashi: *See*—
Takeda, Makoto; Iwane, Hiroshi; and Hashimoto, Takashi, 4,233,226, Cl. 260-345.200.

Hatje, Erich; and Reinert, Norbert, to Buehler-Miag GmbH. Trickler heat-exchange apparatus. 4,232,734, Cl. 165-118.000.

Hattori, Tadashi: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Hauk, Ernest D.; and Kirkpatrick, Jesse C., to Service Equipment Design Co., Inc. Method and apparatus for driving pipe. 4,232,752, Cl. 175-135.000.

Hausberger, Arthur L.; and Dienes, Edward K., to United Catalysts Inc. Process for the conversion of carbon monoxide. 4,233,180, Cl. 252-373.000.

Hauser, Hans; and Clayborne, William J., to J. B. Foote Foundry Co., The. Transaxle. 4,232,569, Cl. 74-701.000.

Havstad, Harold R.: *See—*
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Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., to Hamworthy Engineering Limited. Apparatuses for the anaerobic digestion of natural organic waste. 4,233,155, Cl. 210-92.000.

Hawrylo, Frank Z.; and Kressel, Henry, to RCA Corporation. Method of making a laser diode. 4,233,090, Cl. 148-171.000.

Hayashi, Hideo: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Hayashi, Hiroshi: *See—*
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

Hazel, John G., to PPG Industries, Inc. Preparing extrudable refractory hard metal-wax blends. 4,233,077, Cl. 106-43.000.

Hazeltine Corporation: *See—*
Kerbel, Sheldon J., 4,233,564, Cl. 328-145.000.

Hazen, John O.: *See—*
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Hazerdonk, Teunis J.: *See—*
Bouwhuis, Gijsbertus; and Hazerdonk, Teunis J., 4,233,502, Cl. 250-204.000.

Heath, Ronald A.: *See—*
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Heatherbourne Plastics Limited: *See—*
Meyler-Warlow, Ian; and Law, Graham H., 4,233,373, Cl. 429-181.000.

Heckles, John S., to Armstrong Cork Company. Ureadiacetoacetamido compounds. 4,233,239, Cl. 564-57.000.

Heenan, Sidney A.: *See—*
Johnson, Glenn W., Jr.; and Heenan, Sidney A., 4,232,979, Cl. 404-16.000.

Heiser, Joseph I.; and Erb, Edgar M., to General Battery Corporation. Snap-through anti-ignition vent cap for lead acid storage batteries. 4,233,370, Cl. 429-82.000.

Helbert, John N., to United States of America, Army. Method of patterning a substrate. 4,233,394, Cl. 430-270.000.

Held, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Proximity fuse. 4,232,609, Cl. 102-214.000.

Hendriks, Hendrik B.: *See—*
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Henkel Kommanditgesellschaft auf Aktien (Henkel KGAA): *See—*
Eschwey, Helmut; Galinke, Joachim, deceased; and Wiemers, Norbert, 4,233,194, Cl. 260-22.00A.

Hentschel, Bernhard: *See—*
Kalka, Josef; Hentschel, Bernhard; and Ziebarth, Jurgen, 4,233,437, Cl. 528-500.000.

Herczog, Andrew, to Corning Glass Works. Surgical cutting instrument. 4,232,676, Cl. 128-303.140.

Hernandez, Rafael J.: *See—*
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,232,622, Cl. 113-121.00C.

Herrington, Richard A.: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,232,809, Cl. 225-93.500.

Hesselgren, Sven-Gunnar. Stand for instruments for medical use. 4,232,784, Cl. 206-210.000.

Heusser, Dietrich; and Dingeldein, Elvira, to Merck Patent Gesellschaft mit beschrankter Haftung. Synthetic resin-base, antibiotic compositions containing amino acids. 4,233,287, Cl. 424-14.000.

Hewlett-Packard Company: *See—*
Pirkle, Sherman J., 4,233,659, Cl. 363-134.000.

Hibi, Susumu: *See—*
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.

Hickok, Robert L., to General Electric Company. Internal shunt for series connected lamps. 4,233,543, Cl. 315-75.000.

Hill, John A.; Wang, Yu-chang J.; and Wong, Thomas M., to E. R. Squibb & Sons, Inc. Corticosteroid formulations containing sebacate carrier. 4,233,295, Cl. 424-238.000.

Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., to Atlantic Richfield Company. Apparatus and method for the treatment of liquors. 4,233,152, Cl. 210-703.000.

Hilliard, Garland E.: *See—*
Lynch, Richard W.; Hilliard, Garland E.; and Dotson, Ronald L., 4,233,122, Cl. 204-98.000.

Hillside Engineering, Inc.: *See—*
Roberts, Donald E., 4,233,083, Cl. 134-25.200.

Himmelmann, Wolfgang: *See—*
Nittel, Fritz; Czernik, Karl; Sauereig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

Hinderling, Jurg: *See—*
Hinn, Werner; and Hinderling, Jurg, 4,233,624, Cl. 358-65.000.

Hinn, Werner; and Hinderling, Jurg, to RCA Corporation. Combined kinescope grid and cathode video drive system. 4,233,624, Cl. 358-65.000.

Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, to U.S. Philips Corporation. Method and apparatus for liquid electrostatic development of charge images on a tape-like record carrier. 4,233,385, Cl. 430-117.000.

Hirai, Tadaaki: *See—*
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, to Canon Kabushiki Kaisha. Image information electrostatic recording device. 4,233,612, Cl. 346-160.000.

Hirayama, Kazuhiro: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.

Hirko, Ronald J.; and Mills, Harold E., to Occidental Chemical Company. Recovery of hydrogen fluoride from metallic fluoride salts. 4,233,281, Cl. 423-484.000.

Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, to Nippon Electric Co., Ltd. Telephone transmitter amplifier. 4,233,474, Cl. 179-81.00B.

Hitachi Chemical Company, Ltd.: *See—*
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Hitachi, Ltd.: *See—*
Abe, Masayuki; and Fujihira, Yuji, 4,233,582, Cl. 335-213.000.
Akiyama, Toshiyuki, 4,233,632, Cl. 358-212.000.
Furukawa, Kazuo; and Furukawa, Sumio, 4,233,669, Cl. 365-15.000.
Hanmura, Hisao, 4,233,602, Cl. 340-752.000.
Ikeda, Tadasu; and Taki, Takamitsu, 4,232,993, Cl. 415-103.000.
Kaneko, Kenji; and Okabe, Takahiro, 4,233,574, Cl. 331-108.00D.
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,233,275, Cl. 423-230.000.
Murata, Toshinori; Matsuura, Shigeo; Miyamoto, Hiroshi; and Akutsu, Eisaku, 4,233,591, Cl. 340-347.0DA.
Sato, Seisiro, 4,233,510, Cl. 250-311.000.
Sugimoto, Shun-ichiro; and Shinoki, Hisazi, 4,233,585, Cl. 335-262.000.
Tamura, Hifumi; and Ishitani, Tohru, 4,233,509, Cl. 250-306.000.
Tsuji, Koh, 4,232,994, Cl. 415-127.000.
Tsukada, Katsuo; and Ohnuma, Sadabumi, 4,233,156, Cl. 210-101.000.
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Hitachi Maxell, Ltd.: *See—*
Hashimoto, Noritsugu, 4,232,841, Cl. 242-199.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, 4,233,183, Cl. 252-432.000.

Hitchinson, Patrick W.: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, to Hoechst Aktiengesellschaft. Reducing grinding time and compositions therefor. 4,233,026, Cl. 8-52.000.

Hobbs, Howard F., to Variable Kinetic Drives Limited. Power transmission apparatus. 4,232,567, Cl. 74-677.000.

Hoberg, Heinz; and Klein, Albert, to Bergwerksverband GmbH. Quickly performed measuring method for ascertaining the concentration of the polar components in a material otherwise mainly nonpolar. 4,233,559, Cl. 324-58.50A.

Hochhauser, Arthur M.: *See—*
Chin, Joseph T.; Hochhauser, Arthur M.; and McCarthy, John P., 4,233,016, Cl. 425-288.000.

Hochiki Corporation: *See—*
Takeuchi, Takeshi; and Terasawa, Takao, 4,232,931, Cl. 339-258.00R.
Tanigawa, Takeshi; and Yamauchi, Yukio, 4,233,594, Cl. 340-525.000.

Hochreuter, Richard; and Runyon, James R., to Sandoz Ltd. Salts of polymeric basic amides. 4,233,193, Cl. 260-18.00N.

Hock, Jules M. Ring spring for composite machinery seals and method of manufacturing same. 4,232,873, Cl. 277-206.00A.

Hoechst Aktiengesellschaft: *See—*
Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, 4,233,341, Cl. 427-230.000.
Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, 4,233,026, Cl. 8-52.000.
Klupfel, Kurt; and Sprengel, Heide, 4,233,395, Cl. 430-271.000.
Moraw, Roland; and Schadlich, Gunther, 4,233,380, Cl. 430-2.000.
Nolken, Ernst, 4,233,198, Cl. 260-29.6MP.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,233,300, Cl. 424-248.400.

Hoen, Cuyler, to Simmons Fastener Corporation. Fastener with camming handle. 4,232,890, Cl. 292-114.000.

Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, to BASF Aktiengesellschaft. Process for removing volatiles evolved from plastic melts. 4,233,429, Cl. 526-71.000.

Hof, Craig R.; and Ulin, Roy A., to Akzona Incorporated. Temperature indicating compositions of matter. 4,232,552, Cl. 73-356.000.

Hoff, Glen R.; and Fotis, Peter, to Standard Oil Company (Indiana). High activity catalyst for the polymerization of alpha-olefins. 4,233,182, Cl. 252-429.00C.

Hoff, Glen R.; and Fotis, Peter, to Standard Oil Company (Indiana). Method for the preparation of metal salts of phosphorus acid esters. 4,233,253, Cl. 260-987.000.

Hoffmann-La Roche Inc.: *See—*
Grandchamp, Pierre-Andre, 4,233,664, Cl. 364-555.000.

Hoffmann, Otto-Horst: *See—*
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.

Hoffmann, Werner: *See—*
Baumann, Manfred; and Hoffmann, Werner, 4,233,464, Cl. 568-591.000.

Hogeboom, John G., to Northern Telecom Limited. Sample-and-hold circuit with current gain. 4,233,528, Cl. 307-353.000.

Hokby, Nils: *See—*
Kimber, Erich V.; and Hokby, Nils, 4,232,850, Cl. 248-654.000.

Holick, Hubert: *See—*
Rohr, Franz-Josef; and Holick, Hubert, 4,233,142, Cl. 204-195.00S.

Holiday, Anne. Food packaging. 4,232,787, Cl. 206-443.000.

Hollick, John G., to USM Corporation. Machine for stiffening and forming sheet material. 4,232,418, Cl. 12-61.00A.

Holstein, John H., to Holstein, John H. Capper chuck. 4,232,499, Cl. 53-331.500.

Holstein, John H., to Holstein, John H. Roll-on capper chuck. 4,232,500, Cl. 53-334.000.

Holtman, Dennis C.: *See—*
Elias, Robert T.; and Holtman, Dennis C., 4,233,345, Cl. 427-325.000.

Holub, Fred F.: *See—*
Abolins, Visvaldis; Holub, Fred F.; and Shenian, Popkin R., 4,233,199, Cl. 260-30.60R.

Homan, H. Richard: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Honeycutt, John D.: *See—*
Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., 4,232,777, Cl. 198-404.000.

Honeywell Inc.: *See—*
Mueller, Dale A., 4,232,530, Cl. 62-160.000.
White, Bob B., 4,232,716, Cl. 141-98.000.

Honnen, Lewis R.: *See—*
Lewis, Robert A.; and Honnen, Lewis R., 4,233,168, Cl. 252-51.50A.

Hoogerbrugge, Gary H.: *See—*
Harbaugh, Steven K.; and Hoogerbrugge, Gary H., 4,233,636, Cl. 358-287.000.

Hooker Chemicals & Plastics Corp.: *See—*
Baumgardt, Walter G.; Ondesko, John J.; and Zysman, Bernard K., 4,233,203, Cl. 260-38.000.

Hoover, Troy E.: *See—*
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,232,887, Cl. 282-27.500.

Hopeman Brothers, Inc.: *See—*
Shiflet, Frank L., 4,233,350, Cl. 428-110.000.

Hopper, George O., Jr.: *See—*
Martin, Dennis R.; and Hopper, George O., Jr., 4,232,800, Cl. 221-109.000.

Horgan, Anthony M., to Xerox Corporation. Trigonal selenium photoconductive element. 4,233,383, Cl. 430-58.000.

Horian, James G.: *See—*
Horian, Richard C.; and Horian, James G., 4,232,871, Cl. 274-47.000.

Horian, Richard C.; and Horian, James G. Manual record cleaner. 4,232,871, Cl. 274-47.000.

Horiba, Ltd.: *See—*
Maruyama, Hiroshi; and Watanabe, Masashi, 4,233,257, Cl. 264-113.000.

Horikawa, Yukio: *See—*
Ohtomo, Koichiro; and Horikawa, Yukio, 4,233,211, Cl. 260-123.700.
Otoi, Kiyoshi; and Horikawa, Yukio, 4,233,212, Cl. 260-123.700.

Horler, Hansulrich: *See—*
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, 4,232,999, Cl. 417-64.000.

Horn, John M.: *See—*
Sample, Thomas E., Jr.; and Horn, John M., 4,233,366, Cl. 428-405.000.

Horn, Ulrich: *See—*
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.

Horton, Rex: *See—*
Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., 4,233,155, Cl. 210-92.000.

Hosoda, Tadashi: *See—*
Toda, Kazuo; Hosoda, Tadashi; and Matsuo, Yutaka, 4,233,149, Cl. 204-297.00W.

Hosoi, Hideo: *See—*
Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.

Hosoi, Takuji: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Hosterman, Craig; and Kerwin, William J., to Products of Advanced Technology, Inc. Pressure relief valve with pressure indicating means. 4,232,698, Cl. 137-68.00R.

Housman, Richard W. Low profile display. 4,232,799, Cl. 221-92.000.

Houssian, Vazgen J.: *See—*
Dowzall, Martin E.; and Houssian, Vazgen J., 4,232,452, Cl. 33-430.000.

Howard, Fred. Waterfall carpet display. 4,232,791, Cl. 211-47.000.

Howarth, Michael S., to Imperial Chemical Industries Limited. Manufacture of esters. 4,233,232, Cl. 260-465.00D.

Howell, John K., Jr., to Oxy Metal Industries Corporation. Waterborne coating for metal surfaces. 4,233,197, Cl. 260-29.40R.

Howes, David R., Executor: *See—*
Ledig, Kurt W., deceased; and Howes, David R., Executor, 4,233,445, Cl. 544-250.000.

Howmedica International, Inc. Zweigniederlassung: *See—*
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,232,670, Cl. 128-224.000.

Hruda, Robert M., to Westinghouse Electric Corp. Low voltage vacuum switch with three internal contacts including a center floating contact. 4,233,480, Cl. 200-144.00B.

Hsu, William W., to Textron Inc. Hydro-mechanical failure detection and latching apparatus. 4,232,699, Cl. 137-87.000.

Hubbard, James R., to Graphic Controls Corporation. Disposable instrument pen with integral spring member. 4,233,609, Cl. 346-140.00A.

Hubele, Adolf: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,233,308, Cl. 424-279.000.

Huchler, Otto H.: *See—*
Mueller, Herbert; and Huchler, Otto H., 4,233,228, Cl. 260-346.110.

Hudleson, Bruce D.; and Mahnke, Joachim F. Apparatus and method for transcutaneous electrotherapy nerve stimulator. 4,232 [illegible] Cl. 128-422.000.

Hudson Oxygen Therapy Sales Company: *See—*
Bartholomew, Victor L.; and Havstad, Harold R., 4,232,683, Cl. 128-725.000.

Hudson, Sharon J., Jr.; and Petersen, Karl T., to Sharon Manufacturing Company. Thermal release plug for a fabricated pressure vessel. 4,232,796, Cl. 220-89.00B.

Huffman, William A., to Minnesota Mining and Manufacturing Company. Liquid crystal compositions containing pleochroic dye. 4,232,949, Cl. 350-349.000.

Hughes Aircraft Company: *See—*
Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., 4,233,347, Cl. 427-352.000.
Wang, Victor; and Yariv, Amnon, 4,233,571, Cl. 331-94.50C.

Hughes, Gordon: *See—*
Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., 4,233,601, Cl. 340-703.000.

Huin, Roland: *See—*
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.

Hunter Engineering Company: *See—*
Lewis, William R.; and Smith, Dennis M., 4,232,804, Cl. 222-591.000.

Huntington Alloys Inc.: *See—*
Siddall, Richard J., 4,233,062, Cl. 75-0.50C.

Hurd, Robert L. Method and apparatus for deep mining using chain driven in fixed direction. 4,232,904, Cl. 299-18.000.

Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., to General Foods Limited. Apparatus for the dearomatization of coffee oil. 4,232,598, Cl. 99-483.000.

Husges, Gerd; and Karl, Rupert, to Schubert & Salzer. Knotting mechanism provided with a driving mechanism. 4,232,508, Cl. 57-22.000.

Hwang, Un-Pah; and Simons, Robert E., to International Business Machines Corporation. Dual-pull air cooling for a computer frame. 4,233,644, Cl. 361-384.000.

Hyakumura, Kazushi, to Olympus Optical Co., Ltd. Photographic camera lens system having a short total length. 4,232,945, Cl. 350-223.000.

Hydro-Quebec: *See—*
Berthiaume, Raymond, 4,233,546, Cl. 315-241.00R.

Hydronic Systems, Inc: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,232,707, Cl. 137-624.200.

Ichikawa, Hiroshi: *See—*
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

Ichikawa, Singo: *See—*
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, to Bayer Aktiengesellschaft. Polycondensates containing hydroxyquinoline end groups, their use for the preparation of polymers containing metals and metal containing polycondensates. 4,233,431, Cl. 525-462.000.

Idemitsu Kosan Company Limited: *See—*
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

IEC-Holden Ltd.: *See—*
Winsor, Robert B., 4,232,612, Cl. 105-423.000.

Iemenschot, Johannes A., to U.S. Philips Corporation. Clamping device for a rotatable information carrying record. 4,232,870, Cl. 274-39.00R.

Ihida, Kazuyoshi: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Ii, Motohiko: *See—*
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.

Ikeda, Isamu. Moving coil type cartridge. 4,233,476, Cl. 179-100.41D.

Ikeda, Satoshi; and Shibata, Kouhei, to Shinko Kiko Co., Ltd. Continuous conveyance system. 4,232,782, Cl. 198-706.000.

Ikeda, Tadasu; and Taki, Takamitsu, to Hitachi, Ltd. Low pressure casing for a steam turbine. 4,232,993, Cl. 415-103.000.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Optically compensated zoom lens. 4,232,942, Cl. 350-184.000.

Imada, Kiyoshi: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Standard photographic lens. 4,232,944, Cl. 350-222.000.

Immel, Otto; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for the preparation of 2,2-dimethylolalkanals. 4,233,247, Cl. 568-464.000.

Imperial Chemical Industries Limited: *See—*
Armstrong, Colin; and Walbridge, Derek J., 4,233,396, Cl. 430-320.000.
Blythe, Anthony R., 4,233,562, Cl. 324-455.000.
Cooke, Brian A., 4,233,087, Cl. 148-6.15Z.
Howarth, Michael S., 4,233,232, Cl. 260-465.00D.
Mallion, Keith B., 4,233,454, Cl. 560-122.000.

Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for producing plate-shaped denitrating catalyst. 4,233,183, Cl. 252-432.000.

Incom International Inc.: *See—*
Tao, Ting C., 4,233,042, Cl. 55-482.000.

Indian Explosives Limited: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,233,095, Cl. 149-95.000.

Industria Espanola de Manufacturas Especiales, S.A.: *See—*
Miro, Juan C., 4,232,769, Cl. 192-4.00R.

Ing. C. Olivetti & C., S.p.A.: *See—*
Bernardis, Francesco; and Prevignano, Paolo, 4,232,976, Cl. 400-196.100.

Ingenieursbureau Marcon (Marine Consultants) B.V.: *See—*
Wipkink, Johannes, 4,232,624, Cl. 114-257.000.

Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, to South African Coal, Oil & Gas Corp., Limited; and Gea Luftkuehlergesellschaft Happel GmbH & Co. Air-cooled heat exchanger for cooling industrial liquids. 4,232,729, Cl. 165-39.000.

Innovative Chemicals, Inc.: *See—*
Garcia, Robert I., 4,233,126, Cl. 204-157.10H.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,233,486, Cl. 219-69.00W.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Traveling-wire electrical discharge machine. 4,233,486, Cl. 219-69.00W.

Inoue, Michihiro: *See—*
Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Inoue, Michihiro, 4,233,615, Cl. 357-22.000.

Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, to Bunker Ramo Corporation. Locking mechanism for coupling and uncoupling electrical connectors. 4,232,926, Cl. 339-45.00M.

Inouye, Hiromasa: *See—*
Otsuki, Tomonari; and Inouye, Hiromasa, 4,232,923, Cl. 339-17.0LC.

Inseco Associates, Inc.: *See—*
Eggermann, Paul P., 4,232,823, Cl. 238-7.000.

Institut Francais du Petrole: *See—*
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.

International Business Machines Corporation: *See—*
Balderes, Demetrios; Lynch, John R.; and Yacavonis, Robert A., 4,233,645, Cl. 361-385.000.
Darrow, Russell E.; Memis, Irving; and Poliak, Richard M., 4,233,620, Cl. 357-74.000.
Devine, William T.; and Gianopulos, William, 4,233,667, Cl. 364-900.000.
Friedman, Jules D.; and Saraf, Lumdas H., 4,233,337, Cl. 427-84.000.
Hwang, Un-Pah; and Simons, Robert E., 4,233,644, Cl. 361-384.000.
Kane, Milburn H., 4,232,975, Cl. 400-144.200.
Wilczynski, Janusz S., 4,232,969, Cl. 356-401.000.

International Computers Limited: *See—*
Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., 4,233,601, Cl. 340-703.000.

International Flavors & Fragrances Inc.: *See—*
Slangan, Gary; and Tsunashima, Masaaki, 4,233,325, Cl. 426-107.000.

International Lead Zinc Research Organization, Inc.: *See—*
Kronstein, Max, 4,233,088, Cl. 148-6.160.

International Vitamin Corp.: *See—*
Jehle, Felix A.; and Aly, Fawzy, 4,233,324, Cl. 426-96.000.

Inukai, Yuzo: *See—*
Tada, Sugihiko; and Inukai, Yuzo, 4,233,397, Cl. 430-449.000.

Ishitani, Tohru: *See—*
Tamura, Hifumi; and Ishitani, Tohru, 4,233,509, Cl. 250-306.000.

Ishiyama, Toshio: *See—*
Kawabata, Toshio; and Ishiyama, Toshio, 4,233,461, Cl. 562-554.000.

Ispen Industries International Gesellschaft mit beschrankter Haftung: *See—*
Limque, Ferdinand; and Bless, Franz, 4,232,852, Cl. 266-80.000.

Ito, Daizaburo, to Kai Cutlery Center Co., Ltd. Knife apparatus. 4,232,445, Cl. 30-162.000.

Ito, Hiroaki: *See—*
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, 4,232,926, Cl. 339-45.00M.

ITT Industries, Inc.: *See—*
De Kock, Cornelis, 4,232,767, Cl. 188-319.000.

Iverson, James R.; and Alcock, Derrick N., to Electric Machinery Mfg. Company. Electrical power switching apparatus with sliding fuse drawer and interlock system. 4,233,643, Cl. 361-344.000.

Iwane, Hiroshi: *See—*
Takeda, Makoto; Iwane, Hiroshi; and Hashimoto, Takashi, 4,233,226, Cl. 260-345.200.

Iwashita, Tomonori: *See—*
Fukahori, Hidehiko; Iwashita, Tomonori; and Mashimo, Yukio, 4,232,958, Cl. 354-212.000.

Iwatate, Fujio: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.

Izard, David G.: *See—*
Baehr, Donald O.; and Izard, David G., 4,233,368, Cl. 428-538.000.

J. B. Foote Foundry Co., The: *See—*
Hauser, Hans; and Clayborne, William J., 4,232,569, Cl. 74-701.000.

J. J. Barker Company Limited: *See—*
Barker, John C.; and McLaughlin, Ivan P., 4,233,343, Cl. 427-264.000.

J. V. Manufacturing & Welding, Inc.: *See—*
Ulrich, James A., 4,232,599, Cl. 100-25.000.

Jackering, Gunther: *See—*
Wieg, Andras J.; and Jackering, Gunther, 4,233,406, Cl. 435-275.000.

Jacobs, Melvin J., to Triram Corporation. Material for waterproofing bridge decks and the like. 4,233,356, Cl. 428-244.000.

Jacobs, Ralph R.: *See—*
Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., 4,233,570, Cl. 331-94.50F.

Jacobs, Ronald S. Mobile ladder-scaffolding system. 4,232,759, Cl. 182-39.000.

Jacobson, Allan J.: *See—*
Whittingham, M. Stanley; and Jacobson, Allan J., 4,233,375, Cl. 429-194.000.

Jacquelin, Roland, to Commissariat a l'Energie Atomique. Safety apparatus for a nuclear reactor. 4,233,115, Cl. 176-36.00C.

Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, to L'Oreal. Anti-solar acrylamide derivative polymers, method of making the same and cosmetic compositions containing the same. 4,233,430, Cl. 526-259.000.

Jagenberg-Werke Aktiengesellschaft: *See—*
Buschmann, Gerhard, 4,232,802, Cl. 222-56.000.

Janovsky, Franz, to Viennatone Gesellschaft m.b.H. Prosthesis joint. 4,232,405, Cl. 3-12.300.

Jansen, Renate Galinke nee, heir: *See—*
Eschwey, Helmut; Galinke, Joachim, deceased; and Wiemers, Norbert, 4,233,194, Cl. 260-22.00A.

Jansma, Roger H.: *See—*
Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., 4,233,411, Cl. 525-155.000.

Japan Automobile Research Institute, Inc.: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.

Jarder, Lars; and Ahlstroem, Bengt. Pressure sensitive device. 4,233,523, Cl. 307-119.000.

Jargiello, Paul, to Polychrome Corporation. Lithographic printing plate having dual photosensitive layering. 4,233,390, Cl. 430-156.000.

Jefco Laboratories, Incorporated: *See—*
Cox, Norman D., 4,232,595, Cl. 98-59.000.

Jehle, Felix A.; and Aly, Fawzy, to International Vitamin Corp. Isolated soy protein composition. 4,233,324, Cl. 426-96.000.

Jeng, Wang-Shing. Rotary pump. 4,233,003, Cl. 418-8.000.

Jenkins, Sherman. Reconfigurable loop of tubular elements. 4,232,473, Cl. 46-1.00R.

Jensen, Axel; and Molgaard, Niels, to Grundfos A/S. Control circuit for an A.C. motor. 4,233,551, Cl. 318-809.000.

Johann, Donald F.: *See—*
Walberg, Per-Erik; Johann, Donald F.; and Mendenhall, Charles E., 4,233,666, Cl. 364-900.000.

Johansson, Lars. Belt buckle. 4,232,428, Cl. 24-188.000.

John Formby & Company Limited: *See—*
Formby, John A., 4,233,499, Cl. 235-92.0MP.

John Gladstone & Company (Engineering) Limited: *See—*
Finlay-Maxwell, David, 4,233,120, Cl. 203-2.000.

Johns-Manville Corporation: *See—*
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased, 4,233,100, Cl. 156-260.000.
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.

Johnson, Albert V. Heat arrester boot for room stove. 4,232,732, Cl. 165-77.000.

Johnson, Christian E., Sr., to United States of America, Commerce. Ultra-black coating due to surface morphology. 4,233,107, Cl. 156-632.000.

Johnson, Dwight N., to Textron Inc. Fluid control valve and liner therefor. 4,232,851, Cl. 251-61.100.

Johnson, Fred J.; and Bell, Richard L., to Container Corporation of America. Clamshell type carton. 4,232,816, Cl. 229-33.000.

Johnson, Glenn W., Jr.; and Heenan, Sidney A., to Amerace Corporation. Pavement marker. 4,232,979, Cl. 404-16.000.

Johnson, Howard L. Trailer with multiple bale elevating apparatus and method of bale handling. 4,232,986, Cl. 414-24.500.

Johnson & Johnson: *See—*
Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,233,192, Cl. 252-545.000.

Johnson & Johnson Baby Products Company: *See—*
Elias, Robert T.; and Holtman, Dennis C., 4,233,345, Cl. 427-325.000.

Johnson, Matthey & Co., Limited: *See—*
Knapton, Arthur G.; and McGill, Ian R., 4,233,185, Cl. 252-462.000.

Johnson, Peter D.; and Jones, Charles E., to General Electric Company. Photoflash lamp having expandable burning volume. 4,233,023, Cl. 431-362.000.

Johnson, Timothy F.: *See—*
Mammino, Joseph; Johnson, Timothy F.; Walters, David W.; and Perez, Steven R., 4,233,387, Cl. 430-137.000.

Johnson, Warren E., to Sherwood Tool, Incorporated. Cup making machine having applicator mechanism. 4,232,590, Cl. 493-10.000.

Jon, Min-Chung; and Palazzo, Vito, to Western Electric Company, Inc. Methods for determining bond failure modes using stress wave emission techniques. 4,232,558, Cl. 73-801.000.

Jones, Charles E.: *See—*
Johnson, Peter D.; and Jones, Charles E., 4,233,023, Cl. 431-362.000.

Jones, Clarence E.: *See—*
Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., 4,232,456, Cl. 35-25.000.

Jones, Myron, Jr.: *See—*
Mangam, William M., Jr.; Willis, John J., Jr.; and Jones, Myron, Jr., 4,232,531, Cl. 62-171.000.

Jones, Norman; and Dawson, Peter, to Clemead Limited. Method for the production of waterproof and like fabrics. 4,233,358, Cl. 428-246.000.

Jongerius, Hermanus M.; and van der Wolf, Rein W., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,233,653, Cl. 362-84.000.

Joo', Louis A.; and Miller, Frederick C., to Great Lakes Carbon Corporation. Process for manufacture of positive electrode for lithium/-metal sulfide secondary cell. 4,233,378, Cl. 429-220.000.

Joppien, Hartmut: *See—*
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Joseph Gamell Industries, Inc.: *See—*
Gamell, Joseph A., 4,232,991, Cl. 415-90.000.

Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, to Bergwerksverband GmbH. Manufacture of abrasion-resistant coke. 4,233,117, Cl. 201-6.000.

Jurges, Peter: *See—*
Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, 4,233,026, Cl. 8-52.000.

K-B Engineering Co.: *See—*
Kice, Jack W., 4,232,632, Cl. 119-82.000.

K & S Baubeschlage Hugo Kruger KG, Firma: *See—*
Kern, Klaus, 4,232,626, Cl. 114-285.000.

Kabel- und Metallwerke Gutehoffnungshuette AG: *See—*
Rohner, Peter; and Still, Michael, 4,232,935, Cl. 350-96.230.

Kabushiki Kaisha Suwa Seikosha: *See—*
Murata, Masami, 4,233,681, Cl. 368-242.000.

Kai Cutlery Center Co., Ltd.: *See—*
Ito, Daizaburo, 4,232,445, Cl. 30-162.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Brown, William E., 4,233,078, Cl. 106-56.000.

Kalka, Josef; Hentschel, Bernhard; and Ziebarth, Jurgen, to Chemische Werke Huels Aktiengesellschaft. Continuous process for the removal of monomeric impurities from aqueous dispersions of homo- and copolymers of vinyl chloride. 4,233,437, Cl. 528-500.000.

Kalns, Rudolph W., to Chloride, Incorporated. Apparatus for detecting the passage of glowing embers. 4,233,504, Cl. 250-214.0RC.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines N-monosubstituted in the 4'-position and the use thereof in dye compositions for keratinic fibers. 4,233,241, Cl. 564-221.000.

Kamino, Yasumi: *See—*
Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, 4,233,183, Cl. 252-432.000.

Kammlade, William G., Jr. Method and apparatus for indicating the onset of parturition. 4,232,686, Cl. 128-775.000.

Kane, Milburn H., to International Business Machines Corporation. Print hammer control. 4,232,975, Cl. 400-144.200.

Kanebo, Ltd.: *See—*
Ohtomo, Koichiro; and Horikawa, Yukio, 4,233,211, Cl. 260-123.700.
Otoi, Kiyoshi; and Horikawa, Yukio, 4,233,212, Cl. 260-123.700.

Kanebo Spun Silk, Ltd.: *See—*
Ohtomo, Koichiro; and Horikawa, Yukio, 4,233,211, Cl. 260-123.700.
Otoi, Kiyoshi; and Horikawa, Yukio, 4,233,212, Cl. 260-123.700.

Kaneko, Kenji; and Okabe, Takahiro, to Hitachi, Ltd. Oscillation circuit. 4,233,574, Cl. 331-108.00D.

Kaneko, Yutaka: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,233,400, Cl. 430-523.000.

Kanno, Takashi: *See—*
Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, 4,233,206, Cl. 260-42.210.

Kaplow, Roy; and Lewis, Marvin C., to General Solar Energy Corporation. Passive solar device for heating and cooling. 4,232,731, Cl. 165-48.00S.

Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., to Data Packaging Corporation. Disk pack bottom cover with magnetic latch. 4,233,586, Cl. 335-303.000.

Karg, Rudolph F., to Copolymer Rubber & Chemical Corp. Free flowing particles of elastomeric material and method. 4,233,365, Cl. 428-404.000.

Karl, Rupert: *See—*
Husges, Gerd; and Karl, Rupert, 4,232,508, Cl. 57-22.000.

Karlsson, Stig A., to Uddeholms Aktiebolag. Apparatus for powder manufacture by atomizing a molten material. 4,233,007, Cl. 425-7.000.

Karp, Joel A.; Lee, Ilbok; and Reed, John A., to National Semiconductor Corporation. X Sense AMP memory. 4,233,675, Cl. 365-205.000.

Karpe, Wolfgang; Kluge, Johannes; and Oemus, Klaus-Dieter, to Mannesmann Demag AG. Switch. 4,233,479, Cl. 200-77.000.

Karpinsky, William J., to Container Corporation of America. Carton erecting apparatus. 4,232,591, Cl. 493-314.000.

Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, to Shinpo Kogyo Kabushiki Kaisha. Stepless speed change gear. 4,232,561, Cl. 74-191.000.

Kasper, Daniel K., to Warner & Swasey Company, The. Force measuring device for a chuck or collet. 4,232,547, Cl. 73-141.00A.

Kassat, Harry: *See—*
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.

Kathawala, Faizulla G., to Sandoz, Inc. Cyclopropyl sulfonium salts. 4,233,292, Cl. 424-185.000.

Kato, Matsuo: *See—*
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, 4,232,926, Cl. 339-45.00M.

Kato, Yoshiaki: *See—*
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Katsube, Junki: *See—*
Ono, Keiichi; Sasajima, Kikuo; Katsube, Junki; and Yamamoto, Hisao, 4,233,307, Cl. 424-267.000.
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, 4,233,222, Cl. 260-343.30P.

Katsuhide, Suzuki: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.

Katsura, Hidetoshi: *See—*
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.

Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, to Toyo Ink Manufacturing Co., Ltd. Process for the production of colored polyolefin molded articles and colorants used therein. 4,233,206, Cl. 260-42.210.

Kattermann, Dietrich E.: *See—*
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., 4,233,146, Cl. 204-255.000.

Kaufmann, Frank H.; and Kramer, Charles F., to Steel Heddle Manufacturing Company. Heddle frame nose guide. 4,232,713, Cl. 139-91.000.

Kautex-Maschinenbau, GmbH: *See—*
Hagen, Reinold, 4,233,009, Cl. 425-142.000.

Kawabata, Toshio; and Ishiyama, Toshio, to Sumitomo Chemical Company, Limited. Process for preparing colorless methionine. 4,233,461, Cl. 562-554.000.

Kawabe, Yunosuke, to Fujitsu Limited. Method of manufacturing semiconductor devices having improved alignment marks. 4,233,091, Cl. 148-175.000.

Kawakubo, Kazuo: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.

Kawamoto, Shunichi: *See—*
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.

Kawano, Mitugi: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Uozumi, Yukio, 4,232,611, Cl. 105-215.00R.

Kawasaki, Mikio: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,233,400, Cl. 430-523.000.

Kawasaki Steel Corporation: *See—*
Bando, Seiji; and Sadao, Ebata, 4,232,853, Cl. 266-114.000.

Kawasumi, Yoshio: *See—*
Sato, Haruki; and Kawasumi, Yoshio, 4,233,254, Cl. 264-37.000.

Kawata, Shoji: *See—*
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.

Kaye, Larry A.; and Koros, Robert M., to Exxon Research & Engineering Co. Gas liquid distributor. 4,233,269, Cl. 422-207.000.

Kazihata, Ryohei: *See—*
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

KBG Corporation: *See—*
Benedetto, Kenneth R.; and Linder, Larry J., 4,232,553, Cl. 73-516.0LM.

KDM Elecktronik GmbH: *See—*
Aigner, Georg, 4,232,550, Cl. 73-258.000.

Keating, Kenneth P.: *See—*
Nieh, Edward C. Y.; and Keating, Kenneth P., 4,233,447, Cl. 544-352.000.

Keene Corporation: *See—*
Fabbri, William C., 4,233,651, Cl. 362-33.000.

Keeton, John H. Metal-working hand tool. 4,232,621, Cl. 113-54.00R.

Kegel, Robert: *See—*
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.

Kelly, Charles J.: *See—*
Gray, Charles R.; Hazen, John O.; and Kelly, Charles J., 4,232,493, Cl. 52-221.000.

Kelly, Robert C., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-9-deoxy-6,9α-epoxymethano-5,6-didehydro-PGF_1 compounds. 4,233,225, Cl. 260-345.200.

Kelsey Hayes Co.: *See—*
Augustine, Robert F., 4,233,587, Cl. 338-96.000.

Kemner, Rudolf; and Cramer, Rudy R., to U.S. Philips Corporation. Television pick-up device suitable for a discontinuous recording of information during continuous operation. 4,233,633, Cl. 358-221.000.

Kempf, Alfons, to Frentrup, Adolf; and Kempf, Alfons. Armor plated safe. 4,232,613, Cl. 109-40.000.

Kempf, Paul S. Optical comparator with 3-D image. 4,232,968, Cl. 356-393.000.

Kennecott Copper Corporation: *See—*
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,232,727, Cl. 164-76.000.

Kerbel, Sheldon J., to Hazeltine Corporation. Apparatus for changing the scale of a logarithmic signal. 4,233,564, Cl. 328-145.000.

Kerkhofs, Jacques G., to AGFA-GEVAERT N.V. Method and apparatus for applying a plurality of superposed layers to a web by curtain coating. 4,233,346, Cl. 427-345.000.

Kern, Klaus, to K & S Baubeschlage Hugo Kruger KG, Firma. Device for controlling the orientation of a boat in water. 4,232,626, Cl. 114-285.000.

Kern, Rene; and Augustin, Daniel, to ATO Chimie. Separation of sulphonic acids from the medium in which they are prepared. 4,233,236, Cl. 260-504.00S.

Kero Metal Products Co., Inc.: *See—*
Bukaitz, Finley M., 4,232,920, Cl. 312-257.00R.

Kerwin, William J.: *See—*
Hosterman, Craig; and Kerwin, William J., 4,232,698, Cl. 137-68.00R.

Ketterer, Stanley J., to Singer Company, The. Bobbin winder arrangement for sewing machine looptaker. 4,232,618, Cl. 112-184.000.

Keusch, Preston: *See—*
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., 4,233,146, Cl. 204-255.000.

Khan, A. Hameed: *See—*
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, 4,233,215, Cl. 260-239.0EQ.

Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., to Design & Process Engineering, Inc. Infeed assembly and a discharge assembly for a conveyor system. 4,232,779, Cl. 198-472.000.

Kice, Jack W., to K-B Engineering Co. Live fowl conveying system. 4,232,632, Cl. 119-82.000.

Kijewski, Joachim, to Auto-Weber GmbH & Co. KG. Device for gripping tired wheels of a vehicle. 4,232,893, Cl. 294-82.0AH.

Kikkawa, Ikuo: *See—*
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.

Kikuchi, Tomoo. Screen with high luminance and wide angle. 4,232,939, Cl. 350-129.000.

Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., to Rohm and Haas Company. 3-Pyridylmethylthiocarbamates. 4,233,289, Cl. 424-84.000.

Killorin, Francis H. System for use with solar collector. 4,232,657, Cl. 126-427.000.

Kilpper, Gerhard; and Grimmer, Johannes, to BASF Aktiengesellschaft. Continuous manufacture of anthranilic acid. 4,233,459, Cl. 562-458.000.

Kim, Chang J.: *See—*
Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., 4,233,139, Cl. 208-112.000.

Kim, Sung C.; and Schwartz, Marvin P. Double-walled finned heat transfer tube. 4,232,735, Cl. 165-183.000.

Kimber, Erich V., to Atlas Copco Aktiebolag. Drill boom arrangement. 4,232,848, Cl. 248-652.000.

Kimber, Erich V.; and Lundstrom, Axel L., to Atlas Copco Aktiebolag. Drill boom arrangement. 4,232,849, Cl. 248-654.000.

Kimber, Erich V.; and Hokby, Nils, to Atlas Copco Aktiebolag. Drill boom arrangement. 4,232,850, Cl. 248-654.000.

Kimberlin, Dan R., to General Motors Corporation. Floor mounted shift control mechanism with drive transmitting cables. 4,232,571, Cl. 74-878.000.

Kimoto, Koichi: *See—*
Okai, Sakuo; and Kimoto, Koichi, 4,233,391, Cl. 430-281.000.

Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, to Hitachi, Ltd. Process and apparatus for purifying raw coal gas. 4,233,275, Cl. 423-230.000.

Kine, Benjamin B.: *See—*
Novak, Ronald W.; and Kine, Benjamin B., 4,233,362, Cl. 428-332.000.

King, Arthur S. Method and apparatus for extracting polar substances from solution. 4,233,134, Cl. 204-186.000.

Kingsdown Medical Consultants Limited: *See—*
Steer, Peter L.; and Edwards, John V., 4,232,672, Cl. 128-283.000.

Kingsley, Jack D., to General Electric Company. Solid state radiation detector and arrays thereof. 4,233,514, Cl. 250-370.000.

Kinney, George A., to Du Pont de Nemours, E. I., and Company. Apparatus for preparing a nonwoven web. 4,233,014, Cl. 425-174.80R.

Kirchhofer, Hubert: *See—*
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, 4,232,999, Cl. 417-64.000.

Kirkpatrick, Jesse C.: *See—*
Hauk, Ernest D.; and Kirkpatrick, Jesse C., 4,232,752, Cl. 175-135.000.

Kirtley, James L., Jr., to Massachusetts Institute of Technology. Variable speed electronic motor. 4,233,548, Cl. 318-138.000.

Kita, Nobuyuki: *See—*
Shiba, Keisuke; and Kita, Nobuyuki, 4,233,393, Cl. 430-265.000.

Kitai, Kiyoshi; and Ogihara, Masuo, to Seiko Koki Kabushiki Kaisha. Time detecting device for a clock. 4,232,511, Cl. 368-73.000.

Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, to Canon Kabushiki Kaisha. Recording position adjuster. 4,232,954, Cl. 354-7.000.

Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, to Ciba-Geigy Aktiengesellschaft. Photographic elements containing amino-substituted hydroxy-pyridones. 4,233,399, Cl. 430-510.000.

Kizler, Alfred: *See—*
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,232,545, Cl. 73-35.000.

Kjellin, Per G.: *See—*
Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., 4,233,303, Cl. 424-253.000.

Klaassen, Francois M.; and Appels, Johannes A., to U.S. Philips Corporation. Field effect transistor with insulated gate electrode. 4,233,617, Cl. 357-23.000.

Klaue, Hermann. Full-coat disk brake. 4,232,763, Cl. 188-18.00A.

Klees, Garry W. Ski pole grip with self hinge for improved forward reach. 4,232,875, Cl. 280-822.000.

Klein, Albert: *See—*
Hoberg, Heinz; and Klein, Albert, 4,233,559, Cl. 324-58.50A.

Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., to General Electric Company. Apparatus and system for protecting power distribution circuits against ground faults. 4,233,639, Cl. 361-44.000.

Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., to General Electric Company. Ground fault apparatus and protection system. 4,233,640, Cl. 361-44.000.

Kleinwachter, Jurgen: *See—*
Ritter, Alfred E.; and Kleinwachter, Jurgen, 4,232,820, Cl. 237-2.00B.

Kleis, Derk, to U.S. Philips Corporation. Loudspeaker combination, comprising a plurality of dynamic loudspeakers, which are arranged adjacent each other in substantially one continuous plane. 4,233,472, Cl. 179-1.0GA.

Kleitman, David: *See—*
Russell, Lewis K.; and Kleitman, David, 4,233,674, Cl. 365-200.000.

Klendauer, Wolfgang: *See—*
Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, 4,233,341, Cl. 427-230.000.

Kline Manufacturing Co.: *See—*
Kline, William L., 4,232,587, Cl. 91-499.000.

Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., to Nanodata Corporation. Circuit card adapter. 4,232,924, Cl. 339-17.00L.

Kline, William L., to Kline Manufacturing Co. Fluid pump. 4,232,587, Cl. 91-499.000.

Kluge, Johannes: *See—*
Karpe, Wolfgang; Kluge, Johannes; and Oemus, Klaus-Dieter, 4,233,479, Cl. 200-77.000.

Klupfel, Kurt; and Sprengel, Heide, to Hoechst Aktiengesellschaft. Photopolymerizable transfer material. 4,233,395, Cl. 430-271.000.

Knapton, Arthur G.; and McGill, Ian R., to Johnson, Matthey & Co., Limited. Catalysts for oxidation and reduction. 4,233,185, Cl. 252-462.000.

Knauer, Karl; and Pfleiderer, Hans-Jorg, to Siemens Aktiengesellschaft. Transversal filter. 4,233,578, Cl. 333-165.000.

Knoblauch, Karl: *See—*
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.

Knox Manufacturing Co.: *See—*
Brown, Donald J., 4,232,487, Cl. 51-425.000.

Knudsen, Ole F., to Danfoss A/S. Measured value receiver for the polarographic measurement of gases in liquids. 4,233,143, Cl. 204-195.00P.

Kobayashi, Akira: *See—*
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.

Kobayashi, Hideo: *See—*
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.

Kobayashi, Makoto: *See—*
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

Kobayashi, Yosiharu: *See—*
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, 4,233,663, Cl. 364-515.000.

Kobe, Inc.: *See—*
Presley, Charles L., 4,233,154, Cl. 210-800.000.

Kobe Steel, Limited: *See—*
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Koch, Christian; and Behrmann, Alfred E., to Kraftwerk Union Aktiengesellschaft. Process for preventing adhesion or caking of coal. 4,233,036, Cl. 48-210.000.

Koch, Julius: *See—*
Seebeck, Dieter; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, 4,233,407, Cl. 435-311.000.

Koch, Lehel, to Vepex Fovallalkozasi Iroda Rt. Process for preparing non-specific protein concentrate and of other fodder additives having a biological activity. 4,233,210, Cl. 260-112.00R.

Koch, Rudolf; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Charge injection device opto-electronic sensor. 4,233,527, Cl. 307-311.000.

Kochanneck, Uwe. Article storage and retrieval system. 4,232,988, Cl. 414-331.000.

Kockums Industries, Inc.: *See—*
Shields, Dean W., 4,232,792, Cl. 212-160.000.

Koeppel, Robert, to Produits Chimiques Ugine Kuhlmann. Anhydrite cellular concrete and composite building elements. 4,233,080, Cl. 106-87.000.

Koike, Tadao, to Ricoh Company, Ltd. Device for positioning movable reflector of optical system of electrophotographic copying apparatus. 4,232,963, Cl. 355-49.000.

Koiwai, Tamotsu: *See—*
Hashimoto, Akihiko; and Koiwai, Tamotsu, 4,232,956, Cl. 354-106.000.

Kolbel, Hans J.; and Andres, Harald, to Volkswagenwerk Aktiengesellschaft. Suspension arrangement for motor vehicles. 4,232,881, Cl. 280-721.000.

Kolenda, Herbert: *See—*
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.

Kolk, Glenn R.; and Haraka, Wayne. Crabbing chum lure. 4,232,471, Cl. 43-44.990.

Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, to Ciba-Geigy Corporation. Process for the level dyeing of polyacrylonitrile materials of slow, normal and rapid absorptive capacity. 4,233,028, Cl. 8-534.000.

Komeda, Tadao: *See—*
Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Inoue, Michihiro, 4,233,615, Cl. 357-22.000.

Konetehdas Maskinfabrik NORCAR Ky Kb: *See—*
Carlsson, Kaj, 4,232,753, Cl. 180-9.20R.

Konijnendijk, Willem L.: *See—*
van de Spijker, Willebrordus H. M. M.; and Konijnendijk, Willem L., 4,233,538, Cl. 313-486.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,233,400, Cl. 430-523.000.

Konnai, Makoto: *See—*
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,233,061, Cl. 71-103.000.

Konnerth, Andrew, III: *See—*
Terrell, George C.; and Konnerth, Andrew, III, 4,232,634, Cl. 122-41.000.

Konya, Calvin J. Explosive composition forming no water as a reaction product during detonation. 4,233,094, Cl. 149-43.000.

Korchnak, Joseph D., to Davy Powergas Inc. Process for purifying crude phosphoric acid. 4,233,278, Cl. 423-321.00S.

Koros, Robert M.: *See—*
Kaye, Larry A.; and Koros, Robert M., 4,233,269, Cl. 422-207.000.

Kosaka, Hidetoshi: *See—*
Maehashi, Yukio; and Kosaka, Hidetoshi, 4,233,665, Cl. 364-715.000.

Koseki, Wasuke; Mori, Kunihito; Obata, Hideo; and Shinchi, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Agitator-type washing machine. 4,232,536, Cl. 68-12.00R.

Koshikawa, Makoto: *See—*
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Koul, Maharaj K., to Foote Mineral Company. Effective boron alloying additive for continuous casting fine grain boron steels. 4,233,065, Cl. 75-134.00S.

Kovacs, John M. Camera multiple exposure control mechanism. 4,232,957, Cl. 354-209.000.

Kovacs nee Mindler, Vera: *See—*
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

Kozlowski, Deborah R.: *See—*
Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., 4,232,951, Cl. 350-350.00R.

Kozuka, Nobuhiko: *See—*
Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, 4,233,386, Cl. 430-125.000.

Kraft, Joseph K., to Westinghouse Electric Corp. Step link for transportation apparatus. 4,232,783, Cl. 198-851.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Koch, Christian; and Behrmann, Alfred E., 4,233,036, Cl. 48-210.000.
Losel, Georg, 4,232,635, Cl. 122-406.0ST.

Kramer, Charles F.: *See—*
Kaufmann, Frank H.; and Kramer, Charles F., 4,232,713, Cl. 139-91.000.

Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, to Bayer Aktiengesellschaft. Antimicrobial agents and their use. 4,233,311, Cl. 424-273.00R.

Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika. Polyamide from aromatic phosphorus containing diamine. 4,233,434, Cl. 528-337.000.

Krause, Manfred: *See—*
Lemke, Otto; and Krause, Manfred, 4,232,566, Cl. 74-569.000.

Krause Plow Corporation: *See—*
Pfenninger, Billy J.; and Stansel, F. Harrison, 4,232,747, Cl. 172-311.000.

Kreiling, Ronald L.: *See—*
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.

Kressel, Henry: *See—*
Botez, Dan; Ettenberg, Michael; and Kressel, Henry, 4,233,614, Cl. 357-17.000.
Hawrylo, Frank Z.; and Kressel, Henry, 4,233,090, Cl. 148-171.000.

Kroger Company, The: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Kroll, Steve; and Schindler, James C., to Restaurant Technology, Inc. Low heat capacity fry basket assembly. 4,232,596, Cl. 99-410.000.

Kronstein, Max, to International Lead Zinc Research Organization, Inc. Phosphatization of steel surfaces and metal-coated surfaces. 4,233,088, Cl. 148-6.160.

Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, to Schering Aktiengesellschaft. 1,2,3-Triazole carboxylic acid amides and biocidal compositions containing the same. 4,233,059, Cl. 71-92.000.

Kruger, Jack L. Mechanical transfer switch. 4,233,481, Cl. 200-153.00D.

Krulwich, Lester S. Magnetic press and refresher for clothes. 4,232,460, Cl. 38-1.00R.

Krupke, William F.: *See—*
Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., 4,233,570, Cl. 331-94.50F.

Kubota, Yukio, to Sony Corporation. Rotating magnetic head piezoelectric assembly and drive circuitry for video tape recorder. 4,233,637, Cl. 360-10.000.

Kuhar, George A., to Goodyear Tire & Rubber Company, The. Thermoplastic high acrylonitrile resins. 4,233,416, Cl. 525-234.000.

Kuhn, Helmut: *See—*
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.

Kuhr, Albert F., to United States Gypsum Company. Modular ceiling panel unit usable with air distribution systems. 4,232,594, Cl. 98-40.00D.

Kuki, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Outside door handle assembly for vehicles. 4,232,892, Cl. 292-347.000.

Kumar, Anand: *See—*
Pace, Salvatore J.; and Kumar, Anand, 4,233,144, Cl. 204-195.00B.

Kume, Kazunari: *See—*
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.

Kummer, David A. Bulk pasteurization of mushroom compost. 4,233,266, Cl. 422-184.000.

Kummer, Joseph T.: *See—*
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.

Kunishima, Mamoru: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, 4,233,224, Cl. 260-343.600.

Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, to Ciba-Geigy Corporation. Microbicidal compositions. 4,233,308, Cl. 424-279.000.

Kupferschmidt, Peter: *See—*
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, 4,233,680, Cl. 368-76.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.
Sawa, Yuji; and Endo, Sigeru, 4,233,019, Cl. 425-305.100.

Kurisaki, Konomu: *See—*
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

Kurogi, Yukinori; and Sugibuchi, Kiyoshi, to Nippon Electric Co., Ltd. Semiconductor memory device having multi-gate transistors. 4,233,526, Cl. 307-238.000.

Kurozumi, Seizi: *See—*
Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, 4,233,309, Cl. 424-270.000.

Kurz, Gerhard. Device indicating a state due to the pressure modification. 4,233,597, Cl. 340-626.000.

Kurz, Milton. Thermal insulating material. 4,232,620, Cl. 112-420.000.

Kurz, Otto: *See—*
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Kuwakado, Satosi: *See—*
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.

Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Imidyl-benzene-dicarboxylic and -tricarboxylic acid derivatives. 4,233,220, Cl. 260-326.260.

Kyker, Glendon D.; and Paul, Kalidas, to Velsicol Chemical Corporation. Process for preparing hexachlorocyclopentadiene. 4,233,251, Cl. 570-220.000.

Kyocera International, Inc.: *See—*
Nakano, Masahiko; and Miyauchi, Nobuaki, 4,232,815, Cl. 228-180.00A.

Kyomasu, Mikio; and Nakao, Yoshiharu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor non-volatile memory. 4,233,616, Cl. 357-23.000.

Kyoto University, The President of: *See—*
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

L. Schuler GmbH: *See—*
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Laco Laboratories, Inc.: *See—*
Schpak, Fred; and Malkes, Ian D., 4,232,966, Cl. 356-244.000.

Lair, Clair K., to General Dynamics Corporation Pomona Division. Warhead orientation device. 4,232,605, Cl. 102-8.000.

Laker, Robert W.: *See—*
Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., 4,233,601, Cl. 340-703.000.

Lamarche, Paul E., to Borg-Warner Corporation. Extended travel vibration damper assembly. 4,232,534, Cl. 64-27.00C.

Laminoirs a Froid de Thionville: *See—*
Urbain, Daniel, 4,233,098, Cl. 156-242.000.

Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., to Dow Chemical Company, The. Dehydration of α-methylbenzyl alcohols to form monovinylidene aromatic monomers. 4,233,467, Cl. 585-437.000.

Lancia, Frederick N.: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Land, Jerry E.: *See—*
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E., 4,233,492, Cl. 219-217.000.

Landkammer, Franz J., to Christoph Emmerich KG. Chain-type door latch and alarm. 4,233,595, Cl. 340-542.000.

Lange, Karl-Heinz, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG. Pivot-joint construction for binocular telescope. 4,232,936, Cl. 350-75.000.

Langens, Jan; and Devroe, Guido, to BASF Aktiengesellschaft. Manufacture of anhydrous hydrogen chloride by combusting chlorine-containing organic substances. 4,233,280, Cl. 423-481.000.

Lanier Business Products, Inc.: *See—*
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,233,638, Cl. 360-92.000.

Lankro Chemicals Limited: *See—*
Sheridan, Geoffrey P., 4,233,174, Cl. 252-170.000.

Lanner, Christer, to Aktiebolaget Garphytte Bruk. Low-alloyed steel for the preparation of valve spring wire. 4,233,089, Cl. 148-36.000.

Lanoa, Benzion, to Savin Corporation. Method and apparatus for increasing the apparent resolution of developed electrophotographically reproduced images. 4,233,381, Cl. 430-33.000.

Lantech Inc.: *See—*
Stackhouse, William H., 4,232,501, Cl. 53-399.000.

Lanza, Emmanuel: *See—*
Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., 4,233,418, Cl. 525-243.000.

Laporte Chemicals Limited: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.

Larsen, Frank R.: *See—*
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Larsen, Ronald F.: *See—*
Woods, Don F.; and Larsen, Ronald F., 4,232,446, Cl. 33-143.00L.

Larson, William A.; and Wilterink, Dale P. Hollow cotton roll. 4,233,025, Cl. 433-136.000.

Larsson, Stig-Goran: *See—*
Fischbeck, Kenneth H.; Larsson, Stig-Goran; and Sultan, S. Bertil, 4,233,610, Cl. 346-140.00R.

Laszcz, Stanislaw: *See—*
Bezubik, Slawomir J.; and Laszcz, Stanislaw, 4,232,857, Cl. 269-212.000.

Laud, Kamlakar R.: *See—*
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,232,441, Cl. 29-612.000.

Laurel Bank Machine Co., Ltd.: *See—*
Watanabe, Kenkichi; and Furuya, Katusuke, 4,232,690, Cl. 133-8.00R.

Lavanish, Jerome M., to PPG Industries, Inc. 3-[5-(1-Phenoxy-alkyl, -alkynyl, -alkenyl, or haloalkyl)-1,3,4-thiadiazol-2-yl]-4-hydroxy-1-methyl-2-imidazolidinones. 4,233,057, Cl. 71-090.000.

Law, Brian R.: *See—*
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., 4,232,579, Cl. 83-788.000.

Law, Graham H.: *See—*
Meyler-Warlow, Ian; and Law, Graham H., 4,233,373, Cl. 429-181.000.

Lazzara, Samuel P.: *See—*
Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P., 4,232,523, Cl. 60-641.000.

Le Moteur Moderne: *See—*
Pichard, Jacques, 4,232,637, Cl. 123-263.000.

LeaRonal, Inc.: *See—*
Brasch, William, 4,233,344, Cl. 427-304.000.

Leber, Karl. Support system for filing computer paper. 4,232,918, Cl. 312-184.000.

Lecerf, Andre, to SAFT-Societe des Accumulateurs Fixes et de Traction. Double chromate compositions for use as positive active material in batteries. 4,233,374, Cl. 429-194.000.

Ledig, Kurt W., deceased; and by Howes, David R., Executor, to American Home Products Corporation. 7-(Substituted)-7H-pyrrolo[3.2-F]-quinazoline-1,3-diamines. 4,233,445, Cl. 544-250.000.

Lee, Fred C., to Bechtel International Corporation. Beaded liquid product and method for reducing coefficient of friction. 4,232,981, Cl. 405-154.000.

Lee, Ilbok: *See—*
Karp, Joel A.; Lee, Ilbok; and Reed, John A., 4,233,675, Cl. 365-205.000.

Leekha, Rajendra K.: *See—*
Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., 4,232,717, Cl. 141-179.000.

Le Fur, Bernard: *See—*
Gharadjedaghi, Fereydoun; and Le Fur, Bernard, 4,232,946, Cl. 350-320.000.

Lehmann, Gunter: *See—*
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.

Leibinsohn, Saul. Microbe-barrier drainage device. 4,232,677, Cl. 128-350.00R.

Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, to Timex Corporation. Method for making electrochromic films having improved etch resistance. 4,233,339, Cl. 427-108.000.

Leichle, Claude, to Regie Nationale des Usines Renault. Method for detection of the angular position of a part driven in rotation and instrumentation using it. 4,233,592, Cl. 340-347.00P.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Polyhydric phenol coester stabilizers. 4,233,414, Cl. 525-146.000.

Le Jeune, Gwenole, to Societe Civile Hydromer. Process and apparatus for treating matter comprising a solid phase and a liquid or pasty phase. 4,232,600, Cl. 100-37.000.

LeMay, Christopher A. G., to EMI Limited. Radiography. 4,233,662, Cl. 364-414.000.

Lemke, Harold C.; and Rohowetz, Stanley E., to American Can Company. Method of securing opener key to a container using oriented polypropylene film with solventless acrylic adhesive. 4,233,331, Cl. 426-407.000.

Lemke, Otto; and Krause, Manfred, to Carl Still, Firma. Switching lever mechanism. 4,232,566, Cl. 74-569.000.

Leonheart, William H., to McMinnville Tool & Die, Inc. Throttle twist-grip control device. 4,232,565, Cl. 74-489.000.

Lepere, Guy, to Thomson-CSF. Receiver with fixed-echo suppressor. 4,233,604, Cl. 343-7.0AG.

Leshner, Ervin; and Leshner, Michael D., to Fuel Injection Development Corporation. Charge forming system for maintaining operation of an internal combustion engine at its lean limit. 4,232,643, Cl. 123-440.000.

Leshner, Michael D.: *See—*
Leshner, Ervin; and Leshner, Michael D., 4,232,643, Cl. 123-440.000.

Letraset International Limited: *See—*
Dowzall, Martin E.; and Houssian, Vazgen J., 4,232,452, Cl. 33-430.000.

Leung, Ernest C.; and Revah, Isaac R., to Northern Telecom Limited. Latching lever for printed circuit boards. 4,233,646, Cl. 361-399.000.

Lever Brothers Company: *See—*
Melican, Nigel J. T., 4,232,674, Cl. 128-287.000.

Levin, Igor A. Method and apparatus for mixing substances. 4,232,972, Cl. 366-108.000.

Levinsky, Roland J.: *See—*
Soothill, John F.; and Levinsky, Roland J., 4,233,286, Cl. 424-12.000.

Lewis, Marvin C.: *See—*
Kaplow, Roy; and Lewis, Marvin C., 4,232,731, Cl. 165-48.00S.

Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Lubricant compositions containing dispersant additives. 4,233,168, Cl. 252-51.50A.

Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., to Rolls-Royce Limited. Flow deflecting devices. 4,232,516, Cl. 60-226.00A.

Lewis, William R.; and Smith, Dennis M., to Hunter Engineering Company. Molten metal feed tip. 4,232,804, Cl. 222-591.000.

Leybold-Heraeus GmbH: *See—*
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.
Dietrich, Walter; and Stephan, Herbert, 4,233,515, Cl. 250-397.000.

Li, Norman N.: *See—*
Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., 4,233,165, Cl. 252-8.55R.

Libbey-Owens-Ford Company: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,232,809, Cl. 225-93.500.

Lichtenstein, Bernard; and Nemeth, Edward, to VIP Industries, Inc. Wire insertion guide. 4,232,443, Cl. 29-753.000.

Lidkopings Mekaniska Verkstads AB: *See—*
Nilsson, Bengt, 4,232,913, Cl. 308-9.000.

Liebel, John T., Jr.: *See—*
Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., 4,232,924, Cl. 339-17.00L.

Liebergot, Harris L.; and Sedmak, Richard M., to Sperry Corporation. Fault detection and isolation system. 4,233,682, Cl. 371-68.000.

Lieberman, Arthur M. Children's mask. 4,232,476, Cl. 46-88.000.

Liggett Group Inc.: *See—*
Hall, Floyd V., 4,232,574, Cl. 82-84.000.

Lighting Systems, Inc.: *See—*
Zelina, Francis J., Jr.; and Zelina, John H., Jr., 4,233,655, Cl. 362-258.000.

Ligouzat, Pierre, to Societe Symac. Continuous mixing apparatus for flowable products. 4,232,973, Cl. 366-157.000.

Lilliston Corporation: *See—*
Thompson, Jack E., 4,232,744, Cl. 171-101.000.

Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., to Hughes Aircraft Company. Process for reinforcing structurally fragile inorganic fabrics. 4,233,347, Cl. 427-352.000.

Limpaecher, Rudolf. Multicusp plasma containment apparatus. 4,233,537, Cl. 313-231.000.

Limque, Ferdinand; and Bless, Franz, to Ispen Industries International Gesellschaft mit beschrankter Haftung. Apparatus for control of the carburization of parts in a vacuum furnace. 4,232,852, Cl. 266-80.000.

Lin, Charles C. C., to Shelcore, Inc. Inflatable hassock-shaped toy. 4,232,477, Cl. 46-88.000.

Lin, Tung-Yen; and Yang, Yue-Chyou, to T. Y. Lin International. Precast units for constructing cooling towers and the like. 4,232,495, Cl. 52-224.000.

Lin, Tz-Hong: *See—*
Winchell, Harry S.; and Lin, Tz-Hong, 4,233,285, Cl. 424-1.000.

Lincoln Manufacturing Company, Inc.: *See—*
Scoville, John R.; and Gigandet, Richard W., 4,233,495, Cl. 219-386.000.

Lind, Eugene L., to Lind's Manufacturing Inc. Wood burning furnace. 4,232,651, Cl. 126-110.00E.

Lindahl, Bengt E., to Svensk Lasthantering, Bengt Lindahl AB. Lifting loop. 4,232,619, Cl. 112-417.000.

Linde Aktiengesellschaft: *See—*
Pawlik, Rudolf; and Fierlbeck, Walter, 4,233,494, Cl. 219-382.000.

Lindemann, Martin K. O.; and Verdicchio, Robert J., to Johnson & Johnson. Detergent compositions. 4,233,192, Cl. 252-545.000.

Linder, Larry J.: *See—*
Benedetto, Kenneth R.; and Linder, Larry J., 4,232,553, Cl. 73-516.0LM.

Lind's Manufacturing Inc.: *See—*
Lind, Eugene L., 4,232,651, Cl. 126-110.00E.

Lindsay, Rudy E.: *See—*
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E., 4,233,492, Cl. 219-217.000.

Linenberger, Darrell. Bore sighting apparatus. 4,232,449, Cl. 33-235.000.

Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., to Cosden Technology, Inc. Process for preparing rubber-modified styrene copolymers by suspension copolymerization. 4,233,418, Cl. 525-243.000.

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Bottoms, Harry S.; and Heath, Ronald A., 4,233,005, Cl. 418-190.000.
Potter, James C.; and Sosnowski, Stanislaw J. A., 4,232,644, Cl. 123-450.000.

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Maehashi, Yukio; and Kosaka, Hidetoshi, to Nippon Electric Co., Ltd. Date data processor. 4,233,665, Cl. 364-715.000.
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Mangus, James D., to Westinghouse Electric Corp. Nuclear reactor coolant transport system. 4,233,116, Cl. 176-65.000.
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Meyer, Gustavo A.; Fekete, Simon O.; and Wicker, Gordon R., to Amax Inc. Selective extraction of iron and aluminum from acidic solutions. 4,233,273, Cl. 423-112.000.
Meyers, Leo J.; and Grant, Louis A., to Louis A. Grant, Inc. Ascension pipe and elbow cleaning apparatus. 4,233,119, Cl. 202-241.000.
Meyler-Warlow, Ian; and Law, Graham H., to Heatherbourne Plastics Limited. Cell casing and grommet therefore. 4,233,373, Cl. 429-181.000.
Michelson, Anatol. Process and core box assembly for heatless production of hollow items of mineral granular material. 4,232,726, Cl. 164-12.000.
Miesch, Michel: *See*—
Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, 4,233,129, Cl. 204-158.00R.
Mieville, Andre, to Orchimed SA. Esters of p-carbonylphenoxy-isobutyric acids. 4,233,298, Cl. 424-244.000.
Migrin, Robert S.; and Olson, Jerry A., to Eaton Corporation. Two stage flowmeter. 4,232,549, Cl. 73-202.000.
Mijnheer, Andries, to U.S. Philips Corporation. Method and device for manufacturing information carriers. 4,233,261, Cl. 264-293.000.
Mikoshiba, Nobuo; and Minagawa, Shoichi, to Clarion Co., Ltd. Elastic surface wave device. 4,233,530, Cl. 307-424.000.
Miller Desk: *See*—
Peele, David L., 4,232,921, Cl. 312-350.000.
Miller, Donald; and Skipton, Robert W., to United States of America, Navy. Marine mammal retrieval apparatus. 4,232,417, Cl. 9-8.00R.
Miller, Frederick C.: *See*—
Joo', Louis A.; and Miller, Frederick C., 4,233,378, Cl. 429-220.000.
Miller, J. Wayne; and Anderson, Mark J., to Union Oil Company of California. Desulfurization of coal. 4,233,034, Cl. 44-1.0SR.
Miller, John A.: *See*—
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.
Miller, Laurence L., to TRW Inc. Fluid controller. 4,232,708, Cl. 137-625.210.
Miller, Oliver G.: *See*—
Bourgeous, Clarence G.; and Miller, Oliver G., 4,232,883, Cl. 280-759.000.
Miller, Peter A. Travelling sheet, flat-bed filter apparatus and system. 4,233,157, Cl. 210-137.000.
Miller, Roy W., to Pullman Incorporated. Cam actuated railway hopper car door operating mechanism. 4,232,989, Cl. 414-387.000.
Mills, Harold E.: *See*—
Hirko, Ronald J.; and Mills, Harold E., 4,233,281, Cl. 423-484.000.

Mills, W. Ralph. to Reynolds Metals Company. Metallic printing inks and metallized papers printed therewith. 4,233,195, Cl. 260-23.00S.
Milton, Russell E. Dual ball towing hitch. 4,232,877, Cl. 280-415.00A.
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, to Teijin Limited. Leathery sheet material and process for the preparation thereof. 4,233,359, Cl. 428-254.000.
Minagawa, Motonobu: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.
Minagawa, Shoichi: *See—*
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Minami, Junichi: *See—*
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Minneapolis Electric Steel Castings Company: *See—*
Player, Duane W.; and Weil, James A., 4,232,834, Cl. 241-293.000.
Minnesota Mining and Manufacturing Company: *See—*
Benham, Judith L., 4,232,950, Cl. 350-349.000.
Huffman, William A., 4,232,949, Cl. 350-349.000.
Worm, Allan T., 4,233,421, Cl. 525-343.000.
Miro, Juan C., to Industria Espanola de Manufacturas Especiales, S.A. Racking mechanism for bobbin machine. 4,232,769, Cl. 192-4.00R.
Mita Industrial Co., Ltd.: *See—*
Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, 4,233,386, Cl. 430-125.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kyomasu, Mikio; and Nakao, Yoshiharu, 4,233,616, Cl. 357-23.000.
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.
Satoh, Tsuyoshi, 4,233,588, Cl. 340-21.000.
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Toda, Kazuo; Hosoda, Tadashi; and Matsuo, Yutaka, 4,233,149, Cl. 204-297.00W.
Mitsubishi Paper Mills, Ltd.: *See—*
Fuchigami, Mitsuru, 4,233,178, Cl. 252-316.000.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Takeda, Makoto; Iwane, Hiroshi; and Hashimoto, Takashi, 4,233,226, Cl. 260-345.200.
Mitsuishi, Yukio: *See—*
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Mitter & Co.: *See—*
Mitter, Mathias, 4,232,601, Cl. 101-120.000.
Mitter, Mathias, to Mitter & Co. Squeegee arrangement. 4,232,601, Cl. 101-120.000.
Miura, Tatsuya: *See—*
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Miura, Yasuki: *See—*
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Miyabara, Stanley M. Oil seal. 4,232,872, Cl. 277-47.000.
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Mizuma, Yoshikuni: *See—*
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Rollmann, Louis D.; and Walsh, Dennis E., 4,233,138, Cl. 208-106.000.
Mochizuki, Manabu: *See—*
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Molins Limited: *See—*
Green, Robert J.; and Hales, Gerald A., 4,233,598, Cl. 340-652.000.
Moller, Kurt H.: *See—*
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Momofuku Ando: *See—*
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.
Monaco, Jose R.; and Rausing, Hans A., to Tetra Pak Developpement SA. Method for sterilizing, homogenizing and packaging protein containing food. 4,233,320, Cl. 426-7.000.
Monahan, Daniel E. Process and apparatus for generating hydrogen and oxygen using solar energy. 4,233,127, Cl. 204-157.10R.
Mongault, Jacques H. C. Device for use as a cot on the rear seat of a vehicle. 4,232,413, Cl. 5-94.000.
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, to Hitachi Chemical Company, Ltd. Resin composition with low shrinkage. 4,233,413, Cl. 525-168.000.
Monroe, Ronald D.: *See—*
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Monsanto Company: *See—*
Bulkley, Charles W., 4,233,409, Cl. 525-71.000.
Dyroff, David R.; and Lynch, Gary J., 4,233,422, Cl. 525-398.000.
Dyroff, David R.; Lynch, Gary J.; and Papanu, Victor D., 4,233,423, Cl. 525-398.000.
Mayer, James M.; and Payne, John H., 4,233,173, Cl. 252-102.000.
Van Eenam, Donald N., 4,233,417, Cl. 525-359.000.
Moon, William S., to Measurex Corporation. Method for controlling the thickness or weight of extruded stock. 4,233,255, Cl. 264-40.400.
Moore, George E., Jr. Apparatus for coupling a tractor and farm implement. 4,232,878, Cl. 280-461.00A.
Moorhouse, Major D.: *See—*
Pearson, Kenneth A.; and Moorhouse, Major D., 4,232,513, Cl. 60-39.09R.
Moran, Robert L.; and O'Hara, Francis J., to Raytheon Company. Broadband antenna element. 4,233,608, Cl. 343-728.000.
Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Process for shaping a thermoplastic layer. 4,233,380, Cl. 430-2.000.
Moreau, Michel: *See—*
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Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, to Maruma Jyusharyo Kabushikigaisha. Metal build-up apparatus with improved cooling means. 4,233,487, Cl. 219-76.110.
Morimoto, Kazuhisa: *See—*
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Morimoto, Kiyoshi, to Futaba Denshi Kogyo K.K. Compound semiconductor wafer. 4,233,613, Cl. 357-16.000.
Morita, Toyoo: *See—*
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Morrison-Knudsen Company, Inc.: *See—*
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Burgin, Charles W., 4,232,416, Cl. 8-156.000.
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Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.
Mosher, Mitchell R. Orthotic insert. 4,232,457, Cl. 36-44.000.
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Motor Wheel Corporation: *See—*
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Motorola, Inc.: *See—*
Alberkrack, Jade H., 4,233,557, Cl. 323-9.000.
Chapman, Ronald H.; and Hansen, Kenneth A., 4,233,575, Cl. 331-111.000.
Chmura, Stanley J., 4,233,565, Cl. 329-50.000.
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Moulton, Clifford H.: *See—*
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Muehlthaler, Wolfgang: *See—*
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Mueller, Dale A., to Honeywell Inc. Heat pump system compressor start fault detector. 4,232,530, Cl. 62-160.000.
Mueller, Herbert; and Huchler, Otto H., to BASF Aktiengesellschaft. Purification of tetrahydrofuran. 4,233,228, Cl. 260-346.110.
Muelling, Earl L., to Earl Enterprises, Inc., The. Animal trap. 4,232,472, Cl. 43-61.000.

Muguruma, Yoshikata: *See—*
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Muller, Erwin: *See—*
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Muller, George H.; and Downs, William T., to A.I.R. Foundation. Bulk material retaining system having plural retainers. 4,232,803, Cl. 222-105.000.
Muller, Karl-Heinz, to Dr. Hans Boeckels GmbH & Co. Method of and apparatus for operating a dosing arrangement for good and poorly flowing loose material. 4,232,781, Cl. 198-505.000.
Muller, Lutz: *See—*
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Murata, Masami, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,233,681, Cl. 368-242.000.
Murata, Toshinori; Matsuura, Shigeo; Miyamoto, Hiroshi; and Akutsu, Eisaku, to Hitachi, Ltd. Digital-to-analog converter of the pulse width modulation type. 4,233,591, Cl. 340-347.0DA.
Murbach, Erwin: *See—*
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Murray, John A., to U.S. Terrazzo Panels, Inc. Apparatus for the manufacture of concrete products. 4,233,008, Cl. 425-77.000.
Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., to Exxon Research & Engineering Co. Acid catalyzed hydrocarbon conversion processes utilizing a catalyst comprising a Group IVB, VB or VIB metal oxide on an inorganic refractory oxide support. 4,233,139, Cl. 208-112.000.
Muto, Masahito: *See—*
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Myers, Claude V.: *See—*
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Myers, Philip A.; and Westlake, David J., to British Petroleum Company Limited, The. Heteropolysaccharide biopolymer. 4,233,438, Cl. 536-1.000.
Myodo, Osamu: *See—*
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Naarden International N.V.: *See—*
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Nagai, Kenichi: *See—*
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Nagasaka, Takakazu; and Nakamura, Yasuhide, to Sharp Kabushiki Kaisha. Coin dispenser. 4,232,689, Cl. 133-4.00A.
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Larynx stroboscope for photography. 4,232,685, Cl. 128-773.000.
Nagata, Wataru: *See—*
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.
Nagato, Nobuyuki; and Sugiyama, Yuichi, to Showa Denko Kabushiki Kaisha. Process for producing ketazine by reacting a ketone with ammonia and a peroxide. 4,233,242, Cl. 564-249.000.
Nagel, Karl; and Conzelmann, Gerhard, to Robert Bosch GmbH. Voltage regulator, particularly for automotive use. 4,233,556, Cl. 322-28.000.
Nakagawa, Jihei. Objective lens system for microscopes. 4,232,940, Cl. 350-175.0ML.
Nakahara, Yutaka: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.
Nakahashi, Kenichi, to Olympus Optical Co., Ltd. Optical system of colposcope. 4,232,933, Cl. 350-19.000.
Nakamura, Akio: *See—*
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.
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Nakano, Hideharu; and Sakata, Shinichi, to Matsushita Electric Works, Ltd. Assembling and energizing compact motors. 4,233,531, Cl. 310-42.000.
Nakano, Isamu: *See—*
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Nakano, Keita; and Shibata, Yasuo, to Rank Xerox Limited. Recording head for electrostatic printing apparatus. 4,233,611, Cl. 346-155.000.
Nakano, Masahiko; and Miyauchi, Nobuaki, to Kyocera International, Inc. Integrated circuit lead coupling device and method. 4,232,815, Cl. 228-180.00A.
Nakano, Takashi: *See—*
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Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, to Nippon Kayaku Kabushiki Kaisha. Coriolin derivatives. 4,233,224, Cl. 260-343.600.
Nalco Chemical Co.: *See—*
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Nanodata Corporation: *See—*
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Narayanswamy, Venkatachalam: *See—*
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Nath, Gunther. Apparatus for applying intense light radiation to a limited area. 4,233,493, Cl. 219-354.000.
National Research Development Corporation: *See—*
Allen, Edward A.; Phillips, Peter C.; and Smithson, Terence, 4,233,035, Cl. 44-73.000.
Samuelson, Kent M.; and Tuke, Michael A., 4,232,404, Cl. 3-1.910.
Soothill, John F.; and Levinsky, Roland J., 4,233,286, Cl. 424-12.000.
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National Semiconductor Corporation: *See—*
Burdick, Edward J., 4,233,524, Cl. 307-205.000.
Karp, Joel A.; Lee, Ilbok; and Reed, John A., 4,233,675, Cl. 365-205.000.
Reyling, George F., Jr., 4,233,670, Cl. 365-15.000.
NCR Corporation: *See—*
Coleman, William E., 4,233,544, Cl. 315-169.200.
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Nestorovic, Mioljub, to Technical Audio Products Corporation. Distortion free power limiting and clipping prevention circuit. 4,233,566, Cl. 330-59.000.
Neubeck, Clifford E., to Rohm and Haas Company. Process for spray drying enzymes. 4,233,405, Cl. 435-187.000.
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Newton, John E. Cervical support collar. 4,232,663, Cl. 128-75.000.
Nice, Ralph A.: *See—*
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.
Niederhauser, Donald O., to Du Pont de Nemours, E. I., and Company. Suede-like product and process therefor. 4,233,349, Cl. 428-92.000.
Nieh, Edward C. Y.; and Keating, Kenneth P., to Texaco Development Corp. Process for purifying triethylenediamine. 4,233,447, Cl. 544-352.000.
Nielsen, Mogens B. Percussive tool shaft. 4,232,985, Cl. 408-226.000.
Nielson, Niel E.: *See—*
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Nightingale Industries Limited: *See—*
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Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*
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Nihon Kogyo Kabushiki Kaisha: *See—*
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Nikitin, Mikhail D.: *See—*
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Nilsson, Bengt, to Lidkopings Mekaniska Verkstads AB. Restrictor for a bearing pocket in a hydrostatic bearing. 4,232,913, Cl. 308-9.000.

Nippon Electric Co., Ltd.: *See—*
Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, 4,233,474, Cl. 179-81.00B.
Kurogi, Yukinori; and Sugibuchi, Kiyoshi, 4,233,526, Cl. 307-238.000.
Maehashi, Yukio; and Kosaka, Hidetoshi, 4,233,665, Cl. 364-715.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Uchiyama, Yasuji, 4,232,581, Cl. 84-1.030.

Nippon Kayaku Kabushiki Kaisha: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, 4,233,224, Cl. 260-343.600.

Nippon Kokan Kabushiki Kaisha: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Nippon Oil Co., Ltd.: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Nippon Soken, Inc.: *See—*
Okumura, Kazunari; Yamamoto, Shinichi; and Suzuki, Zituo, 4,233,351, Cl. 428-116.000.
Tsuge, Noboru; Kuwakado, Satoo; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Furukawa, Kazuo; and Furukawa, Sumio, 4,233,669, Cl. 365-15.000.
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Nippondenso Co., Ltd.: *See—*
Asai, Masahiro, 4,232,646, Cl. 123-600.000.

Nirschl, Joseph P.: *See—*
Pracht, Hans J.; and Nirschl, Joseph P., 4,233,451, Cl. 548-354.000.

Nishida, Minoru: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Nishihara, Kunisuke: *See—*
Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.

Nishikaichi, Yuji: *See—*
Maruyama, Shigeo; Nishikaichi, Yuji; Fujinaga, Shigeki; and Miura, Tatsuya, 4,233,491, Cl. 219-125.100.

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Nitschke, John S. Speed adaptive conveyor drive for a glass manufacturing system. 4,233,053, Cl. 65-163.000.

Nitshke, Norman L., to Bristol Myers Co. Protective sheath for syringe needle. 4,232,669, Cl. 128-218.00N.

Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, to AGFA-Gevaert, A.G. Process for the hardening of photographic layers utilizing fast acting hardener and polysaccharide. 4,233,398, Cl. 430-495.000.

Nobuoka, Soichiro: *See—*
Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, 4,233,283, Cl. 423-633.000.

Noda, Hideo, to Shimano Industrial Company, Limited. Fishing reel having support for a deflected spool shaft. 4,232,842, Cl. 242-212.000.

Nodov, Eugene; Scott, Burton W.; Denlinger, George W.; and Sutera, Richard, to Mead Corporation, The. Document illumination system. 4,232,964, Cl. 355-70.000.

Noland, Richard D. Baghouse with rotating sweep arm. 4,233,041, Cl. 55-287.000.

Nolken, Ernst, to Hoechst Aktiengesellschaft. Aqueous vinyl polymer dispersion emulsified with an alkane phosphonic acid derivative. 4,233,198, Cl. 260-29.6MP.

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Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Noriaki, Nakao: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.

Norris Industries, Inc.: *See—*
Beisch, Hans R., 4,232,907, Cl. 301-37.00R.

Northern Telecom Limited: *See—*
Hogeboom, John G., 4,233,528, Cl. 307-353.000.
Leung, Ernest C.; and Revah, Isaac R., 4,233,646, Cl. 361-399.000.

Northrop Corporation: *See—*
Coleman, John R., 4,233,605, Cl. 343-18.00D.

Northup, Francis B.; and Hart, Donald R., to Menegatto, Carlo. Apparatus and method for wrapping core yarns. 4,232,507, Cl. 57-16.000.

Northup, John A., Jr. Holder attachment for use with furnace hardware. 4,233,468, Cl. 13-25.000.

Northwestern University: *See—*
Schaeffer, Anthony J., 4,233,263, Cl. 422-28.000.

Nova Biomedical Corporation: *See—*
Spaziani, Frederick F.; and Fowler, James E., 4,233,136, Cl. 204-195.00L.

Novacek, William G., to Bicron Electronics Company. Flux shielded solenoid. 4,233,583, Cl. 335-236.000.

Novak, Ronald W.; and Kine, Benjamin B., to Rohm and Haas Company. Water-soluble air-oxidizing acrylic coatings. 4,233,362, Cl. 428-332.000.

NSK-Warner K. K.: *See—*
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

Numakura, Toshihiko: *See—*
Yamagiwa, Kazuo; and Numakura, Toshihiko, 4,233,621, Cl. 358-8.000.

Numata, Saburo; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd. Memory locking means of an exposure control circuit for a camera. 4,232,955, Cl. 354-51.000.

O & K Orenstein & Koppel Aktiengesellschaft: *See—*
Ziplies, Herbert; and Pyschik, Werner, 4,232,588, Cl. 91-518.000.

O. M. Edwards Co.: *See—*
Remick, David W.; and Ahlgren, David T., 4,232,492, Cl. 52-172.000.

O & R Products, Incorporated: *See—*
Roach, Herschel, 4,232,863, Cl. 272-111.000.

Oates, Alfred E.: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.

Obata, Hideo: *See—*
Koseki, Wasuke; Mori, Kunihito; Obata, Hideo; and Shinchi, Yoshikazu, 4,232,536, Cl. 68-12.00R.

Occidental Chemical Company: *See—*
Hirko, Ronald J.; and Mills, Harold E., 4,233,281, Cl. 423-484.000.

Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Automobile speed control method and system. 4,232,757, Cl. 180-176.000.

Ochii, Kiyofumi: *See—*
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,233,672, Cl. 365-181.000.

O'Connor, James M.; and Sessions, Willie J., to Olin Corporation. Modified polyurethane liquid polymer compositions. 4,233,205, Cl. 260-40.0TN.

Oelke, Waldemar W.: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,232,809, Cl. 225-93.500.

Oemus, Klaus-Dieter: *See—*
Karpe, Wolfgang; Kluge, Johannes; and Oemus, Klaus-Dieter, 4,233,479, Cl. 200-77.000.

Office National d'Etudes et de Recherches Aerospatiales (ONERA): *See—*
Favre, Jean-Paul; Perrin, Joseph; Philbert, Michel; and Surget, Jean, 4,232,559, Cl. 73-827.000.

Ogawa, Hisashi: *See—*
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,232,885, Cl. 280-804.000.

Ogihara, Masuo: *See—*
Kitai, Kiyoshi; and Ogihara, Masuo, 4,232,511, Cl. 368-73.000.

Ogura, Kiyoshi. Case for a tape. 4,232,786, Cl. 206-409.000.

O'Hara, Francis J.: *See—*
Moran, Robert L.; and O'Hara, Francis J., 4,233,608, Cl. 343-728.000.

Ohmi, Atsushi: *See—*
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Ohnishi, Fumio: *See—*
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.

Ohnsorg, Roger W., to Carborundum Company, The. Process for injection molding sinterable carbide ceramic materials. 4,233,256, Cl. 264-44.000.

Ohnuma, Sadabumi: *See—*
Tsukada, Katsuo; and Ohnuma, Sadabumi, 4,233,156, Cl. 210-101.000.

Ohtomo, Koichiro; and Horikawa, Yukio, to Kanebo, Ltd.; and Kanebo Spun Silk, Ltd. Finely powdered fibroin and process for producing same. 4,233,211, Cl. 260-123.700.

Ohura, Osami; and Fujimoto, Osamu, to Tokai Denka Kogyo Kabushiki Kaisha. Process for preparing thiourea dioxide. 4,233,238, Cl. 260-513.700.

Okabe, Kazuo: *See—*
Ono, Masaaki; Okabe, Kazuo; and Miura, Yasuki, 4,233,352, Cl. 428-141.000.

Okabe, Takahiro: *See—*
Kaneko, Kenji; and Okabe, Takahiro, 4,233,574, Cl. 331-108.00D.

Okai, Sakuo; and Kimoto, Koichi, to Napp Systems (USA) Inc. Water developable photopolymerizable compositions containing phosphine activators and saponified polyvinyl acetate. 4,233,391, Cl. 430-281.000.

Okamoto, Hiroo; and Nakauchi, Shunsaku, to Showa Yuka Kabushiki Kaisha. Flare monitoring apparatus. 4,233,596, Cl. 340-578.000.

Okamura, Kikuo: *See—*
Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, 4,232,561, Cl. 74-191.000.

Okamura, Yasushi; and Tanaka, Kiichiro, to Matsushita Electric Industrial Co., Ltd. Stationary record player. 4,232,868, Cl. 274-9.00C.

Okawa, Nobuo: *See—*
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, 4,233,359, Cl. 428-254.000.

Okumura, Kazunari; Yamamoto, Shinichi; and Suzuki, Zituo, to Nippon Soken, Inc. Ceramic honeycomb structure. 4,233,351, Cl. 428-116.000.

Olin Corporation: *See—*
Doonan, David F.; and Moller, Kurt H., 4,233,444, Cl. 544-192.000.
Gasper, Kenneth E., 4,233,265, Cl. 422-135.000.
Lynch, Richard W.; Hilliard, Garland E.; and Dotson, Ronald L., 4,233,122, Cl. 204-98.000.
O'Connor, James M.; and Sessions, Willie J., 4,233,205, Cl. 260-40.0TN.
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,069, Cl. 75-157.500.

Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, to Societe Nationale Elf-Aquitaine (Production). Photosynthesis of mercaptans. 4,233,128, Cl. 204-158.00R.

Olson, Jerry A.: *See—*
Migrin, Robert S.; and Olson, Jerry A., 4,232,549, Cl. 73-202.000.

Olympus Optical Co., Ltd.: *See—*
Hashimoto, Akihiko; and Koiwai, Tamotsu, 4,232,956, Cl. 354-106.000.
Hyakumura, Kazushi, 4,232,945, Cl. 350-223.000.
Imai, Toshihiro, 4,232,944, Cl. 350-222.000.
Nakahashi, Kenichi, 4,232,933, Cl. 350-19.000.
Sato, Masaaki, 4,233,686, Cl. 455-344.000.
Sawamura, Ichiro; and Tsuboshima, Kosaku, 4,232,970, Cl. 356-432.000.
Tojo, Tsutomu, 4,232,941, Cl. 350-175.0ML.

Omokawa, Hiroyoshi: *See—*
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,233,061, Cl. 71-103.000.

Ondesko, John J.: *See—*
Baumgardt, Walter G.; Ondesko, John J.; and Zysman, Bernard K., 4,233,203, Cl. 260-38.000.

Ono, Keiichi; Sasajima, Kikuo; Katsube, Junki; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Spiro-4'-piperidine compounds and their pharmaceutical compositions. 4,233,307, Cl. 424-267.000.

Ono, Masaaki; Okabe, Kazuo; and Miura, Yasuki, to Toray Industries, Inc. Polyester film and method of manufacture thereof. 4,233,352, Cl. 428-141.000.

Oono, Hideshi: *See—*
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.

Oostvogels, Franciscus M. P.; Melis, Gustaaf; and Van Laarhoven, Aime P. A. M., to U.S. Philips Corporation. High-pressure discharge lamp. 4,233,542, Cl. 315-73.000.

Orchimed SA: *See—*
Mieville, Andre, 4,233,298, Cl. 424-244.000.

Orion Industries, Inc.: *See—*
Tucker, James I., 4,232,421, Cl. 16-2.000.

Orlowski, Gerald J.; and Dugle, Thomas E., to Fun-Tech Products Company. Animal exerciser. 4,232,630, Cl. 119-29.000.

Osgood, George M. Method and apparatus for regulating electrolyte solution level in a liquid rheostat. 4,232,998, Cl. 417-36.000.

Oswald, George J., to Morrison-Knudsen Company, Inc. Aircraft illumination apparatus and operating circuitry. 4,233,652, Cl. 362-63.000.

Oswald, Leo A., to Owens-Corning Fiberglas Corporation. Collapsible mandrel. 4,233,020, Cl. 425-471.000.

Otani, Mitsunobu: *See—*
Senda, Teruo; and Otani, Mitsunobu, 4,233,159, Cl. 210-413.000.

Otoi, Kiyoshi; and Horikawa, Yukio, to Kanebo, Ltd.; and Kanebo Spun Silk, Ltd. Process for producing a fine powder of silk fibroin. 4,233,212, Cl. 260-123.700.

Otsu, Akira: *See—*
Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, 4,233,309, Cl. 424-270.000.

Otsuki, Tomonari; and Inouye, Hiromasa, to Bunker Ramo Corporation. Electrical connector. 4,232,923, Cl. 339-17.0LC.

Otterpohl, James H. Wood-burning furnace. 4,232,653, Cl. 126-77.000.

Otteson, Kenneth M.: *See—*
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,233,328, Cl. 426-250.000.

Otton, Jean, to Rhone-Poulenc Industries. Process for preparing olefins by metathesis of cyclic olefins with acyclic olefins. 4,233,230, Cl. 260-410.90R.

Outboard Marine Corporation: *See—*
Prince, Anthony P., 4,232,771, Cl. 192-0.096.

Owades, Joseph L., to Soloway, Norman P., a part interest. Method of making a beverage composition. 4,233,334, Cl. 426-590.000.

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Canfield, Sheldon A., 4,233,520, Cl. 250-561.000.
Eastes, Walter L., 4,233,051, Cl. 65-134.000.
Oswald, Leo A., 4,233,020, Cl. 425-471.000.

Owens-Illinois, Inc.: *See—*
Brady, Thomas E.; and Go, Santos W., 4,233,022, Cl. 425-525.000.
Curto, Nicholas J., 4,233,262, Cl. 264-509.000.
Frissora, Joseph R.; and Platt, Michael H., 4,232,655, Cl. 126-420.000.

Oxy Metal Industries Corporation: *See—*
Howell, John K., Jr., 4,233,197, Cl. 260-29.40R.
Tomaszewski, Lillie C., 4,233,124, Cl. 204-146.000.

Oy Wartsila Ab: *See—*
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Oya, Masayuki: *See—*
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Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, to Chiyoda Chemical Engineering & Construction Co., Ltd.; and Kureha Kagaku Kogyo Kabushiki Kaisha. Method of heat recovering from high temperature thermally cracked hydrocarbons. 4,233,137, Cl. 208-48.00Q.

P. R. Mallory & Co. Inc.: *See—*
Bro, Per; and Wallis, George, 4,233,372, Cl. 429-174.000.

Pace, Salvatore J.; and Kumar, Anand, to Technicon Instruments Corporation. Electrode for voltammetric immunoassay. 4,233,144, Cl. 204-195.00B.

Pacesetter Systems, Inc.: *See—*
Schulman, Joseph H., 4,232,679, Cl. 128-419.0PG.

Pai, Damodar M.: *See—*
Turner, S. Richard; Yanus, John F.; and Pai, Damodar M., 4,233,384, Cl. 430-59.000.

Palazzo, Vito: *See—*
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Palmer, David A.: *See—*
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Palmieri, Joseph M.: *See—*
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,639, Cl. 361-44.000.
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Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,232,622, Cl. 113-121.00C.

Panas, Walter, to Wheaton Industries. Machine for forming expanded resinous products. 4,233,006, Cl. 425-4.00R.

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Papanu, Victor D.: *See—*
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Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,232,779, Cl. 198-472.000.

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Parker, James A., to Collier-Keyworth Company. Chair control. 4,232,900, Cl. 297-305.000.

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DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., 4,233,482, Cl. 200-163.000.

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Day, Reed H., 4,232,688, Cl. 132-91.000.

Pascal, Helene M.; and Emeury, Jean-Marie L., to Societe Nationale des Poudres et Explosifs. Process for the separation of 2,4-dinitro-6-t-butyl-3-methylanisole, referred to as musk ambrette, from the crude synthesis mixtures in which it is present. 4,233,463, Cl. 568-584.000.

Passmore, Edmund M.: *See—*
Waymouth, John F.; Passmore, Edmund M.; and Duggan, George L., 4,233,536, Cl. 313-174.000.

Patent Technology, Inc.: *See—*
Zenner, Sylvester F.; and Stanberry, Daniel C., 4,233,321, Cl 426-19.000.
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Geissler, Udo M., 4,233,648, Cl. 362-17.000.

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Paul, Kalidas: *See—*
Kyker, Glendon D.; and Paul, Kalidas, 4,233,251, Cl. 570-220.000.

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Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

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Payne, John H.: *See—*
Mayer, James M.; and Payne, John H., 4,233,173, Cl. 252-102.000.

Payne, Thomas R.; and Baker, Alfred L., to General Electric Company. Power control for appliance using high inrush current element. 4,233,498, Cl. 219-490.000.

Payton, Robert E. Brush harvester. 4,232,719, Cl. 144-34.00R.

Pearson, Kenneth A.; and Moorhouse, Major D., to Rolls-Royce Limited. Pressure relief panel for aircraft powerplant. 4,232,513, Cl. 60-39.09R.
Pearson, Stephen J.: *See—*
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Peele, David L., to Miller Desk. Drawer suspension assembly. 4,232,921, Cl. 312-350.000.
Peerless Electronics Research Corporation: *See—*
Schmid, Carl J., 4,233,001, Cl. 417-475.000.
Pelchat, Guy M., to Harris Corporation. Automatic polarization decoupling network. 4,233,576, Cl. 333-16.000.
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Pennewiss, Horst: *See—*
Fink, Herbert; Grumbach, Egon; and Pennewiss, Horst, 4,233,200, Cl. 260-33.8UA.
Pennwalt Corporation: *See—*
Shetty, Bola V., 4,233,217, Cl. 260-239.0BB.
Perez, Steven R.: *See—*
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Persson, Carl G. A.: *See—*
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Peschel, Dieter: *See—*
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Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., to Barry Wright Corporation. Laminated elastomeric end bearings for articulating links. 4,232,563, Cl. 74-470.000.
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Petrini, Bartholomew. Patient transfer device. 4,232,412, Cl. 5-86.000.
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Pfenninger, Billy J.; and Stansel, F. Harrison, to Krause Plow Corporation. Farm implement and control structure for wing sections thereof. 4,232,747, Cl. 172-311.000.
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Phillips, Peter C.: *See—*
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Cobb, Raymond L., 4,233,218, Cl. 260-326.00C.
Cordill, Leroy D., 4,233,500, Cl. 235-310.000.
Eddy, William R., 4,232,629, Cl. 118-669.000.
Phillips, Reginald C. Extensible ladder. 4,232,761, Cl. 182-195.000.
Photon Power, Inc.: *See—*
Roderick, Guy A.; and Locke, Peter, 4,233,085, Cl. 136-244.000.
Pichard, Jacques, to Le Moteur Moderne. Surfaces for combustion chamber of internal combustion engine having controlled fuel injection. 4,232,637, Cl. 123-263.000.
Pickett, Richard G.: *See—*
Ray, Robert T., Sr.; and Pickett, Richard G., 4,232,711, Cl. 138-44.000.
Picone, Stephano. Preservative solution for material shining cloth. 4,233,075, Cl. 106-3.000.
Pierce, Linden W., to General Electric Company. Leak detector for vaporization cooled transformers. 4,232,551, Cl. 73-350.000.
Pierce, Richard C. Winch-operated extendable tongue for boat trailers and the like. 4,232,990, Cl. 414-559.000.
Pieroh, Ernst A.: *See—*
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.
Pietratus, Udo; and Rothemeyer, Fritz, to Continental Gummi-Werke Aktiengesellschaft. Method of and apparatus for producing profiled strands from elastomeric material. 4,233,259, Cl. 264-167.000.
Pilkington P. E. Limited: *See—*
Rogers, Phillip J., 4,232,943, Cl. 350-202.000.
Pillette, Kibbie P. Leak detection system and control using non-rigid bladder. 4,232,736, Cl. 166-53.000.
Pilz, Georg: *See—*
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.
Pioneer Electronic Corporation: *See—*
Sato, Reisuke, 4,233,505, Cl. 250-214.00R.
Piotrowski, Tadeusz, to Etablissement Euroburner. Thermal exchanger. 4,232,733, Cl. 165-89.000.
Pirkle, Sherman J., to Hewlett-Packard Company. Defibrillator charging current regulator. 4,233,659, Cl. 363-134.000.
Pisarevskij, Jurij V.: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.
Pissiotas, Georg: *See—*
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Plaiss, Charles E. Wheeled vehicle lock. 4,232,537, Cl. 70-233.000.
Plass, Vernon F. Apparatus for destructive distillation of cellulosic materials. 4,233,024, Cl. 432-72.000.
Plaster, Ronnie C. Automatic car coupler. 4,232,794, Cl. 213-179.000.
Platt, Michael H.: *See—*
Frissora, Joseph R.; and Platt, Michael H., 4,232,655, Cl. 126-420.000.
Player, Duane W.; and Weil, James A., to Minneapolis Electric Steel Castings Company. Roll crusher. 4,232,834, Cl. 241-293.000.
Plempel, Manfred: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.
Plumet, Lucien, to Solvay & Cie. Process for dispersing finely divided particles in an aqueous medium. 4,233,081, Cl. 106-214.000.
Pohanka, Robert C.: *See—*
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Pollman, Frederic W.: *See—*
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Polychrome Corporation: *See—*
Jargiello, Paul, 4,233,390, Cl. 430-156.000.
Pontius, Duane H.; and Smith, Wallace B., to United States of America, Administrator U.S. Environmental Protection Agency. Method of and apparatus for reducing back corona effects. 4,233,037, Cl. 55-2.000.
Popov, Alexei N.: *See—*
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.
Possell, Clarence R. Geothermal turbine and method of using the same. 4,232,992, Cl. 415-90.000.
Potter, James C.; and Sosnowski, Stanislaw J. A., to Lucas Industries Limited. Fuel pumping apparatus. 4,232,644, Cl. 123-450.000.
Pouget, Rene, to Aciers et Outillage Peugeot. Electric inertia-type starter device for a heat engine. 4,233,521, Cl. 290-38.00B.
PPG Industries, Inc.: *See—*
Comperatore, John A.; Wise, David J.; and Black, Edward D., 4,233,050, Cl. 65-107.000.
Cuevas, Ephraim A., 4,232,902, Cl. 299-4.000.
Gintert, Dean W., 4,233,048, Cl. 65-27.000.
Hazel, John G., 4,233,077, Cl. 106-43.000.
Lavanish, Jerome M., 4,233,057, Cl. 71-090.000.
Seymour, Samuel L., 4,233,049, Cl. 65-106.000.
Sheppard, Robert S., 4,233,277, Cl. 423-297.000.
Stultz, James C.; and Pecoraro, George A., 4,233,047, Cl. 65-27.000.
Walser, Douglas M., 4,233,046, Cl. 65-3.00C.
Pracht, Hans J.; and Nirschl, Joseph P., to Procter & Gamble Company, The. Process for making imidazolinium salts. 4,233,451, Cl. 548-354.000.
Pragnell, Robert J.: *See—*
Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., 4,233,357, Cl. 428-245.000.
Presley, Charles L., to Kobe, Inc. Method for treating petroleum well pumping power fluid. 4,233,154, Cl. 210-800.000.
Preston, Ronald: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.
Prevignano, Paolo: *See—*
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Price, Barry J.: *See—*
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.
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Burris, Robert E.; and Budyak, Robert J., 4,232,696, Cl. 137-62.000.
Prince, Anthony P., to Outboard Marine Corporation. Single lever remote control. 4,232,771, Cl. 192-0.096.
Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., to Ault, Inc. Automatic dual mode battery charger. 4,233,553, Cl. 320-23.000.
Procter & Gamble Company, The: *See—*
Camden, James B.; and McCarty, Mark L., 4,233,235, Cl. 260-502.00R.
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Fawzi, Mahdi B., 4,233,284, Cl. 424-1.000.
Lucas, Malcolm B.; and Van Coney, Robert H., 4,233,017, Cl. 425-290.000.
Pracht, Hans J.; and Nirschl, Joseph P., 4,233,451, Cl. 548-354.000.
Proctor & Gamble Company, The: *See—*
Davis, James E., 4,233,164, Cl. 252-8.800.
Products of Advanced Technology, Inc.: *See—*
Hosterman, Craig; and Kerwin, William J., 4,232,698, Cl. 137-68.00R.
Produits Chimiques Ugine Kuhlmann: *See—*
Koeppel, Robert, 4,233,080, Cl. 106-87.000.
Ricard, Jean; and Excoffon, Charles, 4,233,338, Cl. 427-85.000.
Prohazka, George J., to Combustion Engineering, Inc. Maintenance platform built upon retractable support beams. 4,232,636, Cl. 122-479.00R.
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Pullman Incorporated: *See—*
Hallam, Keith J.; and Marsden, Dennis B., 4,232,793, Cl. 213-43.000.
Miller, Roy W., 4,232,989, Cl. 414-387.000.
Pulp and Paper Research Institute of Canada: *See—*
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Purdie, Anthony F.: *See—*
Arthurs, Eugene G.; and Purdie, Anthony F., 4,233,572, Cl. 331-94.50M.
Putch, Samuel W., to Nelson, Norman A., a part interest. Recockable well hanger. 4,232,889, Cl. 285-141.000.
Pyle, Walter R., to Chevron Research Company. Coaxial vapor recovery nozzle. 4,232,715, Cl. 141-1.000.
Pyott-Boone Machinery Corp.: *See—*
Teti, John J., 4,232,930, Cl. 339-186.00M.
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R. A. Jones & Co. Inc.: *See—*
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Radford, Herschel D.: *See—*
D'Souza, Gerard J.; and Radford, Herschel D., 4,233,276, Cl. 423-230.000.
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Fenner, Gary W.; and Ragi, Elias G., 4,232,728, Cl. 165-1.000.
Raines, Dale A.; and Ainsworth, Oliver C., to Dow Chemical Company, The. Ethylene carbonate process. 4,233,221, Cl. 260-340.200.
Ralph M. Parsons Company, The: *See—*
Beavon, David K.; and Mackles, Mark, 4,233,141, Cl. 208-236.000.
Ramanathan, Sivam: *See—*
Chalon, Jack; Ramanathan, Sivam; and Turndorf, Herman, 4,232,667, Cl. 128-203.260.
Rampe, John F., to Rampe Research. Tumbler-type finishing machine. 4,232,486, Cl. 51-164.100.
Rampe Research: *See—*
Rampe, John F., 4,232,486, Cl. 51-164.100.
Ramsey, David E.; and Grindstaff, Lloyd I., to Great Lakes Carbon Corporation. Electrode composition. 4,233,148, Cl. 204-291.000.
Randall, Cyril A.: *See—*
Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., 4,232,704, Cl. 137-218.000.
Randlett, M. Ronald: *See—*
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Rank Xerox Limited: *See—*
Nakano, Keita; and Shibata, Yasuo, 4,233,611, Cl. 346-155.000.
Rao, V. N. Mallikarjuna; and Ziemecki, Stanislaw B., to Du Pont de Nemours, E. I., and Company. Process for oxidation of methanol to formaldehyde with nitrous oxide. 4,233,248, Cl. 568-487.000.
Rasberger, Michael: *See—*
Rody, Jean; and Rasberger, Michael, 4,233,410, Cl. 525-123.000.
Rody, Jean; and Rasberger, Michael, 4,233,412, Cl. 525-167.000.
Ratcliffe, Charles T.; and Yardley, James T., to Allied Chemical Corporation. Process for preparing alkylene episulfides and episelenides. 4,233,131, Cl. 204-162.00R.
Rausing, Hans A.: *See—*
Monaco, Jose R.; and Rausing, Hans A., 4,233,320, Cl. 426-7.000.
Raveglia, Dalmazio; Lonati, Carlo; and Macchi, Giancarlo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Flat transmission path for communication system. 4,233,577, Cl. 333-136.000.
Rawson, Eric G.; and Metcalfe, Robert M., to Xerox Corporation. Active T-coupler for fiber optic local networks which permits collision detection. 4,233,589, Cl. 340-147.00R.
Ray, Robert T., Sr.; and Pickett, Richard G., to Aqua-Retain Valve, Inc. Flow regulating device. 4,232,711, Cl. 138-44.000.
Raychem Limited: *See—*
Squires, David T., 4,232,712, Cl. 138-109.000.
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Moran, Robert L.; and O'Hara, Francis J., 4,233,608, Cl. 343-728.000.
RCA Corporation: *See—*
Bell, Alan E., 4,233,626, Cl. 358-128.500.
Botez, Dan; Ettenberg, Michael; and Kressel, Henry, 4,233,614, Cl 357-17.000.
Groeneweg, Willem H., 4,233,622, Cl. 358-11.000.
Hawrylo, Frank Z.; and Kressel, Henry, 4,233,090, Cl. 148-171.000.
Hinn, Werner; and Hinderling, Jurg, 4,233,624, Cl. 358-65.000.
Strother, John A., 4,233,501, Cl. 250-203.00R.
Webb, Paul P.; and McIntyre, Robert J., 4,233,619, Cl. 357-74.000.
Rechter, Harold L., to Chicago Fire Brick Company. Aluminous refractory compositions containing carbon, silicon and chrome oxide. 4,233,079, Cl. 106-56.000.
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Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.
Redwine, Terry W., to Du Pont de Nemours, E. I., and Company. Butadiene chlorination process. 4,233,252, Cl. 570-231.000.
Reed, John A.: *See—*
Karp, Joel A.; Lee, Ilbok; and Reed, John A., 4,233,675, Cl. 365-205.000.
Reese, Stanton L. Radioactive materials transporting container and vehicles. 4,232,730, Cl. 165-41.000.
Regie Nationale des Usines Renault: *See—*
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Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.
Reider, Samuel B., to General Motors Corporation. Combustor liner joints. 4,232,527, Cl. 60-754.000.
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Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.
Reiman, Walter C.: *See—*
Sway, Boris; and Reiman, Walter C., 4,233,323, Cl. 426-55.000.
Rein, Arnold R.: *See—*
Ticknor, William G.; and Rein, Arnold R., 4,233,367, Cl. 428-476.300.
Reiner, Alberto, to Crinos Industria Farmacobiologica S.p.A. Pyridoxine derivatives. 4,233,304, Cl. 424-256.000.
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Hatje, Erich; and Reinert, Norbert, 4,232,734, Cl. 165-118.000.
Reinhardt, John H. Collapsible column with covered tray. 4,232,917, Cl. 312-128.000.
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Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.
Reliable Electric Company: *See—*
Baumbach, Bertram W., 4,233,641, Cl. 361-119.000.
Remick, David W.; and Ahlgren, David T., to O. M. Edwards Co. Drying apparatus for multi-glazed window unit. 4,232,492, Cl. 52-172.000.
Rempfler, Hermann: *See—*
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, 4,233,060, Cl. 71-94.000.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.
Rengo Kabushiki Kaisha (Rengo Co., Ltd.): *See—*
Tokuno, Masateru, 4,232,859, Cl. 271-35.000.
REPA Feinstanzwerk GmbH: *See—*
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Restaurant Technology, Inc.: *See—*
Kroll, Steve; and Schindler, James C., 4,232,596, Cl. 99-410.000.
Reuter, Franz G.; and Menzel, Tankred, to Reuter Technologie GmbH. Electrically conductive plastics materials and process for their production. 4,233,191, Cl. 252-511.000.
Reuter Technologie GmbH: *See—*
Reuter, Franz G.; and Menzel, Tankred, 4,233,191, Cl. 252-511.000.
Revah, Isaac R.: *See—*
Leung, Ernest C.; and Revah, Isaac R., 4,233,646, Cl. 361-399.000.
Reyling, George F., Jr., to National Semiconductor Corporation. Fault transparent magnetic bubble memory. 4,233,670, Cl. 365-15.000.
Reynolds, George A.: *See—*
Petropoulos, Constantine C.; Reynolds, George A.; and VanAllan, James A., 4,233,443, Cl. 542-454.000.
Reynolds Metals Company: *See—*
Mills, W. Ralph, 4,233,195, Cl. 260-23.00S.
Rhone-Poulenc Industries: *See—*
Bargain, Michel; and Prud'Homme, Christian, 4,233,427, Cl. 525-478.000.
Blanc, Jean-Pierre; and Meiller, Francois, 4,233,076, Cl. 106-38.350.
Otton, Jean, 4,233,230, Cl. 260-410.90R.

Ricard, Jean; and Excoffon, Charles, to Produits Chimiques Ugine Kuhlmann. Processes for deposition of thin films of crystalline silicon on graphite. 4,233,338, Cl. 427-85.000.

Rice, Roy W.; and Pohanka, Robert C., to United States of America, Navy. Flexible, shapeable, composite acoustic transducer. 4,233,477, Cl. 179-110.00A.

Richard, Jean-Claude: *See*—
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., to Shell Oil Company. Temporarily plugging a subterranean reservoir with a self-foaming aqueous solution. 4,232,741, Cl. 166-281.000.

Richens, Jack W.: *See*—
Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., 4,232,717, Cl. 141-179.000.

Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, to Howmedica International, Inc. Zweigniederlassung. Tube type supply container for medical syringe. 4,232,670, Cl. 128-224.000.

Richter, Siegfried; and Vinkovic, Josef, to Swiss Aluminum Ltd. Process for etching and preparing nickel-polyester offset printing plates. 4,233,110, Cl. 156-656.000.

Richters, Johannes J.: *See*—
Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,233,160, Cl. 210-512.00M.

Ricoh Company, Ltd.: *See*—
Harada, Masahide; and Mochizuki, Manabu, 4,233,511, Cl. 250-325.000.
Koike, Tadao, 4,232,963, Cl. 355-49.000.

Riecker, Johann G.; and Schroter, Horst, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Equipment for collecting, extracting and purifying foul gases arising on the coke side of a battery of chamber coke-ovens with vertical flue. 4,233,111, Cl. 202-230.000.

Riedel-de Haen Aktiengesellschaft: *See*—
Schmand, Horst; and Dannenberg, Wolfgang, 4,233,456, Cl. 562-401.000.

Riken Corporation: *See*—
Watanabe, Tamotu; Sakata, Tatsuei; and Mizuma, Yoshikuni, 4,233,072, Cl. 75-236.000.

Riken Piston Ring Industrial Co., Ltd.: *See*—
Takemura, Kazutoshi, 4,233,073, Cl. 75-243.000.

Ringe, Stephen J., to Fruehauf Corporation. Door hardware with positive torque. 4,232,891, Cl. 292-218.000.

Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., to GTE Products Corporation. Process for producing cobalt powder. 4,233,063, Cl. 75-0.5AA.

Ritter, Alfred E.; and Kleinwachter, Jurgen, to Max-Planck-Gesellschaft zur Fordenung der Wissenschaften e.V. Heat collector system. 4,232,820, Cl. 237-2.00B.

Rizzi, Luigi: *See*—
Lupatin, Elio; and Rizzi, Luigi, 4,233,658, Cl. 363-26.000.

Roach, Herschel, to O & R Products, Incorporated. Fitness bar. 4,232,863, Cl. 272-111.000.

Robbins, Michael B.: *See*—
Cottrell, Edward D.; and Robbins, Michael B., 4,232,811, Cl. 227-117.000.

Roberge, Frank L., to Garrett Corporation, The. Fluid control valve and method. 4,232,695, Cl. 137-1.000.

Robert Bosch GmbH: *See*—
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,232,545, Cl. 73-35.000.
Fussner, Paul, 4,233,584, Cl. 335-260.000.
Nagel, Karl; and Conzelmann, Gerhard, 4,233,556, Cl. 322-28.000.
Rohrbach, Fritz, 4,232,749, Cl. 173-48.000.

Roberts, Donald E., to Hillside Engineering, Inc. Presorted flatware washing method and apparatus. 4,233,083, Cl. 134-25.200.

Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Block polymers of hydroxyalkyl phthalate esters and tetrahydrofuran/alkylene oxide copolymers. 4,233,436, Cl. 528-366.000.

Roche, Bernard G. Telephone station with automatic switch-over between pulse code dialling and multifrequency code dialling. 4,233,475, Cl. 179-84.0VF.

Roche, Elizabeth M. Multi-functional convertible garment. 4,232,402, Cl. 2-93.000.

Roche, Lawrence R., to Dyna Technology, Inc. Alternating current generator for providing three phase and single phase power at different respective voltages. 4,233,555, Cl. 322-25.000.

Rockwell International Corporation: *See*—
Vasile, Carmine F., 4,232,557, Cl. 73-629.000.

Roderick, Guy A.; and Locke, Peter, to Photon Power, Inc. Solar panel module. 4,233,085, Cl. 136-244.000.

Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,233,410, Cl. 525-123.000.

Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,233,412, Cl. 525-167.000.

Roethlein, Richard J.: *See*—
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Rogers, Edward J., to S&C Electric Company. Apparatus for connecting a switch operator to a switch. 4,233,483, Cl. 200-337.000.

Rogers, Howard H.: *See*—
Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., 4,233,347, Cl. 427-352.000.

Rogers, James H.; and Butler, Donald J., to Pulp and Paper Research Institute of Canada. Method and system for detecting plate clashing in disc refiners. 4,233,600, Cl. 340-683.000.

Rogers, Phillip J., to Pilkington P. E. Limited. Modified Petzval lens. 4,232,943, Cl. 350-202.000.

Rohm GmbH: *See*—
Fink, Herbert; Grumbach, Egon; and Pennewiss, Horst, 4,233,200, Cl. 260-33.8UA.

Rohm and Haas Company: *See*—
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,233,289, Cl. 424-84.000.
Neubeck, Clifford E., 4,233,405, Cl. 435-187.000.
Novak, Ronald W.; and Kine, Benjamin B., 4,233,362, Cl. 428-332.000.

Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, to W. Schlafhorst & Co. Method and device for joining an upper thread to a lower thread. 4,232,509, Cl. 57-261.000.

Rohner, Peter; and Still, Michael, to Kabel- und Metallwerke Gutehoffnungshuette AG. Communications cable with optical waveguides. 4,232,935, Cl. 350-96.230.

Rohowetz, Stanley E.: *See*—
Lemke, Harold C.; and Rohowetz, Stanley E., 4,233,331, Cl. 426-407.000.

Rohr, Franz-Josef; and Holick, Hubert, to Brown, Boveri & Cie Aktiengesellschaft. Electrochemical measuring cell. 4,233,142, Cl. 204-195.00S.

Rohr, Otto: *See*—
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, 4,233,060, Cl. 71-94.000.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Rohrbach, Fritz, to Robert Bosch GmbH. Convertible rotary/percussion drill. 4,232,749, Cl. 173-48.000.

Rollmann, Louis D.; and Walsh, Dennis E., to Mobil Oil Corporation. Process for the visbreaking of high-metals crudes and resids. 4,233,138, Cl. 208-106.000.

Rolls-Royce Limited: *See*—
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.
Pearson, Kenneth A.; and Moorhouse, Major D., 4,232,513, Cl. 60-39.09R.

Roman, Gian F., to Claber S.p.A. Rocking-arm lawn sprinkler. 4,232,827, Cl. 239-242.000.

Rooney, Clarence S.: *See*—
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,233,452, Cl. 549-79.000.

Roscetti, Thomas L.: *See*—
Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., 4,232,710, Cl. 138-39.000.

Rosenfeld, Robert B., to Eastman Kodak Company. Ultrasonographic exposure apparatus. 4,232,555, Cl. 73-606.000.

Ross, Karl-Heinz: *See*—
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.

Ross, William A.; and Pollman, Frederic W., to Sundstrand Corporation. Engine-transmission control system. 4,232,572, Cl. 74-859.000.

Roth, Jacques. Auto-expansible cushioning bag. 4,232,788, Cl. 206-524.000.

Rothemeyer, Fritz: *See*—
Pietratus, Udo; and Rothemeyer, Fritz, 4,233,259, Cl. 264-167.000.

Rothgordt, Ulf: *See*—
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,233,385, Cl. 430-117.000.

Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., to Allied Chemical Corporation. Cell flow distributors. 4,233,146, Cl. 204-255.000.

Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, to BASF Aktiengesellschaft. Continuous manufacture of an aqueous solution of a salt of an alkanedicarboxylic acid and an alkanediamine. 4,233,234, Cl. 260-501.200.

Roussel Uclaf: *See*—
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,305, Cl. 424-258.000.
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,312, Cl. 424-274.000.
Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, 4,233,129, Cl. 204-158.00R.
Teutsch, Jean G.; and Philibert, Daniel, 4,233,296, Cl. 424-241.000.
Teutsch, Jean G.; and Deraedt, Roger, 4,233,297, Cl. 424-243.000.

Royal Mark Laminates: *See*—
Corvington, Edward J.; and Sitter, Elmer J., 4,232,489, Cl. 52-63.000.

Rubel, Peter A., to Rule Industries. Amine-promoted, peroxide-cured polyester composition. 4,233,204, Cl. 260-40.00R.

Rudolph, Hans: *See*—
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.

Ruhrkohle, A.G.: *See*—
Schmidt, Ludwig; and Wellie, Werner, 4,232,974, Cl. 366-162.000.

Rule Industries: *See*—
Rubel, Peter A., 4,233,204, Cl. 260-40.00R.

Runyon, James R.: *See*—
Hochreuter, Richard; and Runyon, James R., 4,233,193, Cl. 260-18.00N.

Rupert, Robert E., to Anderson, Norman C. Thermometer for remotely measuring temperature. 4,233,512, Cl. 250-338.000.

Rupprecht, Kurt, to Volkswagenwerk Aktiengesellschaft. Drum brake. 4,232,765, Cl. 188-78.000.

Rupprecht, Kurt, to Volkswagenwerk Aktiengesellschaft. Self-adjusting drum brake. 4,232,766, Cl. 188-79.50P.

Rusch, Reinhart: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Rusidze, Vazha V.: *See*—
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,232,854, Cl. 266-266.000.

Russ, Karl J.; and Broughton, Donald R., to United Catalysts Inc. Process for steam reforming of hydrocarbons. 4,233,179, Cl. 252-373.000.

Russell, B. Carson, to Carlson Stapler and Shippers Supply, Inc. String stapler. 4,232,810, Cl. 227-19.000.

Russell, Lewis K.; and Kleitman, David, to Signetics Corporation. Method of configuring an integrated circuit. 4,233,674, Cl. 365-200.000.

Rustler, Hubert: *See*—
Weber, Werner; and Rustler, Hubert, 4,233,496, Cl. 219-390.000.

Rutgaizer, Mikhail I.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Rysti, Alpo. Timber-conveying method and apparatus. 4,232,778, Cl. 198-443.000.

S&C Electric Company: *See*—
Rogers, Edward J., 4,233,483, Cl. 200-337.000.

S. C. Johnson & Son, Inc.: *See*—
Sramek, John A., 4,233,167, Cl. 252-8.750.

S K M, Societe Anonyme: *See*—
Binoche, Michel, 4,232,824, Cl. 239-8.000.

Sadao, Ebata: *See*—
Bando, Seiji; and Sadao, Ebata, 4,232,853, Cl. 266-114.000.

SAFT-Societe des Accumulateurs Fixes et de Traction: *See*—
Lecerf, Andre, 4,233,374, Cl. 429-194.000.

Sagi, Yasuo: *See*—
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Sahli, Muhammad S.: *See*—
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.

Sahoo, Maheswar: *See*—
Atkinson, James T. N.; and Sahoo, Maheswar, 4,233,376, Cl. 429-199.000.

St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Method for preparing addition type polyimide prepregs. 4,233,258, Cl. 264-137.000.

St. John, James E.: *See*—
Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,233,160, Cl. 210-512.00M.

Saito, Koji, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Automatic focus adjusting system. 4,233,503, Cl. 250-204.000.

Saito, Masato: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.

Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, to TDK Electronics Company, Limited. Process for preparing insoluble electrode. 4,233,340, Cl. 427-125.000.

Sakai, Masaru: *See*—
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 155-639.000.

Sakakibara, Naoji: *See*—
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.

Sakakura, Mitsuo; and Takaku, Tetsuo, to Toko, Inc. Method of fabricating piezoelectric thin film. 4,233,135, Cl. 204-192.0SP.

Sakata, Shinichi: *See*—
Nakano, Hideharu; and Sakata, Shinichi, 4,233,531, Cl. 310-42.000.

Sakata, Tatsuei: *See*—
Watanabe, Tamotu; Sakata, Tatsuei; and Mizuma, Yoshikuni, 4,233,072, Cl. 75-236.000.

Sakurai, Masahiro: *See*—
Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, 4,233,487, Cl. 219-76.110.

Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., to Exxon Production Research Company. Well treatment with emulsion dispersions. 4,233,165, Cl. 252-8.55R.

Salino, Michael A.: *See*—
Butcher, John A. W.; and Salino, Michael A., 4,233,471, Cl. 178-69.00G.

Sample, Thomas E., Jr.; and Horn, John M., to Dresser Industries, Inc. Silane coated silicate minerals and method for preparing same. 4,233,366, Cl. 428-405.000.

Samuelson, Kent M.; and Tuke, Michael A., to National Research Development Corporation. Endoprosthetic ankle joint. 4,232,404, Cl. 3-1.910.

Sanada, Sei: *See*—
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, 4,233,663, Cl. 364-515.000.

Sandahl, Evert G. I., to Cementa AB. Method of anchoring elements and a device for carrying out said method. 4,232,984, Cl. 405-261.000.

Sandoz, Inc.: *See*—
Kathawala, Faizulla G., 4,233,292, Cl. 424-185.000.

Sandoz Ltd.: *See*—
Hochreuter, Richard; and Runyon, James R., 4,233,193, Cl. 260-18.00N.

Sanford, Gary G.; Munson, Robert E.; and Metzler, Thomas A., to Ball Corporation. Apparatus and method for improving r.f. isolation between adjacent antennas. 4,233,607, Cl. 343-700.0MS.

Sanger, Winston D. Articulated plumbers snake. 4,232,419, Cl. 15-104.3SN.

Sante Fe International Corporation: *See*—
Goren, Yoram; and Springett, Charles, 4,232,625, Cl. 114-264.000.

Santen Pharmaceutical Co., Ltd.: *See*—
Fujita, Tadashi; Oya, Masayuki; Watanabe, Toshio; and Chiba, Takehisa, 4,233,310, Cl. 424-273.00R.

Santilli, Arthur A.: *See*—
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,233,446, Cl. 544-279.000.

Sanyo Chemical Industries, Limited: *See*—
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.

Saraf, Lumdas H.: *See*—
Friedman, Jules D.; and Saraf, Lumdas H., 4,233,337, Cl. 427-84.000.

Sarkar, Arnab, to Corning Glass Works. Apparatus and method for making optical filament preform. 4,233,045, Cl. 65-3.00A.

Sarudate, Tutomu: *See*—
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Sasajima, Kikuo: *See*—
Ono, Keiichi; Sasajima, Kikuo; Katsube, Junki; and Yamamoto, Hisao, 4,233,307, Cl. 424-267.000.

Sasaki, Makoto: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole-1-carboxylic acid aryl esters and their use as plant protection agents. 4,233,058, Cl. 71-92.000.

Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, to Idemitsu Kosan Company Limited. Sublimable composition. 4,233,161, Cl. 252-1.000.

Sato, Haruki; and Kawasumi, Yoshio, to Nihon Kogyo Kabushiki Kaisha. Process for granulating metal sulfide powders. 4,233,254, Cl. 264-37.000.

Sato, Hidetaka: *See*—
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Sato, Hidetaka: *See*—
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Process for electrical discharge machining of cylindrical work. 4,233,485, Cl. 219-69.00M.

Sato, Masaaki, to Olympus Optical Co., Ltd. Radio tuner for coupling with tape recorder. 4,233,686, Cl. 455-344.000.

Sato, Reisuke, to Pioneer Electronic Corporation. Light receiving circuit having fast response time and a stable output waveform. 4,233,505, Cl. 250-214.00R.

Sato, Seisiro, to Hitachi, Ltd. Scanning electron microscope. 4,233,510, Cl. 250-311.000.

Sato, Yasushi: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.

Sato, Yoshiaki; and Arai, Hajime, to Toray Industries, Inc. Separable composite fiber and process for producing same. 4,233,355, Cl. 428-224.000.

Satoh, Tetsuo: *See*—
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Satoh, Tsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Elevator position detector. 4,233,588, Cl. 340-21.000.

Satohara, Norio: *See*—
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Satterly, Kenneth P.; and Livingston, Frank E., to Witco Chemical Corporation. Polyurethane foams from polyester precursor derived from adipic acid process waste. 4,233,408, Cl. 521-172.000.

Satterwhite, Charles R., to Unit Rig & Equipment Co. Excavating and pipeline installation system. 4,232,982, Cl. 405-179.000.

Sauer, Mark R., to UNL Incorporated. Format assembler for photographic printer. 4,232,962, Cl. 355-46.000.

Sauerteig, Wolfgang: *See*—
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

Sauerwein, Georges, to AB Broderna Kjellstrom. Optical sighting device. 4,232,965, Cl. 356-144.000.

Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, to D G T S.r.l. Medical breathing apparatus. 4,232,666, Cl. 128-203.250.

Savin Corporation: *See—*
Lanoa, Benzion, 4,233,381, Cl. 430-33.000.

Sawa, Yuji; and Endo, Sigeru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for delivering parisons of preselected length and diameter. 4,233,019, Cl. 425-305.100.

Sawada, Daisaku: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Sawada, Kazuo, to Sumitomo Electric Industries, Ltd. Soft copper alloy conductors. 4,233,067, Cl. 75-153.000.

Sawamura, Ichiro; and Tsuboshima, Kosaku, to Olympus Optical Co., Ltd. Apparatus for automatic diagnosis of cells. 4,232,970, Cl. 356-432.000.

Schadlich, Gunther: *See—*
Moraw, Roland; and Schadlich, Gunther, 4,233,380, Cl. 430-2.000.

Schaefer, Robert H.: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Schaeffer, Anthony J., to Northwestern University. Method of maintaining bacterial sterility in urine drainage bags. 4,233,263, Cl. 422-28.000.

Schafer, Fritz P.; and Stuke, Michael, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method of photochemical separation of isotopes. 4,233,125, Cl. 204-157.10R.

Schafer, Jurgen, to Dragerwerk Aktiengesellschaft. Process for the production of carbon dioxide absorption agent pellets for use in respiratory equipment. 4,233,190, Cl. 252-475.000.

Schanbacher, William A. Frequency selective hysteresis comparator. 4,233,563, Cl. 328-138.000.

Schaum-Chemie W. Bauer K.G.: *See—*
Schmidt, Ludwig; and Wellie, Werner, 4,232,974, Cl. 366-162.000.

Scheer, Peter; and Hamann, Arnold. Treatment chair with cool-light lamp for dental medicinal purposes. 4,233,649, Cl. 362-32.000.

Scheffel, Norman B.: *See—*
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.

Scherer, George W.: *See—*
Dominick, Ellen K.; and Scherer, George W., 4,233,052, Cl. 65-144.000.

Schering Aktiengesellschaft: *See—*
Blasing, Horst; and Gute, Manfred, 4,233,145, Cl. 204-202.000.
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Scheuerman, Ronald F.: *See—*
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.

Schildmann, Jens A.: *See—*
Seebeck, Dieter; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, 4,233,407, Cl. 435-311.000.

Schindler, James C.: *See—*
Kroll, Steve; and Schindler, James C., 4,232,596, Cl. 99-410.000.

Schinke, Franz: *See—*
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,233,385, Cl. 430-117.000.

Schirmer, Gunter: *See—*
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,232,545, Cl. 73-35.000.

Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, to Suddeutsche Zucker-Aktiengesellschaft. Glucopyranosido-1,6-mannitol, a process for producing the same and its use as a sugar substitute. 4,233,439, Cl. 536-4.000.

Schmand, Horst; and Dannenberg, Wolfgang, to Riedel-de Haen Aktiengesellschaft. Process for the manufacture of optically active, optionally substituted 2-amino-2-phenylacetic acid. 4,233,456, Cl. 562-401.000.

Schmid, Carl J., to Peerless Electronics Research Corporation. Peristaltic pump. 4,233,001, Cl. 417-475.000.

Schmidt, Ludwig; and Wellie, Werner, to Ruhrkohle, A.G.; and Schaum-Chemie W. Bauer K.G. Means for the production of a multi-component plastics material. 4,232,974, Cl. 366-162.000.

Schmidt, Robert R.: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,233,058, Cl. 71-92.000.

Schmidt, Walter, to Siemens Aktiengesellschaft. Power supply for an electric precipitator. 4,233,039, Cl. 55-139.000.

Schmidt, Walter, to Swiss Aluminium Ltd. Process and device for growing crystal. 4,233,270, Cl. 422-249.000.

Schmitt, Joseph L., Jr.: *See—*
Bright, John H.; and Schmitt, Joseph L., Jr., 4,233,458, Cl. 562-458.000.

Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, to L. Schuler GmbH. Arrangement for punching out circular blanks. 4,232,575, Cl. 83-71.000.

Schneider, Martin V.: *See—*
Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,233,579, Cl. 333-204.000.

Schnelle, Manfred. Furniture hinge. 4,232,423, Cl. 16-130.000.

Scholz, Herbert, to BASF Aktiengesellschaft. Preparation of oxazolidine-2,4-diones. 4,233,450, Cl. 548-226.000.

Schpak, Fred; and Malkes, Ian D., to Laco Laboratories, Inc. Contact lens device. 4,232,966, Cl. 356-244.000.

Schreurs, Jan W. H.: *See—*
Beall, George H.; Mansfield, Gerald R.; and Schreurs, Jan W. H., 4,233,169, Cl. 252-62.590.

Schroeder, Hobe; and Palmer, David A., to Standard Oil Company (Indiana). Phthalic anhydride formation and separation. 4,233,227, Cl. 260-346.700.

Schroer, Horst; Goliasch, Karl; and Beck, Uwe, to Bayer Aktiengesellschaft. Process for the preparation of 2-oxoiminophenylacetonitrile. 4,233,233, Cl. 260-465.00E.

Schroer, Klaus: *See—*
Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., 4,233,272, Cl. 423-7.000.

Schroter, Horst: *See—*
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Schubert & Salzer: *See—*
Husges, Gerd; and Karl, Rupert, 4,232,508, Cl. 57-22.000.

Schulman, Joseph H., to Pacesetter Systems, Inc. Programmable human tissue stimulator. 4,232,679, Cl. 128-419.0PG.

Schulz, Hans-Hermann: *See—*
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,233,424, Cl. 525-440.000.

Schuster, Lilian E.: *See—*
Schuster, Sam; and Schuster, Lilian E., 4,232,420, Cl. 15-209.00D.

Schuster, Sam; and Schuster, Lilian E. Scouring pad handle. 4,232,420, Cl. 15-209.00D.

Schwab, Jean-Francois: *See—*
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, 4,233,680, Cl. 368-76.000.

Schwartz, Charles A. Deep throat resistance welder. 4,233,488, Cl. 219-89.000.

Schwartz, Marvin P.: *See—*
Kim, Sung C.; and Schwartz, Marvin P., 4,232,735, Cl. 165-183.000.

Schwarz, Hans-Helmut: *See—*
Immel, Otto; and Schwarz, Hans-Helmut, 4,233,247, Cl. 568-464.000.

Schwarzschild, Jack, to Timex Corporation. Adjustable piezoelectric transducer for a watch. 4,233,679, Cl. 368-72.000.

Science Union et Cie: *See—*
Simon-Lavoine, Nicole; and Forgeot, Marcel, 4,233,291, Cl. 424-177.000.

Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., to American Home Products Corporation. 5-Chloro-7,8-dihydro-7-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid derivatives. 4,233,446, Cl. 544-279.000.

Scott, Burton W.: *See—*
Nodov, Eugene; Scott, Burton W.; Denlinger, George W.; and Sutera, Richard, 4,232,964, Cl. 355-70.000.

Scott, John G. V.: *See—*
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,233,399, Cl. 430-510.000.

Scoville, John R.; and Gigandet, Richard W., to Lincoln Manufacturing Company, Inc. Food warming cabinet. 4,233,495, Cl. 219-386.000.

Scragg, Frederick; and Marshman, Peter. Method of lining a pipe. 4,233,101, Cl. 156-287.000.

Sears, Roebuck and Co.: *See—*
Speyer, Henning J., 4,232,411, Cl. 5-8.000.

Secretary of State for Defence: *See—*
Shanks, Ian A., 4,232,948, Cl. 350-347.00R.

Sedmak, Richard M.: *See—*
Liebergot, Harris L.; and Sedmak, Richard M., 4,233,682, Cl. 371-68.000.

Seebeck, Dieter; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, to Eckes, Peter. Apparatus for the continuous sterile fermentation. 4,233,407, Cl. 435-311.000.

Seeger, Ernst: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, 4,233,299, Cl. 424-246.000.
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, 4,233,333, Cl. 426-548.000.

Seeliger, Wolfgang: *See—*
Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, 4,233,202, Cl. 260-348.360.

Seibert, Walter, to BASF Aktiengesellschaft. Preparation of 3,3-bis-(4-dimethylaminophenyl)-6-dimethylaminophthalide. 4,233,223, Cl. 260-343.400.

Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi; and Ogihara, Masuo, 4,232,511, Cl. 368-73.000.

Selman, Thomas G., to Gestetner Limited. Plate loader for offset printing machines. 4,232,602, Cl. 101-132.000.

Semi-Alloys, Inc.: *See—*
Hascoe, Norman, 4,232,814, Cl. 228-173.00E.

Sen, Soumendra N.: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,233,095, Cl. 149-95.000.

Senda, Teruo; and Otani, Mitsunobu, to Toray Industries, Inc. Solid-liquid separation element and apparatus. 4,233,159, Cl. 210-413.000.

Sentry Controls, Inc.: *See—*
Bost, Charles, 4,232,819, Cl. 236-47.000.

Serrano, Rudy C. Storage and display device for record albums and tapes. 4,232,790, Cl. 211-40.000.

Service Equipment Design Co., Inc.: *See—*
Hauk, Ernest D.; and Kirkpatrick, Jesse C., 4,232,752, Cl. 175-135.000.

Serwatowski, Frank J. Fireplaces of the type having fireboxes constructed of firebrick. 4,232,652, Cl. 126-120.000.

Sessions, Willie J.: *See—*
O'Connor, James M.; and Sessions, Willie J., 4,233,205, Cl. 260-40.0TN.

Seymour, Samuel L., to PPG Industries, Inc. Method and apparatus for shaping glass sheets by drop forming. 4,233,049, Cl. 65-106.000.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Gambardella, Antonio; and Panigada, Marco, 4,233,133, Cl. 204-181.00N.

Shaffer, Donald J. Engine with additional shared flow control runner for two cylinders. 4,232,639, Cl. 123-52.0MV.

Shaheen, Joseph M., to United States of America, Air Force. High temperature-resistant conductive adhesive and method employing same. 4,233,103, Cl. 156-331.000.

Shalai, Alexandr N.; Nikitin, Mikhail D.; Zakharov, Nikolai I.; and Bratchenko, Anatoly P. Method of reinforcing aluminium alloy piston ring groove. 4,233,490, Cl. 219-121.00P.

Shald, Roland L. Water ski rack. 4,232,806, Cl. 224-42.440.

Shanks, Ian A., to Secretary of State for Defence. Liquid crystal display device. 4,232,948, Cl. 350-347.00R.

Shapiro, Eugene: *See—*
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,068, Cl. 75-157.500.
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,069, Cl. 75-157.500.

Sharon Manufacturing Company: *See—*
Hudson, Sharon J., Jr.; and Petersen, Karl T., 4,232,796, Cl. 220-89.00B.

Sharp Kabushiki Kaisha: *See—*
Funada, Fumiaki; and Shimizu, Keiichiro, 4,232,947, Cl. 350-341.000.
Nagasaka, Takakazu; and Nakamura, Yasuhide, 4,232,689, Cl. 133-4.00A.

Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., to General Motors Corporation. Power steering gear with flow check valve. 4,232,585, Cl. 91-432.000.

Shelcore, Inc.: *See—*
Lin, Charles C. C., 4,232,477, Cl. 46-88.000.

Shelef, Mordecai: *See—*
Gandhi, Haren S.; and Shelef, Mordecai, 4,233,188, Cl. 252-470.000.
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.

Shelffo, Loren E., to Eskofot Research A/S. Toner applicator for electrostatic copier. 4,232,628, Cl. 118-653.000.

Shell Oil Company: *See—*
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.
Willis, Carl L.; and Slaugh, Lynn H., 4,233,460, Cl. 562-537.000.

Shelly, Newton L., Jr. Hand held liquid spray head with removable liquid conduit. 4,232,828, Cl. 239-329.000.

Shemitz, Norman S., to Shemsafe Incorporated. Assemblable lamp shade and structures. 4,233,656, Cl. 362-352.000.

Shemsafe Incorporated: *See—*
Shemitz, Norman S., 4,233,656, Cl. 362-352.000.

Shenian, Popkin R.: *See—*
Abolins, Visvaldis; Holub, Fred F.; and Shenian, Popkin R., 4,233,199, Cl. 260-30.60R.

Sheppard, John P.: *See—*
Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., 4,233,357, Cl. 428-245.000.

Sheppard, Robert S., to PPG Industries, Inc. Preparing refractory metal boride powder. 4,233,277, Cl. 423-297.000.

Sher, Geoffrey: *See—*
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.
Statland, Bernard E.; and Sher, Geoffrey, 4,233,032, Cl. 23-230.00B.

Sheridan, Geoffrey P., to Lankro Chemicals Limited. Quick-break cleaning compositions. 4,233,174, Cl. 252-170.000.

Sheridan, Ronald D.: *See—*
Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., 4,232,924, Cl. 339-17.00L.

Sherwood Tool, Incorporated: *See—*
Johnson, Warren E., 4,232,590, Cl. 493-10.000.

Shetty, Bola V., to Pennwalt Corporation. Substituted 1,2,4,5-tetrahydro-3H, 3 benzazepines. 4,233,217, Cl. 260-239.0BB.

Shiba, Keisuke; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Silver halidephotosensitive material. 4,233,393, Cl. 430-265.000.

Shibata, Akira, to Chugai Denki Kogyo Kabushiki-Kaisha. Apparatus for making a tri-metallic composite electrical contact. 4,232,812, Cl. 228-3.100.

Shibata, Hiroshi, to VLSI Technology Research Association. Masking technique usable in manufacturing semiconductor devices. 4,232,439, Cl. 29-579.000.

Shibata, Kouhei: *See—*
Ikeda, Satoshi; and Shibata, Kouhei, 4,232,782, Cl. 198-706.000.

Shibata, Yasuo: *See—*
Nakano, Keita; and Shibata, Yasuo, 4,233,611, Cl. 346-155.000.

Shiber, Samuel. Variable geometry whirler. 4,232,645, Cl. 123-590.000.

Shields, Dean W., to Kockums Industries, Inc. Crane. 4,232,792, Cl. 212-160.000.

Shiflet, Frank L., to Hopeman Brothers, Inc. Formaminous sheet. 4,233,350, Cl. 428-110.000.

Shigehisa, Fukuda: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.

Shigematu, Takashi: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Shimano Industrial Company, Limited: *See—*
Noda, Hideo, 4,232,842, Cl. 242-212.000.

Shimizo, Hidehiro: *See—*
Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, 4,233,487, Cl. 219-76.110.

Shimizu, Keiichiro: *See—*
Funada, Fumiaki; and Shimizu, Keiichiro, 4,232,947, Cl. 350-341.000.

Shimogawa, Toshiaki: *See—*
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.

Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Cyclopentylacetic acid derivatives. 4,233,222, Cl. 260-343.30P.

Shin-Etsu Chemical Co., Ltd.: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Shin Meiwa Industry Co., Ltd.: *See—*
Maruyama, Shigeo; Nishikaichi, Yuji; Fujinaga, Shigeki; and Miura, Tatsuya, 4,233,491, Cl. 219-125.100.

Shinchi, Yoshikazu: *See—*
Koseki, Wasuke; Mori, Kunihito; Obata, Hideo; and Shinchi, Yoshikazu, 4,232,536, Cl. 68-12.00R.

Shinko Kiko Co., Ltd.: *See—*
Ikeda, Satoshi; and Shibata, Kouhei, 4,232,782, Cl. 198-706.000.

Shinoki, Hisazi: *See—*
Sugimoto, Shun-ichiro; and Shinoki, Hisazi, 4,233,585, Cl. 335-262.000.

Shinopulos, George: *See—*
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,232,727, Cl. 164-76.000.

Shinpo Kogyo Kabushiki Kaisha: *See—*
Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, 4,232,561, Cl. 74-191.000.

Shionogi & Co., Ltd.: *See—*
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.

Shipek, Edward J.: *See—*
Bierlein, John C.; and Shipek, Edward J., 4,233,071, Cl. 75-231.000.

Shishulin, Jury P.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Shiverdecker, Howard P. Fish lure. 4,232,469, Cl. 43-42.270.

Showa Denko Kabushiki Kaisha: *See—*
Nagato, Nobuyuki; and Sugiyama, Yuichi, 4,233,242, Cl. 564-249.000.

Showa Yuka Kabushiki Kaisha: *See—*
Okamoto, Hiroo; and Nakauchi, Shunsaku, 4,233,596, Cl. 340-578.000.

Sibilia, John P.: *See—*
Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., 4,232,951, Cl. 350-350.00R.

Sicre, Jean-Luc; and Gruaz, Daniel, to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.). Method and system for controlling the decelerated approach of an aerodyne. 4,232,839, Cl. 244-188.000.

Siddall, Richard J., to Huntington Alloys Inc. Atomization into a chamber held at reduced pressure. 4,232,062, Cl. 75-0.50C.

Sie, Swan A.: *See—*
Brown, Earl J.; and Sie, Swan A., 4,233,677, Cl. 367-13.000.

Siemens Aktiengesellschaft: *See—*
Knauer, Karl; and Pfleiderer, Hans-Jorg, 4,233,578, Cl. 333-165.000.
Koch, Rudolf; and Pfleiderer, Hans-Joerg, 4,233,527, Cl. 307-311.000.
Schmidt, Walter, 4,233,039, Cl. 55-139.000.
Trepte, Wulf, 4,233,516, Cl. 250-444.000.
Zobawa, Franz, 4,232,929, Cl. 339-143.00R.

SIG Schweizerische Industrie-Gesellschaft: *See—*
Thoma, Hans, 4,232,748, Cl. 173-3.000.

Signetics Corporation: *See—*
Russell, Lewis K.; and Kleitman, David, 4,233,674, Cl. 365-200.000.

Silvestrova, Iraida M.: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.

Silvia, John P.: *See—*
Willwerth, Charles M.; and Silvia, John P., 4,233,012, Cl. 425-162.000.

Simic, Milutin, to Chevron Research Company. Plasticized sulfur coating composition. 4,233,082, Cl. 106-287.230.

Simmons Fastener Corporation: *See—*
Hoen, Cuyler, 4,232,890, Cl. 292-114.000.

Simon-Lavoine, Nicole; and Forgeot, Marcel, to Science Union et Cie. Novel biological substance from a fungus and the process for producing the same. 4,233,291, Cl. 424-177.000.

Simons, Robert E.: *See—*
Hwang, Un-Pah; and Simons, Robert E., 4,233,644, Cl. 361-384.000.

Singer Company, The: *See—*
Garron, Stephen A., 4,232,617, Cl. 112-158.00B.
Ketterer, Stanley J., 4,232,618, Cl. 112-184.000.

Sion, Marcel-Xavier: *See—*
Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, 4,233,245, Cl. 564-506.000.

Sitter, Elmer J.: *See—*
Corvington, Edward J.; and Sitter, Elmer J., 4,232,489, Cl. 52-63.000.

Skipton, Robert W.: *See—*
Miller, Donald; and Skipton, Robert W., 4,232,417, Cl. 9-8.00R.

Skovajsa, Joseph. Device for the local treatment of a patient, and more particularly applicable in acupuncture and auriculotheraphy. 4,232,678, Cl. 128-395.000.

Slangan, Gary; and Tsunashima, Masaaki, to International Flavors & Fragrances Inc. Ice cream package including compartment for heating syrup. 4,233,325, Cl. 426-107.000.

Slaugh, Lynn H.: *See—*
Willis, Carl L.; and Slaugh, Lynn H., 4,233,460, Cl. 562-537.000.

Smith, Albert J.: *See—*
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., 4,232,579, Cl. 83-788.000.

Smith, Dennis M.: *See—*
Lewis, William R.; and Smith, Dennis M., 4,232,804, Cl. 222-591.000.

Smith, Donald L.: *See—*
Clark, Michael N.; and Smith, Donald L., 4,232,843, Cl. 244-3.290.

Smith, Douglas D.: *See—*
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased, 4,233,100, Cl. 156-260.000.

Smith, Edward F., Sr.; and Treesh, Lloyd N. Feeder device. 4,232,631, Cl. 119-52.0AF.

Smith, Eugene L., Jr.: *See—*
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,233,150, Cl. 209-166.000.

Smith International, Inc.: *See—*
Trzeciak, Kurt H., 4,232,751, Cl. 175-101.000.

Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., to Stewart Engineering & Equipment Company. Pan inverting apparatus and method. 4,232,777, Cl. 198-404.000.

Smith, Oliver W.: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,233,130, Cl. 204-159.230.

Smith, Wallace B.: *See—*
Pontius, Duane H.; and Smith, Wallace B., 4,233,037, Cl. 55-2.000.

Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene. Modified brass alloys with improved stress relaxation resistance. 4,233,068, Cl. 75-157.500.

Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, to Olin Corporation. Modified brass alloys with improved stress relaxation resistance. 4,233,069, Cl. 75-157.500.

Smithson, Terence: *See—*
Allen, Edward A.; Phillips, Peter C.; and Smithson, Terence, 4,233,035, Cl. 44-73.000.

Snamprogetti, S.p.A.: *See—*
Antonelli, Sergio; and Borza, Michele, 4,233,140, Cl. 208-180.000.

Snyder, Charles M.: *See—*
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Snyder, Robert: *See—*
Suvak, Fahrettin; and Snyder, Robert, 4,232,603, Cl. 101-148.000.

Snyder, Robert C., to Motor Wheel Corporation. Systems and methods for controlling trailer brakes as a function of trailer wheel rotation. 4,232,910, Cl. 303-96.000.

Sobey, Arnold J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Aerofoil with composite tip section having skewed fibres. 4,232,844, Cl. 244-123.000.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Lupatin, Elio; and Rizzi, Luigi, 4,233,658, Cl. 363-26.000.
Raveglia, Dalmazio; Lonati, Carlo; and Macchi, Giancarlo, 4,233,577, Cl. 333-136.000.

Societe Anonyme Francaise du Ferodo: *See—*
Dauvergne, Jean L. R., 4,232,519, Cl. 60-550.000.

Societe Chimique de La Grande Paroisse, Azote et Produits Chimiques: *See—*
Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, 4,233,245, Cl. 564-506.000.

Societe Civile Hydromer: *See—*
Le Jeune, Gwenole, 4,232,600, Cl. 100-37.000.

Societe d'Applications Generales d'Electricite et de Mechanique (SAGEM): *See—*
Berger, Henri, 4,233,550, Cl. 318-568.000.

Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
Curtil, Remi, 4,232,641, Cl. 123-76.000.

Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.): *See—*
Sicre, Jean-Luc; and Gruaz, Daniel, 4,232,839, Cl. 244-188.000.

Societe Nationale des Poudres et Explosifs: *See—*
Pascal, Helene M.; and Emeury, Jean-Marie L., 4,233,463, Cl. 568-584.000.

Societe Nationale Elf-Aquitaine (Production): *See—*
Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, 4,233,128, Cl. 204-158.00R.

Societe Symac: *See—*
Ligouzat, Pierre, 4,232,973, Cl. 366-157.000.

Sokolov, Viktor E.: *See—*
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

Solartron Electronic Group Limited: *See—*
Stansfeld, James W., 4,232,544, Cl. 73-32.00A.

Soloway, Norman P.: *See—*
Owades, Joseph L., 4,233,334, Cl. 426-590.000.

Solvay & Cie.: *See—*
Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, 4,233,147, Cl. 204-266.000.
Plumet, Lucien, 4,233,081, Cl. 106-214.000.

Sontag, Klaus A. Package for individually wrapped strip-shaped pieces of chewable and edible articles. 4,233,326, Cl. 426-115.000.

Sony Corporation: *See—*
Kubota, Yukio, 4,233,637, Cl. 360-10.000.
Sugawara, Kokichi, 4,232,840, Cl. 242-198.000.
Suzuki, Masao, 4,233,635, Cl. 358-243.000.
Yamagiwa, Kazuo; and Numakura, Toshihiko, 4,233,621, Cl. 358-8.000.

Soothill, John F.; and Levinsky, Roland J., to National Research Development Corporation. Low affinity IGM-latex particles and assay therewith for immune complexes. 4,233,286, Cl. 424-12.000.

Sorenby, Lars M.: *See—*
Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., 4,233,303, Cl. 424-253.000.

Sosnowski, Stanislaw J. A.: *See—*
Potter, James C.; and Sosnowski, Stanislaw J. A., 4,232,644, Cl. 123-450.000.

Souloumiac, Guy: *See—*
Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, 4,233,128, Cl. 204-158.00R.

South African Coal, Oil & Gas Corp., Limited: *See—*
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.

SPA-Societa Prodotti Antibiotici, S.p.A.: *See—*
Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, 4,233,290, Cl. 424-94.000.

Spaziani, Frederick F.; and Fowler, James E., to Nova Biomedical Corporation. Liquid membrane electrode. 4,233,136, Cl. 204-195.00L.

Spees, Arthur T., to Visu-Flex Corporation. Panel file. 4,232,463, Cl. 40-373.000.

Sperry Corporation: *See—*
Liebergot, Harris L.; and Sedmak, Richard M., 4,233,682, Cl. 371-68.000.

Sperry Rand Corporation: *See—*
Walberg, Per-Erik; Johann, Donald F.; and Mendenhall, Charles E., 4,233,666, Cl. 364-900.000.

Speyer, Henning J., to Sears, Roebuck and Co. Combination bed and lounge assembly. 4,232,411, Cl. 5-8.000.

Spinner, Georg: *See—*
Treczka, Leo; and Spinner, Georg, 4,233,580, Cl. 333-261.000.

Spinner GmbH: *See—*
Treczka, Leo; and Spinner, Georg, 4,233,580, Cl. 333-261.000.

Spivack, John D., to Ciba-Geigy Corporation. Hydrolytically stable ortho-alkylated phenyl phosphonites and stabilized compositions. 4,233,207, Cl. 260-45.70P.

Spivack, John D., to Ciba-Geigy Corporation. Polymer compositions stabilized with hindered phenyl secondary phosphites. 4,233,208, Cl. 260-45.8NT.

Sprague Electric Company: *See—*
Genesi, Robert C., 4,233,618, Cl. 357-35.000.

Sprengel, Heide: *See—*
Klupfel, Kurt; and Sprengel, Heide, 4,233,395, Cl. 430-271.000.

Springer, Donald A., to Anchor Hocking Corporation. Food serving tray for use in a food preparation unit. 4,232,789, Cl. 206-562.000.

Springer, William E., to Clairol Incorporated. Variable airflow hair treatment device. 4,232,454, Cl. 34-97.000.

Springett, Charles: *See—*
Goren, Yoram; and Springett, Charles, 4,232,625, Cl. 114-264.000.

Spurr, Robert, to Emhart Industries, Inc. Plastic bottle forming machine. 4,233,021, Cl. 425-525.000.

Squires, David T., to Raychem Limited. Heat-recoverable articles. 4,232,712, Cl. 138-109.000.

Sramek, John A., to S. C. Johnson & Son, Inc. Liquid detergent softening and brightening composition. 4,233,167, Cl. 252-8.750.

Stackhouse, William H., to Lantech Inc. Economy automatic wrapping apparatus. 4,232,501, Cl. 53-399.000.

Stafford, David A.: *See—*
Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., 4,233,155, Cl. 210-92.000.

Stahl, Eugen H., to Hans Grohe GmbH & Co. KG. Method of making a flexible plastic tube. 4,233,097, Cl. 156-143.000.

Stahl, John M.; and DeRoss, Robert W., to Bunker Ramo Corporation. Circuit transfer apparatus. 4,233,478, Cl. 200-51.090.

Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., to General Electric Company. Gas seal for turbine blade tip. 4,232,995, Cl. 415-172.00A.

Stanberry, Daniel C.: *See—*
Zenner, Sylvester F.; and Stanberry, Daniel C., 4,233,321, Cl. 426-19.000.
Zenner, Sylvester F.; and Stanberry, Daniel C., 4,233,330, Cl. 426-321.000.

Standard Oil Company (Indiana): *See—*
D'Souza, Gerard J.; and Radford, Herschel D., 4,233,276, Cl. 423-230.000.
Hoff, Glen R.; and Fotis, Peter, 4,233,182, Cl. 252-429.00C.
Hoff, Glen R.; and Fotis, Peter, 4,233,253, Cl. 260-987.000.
Schroeder, Hobe; and Palmer, David A., 4,233,227, Cl. 260-346.700.

Standard Telephones and Cables Limited: *See—*
Butcher, John A. W.; and Salino, Michael A., 4,233,471, Cl. 178-69.00G.

Stanford University: *See—*
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., 4,233,671, Cl. 365-105.000.

Stansel, F. Harrison: *See—*
Pfenninger, Billy J.; and Stansel, F. Harrison, 4,232,747, Cl. 172-311.000.

Stansfeld, James W., to Solartron Electronic Group Limited. Transducer for sensing a parameter of a fluid. 4,232,544, Cl. 73-32.00A.

Stark, Friedrich: *See—*
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.

Starr, Hank: *See—*
Bauch, Tamil D.; and Starr, Hank, 4,232,494, Cl. 52-221.000.

Statland, Bernard E.; and Sher, Geoffrey, to University of North Carolina at Chapel Hill. Fetal lung maturity test. 4,233,032, Cl. 23-230.00B.

Statland, Bernard E.: *See—*
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.

Stauffer Chemical Company: *See—*
Fancher, Llewellyn W.; and Baker, Don R., 4,233,318, Cl. 424-326.000.
McDonald, Harold, 4,233,163, Cl. 252-8.600.

Stearns, George W., to Wagner Electric Corporation. Combination push-pull valve assembly. 4,232,908, Cl. 303-9.000.

Steel Heddle Manufacturing Company: *See—*
Kaufmann, Frank H.; and Kramer, Charles F., 4,232,713, Cl. 139-91.000.

Steer, Peter L.; and Edwards, John V., to Kingsdown Medical Consultants Limited. Ostomy coupling including a venting valve. 4,232,672, Cl. 128-283.000.

Steffick, Joe A., Jr. Fish hook. 4,232,470, Cl. 43-43.160.

Steiger, Anton, to Sulzer Brothers Limited. Method and apparatus for utilizing waste heat from a flowing heat vehicle medium. 4,232,522, Cl. 60-618.000.

Steinberg, David H.: *See—*
Dexter, Martin; and Steinberg, David H., 4,233,209, Cl. 260-45.85E.

Steinle, Georg: *See—*
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.

Steketee, Cornelis J., to Vandenende B.V. Device for digging up tuberous plants, for example, beets. 4,232,743, Cl. 171-55.000.

Stellinger, Thomas S.; and Crosby, Stephen R., to Wallace Murray Corporation. Saw blade and method of making. 4,232,578, Cl. 83-661.000.

Stenfors, Alan L.: *See—*
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., 4,233,586, Cl. 335-303.000.

Stephan, Herbert: *See—*
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.
Dietrich, Walter; and Stephan, Herbert, 4,233,515, Cl. 250-397.000.

Stephenson, Robert L., to Allied Chemical Corporation. Motorized passive seat belt system. 4,232,882, Cl. 280-804.000.

Stepien, Henryk K.: *See—*
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.

Steppe, Theodore W. Conduit bushing. 4,233,469, Cl. 174-83.000.

Sterck, Lothar: *See—*
Maude, John H.; Sterck, Lothar; and Vilshofer, Alfred, 4,233,264, Cl. 422-117.000.

Sterling Drug Inc.: *See—*
Clarke, Robert L.; and Daum, Sol J., 4,233,448, Cl. 546-125.000.
Clarke, Robert L. G.; and Daum, Sol J., 4,233,449, Cl. 546-125.000.

Stevens, Robert W.: *See—*
Dickerson, Carroll D.; and Stevens, Robert W., 4,232,880, Cl. 280-661.000.

Stewart Engineering & Equipment Company: *See—*
Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., 4,232,777, Cl. 198-404.000.

Stewart, John S. Circular saw blade. 4,232,580, Cl. 83-835.000.

Stewart, Nelson C. Portable stand for use in loading a muzzle loading rifle. 4,232,919, Cl. 312-254.000.

Stewart, Robert. Sign support stake. 4,232,467, Cl. 40-607.000.

Stiles, James A. R.: *See—*
Haering, Rudolph R.; and Stiles, James A. R., 4,233,377, Cl. 429-218.000.

Still, Michael: *See—*
Rohner, Peter; and Still, Michael, 4,232,935, Cl. 350-96.230.

Stoddard, Ione. Illuminated display stand. 4,232,465, Cl. 40-546.000.

Stoffer, Lewis J., to United States of America, Air Force. Light weight fan assembly. 4,232,996, Cl. 416-191.000.

Stolowitz, Mark: *See—*
Cook, Sidney F.; and Stolowitz, Mark, 4,232,983, Cl. 405-210.000.

Stolowitz, Mark L.: *See—*
Cook, Sidney F.; and Stolowitz, Mark, 4,232,983, Cl. 405-210.000.

Stone, Alan J.: *See—*
Tertinek, Christian T.; and Stone, Alan J., 4,232,980, Cl. 404-112.000.

Stone Construction Equipment, Inc.: *See—*
Tertinek, Christian T.; and Stone, Alan J., 4,232,980, Cl. 404-112.000.

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Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,233,467, Cl. 585-437.000.

Strother, John A., to RCA Corporation. Interference suppression for imaging optical systems. 4,233,501, Cl. 250-203.00R.

Strupat, John P. Gas ventilating device. 4,232,668, Cl. 128-204.240.

Stryjewski, Walter A.: *See—*
Ateya, Antoun I.; and Stryjewski, Walter A., 4,232,959, Cl. 355-3.0FU.

Studer, Henry E., to University of California, The Regents of the. Method and apparatus for recovering tomatoes from severed vines, employing a rotated and oscillated shaker. 4,232,506, Cl. 56-327.00R.

Stuke, Michael: *See—*
Schafer, Fritz P.; and Stuke, Michael, 4,233,125, Cl. 204-157.10R.

Stull, John R., to Du Pont de Nemours, E. I., and Company. Electrical connector. 4,232,927, Cl. 339-99.00R.

Stultz, James C.; and Pecoraro, George A., to PPG Industries, Inc. In situ repair of delaminated float bath bottom refractory. 4,233,047, Cl. 65-27.000.

Stump, Paul E., to Babcock & Wilcox Company, The. Drawing technique. 4,232,541, Cl. 72-283.000.

Sturman, Oded E.; and Grill, Benjamin, to Hydronic Systems, Inc. Controller for fluid flow systems. 4,232,707, Cl. 137-624.200.

Styck, Wayne G.: *See—*
Corrigan, Ara L.; Styck, Wayne G.; and Walden, Gerald M., 4,232,754, Cl. 180-9.500.

Suberlucq, Jeannine: *See—*
Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, 4,233,128, Cl. 204-158.00R.

Sublett, Bobby J., to Eastman Kodak Company. Polyester and polyesteramide compositions. 4,233,196, Cl. 260-29.20N.

Suda, Yoshio: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Suddeutsche Zucker-Aktiengesellschaft: *See—*
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.

Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, to VDO Adolf Schindling AG. Electric clock. 4,233,680, Cl. 368-76.000.

Suga, Shigeru. Integrating sphere type standard light source device. 4,232,971, Cl. 356-446.000.

Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, to Toppan Printing Co., Ltd. Apparatus for estimating a necessary amount of ink. 4,233,663, Cl. 364-515.000.

Sugawara, Kokichi, to Sony Corporation. Tape cassette. 4,232,840, Cl. 242-198.000.

Sugibuchi, Kiyoshi: *See—*
Kurogi, Yukinori; and Sugibuchi, Kiyoshi, 4,233,526, Cl. 307-238.000.

Sugie, Akihiko: *See—*
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, 4,233,222, Cl. 260-343.30P.

Sugihara, Yasumasa, to General Corporation, The. Signal multiplexing system. 4,233,627, Cl. 358-143.000.

Sugimoto, Shun-ichiro; and Shinoki, Hisazi, to Hitachi, Ltd. Plunger type electromagnet. 4,233,585, Cl. 335-262.000.

Sugiyama, Keiichi: *See—*
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,232,640, Cl. 123-308.000.

Sugiyama, Yuichi: *See—*
Nagato, Nobuyuki; and Sugiyama, Yuichi, 4,233,242, Cl. 564-249.000.

Suladze, Otari N.: *See—*
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,232,854, Cl. 266-266.000.

Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, to Bayer Aktiengesellschaft. Process for the production of bead polymers. 4,233,424, Cl. 525-440.000.

Sultan, S. Bertil: *See—*
Fischbeck, Kenneth H.; Larsson, Stig-Goran; and Sultan, S. Bertil, 4,233,610, Cl. 346-140.00R.

Sulzer Brothers Limited: *See—*
Steiger, Anton, 4,232,522, Cl. 60-618.000.

Sumitomo Chemical Company, Limited: *See—*
Kawabata, Toshio; and Ishiyama, Toshio, 4,233,461, Cl. 562-554.000.
Ono, Keiichi; Sasajima, Kikuo; Katsube, Junki; and Yamamoto, Hisao, 4,233,307, Cl. 424-267.000.
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, 4,233,222, Cl. 260-343.30P.

Sumitomo Electric Industries, Ltd.: *See—*
Sawada, Kazuo, 4,233,067, Cl. 75-153.000.
Yamamoto, Masachika, 4,232,764, Cl. 188-73.600.

Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas control actuator. 4,232,517, Cl. 60-276.000.

Sun Oil Company (Delaware): *See*—
Caldwell, Walter C., 4,232,535, Cl. 64-28.00M.

Sundin, Anders O.; and Bronnvall, Wolfgang A., to Aktiebolaget Elektrokoppar. Electrical conductor of aluminium. 4,233,066, Cl. 75-142.000.

Sundstrand Corporation: *See*—
Ross, William A.; and Pollman, Frederic W., 4,232,572, Cl. 74-859.000.

Surget, Jean: *See*—
Favre, Jean-Paul; Perrin, Joseph; Philbert, Michel; and Surget, Jean, 4,232,559, Cl. 73-827.000.

Sussman, Milton H.: *See*—
Swaminathan, Krishnaiyer; and Sussman, Milton H., 4,232,937, Cl. 350-91.000.

Sutera, Richard: *See*—
Nodov, Eugene; Scott, Burton W.; Denlinger, George W.; and Sutera, Richard, 4,232,964, Cl. 355-70.000.

Sutt, Iokhannes I. Metering device. 4,232,700, Cl. 137-93.000.

Sutyagin, Oleg Y.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Arus G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Suut, Nikolai K.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Arus G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Suvak, Fahrettin; and Snyder, Robert, to Wood Industries, Inc. Dampening device for offset printing machine. 4,232,603, Cl. 101-148.000.

Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,232,885, Cl. 280-804.000.

Suzuki, Masao, to Sony Corporation. High voltage limiting circuit for a television receiver. 4,233,635, Cl. 358-243.000.

Suzuki, Mitsuyuki; and Ohmi, Atsushi, to Aisin Seiki Kabushiki Kaisha. Sealed type fluid reservoir. 4,232,518, Cl. 60-535.000.

Suzuki, Sadao, to Yoshino Kogyosho Co. Ltd. Orientation-blow molding equipment. 4,233,010, Cl. 425-143.000.

Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, to Tokyo Shibaura Denki Kabushiki Kaisha. High-speed semiconductor device. 4,233,672, Cl. 365-181.000.

Suzuki, Zituo: *See*—
Okumura, Kazunari; Yamamoto, Shinichi; and Suzuki, Zituo, 4,233,351, Cl. 428-116.000.

Svensk Lasthantering, Bengt Lindahl AB: *See*—
Lindahl, Bengt E., 4,232,619, Cl. 112-417.000.

Swaminathan, Krishnaiyer; and Sussman, Milton H., to American Optical Corporation. Bright field-dark field illumination system. 4,232,937, Cl. 350-91.000.

Sway, Boris; and Reiman, Walter C. Method for tenderizing and/or pasteurizing meat. 4,233,323, Cl. 426-55.000.

Swiss Aluminium Ltd.: *See*—
Schmidt, Walter, 4,233,270, Cl. 422-249.000.

Swiss Aluminum Ltd.: *See*—
Richter, Siegfried; and Vinkovic, Josef, 4,233,110, Cl. 156-656.000.

Syva Company: *See*—
Maggio, Edward T.; Wife, Richard L.; and Ullman, Edwin F., 4,233,402, Cl. 435-7.000.
Yoshida, Robert A.; and Maggio, Edward T., 4,233,401, Cl. 435-7.000.

Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, to Ciba-Geigy Corporation. Phenoxyalkanecarboxylic acid derivatives, their production, herbicidal compositions containing them, and their use. 4,233,054, Cl. 71-70.000.

Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Process for the preparation of 5-halo-6,9 α-oxido-prostaglandin derivatives. 4,233,121, Cl. 204-59.00R.

Szemos nee Szonyi, Agnes: *See*—
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

T. Y. Lin International: *See*—
Lin, Tung-Yen; and Yang, Yue-Chyou, 4,232,495, Cl. 52-224.000.

Tachiki, Hideo: *See*—
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

Tada, Sugihiko; and Inukai, Yuzo, to Fuji Photo Film Co., Ltd. Process for the preparation of coupler dispersions. 4,233,397, Cl. 430-449.000.

Tada, Yutaka: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

Takahashi, Hirokazu: *See*—
Tashiro, Norio; and Takahashi, Hirokazu, 4,233,540, Cl. 315-39.510.

Takahashi, Izumi: *See*—
Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, 4,233,487, Cl. 219-76.110.

Takahashi, Kihei; and Morita, Toyoo, to Yoshida Kogyo K.K. Method and apparatus for providing space sections in a continuous slide fastener chain. 4,232,438, Cl. 29-408.000

Takahashi, Takeshi; and Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine equipped with an auxiliary combustion chamber. 4,232,638, Cl. 123-260.000.

Takahashi, Toshihiko: *See*—
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,233,275, Cl. 423-230.000.

Takahashi, Yukio; and Toyoda, Kazuhiro, to Fujitsu Limited. Electronic circuit for use in a digital circuit which prevents passage of pulses having a pulse width narrower than a predetermined value. 4,233,525, Cl. 307-234.000.

Takaku, Tetsuo: *See*—
Sakakura, Mitsuo; and Takaku, Tetsuo, 4,233,135, Cl. 204-192.0SP.

Takata, Mitsumune: *See*—
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.

Takeda, Makoto; Iwane, Hiroshi; and Hashimoto, Takashi, to Mitsubishi Petrochemical Co., Ltd. Novel hexahydrobenzopyran derivative and method of preparing the same. 4,233,226, Cl. 260-345.200.

Takei, Toshihiro: *See*—
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.

Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, to Utsunomiya University. Novel benzenesulfonamide derivatives. 4,233,061, Cl. 71-103.000.

Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor integrated circuit device. 4,233,615, Cl. 357-22.000.

Takemura, Kazutoshi, to Riken Piston Ring Industrial Co., Ltd. Iron-base sintered alloy for valve seat and method of making the same. 4,233,073, Cl. 75-243.000.

Takeuchi, Takeshi; and Terasawa, Takao, to Hochiki Corporation. Connector for coaxial cables. 4,232,931, Cl. 339-258.00R.

Takeuchi, Tomio: *See*—
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, 4,233,224, Cl. 260-343.600.

Taki, Takamitsu: *See*—
Ikeda, Tadasu; and Taki, Takamitsu, 4,232,993, Cl. 415-103.000.

Tamarin, Bernard J.: *See*—
Cutler, Morris; and Tamarin, Bernard J., 4,232,837, Cl. 242-107.000.

Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, to Citizen Watch Co., Ltd. Timepiece. 4,232,510, Cl. 368-28.000.

Tamura, Hifumi; and Ishitani, Tohru, to Hitachi, Ltd. Ion-electron analyzer. 4,233,509, Cl. 250-306.000.

Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, to Kobe Steel, Limited. Process for use in etching the outer surface of a metal member. 4,233,108, Cl. 156-639.000.

Tamura, Zensuke: *See*—
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,233,275, Cl. 423-230.000.

Tanaka, Atsushi: *See*—
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, 4,233,359, Cl. 428-254.000.

Tanaka, Kiichiro: *See*—
Okamura, Yasushi; and Tanaka, Kiichiro, 4,232,868, Cl. 274-9.00C.

Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, to Teijin Limited. Novel 1-substituted-3-acylpyrrole derivatives, platelet aggregation inhibitors containing them, as active ingredients, and processes for production of said derivatives. 4,233,309, Cl. 424-270.000.

Tanigaki, Masataka: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

Tanigawa, Takeshi; and Yamauchi, Yukio, to Hochiki Corporation. Fire detection and observation system. 4,233,594, Cl. 340-525.000.

Tao, John C., to Air Products and Chemicals, Inc. Reactivation system for water-carbon dioxide adsorbers. 4,233,038, Cl. 55-33.000.

Tao, Ting C., to Incom International Inc. Air-oil separator. 4,233,042, Cl. 55-482.000.

Tashiro, Norio; and Takahashi, Hirokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetron for microwave oven. 4,233,540, Cl. 315-39.510.

Tate, Edward D., Sr. Portable target raising and lowering device system. 4,232,867, Cl. 273-406.000.

Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., to Coal Industry (Patents) Limited. Laminated insulating board. 4,233,357, Cl. 428-245.000.

Taylor, Stephen C., to Ford Motor Company. Radio for receiving and reproducing information broadcast on the intermediate frequency. 4,233,685, Cl. 455-151.000.

Taylor, William T. Selectively releasable overshot and pull tool. 4,232,894, Cl. 294-86.210.

TDK Electronics Company, Limited: *See*—
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

Teagan, W. Peter, to Arthur D. Little, Inc. Integral storage collector solar heating system. 4,232,656, Cl. 126-420.000.

Teague, Joe D.; and Wright, Paul J. Employing quicklime in stabilizing earth. 4,233,015, Cl. 405-263.000.

Teass, Horace A., Jr. Signal power coupling to rotary shaft. 4,232,922, Cl. 339-5.00R.

Technical Audio Products Corporation: *See*—
Nestorovic, Mioljub, 4,233,566, Cl. 330-59.000.

Technicon Instruments Corporation: *See*—
Pace, Salvatore J.; and Kumar, Anand, 4,233,144, Cl. 204-195.00B.

Tee-Pak, Inc.: *See*—
Burke, Noel I., 4,233,329, Cl. 426-277.000.

Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., to Dow Chemical Company, The. Addition polymerizable polyethers having pendant ethylenically unsaturated urethane groups. 4,233,425, Cl. 525-455.000.

Teichmann, Paul G.: *See*—
Beneke, Wolfgang; Teichmann, Paul G.; and Weber, Wilfried, 4,232,426, Cl. 19-106.00R.

Teijin Limited: *See*—
Hasegawa, Kinji; Mitsuishi, Yukio; and Masuda, Shigeyoshi, 4,233,354, Cl. 428-195.000.
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, 4,233,359, Cl. 428-254.000.
Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, 4,233,309, Cl. 424-270.000.

Teledyne, Inc.: *See*—
Altman, Norman G., 4,233,625, Cl. 358-101.000.

Teledyne Industries, Inc.: *See*—
Barbeau, Dennis E., 4,232,526, Cl. 60-745.000.

Telefonaktiebolaget L M Ericsson: *See*—
Dick, Willy P. A., 4,232,742, Cl. 169-58.000.

Terasawa, Takao: *See*—
Takeuchi, Takeshi; and Terasawa, Takao, 4,232,931, Cl. 339-258.00R.

Terrell, George C.; and Konnerth, Andrew, III, to Conservation Technologies, Inc. High efficiency hot water boiler. 4,232,634, Cl. 122-41.000.

Tertinek, Christian T.; and Stone, Alan J., to Stone Construction Equipment, Inc. Rotary power trowel. 4,232,980, Cl. 404-112.000.

Terzian, Rouben T., to Marvin Glass & Associates. Animated doll. 4,232,478, Cl. 46-141.000.

Teti, John J., to Pyott-Boone Machinery Corp. Battery plug and receptacle for use in mines. 4,232,930, Cl. 339-186.00M.

Tetra Pak Developpement SA: *See*—
Monaco, Jose R.; and Rausing, Hans A., 4,233,320, Cl. 426-7.000.

Tetra Pak International AB: *See*—
Ernstsson, Ernst G.; and Fuchs, Alfred, 4,233,271, Cl. 422-300.000.

Teutsch, Jean G.; and Philibert, Daniel, to Roussel Uclaf. 11β-Substituted-$\Delta^{4,9}$-estradienes. 4,233,296, Cl. 424-241.000.

Teutsch, Jean G.; and Deraedt, Roger, to Roussel Uclaf. Novel Δ^4-androstenes. 4,233,297, Cl. 424-243.000.

Texaco Development Corp.: *See*—
Nieh, Edward C. Y.; and Keating, Kenneth P., 4,233,447, Cl. 544-352.000.
Park, Jack H., 4,232,740, Cl. 166-276.000.

Texaco Inc.: *See*—
Allen, Joseph C., 4,233,166, Cl. 252-8.55D.
Arnold, Dan M., 4,233,508, Cl. 250-259.000.
Franklin, Barbara J., 4,232,739, Cl. 166-275.000.
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,233,244, Cl. 564-423.000.
Tyler, Timothy N.; and Carlin, Joseph T., 4,232,737, Cl. 166-273.000.

Textron Inc.: *See*—
Chmura, William J., 4,232,436, Cl. 29-148.40B.
Hsu, William W., 4,232,699, Cl. 137-87.000.
Johnson, Dwight N., 4,232,851, Cl. 251-61.100.
McGuire, Ned W., 4,233,099, Cl. 156-242.000.

Tharman, Paul A., to Briggs & Stratton Corporation. Connections for small engine auxiliary electrical system. 4,233,534, Cl. 310-71.000.

Thermatool Corp.: *See*—
Udall, Humfrey N., 4,233,484, Cl. 219-67.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for laying railway track. 4,232,610, Cl. 104-3.000.

Thiel, Gerhard: *See*—
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.

Thoma, Hans, to SIG Schweizerische Industrie-Gesellschaft. Spray-assisted pneumatic stone-working apparatus. 4,232,748, Cl. 173-3.000.

Thompson, Jack E., to Lilliston Corporation. Digger-shaker-inverter apparatus. 4,232,744, Cl. 171-101.000.

Thomsen, Ib. Detector for sensing the angular position of a rotatable magnet. 4,232,451, Cl. 33-361.000.

Thomson-CSF: *See*—
Lepere, Guy, 4,233,604, Cl. 343-7.0AG.

Thorn Automation Limited: *See*—
Whitlock, Reginald H., 4,233,529, Cl. 307-414.000.

Thune-Eureka A/S: *See*—
Eriksen, Gunnar, 4,232,435, Cl. 26-106.000.

Ticknor, William G.; and Rein, Arnold R., to American Can Company. Coextruded multilayer film. 4,233,367, Cl. 428-476.300.

Times Fiber Communications, Inc.: *See*—
Dabby, Franklin W.; and Chesler, Ronald B., 4,232,938, Cl. 350-96.200.

Timex Corporation: *See*—
Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, 4,233,339, Cl. 427-108.000.
Schwarzschild, Jack, 4,233,679, Cl. 368-72.000.

Titus, Theodore, IV: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,233,638, Cl. 360-92.000.

Tobin, Michael F.: *See*—
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., 4,232,585, Cl. 91-432.000.

Toda, Kazuo; Hosoda, Tadashi; and Matsuo, Yutaka, to Mitsubishi Kinzoku Kabushiki Kaisha. Anode support member. 4,233,149, Cl. 204-297.00W.

Tojo, Tsutomu, to Olympus Optical Co., Ltd. Objective lens system for microscopes. 4,232,941, Cl. 350-175.0ML.

Tokai Denka Kogyo Kabushiki Kaisha: *See*—
Ohura, Osami; and Fujimoto, Osamu, 4,233,238, Cl. 260-513.700.

Tokiwa, Taisuke: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.

Toko, Inc.: *See*—
Sakakura, Mitsuo; and Takaku, Tetsuo, 4,233,135, Cl. 204-192.0SP.

Tokuno, Masateru, to Rengo Kabushiki Kaisha (Rengo Co., Ltd.). Blank feeding apparatus. 4,232,859, Cl. 271-35.000.

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Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,233,672, Cl. 365-181.000.
Tashiro, Norio; and Takahashi, Hirokazu, 4,233,540, Cl. 315-39.510.

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Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, 4,233,474, Cl. 179-81.00B.

Toppan Printing Co., Ltd.: *See*—
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, 4,233,663, Cl. 364-515.000.

Topps Chewing Gum, Incorporated: *See*—
Fritz, Douglas P.; and Elias, Ronald J., 4,233,319, Cl. 426-5.000.

Toray Industries, Inc.: *See*—
Ono, Masaaki; Okabe, Kazuo; and Miura, Yasuki, 4,233,352, Cl. 428-141.000.
Sato, Yoshiaki; and Arai, Hajime, 4,233,355, Cl. 428-224.000.
Senda, Teruo; and Otani, Mitsunobu, 4,233,159, Cl. 210-413.000.

Torbenson, Dale A. Machine for stripping shingles. 4,232,906, Cl. 299-39.000.

Toro Company, The: *See*—
Walto, Joseph J., 4,232,505, Cl. 56-12.700.

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Bowen, Willard L., III, 4,232,914, Cl. 308-215.000.

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Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.

Tour & Andersson Aktiebolag: *See*—
Christiansen, Jorn U., 4,232,818, Cl. 236-46.00R.

Toyo Ink Manufacturing Co., Ltd.: *See*—
Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, 4,233,206, Cl. 260-42.210.
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Toyo Pulp Co., Limited: *See*—
Hanaya, Morimasa, 4,232,720, Cl. 144-309.0AC.

Toyoda, Kazuhiro: *See*—
Takahashi, Yukio; and Toyoda, Kazuhiro, 4,233,525, Cl. 307-234.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.
Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, 4,232,517, Cl. 60-276.000.
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,232,885, Cl. 280-804.000.
Takahashi, Takeshi; and Yanagihara, Hiromichi, 4,232,638, Cl. 123-260.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Traber, Walter: *See*—
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,233,306, Cl. 424-263.000.

Tradall S.A.: *See*—
Vigna, Nicola, 4,232,795, Cl. 215-21.000.

Trambarulo, Ralph F.: *See*—
Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,233,579, Cl. 333-204.000.

Trane Company, The: *See*—
Lundblad, James T.; and Ware, Chester D., 4,232,533, Cl. 62-509.000.

Trecker, David J.: *See*—
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,233,130, Cl. 204-159.230.

Treczka, Leo; and Spinner, Georg, to Spinner GmbH. Rotating coupler for transmitting high frequency energy. 4,233,580, Cl. 333-261.000.

Treesh, Lloyd N.: *See*—
Smith, Edward F., Sr.; and Treesh, Lloyd N., 4,232,631, Cl. 119-52.0AF.

Trepte, Wulf, to Siemens Aktiengesellschaft. X-ray image detection apparatus. 4,233,516, Cl. 250-444.000.

Tridair Industries: *See*—
Warkentin, Roy, 4,232,496, Cl. 52-403.000.

Triram Corporation: *See*—
Jacobs, Melvin J., 4,233,356, Cl. 428-244.000.

Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. 4-Hydroxy-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxides and salts thereof. 4,233,299, Cl. 424-246.000.

Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, to Boehringer Ingelheim GmbH. 4,5-Dimethyl-thieno[3,2-d]isothiazolo-3(2H)-one-1,1-dioxides, compositions, and methods of use as a sweetener. 4,233,333, Cl. 426-548.000.

Trutzschler GmbH & Co. KG: *See—*
Beneke, Wolfgang; Teichmann, Paul G.; and Weber, Wilfried, 4,232,426, Cl. 19-106.00R.

TRW Inc.: *See—*
Miller, Laurence L., 4,232,708, Cl. 137-625.210.

Trzeciak, Kurt H., to Smith International, Inc. In-hole motor drill with bit clutch. 4,232,751, Cl. 175-101.000.

Tsipenjuk, Yakov I.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Tsuboshima, Kosaku: *See—*
Sawamura, Ichiro; and Tsuboshima, Kosaku, 4,232,970, Cl. 356-432.000.

Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Method of lighting for colored shadows. 4,233,654, Cl. 362-231.000.

Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, to Nippon Oil Co., Ltd.; and Toyo Ink Manufacturing Co., Ltd. Process for producing curable coating resins. 4,233,420, Cl. 525-310.000.

Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, to Nippon Soken, Inc. Tensioning device for seat belt. 4,232,886, Cl. 280-806.000.

Tsuguhiro, Fukuda: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.

Tsuji, Koh, to Hitachi, Ltd. Centrifugal turbomachine. 4,232,994, Cl. 415-127.000.

Tsuji, Teruji: *See—*
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.

Tsukada, Katsuo; and Ohnuma, Sadabumi, to Hitachi, Ltd. Liquid chromatography apparatus. 4,233,156, Cl. 210-101.000.

Tsukada, Toshihisa: *See—*
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Tsunashima, Masaaki: *See—*
Slangan, Gary; and Tsunashima, Masaaki, 4,233,325, Cl. 426-107.000.

Tsuzuki, Akira: *See—*
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.

Tucker, James I., to Orion Industries, Inc. Alternative diameter gasket. 4,232,421, Cl. 16-2.000.

Tuda, Koji: *See—*
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,232,685, Cl. 128-773.000.

Tuke, Michael A.: *See—*
Samuelson, Kent M.; and Tuke, Michael A., 4,232,404, Cl. 3-1.910.

Tulaszewski, Olaf. Leg positioning device for X-ray filming. 4,232,681, Cl. 128-653.000.

Turndorf, Herman: *See—*
Chalon, Jack; Ramanathan, Sivam; and Turndorf, Herman, 4,232,667, Cl. 128-203.260.

Turner, Raymond, to Aquila Steel Company, Ltd. On-site modular support systems for supporting cables, conduit and the like. 4,232,845, Cl. 248-49.000.

Turner, S. Richard; Yanus, John F.; and Pai, Damodar M., to Xerox Corporation. Imaging system using novel charge transport layer. 4,233,384, Cl. 430-59.000.

Tuturea, David P.: *See—*
Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., 4,232,623, Cl. 114-125.000.

Tuzson, John J., to Borg-Warner Corporation. Drive coupling. 4,232,770, Cl. 192-41.00R.

Twitchett, Peter J.; and Williams, Peter L., to National Research Development Corporation. Methods and apparatus for liquid chromatography. 4,233,030, Cl. 23-230.00R.

Tyler, Timothy N.; and Carlin, Joseph T., to Texaco Inc. Double tapered surfactant waterflood oil recovery process. 4,232,737, Cl. 166-273.000.

Uchida, Hiromichi. Device for binding a thermally adhesive tape to articles. 4,232,498, Cl. 53-76.000.

Uchigasaki, Isao: *See—*
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic accompaniment apparatus. 4,232,581, Cl. 84-1.030.

Udall, Humfrey N., to Thermatool Corp. High frequency current welding of metal strip to a metal part. 4,233,484, Cl. 219-67.000.

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Karlsson, Stig A., 4,233,007, Cl. 425-7.000.

Uebayashi, Takeo: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, to NSK-Warner K. K. Seat belt buckle device. 4,232,433, Cl. 24-230.00A.

Ueno, Susumu: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Ulin, Roy A.: *See—*
Hof, Craig R.; and Ulin, Roy A., 4,232,552, Cl. 73-356.000.

Ullman, Edwin F.: *See—*
Maggio, Edward T.; Wife, Richard L.; and Ullman, Edwin F., 4,233,402, Cl. 435-7.000.

Ulrich, James A., to J. V. Manufacturing & Welding, Inc. Waste paper compacter with front access features. 4,232,599, Cl. 100-25.000.

Umemoto, Toshio: *See—*
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Unibra: *See—*
Delmon, Bernard; and Van Houte, Ghislain, 4,233,175, Cl. 252-192.000.

Union Carbide Corporation: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,233,130, Cl. 204-159.230.
Fenner, Gary W.; and Ragi, Elias G., 4,232,728, Cl. 165-1.000.
Fiato, Rocco A., 4,233,466, Cl. 568-902.000.

Union Oil Company of California: *See—*
Miller, J. Wayne; and Anderson, Mark J., 4,233,034, Cl. 44-1.0SR.

Unit Rig & Equipment Co.: *See—*
Satterwhite, Charles R., 4,232,982, Cl. 405-179.000.

United Catalysts Inc.: *See—*
Atwood, Kenton; Wright, James H.; and Merriam, Jay S., 4,233,187, Cl. 252-466.00J.
Hausberger, Arthur L.; and Dienes, Edward K., 4,233,180, Cl. 252-373.000.
Russ, Karl J.; and Broughton, Donald R., 4,233,179, Cl. 252-373.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Gibson, Peter J., 4,232,570, Cl. 74-866.000.
Sobey, Arnold J., 4,232,844, Cl. 244-123.000.

United States Gypsum Company: *See—*
Baehr, Donald O.; and Izard, David G., 4,233,368, Cl. 428-538.000.
Kuhr, Albert F., 4,232,594, Cl. 98-40.00D.

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Administrator U.S. Environmental Protection Agency: *See—*
Pontius, Duane H.; and Smith, Wallace B., 4,233,037, Cl. 55-2.000.

Air Force: *See—*
Grakauskas, Vytautos, 4,233,249, Cl. 568-926.000.
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Griffin, Warren R., 4,233,426, Cl. 525-477.000.
Shaheen, Joseph M., 4,233,103, Cl. 156-331.000.
Stoffer, Lewis J., 4,232,996, Cl. 416-191.000.
Woods, Don F.; and Larsen, Ronald F., 4,232,446, Cl. 33-143.00L.

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Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, 4,233,215, Cl. 260-239.0EQ.

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Benson, Willard R., 4,232,607, Cl. 102-56.00R.
Ellis, James N., 4,233,554, Cl. 320-46.000.
Helbert, John N., 4,233,394, Cl. 430-270.000.

Commerce: *See—*
Johnson, Christian E., Sr., 4,233,107, Cl. 156-632.000.

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Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., 4,233,570, Cl. 331-94.50F.

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Chernoff, Ralph C. Frequency translating phase conjugation circuit for active retrodirective antenna array. 4,233,606, Cl. 343-100.0TD.

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St. Clair, Terry L., 4,233,258, Cl. 264-137.000.

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Brady, Jesse J., III, 4,233,678, Cl. 367-122.000.
Gaertner, Robert F., 4,233,558, Cl. 323-17.000.
Miller, Donald; and Skipton, Robert W., 4,232,417, Cl. 9-8.00R.
Rice, Roy W.; and Pohanka, Robert C., 4,233,477, Cl. 179-110.00A.

U.S. Philips Corporation: *See—*
Bouwhuis, Gijsbertus; and Hazerdonk, Teunis J., 4,233,502, Cl. 250-204.000.
Eggermont, Ludwid D. J., 4,233,684, Cl. 375-30.000.
Essers, Wilhelmus G., 4,233,489, Cl. 219-121.00P.
Gerritsen, Jan, 4,233,547, Cl. 315-368.000.
Harris, Jeffrey J.; and Wood, Colin E. C., 4,233,092, Cl. 148-175.000.
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,233,385, Cl. 430-117.000.
Iemenschot, Johannes A., 4,232,870, Cl. 274-39.00R.

Jongerius, Hermanus M.; and van der Wolf, Rein W., 4,233,653, Cl. 362-84.000.
Kemner, Rudolf; and Cramer, Rudy R., 4,233,633, Cl. 358-221.000.
Klaassen, Francois M.; and Appels, Johannes A., 4,233,617, Cl. 357-23.000.
Kleis, Derk, 4,233,472, Cl. 179-1.0GA.
Mijnheer, Andries, 4,233,261, Cl. 264-293.000.
Oostvogels, Franciscus M. P.; Melis, Gustaaf; and Van Laarhoven, Aime P. A. M., 4,233,542, Cl. 315-73.000.
van de Spijker, Willebrordus H. M. M.; and Konijnendijk, Willem L., 4,233,538, Cl. 313-486.000.
Verdult, Josephus A.; and Manders, Lambertus W. J., 4,233,336, Cl. 427-67.000.

United States Steel Corporation: *See—*
Curtis, Omer E., Jr., 4,233,432, Cl. 528-298.000.

United States Surgical Corporation: *See—*
Veth, George J., 4,232,682, Cl. 128-671.000.

U.S. Terrazzo Panels, Inc.: *See—*
Murray, John A., 4,233,008, Cl. 425-77.000.

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Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., 4,233,369, Cl. 429-26.000.
Goller, Glen J.; and Breault, Richard D., 4,233,181, Cl. 252-425.300.
Grudkowski, Thomas W., 4,233,573, Cl. 331-107.00A.

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Hammel, Harold T.; and Maggert, James E., 4,233,153, Cl. 203-10.000.
Studer, Henry E., 4,232,506, Cl. 56-327.00R.

University of Illinois Foundation: *See—*
Anderson-Shanklin, Gene C., 4,232,687, Cl. 128-777.000.

University of North Carolina at Chapel Hill: *See—*
Statland, Bernard E.; and Sher, Geoffrey, 4,233,032, Cl. 23-230.00B.

University of Southern California: *See—*
Yen, Teh F.; and Farmanian, Paul A., 4,232,738, Cl. 166-274.000.

UNL Incorporated: *See—*
Sauer, Mark R., 4,232,962, Cl. 355-46.000.

Uozumi, Yukio, to Kawasaki Jukogyo Kabushiki Kaisha. Guided vehicle for guide-way transportation system. 4,232,611, Cl. 105-215.00R.

Upjohn Company, The: *See—*
Kelly, Robert C., 4,233,225, Cl. 260-345.200.

Uranerzbergbau GmbH: *See—*
Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., 4,233,272, Cl. 423-7.000.

Urata, Tetsuro: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Urbain, Daniel, to Laminoirs a Froid de Thionville. Method of making metal-plastic ski. 4,233,098, Cl. 156-242.000.

USM Corporation: *See—*
Hollick, John G., 4,232,418, Cl. 12-61.00A.

Utsunomiya University: *See—*
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,233,061, Cl. 71-103.000.

Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, to Shionogi & Co., Ltd. Azetidinone derivatives and production thereof. 4,233,216, Cl. 260-239.00A.

V & W Parts & Machine Shops, Inc.: *See—*
Fair, James V., 4,232,437, Cl. 29-156.40R.

Vaccari, Franco. Ski boots. 4,232,459, Cl. 36-71.000.

Vacuum Cleaner Corporation of America, The: *See—*
Cutler, Morris; and Tamarin, Bernard J., 4,232,837, Cl. 242-107.000.

Valantin, Alfred A. M., to Charbonnages de France. Carriage with articulated track. 4,232,911, Cl. 305-16.000.

Valayil, Silvester P.; and Elias, Moenes L., to Dart Industries Inc. Dissolution of metals utilizing an aqueous H_2SO_4-H_2O_2-3-sulfopropyldithiocarbamate etchant. 4,233,111, Cl. 156-666.000.

Valayil, Silvester P.; and Elias, Moenes L., to Dart Industries Inc. Dissolution of metals utilizing an aqueous H_2SO_4-H_2O_2-polysulfide etchant. 4,233,112, Cl. 156-666.000.

Valayil, Silvester P.; and Elias, Moenes L., to Dart Industries Inc. Dissolution of metals utilizing an aqueous H_2O_2-H_2SO_4-thioamide etchant. 4,233,113, Cl. 156-666.000.

Valentin, Guenter: *See—*
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.

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van Thiel, Rudolphus A. F. J., 4,233,364, Cl. 428-399.000.

VanAllan, James A.: *See—*
Petropoulos, Constantine C.; Reynolds, George A.; and VanAllan, James A., 4,233,443, Cl. 542-454.000.

Van Coney, Robert H.: *See—*
Lucas, Malcolm B.; and Van Coney, Robert H., 4,233,017, Cl. 425-290.000.

Vandenende B.V.: *See—*
Steketee, Cornelis J., 4,232,743, Cl. 171-55.000.

van der Lely, Cornelis. Device for selectively applying liquid manure onto or into the ground. 4,232,616, Cl. 111-7.000.

van der Lely, Cornelis. Soil cultivating implements. 4,232,746, Cl. 172-59.000.

van der Lely, Cornelis. Device for spreading material. 4,232,831, Cl. 239-673.000.

van der Wolf, Rein W.: *See—*
Jongerius, Hermanus M.; and van der Wolf, Rein W., 4,233,653, Cl. 362-84.000.

van de Spijker, Willebrordus H. M. M.; and Konijnendijk, Willem L., to U.S. Philips Corporation. Luminescent lead-activated alkaline earth metal rare earth metal borates and mercury vapor discharge lamp containing the same. 4,233,538, Cl. 313-486.000.

Van Eenam, Donald N., to Monsanto Company. Wet strength polymers. 4,233,417, Cl. 525-359.000.

Van Houte, Ghislain: *See—*
Delmon, Bernard; and Van Houte, Ghislain, 4,233,175, Cl. 252-192.000.

Van Laarhoven, Aime P. A. M.: *See—*
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Van Pham, Minh. Pneumatic assisted flushing apparatus for toilets. 4,232,409, Cl. 4-362.000.

Van Siclen, Howard E., Jr., to Bendix Corporation, The. Control circuit for diesel injection system. 4,232,647, Cl. 123-478.000.

van't Hooft, Eric. Apparatus for internal irradiation. 4,233,517, Cl. 250-497.000.

van Thiel, Rudolphus A. F. J., to Van Thiel's Draadindustrie (Thibodraad) B.V. Anchoring fibre for use in concrete. 4,233,364, Cl. 428-399.000.

Variable Kinetic Drives Limited: *See—*
Hobbs, Howard F., 4,232,567, Cl. 74-677.000.

Varian Associates, Inc.: *See—*
Coad, George L., 4,233,519, Cl. 250-514.000.
Falce, Louis R., 4,233,539, Cl. 315-5.380.

Vaseen, Vesper A. Portable lung apparatus. 4,232,665, Cl. 128-200.240.

Vasile, Carmine F., to Rockwell International Corporation. Periodic magnet unidirectional transducer. 4,232,557, Cl. 73-629.000.

VDO Adolf Schindling AG: *See—*
Hahn, Joachim, 4,232,915, Cl. 312-107.000.
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, 4,233,680, Cl. 368-76.000.

Veach, Carlos W. Broken line drafting templates. 4,232,448, Cl. 33-174.00B.

Velsicol Chemical Corporation: *See—*
Kyker, Glendon D.; and Paul, Kalidas, 4,233,251, Cl. 570-220.000.

Ventura, Daniel S.: *See—*
Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., 4,232,563, Cl. 74-470.000.

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Koch, Lehel, 4,233,210, Cl. 260-112.00R.

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Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,233,192, Cl. 252-545.000.

Verdult, Josephus A.; and Manders, Lambertus W. J., to U.S. Philips Corporation. Method of applying luminescent material to a glass support. 4,233,336, Cl. 427-67.000.

Vernaleken, Hugo: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.

Verzwyvelt, Scott A.: *See—*
Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., 4,233,347, Cl. 427-352.000.

Vesterlund, Gunnar, to AB Asea-Atom. Method for providing a diffusion barrier. 4,233,086, Cl. 148-6.300.

Veth, George J., to United States Surgical Corporation. Physiological parameter measuring system. 4,232,682, Cl. 128-671.000.

Vidal, Andre: *See—*
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Viramontes, Jose A. B. Harvester with mechanical rod weeder and soil agitator. 4,232,745, Cl. 172-44.000.

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Vitek, John M.: *See—*
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Wakabayashi, Toshio: *See*—
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Wallmann, Wilfried; Menzel, Manfred; and Peschel, Dieter, to Windmoller & Holscher. Apparatus for longitudinally cutting webs of material. 4,232,577, Cl. 83-496.000.
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Whitlock, Reginald H., to Thorn Automation Limited. Transistors power stages. 4,233,529, Cl. 307-414.000.
Whittingham, M. Stanley; and Jacobson, Allan J., to Exxon Research & Engineering Co. High energy density plural chalcogenide cathode-containing cell. 4,233,375, Cl. 429-194.000.
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Wilczynski, Janusz S., to International Business Machines Corporation. Projection optical system for aligning an image on a surface. 4,232,969, Cl. 356-401.000.
Williams, Francis R. Siphon. 4,232,694, Cl. 137-1.000.
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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Davis, Thomas F., Re. 30,434, Cl. 106-1.220.
Brother Kogyo Kabushiki Kaisha: *See—*
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Bussjager, Rudy C., to Carrier Corporation. Heat exchanger. Re. 30,433, Cl. 62-115.000.
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ISSUED NOVEMBER 11, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

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Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,017,304, Johnson & Johnson, ABSORBENT FIBROUS STRUCTURE AND METHOD OF PRODUCTION; **3,612,055,** same, DISPOSABLE DIAPER OR THE LIKE AND METHOD OF MANUFACTURE; **3,616,114,** same, REUSABLE COMPOSITE ADHESIVE SEALING TAPES; **3,938,522,** same, DISPOSABLE DIAPER, **filed** Sept. 21, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77-614, *Johnson & Johnson* v. *Kimberley-Clark Corporation.* Dismissed on Feb. 20, 1980.

3,122,474, Hoffmann-La Roche Inc., CHLORDIAZEPOXIDE AND CLIDINIUM HALIDE COMPOSITION AND METHOD OF USING SAME, **filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80-2952, *Hoffmann-La Roche Inc.* v. *Chelsea Laboratories.* **Same, filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80-2953, *Hoffmann-La Roche* v. *Zenith Laboratories.* **Same, filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80-2954, *Hoffmann-La Roche Inc.* v. *MD Pharmaceutical Inc.* **Same, filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80-2955, *Hoffmann-La Roche Inc.* v. *Pharmadyne Laboratories.*

3,233,151, Daniel G. Russ, METHOD AND APPARATUS FOR MEASURING THRUST IN JET-TYPE ENGINES, **filed** Aug. 5, 1980, U.S. Court of Claims (Wash., D.C.), Doc. 414-80 C, *Telectro-Mek, Inc. and Daniel G. Russ* v. *The United States.*

3,265,902, Itek Corporation, PHOTOELECTRIC SHAFT ANGLE ENCODER; **3,310,798,** same, ANALOG TO DIGITAL OPTICAL ENCODER; **3,312,828,** same, ANALOG TO DIGITAL ENCODING APPARATUS FOR DIRECTLY READING OUT INFORMATION, **filed** Aug. 4, 1980, U.S. Court of Claims (Wash. D.C.), Doc. 412-80 C, *Itek Corporation* v. *The United States.*

3,310,798. (See 3,265,902.)

3,312,828. (See 3,265,902.)

3,368,280, C & B Inc., DENTAL TOOL, **filed** June 20, 1979, D.C., W.D. Wash. (Seattle), Doc. C-79-821V, *Litton Industrial Products, Inc.* v. *Solid State Systems Corp.* Order granting defendant's motion for summary judgment filed Mar. 13, 1980. **Same, filed** July 13, 1979, D.C., N.D. Ind. (South Bend), Doc. 879-205, *Litton Industrial Products Inc.* v. *Mastersonics, Inc.* Plaintiff's complaint dismissed with prejudice and defendant's counterclaim granted. Sept. 15, 1980.

3,374,023, Roberts Consolidated Industries, Inc., KNEE-ACTUABLE CARPET STRETCHER WITH ADJUSTABLE-LENGTH SHANK, **filed** Sept. 4, 1980, D.C., N.D. Ga. (Atlanta), Doc. C80-1542A, *Roberts Consolidated Industries, Inc.* v. *Taylor Industries Co.*

3,491,590, Billy K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS, **filed** Aug. 24, 1979, D.C., W.D. Mo. (St. Joseph), Doc. 79-6053-CV-SJ, *Billy K. Watkins* v. *Dave Hager.* Defendants are enjoined and restrained from infringing plaintiff's patent. Filed Aug. 7, 1980. **Same, filed** Aug. 23, 1979, D.C., W.D. Tenn. (Jackson), Doc. 79-1113, *Billy K. Watkins* v. *Robin Wood et al.* Defendants are enjoined and restrained from infringing plaintiff's patent. Filed Aug. 8, 1980.

3,510,471, Leslie C. Case, NOVEL POLYETHER POLYOLS AND PROCESS FOR PREPARING THE SAME, **filed** Mar. 4, 1975, D.C. District of Columbia (Wash. D.C.), Doc. 75-0290, *Leslie C. Case* v. *The Commissioner of Patents, Hyman M. Molotsky et al.* Order granting motions of defendants 1, 2 and 3 to dismiss; denying motion of plaintiff for summary judgment and denying as moot motion of defendants 1, 2 and 3 to stay proceedings filed on Apr. 30, 1975. **Same, filed** Dec. 29, 1975, U.S. Ct. of Appeals (1st Cir., Boston), Doc. 75-1493, *Leslie C. Case* v. *The Commissioner of Patents and Trademarks et al.* The order of the district court is affirmed. Feb. 20, 1976.

3,612,055. (See 3,017,304.)

3,616,114. (See 3,017,304.)

3,631,294, Princeton Electronic Products, Inc., ELECTRONIC STORAGE UTILIZING A TARGET COMPRISING BOTH SILICON AND SILICON DIOXIDE AREAS, **filed** Oct. 3, 1978, D.C., S.D.N.Y., Doc. 78-C-4642, *Princeton Electronic Products, Inc.* v. *Bell Telephone Labs., Inc.*

3,650,149, Clayton Manufacturing Company, Inc., ENGINE IGNITION AND POWER ANALYZER, **filed** Jan. 3, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-1, *Clayton Manufacturing Company, Inc.* v. *Applied Power, Inc.* Dismissed on Mar. 21, 1980.

3,662,314, Piher Sociedad Anonima, ADJUSTABLE ANNULAR POTENTIOMETER WITH TERMINAL ATTACHMENT MEANS, **filed** Aug. 7, 1978, D.C., N.D. Ind. (South Bend), Doc. 878-0174, *Piher Sociedad Anonima* v. *CTS Corporation.* Ordered that case is reversed and remanded to Bd. of Patent Interferences for consideration of evidence and determination of merits on matters specified in 102(g). Sept. 27, 1979.

3,662,314, Piher Sociedad Anonima, ADJUSTABLE ANNULAR POTENTIOMETER WITH TERMINAL ATTACHMENT MEANS; **3,670,285,** CTS Corporation, VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, **filed** May 12, 1980, D.C., N.D. Ind. (South Bend), Doc. 880-126, *Piher Sociedad Anonima* v. *CTS Corporation.*

3,667,694, Williams Patent Crusher & Pulverizer Co., Inc., MATERIAL REDUCING HAMMER MILL, **filed** Dec. 28, 1976, D.C., E.D. Mo. (St. Louis), Doc. 76-1201C(A), *Gruendler Crusher & Pulverizer Co.* v. *Williams Patent Crusher & Pulverizer Co., Inc. et al.* Plaintiff is enjoined from infringing defendant's patent per final judgment entered Aug. 29, 1980.

3,670,285, CTS Corporation, VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, **filed** Apr. 1, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c1152, *CTS Corporation* v. *Piher International Corporation.* Cause and case hereby dismissed with prejudice on Mar. 10, 1978.

3,670,285. (See 3,662,314.)

3,671,523, Kurt Westphal et al., HERBICIDAL AGENTS; **3,905,801,** Maged M. Fawzi, SUBSTITUTED 1,2,4-TRIAZINE-5-ONES AS HERBICIDES, **filed** Jan. 15, 1980, D.C. District of Columbia (Wash. D.C.), Doc. 80-0124, *Kurt Westphal et al.* v. *Commissioner of Patents and Trademarks.*

3,701,748, Rohm and Haas, UNSATURATED POLYESTER RESINOUS COMPOSITIONS; **3,772,241,** same, **filed** Aug. 15, 1977, D.C., N.D. Ohio (Toledo), Doc. C-77-419, *Rohm and Company* v. *Hatco Polyester Division et al.*

3,706,606, Tile Council of America, Inc., GROUTING COMPOSITION, **filed** Dec. 6, 1977, D.C.N.J. (Newark), Doc. 77-2509, *Tile Council of America, Inc.* v. *Red Devil, Inc.* Stipulation and order dismissing action without costs filed Sept. 28, 1979.

3,766,608, Dennison Mfg. Co., HARNESSING DEVICE, **filed** Nov. 23, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4348, *Panduit Corp.* v. *Dennison Manufacturing Co.* Defendants motion to dismiss complaint as untimely filed is granted on Mar. 1, 1977. **Same, filed** Apr. 13, 1979, D.C., N.D. Ill. (Chicago), Doc. 76c4348, *Panduit Corp.* v. *Dennison Manufacturing Co.*

3,772,241. (See 3,701,748.)

3,773,840, Bernard M. Regan, DIFLUOROMETHYL 1-2,2,3,3-TETRAFLUOROPROPYL ETHER; **3,773,841,** same, 1-CHLORO - 2,2,3,3 - TETRAFLUOROPROPYL DIFLUOROMETHYL ETHER, **filed** Apr. 28, 1980, D.C.N.J. (Trenton), Doc. 80-1209, *Airco, Inc* v. *Baxter Travenol Lab.*

3,773,841. (See 3,773,840.)

3,778,614, TMI Limited, METHOD AND APPARATUS FOR MEASURING X- OR Y-RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA; **3,866,047,** same, PENETRATING RADIATION EXAMINING APPARATUS HAVING A SCANNING COLLIMATOR; **3,924,129,** same, METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION; **3,924,131,** same, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,946,234,** same, APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION; **3,965,357,** same, APPARATUS FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION; **filed** Aug. 8, 1977, D.C. Del. (Wilmington), Doc. C.A. 77-304, *EMI Limited* v. *Pfizer, Inc. et al.*

3,778,614, EMI Limited, METHOD AND APPARATUS FOR MEASURING X- OR Y-RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA; **3,924,129,** same, METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION; **3,924,131,** same, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,944,833,** same, APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **4,035,647,** same, RADIOGRAPHY; **4,052,618,** same, APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **4,096,390,** same, APPARATUS FOR EXAMINING OBJECTS BY MEANS OF PENETRATING RADIATION; **4,114,042,** same, RADIOGRAPHY, **filed** Sept. 25, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-612, *EMI Limited* v. *General Electric Company.*

3,859,575, Shih-Ying Lee and Yao-Tzu Li, VARIABLE CAPACITANCE SENSOR, **filed** Mar. 29, 1978, D.C. Mass. (Boston), Doc. 78-0715-F, *Rosemount, Inc.* v. *Shih-Ying Lee et al.*

3,862,819, Fred A. Wentworth, Jr., FULL CATALYZER; **4,016,837,** same, VAPOR INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES; **D. 235,448,** same, HUMIDIFIER HOUSING FOR ATTACHMENT TO A COMBUSTION SYSTEM, **filed** Sept. 8, 1977, D.C. Mass. (Boston), Doc. 77-2732-S, *Vaporpak, Inc.* v. *Aftco Corporation et al.*

3,866,047. (See 3,778,614.)

3,867,005, Bunker Ramo Corporation, INSULATION-PIERCING CONTACT MEMBER AND ELECTRICAL CONNECTOR, **filed** Oct. 23, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3563, *Bunker Ramo Corporation* v. *TRW Inc.* Order of dismissal with prejudice dated Aug. 26, 1980.

3,868,790, Roy A. Fricke, SPARK PLUG CLEANER; **4,028,851,** same, **4,062,155,** same, **filed** July 13, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-C-436, *Wells Mfg. Corp.* v. *Roy A. Fricke et al.* Transferred to N.D. Ill. (Chicago), on Feb. 22, 1979.

3,890,157, Construction Products Research, Inc., CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS, **filed** Mar. 13, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78-822, *Construction Products Research, Inc.* v. *Cempro, Inc.*

3,905,801. (See 3,671,523.)

3,924,129. (See 3,778,614.)

3,924,131. (See 3,778,614.)

3,930,769, Vereinigte Nahrungsmittelindustrie Aktiengesellschaft, PROCESS AND APPARATUS FOR PRODUCING A THIN DOUGH MATERIAL; **3,991,220,** same, PROCESS FOR PRODUCING A THIN DOUGH MATERIAL, **filed** Jan. 4, 1980, D.C. District of Columbia (Wash. D.C.), Doc. 80-0024, *Everex Corporation* v. *Vereinigte Nahrungsmittelindustrie Aktiengesellschaft.*

3,938,522. (See 3,017,304.)

3,942,338, Furlette and Stadler, TORQUE LIMITING COUPLING; **4,056,953,** same, **filed** Nov. 26, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-74482, *Automa Corp. et al.* v. *Excel Corp. et al.*

3,944,833. (See 3,778,614.)

3,946,234. (See 3,778,614.)

3,965,357. (See 3,778,614.)

3,991,220. (See 3,930,769.)

4,000,000, Robert L. Mendenhall, PROCESS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS, **filed** Mar. 21, 1977, D.C. Ariz. (Phoenix), Doc. 77-217 PHX WEC, *Robert L. Mendenhall* v. *Donald C. Speer et al.*

4,016,837. (See 3,862,819.)

4,022,529, John U. White, FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL, **filed** Feb. 20, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c0873, *John U. White* v. *The Perkin-Elmer Corporation.*

4,028,851. (See 3,868,790.)

4,035,647. (See 3,778,614.)

4,046,923, L. D. Schreiber Cheese Company, Inc., PACKAGE WITH STAGGERED PRODUCT SLICES AND PROCESS FOR PRODUCING THE SAME, **filed** July 28, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-476, *L. D. Schreiber Cheese Company, Inc.* v. *Interstate Food Corporation, Inc. et al.* Dismissed on Jan. 23, 1980.

4,047,355, Studco, Inc., SHAFTWALL, **filed** Oct. 22, 1979, D.C., N.D. Ohio (Cleveland), Doc. C79-1192Y, *Studco, Inc.* v. *National Gypsum Company, doing business as Gold Bond Building Products.*

4,052,618. (See 3,778,614.)

4,053,845, Gordon Gould, OPTICALLY PUMPED LASER AMPLIFIERS, **filed** Oct. 10, 1977, D.C., M.D. Fla. (Orlando), Doc. 77-438-Orl-Civ-Y, *Gordon Gould* v. *Control Laser Corporation.* **Same, filed** July 26, 1978, D.C., N.D. Calif. (San Francisco), Doc. C-78-1670, *Gould* v. *General Photonics Corp.*

4,056,953. (See 3,942,338.)

4,062,155. (See 3,868,790.)

4,096,390. (See 3,778,614.)

4,114,042. (See 3,778,614.)

4,113,760, Olaf A. Hallstrom, RECIPROCATING CONVEYOR, **filed** Oct. 12, 1979, D.C. Oreg. (Portland), Doc. 79-1230, *Olaf A. Hallstrom* v. *R. Keith Foster, doing business as Keith Mfg. Co.*

D. 235,448. (See 3,862,819.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,246,082, Re. S.N. 165,593, Filed Jul. 3, 1980, Cl. 179/1, TELEPHONE HOLD PROGRAM SYSTEM, Alfred Levy, Owner of Record: *Telephone-Hold Systems Corporation, Oyster Bay, N.Y.*, Attorney or Agent: Albert C. Holte, Jr., et al., Ex. Gp.: 234

3,749,975, Re. S.N. 157,286, Filed Jun. 6, 1980, Cl. 315/241 R, ADJUSTABLE WAVEFORM SPARK SOURCE, John P. Walters, Owner of Record: *Wisconsin Alumni Research Foundation, Madison, Wis.*, Attorney or Agent: Francois N. Palmatier, et al., Ex. Gp.: 256

4,101,011, Re. S.N. 178,274, Filed Aug. 15, 1980, Cl. 188/79.5, DRUM BRAKE ADJUSTER, Richard T. Burnett, Owner of Record: *The Bendix Corporation, Southfield, Mich.*, Attorney or Agent: Paul David Schoenle, Ex. Gp.: 315

4,206,106, Re. S.N. 181,514, Filed Aug. 25, 1980, Cl. 260/302, VINYL END-CAPPED POLYMIDE OLIGOMERS, William J. Heilman, Owner of Record: *Gulf Oil Corporation, Pittsburgh, Pa.*, Attorney or Agent: Deane E. Keith, et al., Ex. Gp.: 144

4,210,339, Re. S.N. 179,121, Filed Aug. 18, 1980, Cl. 277/153, SEAL AND SEAL ASSEMBLY, James H. Povejsil, Owner of Record: *Towmotor Corporation, Mentor, Ohio*, Attorney or Agent: Ralph E. Walters, Ex. Gp.: 241

PATENT NOTICES

Certificates of Correction for the Week of Nov. 18, 1980

D. 256,541	4,195,473	4,207,528	4,215,701
4,032,322	4,195,515	4,208,590	4,215,824
4,055,463	4,196,436	4,208,764	4,215,855
4,057,065	4,197,594	4,208,959	4,215,870
4,057,416	4,197,979	4,209,184	4,216,288
4,057,566	4,198,051	4,209,229	4,216,396
4,059,433	4,198,145	4,209,230	4,216,497
4,071,546	4,198,425	4,209,248	4,216,557
4,073,001	4,198,518	4,209,378	4,216,590
4,082,719	4,198,999	4,209,962	4,216,680
4,094,904	4,199,372	4,210,029	4,216,818
4,097,092	4,199,771	4,210,270	4,216,841
4,098,814	4,199,952	4,210,495	4,216,987
4,100,164	4,200,369	4,210,496	4,217,229
4,113,539	4,200,985	4,210,577	4,217,249
4,138,158	4,202,011	4,210,624	4,217,395
4,138,979	4,202,686	4,210,721	4,217,706
4,145,503	4,203,264	4,211,121	4,217,935
4,147,109	4,203,268	4,211,153	4,218,137
4,152,349	4,203,708	4,211,183	4,218,222
4,152,479	4,203,788	4,211,203	4,218,331
4,153,974	4,203,931	4,211,339	4,218,381
4,159,310	4,204,320	4,211,635	4,218,463
4,160,684	4,204,405	4,211,820	4,218,612
4,162,645	4,205,119	4,212,809	4,218,727
4,162,787	4,205,301	4,212,957	4,218,953
4,170,684	4,205,433	4,213,058	4,219,156
4,171,783	4,205,523	4,213,921	4,219,166
4,172,843	4,205,606	4,213,947	4,219,220
4,176,702	4,205,895	4,213,982	4,219,910
4,178,318	4,206,002	4,214,088	4,219,917
4,182,425	4,206,133	4,214,150	4,220,113
4,182,699	4,206,255	4,214,343	4,220,199
4,182,837	4,206,392	4,214,860	4,220,930
4,184,060	4,206,482	4,214,951	4,221,483
4,184,974	4,206,616	4,215,039	4,221,778
4,188,343	4,207,451	4,215,043	4,221,919
4,189,217	4,207,459	4,215,252	4,222,325
4,189,232	4,207,504	4,215,684	4,222,440
4,195,239	4,207,521	4,215,697	4,222,564
			4,223,156

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,725,058, Y. Hayashi, M. Hasegawa, DUAL LAYERED PHOTORECEPTOR EMPLOYING SELENIUM SENSITIZER, Interference No. 98,832, decided May 29, 1980. Claim 1.

Patent No. 3,944,333, M. Leibowitz, ELECTROCHROMIC DISPLAY WITH POROUS SEPARATOR, Interference No. 99,750, decided July 1, 1980, Claims 1, 4 and 6.

Patent No. 4,010,261, E. S. Johnson, R. H. Rippel, Jr., METHOD TO PREVENT REPRODUCTION WITH [DES-GLY^{10}-GN-RH NONAPEPTIDE AMIDE ANALOGS IN POSITION 6, Interference No. 99,713, decided June 11, 1980, Claim 3.

Patent No. 4,041,090, J. D. McClure, ETHYLBENZENE PROCESS USING AN UNSUPPORTED PERFLUORINATED POLYMER CATALYST, Interference No. 100,323, decided Sept. 11, 1980, Claims 1–3.

Patent No. 4,049,934, R. L. Newlon, SECURITY HINGE HAVING ADJUSTABLE CAM OPERATOR AND RECIPROCABLE CAM FOLLOWER ACTUATED SWITCH, Interference No. 100,172, decided Aug. 5, 1980, Claims 5–8.

Patent No. 4,076,403, M. Nishikawa, E. Sato, ELECTROGRAPHIC PROCESS, Interference No. 100,113, decided July 18, 1980, Claims 1 and 3.

Patent No. 4,104,389, C. F. Schwender, B. R. Sunday, ANTIALLERGIC PYRIDO(2,1-b)QUINAZOLIN-ONES, Interference No. 100,294, decided Sept. 16, 1980, Claim 4.

Patent No. 4,144,453, P. Rigny, METHOD AND DEVICE FOR EXCITATION AND SELECTIVE DISSOCIATION BY ABSORPTION OF LASER LIGHT AND APPLICATION TO ISOTOPIC ENRICHMENT, Interference No. 100,422, decided Sept. 15, 1980, Claim 1.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

Disclaimer

4,204,811.—*William L. Carter*, Scottsdale, *Jack F. Greathouse* and *Philip T. Zelinger*, Tempe, Ariz. FLUID PUMPING SYSTEM. Patent dated May 27, 1980. Disclaimer filed Sept. 18, 1980, by the assignee, *The Garrett Corporation*.

Hereby enters this disclaimer to claims 1–19 all claims of said patent.

Disclaimer and Dedication

3,321,202.—*Merrill D. Martin*, Oakland, Calif. AUTOMATIC SHEET STACKERS. Patent dated May 23, 1967. Disclaimer and Dedication filed Mar. 16, 1977, by the inventor.

Hereby disclaims and dedicates all the claims of said patent.

Patents Available for Licensing or Sale

3,061,386. TOILET SEAT COVERS. Ferdianand Beno, Suite 204, 820 S. Park Terrace, Chicago, Ill. 60605.

4,211,657. MEANS FOR BIOLOGICAL TREATMENT OF WATER. V. Etlin, 7403 Lisle Ave., Falls Church, Va. 22043.

4,217,059. VALVE SYSTEM FOR CONTROL OF PAINT TO SPREADER. J. L. Shelton, 257, 43rd Ave. NE., St. Petersburg, Fla. 33703.

Pitney Bowes, Inc., announces that non-exclusive licenses under reasonable terms are available under the following U.S. Patents:

4,074,374. POSTAGE METER CONVERSION APPARATUS.

4,061,044. METER SETTING INDEXING GEAR APPARATUS.

4,082,006. POSTAGE METER CONVERSION APPARATUS.

4,083,262. POSTAGE METER CONVERSION APPARATUS.

4,221,135. POSTAGE METER CONVERSION APPARATUS.

Please address all inquiries to Corporate Patent Counsel, Patent Dept., Pitney Bowes, Inc., Walter H. Wheeler, Jr., Drive, Stamford, Conn. 06926.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Sr., Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,215,921. INTERMITTENT PRIME FILM MOVER USING MULTI-TOOTHED WHEEL DRIVE.

4,216,388. NARROW PULSE ELIMINATOR.

4,216,390. LEVEL SHIFT CIRCUIT.

4,216,393. DRIVE CIRCUIT FOR CONTROLLING CURRENT OUTPUT RISE AND FALL TIMES.

4,216,394. LEAKAGE CURRENT COMPENSATION CIRCUIT.

4,216,396. SAMPLE-HOLD PHASE DETECTOR.

4,216,407. FLAT PANEL DISPLAY DEVICE WITH BEAM COLLECTOR.

4,216,435. VOLTAGE-TO-CURRENT CONVERTER APPARATUS.

4,216,441. ASTABLE MULTIVIBRATOR CIRCUIT.

4,216,442. CONTROL CIRCUIT FOR MULTIVIBRATOR.

4,216,501. OPTICAL ANTI-REFLECTIVE INFORMATION RECORD.

4,216,502. PEAK DETECTOR CIRCUIT.

4,216,523. MODULAR PRINTED CIRCUIT BOARD.

4,216,969. CARRIAGE TRANSLATING APPARATUS FOR VIDEO DISC PLAYER.

4,216,970. VIDEO DISC LUBRICANTS.

4,217,014. METHOD FOR ASSEMBLING A BASE TO AN ELECTRON TUBE.

4,217,148. COMPENSATED AMORPHOUS SILICON SOLAR CELL.

4,217,393. METHOD OF INDUCING DIFFERENTIAL ETCH RATES IN GLOW DISCHARGE PRODUCED AMORPHOUS SILICON.

4,217,519. ISOLATION BUSBAR FOR A FLAT PANEL DISPLAY DEVICE.

4,217,605. COMB FILTER EMPLOYING A CHARGE TRANSFER DEVICE WITH PLURAL MUTUALLY PROPORTIONED SIGNAL CHARGE INPUTS.

4,217,613. MAGNETIC TRANSDUCER HEAD CORE.

4,217,683. METHOD FOR RESISTANCE WELDING OF AN ELECTRO-OPTIC DEVICE HOUSING.

4,217,688. FABRICATION OF AN INTEGRATED INJECTION LOGIC DEVICE INCORPORATING AN MOS/DIPOLAR CURRENT INJECTOR.

4,218,214. GUIDE WING FOR A FURNACE PADDLE.

4,218,638. PUSH-PULL AMPLIFIER.

4,218,657. HANGUP CORRECTOR USEFUL IN LOCKED LOOP TUNING SYSTEM.

4,218,667. CONVERGENCE ADJUSTMENT ARRANGEMENT USING MAGNETIC TABS WITH DIFFERENTIAL MOTION.

4,218,689. ABLATABLE MEDIUM FOR OPTICAL RECORDING.

4,218,698. TV GRAPHICS AND MIXING CONTROL.

4,218,699. BLACK LEVEL CONTROL SYSTEM FOR A COLOR TELEVISION CAMERA.

4,218,708. KEYED AGC CIRCUIT.

4,219,787. RELAXATION OSCILLATOR NOT RESTRICTED BY FET THRESHOLD.

4,219,814. SCANNING RADAR.

4,219,820. OPTICAL RECORDING MEDIUM.

4,219,848. OPTICAL RECORD PLAYBACK APPARATUS EMPLOYING LIGHT FREQUENCY AT WHICH ALTERNATE REGIONS OF RECORD TRACK EXHIBIT ANTI-REFLECTION CONDITION.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–115,844. Gun Simulator System. Filed Jan. 28, 1980.

Patent application 6–132,644. Device for Generating Simulated Waveforms for an Electronic System Maintenance Trainer. Filed Mar. 21, 1980.

Patent application 6–134,358. Laser Excited Molecular Beam Time and Frequency Standard. Filed Mar. 27, 1980.

Patent application 6–140,551. Intrusion Detection System Having Look-Up Sensor Instrumentation for Intrusion Range and Altitude Measurements. Filed Apr. 15, 1980.

Patent application 6–144,465. Minimum Resolvable Contrast Measurement Device for Video Systems. Filed Apr. 15, 1980.

Patent 4,201,654. Anode Assisted Sputter Etch and Deposition Apparatus. Filed Oct. 6, 1978. Patented May 6, 1980. Not available NTIS.

Patent 4,202,360. Gas Relief Valve Design for Low Temperature. Filed June 15, 1978. Patented May 13, 1980. Not available NTIS.

Patent 4,202,516. Electronic Tripod Techniques. Filed June 30, 1978. Patented May 13, 1980. Not available NTIS.

Patent 4,203,285. Partial Swirl Augmentor for a Turbofan Engine. Filed Feb. 6, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,203,286. Cooling Apparatus for an Exhaust Nozzle of a Gas Turbine Engine. Filed Oct. 30, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,203,458. Negative Gravity Swivel Device. Filed Sept. 5, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,204,210. Synthetic Array Radar Command Air Launched Missile System. Filed Sept. 15, 1972. Patented May 20, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–146,546. Wrinkle-Resistance and Durable-Press Cotton-Containing Fabric by Treatment With Acrylamide and Glyoxal. Filed May 5, 1980.

U.S. DEPARTMENT OF ENERGY
Assistance General Counsel for Patents
Washington, D.C. 20545

Patent application 6–005,947. Device and Method for Shortening Reactor Process Tubes. Filed Jan. 24, 1979.

Patent application 6–009,622. System and Method for Charging Electrochemical Cells in Series. Filed Feb. 6, 1979.

Patent application 6–009,624. High Temperatur Concrete Composites Containing Organosiloxane Crosslinked Copolymers. Filed Feb. 6, 1979.

Patent application 6–021,202. Passive Environmental Temperature Control System. Filed Mar. 16, 1979.

Patent application 6–025,503. Polymer Concrete Composites for the Production of High Strength Pipe and Linings in High Temperature Corrosive Environments. Filed Mar. 30, 1979.

Patent application 6–027,680. High Temperature Chemically Resistant Polymer Concrete. Filed Apr. 6, 1979.

Patent application 6–030,044. Method and Apparatus for Timing of Laser Beams in a Multiple Laser Beam Fusion System. Filed Apr. 13, 1979.

Patent application 6–030,527. Improved Method and Apparatus for Electrostatically Sorting Biological Cells. Filed May 16, 1979.

Patent 4,163,637. Method and Apparatus for Producing Small Hollow Spheres. Filed Sept. 29, 1978. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,170,817. Method and Means of Packaging Nuclear Fuel Rods for Handling. Filed May 2, 1978. Patented Oct. 16, 1979. Not available NTIS.

Patent 4,175,258. High Level White Noise Generator. Filed July 28, 1978. Patented Nov. 20, 1979. Not available NTIS.

Patent 4,178,208. Self Locking Drive System for Rotating Plug of a Nuclear Reactor. Filed Feb. 23, 1978. Patented Dec. 11, 1979. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–101,074. Nuclease-Resistant Hydrophilic Complex of Polyriboinosinic-Polyribocytidylic Acid. Filed Dec. 7, 1980.

Patent application 6–130,502. Process for the Preparation of Phosphonoacetic Acid. Filed Mar. 14, 1980.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–109,940. Miniaturized Scan Within a Pulse Sonar. Filed Apr. 1, 1980.

Patent application 6–144,483. Gelled Slurry Explosive. Filed Apr. 28, 1980.

Patent application 6–148,649. Borescope Guide. Filed May 12, 1980.

Patent application 6–149,051. Tinl Base Alloy Shape Memory Enhancement Through Thermal and Mechanical Processing. Filed May 12, 1980.

Patent 4,163,681. Desensitized Explosives and Castable Thermally Stable High Energy Explosive Compositions Therefrom. Filed Apr. 15, 1970. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,165,247. Polyurethane Solid Propellant Binder. Filed Feb. 9, 1966. Patented Aug. 21, 1979. Not available NTIS.

Patent 4,183,301. Induction Ground Mine and Firing Mechanism Therefor. Filed Aug. 7, 1944. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,183,841. Filled Composition Containing Phenol-Aldehyde Resin and Butndiene-Acrylonitrile Polymer. Filed July 16, 1965. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,185,555. Electrolytic Pressure Sensitive Mechanism. Filed June 11, 1953. Patented Jan. 29, 1980 Not available NTIS.

Patent 4,188,905. Mine Sweeping Means. Filed Apr. 13, 1943. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,190,818. Digital Beamsteering for a Parametric Scanning Sonar System. Filed Aug. 25, 1977. Patented Feb. 26, 1980. Not available NTIS.

Patent 4,193,020. Pulsed Helium Magnetometer. Filed Mar. 4, 1903. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,129. Charging Circuit for Sonar Systems. Filed Jan. 2, 1970. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,297. Infrared Fuze Test Simulator. Filed July 31, 1903. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,193,346. Electrolytic Pressure Mechanism. Filed Mar. 10, 1953. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,194,194. Piezoelectric Vibration Detector for Sensing a Nearby Intruder. Filed Jan. 30, 1978. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,194,202. Grid Pulsed Oscillator and Detector. Filed Sept. 16, 1959. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,194,519. Hypersonic Modular Inlet. Filed Nov. 18, 1964. Patented Mar. 25, 1980. Not available NTIS.

Patent 4,195,204. Dual Channel Proximity Fuze. Filed Nov. 15, 1956. Patented Mar. 25, 1980. Not available NTIS

Patent 4,195,205. Pulse Doppler-Radio Proximity Fuze. Filed Jan. 14, 1959. Patented Mar. 25, 1980. Not available NTIS.

Patent 4,196,433. Doppler Frequency Proximity Fuze. Filed Dec. 23, 1959. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,196,448. TV Bandwidth Reduction System Using a Hybrid Discrete Cosine DPCM. Filed May 15, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,197,520. Intrusion Detection Apparatus. Filed Feb. 17, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,202,517. Fluidic Interface Means. Filed July 20, 1977. Patented May 13, 1980. Not available NTIS.

Patent 4,203,365. Jammer Apprehending Amplifier for Proximity Fuzes. Filed July 20, 1977. Patented May 20, 1980. Not available NTIS.

Patent 4,203,366. FM Fuze Circuit. Filed Feb. 1, 1957. Patented May 20, 1980. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–145,210. Metric Half Span Model Support System. Filed Apr. 30, 1980.

Patent application 6–145,272. Photoelectric Detection System. Filed Apr. 30, 1980.

Patent application 6–145,273. Biocentrifuge System Capable of Exchanging Specimen Cages While in Operational Mode. Filed Apr. 30, 1980.

Patent application 6–150,115. Solar-Heated Fluidized Bed Gasification System. Filed May 15, 1980.

Patent 4,196,619. Geological Assessment Probe. Filed Sept. 25, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,199,937. Heat Exchanger and Method of Making. Filed Nov. 30, 1977. Patented Apr. 29, 1980. Not available NTIS.

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	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins with Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers, Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements, Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940 and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,102,270 to 3,105,236, inclusive

Plant Patents..... Numbers 2,277 to 2,286, inclusive

REISSUES

NOVEMBER 18, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,436

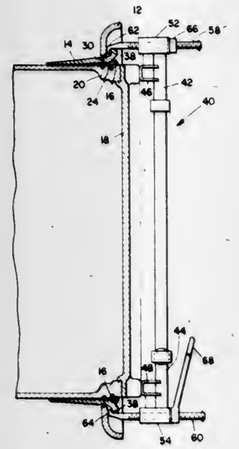
RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION

Robert Casey, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,995,676, dated Dec. 7, 1976, Ser. No. 626,422, Oct. 28, 1975. Application for reissue Jun. 9, 1978, Ser. No. 914,092

Int. Cl.[3] **B60C** *5/16*

U.S. Cl. 152—310 **3 Claims**



1. In a multi-piece wheel assembly comprised of a rim base member, a pair of flange members removably associated at either end thereof and formed to have an inflatable tire mounted therebetween, the rim base member defining first and second annular grooves circumferentially oriented adjacent one end, said first annular groove proximate said end, and a lock ring removably adapted to fit and positionable in said first annular groove and a seal member positioned in said second annular groove, the improvement comprising:

a bead [set] *seat* band formed to receive one flange member and mountable on said rim base member inwardly of said first annular groove and overlying said seal member, said lock ring [while] *being* seated in said first annular groove for retaining said bead seat band on said rim base member *said bead seat band being spaced from said rim base member defining a space therebetween in communication with the interior of the mounted tire;*

said bead seat band defining a plurality of radial ports *adjacent said one flange member* to communicate *the space and hence* the interior of [a] *the* mounted [inflated] tire with atmospheric air *between the flange member and the bead seat band when the radial ports are not sealed by the seal member*, said ports sealed by said seal member to block said communication between the interior of said mounted tire and atmospheric air only while said bead seat band is urged against said lock ring seated in said first annular groove.

Re. 30,437

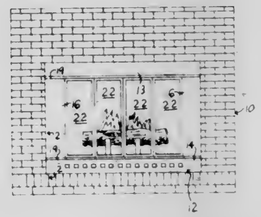
CORNER ASSEMBLY FOR FIREPLACE ENCLOSURE

Robert C. Dew, New Albany, Ind., assignor to S & T Industries, Inc., Louisville, Ky.

Original No. 3,995,612, dated Dec. 7, 1976, Ser. No. 585,474, Jun. 10, 1975. Application for reissue Dec. 4, 1978, Ser. No. 966,475

Int. Cl.[3] **F24C** *15/04*

U.S. Cl. 126—139 **8 Claims**



6. *In a fireplace enclosure disposed to surround a fireplace outwardly of the opening therefor and having horizontal top and bottom panels and vertical side panels, the improvement comprising:*

a. a plate-like corner bracket extending alongside end portions of adjacent horizontal and vertical panels,

b. means securing said plate-like corner bracket to said end portions of adjacent panels so that said end portions of adjacent panels are secured to each other, and

c. an adjustable retaining member carried by said plate-like corner bracket and having an adjustable projecting member disposed to engage an inner portion of the fireplace opening.

PATENTS

GRANTED NOV. 18, 1980

ERRATA

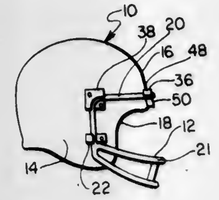
For CLASS	See PATENT NO.
337-374	4,233,750
474-153	4,233,852
474-185	4,233,853
493-132	4,233,888
440-101	4,233,925
248-404	4,234,165
024-068 CD	4,234,166
493-014	4,234,179
244-124	4,234,197
350-274	4,234,255
423-109	4,234,429
568-939	4,234,470
556-413	4,234,502
556-413	4,234,503
568-420	4,234,512
564-026	4,234,513
564-255	4,234,514
564-114	4,234,515
568-341	4,234,516
568-381	4,234,517
568-377	4,234,518
568-492	4,234,519
568-937	4,234,520
424-204	4,234,645
328-171	4,234,802

PATENTS

GRANTED NOVEMBER 18, 1980

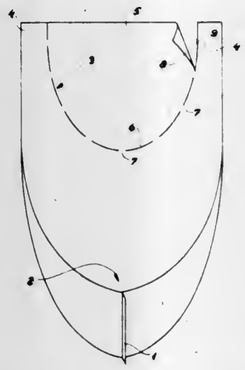
GENERAL AND MECHANICAL

4,233,687
SPORTS HELMET WITH FACE MASK
William E. Lancellotti, 371 Broadway, Providence, R.I. 02909
Filed Aug. 14, 1978, Ser. No. 933,783
Int. Cl.[3] A63B 71/10; A42B 3/00
U.S. Cl. 2—9 **1 Claim**



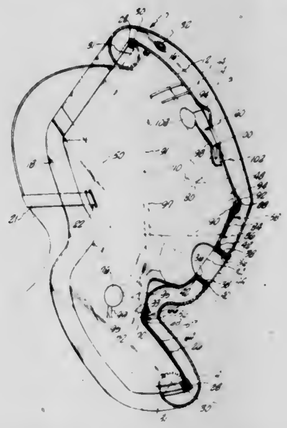
1. A safety device for use with a protective sports helmet in turn having downwardly extending opposed side portions and an upper central connecting portion forming a centrally disposed facial opening, comprising a mask adapted for disposition over said facial opening to protect the face of the wearer, said mask including a peripheral rod-like frame which has portions extending vertically along the outer surfaces of said side portions and then forwardly across the top front of said helmet whereby said frame extends generally around said facial opening, attachment means mounted on the outer surfaces of said side portions, said means comprising a pair of vertically spaced blocks on each side portion, said blocks each having grooves therein with reduced lead-in portions adapted to detachably snap-receive said frame, the bottom block on each side being adapted to receive said vertically extending portion adjacent the lower end thereof and the top block on each side having a curved groove configured to receive the corners where said vertical portions merge with said forward portion, said grooves all being at least partially exposed in a forward direction whereby said mask may be readily detached from said helmet in a forward direction by a pull thereon comprising a significant forward force component.

4,233,688
BIB
Jonna Hjerl, Freltoftevej 22, DK-5653 Near Lyndelse, Denmark
Filed Jan. 9, 1979, Ser. No. 2,057
Int. Cl.[1] A41B 13/10
U.S. Cl. 2—49 R **1 Claim**



1. A bib formed from a substantially rectangular soft sheet material and having a pocket at one end and wherein at the other end of the sheet a single rupture line defines a narrow tie-strip at each side edge of the sheet and further defines a neck-line cutout, the sheet material inside said neckline cutout forming a napkin bounded by the end edge of the sheet and totally removable from the bib along said rupture line.

4,233,689
PROTECTIVE HEADGEAR
Stephen H. Baron, 3967 Eureka Dr., Studio City, Calif. 91604
Filed Mar. 27, 1978, Ser. No. 890,242
Int. Cl.[2] A42B 3/00; A63B 69/02
U.S. Cl. 2—413 **10 Claims**



1. Protective headgear for protecting the wearer's head and face, said headgear comprising a transparent inner shell adapted to fit over the wearer's face, an outer sheet of transparent material extending over said inner shell and about the perimeter portion thereof and being sealably secured to said inner shell along the perimeter portion thereof defining an air tight chamber about said inner shell, a portion of said chamber extending about and inwardly of the perimeter portion of said inner shell, valve means for inflating said chamber to render said chamber shock absorbing, and means for securing said inner shell and outer sheet on the wearer's head.

4,233,690
PROSTHETIC DEVICE COUPLINGS
Robert J. Akins, La Mesa, Calif., assignor to CarboMedics, Inc., San Diego, Calif.
Filed May 19, 1978, Ser. No. 907,664
Int. Cl.[1] A61F 1/22
U.S. Cl. 3—1.5 **3 Claims**

1. A prosthetic heart valve for long term implantation in the human body including

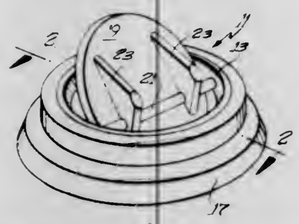
a generally tubular rigid portion,

a circumscribing sewing ring disposed in encircling relationship to said rigid tubular portion, and

a coupling element embedded within said sewing ring for joining said sewing ring to said heart valve tubular portion wherein the improvement comprises

said coupling element being made of a nickel-titanium alloy having a transition-temperature range, said element having been formed to a precise shape at a temperature above said range and having been deformed to a different shape at a temperature below said range whereby joinder of said

sewing ring to said rigid tubular portion is effected by raising the temperature of said element above said range in



order to cause said alloy to attempt to return to said precise shape.

4,233,691
BEDPAN GUARD

Lillian R. Jirard, 107 Wassagussitt Rd., N. Weymouth, Mass. 02191

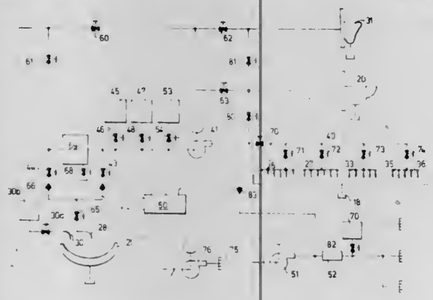
Continuation of Ser. No. 928,895, Jul. 28, 1978, abandoned. This application Sep. 20, 1979, Ser. No. 77,172
Int. Cl.³ A61G 9/00; A47K 17/00
U.S. Cl. 4—450 **2 Claims**

1. The combination of a bedpan and a bedpan guard, the bedpan comprising a basin, for receiving wastes and a shoulder defining an opening, the opening having a longitudinal axis, the bedpan guard comprising a thin flexible, substantially flat body portion and a cover, the body portion including upper and lower surfaces and attachment means applied to the lower surface wherein the bedpan guard is removeably attached to said bedpan on a plane transverse to the opening of the bedpan and in substantially right angle relation to the longitudinal axis of the bedpan and the cover formed of a soft, foldable material, the cover having an end attached to the upper surface of the body portion, folded in accordian fashion into superposed relation to the upper surface of the bedpan guard, a free terminal end of said cover being adapted when extended to overlay the bedpan opening, and the free terminal end spaced from the end of the cover and having a fastening means engaged thereto, the fastening means engaging the bedpan when the cover is extended to overlay the bedpan opening.

4,233,692
REST ROOMS

John D. Sinsley, 509 Sugar Camp Dr., East Palestine, Ohio 44413

Continuation of Ser. No. 917,192, Jun. 20, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,736
Int. Cl.³ A47K 17/00
U.S. Cl. 4—662 **6 Claims**

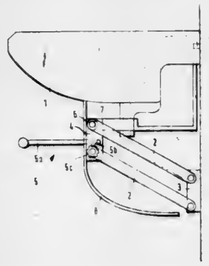


1. A readily sanitized public rest room module comprising a single formed unitary floor, ceiling, four walls and toilet fixtures, an entrance in one of said walls, a sealable closure for said entrance, a drain opening in said floor, lighting means sealingly recessed in one of said walls and ceiling, said toilet fixtures including a commode fixture positioned at the intersection between two of said walls and forming an integral unitary part thereof, and a lavatory and counter fixture on at least one wall adjacent said toilet and forming an integral unitary part of said wall, said wall and fixtures being a single integral unitary assembly free of joints with all intersecting surfaces being arcuately contoured and said floor being free of obstructions from wall to wall.

4,233,693
HEIGHT-ADJUSTABLE WASH-BASIN

Peter Stocklöw, Richard-Strauss-Strasse 12, 1000 Berlin 33, Fed. Rep. of Germany

Filed Apr. 25, 1979, Ser. No. 33,058
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2819428
Int. Cl.³ A47K 1/04; E03C 1/32
U.S. Cl. 4—644 **14 Claims**



1. A height-adjustable washbasin including:
a washbasin having an upper portion and a downwardly extending portion;
a first supporting arm pivotally mounted to a stationary surface at one end and received by said downwardly extending portion of said washbasin at its other end;
a second supporting arm of equal length to said first supporting arm above and parallel to said first support arm mounted to said stationary surface at one end and received by said downwardly extending portion of said washbasin at its other end;
means enabling said washbasin to be arrested at different heights;
and a force reservoir counterbalancing the weight of said washbasin.

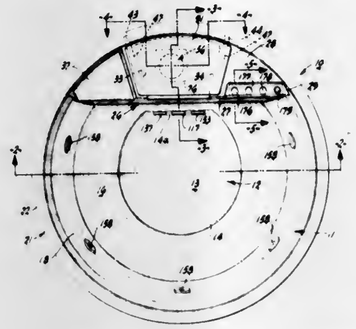
4,233,694
SPA CONSTRUCTION AND ISOLATED CONTROLS THEREFOR

Richard L. Janosko, Oakland, and Ralph D'Innocente, Pleasant Hill, both of Calif., assignors to Jacuzzi Whirlpool Bath, Inc., Walnut Creek, Calif.

Filed Jan. 22, 1979, Ser. No. 5,627
Int. Cl.³ E04H 3/18; A47K 3/00; F24H 1/10; H01H 9/00
U.S. Cl. 4—542 **14 Claims**

1. In a spa construction for use by humans, a shell for containing water and having a well for receiving the feet of the user, a seat area adjacent the well upon which the user can sit and a side wall area against which the user can rest his back, a filter and heater housing, a filter and a heater disposed within the housing, means for establishing communication between the shell and the filter and heater housing so that water can flow from within the shell into the filter and heater housing, pump means for withdrawing water from the filter and heater housing and for introducing the same into the shell after the water has passed through the filter and control means carried

by the shell having controls which are accessible to a user while the user is within the shell for controlling the operation of the heater and the pump means, said heater and said pump means being electrically operated through said control means, said controls of said control means being electrically isolated from the remainder of the control means, and being free of any conductive path connecting the controls to the remainder of

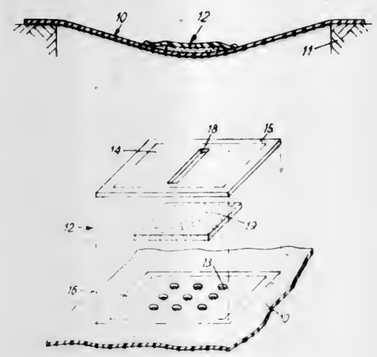


the control means, said shell is formed of an insultating material and said electrically isolated switch means includes first and second actuatable switching elements with the first of said actuatable switchinw elements being positioned on the underside of the shell and wherein said controls include the second actuatable switching element located on the upper side of the shell generally opposite the first switching element for causing operation of said first switching element.

4,233,695
SWIMMING POOL COVER WITH RAIN WATER DRAINAGE AND FILTER MEANS

Michael H. Rowney, The Highwoods, Litlington, Polegate, East Sussex, England

Filed Aug. 2, 1979, Ser. No. 63,031
Claims priority, application United Kingdom, Aug. 4, 1978, 32342/78
Int. Cl.³ E04H 3/16, 3/18
U.S. Cl. 4—498 **6 Claims**



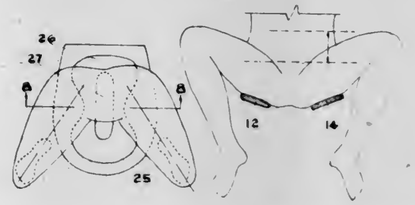
1. A cover for a water pool which comprises:
a sheet of flexible, waterproof material having at least one drainage opening therein and a filter pad assembly disposed over said drainage opening, said filter pad assembly comprising a filter pad and a holding means, said filter pad having a fine, porous structure and said holding means being made of a waterproof material secured in a watertight manner around at least a major portion of its periphery to that region of the cover surrounding the drainage opening thereby forming an envelope or a pocket with said sheet, said holding means containing an opening therein for the introduction of the filter pad thereinto, whereby said filter pad is held over the drainage opening for purifying water passing from the flexible sheet through the opening in the holding means, through the filter pad, and through the drainage opening into the water pool.

4,233,696
TOILET SEAT

Manfred Ibel, 178 Fifth Ave., New York, N.Y. 10010

Division of Ser. No. 922,492, Jul. 6, 1978. This application Nov. 9, 1979, Ser. No. 92,768
Int. Cl.³ A47K 13/00
U.S. Cl. 4—237 **4 Claims**





1. A toilet seat for positioning on a toilet bowl, said seat having an opening and an upper surface including enlarged inwardly extended opposite middle portions for the supportive engagement of the user's thighs, said enlarged middle portions being inwardly sloped and having opposite inner peripheral edge portions defining a relatively narrow middle portion of said opening, said opposite inner peripheral edge portions being on a substantially lower elevation than the outer peripheral upper surface areas of the seat and positioning the perineum of the user on said substantially lower elevation, said enlarged inwardly sloped middle portions also positioning the user's legs upwardly angled with the knees positioned above the elevation of the hip joints; said toilet seat having relatively narrow opposite front surface areas; said toilet seat having relatively narrow opposite rear surface areas defining an enlarged rear portion of said opening; the combined effect of said features positioning the user into a semi-squat position over the middle portion of a toilet bowl for easy defecation.

4,233,697
PROTECTIVE FLANGE COVER AND METHOD OF USE

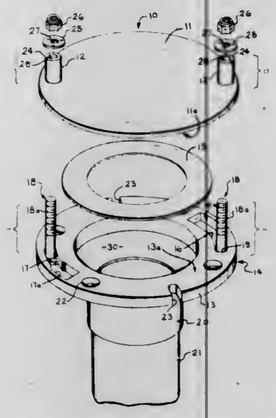
Kenneth R. Cornwall, 30064 Bentley, Livonia, Mich. 48154

Filed Dec. 26, 1978, Ser. No. 972,956
Int. Cl.³ A47K 1/14
U.S. Cl. 4—293 **6 Claims**

1. A cover with an inside and an outside surface adapted for closure of a toilet bowl mounting flange mounted on a drain pipe having a tubular flange opening leading to the drain pipe and having a flat toilet bowl receiving surface with two slots for inserting and holding bolt heads having threaded bolt stems which project from the flange for mounting the toilet bowl on the flange using nuts over washers on the stems and with an interposed ring seal between the receiving surface of the flange and the inside surface of the cover which comprises:

(a) a plastic plate having a thin central round dome portion inside the position of the ring seal which with the ring seal covers and seals the tubular flange opening and toilet bowl receiving surface; and

(b) two tubes with openings through the plate positioned on the plate to receive the stems of the bolts mounted on the



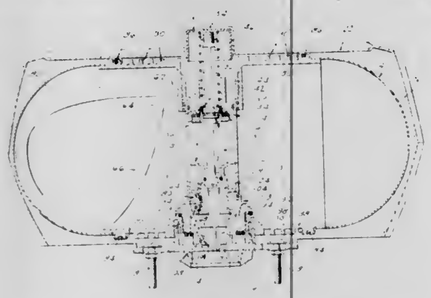
flange in the slots so that the stems project above the tubes sufficiently to receive a nut over a washer on the stem and so as to essentially cover the threads on the stem, wherein the thin central dome portion of the cover when bolted to the flange tends to tighten the seal between the flange and cover when hydrostatic pressure is applied.

4,233,698

PRESSURE FLUSH TANK FOR TOILETS

Raymond B. Martin, Birmingham, Mich., assignor to Water Control Products/N.A., Inc., Troy, Mich.

Filed Jan. 28, 1977, Ser. No. 763,502
Int. Cl.[3] E03D 3/04
U.S. Cl. 4—354 **9 Claims**



1. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) an air inducer valve comprising an air vent opening in the water inlet of the water tank open to the top portion of the tank, an outwardly biased valve located in said water inlet movable to close said air vent opening and having a portion exposed to said water inlet, said valve being movable in response to reduced pressure induced by flow into said water tank through said water inlet and by negative pressure in said water inlet to admit air through said air vent opening to said tank.

2. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) an extension to reduce flow noise on said control valve projecting into said outlet to restrict initial outflow from said tank when said control valve is moved to open said main valve.

4. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore, and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) means resiliently biasing said main flush valve to a partially open position wherein pressure in said cylinder will cause full closing of said main valve, and loss of water inlet pressure in said tank will effect opening of said main valve to allow water to drain from said tank through said main valve seat thus removing it from the water inlet to prevent backflow in the event of below atmospheric pressure in said water inlet, and

(b) a secondary valve opening communicating between the interior of said tank and said water outlet, a refill valve in said secondary valve opening to close the secondary opening in response to pressure in said tank, and means to bias said refill valve to an open position and responsive to a predetermined pressure in said tank to close the refill valve.

5. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) a refill system including a resiliently biased, pressure responsive time-delay valve communicating between the interior of the tank and the outlet responsive to pressure in said tank to control the quantity of water entering the bowl after the siphonic flush action,

(b) a flow restrictor valve in said water inlet to control the flow rate of water into said tank, and

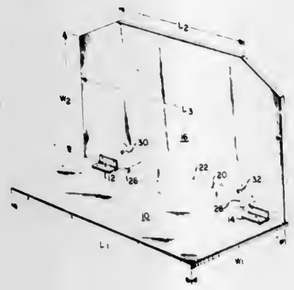
(c) said refill system comprising a secondary valve opening communicating between the interior of said tank and said water outlet, said time delay valve being located in said secondary opening to close the opening in response to predetermined pressure in said tank, and means to bias said time delay valve to an open position and responsive to a predetermined pressure in said tank to close the time-delay valve.

4,233,699

PORTABLE SECURITY WALL

Michael G. Amato, 1306 Turner Ave., Wanamassa, N.J. 07712

Filed Dec. 4, 1978, Ser. No. 966,147
Int. Cl.[2] A47C 21/08
U.S. Cl. 5—426 **5 Claims**



1. A portable security wall for infants, children, invalids, and the like, comprising:

a first, generally rectangular section for insertion beneath a chair cushion, a couch cushion, a mattress, etc., onto which the infant, child, or invalid is to be placed; and

a second, generally rectangular section rotatable with respect to said first section, to be substantially perpendicular therewith when intended for use in preventing such persons from falling from said chair, couch, mattress, etc. and to be substantially parallel therewith when put away and not intended for use with such persons;

wherein said second, generally rectangular section is positioned along a length of said first, generally rextangular section intermediate the ends thereof, and wherein there is also included first means affixed to each of said first and second sections to control the rotation of said sections with respect to each other to substantially ninety degrees;

wherein said included first means comprise a pair of right angled hinges, each of which is secured at one side of said first and second sections proximate the ends thereof;

wherein there is additionally included second means affixed to said second, generally rectangular section, to be rotatable therewith, and to further control the rotation of said second section with respect to said first section to substantially ninety degrees; and

wherein said additionally included second means comprise a pair of backstops, each of which is secured on a side of said second section opposite from the said to which said hinges are secured, to bear against said first section when said second section is rotated for use, to thereby limit the rotation of said second section to ninety degrees.

4,233,700

VENTILATED BODY POSITIONER

Donald C. Spann, 5 Ferncreek Ct., Greenville, S.C. 29615

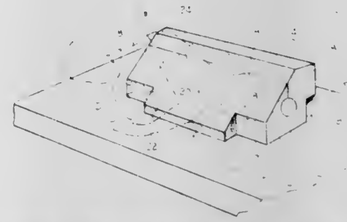
Filed May 31, 1979, Ser. No. 44,261
Int. Cl.[3] A47C 21/00, 27/14
U.S. Cl. 5—431 **5 Claims**

1. A ventilated body positioner for providing lateral support for the body of a patient lying in a side position while providing ventilation and reduced pressure at strategic areas of support, said ventilated body positioner comprising:

an elongated positioner block of resilient deformable material having spaced longitudinal end portions and a plurality of planar surfaces on which said block may be rotated and selectively positioned as either a base or body supporting surface extending generally between said ends;

said planar surfaces being relatively inclined such that said elongated positioner block based on one of said planar surfaces presents another of said planar surfaces as a longitudinal body support surface having a widened sloping contour for properly positioning the patient in a side-rotated position;

said positioner block and hence each said planar surface having a length substantially greater than its lateral width



for supporting a substantial portion of the patient's lateral body length;

a cavity adjacent end portions of said elongated positioner block formed by cutting out a portion of said block in a plane transverse to the plane of said planar surfaces; and

said cavity terminating to define a longitudinally extending edge support surface extending laterally from a main support surface which contact and support an area of said patient's body while said cavity provides ventilation to a non-contacted, supported area of said patient's body adjacent said contacted area reducing the buildup of heat and moisture and pressure at said areas to prevent the formation of decubitus ulcers.

4,233,701

NAPPED BEDDING BLANKET

Ralph G. Barnard, and Judson D. Taylor, Jr., both of Eden, N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

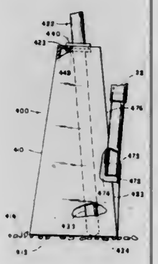
Filed Nov. 8, 1976, Ser. No. 739,598
Int. Cl.[1] A47G 9/00
U.S. Cl. 5—482 **8 Claims**



1. A napped bedding blanket having an enhanced hand and a more uniform surface appearance substantially devoid of clusters of undesirably long raised fibers, said blanket being characterized by substantially maintaining its initial surface appearance during normal usage and after laundering and by a resistance to shedding and pilling without reliance upon any stabilizing chemical treatment, said blanket comprising a fibrous substrate, a nap on at least one side of said substrate formed of raised substrate fibers shielding the substrate from view, the raised fibers of said nap being relatively uniformly distributed throughout the nap and extending generally outwardly away from the substrate, and with substantially all of the raised fibers being sheared and extending a uniform distance from the substrate to provide a substantially planar sur-

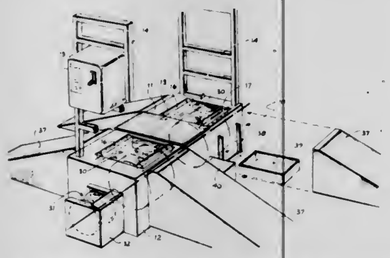
face on the nap substantially devoid of clusters of undesirably long raised fibers along the surface of the nap.

4,233,702
FISH TANK ROCK CLEANER
Michael R. Zweifel, 2434 4th Ave., Council Bluffs, Iowa 51501
Continuation of Ser. No. 5,438, Jan. 22, 1979. This application Aug. 16, 1979, Ser. No. 67,047
Int. Cl.³ E04H *3/20*
U.S. Cl. 15—1.7 **1 Claim**



1. A fish tank rock cleaning device comprising a housing with an open bottom to be rested on rock in the bottom of said aquarium, a stirring rod extended through said housing and moveable with respect to said housing for the stirring of said rock with an inner part of said rod by manipulating the outer part of said rod, a hose being attached to said housing at a point substantially spaced above said open bottom whereby said hose can be connected to a pump.

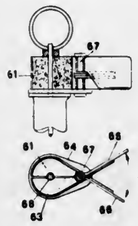
4,233,703
CLEANING DEVICE
John C. Clyne, 6 Leo Ave., Lurnea, New South Wales, Australia (2170); William G. Steel, 27 Bertram Ave., Yagoona, New South Wales, Australia (2199), and Ronald T. Nicholls, 102 Wonga Rd., Lurnea, New South Wales, Australia (2170)
Filed Apr. 16, 1979, Ser. No. 30,590
Claims priority, application Australia, Nov. 3, 1978, PD6629
Int. Cl.³ B60S *3/06*
U.S. Cl. 15—53 B **10 Claims**



1. A cleaning device for use in cleaning the wheels of a vehicle which has wheels which are rotatable about a common axis, the device comprising:

an enclosure which is provided with two openings in an upper horizontal surface thereof, the openings defining cleaning zones, two pairs of spaced-apart substantially parallel rollers located within the enclosure, the rollers being disposed within the cleaning zones to support respective wheels of the vehicle, means for driving at least one roller of each pair whereby rotation of vehicle wheels is induced when the vehicle is supported by the rollers, a wiper element in the form of a rotatable brush located between the rollers of each pair and having an axis of rotation disposed parallel to the axes of rotation of the rollers, the wiper element being disposed within the cleaning zones and being arranged to contact and wipe the vehicle wheels when mounted to the rollers, means for imparting rotational drive to the wiper element, and at least one fixed brush located within each of the cleaning zones, the fixed brushes being located immediately below the respective openings in the enclosure and having bristles extending parallel to the axis of rotation of the wiper element.

4,233,704
OIL DIPSTICK CLEANING DEVICE
Lucio A. Sartorio, Piazza del Teatro 21, Velletri, (Rome), Italy
Filed May 15, 1979, Ser. No. 39,114
Claims priority, application Italy, May 23, 1978, 49495 A/78; Dec. 4, 1978, 52187 A/78; Apr. 23, 1979, 48820 A/79
Int. Cl.³ G01F *15/12*
U.S. Cl. 15—210 B **13 Claims**



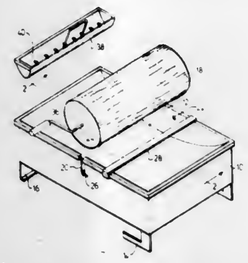
1. An oil dipstick cleaning device, comprising a support having a pair of pivotally interconnected, semi-circular hollow jaws in contact with one another in a closed position, lever arms on said jaws having terminal ends spaced apart in said closed position of said jaws, means for biasing said jaws into said closed position, and cleaning pads disposed within said hollow jaws in confronting relationship in said closed position, said jaws including said pads being movable into an open position away from one another upon movement of said terminal ends of said arms toward one another against the action of said biasing means, whereby an oil dipstick to be cleaned may be inserted between said jaws in said open position, said jaws being then moved into said closed position, and the dipstick being wiped clean by said pads upon extraction thereof.

4,233,705
PAINT METERING TRAY FOR ROLLER APPLICATIONS
Michel Lepage, and Jeanne L. Lepage, both of General Delivery, Capreol, Ontario, Canada (POM 1HO)
Filed Jun. 27, 1979, Ser. No. 52,554
Int. Cl.³ B44D *3/12*
U.S. Cl. 15—257.06 **5 Claims**

1. A paint metering tray for use with a paint roller applicator comprising:

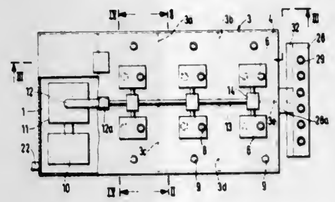
(a) a paint distribution roller positioned to be in contact along a lenthwise portion of the surface thereof with paint in said tray, said distribution roller being axially rotatable so as to permit coverage of the surface of the distribution roller with the paint when rotated, and

(b) a paint metering bar in lengthwise orientation along the surface of the distribution roller so as to control the amount of paint on the distribution roller as the distribution roller is rotated against the said bar wherein the paint



metering bar is adjustably moveable into lengthwise contact along the surface of the distribution roller.

4,233,706
APPARATUS FOR CLEANING OF LARGE SCALE TEXTILE COVERINGS, ESPECIALLY CARPETS AND WALL TO WALL CARPETING
Horst Kauffeldt, Bachstr. 150, 4000 Düsseldorf, Fed. Rep. of Germany
Filed Sep. 27, 1978, Ser. No. 946,287
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743530
Int. Cl.³ A47L *7/00*
U.S. Cl. 15—300 A **12 Claims**



1. An apparatus for cleaning textile covering materials comprising a dirt laden fluid receptacle, said dirt laden fluid receptacle comprising a plurality of vertically disposed partitions depending from the top of said receptacle, but being in out of contact relationship with the bottom of said receptacle whereby there is defined a plurality of vacuum chambers disposed over a common sump, each of said vacuum chambers being in fluid communication with a common suction nozzle via a dirty water pipe disposed therebetween, said vacuum chambers being connected via a suction conduit to at least one suction turbine connected to and activated by a motor, said apparatus having at least one spray jet connected to a supply of cleaning fluid.

4,233,707
FOOTWEAR CLEANING APPARATUS
Gilles Leblanc, 2152 Montee des 4 Lacs, St. Adolphe D'Howard, Montreal P. Q. JOT 2B0, Canada
Filed Jul. 9, 1979, Ser. No. 55,527
Int. Cl.³ A47L *5/22*
U.S. Cl. 15—311 **6 Claims**

2. A footwear cleaning apparatus for cleaning and collecting debris from a pair of articles of footwear such as shoes by a combination of brushing and recirculating compressed air, comprising:

(a) an open housing;

(b) a grill disposed within said housing and of a size to accommodate a pair of shoes, said grill including a plurality of slots disposed normal to an axis parallel with the sides of said shoes, and having a collection area defined by the central portion of said grill;

(c) spring means for supporting said grill on said housing, said spring means allowing downward movement of said grill when a person steps upon said grill;

(d) switch means, mounted to said grill and to said housing, for initiating the cleaning of said shoes upon said downward movement of said grill;

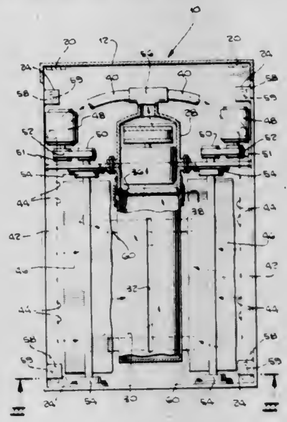
(e) power brush means for brushing debris from the lower sides of said shoes in a manner directing said debris toward said collection area, said brush means comprising:

(i) first brush means, substantially cylindrical in shape and of a length slightly larger than a shoe to be cleaned, for cleaning the bottom of one of said pair of shoes, said brush means being journaled in horizontal disposition in said housing beneath said grill for rotation toward said collection area, and said brush means contacting said shoe through said grill slots upon said downward movement of said grill,

(ii) first motor means, connected to said switch means, for rotating said brush means upon said downward movement of said grill,

(iii) second brush means, substantially identical to said first brush means, for cleaning the bottom of the other of said pair of shoes placed upon said grill, and

(iv) second motor means, connected to said switch means, for rotating said second brush means;



(f) air compressor means for blowing the debris from the upper sides of said shoes by compressed air in a manner directing said debris toward said collection area, and for collecting all aforesaid debris by recirculating said compressed air through said collection area, said air compressor means comprising:

(i) an air compressor connected to said switch means and supplying compressed air,

(ii) a pair of air hoses, connected between said air compressor and said grill for directing compressed air to said grill,

(iii) a pair of air tube means, connected to said air hoses and disposed along the outer edges of said grill, for directing a plurality of streams of compressed air across said upper sides of said shoes toward said collection area, said streams dislodging said debris on said upper sides of said shoes and directing said debris toward said collection area, and

(iv) air intake means, disposed beneath said collection area and connected to said compressor, for allowing said streams of compressed air to be drawn through said grill into said air compressor, said recirculated air carrying all aforesaid debris toward said compressor from said collection area;

(g) means for filtering said collected debris from said recir-

culated compressed air for storing said collected debris, said filtering and storing means comprising:

(i) a generally cylindrical tank removably disposed beneath said grill, said tank including a slot disposed directly beneath said collection area, said tank being open at one end and connected to said air compressor at said open end, and

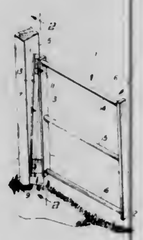
(ii) a filter element disposed across said open end of said tank, whereby debris in said collection area is drawn into said tank through said slot as said compressor recirculates said compressed air in said collection area through said tank, said filter element preventing said debris from entering said compressor and collecting said debris in said tank.

4,233,708

SELF-CLOSING HINGE APPARATUS

Thomas G. Bonar, P.O. Box 102, Agula, Ariz. 85320

Filed Oct. 25, 1978, Ser. No. 954,342
Int. Cl.³ E05F *1/06*
U.S. Cl. 16—152 **7 Claims**



1. A self-closing hinging apparatus for attaching a gate to a vertical upright, said gate having a first vertical edge and an opposite second vertical edge, said hinging apparatus comprising in combination:

a. an upper hinge including a first hinge joint and first and second leaves attached to said first hinge joint, said first leaf having a first attachment end for attachment to an upper portion of said vertical upright and said second leaf having a second attachment end for attachment to an upper portion of said gate;

b. a lower hinge including a second hinge joint and third and fourth leaves attached to said second hinge joint, said third leaf having a third attachment end for attachment to a lower portion of said vertical upright, said fourth leaf having a fourth attachment end for attachment to a lower portion of said gate, the distance between said first hinge joint and said second attachment end being approximately equal to a first distance, the distance between said second hinge joint and said fourth attachment end being approximately equal to a second distance, said second distance being substantially greater than said first distance; and

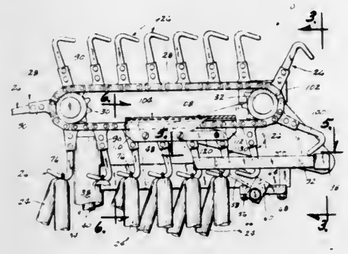
c. a reinforcing member rigidly attached to said upper hinge and said lower hinge adjacent said first hinge joint and second hinge joint, respectively, for maintaining said first hinge joint in alignment with said second hinge joint, said first and second hinge joints having first and second axes, respectively, said first and second axes lying along a common straight line, said common straight line being inclined with respect to said vertical upright, said common straight line also being inclined with respect to a plane parallel to said gate, said first hinge joint resisting any removal of either of said first leaf and said second leaf in a lateral direction from said first hinge joint, said second hinge joint resisting any removal of either of said third leaf and said fourth leaf in a lateral direction from said second hinge joint.

4,233,709

LINK CUTTER

David W. Smith, West Des Moines, and Mark W. Paar, Des Moines, both of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Jun. 6, 1979, Ser. No. 46,119
Int. Cl.³ A22C *11/00*
U.S. Cl. 17—1 F **12 Claims**



1. An apparatus for separating stuffed product casing links interconnected by twisted casing sections, comprising, a support means, a conveyor on said support means, said conveyor including a plurality of hooks extended therefrom

at spaced-apart positions thereon, a cutting member on said support means, said conveyor being operative to advance each hook from a loading

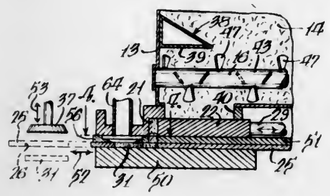
position, wherein said hook is adapted to receive and support a twisted casing section between a pair of links, to a cutting position wherein a twisted casing section supported thereon is moved into cutting engagement with said cutting member so as to be severed thereby.

4,233,710

MOLDING APPARATUS

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Sep. 20, 1978, Ser. No. 944,000
Int. Cl.² A22C *7/00*
U.S. Cl. 17—32 **9 Claims**



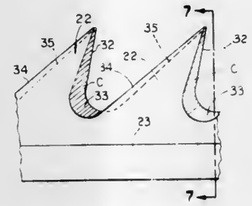
1. Apparatus for shaping a flat article from moldable food material of the nature of ground meat, comprising: a movable mold plate plate having a mold opening through the plate for receiving a pressurized charge of said material for said shaping of said article; spaced plates between which said mold plate is movable between mold opening filling position and article discharge position, said plates comprising means for confining the opposite sides of said mold opening at said mold filling position and thereby means for forming enclosing parts of said mold opening for said shaping, one of said plates comprising a vent plate; an entrance means to said mold opening at said mold filling position; means for directing said pressurized charge through said entrance means at said filling position and into said mold opening for said shaping of said articles; and a plurality of elongated slots in said vent plate extending longitudinally essentially parallel to said mold plate and spaced from said mold opening entrance means when said mold plate is in said filling position for venting from said mold opening air displaced by said pressurized charge entering said mold opening wherein each said slot comprises a narrow air entrance side adjacent to said mold opening joinded to a wider air exhaust side spaced from said mold opening wherein each said slot comprises a narrow air entrance side adjacent to said mold opening joined to a wider air exhaust side spaced from said mold opening has been added.

4,233,711

METALLIC CARD CLOTHING

John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29602

Filed Sep. 6, 1978, Ser. No. 940,004
Int. Cl.³ D01G *15/88*
U.S. Cl. 19—114 **4 Claims**



1. Metallic wire card clothing comprising:

an elongated metallic wire strip having a base portion;

a tooth forming portion integral with and extending upwardly from the base;

a plurality of spaced teeth punched in said tooth forming portion;

said teeth having a front face, sides defined by said tooth forming portion and a trailing edge;

said front face being punched forming an acute angle across the strip presenting a sharpened leading edge pointing in the direction of movement of the clothing; and

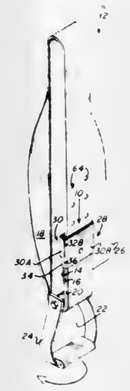
said sharpened leading edge extending substantially along the length of said front face.

4,233,712

STIRRUP BUCKLE

Thomas A. Horst, 2801 N. 111th St., Lafayette, Colo. 80026, and Charles L. Welton; a part interest Golden, Colo. assignors to Thomas A Horst, Lafayette, Colo., by said Charles L. Welton

Filed Jan. 2, 1979, Ser. No. 198
Int. Cl.³ A44B *11/02*
U.S. Cl. 24—166 **5 Claims**



1. A buckle for use in detachably connecting the apertured ends of a strap together in overlapped relation which comprises:

at least one pin having a shank terminating at one end in an oversize head;

a slide having front and rear walls connected together in fixed spaced relation by end walls cooperating therewith to define a sleeve having a passage therethrough sized to receive the overlapped strap ends;

a generally channel-shaped keeper having a web bordered on both sides by inturned flanges, said keeper being sized and shaped to telescope inside the slide with its web in face-to-face relation with one of the walls of the slide and its flanges in sliding engagement with the end walls thereof, said keeper web having an opening therein sized to pass the shank of the pin and hold same in position to enter registering openings in the overlapped strap ends so as to prevent relative lengthwise movement therebetween, and said web and said one slide wall cooperating with one another and with said pin to retain the head of the latter therebetween; and,

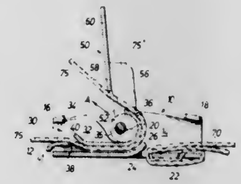
means operatively interconnecting the keeper and slide effective to limit the relative telescopic movement therebetween between a closed position wherein said slide covers the shank of the pin thereby preventing removal of either of the overlapped strap ends therefrom and an open position uncovering the latter, and said means also being effective in all relative positions of said slide and keeper to prevent removal of said pin from its retained position therebetween.

4,233,713

LOCKABLE BUCKLE FOR BELTS, STRAPS AND THE LIKE

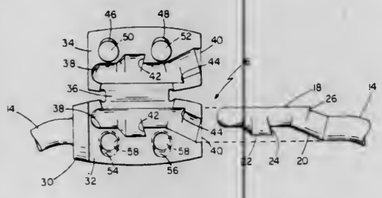
Odd Berg, Myntvägen 9, S-890 23 Själevad, Sweden

Filed May 15, 1978, Ser. No. 905,826
Claims priority, application Sweden, May 2, 1978, 7805073
Int. Cl.³ A44B *11/12*
U.S. Cl. 24—191 **16 Claims**



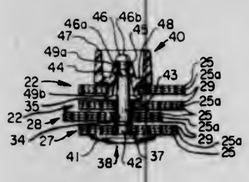
1. A lockable buckle for belts, straps and the like comprising an exterior shoe and a locking means accommodated therein and movable between a locked position and an open position for permitting a belt or the like to pass freely through the shoe in the opened position of the locking means and alternately for becoming locked and fixed in the shoe under friction at an optional place along the belt when the locking means is moved into the locked position, said locking means comprising (a) a movable slide in the shoe, the slide forming with the inside of the shoe a locking area through which the belt passes for nipping in the locked position between the slide and the shoe, and (b) a cam means pivotally mounted in the shoe and actuated by an operating arm, said cam means being engageable with the slide adjacent the exit end of said slide, for pressing the slide against the belt on assuming the locked position, and for lifting the slide from the belt when assuming the open position, said buckle being further comprised in that the slide is freely accommodated in the shoe, said slide including at its said exit end a portion partially surrounding the cam means for said lifting of said slide from said belt, said slide including adjacent its opposite entry end a transverse opening adapted to the cross section of said belt to form an entry opening to the said locking area for the belt.

4,233,714
END CLOSURE
Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.
Filed Dec. 8, 1977, Ser. No. 858,537
Int. Cl.[2] A44B *17/00*; F16G *15/00*
U.S. Cl. 24—201 R **6 Claims**



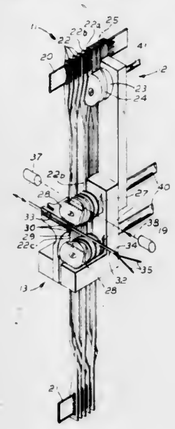
1. End Closure means comprising:
a latch member axially extending to an end and having a latch surface extending generally radially relative to the axis of said member at an acute angle facing away from said end; and
a body member adapted to encapsulate said latch member, said body member having two parts defining an axially extending latch member receiving recess therebetween, said recess having a shoulder extending generally radially at said acute angle for engaging said latch surface and said recess extending to and defining an opening at one end of said body member opposite the portion of said recess adapted for receiving said latch member and; a hinge extending on one side of the body member extending generally parallel to the axis of said recess and connecting said two body member parts together and spaced from said recess, on the side thereof away from said hinge, said body member parts respectively having at least one recess and protrusion having mutually engageable shoulders, said mutually engageable shoulders in said recess and on said protrusion adapted to permanently secure said body member parts together.

4,233,715
FASTENING MEANS FOR FLEXIBLE MATERIAL
Clifton E. McDermott, 1778 Oakridge Dr., Salt Lake City, Utah 84106
Continuation-in-part of Ser. No. 683,263, May 5, 1976, which is a division of Ser. No. 549,426, Feb. 12, 1975, Pat. No. 3,965,589.
This application Jun. 29, 1978, Ser. No. 920,485
Int. Cl.[2] A44B *17/00*
U.S. Cl. 24—217 R **6 Claims**



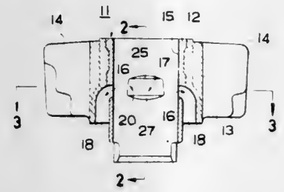
1. Fastening means for flexible material comprising
a male portion consisting of a generally flat base having
a circular shank projecting perpendicularly therefrom, after passing through an opening in the flexible material said shank having a first portion of a given diameter extending from the flexible material followed by a tapered shoulder to a second portion having a smaller diameter and terminating at a head which has a first surface that extends abruptly outwardly at a 90° angle from the smaller shank portion and a second surface which is curved from a central top to the outer periphery of the surface and;
an integral on piece female portion adapted to interlock with the male portion comprising a circular outer ring
having equidistantly spaced bars which project radially inwardly therefrom terminating in upward extensions thereof and in a continuous downwardly extending annular ring, said upward extensions being inclined inwardly and curved on the inside surface so that the space enclosed by the end of the upward extensions is a circle of approximately the same diameter as the smaller portion of the shank thus enabling the upper extensions to expand over the shank head and snap permanently into place around the shank; said continuous downwardly extending annular ring being in substantially the same inclined plane as the upward extensions and adapted to pass through an opening in the flexible material to be fastened and then flared outwardly to form a lip which secures the flexible material between the outer ring and said outwardly flared lip.

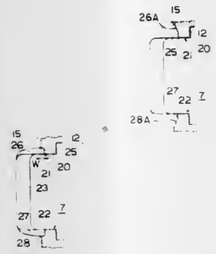
4,233,716
PHOTOELECTRIC HEDDLE DETECTION DEVICE
Dhiru B. Patel, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.
Filed Feb. 12, 1979, Ser. No. 11,299
Int. Cl.[3] D03J *1/14*
U.S. Cl. 28—187 **10 Claims**



1. In a warp drawing machine having at least one heddle frame mounted thereon, each of said heddle frames having a pack of heddles slidably supported thereon, each of the heddles in said pack having a warp strand receiving eye therethrough, a heddle selecting mechanism for each of said heddle frames to separate an end one of said heddles from the pack on the frame, a heddle positioning mechanism for each of said heddle frames adapted to cooperate with a respective heddle selecting mechanism to engage and position the separated heddle such that the eye thereof occupies a predetermined warp strand receiving position, a drawing-in mechanism adapted to cooperate with said heddle position mechanisms for drawing successive ones of a plurality of warp strands through the eye of respective successively positioned ones of said heddles, and a heddle detecting device operatively associated with the heddle positioning mechanisms for detecting the absence of any heddle being in a warp strand receiving position, said heddle detecting device comprising a light source producing a beam of light, said source located to one side of said heddle frames and said heddle selecting and positioning mechanisms in a position to project said beam of light across the machine in a path interrupted by any of said positioned heddles, a light beam receiver located to the opposite side of said heddle frames and said heddle selecting and positioning mechanisms in a position to receive the beam of light when no heddle is in a warp strand receiving position, and a photoelectric device producing a signal in resonse to reception of the beam of light by said light beam receiver.

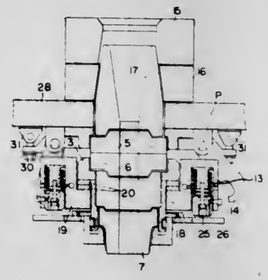
4,233,717
METHOD OF BEVELLING PORT OPENINGS IN CYLINDERS FOR TWO-CYCLE ENGINES
Kenichi Noda; Hiroshi Murakami, both of Tokyo, and Noboru Kurata, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 11, 1978, Ser. No. 940,985
Claims priority, application Japan, Sep. 12, 1977, 52-109700
Int. Cl.[3] B23P *13/00*, *15/00*
U.S. Cl. 29—156.4 WL **10 Claims**





1. A method of bevelling a port opening in a cylinder of an engine, said port opening having a pair of spaced side edges extending parallel with the cylinder axis and upper and lower edges extending therebetween, comprising the steps of:
shaping at least the upper and lower edges, transverse to a piston stroke, of a port opening, on an inner wall of a cylinder;
said shaping being done integrally with said cylinder when casting said cylinder;
said shaping being performed such that said upper edge is shaped into a concavity disposed above said port opening in said inner wall of said cylinder and said lower edge is shaped into a concavity disposed below said port opening in said inner wall of said cylinder, each said concavity being arcuately recessed in both the axial and radial directions of said cylinder; and
bevelling only the boundary edges common to and between said recessed concavities and the inner wall surface of said cylinder with a rotary member having a substantially smooth peripheral surface.

4,233,718
METHOD FOR APPLYING A DESIRED SEALING PRESSURE BETWEEN REFRACTORY PLATES OF SLIDING NOZZLE
Hiroshi Horiguchi, Ohmiya, and Terumoto Matsuo, Kitakyushu, both of Japan, assignors to Kurosaki Refractories Co. Ltd., Kitakyushu and Nippon Steel Corporation, Tokyo, both of, Japan
Division of Ser. No. 743,421, Nov. 19, 1976, Pat. No. 4,116,372.
This application Jul. 13, 1977, Ser. No. 815,323
Claims priority, application Japan, Nov. 26, 1975, 50-141791
Int. Cl.[3] B23P *15/00*; B22D *41/08*
U.S. Cl. 29—157 C **4 Claims**

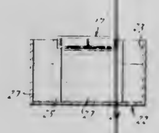


1. A method for applying and maintaining a desired sealing pressure between stationary and slidable refractory plates of a sliding nozzle assembly used in the regulation of the flow of molten metal from a vessel comprising:
positioning a sliding nozzle assembly which includes stationary and slidable refractory plates across the discharge opening of a vessel containing a molten metal,
providing said sliding nozzle assembly and vessel with mounting means for detachably connecting a fluid pressure control device thereto,
temporarily mounting said readily detachable fluid pressure control device to said sliding nozzle assembly and vessel,
applying a controlled pressure by said fluid pressure control device to said refractory plates so that a desired sealing force is effected at the interface between said stationary and slidable plates,
rigidly connecting said plates together by connecting means after said controlled pressure has been applied by said pressure control device,
maintaining said desired sealing force by means of said connecting means, and
removing said pressure control device from said sliding nozzle assembly, whereby said pressure control device is not subjected to the temperature of the molten metal during operation of the sliding nozzle assembly.

4,233,719
METHOD FOR MANUFACTURING A HEAT TRANSFER ASSEMBLY
Eugene E. Rhodes, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 6, 1978, Ser. No. 940,932
Int. Cl.[1] B23P *15/26*
U.S. Cl. 29—157.3 A **2 Claims**

1. In the method for manufacturing a heat transfer assembly comprising the steps of:
(a) forming a plurality of fin strips, each of said fin strips being made from a unitary strip of metal folded back and forth to form a plurality of fin elements each having an essentially planar member between the fold edges;
(b) forming a plurality of substantially flat-sided metal tubes, said tubes being seamless or having seams that are welded or otherwise sealed;

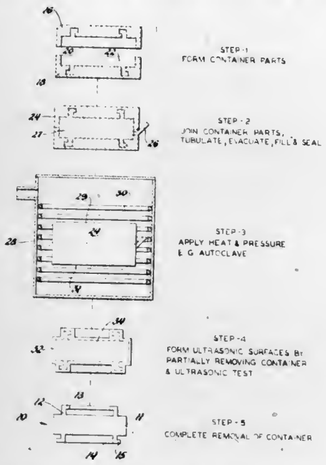
(c) cleaning said fin strips and said tubes with flux to remove surface oxidation and contaminants therefrom;
(d) forming a heat transfer assembly by the assembly of a plurality of said fin strip and tubes, at least one flat side of each of said tubes being in conductive heat transfer contact with a plurality of the fold edges of at least one of said fin strips through solder joints made at the locations of said conductive heat transfer contact, said solder joints being made by the application of solder to selected components in said heat transfer assembly and by the application thereafter to said heat transfer assembly of heat and temperature sufficient to cause said solder to flow, thereby, to join said selected components to other components in said heat transfer assembly;
wherein the improvement comprises:



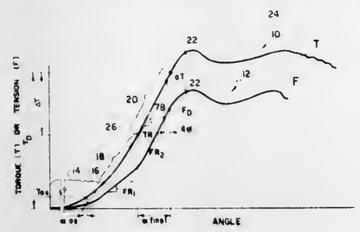
(e) prior to the assembly of said fin strips and tubes, applying solder as a bead extending along a majority of the length of said fold edges of said fin strips, the solder bead on the fold edges being applied to said fold edges by causing said fin strips to pass through liquid solder which thereafter solidifies on said fold edges as beads, the liquid solder being in a vessel, the surface of the liquid solder having a standing wave generated therein whereby a solder peak is formed, the metal from which said fin strips are formed, after being folded back and forth to form said fold edges, having said fold edges pass through the solder peak in said vessel; and
(f) said heat and temperature thereafter applied to said heat transfer assembly causing solder to flow from said fold edges to said tubes, thereby, to form said solder joints made at locations of said conductive heat transfer contact.

4,233,720
METHOD OF FORMING AND ULTRASONIC TESTING ARTICLES OF NEAR NET SHAPE FROM POWDER METAL
Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Nov. 30, 1978, Ser. No. 965,168
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 29—407 **2 Claims**

1. A method of forming and sonic testing powder metal articles comprising the steps of producing a thick-walled container by forming a cavity of predetermined complex shape in a mass of suitable container material such that the walls of the container are of sufficient thickness so that the exterior surface thereof does not closely follow the contour of the cavity, cleaning the cavity to remove contaminants, filling the cavity with powder metal and sealing the container, applying heat and pressure to the container to consolidate the powder metal to produce a densified compact, preparing the densified compact for sonic testing by selectively removing portions of the container to form sonic surfaces on the jacket of container material around the densified compact, sonic testing the densified compact and completing removal of the container material.

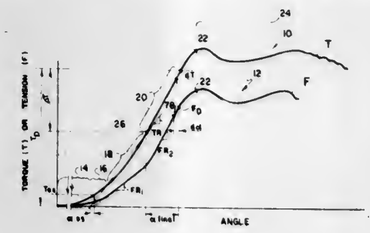


4,233,721
TENSION CONTROL OF FASTENERS
Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Division of Ser. No. 912,151, Jun. 2, 1978, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,358
Int. Cl.[2] B25B *23/14*; B23Q *5/00*; G01L *3/22*
U.S. Cl. 29—407 **8 Claims**



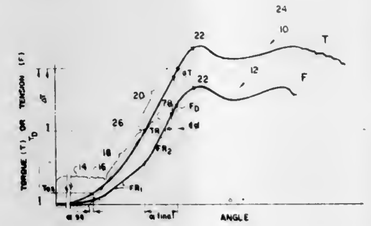
1. A method for tightening a threaded fastener, comprising
applying torque and imparting rotation to the fastener for advancing the fastener into a region of increasing torque and increasing rotation;
sensing applied torque at a plurality of rotational locations; then
stopping rotation of the fastener; then
determining the torque rate of the fastener in a region preceding stopping of rotation including
disregarding at least those torque sensings immediately preceding stopping of rotation where the magnitude of the sensing is affected by the act of stopping rotation;
selecting a plurality of torque sensing sensed at rotational locations lower than the disregarded sensings; and
averaging the selected torque sensings into an average torque rate.

4,233,722
TENSION CONTROL OF FASTENERS
Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,363
Int. Cl.[3] B23P *19/06*
U.S. Cl. 29—407 **16 Claims**



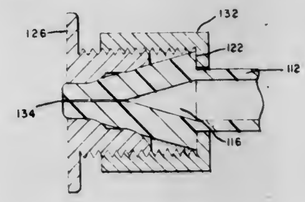
1. A method of tightening a threaded fastener including the sequential steps of
tightening the fastener with a powered instructable tool;
suspending tightening and measuring the amount of tool overrun;
resuming tightening; and
instructing the tool to terminate tightening as a function of the measured tool overrun.

4,233,723
TENSION CONTROL OF FASTENERS
Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,686
Int. Cl.[3] B23P *19/06*
U.S. Cl. 29—407 **4 Claims**



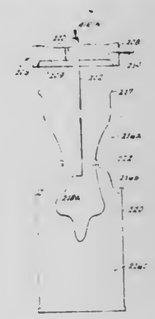
1. A method of monitoring performance of a tool during tightening of a threaded fastener, including
tightening the fastener with the tool;
predicting the amount of tool overrun;
causing the tool to terminate tightening and measuring the amount of actual tool overrun; and
signalling in the event that the measured tool overrun diverges significantly from the predicted tool overrun.

4,233,724
METHOD OF ACCURATELY POSITIONING FIBER CABLES WITHIN FERRULES
Terry P. Bowen, Etters; Charles D. Hoover, Harrisburg; Gilbert D. Ferdon, Hummelstown, and Robert G. Harwood, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Division of Ser. No. 819,919, Jul. 28, 1977, Pat. No. 4,167,303. This application Apr. 20, 1979, Ser. No. 31,903
Int. Cl.[3] B23P *19/00*
U.S. Cl. 29—428 **8 Claims**



1. A method for accurately positioning fibers of optical fiber cables within respective ferrule members, each said cable having at least one optical fiber within a shielding jacket, comprising the steps of:
forming said ferrule member with a profiled outer surface at a front end and an axial blind bore extending therein from a rear end,
mounting said ferrule member in a bushing which exerts radially compressive force on said front end,
drilling a bore coaxially with said bushing to intersect said blind bore,
releasing said bored ferrule member from said bushing,
inserting said at least one optical fiber of said cable into said ferrule member to pass through said bores, and
securing said at least one fiber therein whereby said at least one fiber is accurately positioned within said ferrule in all subsequent matings thereof.

4,233,725
METHOD AND APPARATUS FOR INSERTING A FLEXIBLE INNER CONTAINER WITHIN A RIGID OUTER CONTAINER
Norman D. Burger, Culver City, Calif., assignor to Nicholas A. Mardesich, Palos Verdes Estates, Calif., a part interest
Division of Ser. No. 774,896, Mar. 7, 1977, Pat. No. 4,150,522. This application Feb. 9, 1979, Ser. No. 10,899
Int. Cl.[3] B23P *19/02, 11/02*
U.S. Cl. 29—451 **5 Claims**



1. A method for inserting a flexible inner container having a bottom surface within a rigid outer container having a neck opening in the formation of an aerosol dispensing system, said method comprising:

aligning a bottom surface of the flexible inner container with said neck opening, and

applying a pressure to the inside of said aligned bottom surface of said inner container to force said bottom surface through the neck opening with the balance of the inner container being pulled by the bottom surface into the rigid outer container.

5. An apparatus for inserting a flexible inner container through a neck opening of a rigid outer container in forming an aerosol system in which the flexible inner container has a mouth opening and a bottom, said apparatus comprising:

means for supporting the flexible inner container with the mouth opening of the inner container in an opened condition and with the bottom of said flexible inner container aligned with the neck opening of said rigid outer container, and

means for directing a stream of gas into the mouth opening and against the inside bottom of the inner container to move the inner container in the direction of the stream of gas and away from the means for supporting the flexible inner container to force the flexible inner container through the neck opening of a rigid outer container by directing the said stream of gas toward the neck opening.

4,233,726

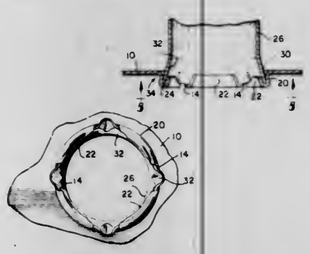
METHOD OF JOINING A TUBE TO A PLATE

Ronald S. Williams, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Division of Ser. No. 908,393, May 22, 1978, Pat. No. 4,195,943. This application Dec. 21, 1978, Ser. No. 972,043

Int. Cl.³ B21D *39/00*; B23P *11/02*

U.S. Cl. 29—507 **8 Claims**



1. The method of joining a tube to a plate comprising the steps of forming an aperture in the plate where the tube is to be joined, forming a flange around the perimeter of the aperture, the flange including a first portion extending away from the plane of the plate, a second lip portion extending generally radially of the axis of the aperture, and a third portion extending toward the plane of the plate, the first, second, and third flange portions cooperating to define an annular groove for receiving the tube end, forming an opening in one of the flange and tube side wall, inserting the tube into the aperture into contact with the lip portion of the flange, the flange including a side wall which extends generally along the side wall of the inserted tube, the opening extending longitudinally and perimetrally of the tube and flange, and deforming the other of the flange and tube side wall radially into the opening to capture the tube against rotation and longitudinal movement with respect to the flange.

4,233,727

ATTACHMENT FOR SCREW-TIGHTENING DEVICES, PREFERABLY FOR REACTOR PRESSURE VESSELS

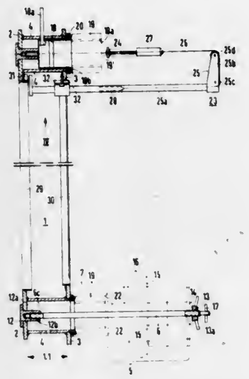
Anton Kautetzky, Forchheim, and Otto Müller, Effeltrich, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 930,977

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736733

Int. Cl.³ B25B *29/02*

U.S. Cl. 29—560 **14 Claims**



1. Accessory for a screw-tightening device having a support ring with hydraulic piston-cylinder assemblies as tensioning elements for pressure-vessel cover screws, the assemblies being disposable on a flange of the pressure-vessel cover, fastening nuts for the cover screws being loosenable and tightenable as well as transportable by the screw-tightening device, comprising a divided auxiliary ring having parting gaps formed in a circumferential region thereof corresponding to a circumferential region of the support ring at which parting gaps are likewise formed, said auxiliary ring and said support ring being mutually superimposable and clampable, said divided auxiliary ring having the parts thereof provided with respective means for engagement by a lifting tool, said rings having flange connections at said parting gaps thereof, said flange connections being disconnectible to form at least two separate arcuate units respectively including part of the support ring and part of said auxiliary ring clamped together for transport by said lifting tool.

4,233,728

METHODS FOR MAKING AND USING SLOT CLOSURE WEDGES AT A COIL INJECTION STATION

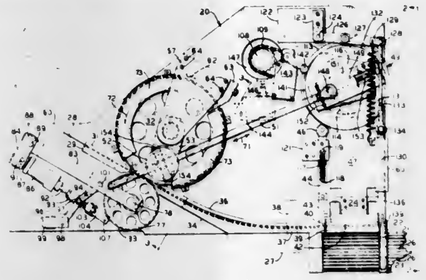
Louis W. Pieper, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 27, 1978, Ser. No. 964,075

Int. Cl.³ H02K *15/10*

U.S. Cl. 29—596 **5 Claims**

1. A method of making wedges in a multifunction, stator wedge making and inserting, and stator winding injecting apparatus, wherein the apparatus includes means for severing wedge material from an indeterminate amount of supply of such material having a predetermined and generally uniform thickness, in order to establish pieces of wedge material of a determinate length, wherein the apparatus includes a wedge magazine having a plurality of locations for receiving the pieces of wedge material of a determinate length, and wherein the apparatus further includes means for transferring the pieces of wedge material of a determinate length into the wedge magazine; the method comprising: pinching wedge material between two roller members and advancing a predetermined length of the material from the material supply toward the means for transferring, while also reducing the thickness of the wedge material at preselected locations where the material is being pinched and thereby forming the wedge material into a predetermined symmetrical shape having a central portion and two leg portions with the junctures and dimensions of the leg portions and the central portion being accurately defined by reduced thickness segments of the wedge material that are established by said pinching of the wedge material; severing



the same predetermined length of previously pinched wedge material with the means for severing to establish a wedge of finite length; transferring the severed predetermined length of previously pinched wedge material to the wedge magazine; and subsequently transferring part of at least one stator winding and said wedge of finite length into a slot of a stator core with said multifunction stator wedge making and inserting and stator winding injecting apparatus.

4,233,729

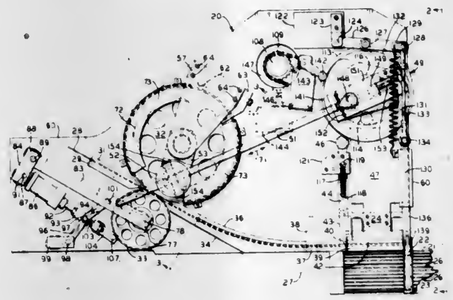
APPARATUS AND METHODS FOR MAKING AND USING SLOT CLOSURE WEDGES AT A COIL INJECTION STATION

Fredrick Koenig, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 27, 1978, Ser. No. 964,076

Int. Cl.³ H02K *15/10*

U.S. Cl. 29—596 **11 Claims**



1. In a method of making wedges in a multi-function, stator wedge making and inserting, and stator winding injecting apparatus, wherein the apparatus includes means for severing wedge material from an indeterminate amount of supply of such material having a predetermined and generally uniform thickness, in order to establish pieces of wedge material of a determinate length, wherein the apparatus includes a wedge magazine having a plurality of locations for receiving the pieces of wedge material of a determinate length, and wherein the apparatus further includes means for transferring the pieces of wedge material of a determinate length into the wedge magazine; and wherein the method comprises: pinching wedge material between two roller members and advancing a predetermined length of the material from the material supply toward the means for transferring, while also reducing the thickness of the wedge material at preselected locations where the material is being pinched and thereby forming the wedge material into a predetermined symmetrical shape having a central portion and two leg portions with the junctures and dimensions of the leg portions and the central portion being accurately defined by reduced thickness segments of the wedge material that are established by said pinching of the wedge material; severing the same predetermined length of previously pinched wedge material with the means for severing to establish a wedge of finite length; transferring the severed predetermined length of previously pinched wedge material to the wedge magazine; and subsequently transferring part of at least one stator winding and said wedge of finite length into a slot of a stator core with said multifunction stator wedge making and inserting and stator winding injecting apparatus; the improvement comprising: confining the pinched wedge material in a guide having a shape to insure retention of said symmetrical shape by the wedge material as it is advanced from the roller members to the means for severing.

4,233,730

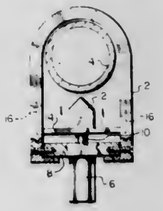
BOILER TUBE PULLING METHOD AND APPARATUS

James R. Godbe, P.O. Box 35429, Dallas, Tex. 75235

Filed Jul. 31, 1978, Ser. No. 929,279

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—727 **6 Claims**



1. Apparatus for breaking the bond between a tube and a tube sheet comprising:

a substantially rigid tube engaging member having a concave surface conforming to substantially half the circumference of a tube,

driving means attached to said tube engaging member, and

a crimping wedge attached to the driving means and positioned opposite of said concave surface to be driven toward said concave surface by said driving means.

4,233,731

RESILIENT CONNECTOR

Robin J. T. Clabburn, Swindon, and Richard J. Penneck, Lechlade, both of England, assignors to Raychem Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,184

Claims priority, application United Kingdom, Jan. 24, 1977, 2832/77

Int. Cl.³ H01R *43/00*; H02G *15/08*

U.S. Cl. 29—859 **19 Claims**

16. A method of forming an earth connection to an end of a mineral-insulated cable, comprising:

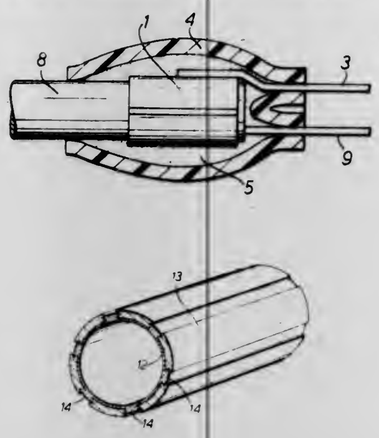
(a) placing about said cable end a resiliently recoverable connector which comprises:

(i) a longitudinally slit tubular metal member, which has been elastically radially expanded,

(ii) a thermoplastic polymeric keeper placed within the slit to hold said member in its expanded state, the keeper

material being positioned substantially out of the path of radial recovery of said member, and

(iii) an earth lead connected to said member; and



(b) heating said keeper so that it weakens to permit said member to resiliently radially recover into tight gripping engagement about said cable end.

4,233,732

METHOD OF ASSEMBLING A RELAY DEVICE

Thomas J. Kindelspire, Morris, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 795,797, May 11, 1977, Pat. No. 4,158,828. This application Nov. 13, 1978, Ser. No. 959,913

Int. Cl.[3] H01R *43/00*

U.S. Cl. 29—881 **1 Claim**



1. A method of assembling a relay device having a flange portion and a cover portion adapted to be releasably secured together in a preselected assembly position and with at least the cover portion formed from a material having a resilient characteristic, the flange portion including a generally planar upper surface interconnected between a plurality of side surfaces depending therefrom, a pair of opposite facing latches on a pair of opposite side surfaces of the side surface plurality, and a pair of female terminal receiving cavities extending into the upper surface and intersecting with another one of the side surfaces of the side surface plurality interposed between the opposite side surface pair thereby to define therethrough a pair of intersections, respectively, the cover portion including a generally planar cover wall interconnected between a plurality of sidewalls depending therefrom, a pair of latch receiving openings in a pair of opposite sidewalls of the sidewall plurality and a pair of uninterrupted cavity communicating apertures in another one of the sidewalls of the sidewall plurality interposed between the sidewall pair, the method comprising the steps of:

placing a pair of female terminals in the cavities therefor of the upper surface and disposing a female electrical connector section of the female terminals at least adjacent the intersection pair for communication therewith, respectively;

initially overlapping in opposed at least adjacent relation only distal portions of the sidewalls with confronting portions of the side surfaces so that the cover wall is arranged in spaced apart generally parallel planar relation with the upper surface and aligning with the opening pair and the aperture pair in spaced relation with and generally above the wedge pair and the intersection pair thereby to place the cover portion and the flange portion in a preselected preassembly position prior to the releasable securing thereof on the preselected assembly position, respectively;

applying an assembly force onto at least one of the cover portion and the flange portion so as to displace them from the preassembly position toward the assembly position thereof;

moving in response to the applied assembly force the cover wall in a direction generally perpendicular toward the upper surface so as to maintain the generally parallel planar relation therebetween;

wedging the opposite sidewall pair at least in the vicinity adjacent the opening pair therein into engagement with the latch pair on the opposite side surface pair and spreading apart the opposite sidewall pair in the at least vicinity adjacent the opening pair therein in opposite directions generally away from the confronting portions of the opposite side surface pair respectively in the overlapping relation therewith at least generally simultaneously with the moving step;

then passing the opening pair in the opposite sidewall pair over the latch pair on the opposite side surface pair while the opposite sidewall pair are spread apart and moving the aperture pair in the another one sidewall generally into aligned overlapping relation with the intersection pair in the another one side surface so as to communicate therethrough with the female electrical connector sections of the female terminal pair in the cavity pair, respectively; and

resiling the spread apart opposite sidewall pair in a return direction toward the opposite side surface pair thereby to place the sidewalls of the cover portion in overlapping relation at least adjacent the confronting side surfaces of the flange and releasably securing thereby the cover portion and the flange portion in the preselected assembly position thereof with the female terminal pair captured in the cavity pair between the upper surface and the cover wall in the generally parallel relation thereof.

4,233,733

ELECTRIC SHAVER

George P. Gallanis, Des Plaines; Albert R. Spohr, Park Ridge, and Robert R. Lube, Countryside, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

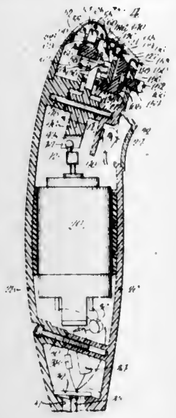
Filed Jan. 2, 1979, Ser. No. 46

Int. Cl.[3] B26B *19/04*

U.S. Cl. 30—43.92 **7 Claims**

1. A shaver comprising a housing, a shaving head detachably mounted on said housing, a skin engaging comb secured to said shaving head, a modular cutter assembly removably mounted in said shaving head adjacent said comb, and actuating means for actuating said cutter assembly, said cutter assembly includes a plurality of cutting blades secured together by pin

means, a blade mounting block including at least one spring arm releasably secured to said pin means and biasing means



mounted on said block for resiliently biasing said blades away from said block.

4,233,734

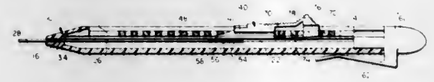
RETRACTABLE BLADE KNIFE

Sylvester W. Bles, Bloomfield, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jan. 22, 1979, Ser. No. 5,022

Int. Cl.[3] B26B *1/08*

U.S. Cl. 30—162 **3 Claims**



1. A retractable blade knife comprising an elongated tubular handle of generally C-shaped cross-section having a longitudinally extending slot in one wall thereof formed with opposed parallel side edges, a flat thin elongate steel blade, a pair of opposed inwardly facing grooves inside the handle mounting the blade for sliding movement parallel to the slot, a longitudinally extending rib formed on one of said side edges and a row of contiguous teeth formed on the other of said side edges facing and in opposed relationship to the rib, a combined slide and latching member for positioning the blade relative to the housing comprising a slide dimensioned to fit between the side edges of the slot and having outwardly facing side grooves receiving the longitudinally extending rib and the row of teeth on the side edges of the slot whereby the slide is supported for sliding movement longitudinally of the handle, means releasably interconnecting the slide and the blade, a flexible thumbpiece extending upwardly and rearwardly from the slide and having a depending abutment at its free end extending inwardly between the longitudinally extending rib and the row of contiguous teeth, and a tooth carried by and extending outwardly from the side of the depending abutment of the thumbpiece facing and normally meshing with said row of teeth and being disengaged therefrom when the thumbpiece is flexed inwardly toward the handle thereby moving the thumbpiece laterally of the row of teeth.

4,233,735

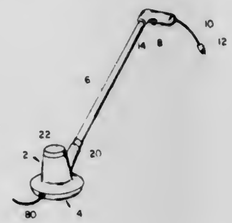
FLEXIBLE LINE CUTTING APPARATUS

William S. Tsuchiya, East Moline, Ill., assignor to The Toro Company, Minneapolis, Minn.

Filed Nov. 18, 1975, Ser. No. 632,972

Int. Cl.[2] B26B *27/00*

U.S. Cl. 30—276 **12 Claims**



1. Apparatus for cutting vegetation and the like comprising: a member rotatable about an axis normal to a cutting plane; means forming a continuous passageway in said member extending from a first opening intersected by said axis to a radially spaced second, tubular opening intersected by said cutting plane; flexible line means extending through said passageway and including a first end portion extending outwardly from said first opening and secured externally of said member against rotation with said member, and a second, free traveling end portion extending outwardly from said second, tubular opening, said line means being confined within said tubular opening and free to rotate about its own axis of elongation within said passageway as said member is rotated.

4,233,736

PRESSURE SENSITIVE PICTURE FRAME MAT OPENING CUTTER

Richard W. Duggins, Cedar Grove, and James W. Rodgers, Durham, both of N.C., assignors to Framework, Inc., Cedar Grove, N.C.

Continuation-in-part of Ser. No. 916,898, Jun. 19, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,660

Int. Cl.[3] B26B *29/00*

U.S. Cl. 30—293 **8 Claims**

1. A picture frame mat opening cutter comprising:

(a) a body member having a flat bottom adapted for being moved on the work surface of a picture frame mat during the forming of an opening therein and having a guide slot formed and disposed at a predetermined angle therein;

(b) a blade support bar slidably mounted in said guide slot and providing a blade mounting surface thereon;

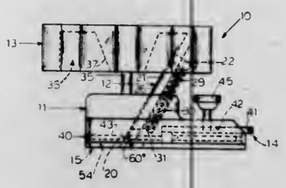
(c) a mat opening cutter blade having a cutting edge and detachably mounted on said blade mounting surface for slidable movement therewith to extend and retract said edge below and above said body member bottom;

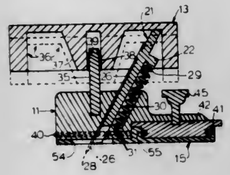
(d) compressible spring means mounted within said body member and operative to constantly tension said blade support bar and blade in a retracted blade edge direction;

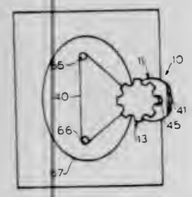
(e) vertical post means located on a top surface portion of said body member; and

(f) a knob member mounted for rotation and vertical sliding on said post means, said knob member having a manually operable knob portion and integral with said knob portion a guide portion providing a flat surface slidably engaging an upper end surface portion of said blade support bar thereby enabling said knob member when pressed downwardly by a downward force and while rotating on said post means to force said blade support bar and blade downwardly against the tension of said spring means to extend said cutting edge of said blade below said flat

bottom of said body member to a depth which within the limits of travel of said blade support bar and blade is







determined by the amount of said downward force applied to said knob member.

4,233,737

KNIFE WITH REMOVABLE BLADE

Paul W. Poehlmann, P.O. Box 445, Stinson Beach, Calif. 94970

Continuation of Ser. No. 873,506, Jan. 30, 1978, abandoned. This application Apr. 13, 1979, Ser. No. 29,847

Int. Cl.[3] **B26B** *1/00*

U.S. Cl. 30—335 **4 Claims**

1. A knife comprising

a removable blade having a tip at one end and having a tang with substantially parallel sides at the other end;

means in said tang between said sides defining a keyhole-shaped slot having parallel walls extending inwardly from said other end of the blade toward the tip and merging with an enlarged circular opening in said tang between said sides;

a handle assembly;

means in said handle assembly including side plates defining a longitudinal socket between them and adapted to receive the tang sides in close fitting relationship;

means in one of said side plates defining a circular opening into one side of said socket;

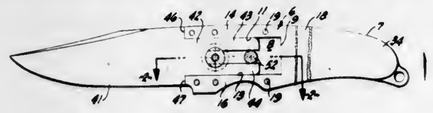
means in the other of said side plates defining an oppositely located, non-circular aperture opening into the other side of said socket;

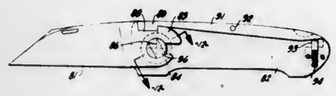
a generally circular-cylindrical blade-locking pin extending through said aperture, socket and opening, and having axial movement therein between transverse extreme positions;

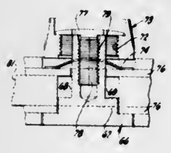
heads at opposite ends of said pin adapted to abut said side plates thereby limiting said transverse movement;

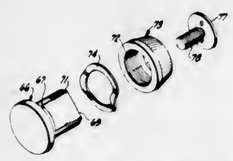
said pin for a part only of its length having a non-circular portion between opposite flats, the dimension across said flats establishing slidable engagement of said flats with the parallel walls of the keyhole slot in the tang, and the diameter of the cylindrical portion of the pin corresponding substantially with the diameter of said tang circular opening;

the free length of the flats along the pin when the pin is at one of said extreme positions corresponding at least to the width between the tang sides at the keyhole-shaped slot, the circular-cylindrical portion of the pin projecting into









the socket when the pin is at the other of said extreme positions;

means for biasing the pin into a position with said circular-cylindrical portion thereof in said circular opening of said tang for preventing longitudinal movement of the blade away from the socket except when said pin is axially moved against said biasing means to permit said flats to slide between said parallel sides of said keyhole slot;

and lock means movable into and out of a position for positively preventing axial movement of said pin.

4,233,738

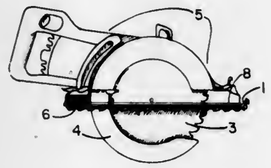
GLIDE PAD FOR PORTABLE POWER SAW

Ted R. Dedrick, 6145 Lubbock Ave., La Mesa, Calif. 92041

Filed Nov. 16, 1978, Ser. No. 961,218

Int. Cl.[2] **B27B** *9/04*

U.S. Cl. 30—374 **4 Claims**



1. A glide pad for a portable power saw having a metallic table, comprising:

(a) a substantially rigid planar deck of plastic or metal having an upturned leading edge conforming to the table of a portable power saw and including an elongated, longitudinally-extended slot to accommodated the blade of said saw;

(b) a layer of non-abrasive material bonded to the bottom of said deck;

(c) said deck having means for mounting same flush against the bottom of said table with said slot aligned with the blade of said saw.

4,233,739

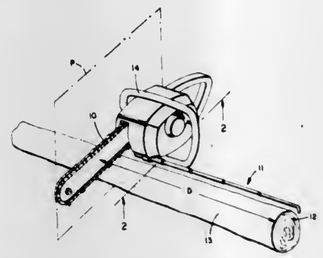
CHAINSAW ACCESSORY

Leslie W. Hinrichs, Box 176, Summerland, Calif. 93067

Filed Jul. 16, 1979, Ser. No. 57,791

Int. Cl.[3] **B27B** *17/00*

U.S. Cl. 30—383 **2 Claims**



1. A chainsaw accessory for use in combination with a portable chain saw to define a fixed pre-determined distance of the cutting plane of said saw from an end of work to be cut so that successive cuts of identical lengths can be rapidly made, said accessory comprising a plurality of straight cylindrical tubes of progressively decreasing diameter so that they can be nested in telescoped relationship, the outermost tube being secured to said chain saw in a position such that the telescoped tubes can be extended in a direction normal to said plane, the outer opening end of each tube from which the next successive tube extends being peened radially inwardly so that the outer end of said next successive tube is frictionally engaged over 360°, the inner end opening of each tube surrounded by the next larger tube being flared outwardly to frictionally engage over 360° the inner wall of said larger tube, whereby any length to which the tubes are extended will be maintained by said frictional engagement of the tubes so that said fixed predetermined distance can be changed and retained in the changed position.

4,233,740

PHOTOGRAMMETRIC PLOTTER AND CONSTRAINT FREE DRIVE SYSTEM THEREFORE

Robert F. Bunn, Clinton, Md., and Clifford W. Greve, Arlington, Va., assignors to Autometric Incorporated, Beltsville, Md., by said Clifford W. Greve

Filed Feb. 16, 1979, Ser. No. 12,689

Int. Cl.[3] **F16H** *27/02;* **G02B** *27/22*

U.S. Cl. 33—1 A **14 Claims**

1. A photogrammetric instrument having a supporting base, way bars mounted on said supporting base and a photocarriage stage mounted on said way bars for translation along at least one selected axis, position transducer means for sensing the position of said photocarriage stage along said at least one axis and producing an electrical signal indicative of said position and drive motor means operating between said base and said photocarriages stage for driving said photocarriages stage relative to said supporting base along said axis, improvement in said drive motor means comprising

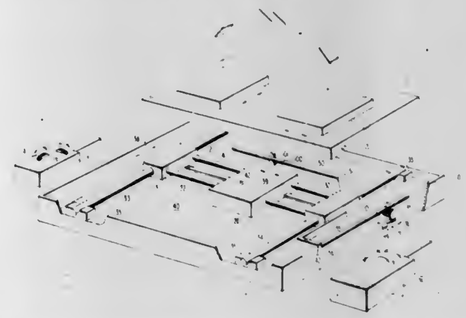
a drive rod having a longitudinal axis which is substantially parallel to said at least one axis,

means supporting said drive rod on one of said (1) supporting base, (2) photocarriage stage so as to allow said rod to pivot and move transverse to its longitudinal axis,

said drive motor means including means for engaging said drive rod, and

means mounting said drive motor means on the other one of said (1) supporting base, (2) photocarriage stage such that any non-parallelism between said drive rod and the movement along said one axis will result in a displacement of said drive rod with respect to said drive motor means in directions transverse to said longitudinal axis.

8. In a stereoplotter having a supporting base, a first set of way bars mounted in said base and a pair of trolley elements movably mounted on said first set of way bars, a second set of way bars supported on said trolley elements, a photocarriage mounted for movement on said second set of way bars, the improvement in means for driving said photocarriage along one of said sets of way bars comprising,



a drive rod extending parallel to the direction of drive along one of said sets of way bars,

means mounting one end of said drive rod on one of said pair of trolley elements so that said rod is displaceable transverse to the direction of drive,

a rotatable drive wheel and motor for rotating same, and,

means causing said drive wheel to bear on said drive rod, said drive rod being rigidly supported at said one end only in an axial direction, the mounting of said drive rod at said one end being in and permitting movements of said rod transverse to the direction of drive and the longitudinal axis of said drive rod whereby any non-parallelism between the set of way bars establishing direction of drive of said photocarriage and said drive rod results in movement of said drive rod in the fashion stated.

4,233,741

MAP READING DEVICE

Claude O. Bisset, Johannesburg, South Africa, assignor to Hausler Scientific Instruments (Proprietary) Limited, Transvaal, South Africa

Filed Apr. 16, 1979, Ser. No. 30,488

Claims priority, application South Africa, Apr. 17, 1978, 78/2179

Int. Cl.[3] **G01B** *3/56*

U.S. Cl. 33—1 N **4 Claims**

4. A map reading device comprising:

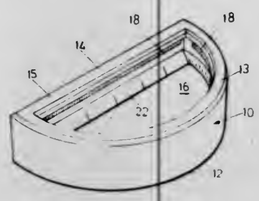
(a) a housing open at the top and the bottom, defined by a semicircular wall and a straight wall;

(b) inturned edges on the top of said walls forming recesses;

(c) tritium-powered microlight containing tubes secured in the recesses defined by said inturned edges and the inside of said walls;

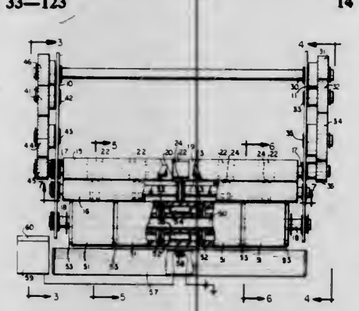
(d) an inclined portion formed on the internal walls of said housing, said inclined portion adapted to be illuminated by said micro lights;

(e) angular graduations on the inclined portion of said semi-circular wall; and



(f) a central graduation mark on the inclined portion of said straight wall.

4,233,742
APPARATUS FOR AREA MEASUREMENT OF ELONGATED STRIPS
Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090
Filed Aug. 2, 1979, Ser. No. 62,971
Int. Cl.³ G01B 7/32
U.S. Cl. 33—123 **14 Claims**



1. Apparatus for measurement of area of elongated strips of different width and length which comprises

width and length sensing means for said strip comprising

a driven roller for engagement by the strip as determined by its width and length and having a plurality of spaced grooves thereon,

a shaft fixedly mounted in spaced parallel relation to said driven roller,

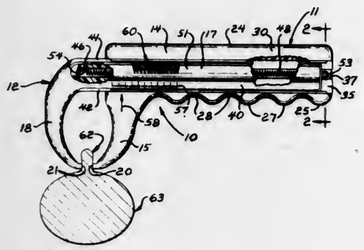
a plurality of spaced roller members freely pivotally mounted on said fixedly mounted shaft and each having a force transfer portion for simultaneous engagement by the strip with said driven shaft member and said spaced roller members as determined by the width and length of the strip,

each of said force transfer portions extending into one of said grooves for actuation of said roller members upon engagement of a portion of a strip therewith,

activating members responsive to rotary movement of said roller members as determined by engagement of a strip with said roller members and

fixedly mounted members responsive to movement of said activating members as determined by the width and length of the strips.

4,233,743
SKIN-FOLD CALIPER
Francis S. Flick, Oakbrook, Ill., assignor to Health & Education Services Corporation, Bensenville, Ill.
Filed Feb. 3, 1977, Ser. No. 765,090
Int. Cl.³ G01B 3/38
U.S. Cl. 33—143 C **2 Claims**



1. A skin-fold caliper for manipulated measuring of the thickness of a person's body and limbs skin fold comprising:

a base member having a first jaw portion adjacent one end and a handle portion defining its other end, said base member having a dovetail-shaped recess defined therein, said recess having an end open at the first jaw end and extending toward the handle end, said jaw portion having a nib facing axially outward from the first jaw end;

a slide member having a second jaw portion adjacent one end and a mounting portion defining its other end, said mounting portion having a sectional size and configuration corresponding to said recess so that said mounting portion is axially slidable therein when inserted into the open end of said recess, said base member and said slide member thereby having respective opposing surfaces slidable relative to each other, said base member having a first axially-extending channel formed in its opposing surface, said first channel opening toward said slide member and having an end open at the first jaw end, said slide member having a second axially-extending channel formed in its opposing surface, said second channel opening toward said base member opposite said first channel and having an end open at the mounting end so that said first and second channels together defining a hollow housing;

a coiled spring within said housing;

first means carried by said base member in the housing adjacent the handle end for attaching one end of said spring thereto;

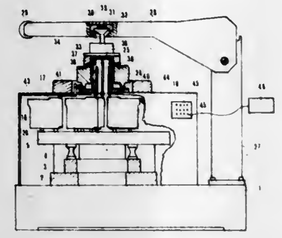
second means carried by said slide member in the housing adjacent the second jaw end for attaching the other end of said spring thereto so as to urge said jaw portions closed;

gripping means integrally formed on said base member providing increased gripping capability for an operator's hand;

gripping means integrally formed on said slide member for providing increased gripping capability for an operator's thumb so that said jaw portions may be manually opened against the pressure of said spring by an operator using one hand; and

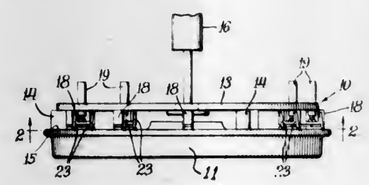
scale means on said slide member and said base member juxtaposed for visual identification of the distance between said nibs thereby providing an indication of the thickness of a skin fold clamped between said nibs under spring pressure.

4,233,744
APPARATUS FOR THE GEOMETRICAL CHECKING OF WORKPIECES HAVING SURFACES OF ROTATION
Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino, Italy
Filed Dec. 1, 1978, Ser. No. 965,402
Int. Cl.³ G01B 7/14
U.S. Cl. 33—143 L **12 Claims**



1. An apparatus for the geometrical checking of workpieces having at least one surface of rotation with respect to a geometrical axis, including a base, workpiece support and mechanical reference means mounted on the base, measuring heads with feeler elements adapted to co-operate with the surface of rotation for checking dimensions in a diametral direction, means for supporting and adjusting the position of the measuring heads carried by the base, and indication means connected to the measuring heads, and in which the feeler elements of the heads lie in a plane passing through the geometrical axis, said means for supporting and adjusting include a plurality of guides placed beside one another in an established direction, each guide being adapted to support an associated group of said measuring heads and enabling the displacement of the associated heads according to an axis perpendicular to said geometrical axis, the feeler elements of the measuring heads remaining—during the displacement—in said plane, said established direction being perpendicular to this plane.

4,233,745
WARPAGE GAGE
Thomas Ramon, Park Forest, Ill., and Richard O. Peck, Lakewood, Colo., assignors to Amsted Industries Incorporated, Chicago, Ill.
Filed Oct. 28, 1976, Ser. No. 736,563
Int. Cl.³ G01B 7/02, 7/28
U.S. Cl. 33—174 L **7 Claims**



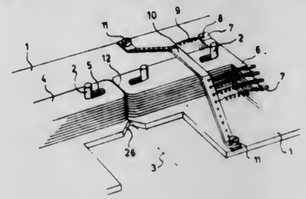
1. A warpage gage for railroad wheels and the like comprising:

a generally circular, planar support means;

at least three spaced spacer means affixed near the edge of said support means and adapted to seat against a generally planar surface to be gaged thereby positioning said support means at a predetermined distance from said planar surface;

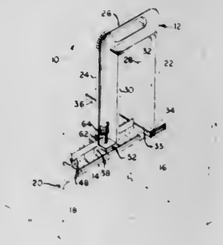
and a plurality of spaced displacement gages affixed near the edge of said support means, each adapted to seat against the planar surface to be gaged, each of said displacement gages generating a signal representative of the displacement thereof, said signals thereafter being utilized to determine the warpage of the planar surface.

4,233,746
DEVICE FOR TESTING THE SECTION OF A FLAT KEY
Willy Troillet, 48, Chemin de Cressy, CH-1213 Onex, Geneva, Switzerland
Continuation of Ser. No. 873,942, Jan. 31, 1978, abandoned. This application Apr. 10, 1979, Ser. No. 28,676
Claims priority, application Belgium, Jan. 31, 1977, 850914
Int. Cl.³ G01B 5/20
U.S. Cl. 33—174 F **6 Claims**



6. Device for testing or checking the section of a flat key which comprises a base plate, a plurality of laminations extending parallel to said base and superimposed to the latter and to one another in stack configuration, each of said laminations being formed of a pair of half-laminations extending ina common plane, each of said half-laminations having a front edge, said half-laminations being slidably mounted in their common plane towards one another up to a position in which said front edges meet one another and become juxtaposed edges thus defining a median plane perpendicular to said common plane, and away from each other at least to the extent necessary for the introduction of a key between said juxtaposed edges of said half-laminations, and means for applying a pressure to the stack of laminations to fix the individual half-laminations in a position which corresponds to the predetermined cross-sectional profile or shape of the flat key to be checked as given in said median plane, each of said half-laminations having at its end remote from said front edge at least one lug extending laterally, the lateral lugs of the various laminations when considered from the bottom to the top of the stack, having a decreasing length from one lamination to the next following and having their ends each time somewhat ben upwards.

4,233,747
THREE DIMENSIONAL LAYOUT TOOL
Richard A. Fisher, Cheasapeake, Va., assignor to Globe Iron Construction Co., Inc., Norfolk, Va.
Filed Sep. 27, 1979, Ser. No. 79,444
Int. Cl.³ G01B 5/14; B23Q 35/02
U.S. Cl. 33—174 R **5 Claims**



1. A tool for layout of H beams, comprising a U shaped frame having a first leg, a second leg and a rib joined to one

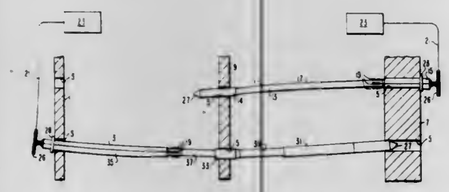
end of each leg, said first leg being longer in length than said second leg and terminating at its other end in a rectangular bar extending laterally and perpendicularly of said first leg, said rectangular bar having a flat wear surface adapted to be positioned against an outer surface of the beam to establish a point from which all dimensions are taken, said second leg having a channel at its other end, a T scale having a base and a vertical leg, means for slidingly receiving said vertical leg in said channel such that the lower surface of said base is adapted to be disposed flat on the surface of said web and a locking mechanism on said second leg for locking said scale in a predetermined position.

4,233,748

HOLE ALIGNMENT PROBE

Daniel E. Ford, Brandon, Fla., and Jeffrey A. Pyle, Greer, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 19, 1979, Ser. No. 58,894
Int. Cl.³ G01B 7/31
U.S. Cl. 33—180 R **9 Claims**



1. A hole alignment probe for determining the misalignment of holes in spaced-apart plates, said probe comprising:
an elongated rod, said rod having at least three lands slightly smaller in diameter than the holes in said plates and spaced generally the same as said plates and having a turned down portion disposed between adjacent lands;
at least two strain gages disposed on one of said turned down portion 90 degrees apart;
cables extending from said strain gages;
at least one cable run disposed to bring said cables through one of said lands without interfering with the fit between the land and the associated hole;
means for determinng the orientation of the strain gages;
whereby upon insertion of the probe in aligned holes in adjacent plates and by determining the strain registered by the strain gages the amount and direction of misalignment of the holes can be determined.

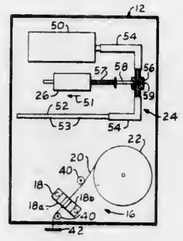
4,233,749

APPARATUS FOR MEASURING AND MARKING PRESELECTED MEASUREMENTS

Howard W. Coulter, 12 Oakcrest Dr., Pekin, Ill. 61554, and Dennis R. Triggs, 348 E. Fernwood St., Morton, Ill. 61550

Filed Apr. 16, 1979, Ser. No. 30,304
Int. Cl.³ B25H 7/04; G01B 5/14
U.S. Cl. 33—189 **9 Claims**

1. Apparatus for marking preselected measurements on an object, comprising:
a housing, said housing being of a construction sufficient for being hand-held;
a source of electrical energy mounted in said housing;
means for receiving and storing preselected data, said data means being a microcomputer mounted in said housing and connected to said source of electrical energy;
means for guiding said housing along said object in a substantially straight line, said means including a member extending from said housing for engagement with said object;
a storage member attached to said housing;
means for measuring preselected distance on said object, said measuring means connected for being extended from and retracted to said storage member, said measuring means being marked at equally spaced intervals;
means, connected to said energy source, for electrically sensing movement of said intervals when said measuring means is extended from said storage member, and for registering movement of said intervals with said preselected data; and



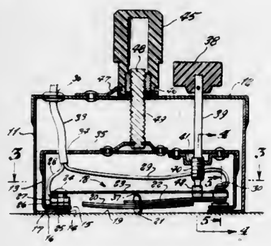
means, connected to said enegy source, for marking said object in response to said registered movement of said intervals, said marking means being electrically energized for urging a color impregnated marking medium into repeated momentary contact with said object in a spaced marking pattern corresponding to said preselected stored data.

4,233,750

ADJUSTABLE SURFACE TEMPERATURE DETECTOR

Sheng-Hsiung Cheng, P.O. Box 17092, West Hartford, Conn. 06117

Filed Dec. 26, 1978, Ser. No. 973,148
Int. Cl.³ H01H
U.S. Cl. 337—374 **3 Claims**



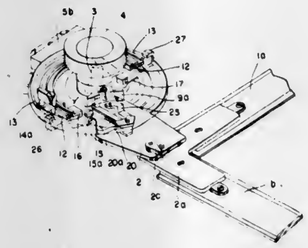
1. An adjustable surface temperature detector, comprising in combination, an outer case, an inner case vertically adjustable in said outer case and carrying a switch mechanism, a hole in a bottom wall of each said case so that said mechanism contacts a supporting surface upon which said detector is placed; said mechanism including a bimetallic sensor disc secured by a rivet to a bimetallic sensor strip, and said mechanism includes an aluminum strip above said rivet for being contacted thereby when a temperature of said surface is raised, said strips each being connected by a conductor in an electric circuit with an alarm and a power source.

4,233,751

UNIVERSAL PARALLEL RULER FOR THREE-DIMENSIONAL DRAWING

Masao Koenuma, Tokyo, and Yoshitaka Gibu, Wakou, both of Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1979, Ser. No. 30,738
Claims priority, application Japan, Apr. 20, 1978, 53-46828; Jun. 12, 1978, 53-70665
Int. Cl.³ B43L 13/14
U.S. Cl. 33—434 **14 Claims**



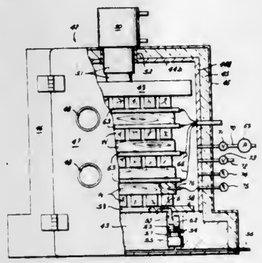
1. A universal parallel ruler for a three-dimensional drawing including a protractor disc and at least one scale, comprising:
preset stopper means corresponding to at least one of said the basic three axes of said three-dimensional drawing, said preset stopper means for angularly adjusting said at least one scale relative to said protractor disc; and
scale supporting means for supporting said at least one scale, said scale supporting means positively engaging said preset stopper means for angularly setting said at least one scale to align said scale with one of the basic three axes of said three-dimensional drawing.

4,233,752

APPARATUS AND PROCESS FOR TREATING WOOD AND FIBROUS MATERIALS

Robert A. Kleinguenther, Rte. 4, Box 433, Seguin, Tex. 78155

Continuation-in-part of Ser. No. 787,881, Apr. 15, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,760
Int. Cl.³ F26B 3/00, 7/00, 5/04
U.S. Cl. 34—9.5 **11 Claims**



1. A process for removing acids, salts and other chemical products from wood to upgrade the quality of said wood comprising the steps of
(1) placing at least one piece of wood in a closed chamber,
(2) applying a vacuum in the order of 0.005-700 mm. Hg to said chamber,
(3) introducing a fluid into said chamber adapted to neutralize said chemical products in said wood,
(4) increasing the atmospheric pressure in said chamber to 2-200 atmospheres,
(5) reducing the atmospheric pressure in said chamber to room pressure,
(6) removing the fluid from said chamber, and
(7) removing the wood from the chamber.

4,233,753

METHOD FOR PREVENTING THE SPLITTING OF LOGS DURING DRYING

Alvin E. Olson, Beaverton, Oreg., assignor to Allwood, Inc., Portland, Oreg.

Filed Jan. 22, 1979, Ser. No. 5,662
Int. Cl.³ F26B 5/04
U.S. Cl. 34—16.5 **2 Claims**

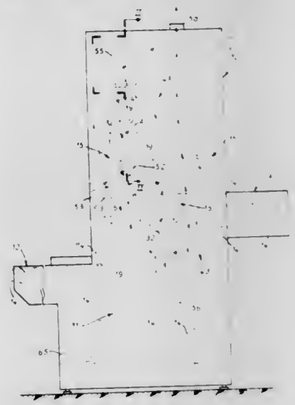
1. A method for preventing splitting of whole logs during the drying thereof, comprising:
(a) placing a whole log in a pressure containment vessel and sealing said vessel;
(b) after said vessel is sealed, injecting steam therein until the temperature throughout said log is within the range of about 190° F. through about 240° F.;
(c) thereafter, releasing the pressure within said vessel at a rate sufficiently low that no significant collapse of the wood within said log occurs, until ambient atmospheric pressure is reached;
(d) debarking said log; and
(e) after steps (c) and (d), storing said log in an atmosphere controlled to maintain no less than about 45% relative humidity until the moisture content in said log has been reduced to a predetermined amount.

4,233,754

APPARATUS FOR ULTRAVIOLET DRYING AND/OR CURING OF SOLVENT-FREE INK ON THREE-DIMENSIONAL ARTICLES

Jean-Louis Dubuit, 60, Rue Vitruve, 75020 Paris, France

Filed Feb. 14, 1978, Ser. No. 877,720
Claims priority, application France, Feb. 18, 1977, 77 04667
Int. Cl.³ G01B 5/20
U.S. Cl. 34—203 **17 Claims**



1. Apparatus for ultraviolet drying and/or curing solvent free ink on three-dimensional articles, comprising a housing, an endless conveyor arranged at least partly inside said housing and having at longitudinally spaced locations baskets for carrying articles bearing ink to be dried and/or cured, said conveyor having a pathway including, in elevation, at least one bend or loop inside said housing, said bend or loop having an axis of curvature, an elongate ultraviolet lamp disposed proximate to said bend or loop for irradiating a predetermined sector of each article passing over said bend or loop with said sector including a portion of each article being disposed with a respective

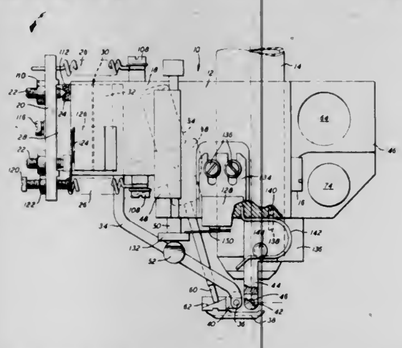
basket, means for swivelly mounting said baskets on said conveyor about axes parallel to said axis of curvature, so that as the said baskets pass over said bend or loop the portion of the predetermined sector exposed to said elongate ultraviolet lamp varies and said baskets being of perforate construction with perforate and nonperforate portions arranged so that shadows due to the nonperforate portions continuously move along the predetermined sectors of the articles thereby avoiding constantly obstructed spots in the predetermined sectors.

4,233,755

VEHICLE SIMULATOR OPTICAL PICK-UP HEAD

John A. Boniface, Lancing; Ronald E. Field, Brighton; Eric C. Gwynn, Hove, and William L. A. Turner, North Lancing, all of England, assignors to The Singer Company, Binghamton, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,478
Claims priority, application United Kingdom, Feb. 14, 1978, 05879/78
Int. Cl.³ G09B *9/04*
U.S. Cl. 35—11 R **15 Claims**



1. A visual pick-up head for use in a vehicle simulator system having a model board surface and movable camera, including an optical system, for visual image generation, comprising:
(a) a body, including means for mounting said body in a substantially fixed space relation with respect to the camera;
(b) a shoe moveably, adjustably attached to said body and having pivotal freedom of movement about a first, lateral horizontal pitch axis, for contacting the model board surface and traversing said surface as the camera moves;
(c) a mirror attached to said body above said shoe, and pivotable about a horizontal axis, for directing an image to the optical system of the camera;
(d) first sensing means for sensing pitch of said shoe; and
(e) tilt means associated with said first sensing means for rotating said mirror about its pivotal axis.

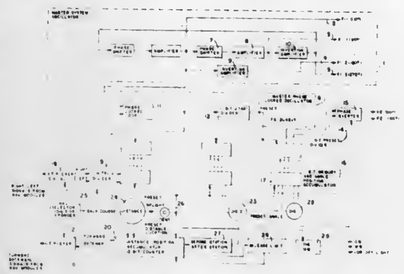
4,233,756

AIRCRAFT FLIGHT SIMULATING INSTRUMENT TRAINER

Joshua Horwitz, Magnolia, Mass., assignor to Pacer Systems, Inc., Burlington, Mass.

Filed Dec. 6, 1976, Ser. No. 748,116
Int. Cl.² G09B *9/08*
U.S. Cl. 35—12 F **19 Claims**

17. A simulated aircraft instrument apparatus comprising turbulence signal generator apparatus having a monostable vibrator, first and second counters connected to the monostable vibrator, and first and second digital to analog converters connected to the first and second counters, and first and second



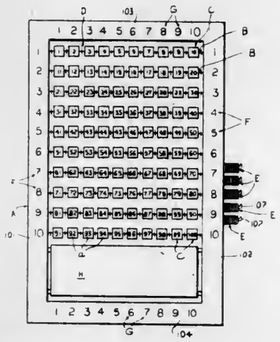
turbulence signal means connected to outputs of the first and second digital analog converters.

4,233,757

MATHEMATICS DEVICE

Jacqualine Narcise, 1300 Delaware St., Berkeley, Calif. 94702

Filed Sep. 5, 1978, Ser. No. 939,364
Int. Cl.³ G09B *19/02*
U.S. Cl. 35—73 **1 Claim**



1. A mathematical device comprising:
(a) a rectangular frame having two side members and top and bottom members;
(b) ten parallel rods spaced apart and having the ends thereof supported by said frame side members;
(c) ten cubes mounted on each rod and being individually rotatably mounted on the rod, each cube having four peripheral faces with one of the faces on each cube in a row being consecutively numbered from 1 to 10; a second face on each cube in the top row being consecutively numbered from 1 to 10; and the second row consecutively numbered from 11 to 20, and so on to the tenth row which is consecutively numbered from 91 to 100;
(d) a third peripheral face on each cube in the first row being consecutively numbered 1 to 10, and in the second row being numbered in multiples of 2 from 2 to 20, in the third row being numbered in multiples of 3 from 3 to 30, and so on up to the tenth row where each third face of the ten cubes is in multiples of 10 from 10 to 100;
(e) a fourth face on each cube in the first row being consecutively numbered with improper fractions of 1/1; 2/2 and up to 10/1; while the fourth face on the ten cubes in the second row have improper fractions from 2/2 to 20/2 and so on up to the tenth row having improper fractions from 10/10 to 100/10;
(f) the frame side members having numbers from 1 to 10 representing the ten rows of cubes and at least one of the top and bottom frame members being numbered from 1 to 10 representing ten columns of cubes
(g) a plurality of spacers mounted on each rod with a spacer disposed in fixed position longitudinally of the rod between adjacent cubes on each rod; and
(h) markers removably mounted on said rods and being used in solving various mathematical problems.

4,233,758

FOOTWEAR

Horace Auberry, Waynesville, N.C., assignor to Ro-Search, Inc., Waynesville, N.C.

Filed Feb. 27, 1979, Ser. No. 15,660
Int. Cl.³ A43B *7/06*; A43D *21/00*
U.S. Cl. 36—3 A **5 Claims**



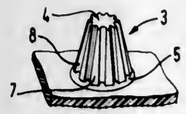
1. Footwear comprising an upper, a tread sole of elastomeric material, said upper being formed of impermeable material and extending downwardly toward but spaced from the upper portion of said sole, a rim of permeable material secured adjacent to the lower margin of said upper and bonded to said sole and having a portion thereof covering at least a portion of said space, said space between the bottom margin of said upper and sole providing ventilation for the footwear through said permeable rim.

4,233,759

OUTSOLES FOR SPORTS SHOES, PARTICULARLY FOR USE ON ARTIFICIAL GRASS

Alfred Bente, Herzogenaurach, Fed. Rep. of Germany; Adolph Dassler, deceased, late of Herzogenaurach, Fed. Rep. of Germany, and by Albert Henkel, legal representative, Düsselford, Fed. Rep. of Germany, assignors to Adidas Sportschuhfabriken Adi Dassler KG, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 27,110
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904471
Int. Cl.³ A43B *13/26*; A43C *15/00*
U.S. Cl. 36—59 R **10 Claims**



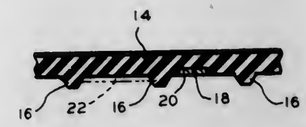
1. An outsole for a sports shoe made from a resiliently deformable material and comprising a multiplicity of deformable frustoconical cleats distributed over the tread side of the outsole and integral therewith, wherein the peripheral surface of the cleats is provided with a multiplicity of axially parallel fine longitudinal ribs and grooves, said ribs and grooves extending over the entire axial length of the cleats.

4,233,760

SHOE WITH REFLECTING MEANS

Joseph E. Haynes, 5945 Merle Dr., Toledo, Ohio 43623

Filed May 29, 1979, Ser. No. 43,059
Int. Cl.³ A43B *23/00*
U.S. Cl. 36—137 **7 Claims**



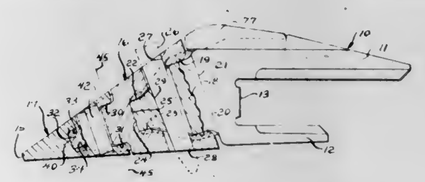
1. In a shoe having an upper and a sole, the improvement comprising: a pluarlity of cavities formed in the bottom surface of the sole and an individual bar of reflective material positioned in each of said cavities and attached to the bottom surface of the sole for reflecting incident light whereby the wearer of the shoe is visible from the front and rear as he travels in the path of a lighted vehicle.

4,233,761

EARTH DIGGING BUCKET TOOTH CONSTRUCTION HAVING A NOSE WITH INCREASED SECTION MODULUS

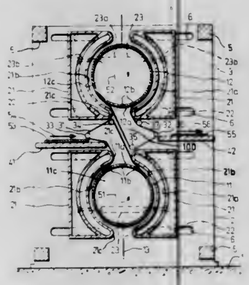
Robert W. Ryerson, St. Louis, Mo., assignor to Page Engineering Company, Chicago, Ill.

Filed Dec. 1, 1978, Ser. No. 965,904
Int. Cl.³ E02F *9/28*
U.S. Cl. 37—142 R **9 Claims**



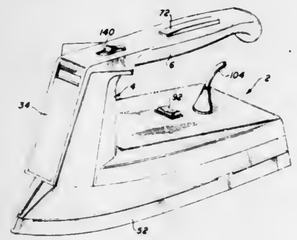
1. A toothpoint construction for an earth digging bucket, comprising:
a removable toothpoint of abrasion resistant metal having relatively wide diverging upper and lower walls and joining sidewalls together forming a hollow rearwardly open internal socket,
a metal nose for reception of the toothpoint socket, said nose and socket each having complementary upper and lower mounting surfaces, said mounting surfaces being substantially planar and extending laterally across the nose at its base and adjacent its outer extremity both on the top and the bottom of the nose,
and means for increasing the section modulus of the nose against bending failure consisting of semi-circular cross-sectional ribs outstanding from said planar mounting surfaces and extending lengthwise of the nose, one such rib being located at each side of the lengthwise center of the nose and being of the order in size at least one inch in diameter for a five and one-half inch thick nose, said toothpoint socket upper and lower walls having complementary grooves fitting over said ribs.

4,233,762
IRONING MACHINE
Robert Theiler, L'Oree du bois, F-68360 Soultz, France
Filed Jan. 18, 1979, Ser. No. 4,912
Claims priority, application Switzerland, Jan. 24, 1978, 722789/78
Int. Cl.[2] D06F 69/02
U.S. Cl. 38—8 **7 Claims**



1. An ironing machine for ironing textile pieces comprising:
frame means;
only one pair of rolls arranged above one another at said frame means;
drive means for rotating said rolls in an opposite rotational sense;
heating means for heating the textile pieces;
said heating means possessing for each roll a heating surface serving to heat and iron the textile pieces;
each said heating surface possessing in cross-section a substantially arcuate-shaped configuration;
each of said rolls having a roll axis;
said arcuate-shaped heating surfaces, when said heating means assume a work position, extending at least approximately coaxially with respect to the roll axis of the related roll;
said rolls which are arranged above one another and the related heating means for each said roll being dispositioned such that an intermediate space is formed between the rolls and the related heating elements;
transport band means arranged in said intermediate space such that the textile pieces are successively transported from one roll to the other roll;
means for transporting the textile pieces at one side of a substantially vertical central plane through the rolls to the rolls;
means for removing the textile pieces, after having past the rolls, from the other side of the vertical central plane away from the rolls;
said heating means comprising a pair of heating elements for each roll;
said heating elements of each roll being arranged to opposite sides of the related roll with respect to the roll axis;
said transport band means comprising for each roll at least one separate transport band which is trained about a major portion of the circumference of such roll, so that the textile pieces, during operation of the ironing machine, are transported about at least the circumferential region of each roll which is spanned by the related pair of heating elements;
means for guiding and deflecting the transport bands of each of the rolls such that said transport band of one roll has a band portion which is deflected in said intermediate space in the direction of a deflected band portion of the transport band of the other roll; and
said deflected band portions of said transport bands of said two rolls defining therebetween a transport and transfer path for the textile pieces so that said transport bands transfer at said transfer path the textile pieces from one roll, where the textile pieces bear at one face against the heating surface of the heating means of said one roll, to the other roll where the textile pieces bear with their other opposite face against the heating surface of the heating means of the other roll, so that said textile pieces are ironed at both opposite faces thereof.

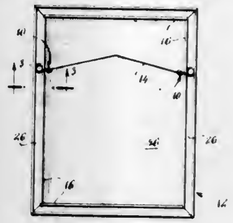
4,233,763
STEAM IRON WITH LOW TEMPERATURE SOLEPLATE
Alan R. McMullen, North Canton, Ohio, assignor to NESCO Products, Inc., Binghampton, N.Y.
Continuation of Ser. No. 658,266, Feb. 17, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,294
Int. Cl.[2] D06F 75/06, 75/38
U.S. Cl. 38—77.83 **6 Claims**



1. A steam iron comprising a handle, a water tank, a heated metal mass including a boiler in fluid communication with said tank, an electrical circuit including a heater for said heated mass, a valve controlling water flow from said tank to said boiler, the improvement comprising:
a plastic soleplate in heat transfer relationship with said heated metal mass and having a pressure surface on its underside,
a thermostat within said electrical circuit for controlling the heat input to said heated metal mass by controlling energization of said heater,
said thermostat being provided with minimum and maximum temperature settings correlated to the thermal conductivity, the melting temperature, the thickness of said plastic soleplate and the heat transfer relationship between said heated metal mass and said soleplate, and said plastic soleplate being of sufficient thickness; such that at the minimum temperature setting said heated mass is maintained at a temperature sufficiently high to boil water entering said boiler, and said pressing surface is maintained at a temperature above the condensation point of steam, and at the maximum temperature setting, the temperature is sufficiently low to prevent damage to said plastic soleplate adjacent said heated metal mass, and said pressing surface of said plastic soleplate is maintained at a temperature below that which would damage low temperature fabrics.

4,233,764
DEVICE FOR HANGING A PICTURE FRAME
Stuart R. Small, West Hartford, Conn., assignor to The Colonial Spring Company, Bristol, Conn.
Filed Dec. 20, 1978, Ser. No. 971,192
Int. Cl.[3] G09F 1/12
U.S. Cl. 40—152.1 **5 Claims**

1. In combination with a picture frame of the type including a U-shaped channel section having a base side and a pair of opposing sidewalls extending away from said base side and terminating in a pair of inwardly turned flanges defining an opening therebetween, a device for hanging said frame on a wall or the like including:
an elongate element having a looped section formed in intermediate portions thereof interposed between said flanges and said base side of said channel section for retaining said device within the latter,
one extremity of said element including a straight leg therein extending outwardly from said looped section and engaging one of said sidewalls of said channel section whereby



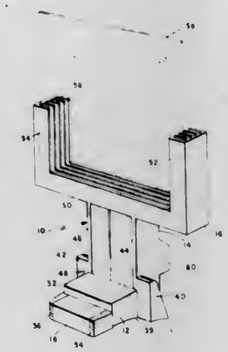
to prevent rotation of said looped portion in one angular direction within said channel section,
the opposite extremity of said element including means adapted for coupling with structure to hang said frame on said wall.

4,233,765
FRAME FOR SECURING FLEXIBLE SHEETS OF MATERIAL
Norman P. O'Mullan, 412 Essex Ave., Bloomfield, N.J. 07003, and Paul R. T. Hahn, 515 Sherwood Pkwy., Westfield, N.J. 07090
Filed Nov. 22, 1978, Ser. No. 962,989
Int. Cl.[3] G09F 1/12
U.S. Cl. 40—156 **9 Claims**



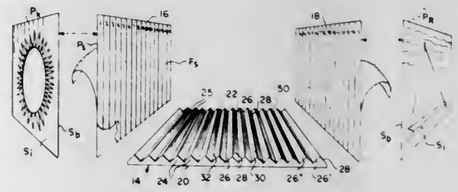
1. A frame for securing thin flexible sheets of material comprising:
a support member having a channel in one face, said channel being adapted to receive a thin flexible sheet of material, and
a longitudinal flexible locking member having a thin flat base and a pair of thin angled legs extending outwardly along a central area of said base, the widest dimension across the open ends of said legs being normally engageable with the opening of said channel in a sliding fit, said legs being compressible to reduce said dimension and engage said channel in a press fit when said thin fexible sheet of material is disposed intermediate said support member channel and said locking member to secure said sheet within said channel said support member and channel extend about the periphery of a central open area, said locking member being a flexible strip including said legs extending along said strip and flat surfaces along said base adjacent said legs said flat surfaces being engageable with said support member adjacent said channel, said support member includes a front face and a back face, said channel extending around and into the back face, and a plurality of flexible strips engageable with said channel in said support member to hold said sheet of material tightly across said open area.

4,233,766
TELEPHONE MOUNTING STAND
Duc Doan, 7814 S. San Pedro St., Los Angeles, Calif. 90003
Filed Feb. 6, 1978, Ser. No. 875,392
Int. Cl.[2] G09F 3/20
U.S. Cl. 40—336 **5 Claims**



1. A display holder comprising:
a base member shaped for defining a plug for fitting into tight fitting frictional engagement with a hand grip socket of a standard desk telephone and including means defining a hand grip with a finger receiving recess for gripping said base for carrying said holder and associated telephone;
a vertically extending support member secured to said base and extending upward therefrom,
a sheet display holding frame secured to the upper end of said vertically extending support member and including at least a slot for receiving and supporting at least one sheet of display material in a substantially vertical plane wherein said vertically extending support member comprises a pair of spaced apart legs, and
said hand grip extends horizontally between said legs and said recess is co-extensive with the hand grip socket of a standard desk telephone.

4,233,767
KIT FOR MAKING A MULTIPLE VIEW PICTORIAL DISPLAY DEVICE
Dmytro Hryhorczuk, Chicago, Ill., assignor to Artex International Corporation, Chicago, Ill.
Filed Aug. 4, 1978, Ser. No. 930,901
Int. Cl.[3] G09F 19/14
U.S. Cl. 40—453 **13 Claims**



1. A kit for making a multiple view pictorial display device which enables different pictorial images to be viewed depending upon an appropriate angle of sight of the viewer relative to the frontal plane of the display device and the displacement of the viewer to the left or right of a plane normal to said frontal plane, the kit enabling an unskilled user to choose any pictorial image and adapt said image for mounting on said display device, said kit including:
(a) a mounting board having a surface of corrugation-con-

tour which provides alternately spaced ridges and valleys, spanning the distance between a pair of opposite side edges of the board and entirely across said board, each ridge having a pair of mounting surfaces canted one relative to the other and conjoined at an apex along the entire length of the ridge;

(b) a carrier card for each chosen pictorial image to be displayed on the device, which pictorial image can be extraneous to the kit, each card having an image side and a mounting side, the chosen pictorial image being mountable on said image side,

i. said image side being adapted to have the chosen pictorial image fixedly secured thereon and covering said side, the pictorial image being secured to the image side of the carrier card by the user of the kit on assembly of the display device,

ii. said mounting side having indicia selectively arranged thereon for severing the card and attached pictorial image into substantially identical strips and coding means disposed on the mounting side for maintaining the sequential arrangement of the strips correlated to their sequential arrangement prior to such severing of the card and attached image,

(c) said coding means enabling the strips obtained from one card to be mounted individually on a selected one of the mounting surfaces of a ridge and the strips obtained from the other of said cards to be mounted individually on the second mounting surface with the image sides of the resulting strips being exposed,

(d) the resulting orientation of the exposed image sides being selected so that the strips obtained from one card all face in the same direction and the strips obtained from said second card face in the same direction albeit said directions being opposite one relative to the other,

(e) said coding means enabling said strips of the individual cards to be mounted to the board consistent with said desired sequential arrangement thereof when severed such that only the intact image of one card is visible to a viewer displaced to the left and the intact image of the other card is visible to a viewer displaced to the right of said normal plane and at the appropriate angle of sight in each instance such that different pictorial images are viewable at the discretion of the viewer, the coding means disposed on the mounting side of the strips not being visible to said viewer.

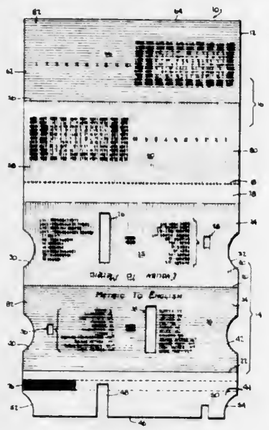
4,233,768

SLIDE CALCULATOR

Howard M. Bromberg, P.O. Box 316 Kingsbridge Station, New York, N.Y. 10463

Division of Ser. No. 701,082, Jun. 30, 1976, Pat. No. 4,132,348. This application Sep. 21, 1978, Ser. No. 944,273
Int. Cl.³ G09F *11/00*
U.S. Cl. 40—489 **10 Claims**

1. A slide construction comprising a flexible, foldable sleeve component formed of at least two generally rectangular elongated sleeve segments continuous with respect to each other along an elongated sleeve fold line, said sleeve segments being folded along said sleeve fold line into overlapping substantially flat disposition and including means for maintaining said overlapping segments together such that said sleeve segments have a generally closed cross-sectional periphery with predetermined inside cross-sectional dimensions, a flexible, foldable slide component formed of at least two generally rectangular elongated slide segments continuous with respect to each other along an elongated slide fold line, said slide segments being folded along said slide fold line to place said slide segments into overlapping substantially flat disposition wherein said overlapped slide segments have predetermined outside cross-sectional dimensions less than the corresponding inside cross-sectional dimensions of said sleeve component to permit accommodation of said folded slide component in said folded sleeve component, wherein said elongated slide fold line is parallel to said elongated sleeve fold line, for relative slidable movement between said components and wherein first and second sleeve data panels are provided on respective first and second outside surfaces of said two sleeve segments and first and second slide data panels are provided on respective first and second outside surfaces of said two folded slide segments, said slide construction further including means for matching said first sleeve data panel with said first slide data panel and said second sleeve data panel with said second slide data panel to indicate positioning of said sleeve in said slide for cooperation between said first sleeve data panel and said first slide data panel, and cooperation between said second sleeve data panel and said second slide data panel, and wherein third and fourth slide data panels



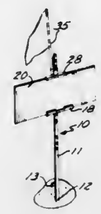
are provided on respective first and second inside surfaces of said two folded slide segments, said matching means being provided on said third and fourth slide data panels for matching said third and fourth slide data panels with respective one of sai first and second sleeve data panels, said slide component being foldable in a reverse direction to reverse the positions of said inside and outside surfaces to indicate positioning of said sleeve in said slide for cooperation between one of said third and fourth slide data panels with one of said first and second sleeve data panels, and cooperation between the other of said third and fourth slide data panels with the other of said first and second sleeve data panels.

4,233,769

REAL ESTATE SIGN SUPPORT

Richard L. Archer, 14100 Chadron, Hawthorne, Calif. 90250

Filed Dec. 4, 1978, Ser. No. 966,083
Int. Cl.³ G09F *7/20*
U.S. Cl. 40—607 **1 Claim**



1. A realtor's sign assembly capable of being carried in a dismantled condition from location to location, and erected at a desired location without the use of tools, said sign assembly including:

a. a sign in the form of a stiff rectangular sheet having first and second sides, and a message for the public imprinted on said first side;

b. an elongate rigid upright of transverse L-shaped cross-section, defined by first and second normally disposed legs, said upright having a pointed end, a foot peg that projects outwardly from said upright adjacent said pointed end, and said foot peg when a downward force is applied thereto forcing the portion of said upright adjacent thereto downwardly into the ground, with said upright being removably supported in a vertical position from the ground as a result thereof, said first leg having a plurality of longitudinally spaced slots therein;

c. a first sign support assembly, said first assembly including a first rigid transverse member of channel shape transverse cross section of substantially the same length as said sign, said first member capable of removably supporting the lower longitudinal edge of said sign, and an elongate tab secured to said first member and spaced therefrom, said tab capable of being selectively and removably inserted in one of said slots to maintain said first assembly at a desired elevation on said upright;

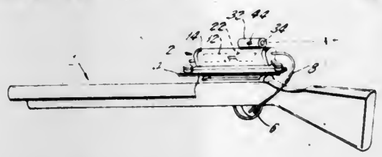
d. a second sign support assembly, said second assembly including a second rigid transverse member of channel shaped cross-section that is capable of removably gripping the upper longitudinal edge of said sign, first means secured to said second, said first means frictionally gripping the upper portion of said upright, with said second assembly gripping the upper longitudinal edge of said sign when said first assembly engages the lower longitudinal edge of said sign, and said first and second assemblies cooperating to hold said sign at a desired elevation on said upright, and said first means including a downwardly extending pocket capable of receiving and removably supporting a lower end portion of an elongate rigid member that has a flag secured thereto, said first means includes a strip of resilient metal secured to said first member and defining a hoop, with said hoop at least partially defining said pocket, and portions of said hoop frictionally engaging said upright to maintain said second assembly at a desired elevation thereon.

4,233,770

LASER AIMING DEVICE FOR WEAPONS

Gerald de Filippis, 10, Avenue Vulliemin, and Jean M. Henry, 20 bis, Montagibert Ave.,, both of 1005 Lausanne, Switzerland

Filed Oct. 23, 1978, Ser. No. 953,585
Int. Cl.³ F41G *1/36*
U.S. Cl. 42—1 A **12 Claims**



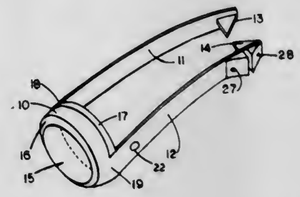
1. A weapon aiming device comprising, a monochromatic light source, means for directing monochromatic light emitted by said light source in an aiming direction, means for activating said light source and being connected to said light source, and means for viewing a target area illuminated by the emitted light comprising a light filter which permits passage therethrough of light of the same wavelength as the emitted light within tolerance limits.

4,233,771

BAIT HOLDER

John G. S. Robinson, Box 26, Sooke, British Columbia, Canada (V0S 1N0)

Filed May 7, 1979, Ser. No. 36,445
Int. Cl.³ A01K *83/06*
U.S. Cl. 43—41 **4 Claims**



1. A holder for holding minnow-type bait comprising:

(a) a ring within which the head of the bait fish is adapted to have a wedged fit so as to expose a portion of the head extending forwardly from near the eyes of the fish,

(b) a pair of elongated arms extending in substantial parallelism from the ring normally in engagement along opposite sides of the body of the bait fish,

(c) hook means at the ends of the arms for piercing the body of the bait fish for maintaining the head of the fish within the ring,

(d) means on at least one of the arms for securing the holder to a fishing line, said means for securing including a passage extending laterally through one of the arms adjacent the ring through which the fishing line can be threaded after passing through the ring and passage means near the trailing end of said one arm though which the fishing line can then be threaded for maintaining said one arm in substantial parallelism with the line, so the line is offset relative to the fore and aft axis of the bait fish and the bait fish moves in a rolling and side to side action when the holder is pulled through the water.

4,233,772

ANIMATED ILLUSTRATION FOR BOOKS AND THE LIKE

Douglas A. Hamar, 0236 SW. Palatine Hill Rd., Portland, Oreg. 97219

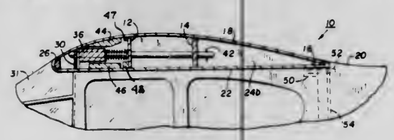
Filed Mar. 15, 1979, Ser. No. 20,757
Int. Cl.³ A63H *33/38*
U.S. Cl. 46—35 **2 Claims**

1. In combination,

a sheet having a printed illustration thereon and defining an open area,

a pliable appendage secured to said sheet in overlying relationship to the open area and contributing visually to the illustration, said appendage including stiffener means to facilitate manipulation of said appendage, said open area being of sufficient size to permit manipulation of said appendage by insertion of fingers of the user through said open area into said appendage, said appendage and stiffener means displaceable through the open area to either of the two sides of the sheet to permit the appendage to be used in conjunction with an illustration on the opposite side of the sheet, said stiffener means having a bendable central portion.

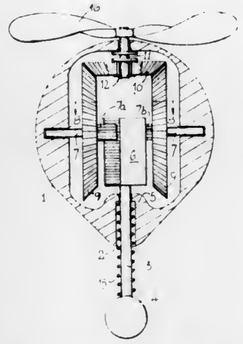
4,233,773
ATTACHMENTS IN MODEL AIRPLANES
Robert S. Jones, 311 Lakeview Ave., Clifton, N.J. 07011
Filed Oct. 17, 1978, Ser. No. 952,114
Int. Cl.³ A63H *24/02*
U.S. Cl. 46—76 R **9 Claims**



1. A combination including biased attaching means for selectively mounting a component to the fuselage of a model aircraft, said attaching means including: (a) at least one forwardly extending projection carried by and in the to-be-removably attached component; (b) a receiving hole for said projection of selected size and position, said hole formed in a forward bulkhead portion of the fuselage; (c) a bias means cooperatively associated with said forward bulkhead portion and projection and adapted to permit a limited forward movement of the to-be-attached component against the resistance of the bias means; (d) at least one rearwardly extending projection fixedly secured to the to-be-removably attached component, said rearwardly extending projection being fixed in an abutting stop, and (e) a receiving hole of selected size and position formed in a rear bulkhead portion of the fuselage and adapted to slidably retain this rear projection whereby when the forwardly extending projection is brought to the receiving hole in the forward bulkhead and the to-be-attached component is moved forwardly against the bias means, forward movement is sufficient for the end of the rearwardly extending projection to be brought in way of the receiving hole in the rear bulkhead portion whereby a rearward movement with the assistance of the bias means may be made and the abutting stop brought to and against the rear bulkhead to mount the component by the front and rear projections.

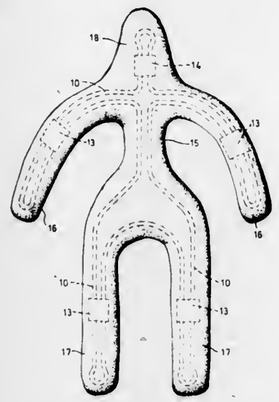
4,233,774
SPINNING TOP
Raphael Sahar, 2 King David St., Tiberias, Israel
Continuation-in-part of Ser. No. 911,177, May 31, 1978, Pat. No. 4,202,133. This application Jun. 26, 1979, Ser. No. 52,111
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—82 **3 Claims**

1. A spinning top comprising a hollow body having an inwardly extending bore in which slides a shaft the innermost end of which carries co-directional with the shaft a Z-profiled member, the sidewardly extending portions of the said Z-profiled member being in frictional contact with two oppositely disposed, co-directional axles seated rotationally in the wall of the said hollow body, a crown wheel being fixedly keyed on each of the said axles, both said crown wheels meshing with a pinion, an axle extending from the pinion and being connected therewith for transmission of rotational movement



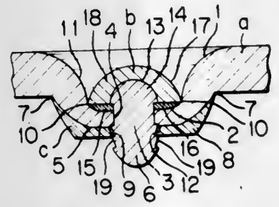
in one direction only, a propeller being fixed to the outer end of the said axle.

4,233,775
SOFT TOYS
Anthony C. Neufeld, London, England, assignor to Newfeld Limited, Ashford, England
Filed Nov. 29, 1978, Ser. No. 964,518
Int. Cl.³ A63H *3/04*
U.S. Cl. 46—151 **10 Claims**



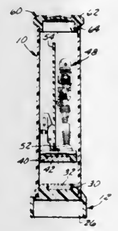
1. A soft toy comprising a body and a fabric covering, said body having a torso, four limb portions and a neck portion all of which portions and the torso consisting essentially of a foamed rubber latex material moulded over a flexible wire skeleton which skeleton is formed from a single length of annealed wire covered with a plastics material, and said fabric covering is permanently fitted over said body and includes hand and foot members at the respective ends of said limb portions and a shaped head member which fits over said neck portion, the hand, foot and head members being stuffed with a stuffing material whereby the hand, foot and head members hold a desired, pre-formed shape dictated by the fabric covering.

4,233,776
ARTIFICIAL EYE STRUCTURE FOR USE IN A DOLL
Kenichi Suzuki, Koshigaya, Japan, assignor to Suzusei Co., Ltd., Saitama, Japan
Filed Jun. 6, 1978, Ser. No. 913,036
Claims priority, application Japan, Mar. 3, 1978, 53-23636
Int. Cl.³ A63H *3/38*
U.S. Cl. 46—165 **7 Claims**



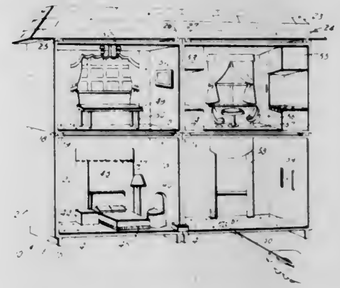
1. An artifical eye structure comprising:
an eye piece including:
an elongated stem, the front end of which is visible as the pupil of the eye,
a washer carried by said stem, said washer having an outer diameter larger than the diameter of the stem whereby the front surface of said washer is visible as the iris of the eye, and
a covering member for the front end of said stem and the front surface of said washer, said pupil and said iris being visible through said covering member; and
retaining means for receiving and retaining the back end of said stem whereby said retaining means can be located behind a face material and said washer in front thereof to retain the eye in the face material.

4,233,777
FLOATING DOLL, TOY ASSEMBLY
Tsutomu Inoue, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 9, 1979, Ser. No. 10,532
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—238 **17 Claims**



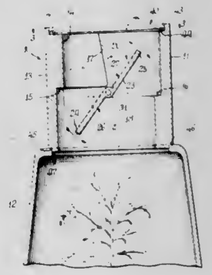
1. A toy assembly comprising:
a container;
a base member mounted to the container and including a first permanent magnet;
a floating base member contained in the container;
a toy figure contained in the container and mounted to the floating base member, the floating base member including a second permanent magnet, the first and second permanent magnets being disposed to repel one another whereby the toy figure is suspended in the container to simulate a floating effect, and
a transparent panel member removably mounted to the floating base member, the panel member being dimensioned to prevent rotation of the toy figure within the container.

4,233,778
MODULAR TOY
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Jul. 19, 1978, Ser. No. 926,135
Int. Cl.³ A63H *33/26, 33/06, 33/04*; G09F *19/00*
U.S. Cl. 46—240 **5 Claims**



1. An assembly toy comprising in combination:
a plurality of containers defining respective room modules and each having side wall portions joined by a bottom wall defining a floor,
said modules being assembled in stacked relationship one above the other with the lower of the two stacked modules having a ceiling spaced a distance below the floor of the upper module providing a free space therebetween,
a magnet disposed within said free space and a manipulator for said magnet operable from the exterior of the assembly to permit the magnet to be shifted to different locations beneath the floor of the upper module, and
a device to be moved across the floor of the upper module including a permanent magnet in the base of said device, said base of said device being disposed on the upper surface of said upper module floor to permit the device to be moved across said floor by the manipulative movement of said magnet within said free space.

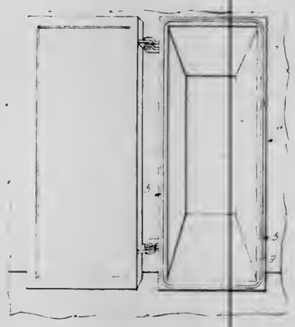
4,233,779
AUTOMATIC ENVIRONMENT STABILIZER AND PROTECTION DEVICE FOR PLANTS
Jerry Griffith, 1038 Westgate Dr., Charleston, Ill. 61920
Filed Feb. 14, 1979, Ser. No. 11,790
Int. Cl.³ A01G *13/04, 9/24*
U.S. Cl. 47—26 **5 Claims**



1. A protective device comprising:
a portable insulated plant cover having a circular opening in its top, and
a generally cylindrical housing of thermal insulating material formed with an axial opening therethrough and said hous-

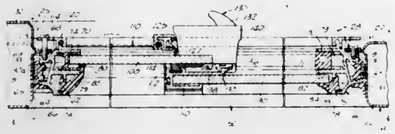
ing being adapted to mount in the circular opening in the top of the plant cover;
a generally flat circular valve of thermal insulating material mounted within said axial opening and disposed to turn about a horizontal diametric axis within said housing;
semicircular shoulder means formed on the interior of said housing adjacent said valve and adapted to abut against same so as to form a thermal seal with said valve;
thermal responsive means attached to said valve and responsive to ambient temperature and operable to close said valve against said shoulder means at all temperatures below some pre-determined minimum temperature and to progressively open said valve for temperature in excess of said pre-determined minimum;
adjustable stop means attached to said thermal responsive means and effective to calibrate said thermal responsive means for operation over some pre-determined ambient temperature range;
vertical stop means also formed on the interior of said housing and operable to limit the degree of opening of said valve with increasing ambient temperature in excess of said pre-determined minimum temperature; and
a generally circular screen mounted on said housing at an axial distance remote from said valve and operable to cover said axial opening so as to prevent the entry of insects, pollen and dust into the plant cover.

4,233,780
DOOR SEAL
John H. Royce, Woodbridge; John E. Rowarth, Markham, and John Walker, Scarborough, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada
Filed Feb. 9, 1979, Ser. No. 10,755
Int. Cl.³ E06B 7/16
U.S. Cl. 49—485 **4 Claims**



1. A gasket assembly for providing an air-tight seal between a door and a door-frame of a vacuum chamber, or the like, wherein the door and the door-frame are warped to varying degrees due to stresses caused by high internal pressure, said assembly comprising a retaining means including a groove extending about and adjacent the perimeter of the door-frame, and a bead of a resilient solid elastomeric material, said bead being retained in and extending somewhat proud of said groove, said retaining means comprising a strip of a solid elastomeric gasket material of shore hardness of about 70, a longitudinal groove extending the length of said strip material, and said bead of a solid resilient elastomeric material comprising about 70–80%/w of a silicone rubber curable at room temperature and about 30–20%/w of sodium silicate in the form of microspheres, said elastomeric material having a shore hardness of about 30 to 45 and tensile strength of 280 to 328 psi, said strip of solid elastomeric gasket material and said bead cooperating to create an air-tight seal when said door is closed against said door-frame.

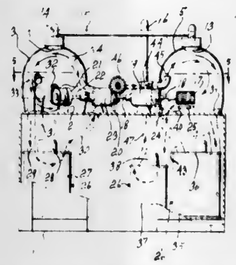
4,233,781
WINDOW ASSEMBLY FOR SOCKET WINDOW
Norman E. Roe, Sierra Madre, Calif., assignor to Hehr International, Inc., Los Angeles, Calif.
Filed Apr. 11, 1978, Ser. No. 895,384
Int. Cl.² E06B 1/04
U.S. Cl. 49—504 **5 Claims**



1. In combination with a housing structure having a window opening formed in a wall thereof with a body flange projecting inwardly toward the central portion of the window opening and forming a socket having a wall surface between said body flange and the external surface of the structure,
a window frame having a peripheral web,
said frame being provided with an interior flange and an exterior flange extending inwardly from said web toward the central portion of said window opening,
said web and said inwardly extending flanges being arranged to support window panel structure within said frame,
said frame also being provided with an interior flange and an exterior flange extending outwardly from said web away from said central portion of said window opening,
said frame having an interior flange section comprising said two interior flanges and an exterior flange section comprising said two exterior flanges,
means securing said interior flange section of said frame directly to said body flange;
means securing window panel structure on said frame and supporting said window panel structure on the exterior side of said body flange; and sealing means extending outwardly from the outer side of said web into engagement with said socket surface for sealing the space between said window frame and said socket surface;
the interior surface of said inwardly extending interior flange being offset toward the interior of said structure from the interior surface of said outwardly extending interior flange and being substantially coplanar with the interior surface of said body flange.

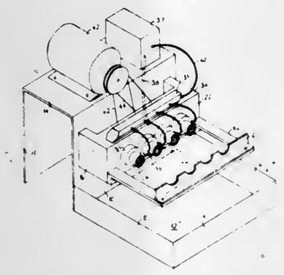
4,233,782
WORK CABINET FOR PODIATRISTS, DENTIST AND THE LIKE
Ronald Perrault, 3 Avenue des Sapins, Notre-Dame des Prairies, Canada (J6E 1C3)
Filed Jun. 21, 1979, Ser. No. 50,783
Int. Cl.³ B24B 55/06
U.S. Cl. 51—5 R **6 Claims**

1. work cabinet for machining, grinding, buffing and polishing small work pieces, such as dental models, foot protheses, foot-correcting inner soles and the like, said work cabinet comprising a housing having a work space to receive a work piece and having a front opening providing working access to said work piece, a power-driven working tool located in said working space, a light source exposed in said working space and mounted within the top portion of said housing to illuminate the work piece and the working tool, an air suction mouth opening in said housing adjacent said working tool, air suction means communicating with said air suction mouth, means to filter the air evacuated from said housing by said air suction means, a clean air-discharging nozzle located in said housing and directed towards said light source to create an air stream of clean air over and around said light source and to prevent deposits of dry and wet dust and grindings on said light source, means to supply clean air under pressure to said nozzle, the



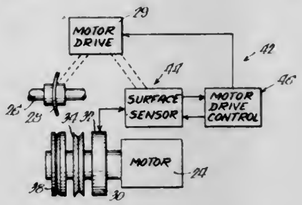
mass flow of air discharged by said nozzle not being greater than the mass flow of air sucked out of said housing by said air suction means, so as not to produce an air over-pressure within said housing.

4,233,783
DEVICE PARTICULARLY USEFUL FOR CUTTING OR GRINDING ROUND GIRDLES OF GEMS
Hanoch Stark, 60 Harishonim St., Ramat Hasharon, Israel, assignor to Hanoch Stark, Ramat Hasharon, Israel
Filed Jan. 26, 1979, Ser. No. 6,999
Int. Cl.³ B24B 9/16
U.S. Cl. 51—73 R **6 Claims**



1. A device particularly useful for cutting or grinding the round girdle surfaces of round-cut gems, comprising: a base; a plurality of cutting heads rotatably mounted on said base about spaced horizontal axes arranged in a straight line; each of said cutting heads being formed on face with a cavity having a grinding surface circular in transverse section and having a larger diameter than that of the round surface to be cut; the outer end of the cavity being curved and its grinding surface having abrasive particles fixed thereto; a support extending across said base and spaced forwardly of said cutting heads; said support including holder-supporting means for supporting a gem-holder in alignment with the cavity of each cutting head; a nozzle for each cutting head for supplying a liquid medium to the grinding surface of its cavity; a receptacle underlying all the cutting heads for receiving the liquid medium run-off from the heads; a pump for pumping said liquid back to the nozzles and a drive for rotating each head around the longitudinal axis of its cavity.

4,233,784
LENS EDGING APPARATUS
Wilfredo P. Loreto, Hoffman Estates, Ill., assignor to AIT Industries, Inc., Schaumburg, Ill.
Filed Mar. 12, 1979, Ser. No. 19,767
Int. Cl.³ B24B 9/14
U.S. Cl. 51—105 LG **15 Claims**



1. In an apparatus for grinding an article, a grinder having a grinding surface; means for supporting the article and for moving the same against said grinding surface; and detector means for detecting the axial position of the highest point on said grinding surface between opposite sides of said surface and means responsive to said detector means for controlling operation of said supporting means to locate the article opposite from and to move the article against said highest point position.

4,233,785
SANDBLASTING APPARATUS
Ralph N. Abell, 6685 Main St., Springfield, Oreg. 97477
Filed Oct. 13, 1978, Ser. No. 951,153
Int. Cl.³ B24C 5/04, 7/00
U.S. Cl. 51—427 **5 Claims**



1. A sandblasting apparatus comprising,
an upright abrasive storage tank having an outlet at its lower end,
a vibratory conduit supported in a free standing manner by the tank upper end and extending substantially the length of the tank and in communication with a source of air pressure and having its discharge end proximate the tank outlet whereby abrasive particles within the tank are put into a fluid state by inherent operational conduit vibration prior to outward passage through said outlet,
mixing means receiving a carrier flow of pressurized air and the fluidized particles discharged from the tank outlet, and
a sandblasting gun in communication with said mixing means receiving the fluidized flow of abrasive particles and the carrier air flow, an air hose in communication with a source of air pressure, said gun served by said air hose and receiving a flow of pressurized air for mergence with and propelling of the fluidized abrasive, said sandblasting gun further including a nozzle having a liner, a sleeve disposed concentric about said liner, a housing disposed outwardly of said sleeve, a mass of solder disposed interiorly within said housing serving to permanently join nozzle liner,

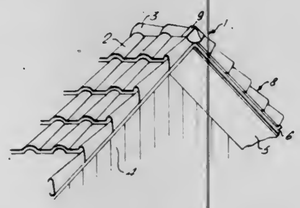
sleeve and housing and to provide a conical transition surface extending intermediate the housing and the liner.

4,233,786

ROOF TILE EDGE COVER

Allan B. Hildreth, 78 Marine Parade, Paraparaumu, New Zealand

Filed Feb. 8, 1979, Ser. No. 10,841
Claims priority, application New Zealand, Feb. 16, 1978, 186496
Int. Cl.³ E04D *13/035*
U.S. Cl. 52—94 **5 Claims**



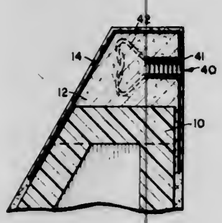
1. A roof tile edge cover assembly comprising a roof tile edge cover having an elongate web of diminishing width along its length said web having along both edges thereof an inwardly directed lip, said lips defining a large and a small opening at respective first and second ends of said web, a rail assembly to the roof edge, and wherein the large opening at the first end of one of said covers is slid over the edge of an end tile of one row and over the second end of a cover already in position over the edge of an end tile of the adjacent lower row with the inwardly directed lips of the covers engaged respectively along the respective tile edges and the downturned lip of the rail assembly such that the covers are secured to the roof edge and the interconnection of the respective covers of adjacent rows secures the rows together.

4,233,787

COMPOSITE BUILDING MODULE AND METHOD FOR MAKING SAME

Matthew R. Piazza, Nichols, Conn., assignor to Maso Therm Corporation, Bridgeport, Conn.

Filed Jul. 17, 1978, Ser. No. 925,251
Int. Cl.³ E04G *21/12*
U.S. Cl. 52—125 **21 Claims**



1. A method for making composite building modules comprising:

a. forming a bottom layer of fiber reinforced wet cementitious material;

b. forming a core by placing at least two rigid hollow foam box members each comprising a hollow tubular central portion and two flat end covers connected thereto side-by-side in a single layer on the bottom layer with all the adjoining edges forming at least one continuous channel completely around the core solely at the exterior thereof; and

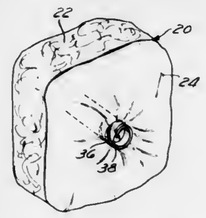
c. encapsulating the core in a fiber reinforced wet cementitious shell by depositing fibers and cementitious material around the sides of the core members and on the top thereof, filling each channel forming a rib completely around the interior of the cementitious shell.

4,233,788

TOOL FOR BLOWING INSULATION INTO AN EXISTING WALL STRUCTURE HAVING A BRICK EXTERIOR

Dale L. Clifft, Tarzana, Calif., assignor to LCG, Inc., Indio, Calif.

Filed Jun. 25, 1979, Ser. No. 51,613
Int. Cl.³ E04G *21/00*
U.S. Cl. 52—127 **5 Claims**



1. In combination with an existing wall structure being formed of an inner wall surface and an outer wall surface with there being an enlarged opening therebetween, a layer of insulation located within said enlarged opening, said layer of insulation being composed of a pad of insulative material which is secured to a backing layer of material, said backing layer of material located adjacent said inner wall surface, a tool to facilitate the blowing of additional insulation within said enlarged opening, said tool comprising:

an elongated straight tubular member having an internal chamber to facilitate the passage of blown insulation therethrough, said tubular member having a longitudinal center axis interconnecting an inner end and an outer end, said outer end terminating in a cutting edge, a helical groove formed within said elongated straight tubular member, said helical groove terminating at its outermost end at said cutting edge, an access opening being provided through said outer wall connecting with said internal enlarged opening, said outer end of said tool to be inserted through said access opening and to be moved to cut through said pad of insulation into contact with said backing layer of material, upon rotating of said tool about said longitudinal center axis said cutting edge cuts through said backing layer of material and further rotation of said tool results in said backing layer of material to be located within said helical groove and spaced from said inner wall surface, whereupon the portion of said backing layer of material that is now located within said elongated tubular member is to be cut through to permit conducting of insulation through said elongated tubular member and be deposited between said backing layer of material and said inner wall thereby compressing said pad of insulation thereby permitting a substantial higher quality and greater amount of insulation to be supplied within said enlarged opening.

4,233,789

STORAGE TANKS

Carlo Dinardo, "Teighness", Main St., Killearn, Stirlingshire, England

Continuation of Ser. No. 788,934, Apr. 19, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,701
Int. Cl.² E02D *27/38*
U.S. Cl. 52—169.2 **9 Claims**



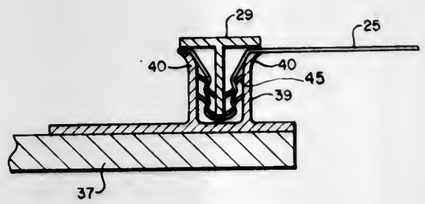
8. A method of manufacturing a tank farm comprising designating on a map of the terrain in which the tank farm is to be located, elongate strips of ground surface located at different predetermined levels of said terrain, the longitudinal axis of each of which strips, when taken in plan view, substantially conforms to a contour line of the map, forming tank sites in the terrain in the form of shallow trenches corresponding to the location of said strips, constructing on each of said tank sites an elongate, closed tank having its longitudinal axis substantially horizontal, its vertical dimension being substantially the same as the depth of the trench, wherein a plurality of the closed tanks at one of said levels of the terrain are disposed substantially end to end and separated from one another and wherein the longitudinal axis of at least one of said closed tanks is curvilinear when taken in plan view so as to substantially conform to a curvilinear portion of the contour line at the predetermined level at which said one closed tank is constructed, and covering the tanks with the earthworks excavated from said trenches substantially to restore the contour of the natural terrain, each said tank including a plurality of longitudinally-extending containment barriers at least one of which is made of concrete.

4,233,790

EXTRUSIONS AND BUILDING STRUCTURES

David F. Meadows, Milton, W. Va., assignor to DoNel Corporation, Mt. Vernon, Ohio

Continuation-in-part of Ser. No. 807,492, Jun. 17, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,593
Int. Cl.³ A47H *13/00*
U.S. Cl. 52—222 **1 Claim**



1. A window-like structure comprising:

a plurality of rigid side and end members secured together in perpendicular and parallel relationship to form a frame and arranged to be secured to a building structure, the ends of said members being mitered and united together, each of said members of said frame being formed with channels which combine to form a channel positioned around the periphery of said frame, said channel including teeth projecting inwardly from its sides;

a sheet of flexible plastic material spreading over all of said side and end members;

a plurality of locking members, one of which is inserted in each of said channels, forcing a portion of said flexible sheet into said channels and stretching, sealing, holding, and locking said sheet to said frame in said channels;

said locking members being each formed as a one piece extrusion having a generally T-shape in cross section with a stem and a head both of which are formed of substantially rigid plastic material and which has both sides of the stem of the T provided with integral spaced angularly and outwardly extending projections of plastic material substantially more flexible than the substantially rigid material of the main section of the T and integrally united with the substantially rigid material of the main section of the T, said projections having a thickness less than the stem and being inclined from the stem toward the head;
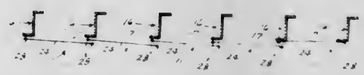
the width of the channel between the crests of the teeth being less than the width between the outer ends of the projections, the teeth and projections combining to lock the sheet in place.

4,233,791

VAPOR IMPERMEABLE INSULATION FACING CONSTRUCTION

LeRoy L. Kuhl, 1101 - 31st St., West Des Moines, Iowa 50265, and Lester L. Thompson, P.O. Box 603, Montezuma, Iowa 50171

Filed Feb. 9, 1979, Ser. No. 10,713
Int. Cl.³ E04B *1/74, 7/00*
U.S. Cl. 52—309.1 **12 Claims**



1. In a roof structure which includes a number of ceiling purlins supported at their ends by horizontal beams, a continuous vapor impermeable facing construction attached to said purlins and said beams which supports overlying layers of insulation and prevents vapor from passing through said facing construction and into said insulation, said facing construction comprising:

a facing material, wherein said facing material is both vapor impermeable and sufficiently strong to support the weight of overlying insulation, said facing material being formed into a number of rectangular sheets, each of said rectangular sheets being suitable in width to extend between an adjacent and parallel pair of said purlins, and suitable in length to extend from one end of said purlins to the other, said rectangular facing sheets being joined together at said purlins to cover the ceiling area spanned by said purlins;

a number of reinforcing members attached to said facing sheets along the portions where said facing sheets are attached to said purlins, and also along the portions where said facing sheets are attached to said beams, each of said rectangular facing sheets having a pair of longer sides and a pair of shorter ends, one of said reinforcing members being attached along each of the sides and each of the ends of each of said rectangular facing sheets; and

permanent fastening means, wherein said permanent fastening means attach said rectangular facing sheets, through said reinforcing members, to said purlins and said beams, each of said purlins having a lower flange such as is included in a C or a Z type purlin, and wherein when an adjacent pair of said purlins are viewed together, each of

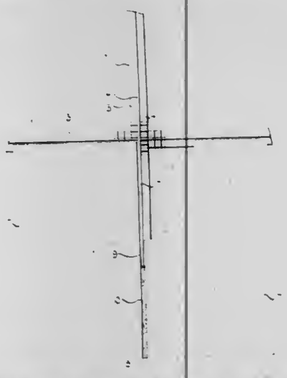
the bottom sides of the lower flanges of said pair of purlins has an outer portion, said rectangular facing sheets being attached to the outer portions of the bottom sides of the lower flanges of said purlins to permit said rectangular facing sheets to overlap when connected to a common purlin to create an overlapping facing joint, said overlapping facing joint being impervious to vapor, and thus, preventing vapor from passing through said overlapping facing joint.

4,233,792

PROCESS FOR THE LAYING OF A FLOOR, AND FOR A TILE CLOTHING, AND ELEMENTS FOR THE REALIZATION THEREOF

Alberto Malavasi, Piazza Citta Leonina, 9, 00193 Rome, Italy

Filed Dec. 26, 1978, Ser. No. 973,389
Int. Cl.[2] E04F *13/08*
U.S. Cl. 52—387 **9 Claims**



1. A net-like support structure for use with tiles to facilitate the laying thereof to cover a surface formed from a plurality of modular elements, each of which when connected to another modular element forms the net-like support structure, each of said modular elements comprising:

a horizontal listel;

a vertical band connected with said horizontal listel to form therewith an inverted T-shaped member to hold the tiles in place, said vertical band forming a spacer between adjacent tiles;

said horizontal listel including upper surfaces on both sides of said vertical band to form a stop for the edge of the lower surface of the tiles; and,

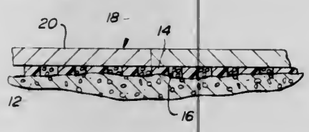
projecting resting means on said horizontal listel upper surface adapted to receive a material which is also used to hold the tiles to the surface to be covered.

4,233,793

RESILIENTLY CUSHIONED ADHESIVE-APPLIED WOOD FLOORING SYSTEM AND METHOD OF MAKING THE SAME

Ray E. Omholt, 590 Grove Rd., Thorofare, N.J. 08086

Continuation-in-part of Ser. No. 339,496, Mar. 8, 1973, Pat. No. 3,893,275. This application Jul. 7, 1975, Ser. No. 593,607
Int. Cl.[2] E04F *13/00*
U.S. Cl. 52—390 **9 Claims**



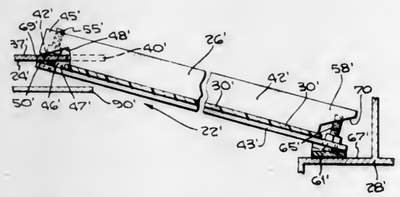
1. A restricted-growth resiliently cushioned bridging adhesive-applied wood flooring system comprising a support base and wooden flooring members, uncured elastomeric adhesive spread upon at least one of said support base and said wooden flooring members in spaced ridges, adjacent ridges each having substantially uniform height, at least some of said ridges being spaced a substantial distance from an adjacent ridge, said wooden flooring members being forced toward said base so that an intimate bond of said adhesive ridges with both the base and the bottom faces of the wooden flooring members will be achieved and such that gaps remain between at least some adjacent ridges of adhesive; discrete supporting means between said ridges, said supporting means comprising a plurality of essentially spherical beads made of a material which has a relatively low resistance to crushing but which has sufficient resistance to crushing to provide initial support for said wooden flooring members when said wooden flooring members are initially forced toward said base, said supporting means having a vertical height less than the height of said uncured ridges of adhesive prior to said wooden flooring members being forced toward said base, said adhesive ridges having sufficient gripping and tensile strength to overcome potential buckling forces generated within said wooden members as a result of normal atmospheric moisture changes, and said adhesive, after it has cured, cooperating with the gaps between adjacent ridges of cured adhesive to provide resilient cushioning for said flooring system.

4,233,794

ADJUSTABLE CONNECTING MEANS FOR CEILING CONSTRUCTIONS AND THE LIKE

Ben Mayer, Los Angeles, Calif., assignor to Envel Corporation, Los Angeles, Calif.

Filed Dec. 18, 1978, Ser. No. 970,274
Int. Cl.[3] E04B *5/52, 1/343*
U.S. Cl. 52—484 **7 Claims**



1. A connecting means for structural members of a suspended ceiling construction which is supported at least at its periphery and its center, comprising in combination:

a central support member having an edge portion,

said edge portion including a plurality of open ended slots;

a plurality of longitudinal structural members each having a vertically disposed web provided with flanges on opposite sides thereof and lying in a plane normal to the web,

one end of said web having a sector shaped opening;

a web portion inwardly of said sector shaped opening being receivable within said slot,

said sector shaped opening receiving said edge portion inwardly of the slot whereby such interengagement of said longitudinal structural member and said edge portion restricts relative lateral movement, relative longitudinal movement in one direction, and permits relative movement in a vertical direction of said support member and structural member;

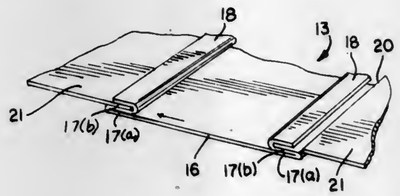
and means securing said edge portion to said flanges in a selected relation.

4,233,795

FIELD REPAIR ROOF PANEL FOR A RAILWAY CAR

Richard C. Snyder, Michigan City, Ind., and Donald C. Bodinger, Pelham, Ala., assignors to Pullman Incorporated, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 958,084
Int. Cl.[3] E04G *23/02*; B61D *17/12*
U.S. Cl. 52—514 **8 Claims**



1. In a railway car a roof sheet provided with a pair of spaced roof sheet margin portions each defining with the other an opening to be covered by a replacement panel,

said replacement panel comprising

a sheet of material having an end flange with an outer free edge and an end flange unit generally parallel to and defining with the flange an outwardly opening slot and receiving a respective margin portion of the roof sheet, said slot having an open end at said free edge,

said end flange unit having a pair of substantially contiguous generally parallel flange sections that are generally parallel to the flange, one of said flange sections forming a part of said slot and being between the other flange section of the flange,

a first nose portion being a curved portion connecting the flange with the one flange section and forming a closed terminus of the slot,

said central portion connecting with said other flange sections and said first nose portion overlying said central portion,

a second nose portion being a curve portion connecting the one flange section with the other flange section and extending outwardly of the outer edge of the flange in the opposite direction of said first nose portion and forming the outer end part of the end portion,

welding means securing each of said outer end portions to said each of said roof margin portions, and

each of said outer end part of each said second nose portion extending outwardly of said end outer edge of the flanges providing a welding support and roof margin guide adjacent the outer edge of each flange for attachment of a respective roof sheet margin portion to each flanged outer end portion.

4,233,796

DESICCATED SPANDREL PANELS

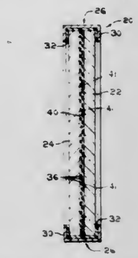
Renato J. Mazzoni, Tarentum, and Vernon A. Shoop, Springdale, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 22, 1978, Ser. No. 963,075
Int. Cl.[3] E04C *2/54*; E06B *7/12*
U.S. Cl. 52—789 **15 Claims**

1. A spandrel unit comprising:

a film containing a desiccant;

a pair of panels each having a major surface, the major surface of said panels facing one another with said film between and substantially coextensive with the major surfaces with said desiccant absorbing moisture between the major surfaces; and



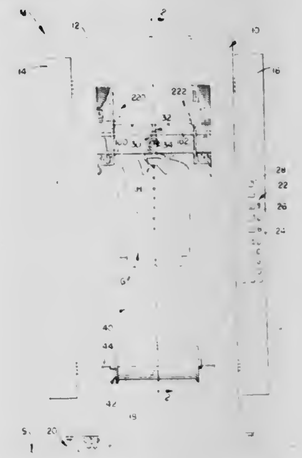
sealant means mounting said panels to provide a moisture-resistant barrier against moisture penetration between the major surfaces of said panels.

4,233,797

AUTOMATIC BAGGING MACHINE

Karl E. Schwarz, 714 Tifft Ave., Horseheads, N.Y. 14845

Filed Apr. 17, 1979, Ser. No. 30,947
Int. Cl.[3] B65B *57/04, 43/28*
U.S. Cl. 53—66 **28 Claims**



1. A garment bagging machine comprising:

a cabinet;

material guide means on said cabinet for guiding tubular bag forming material from a bag forming material supply means;

spreader means on said cabinet for spreading the walls of said tubular material apart;

hanger means on said spreader for supporting a garment to be bagged;

pulldown means movably mounted on said cabinet and having material gripping means thereon for gripping the bag forming material so that such bag forming material can be pulled down over a garment supported on said hanger means;

gripping means power means on said pulldown means, and gripping jaw connecting means connecting said gripping means power means to said gripping means;

garment length sensing means on said pulldown means;

bag sealing means mounted on said cabinet for sealing the walls of the tubular bag forming material together, said sealing means including a hot air generating means which

generates air hot enough to melt the bag forming material, hot air directing means on said hot air generating means for directing hot air onto the bag forming material to be sealed, and clamping means on said bag sealing means for clamping the walls of the bag forming material together adjacent said hot air directing means so that hot air issuing from said hot air directing means contacts the clamped together walls of the bag forming material whereby such hot air melts the bag forming material so that such clamped together walls are fused together thereby forming a seal on a bag;

bag cutoff means on said bag sealing means for cutting off a length of material from the bag forming material guided from the supply means;

main drive power means for moving said pulldown means, said main drive power means including a drive pneumatic cylinder;

said pneumatic cylinder including an actuating rod and connecting means connecting said pneumatic cylinder actuating rod to said drive means with said connecting means including a drive block slidably mounted on said cabinet and connected to said actuating rod to be reciprocated thereby, a pulley mounted on said drive block, a sprocket mounted on said drive block, a first rotatable drive sprocket mounted on said cabinet, a cable means trained around said pulley and connected at the end thereof to said cabinet, said cable means translating the linear reciprocating movement of said drive block into rotational movement of said first drive sprocket so that as said drive block reciprocates in response to reciprocating movement of said drive pneumatic cylinder actuating rod, said first drive sprocket rotates, a second drive sprocket connected to said first drive sprocket for rotation therewith, a pulldown means chain means trained around said second drive sprocket to be moved thereby and connected at the ends thereof to said pulldown means for causing linear reciprocating movement of said pulldown means in response to rotation of said second drive sprocket; and

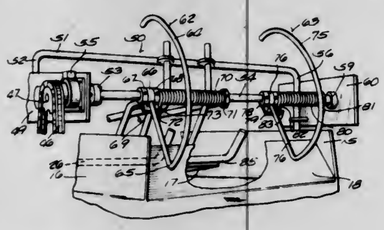
control means for controlling operation of said main drive power means.

4,233,798

BOX CLOSING MACHINE

James R. Helding, 8415 Five Mile Rd., Franksville, Wis. 53126

Filed Jul. 30, 1979, Ser. No. 62,251
Int. Cl.³ B65B *57/02, 7/20*
U.S. Cl. 53—76 **6 Claims**



1. A machine for folding and holding the leading and trailing top end flaps and side flaps of a box over the body of the box, said machine comprising:

power driven conveyor means for conveying a succession of boxes along a predetermined path into and through the machine,

a shaft extending laterally in relation to said path and spaced from said conveyor means,

clutch means having power input means for being continuously driven and power output means operatively coupled to said shaft, said clutch means having operating means operative to couple and uncouple said power input means to and from said output means, respectively,

means responding to a box reaching a predetermined position on said conveyor means by causing said clutch operating means to couple said input to said output means for said shaft to make one revolution and then to uncouple said means,

arm means journaled on said shaft and extending generally radially outwardly from the shaft, said arm means being subject to rotation for applying a closing force to the trailing flap of the box when the box reaches said predetermined position,

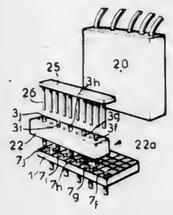
spring means interposed between said shaft and said arm means for driving said arm means rotationally to apply said closing force to said trailing flap when said shaft is rotating and for enabling said arm means to yield and limit the force on said flap.

4,233,799

DISTRIBUTING MACHINE FOR PLACING STORED OBJECTS ON GRILL STANDS

Gilles Caille, Paris, France, assignor to Societe Anonyme Expandet, Paris, France

Filed Apr. 27, 1979, Ser. No. 34,280
Claims priority, application France, May 29, 1978, 78 15886
Int. Cl.³ B65B *5/10*
U.S. Cl. 53—154 **5 Claims**



1. A distributing machine for placing stored cylindrical objects on grill stands having pockets in a plurality of rows parallel to the longitudinal axis of the grill, such as plastic expansion pins in grill stands which themselves are plastic, comprising:

(a) a plate carrying grills to be filled and which moves them successively under a plurality of distributing stations, each of which stations fills one of said rows of said grill ;

(b) bulk pin bins to continuously feed pins to the distributing stations;

(c) pin transfer carriages having pin carrying pockets spaced a distance equal to the distance between the centers of alternate pockets of said grill to transfer a plurality of pins from the distributing stations to the grills,

(d) drive means to move the transfer carriages over the grills longitudinally and transversally relative to said grills and,

(e) push rod means to transfer the pins from the transfer carriages into alternate pockets of a single row of the grills carried by the plate, (f) control means for said drive means to transversally move said carriages filled with one set of pins from the distributing stations to over one of said rows of the grills to thereby allow said push rod means to transfer said pins to alternate pockets of said one row and to longitudinally move said carriages a distance equal to the distance between the centers of two adjacent pockets of the grill after receipt of a second set of pins from said distributing stations to thereby allow said push rod means to transfer said second set of pins into the remaining alternate empty pockets of said one row of the grills.

4,233,800

ENVELOPE OPENER

William J. Long, Birmingham; Larry W. Roberts, Fairfield, and H. Ross Williams, Birmingham, all of Ala., assignors to Amer-O-Matic Corporation, Birmingham, Ala.

Continuation-in-part of Ser. No. 826,613, Aug. 22, 1977, Pat. No. 4,142,430. This application Dec. 20, 1978, Ser. No. 971,273
Int. Cl.³ B43M *7/02*
U.S. Cl. 53—381 R **12 Claims**



1. An improved envelope opener, comprising:

a rotatable shear barrel having at least one shear blade for shearing an edge of an envelope;

a pivotable anvil assembly operatively asociated with said shear barrel;

said anvil assembly having an anvil blade,

contact means operatively associated with said shear barrel and said anvil assembly and disposed in relation to said anvil blade to contact said shear blade as said shear barrel rotates and thereby pivotably displace said anvil assembly from a home position with respect to said shear barrel;

means for pivotaby returning said anvil assembly towards said home position with respect to said shear barrel as said shear barrel continues to rotate;

a pivotable gate disposed downstream of said shear barrel;

said gate having a stop member;

means for transporting said envelope from said shear barrel to said gate;

means for causing said gate to pivot downwardly to pass an envelope, and

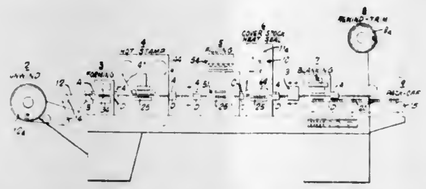
a support rod disposed in proximity to said gate stop member for supporting said envelope when said gate is pivoted downwardly.

4,233,801

APPARATUS AND PROCESS FOR THE MANUFACTURE OF DISPOSABLE THERMOMETERS

William E. R. Watt, Barto, Pa., assignor to Ashley-Butler, Inc., Somerville, N.J.

Filed Jul. 31, 1978, Ser. No. 929,402
Int. Cl.³ B65B *47/02*
U.S. Cl. 53—453 **16 Claims**



10. Method for producing from stretchable film a marked laminated package containing a product with precise registration between the product and the marking comprising the steps of:

supply a continuous web of a coated stretchable substrate film along a processing path, said web having a central portion to be operated upon and integral edge portions, at least as wide as said central portion, to be used for handling said web;

advancing said substrate web along said path with indexed movement by gripping said edge portions while carefully guiding it laterally in the path by guide means comprising a base member and a cover member having aperture means therebetween for precisely passing said substrate web, and said cover member comprises means for passing said product element on said web;

operating on said web at respective stations along said path including the steps of:

marking the central portion of said substrate web with indicia;

depositing at least one product element to be packaged on said central portion of said substrate web in registration with said indicia;

providing a continuous web of a cover film and sealing it to said substrate web in said central portion with said product element disposed therebetween to form a laiminated package containing said product element;

holding said edge portions of said substrate web at the operating stations during each of said operating steps; and

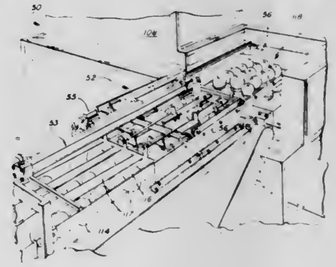
separating said laminated package from said webs.

4,233,802

PACKAGING MACHINE

John L. Booth, Richton Park, and Peter A. Rittmaster, Chicago, both of Ill., assignors to International Honeycomb Corporation, Park Forest South, Ill., by said John L. Booth

Continuation-in-part of Ser. No. 876,841, Feb. 10, 1978, abandoned. This application Jan. 25, 1979, Ser. No. 6,085
Int. Cl.³ B65B *5/08, 5/06*
U.S. Cl. 53—475 **24 Claims**



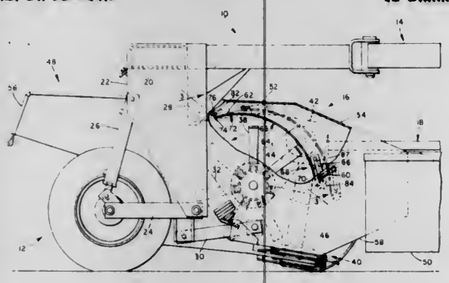
1. A machine for automatically packaging articles into expanded honeycomb and into a container comprising means for locating a container at a loading station of the packaging machine to be filled and moving the container out of the loading station after it has been filled, means for loading articles to be packaged on a carrier assembly disposed outside of the loading station, means for moving said carrier assembly into and out of the loading station of the packaging machine, means for automatically providing in said loading station below said carrier assembly a honeycomb expander tray on which is located a separator sheet and an open honeycomb section for receiving articles and for removing the tray after the honeycomb section and separator sheet have been removed therefrom, and means for lifting said articles from said carrier assembly and depositing them in said open honeycomb and subsequently lifting the filled honeycomb and separator sheet from said tray and then depositing the same in a container located therebelow.

4,233,803

ADJUSTABLE CONDITIONING PLATE FOR AN IMPELLER MOWER-CONDITIONER

Wilbur M. Davis; Bobby G. Sawyer, both of Ottumwa, Iowa; John A. Nichols, Brookston, Ind., and John F. Husman, Silvis, Ill., assignors to Deere & Company, Moline, Ill.

Filed May 4, 1978, Ser. No. 902,654
Int. Cl.³ A01D *84/00*
U.S. Cl. 56—14.9 **12 Claims**



1. In a mobile mower-conditioner for advancing over a field to cut and condition crop material and including a frame, an improved impeller-type crop handling and conditioning means comprising:

an impeller rotor for engaging cut crop material rotatably mounted in the frame and having an axis of rotation approximately transverse the machine;

a concave guide plate having an inner surface, partially wrapping and generally concentric with the rotor, extending over only approximately the forward upper quadrant of the rotor and spaced radially from the rotor periphery, the inner surface cooperating with that periphery to define a transversely and circumferentially extending conveying channel, said guide plate having with respect to rotor rotation leading and trailing edges and being disposed so that a tangent to the inner surface adjacent the trailing edge is approximately horizontal;

mounting means for adjustably supporting the guide plate in the frame so that the disposition of both the leading and the trailing edges may be changed relative to the rotor periphery; and

means for rotating the rotor so that at least a portion of the cut crop material engaged by the rotor is conveyed generally circumferentially in the conveying channel by the rotor and discharged from the channel adjacent the trailing edge in a substantially horizontal rearwardly directed stream.

4,233,804

CORN HEAD SNAPPING ROLLS

Thomas R. Fischer, Wapakoneta, and Robert A. Stelzer, Celina, both of Ohio, assignors to Paul Revere Corporation, Greenwich, Conn.

Filed Apr. 9, 1979, Ser. No. 28,099
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—104 **7 Claims**

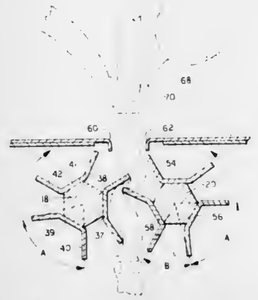
1. In a corn head attachment adapted to be mounted at the forward end of a corn harvester, said corn head having a forward projecting row unit which includes a subframe on which is supported a stripper plate having a fore and aft extending slot for receiving stalks of corn, said row unit also including a pair of spaced apart forward projecting gear driven elements, said elements being arranged equidistant and symmetrically below and at the rearmost end of the slot in said stripper plate, the leftmost one of said elements as viewed from a position forward of said row unit being rotatably driven clockwise by said gear means whereas the rightmost one of said elements is driven counter-clockwise by said gear means, the axes of said elements being parallel both to each other and with the plane containing said stripper plate, the improvement which comprises:

a pair of fore and aft extending snapping rolls, each having a central shaft, said snapping rolls being transversely spaced apart beneath said stripper plate on opposite sides of the slot therein, the base end of the first roll being drivingly connected to and in axial alignment with the leftmost of said elements, the base end of the second roll being drivingly connected to and coaxially aligned with the rightmost of said elements;

a number of longitudinally extending flutes arranged in two sets around the periphery of each of said snapping rolls;

one set of flutes extending in a radially outward direction relative to the axis of the snapping rolls;

a second set of flutes extending outwardly in a non-radial angle relative to the axis of said rolls, said second set of flutes being interspersed between the radially outward directed set of flutes;



the height of said flutes being such that the tips of said odd and even numbered flutes all lie on an imaginary circle placed concentric with and perpendicular to the axis of said snapping rolls, the maximum height of said flutes being such that the flutes of one roll must interleave with the flutes of the other roll throughout a portion of the length of said snapping rolls; and

synchronizing means for rotating said snapping rolls in unison such that the sequence of intermeshing flutes in the region between the axes of said snapping rolls comprise the repetitious rotational passage of a non-radial flute from one roll, a non-radial flute from the second roll, a radial flute from the first roll, a radial flute from the second roll and repeat, the rotational passage of a non-radial flute generating an action whereby the stalk of corn is deeply pinched as it is drawn through said corn head.

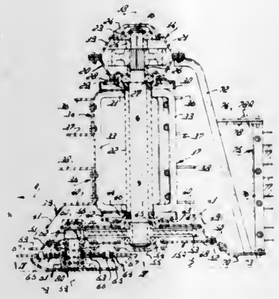
4,233,805

MOWING MACHINE

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 11, 1978, Ser. No. 941,321
Claims priority, application Netherlands, Sep. 19, 1977, 7710240
Int. Cl.² A01D *43/00, 57/22, 57/28*
U.S. Cl. 56—192 **29 Claims**

1. A mowing machine comprising a mowing element which is mounted for rotation about a substantially vertical axis and which includes a cutting member, the machine further comprising a guide member which completely covers said cutting member except for a portion of said cutting member where it extends forward of said guide member during part of its rotation whereby to cut crop in its forward path of movement, and crop displacing means mounted on said guide member for conveying crop cut by said cutting member over said guide member, said guide member including a downwardly extending screen portion disposed behind said mowing element with respect to the intended normal direction of travel of the machine, said crop displacing means comprising a plurality of tines which are movable about a further substantially vertical



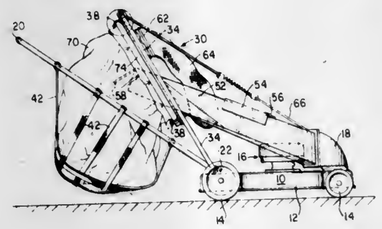
axis spaced behind said first-mentioned vertical axis, said tines rotating through said first-mentioned vertical axis and proximate to where said cutting member rotates forward of said guide member, said guide member serving as a housing for a driving mechanism of said mowing element.

4,233,806

SELF-BAGGING DEVICE FOR POWERED LAWN TOOLS

Charles M. Richardson, 133 Lodge Ave., Huntington Station, N.Y. 11746

Filed Feb. 21, 1979, Ser. No. 13,284
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—202 **15 Claims**



1. In a lawn tool comprising a motor and a housing mounted on wheels in which grass cuttings and/or leaves are discharged in a stream of air through a port in said housing, means for collecting said cuttings and/or leaves comprising:

(a) a frame mounted toward the rear of said housing and extending upwardly and rearwardly of said housing;

(b) a perforate member attached to said frame, said perforate member containing therein first and second large holes and a plurality of small holes;

(c) means for mounting a substantially impervious container beneath said perforate member with the upper periphery of said container against the periphery of said perforate member;

(d) a chute connecting said port in said housing to said first large hole in said perforate member;

(e) said small holes in said perforate member being sized to permit the flow of air therethrough while substantially blocking the flow of solid matter entrained in such air; and

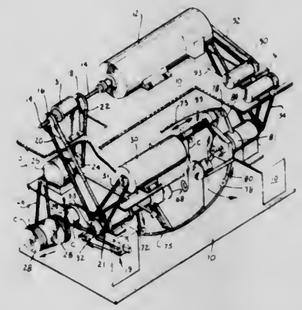
(f) means for mounting on said perforate member a container which is permeable to air, said mounting means holding an open end of said container adjacent said second large hole such that air flowing from said hole enters the open end of said container.

4,233,807

APPARATUS FOR FORMING TWISTED CONDUCTOR UNITS

Edward R. Venable, Gwinnett, Ga., assignor to Western Electric Company Inc., New York, N.Y.

Filed May 31, 1979, Ser. No. 43,991
Int. Cl.³ H01B *13/02*
U.S. Cl. 57—58.52 **7 Claims**



1. Apparatus for forming twisted conductor units comprising a first power transmission train having a rotatable member defining a cavity coupled with a power source and being mounted for rotation about an axis; a bow mounted to said first power transmission train rotatable member for revolutionary movement in an orbit about a reel take-up space; means for supporting and rotating a reel about a reel axis within said reel take-up space; and a second power transmission train extending through said first power transmission train rotatable member cavity offset from said axis coupling said reel supporting and rotating means with a power source.

4,233,808

TOBACCO TYING PRODUCT

Edward T. Gieske, Jr., Chattolanee Hill, Owings Mills, Md. 21117

Filed Apr. 18, 1979, Ser. No. 31,137
Int. Cl.³ D02G *3/02, 3/44*; A24B *3/14*
U.S. Cl. 57—200 **6 Claims**

1. A product suitable for use in tying tobacco leaves together, said product comprising a twine formed from a web consisting essentially of fibrous portions of tobacco plants and substantially exclusive of tissue portions of the plants.

4,233,809

SIZE COMPOSITION FOR GLASS FIBERS

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1978, Ser. No. 971,453
Int. Cl.³ D02G *3/00*
U.S. Cl. 57—250 **21 Claims**

1. An aqueous forming size composition for treating glass fibers that are to be made into twisted glass fiber strands wherein the forming size composition gives the glass fiber strand flexibility and abrasion resistance during processing operations to produce woven twisted glass fiber strands, wherein the necessity is reduced for removing the size composition from the woven sized twisted glass fiber strands, consisting essentially of

(a) silylated polyazamide in an amount in the range of about 20 to about 94 weight percent of the solids in the aqueous sizing composition,

(b) an emulsifiable lubricant in an amount in the range of about 6 weight percent to about 40 weight percent of the solids in the aqueous sizing composition.

9. A twisted glass fiber strand having the dried residue of an aqueous sizing composition on the fibers in the twisted glass

fiber strand, wherein the residue need not be removed from the strand and where the sizing composition consists essentially of:

(a) silylated polyazamide in an amount in the range of about 20 to about 94 weight percent of the solids in the aqueous sizing composition, and

(b) an emulsifiable lubricant in an amount of at least about 6 weight percent based on the solids of the size composition.

4,233,810

DEVICE FOR AUTOMATICALLY REMOVING A COIL FROM A SPINDLE OF A RING SPINNING FRAME OR A RING TWISTER

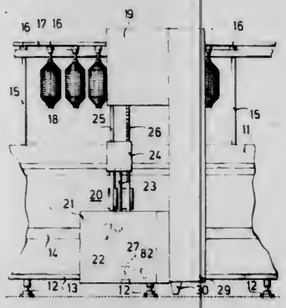
Heinz Kamp, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,394

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756397

Int. Cl.³ D01H 9/10

U.S. Cl. 57—270 **6 Claims**



1. In a ring spinning or twisting frame having a traveling device drivable from work station to work station along the frame for successively removing coils from the spindles automatically, the improvement therein comprising an axially displaceable coil-core releasing ring operatively associated with each spindle of a respective work station at a location below a respective foot of a coil-core receivable on the spindle; the traveling device having means connectible with said releasing ring for releasing a coil core from a respective spindle whereon the coil core is mounted, and having a coil transporter connectible to the respective coil-core, said coil-core releasing means being pivotable and limitedly reciprocable, said coil-core releasing means being actuatable in a first operating cycle for releasing a coil core, and said coil transporter being actuatable in a second operating cycle for transporting the coil core away from the respective spindle.

4,233,811

EXHAUST GAS REACTION CONTROL SYSTEM

Kenji Masaki, No. 30-8, Nagahama, Kanazawa-ku, Yokohama City, Japan

Continuation of Ser. No. 690,106, May 26, 1976, abandoned. This application Apr. 20, 1978, Ser. No. 898,021

Claims priority, application Japan, May 30, 1975, 50/64998

Int. Cl.³ F01N 3/10, 3/14; F02M 25/06

U.S. Cl. 60—274 **4 Claims**

1. In a method of operating an internal combustion engine having an induction system including an air-fuel mixture forming device, a combustion chamber, an exhaust system including an exhaust gas purifying device and an exhaust gas recirculation system interconnecting said induction and exhaust systems, the steps of:

recirculating exhaust gases from said exhaust system to said induction system for lowering the peak combustion temperature in said combustion chamber;

sensing the temperature prevailing in said purifying device;

generating a first command signal upon said temperature in said purifying device being sensed at or below a predetermined lower level and continuing to generate said first command signal until the temperature in said purifying device reaches a predetermined upper level;

generating a second command signal upon said temperature in said purifying device being sensed at or above said upper level and continuing to generate said second command signal until the temperature in said purifying device decreases to said lower level;

raising the temperature in said purifying device in response to said first command signal by

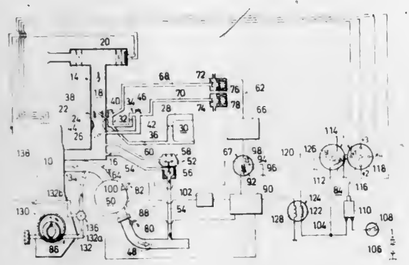
1 enriching the air fuel mixture produced by said air-fuel mixture forming means so as to have an air-fuel ratio lower than stoichiometric;

2 retarding the ignition timing of the ignition of said enriched air-fuel mixture in said combustion chamber;

3 supplying secondary air into the exhaust system upstream of said purifying device so as to mix with the combustion products produced by said retarded ignition of said enriched air-fuel mixture;

4 producing sparks in said purifying device so as to positively ignite the mixture of said combustion products and said secondary air and produce heat to raise the temperature within said purifying device;

lowering the temperature within said purifying device in response to said second commmand signal by;



1 leaning said air-fuel mixture produced by said air-fuel mixture forming device;

2 sensing the oxygen content in the exhaust gases in said exhaust system and producing an output signal indicative of the oxygen content sensed;

3 controlling the air-fuel ratio of the air-fuel mixture produced by said air-fuel mixture forming device in accordance with said output signal thus maintaining the temperature within said purifying device at which spontaneous self-supporting combustion therein occurs, substantially constant; p1 4 advancing the ignition timing of the ignition of said leaned air-fuel mixture in said combustion chamber so as to efficiently and rapidly combust said mixture thus reducing the amount of combustible matter contained in the exhaust gases subsequently exhausted into said exhaust system;

5 terminating the supply of secondary air into said exhaust system;

6 terminating the production of sparks in said purifying device; and

7 utilizing the reduced peak combustion temperature by said recirculation of exhaust gas in combination with said steps of leaning, sensing, controlling, advancing, terminating and terminating to feed exhaust gas having a relatively low temperature into said purifying device to facilitate the cooling thereof.

4,233,812

GAS DISCHARGE APPARATUS

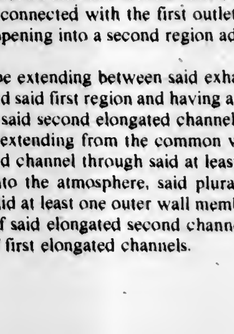
Hans K. Leistritz, Stegwiesen 8, D 7891 Kussaberg 2, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,247

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718944; May 2, 1977, 2719513; May 3, 1977, 2719634; May 7, 1977, 2720558; May 14, 1977, 2721956; May 18, 1977, 2722422; Jun. 21, 1977, 2727728; Jul. 2, 1977, 2730007; Jul. 6, 1977, 2730480; Jul. 25, 1977, 2733443; Oct. 24, 1977, 2747655; Oct. 26, 1977, 2747959

Int. Cl.³ F01N 3/02; F02M 35/00; F01N 1/08; F28D 7/10

U.S. Cl. 60—320 **4 Claims**



1. An exhaust gas muffler apparatus, comprising:

exhaust gas intake means for receiving hot exhaust gases from an engine;

an expansion chamber communicating with said exhaust gas intake means and including a first wall member having at least one aperture therein;

an exhaust expansion chamber including an exhaust gas outlet tube for exhausting cooled exhaust gases to the atmosphere;

a plurality of first elongated channels each having a first inlet and a first outlet and extending between said first wall member and a first region adjacent said exhaust expansion chamber, the first inlets being interconnected with said at least one aperture and each of the first outlets opening into said first region, and said plurality of first elongated channels having at least one outer wall member exposed to the atmosphere;

at least one second elongated channel having a common wall with respective walls of said plurality of first elongated channels and a second inlet and second outlet, said second inlet being interconnected with the first outlets, and said second outlets opening into a second region adjacent said wall member;

an exhaust gas tube extending between said exhaust expansion chamber and said first region and having a wall member common to said second elongated channel; and

a plurality of fins extending from the common wall of said elongated second channel through said at least one outer wall member into the atmosphere, said plurality of fins together with said at least one outer wall member and the common wall of said elongated second channel, forming said plurality of first elongated channels.

4,233,813

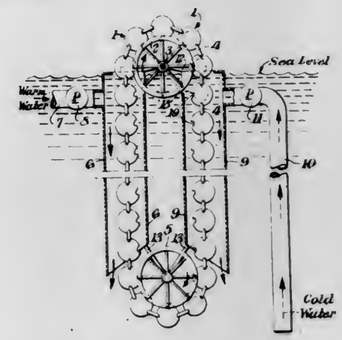
OCEAN THERMAL ENGINE

Walter J. Simmons, Martinsburg, W. Va., assignor to University of Delaware, Newark, Del.

Filed Mar. 15, 1979, Ser. No. 20,639

Int. Cl.³ F03G 7/06

U.S. Cl. 60—496 **4 Claims**



1. An ocean thermal engine comprising

a. a series of rigid containers disposed in spaced relation to form an endless chain;

b. rotatable supporting means for suspending said endless chain substantially vertical;

c. open ducts through which the two vertical lengths of the chain of containers extend;

d. means for circulating seawater from near the surface through one duct and means for circulating colder seawater through the other duct;

e. each container having means for confining a thermodynamic fluid, said thermodynamic fluid being capable of vaporizing within the temperature range of the seawater in said first duct and condensing within the temperature range of the seawater in said second duct, said means effecting discharge of seawater from the container upon vaporization of the fluid and intake of seawater upon condensation of the fluid, thereby effecting a change in buoyancy of the containers and their movement through said ducts;

f. means for recovering useful power from the movement of said chain.

4,233,814

SUPERCHARGED INTERNAL COMBUSTION ENGINES

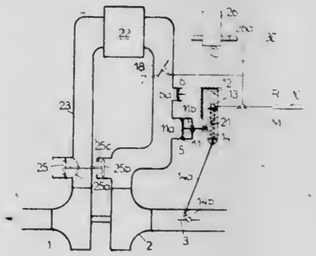
Bernard Thore, 95, rue de Longchamp, 75116 Paris, France

Filed Aug. 16, 1978, Ser. No. 934,021

Claims priority, application France, Aug. 22, 1977, 77 25571

Int. Cl.³ F02B 37/00

U.S. Cl. 60—601 **7 Claims**



1. A power unit comprising:

an internal combustion engine capable of operating without supercharging,
a supercharging turbine-compressor unit whose turbine is connected to receive the exhaust gases of the engine and whose compressor is connected to supply compressed air to an intake pipe of the engine,
a non-return check valve connected to said intake pipe for admitting atmospheric air into said intake pipe in response to occurence of a subatmospheric pressure in said intake pipe,
a power control member movable between a maximum power position and an idling position,
a compressor inlet valve located in the air inlet of the compressor and movable between an open position and a closed position, operatively connected to said power control member for being biased toward closure when the latter is moved towards its idling position, at least beyond a pre-determined position, and for being moved toward full opening when the latter is moved towards its maximum power position,
locking means arranged to prevent closure of said compressor inlet valve,
and control means subjected to the air pressure delivered by the compressor and operatively associated with said locking means for rendering said locking means effective in response to the outlet pressure of the compressor being greater than a predetermined threshold.

4,233,815

METHODS OF SUPERCHARGING A DIESEL ENGINE, IN SUPERCHARGED DIESEL ENGINES, AND IN SUPERCHARGING UNITS FOR DIESEL ENGINES

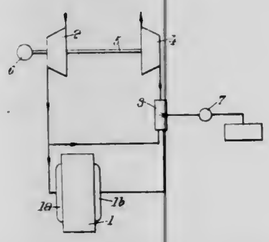
Jean F. Melchior, Neuilly-sur-Seine, France, assignor to Etat Francais, Paris, France

Division of Ser. No. 721,576, Sep. 8, 1976, Pat. No. 4,125,999, which is a division of Ser. No. 437,748, Jan. 29, 1974, Pat. No. 3,988,894, which is a continuation-in-part of Ser. No. 345,968, Mar. 29, 1973, abandoned, and a continuation-in-part of Ser. No. 384,566, Aug. 1, 1973, abandoned, which is a continuation of Ser. No. 139,080, Apr. 30, 1971, abandoned. This application Aug. 28, 1978, Ser. No. 937,141

Claims priority, application France, May 5, 1970, 70 16289; Apr. 6, 1972, 72 12113; Mar. 21, 1973, 73 10041

Int. Cl.³ F02B 37/00

U.S. Cl. 60—606 **11 Claims**



1. A method of operating an assembly of a supercharged diesel internal combustion engine and a turbine-compressor supercharger in which the turbine drives the compressor, said engine having an air intake manifold communicating with the compressor output and an exhaust manifold communicating with the turbine and having a compression ratio less than 12, a gas flow path being provided from the compressor to the turbine, a combustion chamber in the gas flow path, said method comprising the steps of:
(a) starting the turbine-compressor supercharger in rotation by separate starting means so as to initiate gas flow through the gas flow path to the turbine,
(b) igniting fuel in the combustion chamber to heat gases flowing through said gas flow path and entering the turbine so as to bring the turbine-compressor supercharger into self-maintaining operation at or above a minimum threshold speed sufficient for the compressor to deliver air at temperature and pressure conditions high enough to provide self-ignition of the air fuel mixture in the engine at the end of its compression strokes when the engine is just about to start,
(c) starting said engine with said air from the compressor at said temperature and pressure conditions entering the engine intake manifold,
(d) thereafter, while operating said engine and supercharger assembly after start-up, maintaining the speed of the turbine-compressor supercharger at or above said minimum threshold speed which provides temperature and pressure conditions sufficient to enable said self-ignition at the end of the compression strokes when the engine has begun to operate, said minimum threshold speed having a fixed value for an engine having a given compression ratio, said minimum threshold speed being lower for an engine having a higher compression ratio and being higher for an engine having a lower compression ratio and
(e) concurrently with each of said steps (a) through (d) maintaining said gas flow path constantly open.

4,233,816

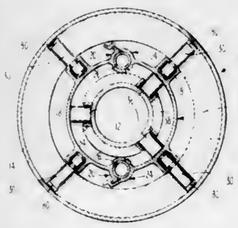
CRYOGENIC FLUID TRANSFER LINE

Steve L. Hensley, Columbus, Ohio, assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 8, 1979, Ser. No. 64,657

Int. Cl.³ F17C 7/02

U.S. Cl. 62—55 **6 Claims**



1. A cryogenic fluid transfer line comprising:
(a) an interior conduit for passage therethrough of cryogenic fluid;
(b) an exterior conduit concentrically spaced about said interior conduit, defining the exterior of said line;
(c) an annular heat transfer shield generally concentric with and interjacent to said interior and exterior conduits, comprising:
1. at least one longitudinally extending resilient arcuate member including a longitudinally extending generally arcuate hooking edge;
2. at least one longitudinally extending resilient arcuate member including a longitudinally extending generally arcuate catching edge;
said hooking and catching edge members being interlockingly engageable with each other when said member including the hooking edge is flexed to a smaller arcuate radius, positioned with said hooking edge disposed inwardly of said catching edge, and then relaxed; each set of engaged hooking and catching edges defining a hollow generally cylindrical nest having a substantially closed curved surface, each nest extending longitudinally substantially the length of said shield;
3. a longitudinally extending heat transfer conduit resident within each nest, retained therewithin by circumferential pressure exerted radially inwardly thereon by portions of said engaged arcuate hooking and catching edges defining said nest;

(d) first heat insulative spacer means for retaining said interior conduit within and spaced from said annular shield;
(e) second heat insulative spacer means for retaining said annular shield within and spaced from said exterior conduit;
(f) radiation shields concentric with said interior conduit and interposed between said interior conduit and said annular heat transfer shield, said first insulative spacer means passing therethrough; and
(g) radiation shields concentric with said exterior conduit and interposed between said exterior conduit and said annular heat transfer shield, said second heat insulative spacer means passing therethrough.

4,233,817

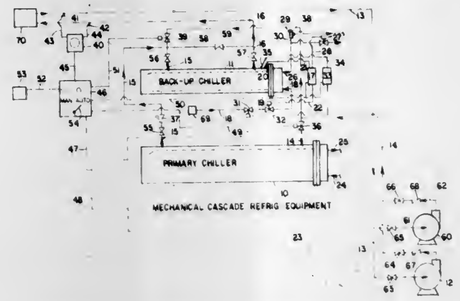
REFRIGERATION APPARATUS

Steven J. Toth, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 3, 1978, Ser. No. 957,465

Int. Cl.³ F25B 7/00, 25/00

U.S. Cl. 62—175 **9 Claims**



1. Refrigeration apparatus for maintaining the temperature in a circulating refrigerant at or below a predetermined level which comprises in combination a first chiller associated with a primary refrigeration system, a second chiller, a refrigerant pump, refrigerant conduits for circulating refrigerant in series through said pump and said first and second chillers, a first sensor for sensing the temperature of the circulating refrigerant and providing output signals based thereon, valve means associated with said second chiller and responsive to signals from said first sensor for supplying liquid nitrogen from a source to said second chiller whenever the temperature of the circulating refrigerant rises above a predetermined level, a second sensor for sensing the temperature of the circulating refrigerant and providing output signals based thereon, and valve means associated with said second chiller and responsive to signals from said second sensor for stopping the supply of liquid nitrogen to said second chiller whenever the temperature of the circulating refrigerant drops below a predetermined level.

4,233,818

HEAT EXCHANGE INTERFACE APPARATUS

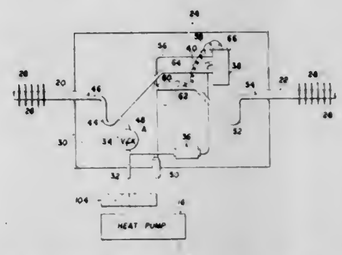
William R. Lastinger, 1533 Winding Way, Clearwater, Fla. 33516

Filed Jun. 23, 1978, Ser. No. 918,595

Int. Cl.³ F25B 13/00

U.S. Cl. 62—224 **6 Claims**

1. An apparatus for interfacing between heat exchange tubing, of the type designed to be installed along the perimeter of a generally enclosed space to modify temperature within the enclosed environment, and a working fluid device, including a compressor having an outlet or pressure side and an inlet or vacuum side and a fluid expansion member, for supplying a temperature modifying fluid to the heat exchange tubing for distribution along the perimeter of the generally enclosed space, said interfacing apparatus comprising:
first conduit means for connection at one end into a fluid path in the outlet side of the compressor, in a cooling mode of operation of the working fluid device, and for connection at the other end thereof into one end of the heat exchange tubing installed about the perimeter of the generally enclosed space;
second conduit means for connection at one end into a fluid path in the inlet side of the compressor, in a cooling mode of operation of the working fluid device, and for connection at the other end thereof into the other end of the heat exchange tubing installed about the perimeter of the generally enclosed space;
valve means interposed between said one end and said other end of said first conduit means for regulating the amount of working fluid, cooled by the fluid expansion member within the working fluid device, that passes from said first end to said second end of said first conduit means, said valve means comprising,



a variable, self-adjusting valve means for controlling the amount of cooling fluid flowing through the apparatus for interfacing;
temperature sensing means mounted upon said second conduit means and being operably connected to said valve means for adjusting said valve means in accordance with the temperature of the cooling fluid within said second conduit means;
third tubing means connected at one end into said second tubing means and at the other end into said variable, self-adjusting valve means for at least partially offsetting internal pressure with said valve means to facilitate opening said valve means;
liquid trap means formed intermediate the ends of each of said first conduit means and said second conduit means to isolate the inlet side of the compressor from liquid; and
eccentric coupling means connected between each of said first and second conduit means and a respective end of said heat exchange tubing for permitting liquid within the heat exchange tubing to pass into said trap means.

4,233,819

AUTOMATIC ICEMAKER WITH SIMPLIFIED ICE PIECE EJECTION

Richard L. Stottmann, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 3, 1979, Ser. No. 35,380

Int. Cl.³ F25C 1/10

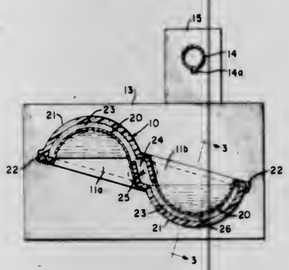
U.S. Cl. 62—349 **5 Claims**

1. An icemaker comprising:
a rotatable ice mold having a plurality of ice forming cups inverted and offset with respect to each other on opposite sides of the mold's axis of rotation, each of the cups having a concave wall in which ice pieces are formed and a back wall spaced from said concave wall and joined thereto so as to form an enclosed cavity between the walls, the cavities of cups adjoining on opposite sides of said axis of rotation being in fluid communication with each other;
a volatile liquid disposed in said cup cavity so as to be in

thermal contact with a substantial portion of the cup's concave wall when the cup is in its ice forming position;

means for rotating the mold between alternate ice forming positions in which the cavity of an upwardly facing cup is lower than the cavity of the adjoining downwardly facing cup with which it is in fluid communication; and

means for supplying a controlled amount of fresh water to the upwardly facing cup when in its ice forming position,



whereby heat from the fresh water volatilizes said liquid causing heated vapor to rise to the cavity of the higher cup where it condenses and transfers heat to the concave wall of the higher cup to release an ice piece held therein, the condensate thereupon returning to the lower cavity in which a new ice piece is being formed.

4,233,820

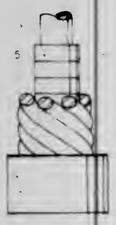
FLEXIBLE DRILL PIPE

W B Driver, 19 Sheridan Rd., Arnold, Md. 21012

Division of Ser. No. 799,088, May 20, 1977, Pat. No. 4,149,391. This application Feb. 14, 1979, Ser. No. 12,059

Int. Cl.³ F16C 1/02

U.S. Cl. 64—2 P **8 Claims**



1. A flexible drill pipe which comprises, a closed pitch cylindrical shaped coil of wire rod, a plurality of wire wound solid flexible shafts, an internal support assembly, a female tool joint attached to one end portion of said rod, a male tool joint attached to the other end portion of said rod, said internal support assembly being laid through said coil of wire rod and extending from said female tool joint to said male tool joint, said shafts being laid through said coil of wire rod wrapped around said assembly, respective ends of said shafts being attached to said female tool joint and said male tool joint, said assembly supports said shafts and said coil of wire rod under torsion loads and keeps said shafts and said coil of wire rod from collapsing under torsion loads, said assembly providing a means for drilling fluids to be pumped through said drill pipe, said assembly being constructed to provide an even distribution of flexibility over the length of said coil of wire rod.

4,233,821

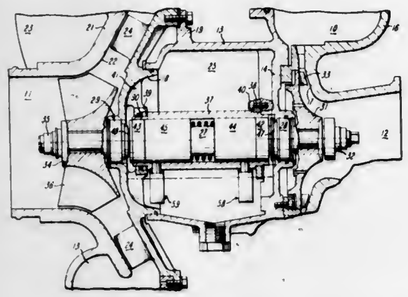
ROTOR SUPPORT

Dennis W. Desalve, Findlay, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Feb. 28, 1979, Ser. No. 16,113

Int. Cl.³ F16D 3/84

U.S. Cl. 64—32 R **5 Claims**



1. In a rotor assembly, a housing structure providing spaced apart walls, a rotor extending transversely of said walls, means providing bearing support for said rotor including a cartridge member in surrounding relation to said rotor and fixed at one end to one of said housing walls, said cartridge member extending toward another of said walls, said other wall having fixed thereto a collar receiving an opposite end of said cartridge in a telescoping relation, a resilient metallic C-ring installed between said cartridge member and said collar to be under an initial compression in the assembly of said cartridge member to said collar, and said means providing bearing support for said rotor including bearing means within said cartridge transmitting dynamic influences of said rotor to said cartridge member and through said cartridge member and said C-ring to said housing.

4,233,822

KNITTING METHOD AND MACHINE

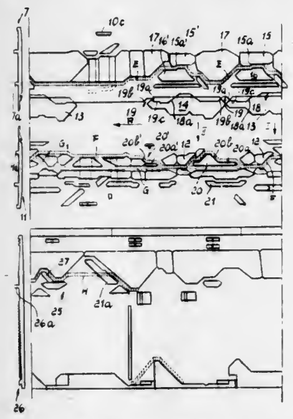
Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Apr. 10, 1978, Ser. No. 894,782

Claims priority, application Italy, Apr. 21, 1977, 22713 A/77

Int. Cl.² D04B 9/10, 15/06

U.S. Cl. 66—14 **7 Claims**



1. A method of manufacturing knitted garments on a double-cylinder circular knitting machine having an upper and a lower needle cylinder, latch needles therein including upper and lower cylinder needles, stitch sinkers within said lower needle cylinder, each of said stitch sinkers having a hook, and sliders for controlling said needles, comprising the steps of controlling said stitch sinkers to move in a projecting position and said upper and lower cylinder needles to pick up yarn and form loops in said yarn, holding said upper cylinder needles in a raised position after having formed said loops, withdrawing said stitch sinkers from said projecting position with said hooks engaging only portions of said yarn next to said lower cylinder needles, successively lowering, in a substantially complete manner, said upper cylinder needles while causing said stitch sinkers to newly project and to pick up portions of said yarn held between said upper cylinder needles, again withdrawing said stitch sinkers with said yarn portions, and controlling said lower and said upper cylinder needles to further pick up yarn only after said sinkers have been again withdrawn.

4,233,823

DOUBLE-CYLINDER CIRCULAR KNITTING MACHINE

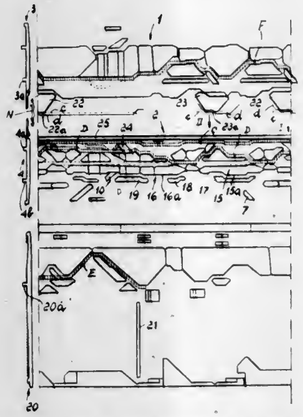
Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Apr. 10, 1978, Ser. No. 894,883

Claims priority, application Italy, Apr. 21, 1977, 22714 A/77

Int. Cl.² D04B 9/10, 15/08

U.S. Cl. 66—14 **4 Claims**



1. A double-cylinder circular knitting machine having an upper and a lower needle cylinder, latch needles movable therein, at least one yarn feed, sliders associated with said latch needles and having control butts, said sliders comprising sliders in said upper needle cylinder having said control butts movable along an upper knitting track to cause corresponding rib needles to knit in said upper needle cylinder, sliders within said lower needle cylinder having said control butts movable along a lower knitting track to cause corresponding needles to knit in said lower needle cylinder, and needle-free sliders within said lower needle cylinder corresponding to said rib needles knitting in said upper needle cylinder, a cam box having cams defining a non-knitting track for said control butts of said needle-free sliders, said non-knitting track having at least portions thereof at a level at which said needle-free sliders engage said rib needles before the latter take up yarn, to cause opening of the latches of said rib needles while said sliders in said upper needle cylinder corresponding to said rib needles move with said control butts along said upper knitting track, means for selectively bringing said needle-free sliders with said control butts into said non-knitting track and means for returning said needle-free sliders with said control butts into said lower knitting track, wherein said non-knitting track is above said lower knitting track all around said cam box.

4,233,824

WARP KNITTING OF DOUBLE JACQUARD-PATTERNED PILE FABRIC

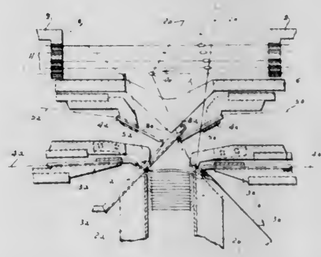
Manfred Schneider, Karl-Marx-Stadt, German Democratic Rep., assignor to Veb Textima Wirkmaschinenbau Karl Marx Stadt, Karl Marx stadt, German Democratic Rep.

Continuation-in-part of Ser. No. 45,852, Jun. 5, 1979, abandoned. This application Jun. 25, 1979, Ser. No. 51,415

Claims priority, application German Democratic Rep., Jun. 8, 1978, 205859

Int. Cl.³ D04B 23/02

U.S. Cl. 66—87 **17 Claims**



1. A method for producing a double patterned pile fabric on a warp-knitting machine,

the warp-knitting machine comprising two needle-rows, the needles of each needle-row being hooked and being mounted for longitudinal shifting motion between a cast-off position and an extended position,

each needle-row defining a general plane, the two general planes defined by the two needle-rows intersecting at a location towards which the needles of a needle-row move when longitudinally shifted from cast-off to extended position,

each needle of a needle-row being located substantially directly opposite to a corresponding needle of the other row and constituting therewith a needle-pair, the two needle-rows accordingly being constituted by a row of such needle-pairs,

the method comprising the steps of:

(a) longitudinally shifting one and then the other needle of each needle-pair, in alternation, from cast-off to extended position and back to cast-off position;

(b) feeding knitting threads, one per needle, to the needles of one needle-row and effecting the production of one ground fabric, and feeding further knitting threads, one per needle, to the needles of the other needle-row and effecting the production of another and corresponding ground fabric;

(c) feeding to each needle-pair a respective set of pile threads of which differing ones are at differing times in the production of the fabric to become patterning pile threads visible in the fabric's pile pattern, the feeding of each set of pile threads being performed using a respective set of individually displaceable pile-thread guiders;

(d) for so long as a given one of the set of pile threads is not to be a patterning pile thread, keeping it out of the vicinity of the position which the hooks of the needles of the needle-pair assume when in extended position in order that the non-patterning pile thread not be caught by the hook of either needle of the needle-pair, and instead tying the non-patterning pile thread into a first of the two ground fabrics in the form of an unlooped walewise-running thread;

(e) then, when such non-patterning pile thread is to become a patterning pile thread, displacing its pile-thread guider and thereby it in the direction from the first ground fabric towards the second ground fabric and laying it across the second needle of the needle-pair

when the second needle is in extended position, so that both the patterning pile thread and also a knitting thread be during return of the second needle to cast-off position caught in the second needle's hook to tie the pile thread into the second ground fabric in the form of a half-loop accompanied by a loop of knitting thread;

(f) then, with this patterning pile thread now extending between its pile thread guider and the case-off location of the second needle of the needle-pair, laying this pile thread across the first needle when the latter is in extended position so that both this patterning pile thread and also a knitting thread be during return of the first needle to cast-off position caught in the first needle's hook to tie this pile thread into the first ground fabric as a half-loop accompanied by a loop of knitting thread; and

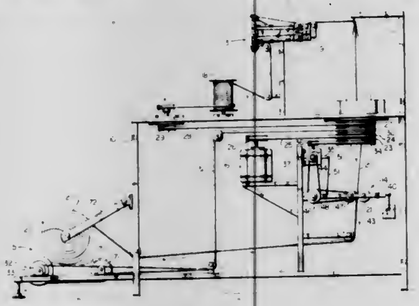
(g) then, when this patterning pile thread is to again become a non-patterning pile thread, displacing its pile-thread guider and thereby it towards one of the two ground fabrics and once more tying the now again non-patterning pile thread into the last-mentioned one of the two ground fabrics once more in the form of an unlooped walewise-running thread.

4,233,825

KNITTING MACHINE

Donald L. Glaspie, Dallas, Tex., assignor to Glitsch, Inc., Dallas, Tex.

Filed May 5, 1978, Ser. No. 903,214
Int. Cl.[2] D04B 35/24, 15/48, 15/88, 35/12
U.S. Cl. 66—125 A **11 Claims**



1. A knitting machine comprising:

a frame;

a knitting head and cylinder mounted on said frame in position to receive knitting filament fed thereto from above said cylinder and to deliver a tube of knitted fabric downwardly out of said cylinder;

take-down means mounted on said frame below said cylinder for tensioning said knitted tube and drawing it downwardly out of said cylinder;

take-up means mounted on said frame for receiving said knitted tube from said take-down means and winding it up into a roll;

knitting filament feed means mounted on said frame for feeding knitting filament to said knitting cylinder;

power means mounted on said frame for operating said knitting machine;

power train means connecting said power means to said knitting head, said knitting head to said take-up means, and said knitting head to said knitting filament feed means, whereby variations in knitting head speed are instantaneously compensated for by variations in the speed of said feed and take-up means;

said take-down means comprising:

a lever pivotally mounted on said frame;

a variable speed drive means having a throttle;

a pair of pinch rolls mounted on said lever for engaging said knitted tube and drawing it downwardly out of said cylinder;

a pulley and belt system interconnecting said drive means and said pinch rolls;

means for variably biasing said pinch rolls away from said cylinder; and

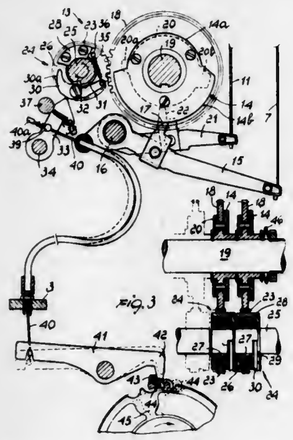
means for operating said drive means throttle to increase the speed of said drive means upon downward excursions of said throttle and decrease the speed of said drive means upon upward excursions of said throttle.

4,233,826

CONTROL DEVICE FOR STRIPER UNITS IN CIRCULAR KNITTING MACHINES

Francesco Lonati, Brescia, Italy, assignor to Construzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Oct. 11, 1978, Ser. No. 950,411
Claims priority, application Italy, Oct. 21, 1977, 28877 A/77
Int. Cl.[3] D04B 15/60, 15/80
U.S. Cl. 66—140 R **8 Claims**



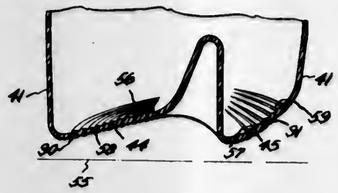
1. A control device for striper units in a circular knitting machine having at least one rotatable needle cylinder and at least one thread feed comprising a plurality of thread fingers, the device comprising a plurality of first cam disks each corresponding to one of said thread fingers, a common shaft for supporting said first cam disks, control levers each having cam follower means constantly engaging a respective one of first cam disks and each operatively connected to a corresponding one of said thread fingers to control said corresponding one of said thread fingers between an operative thread feeding position and an inoperative thread withdrawing position, a plurality of actuating members each rigid with a corresponding one of said first cam disks, said first cam disks and said actuating members being axially non-displaceable on said common shaft, a plurality of revolvable actuator elements each in constant engagement with a respective one of said actuating members, a rotatable drive shaft for idly supporting said actuator elements, said drive shaft being rotatable at a rotational speed bearing a predetermined speed ratio to the rotational speed of said at least one rotatable needle cylinder, and means for selectively coupling said actuator elements with, and uncoupling from, said drive shaft for predetermined time lapses wherein the respective of said thread fingers are displaced between said operative thread feeding position and said inoperative thread withdrawing position according to a machine knitting program.

4,233,827

UNSYMMETRICAL BASKET FOR AN ORBITAL CLOTHES WASHER

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,226
Int. Cl.[3] D06F 21/06
U.S. Cl. 68—172 **6 Claims**



1. A basket for an orbital washer comprising:

an annular outer wall;

a basket bottom wall;

a post projecting vertically upwardly from said basket bottom wall generally parallel to said outer wall and disposed generally centrally thereof;

said basket bottom wall comprising:

a first bottom portion sloping generally upwardly in the radial direction from said outer wall toward said post; said first bottom portion sloping continuously upwardly in the generally circumferential direction from a first circumferential position to a second circumferential position located axially above said first position; and

a second bottom portion sloping generally downwardly from said outer wall toward said post in the radial direction; said second bottom portion sloping continuously downwardly in the generally circumferential direction from said second positon to said first position; said first portion being disposed generally circumferentially opposite said second portion; and

said outer wall having on a first portion thereof adjacent said first bottom portion an inner surface having, over a substantial portion of its height extending vertically upward from the intersection of said outer wall and said first bottom portion, a resistance to relative motion of damp cloth in contact therewith greater than the resistance of said bottom wall to relative motion of said same damp cloth in contact with said bottom wall in the radially outward direction; and said outer wall having on a second portion thereof an inner surface adjacent said second bottom portion having a resistance to relative motion of said same damp cloth in contact therewith less than said resistance to relative motion of said first portion of said outer wall; and said post having a generally vertical smooth surface disposed adjacent said second bottom portion having a resistance to relative motion of said same damp cloth in contact therewith less than said resistance to relative motion of said first portion of said outer wall.

4,233,828

CHANGEABLE COMBINATION, AXIAL PIN TUMBLER LOCK WITH SINGLE INTERFACE

Robert L. Dauenbaugh, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Nov. 22, 1978, Ser. No. 963,156
Int. Cl.[3] E05B 27/00
U.S. Cl. 70—363 **12 Claims**

1. An improved changeable, axial pin tumbler lock cooperative with a service key for normal lock operation and cooperative with set keys for changing the lock tumbler combination for subsequent cooperation with a different service key, said lock comprising, in combination:

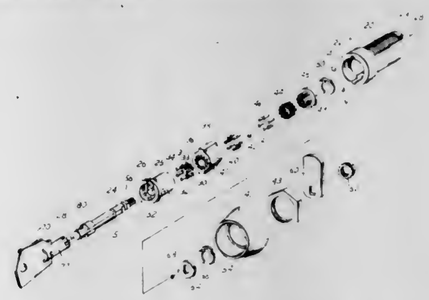
a fixed barrel having a center line axis, a shear surface transverse to the axis, and a plurality of (n) tumbler passages generally parallel to the axis and to each other, said passages arranged at equal radial distances from the axis;

a rotatable barrel rotatable about the axis and having a shear surface in opposed relation to the fixed barrel shear surface to define a single line of cleavage between the barrels, said rotatable barrel also including a front surface and less than (n) parallel, front tumbler passages, said front tumbler passages being arranged parallel to the axis and in alignment with selected fixed barrel passages when said lock is in the locked position, all of said rotatable barrel passages being at the same radial distance from the axis and also having the same cross sectional shape as the fixed barrel passages, those fixed barrel passages which are not selected for alignment defining storage passages;

bolt means attached to the rotatable barrel and operated in response to rotation of said rotatable barrel;

a plurality of changeable pin tumblers in the fixed barrel storage passages;

locking pin tumblers extending from the fixed barrel passages into the aligned rotatable barrel passages when in the locked position;



biasing means in the fixed barrel continuously biasing tumblers in the fixed barrel passages toward the rotatable barrel shear surface;

drive tumblers having inner tumbler ends in the rotatable barrel passages for engagement by the locking pin tumblers when the lock is in locked position and having opposite ends projecting toward the rotatable barrel front surface for cooperation with a key; and

means for retaining the drive tumblers in said rotatable barrel, said drive tumblers being arranged for engagement by a first service key or an identically bitted first change key for axial translation to position the inner tumbler ends at the single line of cleavage whereby the rotatable barrel may be rotated between a locked and unlocked position, at least one of said rotatable barrel passages being aligned with a fixed barrel storage passage when the lock is rotated to a combination change position, said first change key being removable at both the locked and combination change positions whereby at the combination change position a second change key with a distinct bitting may be inserted in the lock to transfer tumblers to or from the storage passage and thereby alter the lock combination.

4,233,829

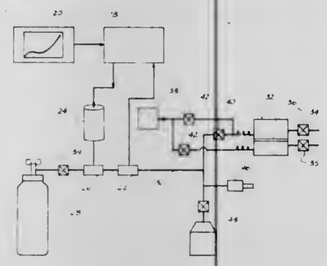
APPARATUS FOR SUPERPLASTIC FORMING

C. Howard Hamilton; Neil E. Paton, both of Thousand Oaks, and John M. Curnow, Agoura, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 839,243, Oct. 4, 1977. This application Oct. 10, 1978, Ser. No. 949,827
Int. Cl.[1] B21B 9/00
U.S. Cl. 72—38 **5 Claims**

1. An apparatus for superplastically forming a part comprising:

a die having a surface which is complementary to the shape of the part;
means for holding in said die at a forming temperature a blank of material which exhibits an effective value of strain rate sensitivity at a forming temperature;



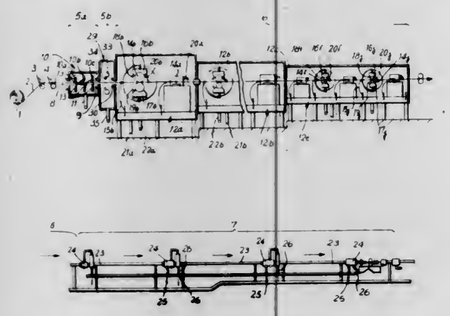
means for automatically applying a gas directly against a surface of said blank to create a pressure across the thickness of a portion of said blank in accordance with a predetermined relationship between time and the pressure required to form said blank against said surface of said die at a strain rate corresponding to said effective value of strain rate sensitivity of said blank.

4,233,830

METHOD FOR THE CONTINUOUS PRODUCTION OF A BRIGHT COPPER ROD BY THE ROLLING OF STOCK OBTAINED FROM A CONTINUOUS CASTING APPARATUS

Pierre Houdion, Vaires, France, assignor to Secim, Courbevoie, France

Continuation-in-part of Ser. No. 852,568, Nov. 17, 1977, abandoned, which is a continuation of Ser. No. 734,270, Oct. 20, 1976, abandoned. This application Nov. 14, 1978, Ser. No. 961,386
Int. Cl.³ B21B *9/00, 45/08*
U.S. Cl. 72—38 **3 Claims**



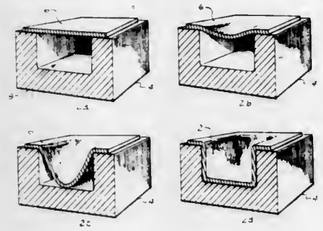
1. A method for the continuous production of bright copper rod from stock after discharge from a continuous casting machine, said stock having been exposed to air and being treated prior to entry into a rolling mill, said method including the steps of:
(a) initiating the breakage and separation of an oxide layer formed on the stock during its passage to the rolling mill by thermal shock and the chemical action of jets of a chemically active liquid at a relatively low pressure of 2–3 bars, the stock being subjected to this action of the low pressure jets for a time from 1 to 5 seconds before entry of the stock into the rolling mill,
(b) descaling said stock after initiation of the breakage of the oxide layer and before its entry in the rolling mill by projecting on said stock jets of liquid at a relatively high pressure of 200–220 bars thus eliminating the flakes of oxide partially detached from the stock during the preceding step, wherein the duration of said descaling is less than the time required for initiating the breakage and separation of the oxide layer as recited in step (b) to simultaneously effect descaling and to maintain said stock as a temperature enabling hot rolling,
(c) hot rolling said stock in said rolling mill in the presence of a cooling and lubricating liquid which isolates said stock from the outside atmosphere during its passage through said rolling mill, and,
(d) cooling the rod obtained from said rolling mill by passing said rod through a duct and causing cooling liquid to flow through said duct in a direction opposite to the direction of travel of said rod such that the rod leaves said duct at a temperature below 80° C.

4,233,831

METHOD FOR SUPERPLASTIC FORMING

C. Howard Hamilton, Thousand Oaks, and Edward D. Weisert, Rolling Hills Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1978, Ser. No. 875,279
Int. Cl.³ B21D *26/04*
U.S. Cl. 72—60 **8 Claims**



1. A method of forming a part comprising the steps of:
providing a blank of material having superplastic characteristics;
providing a die having a surface which is complementary to the shape of the part;
determining a relationship between time during forming and the pressure required to superplastically form said blank against said surface of said die at a suitable substantially constant strain rate;
positioning said blank relative to said die;
bringing said blank to within a temperature range at which said blank exhibits superplastic characteristics; and
applying pressure of varying magnitude to said blank in accordance with said relationship between time and pressure to induce tensile stresses in said blank and superplastically form said blank against said surface of said die.

4,233,832

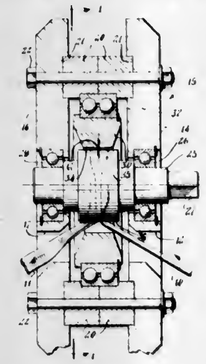
METHOD AND APPARATUS FOR ROLLING METAL WIRE OR ROD INTO WIDE, FLAT STRIPS

Douglas W. Rowell, Washington Ave., Woodbury, Conn. 06798

Filed Jan. 26, 1979, Ser. No. 6,659
Int. Cl.³ B21B *1/24*
U.S. Cl. 72—91 **13 Claims**

1. The method of rolling a metal wire for producing a wide, flat metal strip having a width W at least 4.0 times the original diameter D of the metal wire comprising the steps of:
providing an inner roll having a smooth exterior rolling surface and rotatable about a first axis;
providing an outer roll having a smooth interior rolling surface, said outer roll being mounted around said inner roll and being rotatable about a second axis;

said outer roll being rotatable in the same direction as said inner roll and having its axis eccentrically positioned with respect to said first axis for defining a converging throat between said opposed smooth exterior and interior rolling surfaces travelling in the same direction at the same speed toward a region of closest approach between said converging rolling surfaces;
one of said rolling surfaces having a tongue configuration;
the other of said rolling surface having a groove configuration and having an axial width W between the cheeks of said groove;
said tongue rolling surface fitting snuggly into said groove at said region of closest approach;
introducing a metal wire of diameter D longitudinally into said converging throat region;
moving said wire longitudinally through said region of clos-



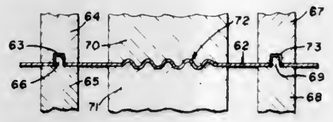
est approach between said smooth converging tongue and groove rolling surfaces travelling in the same direction;
said region of closest approach between said tongue and groove rolling surface defining a rectangular opening having a cross sectional area which is somewhat less than the original cross sectional area of the wire;
said converging throat defined between said opposed smooth tongue and groove rolling surfaces travelling in the same direction extending for a longitudinal distance of at least 4 D between the point where the wire first contacts the two smooth rolling surfaces and said region of closest approach; and
said metal wire being laterally displaced in said converging throat and in said region of closest approach for flattening and widening said metal wire into a wide strip having a width W at least 4.0 times the original diameter D of said wire.

4,233,833

METHOD FOR STRETCHING SHEET METAL AND STRUCTURAL MEMBERS FORMED THEREFROM

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,619
Int. Cl.³ B21D *13/04, 13/02, 47/02*
U.S. Cl. 72—180 **2 Claims**



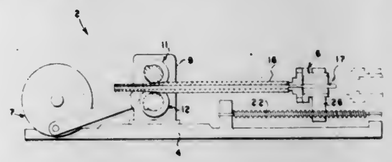
1. A method for forming a stud from a metal sheet in strip form while increasing the width of the sheet, which comprises providing a hem at each margin of the sheet substantially perpendicular to said sheet, said hem being of substantial width maintaining said hems in fixed relationship to each other by means of backup rolls and at the same time providing corrugations solely in a limited central area with respect to the width of said sheet while margins at the two edges of said sheet parallel to said corrugations are maintained flat, unstretched and in substantially fixed relationship to each other, thereby causing the metal at said corrugations to be stretched, at least partially reducing the depth of the corrugations by rolling to increase the width of said sheet, and forming said sheet to provide flanges, thereby forming a stud having certain limited areas of reduced thickness and the remainder of said stud of original thickness.

4,233,834

METHOD AND APPARATUS FOR PRODUCING ZIRCALOY TUBES AND ZIRCALOY TUBES THUS PRODUCED

Ulf A. Matinlassi, Kennewick, Wash., assignor to Sandvik Special Metal Corporation, Kennewick, Wash.

Continuation-in-part of Ser. No. 789,334, Apr. 20, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,757
Int. Cl.² B21B *17/06, 21/00*
U.S. Cl. 72—208 **5 Claims**



1. In a method of producting a metal-working pass upon a substantially cylindrical zircaloy reactor tube which includes the steps of, mounting a mandrel within a tubular zircaloy workpiece wherein the mandrel presents an outside cylindrical surface substantially mating with the internal surface of the workpiece with one end of the workpiece being positioned initially adjacent a work zone and in axial alignment therewith, moving said workpiece axially through said work zone in a step-by-step manner and turning it a predetermined turning angle about its axis with each step, rocking a pair of rolls with respect of said workpiece with said rolls exerting equal and opposite forces parallel to a plane which extends through the axis of said mandrel and transversely of the axes of said rolls and thereby exerting substantial forces upon primary working surfaces of the workpiece which are oppositely disposed thereon, with the workpiece having transverse working surfaces upon its opposite sides with their centers substantially along a line transverse of said plane, the improvement which comprises, positioning one of said rolls with its center upon one side of said plane and positioning the other of said rolls upon the other side of said plane, and wherein said turning of the workpiece is through a number of degrees which is greater than 35 and which is not divisible into 360, and the further step of restraining each of said rolls from being moved axially by the action of a component of the forces exerted by said rolls.

4,233,835

ELECTROSTATIC DISCHARGE TESTER

C. James Dahn, Chicago, Ill., assignor to Safety Consulting Engineers Inc., Rosemont, Ill.

Filed Apr. 23, 1979, Ser. No. 32,699
Int. Cl.³ G01N *33/22*
U.S. Cl. 73—35 **8 Claims**

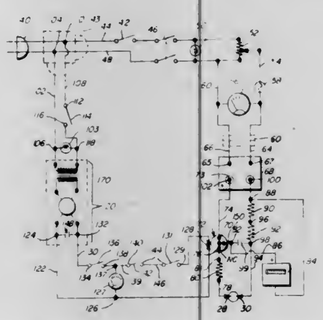
1. A test apparatus for determining the sensitivity of a substance to electrostatic discharge, comprising:
ignition electrode means including a pair of elongated generally cylindrical spark electrodes, and means for mounting said spart electrodes with respective end portions dis-

posed in a spaced relationship defining a spark gap therebetween;

activate means including output circuit means for storing electrical energy and energizing means for supplying energy to said output circuit means;

actuating means including switching means operable when enabled to connect said output circuit means to said spark electrodes to transfer the energy stored by said output circuit means to said electrodes whereby a high energy spark is generated in the gap between said electrodes;

and support means for positioning a sample of the substance adjacent to said spark electrodes to permit the sample to be subjected to the high energy spark generated in the gap,



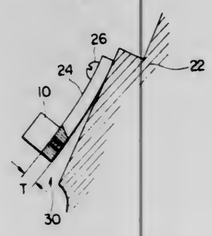
said support means comprising a hollow tubular member having an internal diameter of a fraction of an inch larger than the outside diameters of said electrodes, permitting the tubular member to be mounted on said electrodes with the end portion of one electrode extending through one end of the tubular member and the end portion of the other electrode extending through the opposite end of said tubular member whereby said tubular member is supported by said electrodes with said end portions of said electrodes extending axially therewithin, and said sample being contained within said tubular member and positioned in the spark gap between said electrodes.

4,233,836

KNOCKING DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kenji Yoneda, Fujisawa, and Yasuo Takagi, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 26, 1979, Ser. No. 33,347
Claims priority, application Japan, May 1, 1978, 53-59311[U]
Int. Cl.³ G01L *23/22*; G01M *15/00*
U.S. Cl. 73—35 **6 Claims**



1. A system for detecting the degree of knocking of an internal combustion engine, the system comprising:

a vibration sensing device which is attached to a body of an internal combustion engine and comprises a vibration pickup which has a housing and a seismic mass resiliently held in said housing and is capable of converting mechanical vibrations into electrical signals, and a resonance plate means fixed only in one end region thereof to said body of said engine for mechanically amplifying only those vibrations having a frequency within a band attributable to knocking of said engine, said housing of said vibration pickup being fixedly mounted on said resonance plate in a free end region distant from said one end region, said vibration sensing device, as an assembly of said pickup and said resonance plate, having a resonance frequency within a frequency band of vibrations attributable to knocking of said engine;

reference signal producing means for producing an electrical reference signal which is variable depending on the rate of revolution of said engine; and

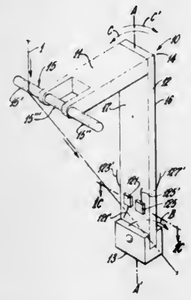
signal treatment means for producing an electrical knock-indicating signal which represents the degree of knocking of said engine based on a comparison of an electrical vibration-indication signal derived from said vibration sensing device with said reference signal.

4,233,837

APPARATUS FOR MEASURING TENSION IN A LINEAR MATERIAL

Sheldon A. Canfield, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 8, 1979, Ser. No. 10,442
Int. Cl.³ G01L *5/10*
U.S. Cl. 73—144 **14 Claims**



1. An apparatus for measuring tension in linearly extended flexible material, said apparatus comprising: (a) a support means; (b) a first member having one end attached to said support means; (c) means associated with said first member for engaging tensioned material to impart a bend thereto, thereby causing strain in said first member, said strain being produced by first and second moments, said first and second moments being separate moments; and (d) means for sensing said strain caused in said first member by only said first moment and for generating a signal responsive thereto as an indication of the tension in said material.

4,233,838

LOAD CONTROL FOR TIRE TEST MACHINE

Ariel Stiebel, Bloomfield Hills Township, Oakland County, Mich., assignor to Uniroyal, Inc., New York, N.Y.

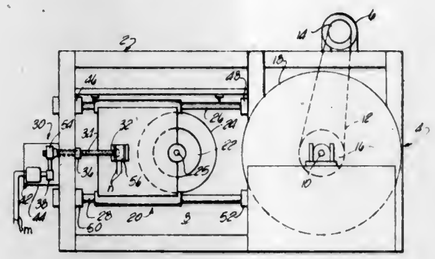
Filed May 22, 1979, Ser. No. 41,373
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 **12 Claims**

9. In a method for testing tires utilizing a rotating road wheel, movable tire holding means rotatably mounting a tire in loaded engagement with the road wheel, tire loading means, and control means for operating the loading means to thereby control the load on the tire, the steps comprising;

operating the control means to apply a load to said tire;

sensing the load applied to the tire and comparing the applied load with a desired load value;

producing an indication when the applied load differs from the desired load value; and



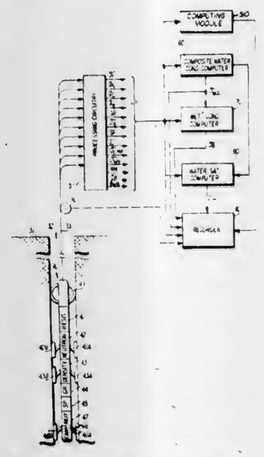
operating the control means only to reduce the applied load in response to said indication.

4,233,839

APPARATUS AND METHOD FOR DETERMINING CHARACTERISTICS OF SUBSURFACE FORMATIONS

George R. Coates, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 842,005, Oct. 7, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,186
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—152 **62 Claims**



1. Apparatus for determining a composite parameter of the formation water in formations surrounding a borehole, comprising:

means for deriving a first quantity representative of said parameter attributable to the free water in said formations;

means for deriving a second quantity representative of the fraction of bound water in said formations;

means for deriving a third quantity representative of said parameter attributable to the bound water in said formations; and

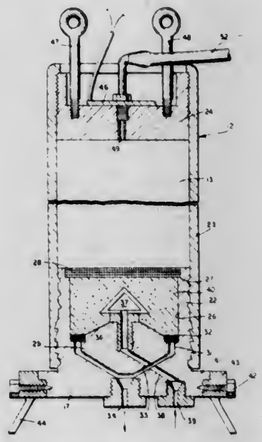
means for determining said composite parameter as a function of said first, second, and third quantities.

4,233,840

METHOD FOR EVALUATION OF THE RESPONSE OF DIFFERENT CORES TO A RECOVERY PROCESS AND APPARATUS THEREFOR

Michael J. Goss, Cochrane, and David A. Redford, Fort Saskatchewan, both of Canada, assignors to Texaco Canada Inc., Calgary, Canada

Filed Apr. 30, 1979, Ser. No. 34,233
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—153 **13 Claims**



1. Apparatus for treating a core specimen (13) of substrate which contains an amount of bitumen therein, to separate at least a part of the contained bitumen from the core specimen, which apparatus includes;

enclosure means (16, 21) defining a disconnectable fluid-tight chamber (11) communicated with a source of pressurizing gas (57, 14) for controlling the atmosphere within said chamber (11),

a specimen holder (12) removably positioned within said fluid-tight chamber (11) and having an enclosing sleeve (23) adapted to receive said core specimen (13),

conduit means communicating said specimen holder (12) with a source of a heating fluid for injecting a stream of said heating fluid into the specimen holder, whereby to raise the temperatures of a pressurized specimen (13) and thereby lower the viscosity of bitumen contained in said specimen,

at the lower end of said specimen holder (12) defining a collector (31) to receive bitumen which flows downwardly from said heated specimen (13).

4,233,841

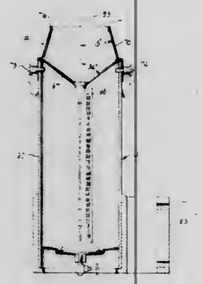
RAINWATER GAUGE

Alan C. Abele, R.D. 2, Box 132, Harmony, Pa. 16037

Filed Mar. 8, 1979, Ser. No. 18,737
Int. Cl.³ G01W *1/14*
U.S. Cl. 73—171 **12 Claims**

1. A rainwater gauge comprising, an upstanding elongated hollow housing open at the top end, an upstanding elongated hollow rainwater receiving flask open at the top end and disposed interiorly of the housing in spaced relation therein, and a hollow open-ended rainwater receiver funnel disposed on the top end of the housing for collecting rainwater and funneling it into the flask, said funnel having a lower portion having downwardly and inwardly converging walls converging to an outlet opening at the lower end of the funnel at an angle to the funnel vertical centerline of between fifty and fifty-eight degrees, and said funnel having an upper portion connected to said lower portion and having upwardly and inwardly converging walls converging to a rainwater receiving opening of a larger cross-

sectional area than said outlet opening at an angle to the funnel vertical centerline of between twelve and eighteen degrees,



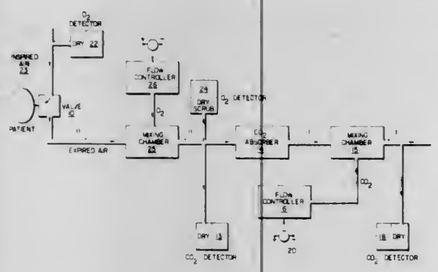
said funnel upper portion having a substantially greater axial height than said lower portion of the funnel.

4,233,842

APPARATUS FOR MEASUREMENT OF EXPIRATION FLUIDS

Daniel B. Raemer; Dietrich K. Gehmlich, and Dwayne R. Westenskow, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 20, 1978, Ser. No. 953,234
Int. Cl.[3] G01F *1/00*; A61B *5/08*
U.S. Cl. 73—861.04 **16 Claims**



1. A dynamic method for determining rate of expiration of a selected fluid constituent in a mixed flow of expired respiration fluids, comprising the recurring steps of:

a. exposing a first sample fraction of the expired fluids to detection means producing a first signal which is a function of concentration of said selected fluid constituent,

b. removing substantially all of said fluid constituent from a second fraction of the expired fluids,

c. exposing said second fraction to detection means producing a second signal which is a function of concentration of the selected fluid constituent,

d. comparing said first and second signals,

e. replenishing said second fraction of expired fluids with resupply of said fluid constituent at a sufficient flow rate to equalize the compared signals of the previous step, and

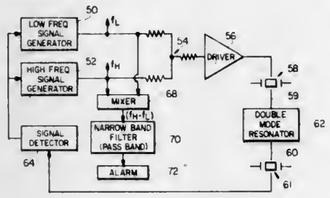
f. monitoring the flow rate to provide data for determining said rate of expiration.

4,233,843

METHOD AND MEANS FOR MEASURING TEMPERATURE USING ACOUSTICAL RESONATORS

John H. Thompson, Severna Park; George F. Gannon, Jr., Chester, and Fred G. Geil, Annapolis, all of Md., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 30, 1978, Ser. No. 955,634
Int. Cl.[3] G01K *11/26*
U.S. Cl. 73—339 A **18 Claims**



1. the method of measuring the temperature of an environment by sensing the response of a temperature sensitive acoustical resonator comprising

(a) providing in said environment a temperature sensitive resonator having at least two modes of vibration with a first resonant frequency and a second resonant frequency, said first and second resonant frequencies varying with temperature proportionately with said first frequency and said second frequency having a substantially uniform frequency difference,

(b) applying to said temperature sensitive resonator by waveguide means an acoustical signal including said first and second resonant frequencies,

(c) establishing the frequencies of said first resonant frequency and said second resonant frequency,

(d) comparing the frequency difference of said first resonant frequency and said second resonant frequency with said substantially uniform frequency difference thereby detecting if a spurious signal has been received, and

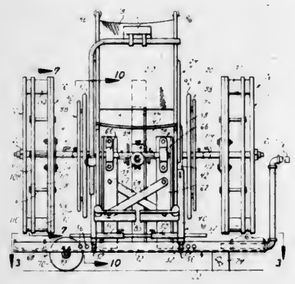
(e) determining the temperature of said environment from at least one of said resonant frequencies.

4,233,844

WHEELCHAIR ERGOMETER

Thomas E. Dreisinger, Moberly, and William L. Carson, Columbia, both of Mo., assignors to Cardrei Corporation, Moberly, Mo.

Filed Dec. 21, 1978, Ser. No. 971,891
Int. Cl.[3] G01L *5/02*
U.S. Cl. 73—379 **22 Claims**



1. A device to permit the stationary exercise of a subject by simulating the propulsion of a wheelchair comprising a chair means to support a subject in a sitting position, a support to elevate said chair means and device above its supporting surface, a central shaft rotatably secured to said support, means secured to said shaft to permit said subject to apply a force to said shaft, means to apply a braking force directly to said shaft to thereby resist rotation of said shaft by said subject, means to measure the force applied by the subject to the shaft, and means secured to said central shaft to compensate for translational inertia whereby the subject may simulate the propulsion of a wheelchair by sitting in the chair means and applying a force to the central shaft.

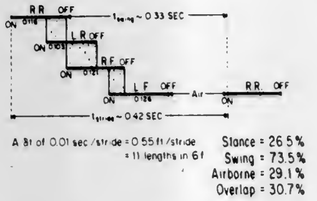
10. A stationary wheelchair ergometer for measuring the energy supplied by a subject in an exercise bout comprising a support, a wheelchair superstructure secured to said support, and elongated central shaft mounted transversely to said wheelchair superstructure and rotatably supported from said support, means to apply a braking torque to said shaft, a torque platform fixedly secured to said braking means, bearing means between said platform and said support so that rotation of said central shaft pivots said torque platform and said braking means, means to measure the angle formed between said torque platform and said support as said shaft is rotated, and means to measure the speed of rotation of said shaft.

4,233,845

METHOD OF ASSESSING PERFORMANCE POTENTIAL OF A QUADRUPED

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 28, 1978, Ser. No. 928,654
Int. Cl.[3] G01D *21/00*
U.S. Cl. 73—432 R **12 Claims**



1. A method of assessing the performance potential of a quadruped, that comprises:

causing the quadruped to move at a high speed gait;

determining the timing of successive making and breaking of ground contact by the legs of the quadruped during its stride in said gait;

measuring the overlap time during said stride;

measuring the speed of said gait;

and producing and displaying an output dependent upon the overlap time at said speed.

4,233,846

METHOD AND APPARATUS FOR MEASURING THE IMBALANCE OF A BOWLING BALL

Wilson G. Taylor, P.O. Box 42517, San Gabriel, Calif. 90050

Filed Jul. 31, 1979, Ser. No. 62,359
Int. Cl.[3] G01M *1/04, 1/16*
U.S. Cl. 73—460 **16 Claims**

1. An apparatus for measuring the imbalance of a bowling ball comprising:

a base;

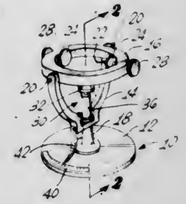
a first gimbal;

means for mounting said first gimbal on said base so as to permit rotation of said first gimbal about a first axis;

a second gimbal;

means for mounting said second gimbal on said first gimbal so as to permit rotation about a second axis perpendicular to said first axis; and

means for rotatably supporting a bowling ball on said second gimbal, whereby said ball can be placed in a desired orientation and rotated while supported by said second gimbal and gyroscopic precession can be observed.

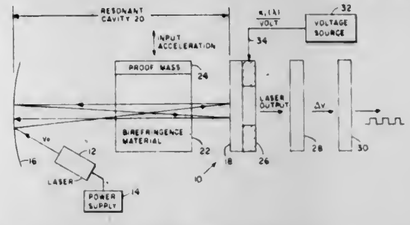


4,233,847

PASSIVE LASER ACCELEROMETER

Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803

Filed Jul. 2, 1979, Ser. No. 54,373
Int. Cl.[3] G01P *15/08*; G01B *11/18*
U.S. Cl. 73—517 R **8 Claims**



1. A passive laser accelerometer comprising:

(a) first and second reflective members disposed in spaced relation forming a resonant cavity;

(b) a birefringent material having a proof mass thereon disposed in said resonant cavity;

(c) means external of said resonant cavity for generating a beam of coherent light said beam disposed to be reflected back and forth between said reflective members and through said birefringent material, part of said beam disposed for passing through said second reflective member.

(d) means for changing the effective length of said resonant cavity;

(e) detector means for receiving said part of said beam and for providing an output which is a beat frequency proportional to accelerations acting on said accelerometer.

4,233,848

STRAIN GAUGE PRESSURE TRANSDUCER APPARATUS HAVING AN IMPROVED IMPEDANCE BRIDGE

Hideo Sato, Hitachi; Kanji Kawakami, and Motohisa Nishihara, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1978, Ser. No. 971,358
Claims priority, application Japan, Jan. 6, 1978, 53-160; Jun. 2, 1978, 53-65751
Int. Cl.[3] G01L *9/06*
U.S. Cl. 73—727 **10 Claims**

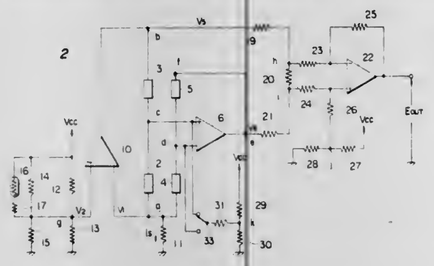
1. A strain gauge pressure transducer apparatus comprising:

an impedance bridge having first and second arms, each of which includes two series-connected pressure transducer elements of strain gauges formed on a thin wall semiconductor diaphragm to which a pressure to be detected is applied, first ends of the first and the second arms being electrically connected to each other;

an excitation source, one pole of which is connected to the junction to said first ends of the first and the second arms

of said impedance bridge and the other pole to the other end of the first arm; and

an operational amplifier having non-inverting and inverting inputs which are respectively connected to intermediate



nodes of the first and the second arms of said impedance bridge, the output of the operational amplifier being electrically connected to the other end of the second arm of said impedance bridge.

4,233,849

METHOD FOR MEASURING THE FATIGUE OF A TEST-PIECE SUBJECTED TO MECHANICAL STRESS

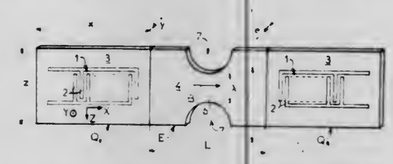
André Defebvre, Lambersart, and Jean Pouliquen, Santes, both of France, assignors to Agence National de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Feb. 6, 1979, Ser. No. 9,827

Claims priority, application France, Feb. 16, 1978, 78 04995

Int. Cl.³ G01N *3/32*

U.S. Cl. 73—812 **13 Claims**



1. A method for measuring the fatigue of a test-piece subjected to stress by measuring the acoustic attenuation of ultrasonic waves, comprising affixing to said test-piece ultrasonic transmitting and receiving means at opposite sides respectively of an area of said test-piece to be stressed, applying stress to the test-piece in said area, propagating ultrasonic pulses of predetermined frequency in an open circuit along the test-piece from said transmitting means to said receiving means at different degrees of stress, measuring the acoustic attenuation of said pulses, and evaluating said attenuation in terms of fatigue.

4,233,850

HAND TOOL

Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

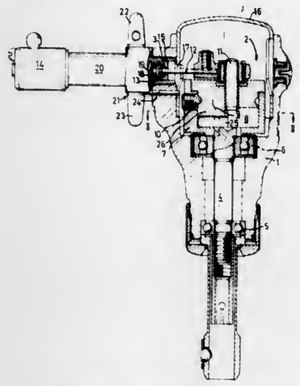
Filed Sep. 7, 1978, Ser. No. 940,363

Claims priority, application Switzerland, Sep. 14, 1977, 102986/77

Int. Cl.³ F16H *21/22*

U.S. Cl. 74—44 **1 Claim**

1. Hand tool, comprising two moving parts, specifically a rotating part (2) and a reciprocating part (3), the latter part (3) being intended to carry a machining tool and receiving its movement from the first-mentioned rotating part (2) via a crank mechanism (11,12) with variable eccentricity for adjusting the length of stroke of the reciprocating part, for this purpose a crank pin (11) in the crank mechanism being eccentrically disposed on a rotatable slide (9) which can be locked fast in various positions, said slide being in turn eccentrically journalled in rotatable slide holder (7) which receives rotating movement from the drive means of the hand tool, characterized in that counterweights (25,26) are disposed in the slide holder (7) and in the slide (9) in order to achieve together a counterbalancing, corresponding to the varying lengths of stroke, of the movements of the reciprocating part (3), said counterweights (25,26) being disposed, upon setting of the crank mechanism (11,12) in order to obtain the desired length of stroke, to either work in conjunction or in opposition, and are therefore rotatable relative to one another to an extent corresponding to the relative movements of the slide (9) and



the slide holder (7), the counterweights (25,26) being securely joined to the slide (9) and the slide holder (7) respectively and being rotatable relative to one another by the slide being rotatable in the slide holder, the counterweights (25,26) being rotatable relative to one another in adjacent parallel planes, which overlap one another, the counterweights (25,26) having the form of semicircular discs, one (26) of which is made as one piece with the slide (9) and is located at the interior end of the same in the slide holder (7), and one (25) of which is located and fastened in the bottom of a space (8) in the slide holder (7) for the slide (9).

4,233,851

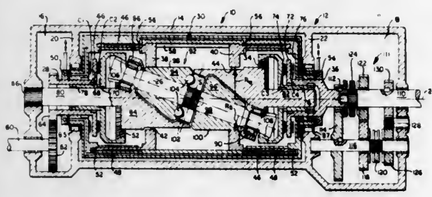
INFINITELY VARIABLE TRANSMISSION UNIT AND METHOD

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Filed May 4, 1979, Ser. No. 36,231

Int. Cl.³ F16H *15/16*

U.S. Cl. 74—191 **28 Claims**



1. In an infinitely variable transmission having a power input, a power output, and means to transmit power from said input to said output including an alpha body concentric with a first axis and rotatably supporting a beta body having a pair of traction surfaces of revolution about a second axis intersecting the first axis at a point of axes intersection, the traction surfaces on the beta body being in engagement on opposite sides of the point of axes intersection with a pair of traction surfaces of

revolution about the first axis and carried on an omega body concentric with the first axis, the radius ratio of traction surfaces on the respective beta and omega bodies varying between minimum and maximum values by axial shifting of the points of traction surface engagement relative to the point of axes intersection, the improvement comprising:

means for connecting said power input with and to impose a driving torque on one of said alpha, beta and omega bodies;

means for retaining another of said bodies against rotation to impose a reaction torque thereon, said driving torque being transmitted through said traction surfaces to impose a driven torque on the remaining one of said three bodies;

means for connecting the remaining one of said bodies to drive said power output; and

means to alternate the imposition of at least two of said driving, reaction and driven torques on at least two of said bodies to provide different ranges of input/output speed ratios, the speed ratios in each such range being variable between range end limits determined by adjustable values of the radius ratio of the traction surfaces.

4,233,852

MECHANICAL POWER TRANSMISSION SYSTEM

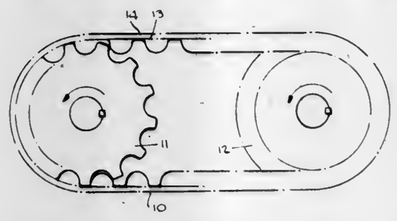
James A. Bruns, Itasca Pengilly, Minn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Dec. 8, 1978, Ser. No. 967,768

Claims priority, application United Kingdom, Dec. 14, 1977, 51992/77

Int. Cl.³ F16H *7/02*

U.S. Cl. 474—153 **39 Claims**



1. A pulley for use with a flexible drive belt which has a plurality of teeth, the pulley comprising a plurality of teeth separated by grooves, each pulley groove being symmetrical about its radial center-line and having a substantially U-shaped longitudinal cross-section comprising first and second non-intersecting curved lines defining parts of opposed flanks of the groove, each curved line being, or approximating to, an arc of a circle drawn from a center lying within the area of the groove, and extending to a height that is at least 25% of the depth of the groove, a first connecting line connecting the first and second curved lines and defining the base of the groove, a second connecting line connecting the first curved line to the tip of a first adjacent tooth and a third connecting line connecting the second curved line to the tip of a second adjacent tooth, each tooth tip, when seen in longitudinal cross-section, comprises third and fourth non-intersecting curved lines joined respectively to the second connecting line of one groove and the third connecting line of an adjacent groove, each of the third and fourth curved lines being, or approximating to, an arc of a circle, and a fourth connecting line connecting the third and fourth curved lines, the length of the fourth connecting line is from 2% to 100% of the width of the belt tooth on the belt with which the pulley is to be used.

4,233,853

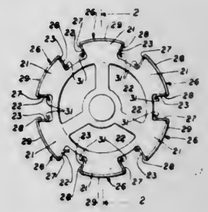
BELT PULLEY

William G. Holz, 207 W. Vine, Lodi, Calif. 95240

Filed Oct. 16, 1978, Ser. No. 951,680

Int. Cl.² F16H *55/36, 55/52*

U.S. Cl. 74—185 **10 Claims**



1. A belt pulley comprising:

a shaft;

a plurality of disc-shaped members adapted for coaxial mounting in longitudinally spaced relation on said shaft for rotation therewith and each being formed with a plurality of circumferentially spaced radially outstanding protuberances, each having opposite radially extending circumferentially spaced sides;

a plurality of elongated channel-shaped members having spaced apart side walls and a connecting wall and dimensioned to embrace said protuberances with said side walls in bearing support with said protuberance sides and said connecting walls positioned at the radially outer extremities of said protuberances and extending between said disc-shaped members for supporting engagement with a belt entrained around said channel-shaped members; and

said channel-shaped members being formed of resilient sheet metal with said connecting wall of concavo-convex form, convex outwardly with respect to said side walls and pulley to provide a plurality of substantially circular segments about said shaft.

4,233,854

MOUNTING ARRANGEMENT FOR MOUNTING A PISTON COMPRESSOR ATTACHED AS AN AUXILIARY MACHINE TO AN INTERNAL COMBUSTION ENGINE

Herbert Schleiermacher, Brühl, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 42,880

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2823992

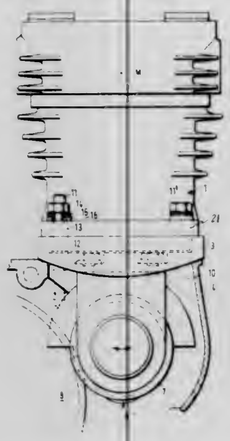
Int. Cl.³ F03B *11/02*

U.S. Cl. 74—325 **6 Claims**

1. A mounting arrangement for mounting a piston compressor to be operatively associated as an auxiliary machine of an internal combustion engine which includes a transmission system and a housing for said transmission system, said piston compressor including an open crank assembly with an extended crankshaft for a gear wheel engageable with a gear of said transmission system, and a mounting flange surface portion, said mounting arrangement comprising:

an intermediate flange member arranged between said mounting flange surface portion and said housing for said transmission system, said intermediate flange member having a flange surface which is directed towards said housing and is axis-parallel with and cylindrically arched toward said gear wheel; and

a matching concave surface portion on said housing, whereby said intermediate flange member is radially mov-



able in the circumferential direction of said flange surface of said intermediate flange member.

4,233,855

MECHANISM FOR THE AXIAL SHIFTING OF AN ANTI-FRICTION BEARING

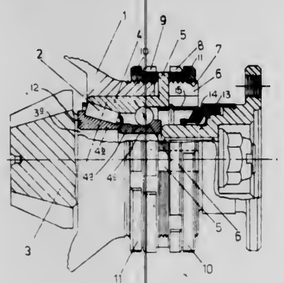
Armin Olschewski; Heinrich Kunkel, both of Schweinfurt; Manfred Brandenstein, Aschfeld, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,654

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726080

Int. Cl.³ F16H *35/06*

U.S. Cl. 74—396 **6 Claims**



1. Mechanism for axially shifting an anti-friction bearing mounted in a bore of a housing extension (**1**) or the like comprising an annular member (**4**) mounted in said bore, at least one radially outwardly directed protrusion (**5**) connected to said annular member projecting through an axially extending slit (**6**) in said extension (**1**), the outer peripheral surface of said extension being provided with threads (**7**) adjacent said slit and two adjusting locking nuts (**8, 9**) engageable on said thread (**7**) on opposite sides of said protrusion (**5**) thereby permitting axial adjustment of said annular member in either axial direction and locking said annular member in a predetermined position against axial displacement in either direction.

4,233,856

Patent Not Issued For This Number

4,233,857

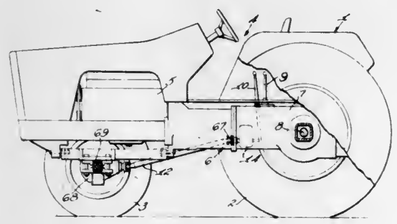
MULTIPLE SPEED TRANSMISSION WITH AUXILIARY TRANSFER DRIVE

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 2, 1978, Ser. No. 911,779

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—665 GA **10 Claims**



1. A vehicle transmission comprising, an input shaft and an output shaft rotating about a common axis, a countershaft rotating about a parallel axis, an input countershaft gearset connected between said input shaft and said countershaft for driving said countershaft, an output countershaft gearset connected between said countershaft and said output shaft for driving said output shaft device, a clutch for selectively and alternatively engaging a clutch on said output shaft and the countershaft with said output countershaft gearset, means connecting the output gear in said output countershaft gearset to said output shaft for rotating at the same speed as said output shaft, a transfer gear driven by said output gear of said output countershaft gearset for driving an auxiliary drive mechanism from said output gear.

4,233,858

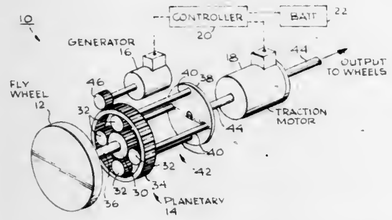
FLYWHEEL DRIVE SYSTEM HAVING A SPLIT ELECTROMECHANICAL TRANSMISSION

Beb H. Rowlett, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 27, 1976, Ser. No. 754,597

Int. Cl.³ F16H *37/06*; B60K *1/00, 41/04*

U.S. Cl. 74—675 **30 Claims**



1. A combination electromechanical drive system utilizing a flywheel as the principal power source, comprising:

a flywheel mounted for rotation within a housing and having a shaft connected thereto;

a differential planetary transmission having a sun gear, a plurality of planet gears coupled to a carrier, and a ring gear together with first, second and third terminals, the first terminal being coupled directly to the flywheel shaft;

a first output shaft coupled to the second terminal in a first mechanical power transmission path; and

a second electrical power transmission path comprising first and second motor/generator machines electrically connected together with a controller to control the amount of electric power transmitted thereby, the first machine being mechanically coupled to the planetary transmission third terminal and the second machine having a second output shaft for transmitting rotary mechanical power.

4,233,859

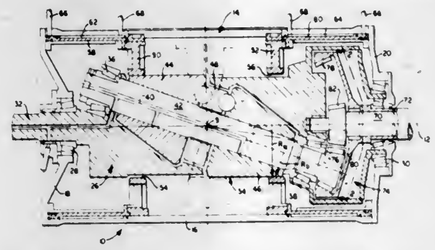
INFINITELY VARIABLE TRANSMISSION UNIT AND SYSTEM INCORPORATING SAME

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Continuation of Ser. No. 955,264, Jul. 31, 1979, abandoned. This application Oct. 1, 1979, Ser. No. 80,221

Int. Cl.³ F16H *37/06*; F16F *15/16*

U.S. Cl. 74—690 **13 Claims**



1. An infinitely variable torque transmission system comprising:

a system input;

a system output;

an I.V. unit including an alpha body rotatable on a first axis and drivably connected with said system input, a beta body having a beta rolling surface of revolution about a second axis, said beta body being carried by said alpha body so that said second axis is inclined with respect to and intersecting said first axis at a point of axes intersection, and an omega body having an omega rolling surface of revolution about said first axis, one of said beta and omega rolling surfaces being of variable radii whereas the other of said rolling surfaces is of relatively constant radius, said rolling surfaces being in frictional engagement at each other at a contact point, means for adjusting the position of said contact point to vary the ratio of said rolling surface radii, a pair of rotatable unit output shafts, first fixed ratio means for combining movement of at least two of said alpha, beta and omega bodies to drive one of said unit output shafts in a first range of unit output speeds for a given system input speed dependent on variation of said ratio of rolling surface radii and second fixed ratio means for combining movement of the same two of said alpha, beta and omega bodies to drive the other of said unit output shafts in a second different range of unit output speeds for said given input speed dependent also on variation of said ratio of rolling surface radii; and

means for alternately coupling one or the other of said unit output shafts to said system output and to provide at least two system ranges of output/input speed ratios.

4,233,860

CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION WITH EMERGENCY OPERATION FEATURE

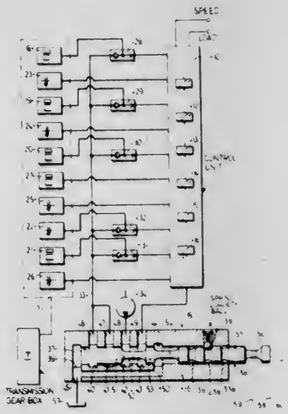
Volker Kadelbach, Freiberg; Gerhard Will, Weinstadt, and Joseph Sauer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,367

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715553

Int. Cl.³ F16H *3/74*

U.S. Cl. 74—752 A **10 Claims**



1. Control system for an automotive, automatic magnetically controlled gear change transmission (T) and permitting operation of the transmission under emergency condition upon failure of automatic control having

means (**34**) providing a source of pressurized hydraulic fluid;

a hydraulic servo unit (**17**) including a plurality of hydraulic servo elements (**18–27**);

and an automatic control unit (**10**) including a plurality of electrically controlled valves (**11–16**), said valves selectively controlling said servo elements upon selective energization of said valves to command engagement of selected gears of the transmission (T) in accordance with selected operation of the controlled valves,

and comprising, in accordance with the invention,

a valve means (**35**) interposed between the pressure fluid source (**34**) and the control unit (**10**) having three positions (**58, 59, 60**), said valve means controlling application of pressure fluid from said source (**34**), selectively,

(1) when the valve is in a first position (**58**) forming the position for normal operation, to the control unit (**10**), to provide for control of the servo elements by said valves of the control unit,

(2) when the valve is in a second position (**59**), directly to the servo elements (**18, 19, 20, 21, 22**) controlling placement of the transmission gear box (T) in "reverse" gear, and

(3) when the valve is in a third position (**60**), interrupting application of pressurized fluid to the control unit (**10**) and hence to the servo unit (**17**) whereby the transmission (T) will be placed in disengaged or "neutral" position.

4,233,861

CHANGE-SPEED TRANSMISSION

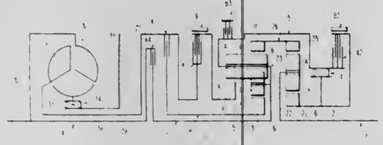
Hermann Gaus, Stuttgart, and Jürgen Pickard, Wernau, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 23,762

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813223

Int. Cl.³ F16H 57/10

U.S. Cl. 74—763 11 Claims



1. A change-speed transmission which includes an input shaft adapted to be driven by a prime mover, an output shaft adapted to be coupled with wheels of a vehicle, a forward and rearward planetary gear system for drivingly connecting the input shaft to the output shaft, the forward planetary gear system including a double carrier means for mounting two planetary gear means, one of the planetary gear means being adapted to mesh only with a first sun gear of the forward planetary gear system, the other planetary gear means being adapted to mesh with a second sun gear of the forward planetary gear system and with a ring gear means, one of the sun gears is adapted to be driven by the input shaft and the other sun gear is adapted to be fixedly braked, a first torque transmitting connection means for drivingly connecting the carrier means with a first transmission member of the rearward planetary gear system, a second torque transmitting connection means for drivingly connecting the ring gear means with a second transmission member of the rearward planetary gear system, and a change-speed clutch means arranged in one of the torque transmitting means for producing a direct transmission of the rearward planetary gear system, characterized in that the change-speed clutch means is arranged in the first torque transmitting means, a gear shifting clutch means is operatively connected with the carrier means and the input shaft for enabling a driving of the carrier means by the input shaft, the second sun gear of the forward planetary gear system is arranged between the first sun gear and the output shaft, and in that a further gear shifting clutch means is operatively connected with the input shaft and the sun gear for enabling a driving of the second sun gear by the input shaft.

4,233,862

DEVICE FOR SELECTING CHARACTERISTICS OF A TRANSMISSION BETWEEN A MOTOR AND ITS LOAD

Andre M. E. Richard, La Celle-Saint-Cloud, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

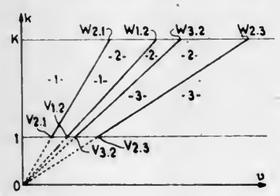
Continuation-in-part of Ser. No. 593,117, Jul. 3, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,481

Claims priority, application France, Jul. 5, 1974, 74 23394; Jun. 25, 1975, 75 19959

Int. Cl.³ B60K 41/04

U.S. Cl. 74—866 15 Claims

1. A device for selecting characteristics of a transmission associated with a motor, in particular for an automobile vehicle, the transmission having an output shaft and permitting a plurality of transmission ratios to be selected, the device comprising a generator of electric signals coupled to the output shaft of the transmission and having an output at which output the generator is capable of generating a first alternating signal whose frequency and amplitude are proportional to the speed of the output shaft of the transmission, means having an output for producing from said first alternating signal an additional electric signal whose level is exclusively a function of the load of the motor, said means for producing said additional signal being connected to the output of said generator and comprising a circuit for integrating with respect to time said first alternating signal, means for producing from said first and additional signals characteristics of change between the ratios of the transmission, means connected to the outputs of the generator and of the means for producing said additional signal, for weighting and comparing said first signal and said additional signal and having outputs at which outputs there is produced signals periodically representing the desired state of the transmission, and means for memorizing the desired state of the transmission, connected to said outputs of the weighting



and comparing means, said memorizing means being capable of causing a change from one ratio to a next ratio of the transmission as a function of the said signals produced by said outputs of the weighting and comparing means, which is indicative of the desired state of the transmission said transmission having n ratios, said weighting and comparing means comprising n−1 pairs of weighting and comparing circuits each comprising a weighting and comparing circuit for producing the characteristic of change from one ratio of the transmission to the next higher ratio and a weighting and comparing circuit for producing the characteristic of change in the opposite direction, a memorizing circuit being connected to each pair of weighting and comparing circuits.

4,233,863

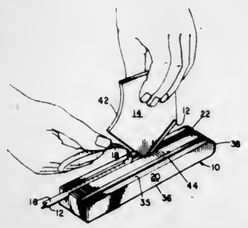
FOIL APPLICATOR TOOL

William C. Cooper, and Alberto A. Garcia, both of Seattle, Wash., assignors to Linda F. O'Brien, Seattle, Wash.

Filed Jun. 13, 1978, Ser. No. 915,276

Int. Cl.³ B31F 1/00; B25B 27/00

U.S. Cl. 81—3 R 3 Claims



1. A foil applicator tool for applying foil strip to the marginal edges of glass panels comprising a body having a substantially planar surface and an adjacent curved surface and having an elongated groove including means for receiving and supporting the foil strip in an unfolded condition which forms an upper portion of the groove and means for closely receiving the marginal edge of the glass panel and foil about the panel edge which forms a lower portion of the groove which is narrower than the upper portion and wherein the body defines the groove such that it extends over the planar surface in a parellel relation thereto and the curved surface following the curvature thereof.

4,233,864

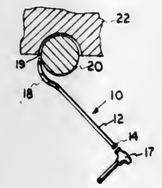
UPPER MAIN BEARING REMOVAL TOOL

Abel Gutierrez, Jr., 169 Dolores St., Oswego, Ill. 60543

Continuation of Ser. No. 776,310, Mar. 10, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 950,989

Int. Cl.³ B25B 27/14

U.S. Cl. 81—3 R 11 Claims



1. A tool for removal of an upper main bearing of an engine from a position between an external cylindrical crankshaft surface and an internal semi-cylindrical engine block surface, comprising: a straight elongated handle section and an arcuate blade section integrally secured at one end to one end of said handle section, said blade section extending from said one end thereof to an opposite free end having a flat face for engagement with one end of said upper main bearing, said handle section extending from said one end thereof to an opposite free end having a flat face for application of tapping forces by an impact tool, said flat face of said free end of said blade section being engageable with one edge of said upper main bearing while tapping forces are applied to said flat face of said free end of said handle section with the tapping forces being transmitted through said tool to said main bearing, said blade section being substantially rigid but relatively thin and having an arcuate length of between 90 and 180 degrees, short enough for effective transmission to said main bearing of impact forces applied from said handle section but long enough for effecting removal of the major portion of said main bearing from said position.

4,233,965

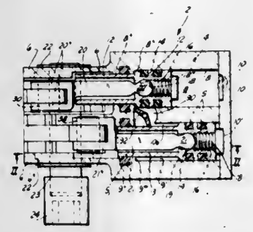
HYDRAULIC WRENCH

John K. Junkers, 7 Arrow Head La., Saddle River, N.J. 07458

Filed Apr. 25, 1979, Ser. No. 35,469

Int. Cl.³ B25B 13/00

U.S. Cl. 81—57.44 16 Claims



1. A hydraulic wrench comprising a housing having a main portion and a portion projecting forwardly from said main portion; a pair of parallel cylinder bores in said main portion of said housing, having each an open front end and a closed rear end; a pair of axially displaced piston means respectively mounted in said cylinder bores movable between an active forward stroke and a return stroke, said piston means forming with said closed ends of said bores a pair of compartments; a pair of piston rods, each pivotally connected at one end to a respective one of said pair of piston means; a shaft mounted on said projecting housing portion for rotation about an axis substantially normal to said cylinder bores and transversely spaced therefrom; a pair of ratchet gear means fixed to said shaft for rotation therewith, each of said ratchet gear means having the same number of teeth, with the teeth of one of said ratchet gear means displaced in circumferential direction relative to those of the other ratchet gear means substantially through half a pitch; a pair of drive arms each pivotally mounted at one of the ends thereof on said shaft and pivotally connected at the other end thereof to the other end of a respective one of said piston rods; a pair of pawl means respectively pivotally connected to said drive arms intermediate the ends of the latter and respectively engaging the teeth of said pair of ratchet gear means for rotating said shaft during movement of each of said piston means along its active forward stroke; an exchangeable socket connected to an end portion of said shaft projecting beyond said ratchet gear means mounted thereon for turning a threaded connector engaged in said socket during rotation of said shaft, whereby during such turning of the threaded connector in one direction a force is created tending to turn said housing about the axis of said shaft in the opposite direction; means on said main portion of said housing and adapted to engage a fixed abutment adjacent to the threaded connector to be turned for counteracting said force; and valve means in communication with said compartments for alternatingly feeding pressure fluid into one of said compartments and for discharging pressure fluid from the other compartment so that during the return stroke of one of the piston means the other of said piston means will perform its active forward stroke, whereby said shaft is continuously rotated.

4,233,866

TOOL FOR, AND A METHOD OF, EFFECTING A ROTARY TURNING OPERATION

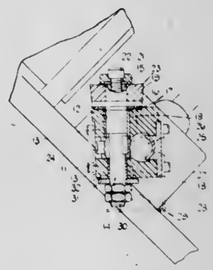
Roland M. Thomas, Birmingham, England, assignor to Lucas Industries Limited, Brimingham, England

Continuation of Ser. No. 831,926, Sep. 9, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 32,734

Claims priority, application United Kingdom, Sep. 21, 1976, 39027/76

Int. Cl.² B23B 1/00, 3/00

U.S. Cl. 82—1 C 4 Claims



1. A tool for effecting a rotary turning operation on a rotatably driven workpiece, comprising a tool carrier, a spindle supported by the carrier for rotational movement about the axis of the spindle, a tool tip engagable with the rotating surface of the workpiece to remove material therefrom, clamping means rigidly securing the tool tip at one end of the spindle, means for applying an adjustable force between the spindle and the carrier including a thrust bearing between the spindle and the carrier, said adjustable force preventing the spindle being, in use, rotated about its axis by the frictional torque imparted to the tool tip by the rotating workpiece, a separate drive mechanism for the spindle, and means connecting the spindle to said separate drive mechanism to positively drive said spindle against said force and rotate said spindle about its axis relative to the carrier; said force applying means includes a screw-threaded member engaged with a complementarily screw-threaded portion of the spindle and movable to urge respective

portions of the spindle and the carrier axially towards each other to compress said thrust bearing.

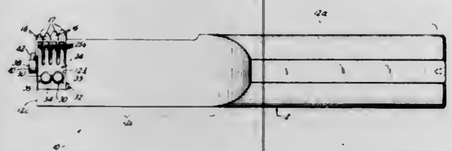
3. A method of effecting a rotary turning operation on a rotatably driven workpiece having an axis of rotation, the method comprising the steps of urging a tool tip having an axis of rotation against the rotating surface of the workpiece, said tool tip axis of rotation being at an oblique angle relative to the axis of rotation of the workpiece, exerting a restraining force on the tool tip sufficient to prevent the tool tip being rotated by the frictional torque imparted thereto by the rotating workpiece, and at the time positively driving said tool tip at a rotational speed below the speed at which the tip would be rotated by the workpiece in the absence of said restraining force.

4,233,867

MULTIPLE INSERT TOOL ASSEMBLY FOR THREADING, GROOVING AND THE LIKE

William R. Zimmerman, Califon, N.J., assignor to General Electric Company, Detroit, Mich.

Filed Dec. 5, 1978, Ser. No. 966,573
Int. Cl.³ B23B *29/00*; B23G *1/00*; B26D *1/12*
U.S. Cl. 82—36 R **8 Claims**



1. A tool assembly for machine tools, such as lathes and the like, for forming a helical thread or a groove on a workpiece, particularly on the interior surface of a hollow workpiece, which comprises:

a generally elongate shank having a head portion formed at one end and a butt portion at its other end for mounting to the machine tool, the head portion of said shank being formed with a notch-like cut-out providing an abutment surface extending generally perpendicular to the longitudinal axis of the shank, a seating surface and a plurality of bearing surface segments, each bearing surface segment extending at an angle with respect to the seating surface while said seating surface and said bearing surface segments are generally perpendicular to said abutment surface, said notch-like cut-out extending from said abutment surface to the end edge of said head portion, and said bearing surface segments being formed in generally ascending step-like configuration beginning at the end edge of said head portion;

a plurality of cutting inserts which are of essentially the same length, each said insert having a cutting edge on at least one end and having its other end adapted to bear against one of said bearing surface segments and having its bottom surface adapted to be supported by said seating surface during operation of the machine tool;

a first clamp member adapted to be secured to said shank, said first clamp member having a plurality of clamping fingers, said plurality of clamping fingers corresponding in number to the number of said bearing surface segments, said clamping fingers adapted to hold said inserts against said seating surface during operation of the machine tool when said first clamping member is secured to said shank;

first fastening means for tighteningly securing said first clamp member to said shank to hold said cutter inserts securely in place during operation of the machine tool;

an end clamp member adapted to be mounted to the end edge of said shank at the head thereof, said end clamp member including at least one finger-like member adapted to clamp all the cutting inserts against said abutment surface when said end clamp member is secured to said shank;

second fastening means for tighteningly securing said end clamp member to said shank to hold said cutter inerts in place during operation of the machine tool,

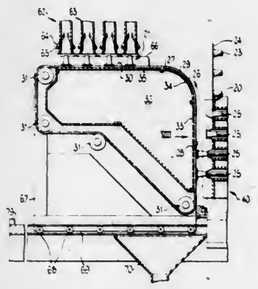
each said cutter insert being mounted to said shank with an end abutting a said bearing surface segment and oriented to extend essentially perpendicular to the longitudinal axis of the shank, the cutting edge of each said cutter insert projecting beyond an edge of said shank defined along said seating surface and all said cutting edges generally defining a line which forms an acute angle with the longitudinal axis of said shank, the cutting edge of the first insert to contact the workpiece being spaced the least distance from the longitudinal axis of the shank, such that as each successive cutter insert contacts the workpiece, the groove cut by each preceding insert is enlarged.

4,233,868

APPARATUS FOR MOVING LIGHTWEIGHT ARTICLES

Wolfgang Heni, Schlangenbad-Georgenborn, and Peter Wolf, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Bellaplast GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,636
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905619
Int. Cl.³ B21D *45/02*; B26F *1/38*
U.S. Cl. 83—126 **24 Claims**



22. Apparatus for moving lightweight articles in the form of containers from a first location to a second location comprising:

(a) an endless conveyor moveable continuously past the first location, and having an article carrying surface directed towards the first location and air flow passages from the article carrying surface to the side of the conveyor remote from the carrying surface;

(b) air pressure reducing means disposed at said remote side of the conveyor and operable to draw air through the conveyor and hold containers against the carrying surface by suction effect as the conveyor moves towards the second location;

(c) a severing device disposed in the first location, said device comprising a pair of coacting cutting tools, one of said tools being a female cutting tool having an annular cutting edge and the other tool being a male cutting tool moveable on a cutting stroke towards the carrying surface and through the female cutting tool to sever containers at their rims from a length of material with which they are integral, the male cutting tool being annular so as to move along and surround the side wall of a container located in the first location as the male cutting tool moves towards the female cutting tool in its cutting stroke;

(d) an article guide extending from the female cutting tool towards the carrying surface and defining an article guide passage for guiding a container as it is moved from the first location to the carrying surface; and

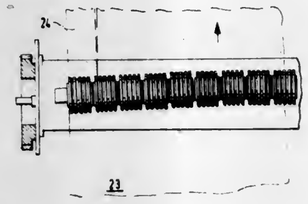
(e) an article ejector pin moveable on a working stroke towards the carrying surface while trailing the male cutting tool moving on its working stroke, the ejector pin continuing its working stroke after the completion of the cutting stroke to pass through the annular male cutting tool and engage a surface of a closed end of a severed container and transfer the container to the carrying surface, the ejector pin then being moveable on a return stroke preparatory to a succeeding working stroke.

4,233,869

APPARATUS FOR SLITTING WEBS OF MATERIAL

Rolf Meyer, and Herbert Schonmeier, both of Dusseldorf, Fed. Rep. of Germany, assignors to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 46,404
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824900
Int. Cl.³ B26D *7/26*; B23D *19/06*
U.S. Cl. 83—500 **8 Claims**



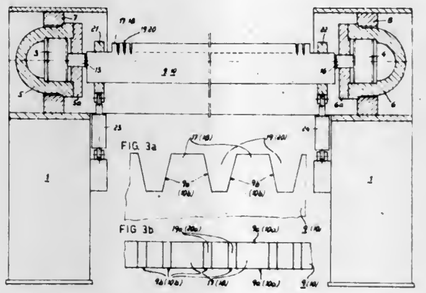
1. In an apparatus for the longitudinal cutting of webs of material into individual strips, having a plurality of cutting pairs consisting of a lower cutter and an upper cutter and disposed side by side, and means for spreading the meterial on its width and for the spreading apart of the strips of the material, after cutting, the improvement wherein the means for spreading solely comprises means mounting the cutter pairs to be disposed in an arc along the direction perpendicular to the direction of travel of the webs and for the tilting movement of the cutter pairs into the plane of movement of the web of material.

4,233,870

SHEARING MACHINE FOR SEVERING PARALLEL LONGITUDINAL MEMBERS OF GRIDS OR GRATINGS

Hans Gött; Josef Ritter; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwickoungs-Gesellschaft mbH, Graz, Austria

Filed Dec. 7, 1978, Ser. No. 967,410
Claims priority, application Austria, Mar. 2, 1978, 1505/78
Int. Cl.³ B23D *15/02*
U.S. Cl. 83—563 **6 Claims**



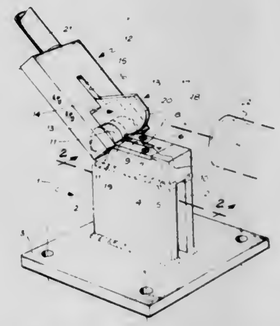
1. In a shearing machine including a machine frame, for severing parallel longitudinal members of grids or gratings, said machine having a horizontal guide-beam which is stationary during the cut and upon which are provided counterbutts in the manner of comb teeth; and a cutter-beam which is movable parallel to and alongside said guide-beam during the cut and upon which blades are provided in the manner of comb teeth, said blades cooperating with said counterbutts on said guide-beam to shear longitudinal members extending through notches formed between adjacent counterbutts of said guide-beam and between adjacent blades of said cutter-beam, the improvement comprising means guiding said guide-beam and said cutter-beam in said machine frame for vertical movement into and out of a working position and associating said guide-beam and said cutter-beam for common vertical motion; two end faces on said guide-beam and a respective stop-face provided opposite to each of said guide-beam end faces; two end faces of said cutter-beam and a respective single-acting fluid pressure-operated cylinder fixed in said machine frame opposite to each of said cutter-beam end faces, each of said cylinders having a piston with a piston rod formed at its end as a thrust face for the respective cutter-beam end face for imparting to said cutter-beam a stroke parallel to said guide-beam and away from that cylinder to which fluid pressure is applied at that time.

4,233,871

NOTCHING TOOL

Anthony A. Alessi, 429 West Botany St., Kogarah, N.S.W. 2217, Australia

Filed Aug. 14, 1978, Ser. No. 933,418
Claims priority, application Australia, Apr. 26, 1978, 4172/78
Int. Cl.³ B23D *17/08, 21/00, 27/00*; B26D *3/14*
U.S. Cl. 83—607 **7 Claims**



1. A pipe notching tool to produce a notch extending longitudinally of the pipe from an end thereof, said tool comprising a first member, a second member and a pivot pin pivotally connecting lugs on the first member and holes in the second member, the first member including a base affixed to a column and means for removably mounting a female blade on the first member, a uniform width slot in the female blade extending away from the pivot pin and having two shearing sides and a shearing end remote from the pivot pin, a head affixed to the column, said head containing the lugs, said lugs provided with aligned pivot pin holes, the second member further including a blade holder having aligned pivot pin holes, and means for removably securing a male blade in a slot in the holder said blade being positionable to enter the end of a pipe to be notched, said male blade being aligned with the slot of the female blade so as to enter therein on a closing relative pivotal movement between the first and second members to cause a shearing action between opposed corners of a shearing edge of the male blade and the shearing sides of the female blade slot and a shearing action between a trailing end of the male blade and the shearing end of the female blade slot, said shearing edge of said male blade being convexly curved with the convex curve extending from a leading end of the male shearing

edge to said trailing end of the male blade, the leading end of the male blade shearing edge being spaced from the female blade by an amount at least equal to the thickness of the wall of the pipe to be notched to permit the pipe wall to pass between the female blade and the leading end of the male blade shearing edge when the first and second members are pivoted to an open pipe-receiving relationship, and means for causing the male blade to initially contact the pipe to be notched in a direction substantially perpendicular to the surface of the pipe.

4,233,872

HYDRAULIC SHOCK ABSORPTION IN PUNCH OR CUTTING PRESSES

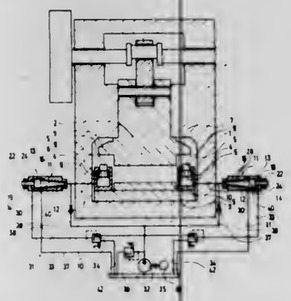
Eckehart Schulze, Weissach-Flacht, Fed. Rep. of Germany, assignor to Firma Hartman & Lämmle GmbH & Co. KG, Rutesheim, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,384

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748145

Int. Cl.³ B30B *15/00*

U.S. Cl. 83—617 **17 Claims**



1. A hydraulic shock absorption apparatus for cutting or punch mechanical presses provided with at least one damping cylinder having a pressure chamber, pump means for supplying a preset pressure to said pressure chamber, and a damping valve connected to the pressure chamber of said damping cylinder, wherein said damping valve includes:

a housing;

a displacing element, which is disposed within said housing and which defines with said housing a throttle gap or opening whose cross-section is determined by said displacing element;

throttle gap increasing means for subjecting said displacing element to a pressure-dependent load which acts in a direction to increase said throttle gap cross-section; and

throttle gap decreasing means for subjecting said displacing element to a counter-pressure load which acts in another opposite direction to decrease said throttle gap cross section;

whereby said throttle gap is adjusted in dependence on pressure.

4,233,873

PERMANENT MAGNETIC HOLD DOWN FOR STEEL RULE DIES

Kenneth C. Jessen, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 6, 1978, Ser. No. 957,953

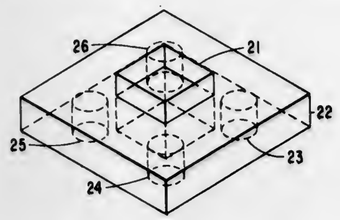
Int. Cl.³ B26F *1/44*; B26D *7/26*

U.S. Cl. 83—652 **3 Claims**

1. A steel rule die assembly for attachment to a steel chase, the steel rule die assembly comprising:

a generally flat non-magnetic die board member having top and bottom surfaces;

a steel rule blade embedded in the die board member, the steel rule blade being embedded perpendicular to the top surface of the die board member such that a cutting edge of the steel rule blade partially extends from the top surface of the die board member to define a die cut pattern; and



a permanent magnet member fixedly attached to the die board member for holding the steel rule die assembly in a predetermined position on the steel chase.

4,233,874

FREQUENCY CONVERSION SYSTEM OF TONE SIGNAL PRODUCED BY ELECTRICALLY PICKING UP MECHANICAL VIBRATION OF MUSICAL INSTRUMENT

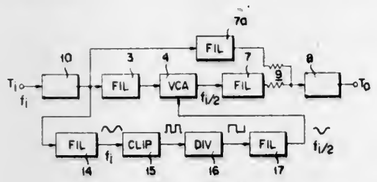
Rokurota Mantani, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 20, 1979, Ser. No. 22,104

Claims priority, application Japan, Mar. 25, 1978, 53-34539; Mar. 25, 1978, 53-34540; Mar. 25, 1978, 53-34541; Mar. 25, 1978, 53-34542; Jun. 13, 1978, 53-71270

Int. Cl.³ G10H *1/06*; H03C *1/00*; H03B *21/00*

U.S. Cl. 84—1.23 **16 Claims**



1. A frequency conversion system for converting a tone signal in octave, comprising:

a multiplier having first and second inputs and an output for providing an output signal at said output which is representative of the product of input signals at said first and second inputs;

first means for coupling to said first input of said multiplier a first tone signal having a first fundamental frequency fi and a frequency spectrum of a musical instrument, said tone signal being obtained by electrically picking up mechanical vibrations of a tone source in a musical instrument; and

second means for coupling to said second input of said multiplier a substantially sinusoidal modulation signal having a second fundamental frequency in a preselected fixed relation to the fundamental frequency fi of said first tone signal, said modulation signal being obtained from said mechanical vibrations by means which extract said first fundamental frequency from said mechanical vibrations and convert said first fundamental frequency to a sinusoidal wave of said second fundamental frequency,

whereby the output signal obtained at the output of said multiplier has a fundamental frequency of m/nfi (m, n=natural numbers).

4,233,875

ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC TRILL PERFORMANCE FUNCTION

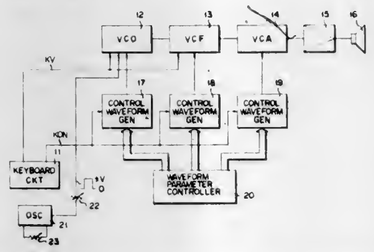
Takeshi Adachi; Masahiko Koike, and Toshiyuki Takahashi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 6, 1978, Ser. No. 939,954

Claims priority, application Japan, Sep. 8, 1977, 52-108279

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.24 **8 Claims**



1. An electronic musical instrument with automatic trill performance, comprising:

keyboard circuit means for providing a pitch determining voltage signal;

rectangular wave generating means for generating a trill controlling rectangular wave voltage signal having a predetermined frequency; and

a voltage-controlled frequency-variable oscillator coupled to said keyboard circuit means and to said rectangular wave generating means and responsive to application of the pitch determining voltage signal and the rectangular wave voltage signal thereto to produce an automatic trill performance by automatically alternately generating first and second tone signals corresponding to respective notes of a musical scale, said first and second tone signals alternating at said predetermined frequency, the tone pitch of said first tone signal being a function of the magnitude of the pitch determining voltage signal, and the tone pitch of said second tone signal being a function of the magnitude of the rectangular wave signal and the magnitude of the pitch determining voltage signal.

4,233,876

METHOD FOR PREVENTING FREEZE-UP OF MUSICAL INSTRUMENT VALVES AND OTHER MOVABLE ELEMENTS

Thomas Leahy, Box 269C, R.R. 1, Breese, Ill. 62230, and John Fenoli, P.O. Box 49, Aviston, Ill. 62216

Filed Jul. 27, 1978, Ser. No. 928,356

Int. Cl.³ G10D *9/04*; C10M *1/22*

U.S. Cl. 84—388 **5 Claims**

1. A method of lubricating movable valve elements in brass, woodwind, and similar musical instruments and for preventing said elements from sticking or becoming sluggish when the temperature falls below 32° F. by applying a solution comprising by volume about 27% to about 37% polyhydric alcohol, about 43% to about 53% monohydric alcohol, and about 18% to about 22% water to said elements.

4,233,877

WIND SHIELD

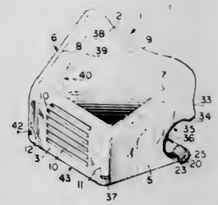
Alvin S. Okami, 1915 Huina St., Honolulu, Hi. 96817

Filed Aug. 24, 1979, Ser. No. 69,393

Int. Cl.³ G10D *9/00*; G10G *7/00*

U.S. Cl. 84—453 **10 Claims**

1. A wind shield for a flute-type instrument comprising a top member, a front member, a bottom member, a left plate, and a right plate; the top member is joined to the front member by a bend; the front member is joined to the bottom member by a bend; left and right plates are secured to the sides of the top and front members; bottom member has a vent opening near its juncture with the front member; the left and right plates each have a facing edge and a holding portion; the facing edges of the left and right plates and the free end of the top member are shaped to provide a comfortable fit when the wind shield is



placed against the face of a flutist; the left and right plates are spaced at a preselected distance from the embouchure hole plate of a flute; holding portions of the left and right plates have a diameter which will accommodate the barrel of a flute in a snug and comfortable fit; and means to retain the barrel of a flute within the holding portions.

4,233,878

BARB AND METHOD OF MAKING SAME

Hugh K. McGauran, Harlow, and Leonard Saunders, Hatfield, both of England, assignors to Aerpat A.G., Zug, Switzerland

Filed Jul. 25, 1978, Ser. No. 927,912

Claims priority, application United Kingdom, Jul. 29, 1977, 31939/77

Int. Cl.² F16B *19/00*

U.S. Cl. 85—7 **14 Claims**



1. A barb of circular symmetry for engagement with deformable material, which barb is formed by a rolling process and comprises:

a radially outermost edge for engaging with the deformable material, the edge being provided at the junction of a first face and a second face, the first face being relatively more steeply sloping than the second face;

a trough adjacent the aforesaid first face;

the trough containing an abutment projecting from the aforesaid first face and radially intermediate in position between the radially outermost edge of the barb and the root of the trough.

4,233,879

GROOVED FASTENER

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 26, 1978, Ser. No. 973,334

Int. Cl.³ F16B *19/00*, *21/16*

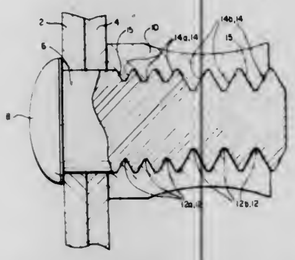
U.S. Cl. 85—7 **6 Claims**

1. A fastener adapted to be connected to a member, comprising:

a head formed to abut the member;

a shank connected to said head at one end thereof and formed to be placed in an opening in the member, said shank including a first section and a second section, said second section having a first group and a second group of a plurality of adjacent grooves therein for forming annular

load bearing surfaces, the depth of said grooves in said first group of grooves being essentially equal and the depth of said grooves in said second group of grooves being essentially equal and the depth of said second group of grooves being greater than the depth of said first group of grooves; and



a collar adapted to be swaged into said grooves so that said load bearing surfaces abut said collar, said collar having an abutting relationship to the member, thereby placing said shank in tension.

4,233,880

STAINLESS STEEL DRILL SCREW

Lowell L. Bjorklund, Elgin; Ramon A. Berg, Roselle, and George A. Friedland, Hampshire, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 20, 1978, Ser. No. 926,185
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—41 **4 Claims**



1. A corrosive resistant self-drilling and thread-forming screw formed from a 300 series, initially primarily entirely austenitic, stainless steel material, comprising: an elongated shank having a helical thread formed thereon, a radially enlarged driving head at one extremity and a subsequently cold formed drill point at the opposite extremity, the drill point having 40%–70% martensitic structure as a result of point formation while the structure of the head and shank becomes only 10%–40% martensitic structure, providing a fastener with a drill point having at least a surface hardness in the range of Rc 50–58 said hardness being produced without subjecting the screw to elevated temperatures whereby said screw is capable of drilling through steel while retaining the desirable corrosion resistant characteristics of austenitic 300 series stainless steel.

4,233,881

WALL FASTENER STRUCTURE

Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717

Filed May 5, 1978, Ser. No. 903,110
Int. Cl.[3] F16B *13/10*
U.S. Cl. 85—81 **3 Claims**

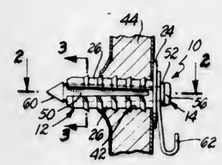
1. A wall fastener structure which includes:

an expansion member including a sleeve having ends and an opening extending therethrough between said ends, a flange extending outwardly from adjacent to one of said ends of said sleeve and two expansion arms extending from the other of said ends of said sleeve,

said arms extending generally parallel to one another, said arms being unattached, said arms having adjacent interior surfaces facing one another which are spaced so as to define a space extending between said arms which is aligned with said opening in said sleeve and extending along the length of said arms, said arms also having external surfaces which are remote from one another,

said internal surfaces being shaped and said arms being positioned in respect to one another so that a blade shaped member of less thickness than width may be inserted between said arms through said opening in said sleeve without changing the positions of said arms,

said internal surfaces including cam surfaces, said cam surfaces being capable of being engaged by said blade shaped member after said blade shaped member has been inserted between said arms and as said blade shaped member is twisted so that contact between said blade shaped member and said cam surfaces applies a pressure to said arms in order to deflect said arms outwardly from their normal configuration,



an expanding member, said expanding member including an elongated shank, a head on one end of said shank which is incapable of fitting through said opening, at least a portion of said shank having a blade like shape which is of less thickness than width, said portion of said shank being said blade like member,

said portion of said shank includes flat sides on said shank which are located so as to be spaced from one another and ridge means located on said shank and extending outwardly from said shank between said flat sides,

said shank includes an elongated ridge means for guiding the insertion of said shank in said expansion member located on one of said flat sides,

said arms include gripping ridges located on said external surfaces so as to extend outwardly therefrom, said gripping ridges being located along the length of said arms,

said internal surfaces include stop means adjacent to said cam surfaces for limiting the amount said blade shaped member can be twisted so that said blade shaped member can only be twisted 90 degrees.

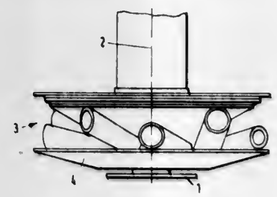
4,233,882

AZIMUTHABLY LAYABLE OR AIMABLE LAUNCHING DEVICE, MORE PARTICULARLY FOR CANISTERS CONTAINING CAMOUFLAGING MEANS OR AGENTS

Kurt Eichweber, Hamburg-Niendorf, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,091
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2750776
Int. Cl.[3] F41F *1/00*
U.S. Cl. 89—1 L **10 Claims**

1. A camouflage launching device for camouflaging a station with which the device is associated from an incoming projectile, comprising a stator, a launching rotor rotatably mounted on the stator for rotation about a generally upright axis and having at least one camouflage projectile launching guide adapted to be selectively activated for selectively firing camouflage projectile outwardly therefrom into a selected azimuth sector, and a fire signal receiver for each launching guide operable for activating the guide, and motor means for rotating the launching rotor about its upright axis to ready the rotor for camouflaging an azimuth sector of the associated station, the stator comprising a transmission detector for detecting an incoming transmission beam from any azimuth angle, the stator having an annular arrangement of a plurality of fire signal



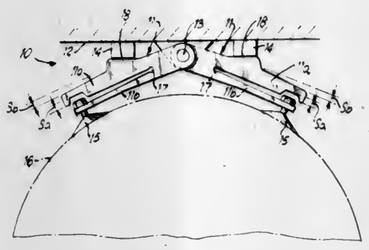
transmitters coaxial with the rotor to operate a fire signal receiver as it rotates thereby and individually selectively operable in accordance with the azimuth angle of a detected incoming transmission beam for selectively operating a fire signal receiver for activating the respective camouflage launching guide for firing a camouflage projectile outwardly into the azimuth sector corresponding to the detected incoming transmission beam.

4,233,883

AUTOMATICALLY SELF-ADJUSTING AND LOAD-LIMITING SWAYBRACE SYSTEM

Richard J. Miko, Paramus, N.J., assignor to Edo Corporation, College Point, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,734
Int. Cl.[3] B64D *1/04*; F41F *5/02*
U.S. Cl. 89—1.5 B **14 Claims**



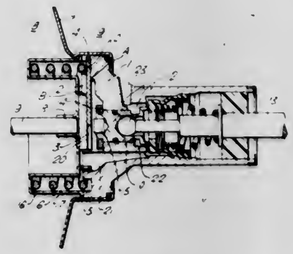
1. An automatically self-adjusting and load-limiting swaybrace system for use in conjunction with stores carried by an aircraft, comprising in combination: at least one pair of opposing swaybrace arms; each arm having means adjacent one end for pivotal connection to aircraft structure; store-contacting means attached to and positioned adjacent the opposite end of each arm; biasing means to be supported by aircraft structure and associated with each arm, for automatically biasing each arm toward the store whereby each store-contacting means maintains contact with the store under no-load, predetermined pre-load and predetermined maximum load conditions at the store-contacting means; each arm having means automatically permitting movement of its store-contacting means toward and away from at least a portion of the adjacent end of said arm through a predetermined distance Sa in operating between the no-load condition and the predetermined pre-load condition at its store-contacting means; each arm having means automatically permitting movement of said at least a portion of the adjacent end of said arm through a predetermined distance Sb in operating between the predetermined pre-load condition and the predetermined maximum load condition at its store-contacting means, said store-contacting means also moving in conjunction therewith through the predetermined distance Sb; and, the distance Sa being equal to the distance Sb; whereby, the predetermined pre-load condition may be automatically obtained and automatically maintained.

4,233,884

VACUUM BRAKE BOOSTER

Rolf Weller, Frankfurt-Sindlingen, and Peter Böhm, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,470
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822101
Int. Cl.[3] F15B *9/10*; B60T *13/20*
U.S. Cl. 91—369 B **24 Claims**



1. A vacuum brake booster comprising:

a vacuum chamber having a longitudinal axis in which a constant pressure prevails;

a working chamber disposed coaxial of said axis in which different pressures prevail;

a movable wall separating said vacuum chamber and said working chamber;

a control valve supported by said movable wall coaxial of said axis actuated by a brake pedal to control the differentials of pressure acting on said movable wall;

a master cylinder controlling push-rod disposed coaxial of said axis in a force transmitting relation with said movable wall extending into said vacuum chamber;

reaction levers in engagement with said movable wall at a first location and in engagement with said push-rod at a second location, said first location being disposed at a greater radial distance from said axis than said second location; and

a reaction-delaying spring acting on one side of said reaction levers adjacent said vacuum chamber at a third location having a greater radial distance from said axis than said first location.

4,233,885

APPARATUS FOR IMPROVED MOTION CONTROL

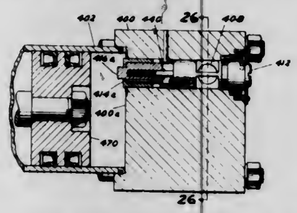
Richard E. Deschner, 5550 Harcross Dr., Los Angeles, Calif. 90043

Division of Ser. No. 783,006, Mar. 30, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,101
Int. Cl.[3] F01B *11/02*; F15B *13/04*
U.S. Cl. 91—410 **8 Claims**

1. In combination.

(1) a pneumatic actuator comprising a head structure, a pressure cylinder attached thereto, a reciprocative piston slidably disposed in said pressure cylinder, a mechanical stop means supported by said head structure and positioned to limit the stroke of the piston, said pneumatic actuator being operated by a flow of compressed air, and means comprising a conduit for conveying air under pressure into said cylinder, and

(2) a safety device for preventing excessive impact of said reciprocative piston against said mechanical stop means comprising a normally open valve in said conduit which is responsive to motive power impulses and operative to close and maintain a closed position in response to a motive power pulse, a weighted movable hammer member having first and second positions, first resilient means bearing against said hammer member, an impact receptive element positioned to receive motive power pulses from the second position of said hammer member, said hammer member and said impact receptive element having spaced opposed impact striking surfaces, and means for transmitting motive power pulses from said receptive element to said valve to cause said normally open valve to close, said hammer member having three critical positions, a first position conditionally maintained by said first resilient means bearing against said hammer member and holding



said first portion protruding into the stroke path of said piston, a second position into which said hammer member is forced when said piston contacts said mechanical stop means and a third position in which said second portion of the hammer member strikes said impact receptive element, said hammer member having a structural shape which precludes it from contacting said impact receptive element while disposed in said second position, the force of said resilient means and the weight and shape of said hammer member being correlated to permit said hammer member to move against said first resilient means from said second position to said third position by inertia to close said valve when the impact of said piston against said mechanical stop means and said hammer member exceeds a predetermined safe value; and

(3) means for mounting said safety device on said pneumatic actuator in the stroke path of said piston.

4,233,886

SEALING DEVICE FOR HYDRAULIC PISTON MECHANISM

Lucien D. Balzano, Jouars Pounchar Vrain, and Marc V. A. Lepretre, Bois-Colombes, both of France, assignors to Bertin & Cie, Plaisir, France

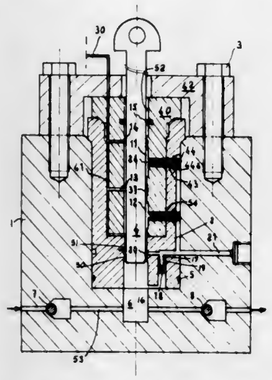
Filed Aug. 1, 1978, Ser. No. 930,042
Claims priority, application France, Aug. 1, 1977, 77 23610
Int. Cl.³ F01B *31/10*; F16J *15/40*
U.S. Cl. 92—86.5 **9 Claims**

1. In hydraulic apparatus of the kind in which a reciprocating piston is slidably fitted with a close clearance gap between it and a cylinder wall designed for forming at an end thereof a high pressure hydraulic chamber located in a hydraulic flow channel for the processing of a first main fluid, the combination comprising,

a further flow channel for the feeding of a second auxiliary viscous fluid distinct from said first main fluid though minglable therewith,

a groove formed on said wall adjacent said high pressure hydraulic chamber and fed from said further flow channel with said second auxiliary viscous fluid to fill said close clearance gap thereby effectively sealing said high pressure hydraulic chamber around said piston, said close clearance gap allowing fluid leakage therethrough thereby permitting said first and second fluids directly to contact each other, and

means in the wall providing a twin hydrostatic bearing system for said piston at a distance from said groove on the side thereof remote from said high pressure hydraulic



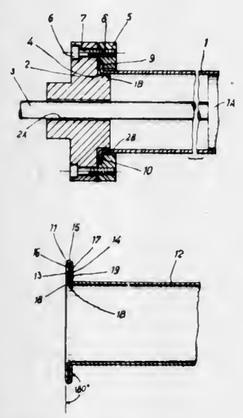
chamber, said twin hydrostatic bearing system being fed with said second auxiliary viscous fluid in parallel with said groove and comprising two separate and distinct elemental fluid bearings formed by separate grooves in said cylinder wall spaced lengthwise along said piston.

4,233,887

PISTON-CYLINDER UNIT

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, N, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,602
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2747676
Int. Cl.³ F16J *11/02*
U.S. Cl. 92—169 **1 Claim**



1. A piston-cylinder unit, comprising:

an elongated and hollow housing having a central opening at one end and a laterally extending flange means at said one end thereof, said flange means consisting of a first portion integral with said housing and extending laterally from said housing and a second portion integral with said first portion extending coextensively parallel to said first portion but spaced axially therefrom, said first and second portions having a 180° angle bead portion therebetween;

releasable end cap means secured to said housing at said one end thereof, said end cap means including an end cap member engaging a first axially facing surface on said first portion and covering said central opening in said hollow housing at said one end, said end cap means further including an annular collar engaging a second axially facing surface on said second portion, said first and second axially facing surfaces facing in opposite longitudinal directions; and

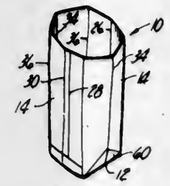
fastener means for securing said end cap member to said annular collar and clamping said flange means therebetween.

4,233,888

METHOD OF MAKING A COLLAPSIBLE DRUM-TYPE CONTAINER

Arthur E. LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Manistee, Mich.

Filed Nov. 6, 1978, Ser. No. 958,130
Int. Cl.³ B31B *31/60, 1/26*
U.S. Cl. 493—132 **11 Claims**



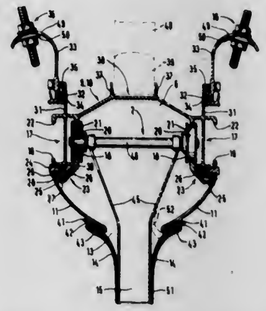
1. The method of making an envelope adapted, when opened, to form a drum-type container having a generally rectangular, flat bottom wall and side walls extending upwardly from the periphery of the bottom wall, comprising, folding a flat blank of self-supporting sheet material upon itself to form a pair of generally overlying flat panels, sealing selected edge portions of said flat panels together to form a flattened tube of generally rectangular shape having an open upper end, generally parallel side edges connected by a fold line and lower edges at the end of said tube opposite said open end which are connected by a fold line, forming a first lengthwise extending score line on each panel throughout the length thereof approximately midway between said side edges, forming on each flat panel a second score line extending transversely of and to said side edges at a location spaced upwardly from said fold line connecting the lower edges of the panels, forming a pair of score lines on each panel which converge upwardly toward each other from points on the second score line spaced equally inwardly from said side edges such that the converging score lines intersect at the first score line, opening the flattened tube by spreading said panels apart, refolding the tube along said first score lines into a refolded flattened tube having a pair of overlying flat side walls and additionally folding the lower portions of said panels upwardly and inwardly along said converging score lines and also along the portions of the first score lines extending below said intersections on each of said panels to form an inwardly folded gusset panel at the lower end of said refolded flattened tube which extends upwardly between the side walls thereof, whereby the upper edge of the folded gusset panel comprises the portions of the first score lines which extend downwardly from said intersections on the initially folded blank and the converging score lines form laterally outwardly and upwardly inclined fold lines connecting the laterally outer edges of the folded gusset panel with the lower corner portions of the flat side walls of the refolded flattened tube.

4,233,889

TRACK FORMING A GAS-THROUGHFLOW DUCT AND PROVIDED WITH A MOVABLE GAS PASSAGE UNIT

Bill P. P. Nederman, Halalid 3, Helsingborg S-252 33, Sweden

Filed Dec. 15, 1978, Ser. No. 970,090
Claims priority, application Sweden, Dec. 16, 1977, 7714340
Int. Cl.³ F23J *15/00*
U.S. Cl. 98—115 VM **15 Claims**



1. A track forming a gas throughflow duct, the track being of the type adapted for guiding a movable gas passage unit therealong in sealing cooperation with the gas throughflow duct, the track comprising:

(a) a plurality of structural girders connected to each other through butt joints by which said girders are disposed in mutually, abutting, end-to-end relationship to form an elongated structural beam;

(b) means for effecting interconnection of said girders to each other in said abutting relationship;

(c) A plurality of lateral sections depending from said girders in spaced pairs, said lateral sections contributing to defining the gas throughflow duct, said lateral sections also defining a lower slot therebetween, each lateral section having an upper side and a lower side, said lateral sections mating with said girders in a connection region, said connecting region being adjacent said upper sides of said lateral sections;

(d) a plurality of interengaging sealing sections coupled with said lateral sections to seal said lower slot, said sealing sections being adapted to sealingly engage the movable gas passage unit and, while maintaining such seal, to allow the gas passage unit to be moved along said beam; said girders, lateral sections, and sealing sections together defining an interior duct passage;

(e) means, in said connecting region, for facilitating and effecting rapid coupling of said lateral sections to said girders;

(f) means, adjacent said lower sides of said lateral sections, for enabling rapid joining of said sealing sections to said lateral sections, said enabling means including catches adjacent said lower sides of said lateral sections; and

(g) said means for effecting interconnection of said girders including said lateral sections, each lateral section extending longitudinally to either side of at least one of said butt joints.

4,233,890

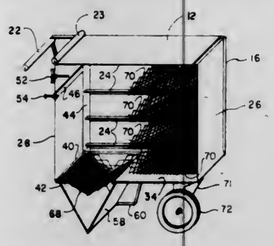
OUTDOOR BAR-B-Q SMOKER AND GRILL

Robert A. Jansen, 3930 Northern Pike, Monroeville, Pa. 15146

Filed Jul. 16, 1979, Ser. No. 57,621
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—340 **7 Claims**

1. A cooking device comprising a generally rectangular

enclosure, an upper sliding cover for said enclosure, an opening in the bottom of the enclosure, means in said opening for burning fuel, a plurality of vertically-spaced guideways extending along opposite sides of said enclosure, and a plurality of cooking racks slideably supported on said guideways and movable from positions where they are directly above said



means for burning fuel to positions where they are not above said means for burning, whereby food can be grilled on the cooking racks directly above said means for burning or can be smoked on racks in positions where they are not above said means for burning.

4,233,891

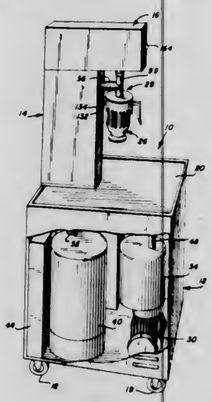
APPARATUS FOR MAKING SCRAMBLED EGGS

James Schindler, Naperville, and Anthony R. Nugarus, Chicago, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Division of Ser. No. 835,644, Sep. 22, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,469

Int. Cl.³ A47J *27/14, 29/00*

U.S. Cl. 99—348 **22 Claims**



1. An apparatus for cooking scrambled eggs in a containerized charge comprising:

a support frame;

a container for holding a charge of uncooked shelled eggs and having a free space expansion above said charge of eggs;

means on said frame for holding said container upright and for introducing a plurality of jets of steam at spaced, stationary locations in the interior of said charge of eggs to disperse said steam therein whereby said charge of eggs is agitated and cooked; and

means for continuously venting said container to allow escape of steam from said container to maintain the interior volume of said container at substantially atmospheric pressure; and

means for terminating the flow of steam in response to a predetermined condition after said charge of eggs is thoroughly and uniformly cooked to a substantially homogeneous scrambled egg mass having an expanded volume and which is light and tender and delectable in appearance and flavor.

4,233,892

SPIT ROASTING APPARATUS AND THE SPIT ROASTING OF ROASTABLE FOODSTUFFS

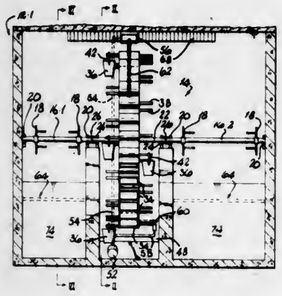
David J. D. Hawkins, Johannesburg, South Africa, assignor to Robin Justice Constance, South Africa

Filed Feb. 26, 1979, Ser. No. 15,066

Claims priority, application South Africa, Mar. 22, 1978, 78/1681

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 M **15 Claims**



1. Spit roasting apparatus comprising a spit member for supporting roastable foodstuffs to be roasted, a rotatably supported water wheel for rotatably driving said spit member, said water wheel having a plurality of water-receiving trough formations at spaced intervals along its periphery for receiving water to drive the water wheel and automatic compensating means associated with the water wheel for automatically compensating for eccentricity in the mass distribution of roastable foodstuffs supported on the spit member.

13. Spit roasting apparatus comprising a spit member for supporting rotatable foodstuffs to be roasted, a rotatably supported water wheel for rotatably driving said spit member, said water wheel having a plurality of water-receiving trough formations at spaced intervals along its periphery for receiving water to drive the water wheel, and compensating means for compensating for eccentricity in the mass distribution of roastable foodstuffs supported on the spit member, said compensating means comprising a plurality of compensating buckets which are associated with at least some of the trough formations to receive and store overflow from these trough formations.

4,233,893

BONDING APPARATUS FOR BRAKE LININGS

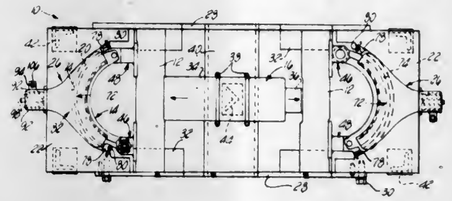
William L. Pringle, Grosse Pointe Shores, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

Filed Jul. 6, 1979, Ser. No. 55,454

Int. Cl.³ B30B *15/34*

U.S. Cl. 100—93 PB **10 Claims**

1. An apparatus for bonding brake linings to tables of brake shoes with an application of heat and pressure which comprises; a restrainer member having a cavity constructed and arranged to receive a brake lining therein, said cavity having a generally arcuate wall constructed and arranged to be complimentary with the outer face of a brake lining received in said cavity, a carrier member adapted to be moved toward and away from said cavity of said restrainer member and constructed and arranged to receive and position a brake shoe such that the outer face of the table thereof may be urged into firm engagement with the inner face of a brake lining received in said cavity of said restrainer member, drive means for moving said carrier member toward and away from said restrainer member to extend and retract the table of a brake shoe carried thereby into and from said cavity of said restrainer member, and a pair of heater units each having at least one heater element and constructed and arranged such that when said carrier member is moved by said drive means to urge the outer face of the table of the brake shoe carried thereby into firm engagement with the inner face of the brake lining received in said



cavity of said restrainer member such heater units can be moved to a first position wherein their heater elements lie behind and closely adjacent the inner face of the table of the brake shoe on opposite sides thereof and to a second position sufficiently distal from said cavity and the brake shoe to permit retraction of said carrier member from said cavity by said drive means and removal of the brake shoe with the liner bonded thereto from said carrier member.

4,233,894

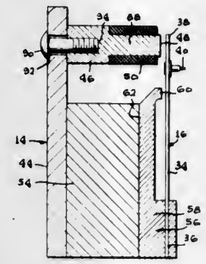
PRINT HAMMER MECHANISM HAVING DUAL POLE PIECES

Gordon B. Barrus, El Segundo, and Jerry Matula, Westminster, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

Filed Jun. 2, 1978, Ser. No. 911,989

Int. Cl.³ B41J *7/70*

U.S. Cl. 101—93.04 **11 Claims**



1. A print hammer mechanism for a dot matrix printer comprising:

a magnetic resilient print hammer element comprising a single elongated, relatively flat strip of resilient material having a relatively small, uniform thickness between opposite broad surfaces and having a fixed end and an opposite free end and including a dot imprinting element extending from one of the broad surfaces of the elongated strip adjacent the free end thereof, the elongated strip being mounted at the fixed end thereof so as to assume a relatively straight configuration defining a neutral position when not flexed;

magnetic circuit means including permanent magnet means and a pair of pole pieces coupled in magnetic circuit with the elongated strip, the pair of pole pieces being disposed adjacent the free end of the elongated strip with one of the pair of pole pieces receiving the other one of the broad surfaces of the elongated strip and the other one of the pair of pole pieces forming an air gap with the other one of the broad surfaces of the elongated strip when the elongated strip is in a spring-loaded retract position in which the strip is flexed out of the neutral position and assumes a curved configuration, and the permanent magnet means establishing a magnetic field normally maintaining the elongated strip in the spring-loaded retract position; and

means coupled to the one of the pair of pole pieces for substantially cancelling the magnetic field in a portion of the magnetic circuit means adjacent the elongated strip to release the elongated strip for flight away from the spring-loaded retract position, the resilient material of the elongated strip combining with the magnetic field of the permanent magnet means to return the strip to the spring-loaded retract position following release of the strip and impact of a printable medium by the dot imprinting element.

4,233,895

PRINTER COMPRISING A PRINTING HEAD WHICH IS ADJUSTABLE BY MEANS OF A MOTOR

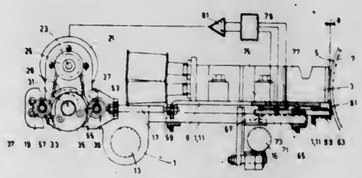
Herbert Wehler, Neunkirchen-Salchendorf, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,455

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2752061

Int. Cl.³ B41J *3/12, 11/20, 7/92*

U.S. Cl. 101—93.05 **2 Claims**



1. A printer for printing a plurality of characters along a line having a predetermined first direction on an associated record carrier which comprises:

a carriage which is displaceable along the record carrier in a direction which is parallel to said first direction,

a printing head carried on said carriage,

means for mounting said printing head on said carriage which allows said printing head to be displaced with respect to said carriage in a direction which is generally transverse to said first direction,

said means for mounting including a motor which is mounted on said carriage,

means for coupling said motor and said printing head, said means for coupling including first and second cam discs, and a drive shaft coupled to said motor, said first and second cam discs being rigidly mounted on said drive shaft, said means for coupling including first and second cam followers located at diametrically opposite sides of said drive shaft with respect to one another and respectively cooperating with said first and second cams, said first and second cams being of a configuration so that the axes of said first and second cam followers remain disposed at a substantially constant distance one from the other upon rotation of said drive shaft, said means for coupling including a slidable member one end of which is connected to said printing head, said first cam follower being rotatably journalled on the opposite end of said slidable member, said second cam follower being carried on a shaft, said follower shaft being mounted in an aperture in said slidable member with said aperture being dimensioned to provide clearance around said follower shaft, means connected to said slidable member for biasing said second cam follower toward said second cam,

said apparatus including means for controlling the position of said printing head, said means for controlling cooperating with said motor and including means for producing a

signal output for as long as the position of said printing head deviates from a predetermined reference value, said means for producing including a sensor, the position of said sensor being dependent on the thickness of the record carrier, said sensor producing the signal output of said means for controlling for as long as the position of said printing head deviates from a predetermined reference value.

4,233,896

LABEL PRINTING AND APPLYING APPARATUS

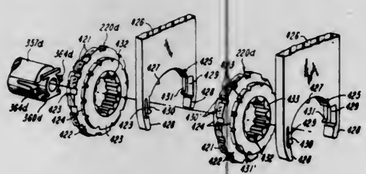
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 653,405, Jan. 29, 1976, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Mar. 19, 1979, Ser. No. 21,534

The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.

Int. Cl.³ B41J *1/22*

U.S. Cl. 101—110 **20 Claims**



1. Printing apparatus, comprising: a print head including a mounting block having a concave mounting surface, a plurality of drive wheels cradled in and rotatable at their outer peripheries on the mounting surface, each drive wheel having a generally central hole, a plurality of printing bands received under tension about the respective drive wheels, a selector adapted to extend into the holes in the drive wheels to engage any selected drive wheel to advance a selected printing band, and spacers disposed between adjacent drive wheels, the spacers having a pair of lugs disposed at the ends of the concave mounting surface.

4,233,897

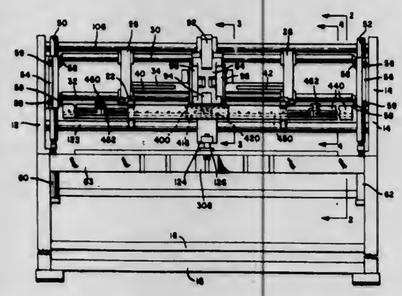
LONG STROKE ATTACHMENT FOR A SCREEN PRINTING MACHINE

Louis A. Lala, Chicago, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Aug. 24, 1978, Ser. No. 936,329

Int. Cl.³ B05C *17/04*

U.S. Cl. 101—123 **3 Claims**



1. A long stroke attachment assembly for use with a screen printing machine for printing on objects of revolution having surfaces of large diameters, said long stroke attachment assembly having a drive means, screen support means and a squeegee support means, each of said screen support means and said squeegee support means engageable with said drive means for reciprocal vertical movement both in concert and relative to one another; said screen support means being capable of causing lateral reciprocal movement of a screen mounted thereto;

a rack member connected to said screen for following lateral reciprocal movement;

a pinion gear mounted for rotation on said screen support means in driving engagement with said rack member;

a sprocket wheel fixedly secured in axial alignment with said pinion gear, said sprocket wheel engaged with a chain, said chain being connected to said drive means for rotating said sprocket wheel and said pinion gear secured thereto;

whereby the relative diameters of said sprocket wheel and said pinion gear determine the length of stroke of said screen in said lateral movement, the stroke length thereby being adjustable to a longer stroke for printing on the surfaces of objects having a large diameter.

4,233,898

REVERSIBLE NEWSPAPER PRESS

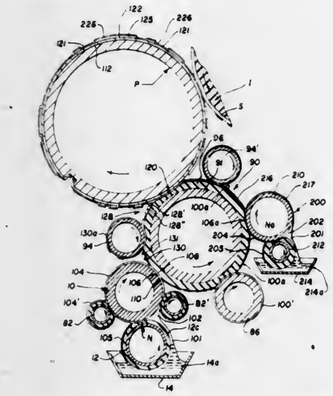
Harold P. Dahlgren, Dallas, Tex., assignor to Dahlgren Manufacturing Company, Dallas, Tex.

Continuation-in-part of Ser. No. 897,262, Apr. 18, 1978. This application Jun. 23, 1978, Ser. No. 918,228

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ B41F *7/26, 7/36, 31/06, 31/36*

U.S. Cl. 101—138 **7 Claims**



1. In a web-fed printing press wherein ink is applied to a printing plate on a plate cylinder which transfers an image to liquid receptive material, the improvement comprising: a single form roller having an ink receptive surface; means rotatably supporting said form roller in pressure indented relation with the printing plate; positive drive means connected to said form roller; an ink transfer roller having an oleophillic ink receptive surface; means rotatably supporting said ink transfer roller in pressure indented relation with said form roller; means forming a film of ink on said transfer roller; reversible drive means drivingly connected to said ink transfer roller, said reversible drive means being adapted to permit reversing the direction of rotation of said ink transfer roller upon reversing the direction of rotation of the form roller and the plate cylinder; a pair of ink storage rollers; and means rotatably supporting said ink storage rollers such that the surface of the form roller which is moving from pressure indented relation with the printing plate moves adjacent to one of said ink storage rollers before moving in pressure indented relation with said ink transfer roller upon rotation of the form roller in a clockwise or a counter-clockwise direction.

4,233,899

PREVENTION OF IMPACT IN IMPRESSION CYLINDER OF SHEET-FED LITHOGRAPHIC PRESS

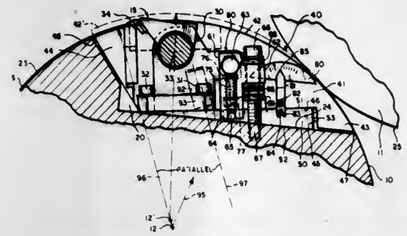
Herbert Rebel, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,601

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824430

Int. Cl.³ B41F *7/04, 13/18*

U.S. Cl. 101—142 **12 Claims**



1. In a lithographic sheet-fed press having an impression cylinder with a gap in the surface thereof defining the printing area and a cooperating blanket cylinder having bearers at its ends, blankets on the cylinders establishing printing pressure therebetween as the cylinders rotate in engagement with one another, a pair of auxiliary short bearer members arranged to bridge the gap in the impression cylinder, said bearer member presenting arcuate edges alined for engagement with the respective bearers on the blanket cylinder, means for supporting the bearer members at such radial height on the impression cylinder that when the blanket cylinder rolls into the region of the gap on the impression cylinder upon reaching the end of the printing area the force of printing pressure between the cylinders is temporarily taken over by the auxiliary bearer members to achieve a smooth restoration of printing pressure upon reaching the end of the gap and at the beginning of the printing area thereby avoiding the cyclical impact accompanying sudden build-up of printing pressure, the impression cylinder including guiding means for guiding the bearer members in a generally radial direction along precisely parallel paths, and adjusting means for reproducibly adjusting the radial positions of the bearer members to precisely corresponding points along the parallel paths to preserve the smooth restoration of printing pressure upon making a change in the thickness of the sheet stock being printed.

4,233,900

LABEL STRIP CHARGING MECHANISM FOR HAND LABELER

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Aug. 31, 1978, Ser. No. 938,422

Claims priority, application Japan, Sep. 2, 1977, 52-105008

Int. Cl.² B41F *1/08*; B65C *9/18, 11/02*

U.S. Cl. 101—288 **22 Claims**

1. A hand labeler, comprising:

a frame, a printing head carrying types to be printed on a label; a platen opposable to said types; means for moving at least one of said printing head and said platen for bringing said types into engagement with a label on said platen;

a feeding roller supported on said frame for feeding a label strip comprised of a series of labels to said platen; means for rotating said feeding roller;

a label strip charging mechanism located upstream of said platen, with respect to the travel of the label strip through said labeler; said charging mechanism comprising a pressure plate positioned near said feeding roller for defining a passage for the label strip between said pressure plate and said feeding roller; said pressure plate including a portion which is connected to be supported by said frame for movement with respect to said frame;

biasing means connected to said pressure plate for biasing said pressure plate apart from said feeding roller, thereby defining a relatively less restricted passage between said pressure plate and said feeding roller for the label strip;

retaining means for retaining said pressure plate in the vicinity of said feeding roller against the bias of said biasing means, thereby defining a more restricted passage between said pressure plate and said feeding roller for the label strip;

an actuating lever connected to said pressure plate; said actuating lever being operable for releasing said retaining means so that said pressure plate can be moved by said biasing means, whereby an enlarged clearance between said feeding roller and said pressure plate is formed to facilitate charging of the label strip.



4,233,901

DRYING PRINTED WEB MATERIAL

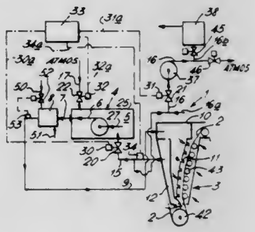
Leonard B. Mallinson, Blackburn, England, assignor to Baker Perkins Holdings, Ltd., Peterborough, England

Filed Jul. 7, 1978, Ser. No. 922,617

Claims priority, application United Kingdom, Nov. 9, 1977, 46538/77

Int. Cl.³ B41F *23/04*

U.S. Cl. 101—416 A **8 Claims**



1. Apparatus for drying printed web material, comprising:

a chamber, housing a fan disposed within a casing, said casing having a fan inlet in open communication with the interior of said chamber;

duct means for discharging a drying flow of air from said fan to outside said chamber;

means disposed outside said chamber for heating said flow;

means disposed outside said chamber for directing the heated air onto the printed web;

collector means for collecting the solvent mixture resulting from the web-drying operation;

first and second outlet means for allowing outflow of the collected solvent mixture from said collector means, said

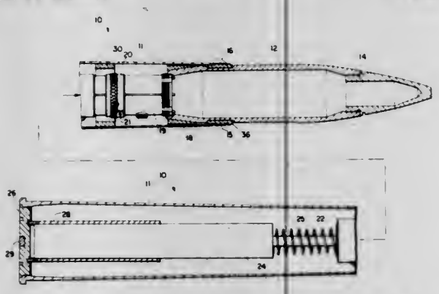
first outlet means being connected to the interior of said chamber;
fresh air inlet means also connected to the chamber interior; and,
valve means for independently controlling flow through the first outlet means, the second outlet means and the fresh air inlet means whereby the solvent mixture can be both recirculated and exhausted, without opening the fresh air inlet means.

4,233,902

76MM RAMMABLE PRACTICE CARTRIDGE

Frederick Hartley, King George; Keith Slocum, Colonial Beach; John Newquist, and Nicholas Moga, both of Fredericksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1978, Ser. No. 963,605
Int. Cl.³ F42B *5/22, 13/20*
U.S. Cl. 102—41 **7 Claims**



1. An inert dummy cartridge adapted to be repeatedly cycled through automatic gun mounts and capable of simulating the mass, rebound and velocity characteristics of live rounds during ramming comprising:
a cartridge case having a flange on the base thereof;
a projectile body fixed in the open end of said cartridge case and including a dummy fuze, said projectile body and fuze having the same mass and center of gravity as the projectile in a live round;
a shock absorber disposed within said cartridge case and fixed to the base of said projectile body, said shock absorber having a piston projecting rearwardly thereof; and
a mass slidably disposed for axial movement within said cartridge case and fixed to the piston of said shock absorber, said sliding mass being adapted to continue moving forward during the ramming cycle of the gun after the cartridge case flange has engaged the face of the breech block until the momentum of said sliding mass has been dissipated in said shock absorber whereby the mass, velocity and rebound characteristics of a live round are simulated.

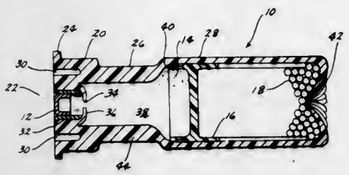
4,233,903

SHOTGUN SHELL

Frederick A. Lage, Rte. 2, Gladbrook, Iowa 50635

Filed Jan. 17, 1979, Ser. No. 4,023
Int. Cl.³ F42B *7/00*
U.S. Cl. 102—42 R **9 Claims**

1. A shotgun shell having rearward and forward ends comprising,
a first cylindrical base portion having an enlarged rim at its rearward end,
a second cylindrical portion extending forwardly from said first cylindrical portion and having an outside diameter less than said first cylindrical portion,
a third cylindrical portion extending forwardly from said second cylindrical portion and having an outside diameter substantially equal to the outside diameter of said first cylindrical portion and having a length substantially greater than the length of said first and second cylindrical portions,
said base portion having a central opening formed in its rearward end for receiving a primer therein,
at least said second cylindrical portion defining a powder chamber which communicates with said central opening,



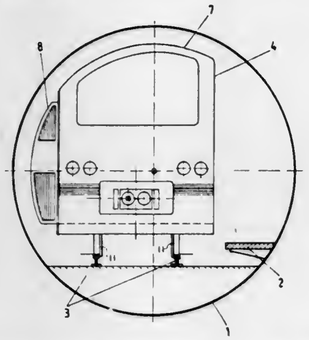
at least said third cylindrical portion defining a shot compartment,
said powder chamber and said second cylindrical portion defining a wall portion capable of expanding laterally outwardly during the firing of the shotgun shell to reduce the recoil created by said firing.

4,233,904

ASYMMETRICAL SUBWAY VEHICLE

Helmut Bugarcic, Hamburg, Fed. Rep. of Germany, assignor to Waggon Union GmbH, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,035
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747286
Int. Cl.³ B61B *13/10*; B61D *1/04, 17/00, 19/02*
U.S. Cl. 104—138 R **2 Claims**



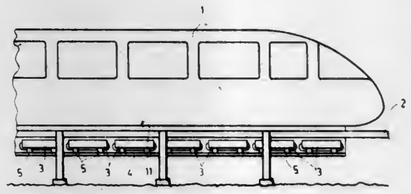
1. A subway vehicle, for service in a tunnel having a circular cross-section, comprising, a car body of the vehicle having an asymmetrical cross-section and having a first longitudinal side with a vertical side wall, window and door means on said vertical side wall, said car body having an arcuate roof and an opposite second longitudinal side of an arcuate configuration conforming substantially to the configuration of the tunnel, said car body having an inner shorter vertical wall spaced laterally inwardly from said vertical side wall and defining a passenger space between said vertical side wall and said inner shorter vertical wall, and means defining a utility space between said opposite second longitudinal side and said inner shorter vertical wall for accommodating an air and heating and cable duct.

4,233,905

MAGNETICALLY SUSPENDED VEHICLE

Eveline Gottzein, Oberpframmern; Christian Roche, and Gerhard Bohn, both of Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 815,000
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633647
Int. Cl.² B61B *13/08*; B61F *5/00, 5/50*
U.S. Cl. 104—281 **3 Claims**



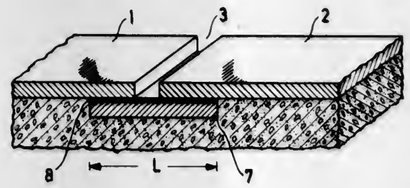
1. A magnetic suspension vehicle for use with a rail, comprising a vehicle body, a plurality of suspension magnets, a carrier mounted on the body for carrying said magnets and positioning the magnets beneath the rail, said magnets being longitudinally aligned, a plurality of spring means each individually coupling one of the magnets to said carrier, said vehicle when operating subjecting said magnets to pitch and roll moments, said spring means each having a size and spring constant to impart stabilizing moments to the magnets in the pitch and roll axes which are greater than the pitch and roll moments to which each of said magnets is subjected.

4,233,906

LINEAR INDUCTION MOTOR WITH IMPROVED RAIL ASSEMBLY

Karl H. Seiler, Breitenau, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,735
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705954
Int. Cl.³ E01B *41/02*
U.S. Cl. 104—294 **3 Claims**



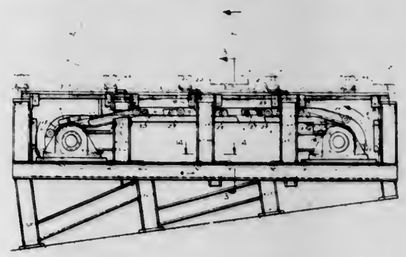
1. In combination with a linear induction motor having a current-induced primary part having a pole length and an electrically conductive reaction rail composed of a multiplicity of successive rail sections, the improvement which comprises an expansion junction between successive rail sections whereby the successive rail sections are one-piece flat elongated plates of constant cross section over their entire lengths and are in inductive energy-transferring relationship with one another but out of direct electrical or mechanical contact and are capable of relative thermal expansion and contraction movement, two main rail sections at each junction have their ends juxtaposed with one another across an air-filled expansion gap and each overlaps in the direction of travel a flat intermediate rail section of the same width and defines a respective induction gap therewith, said induction gap being filled with a solid insulating medium, said intermediate rail section bridging the expansion gap, the length of said rail section corresponding approximately to said pole length.

4,233,907

MOLD CONVEYOR DRIVE ASSEMBLY

Joe B. Brown, East Lansing; Louis I. Thompson, and Stephen P. Mishanec, both of Lansing, all of Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Oct. 25, 1978, Ser. No. 954,463
Int. Cl.³ B61B *13/12*; B65G *23/16*
U.S. Cl. 104—172 B **6 Claims**



1. A mold conveyor drive assembly for driving a mold conveyor chain comprising:
a support frame;
a mold conveyor chain provided on said support frame, said mold conveyor chain defining a plurality of spaced-apart drive dog buttress-receiving openings therein, said mold conveyor chain provided with drive dog buttress-engaging pusher block means at one end of each of said buttress-receiving openings;
a vertically oriented endless cat drive chain mounted on said support frame in spaced-apart aligned register below a rectilinear portion of said mold conveyor chain, said cat drive chain provided with a plurality of spaced-apart drive dog means having mold conveyor chain-engaging buttress portions thereon, said buttress portions adapted to make selective meshing engagement with said buttress-receiving openings so as to exert a central unitary drive force against selected of said pusher block means along the longitudinal axis of said mold conveyor chain;
a plurality of spaced-apart guide wheels provided on said mold conveyor chain intermediate said drive dog buttress-receiving openings;
guide wheel cam rails provided on the support frame along each side of said mold conveyor chain, said cam rails adapted to guidably direct said guide wheels therebetween upon corresponding movement of said mold conveyor chain; and
motor drive means in association with said cat drive chain, said motor drive means adapted to selectively actuate said cat drive chain so as to cause corresponding movement of said mold conveyor chain.

4,233,908

CONSTRUCTION OF REACTOR-DRIVEN ARTICULATED TRAINS WITH ELEVATED TRACKS

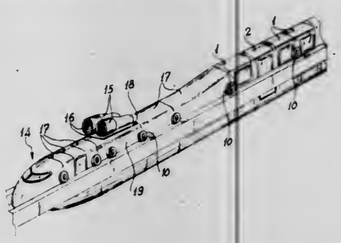
Alejandro G. Omar, Avda. del Generalisimo 4, Madrid-16, Spain

Filed Dec. 28, 1978, Ser. No. 973,905
Int. Cl.³ B61D *17/00*
U.S. Cl. 105—3 **11 Claims**

1. A reactor-driven articulated rail train having a single, tubular, flexible body unit, said body unit comprising:
a plurality of rigid rings, the openings of said rings defining the internal cross-section of said body unit;

elastic joint means comprising a plurality of load-carrying flexible rings having substantially the same opening dimensions as said rigid rings, said body unit being a continuous tubular assembly of said plurality of rigid rings alternating with and joined by said plurality of flexible rings, thereby rendering said tubular unit incrementally flexible;

support means including a plurality of elements adapted to



move along train rails, said elements being spaced along said body unit supporting the weight thereof;

a plurality of seats in said tubular body unit; and

mounting means for attaching said seats to said tubular unit, said mounting means permitting said seats to tilt with respect to said body unit about an axis parallel to the longitudinal axis of said body unit in response to centrifugal force applied to said train.

4,233,909

RAILWAY CAR ASSEMBLY COMPOSED OF A SERIES OF ARTICULATELY INTERCONNECTED CARS

Michael B. Adams, Western Springs; John A. Angold, Naperville, both of Ill.; Robert B. Morrison, and Robert E. Zimmerman, both of Topeka, Kans., assignors to Itel Corporation, San Francisco, Calif.

Filed Mar. 28, 1978, Ser. No. 890,984
Int. Cl.³ B61F *1/00*; B65D *17/10*
U.S. Cl. 105—4 R **26 Claims**



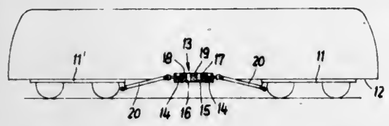
1. A railway car comprising at least two railway car units connected end to end by an articulated connector having mating male and female members, said ends of said car units being mounted on a single truck assembly which spans the space between said ends, each of said car units comprising a center sill which extends substantially the entire length of the car unit, a first of said mating members of said articulated connector fixed to one of said car units and a second of said mating members fixed to a second of said car units, an end sill disposed transversely on each of said car units and extending substantially symmetrically from the center sill, a side bearing support member extending from respective sides of the center sill at points spaced from the said end of each car unit and extending longitudinally between car units, said single truck assembly comprising a pair of side frames holding a pair of axles having wheels mounted thereon, a truck bolster disposed between and extending substantially parallel to said axles for supporting said articulated connector, a side bearing support member on said bolster on opposite sides of the longitudinal axis of the bolster, and one pair of side bearings disposed on each of said bearing support members, each pair of side bearings on the same side of said longitudinal axis of the bolster supporting said pair of side bearing support members of one of said interconnected car units.

4,233,910

RAILWAY CAR HYDRAULICALLY DAMPENED TRACTION RODS

Friedrich Schumacher, Mülheim-Saarn, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,117
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737834
Int. Cl.³ B61F *3/08, 5/16, 5/50*
U.S. Cl. 105—182 R **4 Claims**



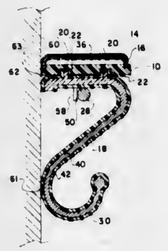
1. A rail vehicle, especially self-propelled vehicle, which includes in combination: a main frame, a pair of bogies pivotable about a central axis and operatively connected with said main frame and arranged in spaced relationship to each other in the longitudinal direction of said main frame, two hydraulic cylinder-piston systems respectively arranged between and in spaced relationship to said bogies and operatively connected therewith, one of said two cylinder-piston systems being arranged on one side of said frame and the other one of said two cylinder-piston systems being arranged on the other side of said frame, said two cylinder-piston systems being located symmetrically with regard to the longitudinal central axis of said rail vehicle, two pairs of pressure and pull rods respectively interposed between said cylinder-piston systems and each bogie of said pair of bogies, each cylinder-piston system having two separately acting working pistons dividing the pertaining cylinder into two end and one intermediate working chambers, each of the two separately acting working pistons of each cylinder-piston system being respectively pivotally connected to one end of one rod of said pair of pressure and pull rods while the other ends of said pressure and pull rods are respectively pivotally connected to the pertaining bogie of said pair of bogies, and three conduit means for establishing communication between the three respective working chambers of one cylinder-piston system with the corresponding working chambers of the other cylinder-piston system for transmitting pulling and braking forces between bogies and said main frame furnishing an adjustable elasticity during power transmission.

4,233,911

SHOWER SHELF

Grace M. Vignale, Garden Rd., Rte. 5, Box 213-O, Deland, Fla. 32720

Filed Apr. 24, 1979, Ser. No. 32,838
Int. Cl.³ A47B *41/04*
U.S. Cl. 108—30 **2 Claims**



1. A bracket and shelf assembly mountable on a towel bar that is fixed at a spaced distance from a vertical wall, comprising a plate for supporting articles; a pair of spaced brackets in snap fit engagement with the bottom of said plate; said brackets having upper and lower hook portions; said upper hook portions shaped to fit over said bar, together with

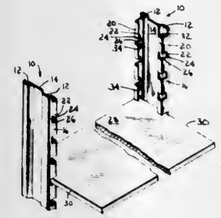
a clip member extending from the underside of the plate, which clip member, in the installed position of the assembly, bears against a side surface of the towel bar which said side surface faces the external surface of the wall to which the towel bar is mounted.

4,233,912

SHELF STANDARD

Irwin J. Ferdinand, Glencoe, Ill., assignor to Hirsh Company, Skokie, Ill.

Filed Apr. 23, 1979, Ser. No. 32,415
Int. Cl.³ A47B *47/02*
U.S. Cl. 108—109 **1 Claim**



1. A shelf support system comprising two shelf standards, each standard having one backwall and two sidewalls each defining aligned cut-out portions circumscribed by a first edge generally parallel to said backwall and second parallel edges normal to said first edge to define an opening adapted to receive shelving, said backwall having a center section panel which extends forwardly from the backwall a distance greater than the distance from the backwall to said first edge to keep the edge of the shelving being inserted and removed from the shelf support free from contact with said first edge to prevent chafing, shearing or other damage to the shelf when it is being moved relative to the support, each standard also having at least one front section extending from one sidewall generally toward the other sidewall, and generally parallel to the backwall which contains a flange to and in support of shelving when said shelving is fully received by the cut-out portion immediately above said front section, whereby the two shelf standards face each other a distance determined by the length of the shelfs to be supported so that the shelf edges are in firm contact with the center section panels of the standards and so that the shelf is restricted from lateral shifting when fully received by said standards.

4,233,913

SAFE DOOR

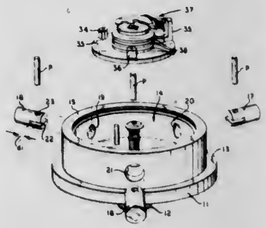
John C. Herrmann, 101 South Fuller Ave., Los Angeles, Calif. 90036

Filed Aug. 23, 1979, Ser. No. 68,948
Int. Cl.³ E05B *63/00*
U.S. Cl. 109—59 T **8 Claims**

1. A safe door having a circular recess and including, in combination:

(a) a cam plate positioned in said recess with its peripheral outer edge having a given clearance with the inside wall of said recess, said cam plate having a central opening with notches and peripheral cam slots coupled to locking bolts for retracting and extending the bolts from the side of the door upon rotation of the cam plate between first and second positions; and

(b) a cam plate driver supporting combination lock components positioned within said central opening of said cam plate, said driver having driving lugs received in said notches with a clearance greater than said given clearance, whereby any lateral movement of said cam plate as might result from a radially inwardly directed blow on one of said bolts, results in the diametrically opposite



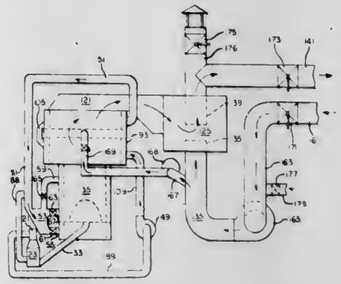
portion of the cam plate engaging the inner wall of said recess before any engagement of the cam plate with said cam plate driver and combination lock components so that the latter components are protected from damage.

4,233,914

PRESSURIZED WASTE WOOD FURNACE SYSTEM

Henry W. Schuette, Tigard, and Charles L. Wellons, West Linn, both of Oreg., assignors to Wellons, Inc., Sherwood, Oreg.

Filed Oct. 2, 1978, Ser. No. 948,091
Int. Cl.² F23J *15/00*
U.S. Cl. 110—233 **9 Claims**



1. In a furnace for supplying combustion gases to a dryer for drying articles of commerce wherein such gases leave the dryer as dryer gases,

a fuel cell for burning fuel and having a floor,

air pressure means for introducing ambient air generally tangentially into said cell to cause the combustion gases to whirl around and prolong the period of time the combustion gases stay in the cell to enable superior consumption of the particles of fuel,

said air pressure means creating a sufficient pressure in said cell to create a pressure gradient causing travel of combustion gases from said cell to the dryer,

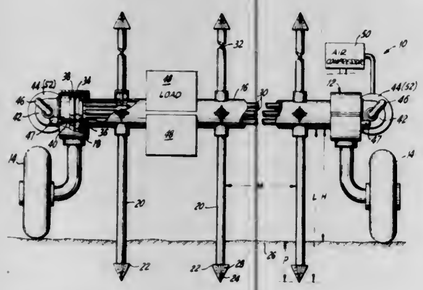
injection means for injecting fuel to be burned into the floor of said cell against the resistance of the pressure therein,

means for creating an air back pressure zone in said injection means to resist back flow of combustion gases through said injection means,

a combustion chamber above said fuel cell having an inlet for receiving combustion gases from the fuel cell and having an outlet disposed at a level above said inlet,

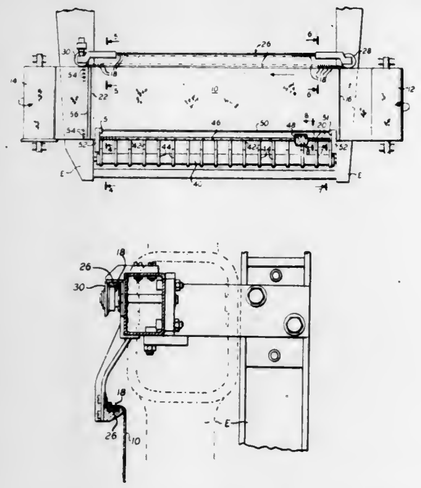
a blending chamber for receiving combustion gases from said combustion chamber enroute to the dryer,
means for returning a portion of the dryer gases to said blending chamber for intermixing with combustion gases,
and means for returning a portion of the dryer gases to said combustion chamber at a level below the outlet of said combustion chamber and introducing said portion of dryer gases into the combustion chamber in generally tangential relationship so as to augment the whirling action of said gases which has been effected in the fuel cell and to prolong the period of time that such gases remain in the combustion chamber to facilitate superior consumption of entrained particles.

4,233,915
APPARATUS FOR CULTIVATING SOIL
Moonish J. Kordon, 4300 Atlantic Ave., Brooklyn, N.Y. 11224
Filed Apr. 30, 1979, Ser. No. 34,572
Int. Cl.[3] A01C *23/02*
U.S. Cl. 111—6 **5 Claims**



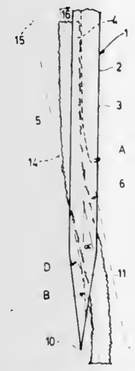
1. An apparatus for cultivating soil by forcing a pressurized fluid therethrough comprising:
a wheeled frame;
a source of pressurized fluid mounted on said frame;
means for controlling the flow from said source of pressurized fluid;
a hollow shaft horizontally and rotatably mounted on said frame;
a plurality of spaced arrays of hollow rods radially extending from said shaft, the individual rods in said arrays being radially aligned to define longitudinal rows of rods, each said rod including a generally conically shaped nozzle connected to the free end thereof, each said nozzle including a plurality of blades radially disposed around the entire periphery of said nozzle to facilitate the embedding of said nozzle in the soil, each said nozzle further including a plurality of outlets disposed along the length of said blades to facilitate the breaking up of the soil, and with the length of each said rod being greater than the distance from said soil to said rotatable shaft; and
conduit means connected to said source of pressurized fluid and said outlets in said nozzles for sequentially channeling said pressurized fluid from said source to said outlets, said conduit means including a plurality of primary pipes disposed inside said hollow rotatable shaft with the number of said primary pipes corresponding to the number of longitudinal rows of said hollow rods and associated therewith, said conduit means further including a plurality of secondary pipes, with each said hollow rod having one secondary pipe disposed therein, said primary pipes being in communication with said pressurized fluid source, and with said secondary pipes being in communication with the associated primary pipe and associated nozzle, said conduit means further including a flange connected to said shaft and rotatable therewith, said rotating flange having a plurality of openings corresponding to the number of primary pipes and in communication therewith, said conduit means further including a stationary flange mounted within said frame and in slidable contact with said rotating flange, said stationary flange having an aperture in communication with said source of pressurized fluid and disposed such that it is sequentially aligned with the opening in said rotating flange which communicates with the primary pipe that is associated with the particular longitudinal row of rods that is then in the vertically downward position, and wherein the movement of said frame causes the sequential embedding of said nozzles of said longitudinal rows of rods in said soil whereby when a longitudinal row of rods is in the vertically downward position, said means for controlling the flow of said source of pressurized fluid releases a short burst of pressurized fluid such that said fluid is channeled through the aligned apertures in said flanges, and through the associated primary pipe to the associated secondary pipes and to said embedded nozzles and is vented through said outlets thereby breaking up the soil.

4,233,916
PROCESS AND APPARATUS FOR PRODUCING CONTINUOUS EMBROIDERED FABRICS
David Krieger, Greenville, S.C., assignor to Emb-Tex Corporation, Travelers Rest, S.C.
Filed Jan. 10, 1978, Ser. No. 868,365
Int. Cl.[2] D05C *7/04*; D05B *27/00*
U.S. Cl. 112—90 **7 Claims**



1. An apparatus for making substantially endless lengths of embroidered fabric comprising in combination an embroidery apparatus and a fabric placement and advancement frame for positioning a fabric in an area to be embroidered by said embroidery apparatus and for advancing the embroidered fabric, said embroidery apparatus including means for piercing a fabric to be embroidered with yarns, said fabric and placement frame comprising means for taking the fabric from a supply, means for advancing the fabric across the width of the embroidery apparatus to said area, means for establishing a predetermined tension in the fabric in the area, a plurality of pins extending across the width of the embroidery apparatus near where one edge of the fabric is located, means for pivoting said pins so as to penetrate and engage the edge of the fabric, means for moving said pins after engagement so as to tension and fabric, and means for releasing the fabric after having been embroidered.

4,233,917
NEEDLE STITCHING
Garth A. Carnaby, Papanui, New Zealand, assignor to Wool Research Organization of New Zealand (Inc.), Canterbury, New Zealand
Continuation-in-part of Ser. No. 932,661, Aug. 10, 1978, abandoned. This application Mar. 27, 1979, Ser. No. 24,452
Claims priority, application New Zealand, Aug. 10, 1977, 184895
Int. Cl.[3] D05C *15/20*
U.S. Cl. 112—222 **11 Claims**



1. A needle for tufting, sewing, stitching and the like machines, the needle comprising a shaped elongate blade having at one end thereof a shank and at the other end thereof a point adjacent to which is positioned a needle eye, the elongate blade and the point having a shaped path formed therein above the needle eye and on the point, the path being defined by longitudinal recess located in one side of the blade above the eye and a cut-away portion on a side of a region of the point opposite said one side on which the longitudinal recess is located, the path allowing substantially unimpeded movement of yarn through the needle eye when the needle is withdrawn in an upward direction, the path being so shaped and dimensioned as to produce a deflection angle of not more than 13 degrees, said deflection angle being defined as an angle between the axis of a measuring rod having a diameter of exactly 0.3 times the maximum lengthwise extent of the needle eye and the longitudinal axis of the needle.

4,233,918
METHOD OF MAKING A RUG
Joseph J. Montell, Laguna Beach, Calif., assignor to Rug Crafters, Santa Ana, Calif.
Continuation-in-part of Ser. No. 810,038, Jun. 27, 1977. This application Oct. 25, 1978, Ser. No. 954,548
Int. Cl.[3] D05C *15/00*
U.S. Cl. 112—266,2 **17 Claims**

1. A method of making a rug comprising:
providing a rug backing having a forward face and a back face;
attaching a plurality of elongated flexible tying elements to the rug backing, the end portions of each of said tying elements extending from said rug backing;
providing a plurality of bundles of strands with said bundles being of predetermined lengths;
placing one of said bundles of strands adjacent the forward face of the rug backing and adjacent one of the tying elements;
wrapping said one tying element at least part way around a central region of said one bundle of strands;
tying a knot in said one tying element to attach said one bundle of strands to the forward face of the rug backing whereby said one bundle forms two clumps of pile on the forward face of the rug backing with said clumps being on opposite sides of said tying element and with each of said clumps being about one half of said predetermined length of said one bundle;
leaving the clumps unattached to the rug backing outwardly of said one tying element; and
repeating said steps of wrapping, tying, and leaving to attach a multiplicity of the bundles of strands to the forward face of the rug backing.

16. A method of making a rug comprising:
providing a rug having a forward face and a back face;
attaching a plurality of elongated flexible tying elements to the rug backing, the end portions of each of said tying elements extending from said rug backing;
said rug backing having a plurality of indicia thereon and said step of attaching including sewing said tying elements onto said rug backing adjacent said indicia, respectively;
providing a template;
wrapping a continuous filament around said template a plurality of times to form a multiplicity of loops of said filament;
holding said loops in position on said template by providing a resilient band around said template and said loops;
cutting each of said loops a plurality of times whereby each of said loops forms at least two bundles of strands;
wrapping one of said tying elements a single time around a central region of one of said bundle of strands;
tying a knot in said one tying element to attach said one

bundle of strands to the forward face of the rug backing whereby said one bundle forms two clumps of pile on the forward face of the rug backing with said clumps being on opposite sides of said tying element, said step of tying including forming said knot so that the end portions of said one tying element extend beyond said knot to form additional strands of said one bundle with said additional strands extending for about the same distance from the rug backing as the other strands of said one bundle; and
repeating said steps of wrapping and tying to attach a multiplicity of the bundles of strands to the forward face of the rug backing.

17. A method of making a rug comprising:
providing a rug backing having a forward face and a back face;
attaching a plurality of elongated flexible tying elements to the rug backing, the end portions of each of said tying elements extending from said rug backing;
providing a plurality of bundles of strands;
wrapping one of the tying elements at least part way around a central region of one of the bundles of strands;
tying a knot in said one tying element to attach said one bundle of strands to the forward face of the rug backing whereby said one bundle forms two clumps of pile on the forward face of the rug backing with said clumps being on opposite sides of said tying element;
repeating said steps of wrapping and tying to attach a multi-

plicity of the bundles to the forward face of the rug backing; and

said step of attaching including sewing a tying element strand into said rug backing to form a plurality of loops on the forward face of the rug backing with the tying element strand being attached to the rug backing intermediate each of said loops and cutting said tying element strand at said loops to form a plurality of said tying elements each of which is attached to the rug backing.

4,233,919

SEWING MACHINE PROTECTION APPARATUS

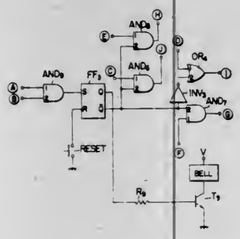
Tadashi Takahashi, and Shigeki Morinaga, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 5, 1978, Ser. No. 921,952

Claims priority, application Japan, Jul. 13, 1977, 52-82874; Sep. 2, 1977, 52-104887

Int. Cl.³ D05B *69/22, 69/36, 19/00*

U.S. Cl. 112—277 **7 Claims**



1. A protection apparatus for safety operation of an electric motor-driven sewing machine, comprising: drive mechanisms for driving said sewing machine by an electric motor; a thread trimmer mechanism for automatically trimming a thread; a thread wiper mechanism removing thread as trimmed by said thread trimmer mechanism, means for supplying predetermined command signals; means for detecting selected positions of a needle of said sewing machine; control circuit means for controlling said various mechanisms in accordance with the corresponding detected signals and control signals; abnormality detecting means for detecting an abnormal state in which two of said signals, which are not to take place simultaneously during normal operation, occur simultaneously and for generating an output abnormality signal in response thereto; and means for responding to the output abnormality signal from abnormality detecting means thereby to invalidate operations of at least said drive mechanism, said automatic thread trimmer mechanism and said thread wiper mechanism and to actuate a stoping mechanism to stop the operation of said sewing machine.

4,233,920

VEE HULL CONSTRUCTION

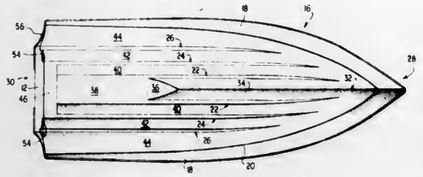
Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Flippin, Ark.

Filed May 24, 1979, Ser. No. 42,200

Int. Cl.³ B63B *1/00*

U.S. Cl. 114—56 **4 Claims**

1. In a power boat hull having a plurality of chine pairs extending fore and aft intermediate the bow and transom thereof; the central one of said chine pairs straddling a centerline keel portion exhibiting a forward vee section and an aft concave section comprising a concave planing pad; said forward vee section merging with said planing pad via an upwardly and rearwardly directed transition area for introducing air to said concave planing pad as the hull approaches full plane and directing air and water thereto during full plane; said concave planing pad terminating at the after end thereof in a transverse step immediately adjacent and forward of said transom whereby water flowing thereacross includes an upward



component at the plane of the transom; and the plane of said transom extending, from above the water line, downwardly and forwardly to said transverse step.

4,233,921

TRANSPORT VESSELS HAVING LIQUID GAS STORAGE TANKS

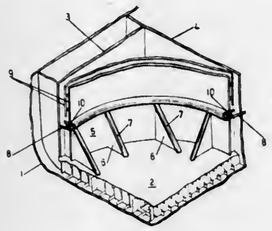
Jaime M. Torroja, Madrid; Jose U. Rivacoba, Bilbao, and Ricardo M. Herrero, Madrid, all of Spain, assignors to Sener Ingenieria y Sistemas, S.A., Madrid, Spain

Filed Jan. 26, 1979, Ser. No. 6,859

Claims priority, application Spain, Jan. 31, 1978, 466.499

Int. Cl.³ B63B *25/14*

U.S. Cl. 114—74 R **12 Claims**



1. In a vessel equipped with at least one pressurized independent tank wherein there is at least one support covering placed above a substantially horizontally oriented platform, the improvement comprising:

means for reducing the tensions induced in the tank and its support covering due to vertical deformations of the hull of the vessel, said means including

a continuous sheet located above said platform and being positioned substantially parallel to said platform,

a deformable element capable of regaining its form and being placed between said continuous sheet and said platform;

said continuous sheet being connected to the platform by means of at least one intermediate element and being equipped with a central opening through which said tank can pass,

said deformable element being capable of transmitting, between said continuous sheet and said platform, perpendicular forces of the hull of the vessel,

said continuous sheet being constructed to transmit parallel forces of the hull of the vessel in the form of sharp pressures, while at the same time allowing vertical deformation of the deformable element.

4,233,922

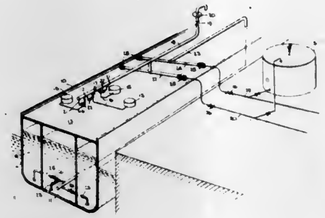
FLUID TRANSFER SYSTEM FOR TANKER VESSELS

Charles S. Conway, Featherbed La., New Vernon, N.J. 07976

Filed Feb. 9, 1979, Ser. No. 10,909

Int. Cl.³ B63B *25/12*

U.S. Cl. 114—74 R **10 Claims**



1. In a tanker vessel for the transportation of fluid chemical and petroleum products in water, said vessel including a hull comprising a bottom and sides, a top deck, a plurality of watertight and substantially air-tight cargo compartments disposed within said hull between said top deck and said hull bottom for receiving said products, cargo expansion trunk means coupled to and opening downwardly into each of said cargo compartments, branch vent line means coupled to the cargo expansion trunk means and including pressure/vacuum relief valve means, and longitudinally disposed trunk vent line means including pressure/vacuum relief valve means, said trunk vent line means being coupled to said branch vent line means and being communicative with the atmosphere for venting contaminated gases formed by said fluid products and contained within said cargo compartments from said cargo compartments through said cargo expansion trunk means and said branch vent line means to the atmosphere, the improvement comprising bypass vent line means including vent closure valve means coupled to at least one of said cargo compartments, said bypass vent line means being coupled at one end to said trunk vent line means and at the other end to said cargo expansion trunk means of said one of said cargo compartments, said vent closure valve means being adapted to be opened and couple said trunk vent line means to said cargo expansion trunk means of said one of said cargo compartments through said bypass vent line means thereby bypassing said pressure/-vacuum relief valve means of said branch vent line means and venting contaminated gases to or from said one of said cargo compartments through said cargo expansion trunk means of said one of said cargo compartments, and bypass vent line means and said trunk vent line means.

4,233,923

SAFETY RELEASE FOR WATER SKIING TOW LINE

Edward F. Casad, St. Marys, and Thomas R. Casad, Celina, both of Ohio, assignors to Ajax Machine & Welding Co., St. Marys, Ohio

Filed Oct. 5, 1978, Ser. No. 948,958

Int. Cl.² B63B *21/56*

U.S. Cl. 114—253 **10 Claims**

1. A safety release for water skiing tow ropes actuable by a tow boat occupant comprising:

a body having front and rear portions;

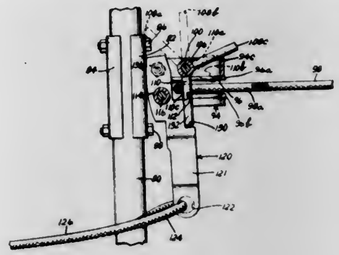
first means for removably attaching said body to a towing boat;

a horizontally disposed slot formed in and opening through the front portion of said body and adapted to slidably receive a loop of rope therein, the loop being slidable in said slot between a rearward slot position to a forward loop-attaching position;

second means for engaging and positioning the loop in the slot;

said second means being freely movable in a rearward direction out of said slot under a pulling force of said rope;

third means pivotably movable into engagement with said second means for holding said second means in said loop-attaching position and for manually releasing said engagement to permit said second means to move rearwardly,



said engagement being substantially in a horizontal plane including the pivot axis of the third means, locating means including said slot for positioning said loop of rope in or above the plane of said engagement; and

fourth means for yieldably retaining said third means in engagement with said second means.

4,233,924

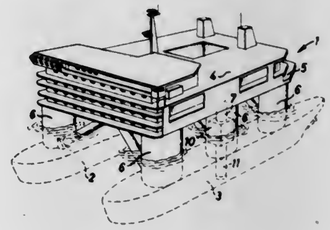
UNDERWATER CRAFT LAUNCH TUBE

John S. Clinton, Bourne End, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 13, 1978, Ser. No. 895,996

Int. Cl.³ B63B *35/40*

U.S. Cl. 114—259 **14 Claims**



1. A launch tube for passing an underwater craft through an air/liquid interface comprising a substantially vertical passageway having a surrounding surge chamber adjacent to the air/liquid interface, the surge chamber communicating with the passageway through a perforated section of the passageway, the chamber and perforations being of a size and distribution in relation to the passageway such that there is damping of liquid oscillation in the tube.

4,233,925

PADDLES FOR BOATS

Douglas B. I. Proctor, "Fenmead", Brook Ave., Warsash, Hampshire, England

Filed Feb. 21, 1979, Ser. No. 13,561

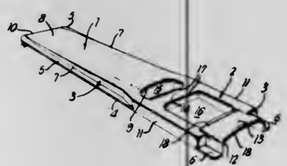
Claims priority, application United Kingdom, Feb. 23, 1978, 7259/78

Int. Cl.³ B63H *16/04*

U.S. Cl. 440—101 **7 Claims**

1. A paddle of rigid unitary construction formed in plastics material, for use with boats, and consisting of a hand-receiving portion forming one end-part of the paddle, a longitudinally extending generally planar blade portion of substantially

greater length than width forming the other end-part and laterally spaced walls extending longitudinally in both the blade portion and the hand-receiving portion, the side walls having lower edges which lie in a plane defining the base of the paddle and being disposed generally transversely to said plane; a rigid lateral hand-grip that is relatively narrow in the longitudinal direction spanning the side walls at a position longitudinally spaced from the blade portion between the ends of the paddle to define a first aperture between the side walls, the blade portion and the hand-grip whereby a hand may be curled around the grip; a rigid lateral bracing portion spanning the ends of the side walls remote from the blade portion in longitudinally spaced manner from the hand-grip to define a second aperture between the hand-grip, the bracing portion and the side walls, both the bracing portion and the hand-grip lying generally in the extended principal plane of the blade portion whereby in use with the fingers of one hand curled around the



hand-grip, the hand extends through the second aperture with the lower arm bearing against the bracing portion to restrain the paddle against pivotal movement with the grip while the blade portion is subjected to pressure during propulsion, and wherein in the blade portion extends across the side walls from upper portions thereof and longitudinally from a position adjacent the first aperture to the remote end of the blade portion, the side walls in the blade portion tapering in height from said position adjacent the first aperture to the remote end of the blade portion whereby the end of the blade at the remote end of the blade portion extends in the plane defining the base of the paddle with said end substantially perpendicular to the side walls, and a lateral wall disposed generally transversely to said base plane between the side walls and extending from the blade adjacent the first aperture to a lower edge thereof in said base plane such that a water scoop is defined between the remote end of the blade, the lateral wall and the side walls in the blade portion.

4,233,926

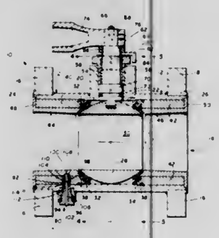
FLANGE VALVE HAVING IMPROVED SEALING CHARACTERISTICS AND WEAR INDICATOR

Philip W. Rogers, and Claude E. Parkin, both of Mexico City, Mexico, assignors to A. Dean Mammel, Dallas, Tex.

Division of Ser. No. 695,973, Jun. 14, 1976, Pat. No. 4,137,709. This application Jul. 31, 1978, Ser. No. 929,453

Int. Cl.[3] G01D *21/00;* **G01L** *19/12;* **F16C** *15/04*

U.S. Cl. 116—208 **8 Claims**



1. A wear detector for a valve including a valve body with a wall defining a fluid flow path through the valve, comprising:

said wall having inner and outer surfaces and being of predetermined thickness,

said wall including an aperture formed in the outer surface of said wall to a depth less than said predetermined thickness corresponding to the amount of wear of the inner wall surface desired to be detected,

an indicator stem slidably mounted within said aperture for movement between an inward position and an extended position, said stem being normally maintained in said inward position until the inner surface of said wall wears sufficiently to expose said aperture such that said indicator stem is fluidly biased to said extended position thereby signaling wear of said valve body wall, and

sleeve means mounted in said aperture for guiding said indicator stem between the inward and extended positions.

4,233,927

INSTRUMENT ASSEMBLY WITH ILLUMINATED METER MOUNTING PANEL

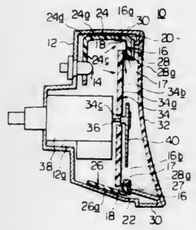
Akio Oikawa, Yokosuka, and Koji Sasai, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 18, 1979, Ser. No. 49,450

Claims priority, application Japan, Jun. 21, 1978, 53-74137

Int. Cl.[3] G01D *11/28;* **G05D** *25/02*

U.S. Cl. 116—287 **10 Claims**



1. An instrument assembly, comprising:

a casing having a generally open front side;

at least one meter movement disposed in said casing;

a spindle extending from said movement toward the front side of said casing and being rotatable about the axis thereof;

a dial board disposed in said casing in front of said meter movement and having a front face facing the front side of said casing, said front face having indicia thereon and an opening therein through which said spindle passes;

a pointer having a hub portion fixed to said spindle so as to move over the front face of said dial board in response to rotation of said spindle;

a meter mounting panel having a rear edge and a front portion, said front portion positioned in said casing in front of said dial board and having an opening through which the front face of said dial board is exposed, said panel being constructed of a transparent material;

an opaque layer covering at least a portion of the face of said panel which faces away from the front side of said casing;

at least one light source located in said casing at a position to the rear of said dial board for producing light;

a light guiding member which is constructed of a transparent material and is located with respect to said light source and said rear edge of said panel so as to transmit the light from said light source to the edge of said panel; and

means formed on said panel for reflecting the light which has entered the edge of said panel in a direction parallel to the front face of said panel, whereby the reflected light travels in said panel to illuminate the entire of said panel from within.

4,233,928

INNER BURR CUTTING, INNER FACE CLEANING AND INNER FACE PAINTING APPARATUS FOR LONG PIPES OF SMALL AND MEDIUM DIAMETERS

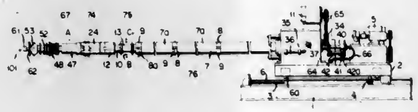
Keiichi Hara, and Tomoji Fujisawa, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1979, Ser. No. 68,512

Claims priority, application Japan, Aug. 29, 1978, 53-105230

Int. Cl.[3] B05C *5/00, 7/02*

U.S. Cl. 118—35 **7 Claims**



1. An inner burr and inner surface cleaning apparatus for pipes of medium and small diameters comprising:

a base;

a carriage mounted on the base and reciprocable along a long pressure-welded pipe of medium and small diameters having an inner burr produced on an inner face thereof;

a supporting tube inserted into the pressure-welded pipe and having two ends, one end being supported by the carriage;

first drive means mounted on the carriage;

a hollow cylindrical rotary shaft having two ends and passing through the supporting tube with one end protruding from said other end of the supporting tube and rotated at the other end thereof by the first drive means;

inner burr cutting means fixedly mounted on the rotary shaft for cutting off the inner burr;

sets of guide rollers, each of said sets being arranged circumferentially on an outer periphery of the supporting tube for contacting the inner face of the pressure-welded pipe;

centering means disposed at the other end of the supporting tube for centering the inner burr cutting means in the pressure-welded pipe;

second drive means mounted on the centering means;

spatter crushing means disposed adjacent to the second drive means and rotated thereby for crushing spatters produced in the pressure-welded pipe, said spatter crushing means having two ends, one end being nearer to the carriage and the other end being more remote therefrom;

electromagnetic means disposed at one of said two ends of the crushing means for attracting chips and spatters in the pressure-welded pipe;

spattering prevention means disposed between the inner burr cutting means and said one end of the supporting tube;

a paint spraying device disposed at an end of the apparatus which is remote from the carriage for spraying paint on the inner face of the pressure-welded pipe; and

a cooling device surrounding pressure-welded portions of the pressure-welded pipe for cooling said pressure-welded portions.

4,233,929

APPARATUS FOR THE TREATMENT OF TIMBER

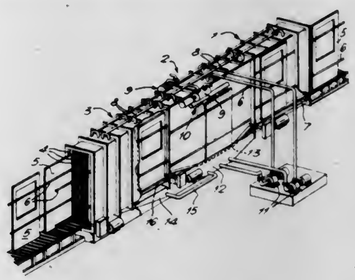
Robert G. Hurst, High Wycombe, and Alan L. Pinner, Beaconfield, both of England, assignors to Protim International Limited, Marlow, England

Filed Jan. 8, 1979, Ser. No. 1,803

Int. Cl.[3] C23C *13/08, 11/00;* **B05D** *3/00*

U.S. Cl. 118—50 **7 Claims**

1. An apparatus for the continuous treatment of a sucession of individual generally elongate items of timber, comprising a vessel having at least three chambers arranged in series for passage of the timber therethrough, means for drawing a vacuum in each of the end chambers and means for spraying the timber with preservative liquid in an intermediate chamber, guide means for holding the timbers upright, conveying means for transporting the upright timber sequentially through said chambers, sealing means adapted to maintain the vacuums in the end chambers, said sealing means being located at the ends



of the vessel and between said chambers and timing means to control the period of treatment in the chambers.

4,233,930

APPARATUS FOR THE CONTINUOUS AND SIMULTANEOUS APPLICATION OF COATINGS OF CONSTANT THICKNESS TO BOTH SIDES OF A WEB

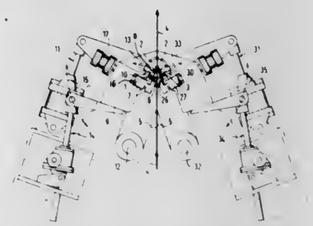
Gerhard Wohlfeil, Monheim, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 9, 1979, Ser. No. 2,771

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845036

Int. Cl.[3] B05C *11/04*

U.S. Cl. 118—122 **11 Claims**



1. In an apparatus for the continuous simultaneous application of coatings of constant thickness to two sides of a material web, having two adjustable two-edged spreader blades confronting one another at an angle, between which the material web passes for the proportioning of the coatings, a chuck for each blade, and means clamping each spreader blade at a clamping line along one edge in the chuck, the other edge of each blade parallel to the clamping line being free and engaging under bias and a corresponding biasing force the material web carried over the free edge of the other spreader blade along an engagement line at an acute attitude angle with respect to the direction of movement of the material web, and means applying said biasing force to each blade along a fulcrum line, the improvement wherein one spreader blade is rigid and the other spreader blade is resilient, means mounting the chuck of the resilient spreader blade for pivoting movement of the resilient spreader blade about the engagement line between the resilient spreader blade and the rigid spreader blade and about a line outside of the clamping line for movement of said resilient blade away from said rigid blade, and means mounting the clamping means of said resilient blade to effect displacement of the clamping line of the resilient spreader blade relative to its fulcrum line and relative to the rigid spreader blade to adjust the biasing force without changing the attitude angle between the fulcrum line and the engage-

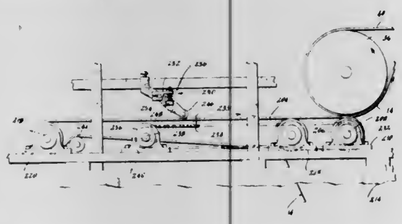
ment line of said resilient blade, while the engagement line and fulcrum line of the resilient spreader blade are fixed relative to the rigid spreader blade during a continuous coating operation.

4,233,931

ENVELOPE FEED APPARATUS

David L. Gingerich, San Bruno, Calif., and Robert Cohn, Omaha, Nebr., assignors to Champion International Corporation, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,333
Int. Cl.[3] B05B *13/00*
U.S. Cl. 118—239 **3 Claims**



1. In an apparatus for applying a sealant material to the flap closure and adjacent body portion of an envelope, said apparatus including at least one endless primary belt for supporting and conveying said envelopes between it and an overlapping belt through said apparatus and means for applying sealant material to the flap closure and an adjacent body portion of said envelope, the improvement comprising:

means for feeding said envelopes onto said endless primary belt, said means including:

a first shaft means;

a plurality of pulleys spaced along said first shaft means and affixed thereto;

a group of coplanar and spaced endless secondary belts interleaved with said endless primary belt, and with each of said pulleys on said first shaft means being drivingly connected to one of said secondary belts and wherein said endless primary belt has an upper run disposed coplanar to the upper run of each of said secondary belts and intermediate the ends of the upper runs of said secondary belts;

a drive means operatively connected to said first shaft means;

means for holding said envelopes on said group of secondary belts, said means including a vertically adjustable roller in contact with the upper run of each said secondary belts;

first sprocket means fixed to each of said pulleys of said first shaft means, said first sprocket means having a diameter less than the diameter of said pulleys, such that the peripheral surface speed of said sprocket means is less than the peripheral surface speed of said pulleys;

a second shaft means;

second sprocket means fixedly connected to said second shaft means;

an endless chain, said chain being drivingly connected to said first and second sprocket means, said endless chain moving at a speed equal to the speed of said primary belt and slower than the speed of said secondary belts; and

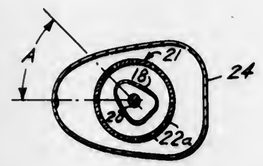
a plurality of spaced upright dogs connected to said endless chain, whereby the envelopes being conveyed on said secondary belts move at a speed faster than said dogs on said endless chain, such that each envelope catches up with and is restrained by an individual dog thereby spacing each envelope a predetermined distance from the succeeding envelope and conveying said envelopes at a speed equal to said primary belt thereby assuring that the envelopes are securely fed in spaced relation onto said endless primary belt.

4,233,932

CONTROLLED DISPERSIONS OF COATINGS

Harry N. Blakeslee, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 17, 1978, Ser. No. 961,513
Int. Cl.[2] B05B *13/06*
U.S. Cl. 118—306 **10 Claims**



1. An apparatus for distributing coating material in a predetermined manner comprising:

(a) a first means mounted for rotation about an axis at relatively high angular velocity for disbursing coating material from said first means,

(b) a coating delivery means having a pressurized coating material supply and a transportation system connected and arranged to deposit a quantity of coating material upon said first means,

(c) a shaped passage ending in a generally non-circular orifice nozzle means at the distal portion of said transportation system and generally in alignment with said axis for defining the form of said deposit for its distribution by said first means, and

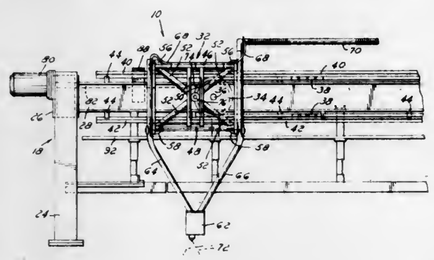
said nozzle means having a configuration bearing a relationship to the distribution pattern desired for disbursing coating material in a predetermined manner.

4,233,933

SPRAY COATING MACHINE

Dorian R. Gray, Nashville, Tenn.; Richard N. Bishop, Plymouth, and William K. Timmons, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1979, Ser. No. 41,206
Int. Cl.[3] B05C *5/00*
U.S. Cl. 118—314 **1 Claim**



1. A machine for applying a spray coating across the width of a glass ribbon being carried on a conveyor moving past the machine, the machine comprising:

first support structure including right side support structure located on the right side of the conveyor and left side support structure located on the left side of the conveyor;

second support structure including upstream support structure and downstream support structure, said upstream and downstream support structures having their opposite ends secured to said right side support structure and said left side support structure in a manner that said upstream and said downstream support structures extend across the conveyor in a position spaced above the same;

said upstream support structure and said downstream support structure each having the following structure mounted thereon;

a pair of pulleys, one mounted near each of the ends of said structure,

an endless drive chain extending over said pair of pulleys,

guide means for forming a guide track, said guide means extending along the length of said structure generally from one end to the other end thereof,

spray gun carrying means for supporting a spray gun and associated equipment, said spray gun carrying means being mounted on said guide means for movement back and forth along said structure above the glass ribbon on the conveyor,

spray gun and associated equipment means for applying a spray of material to the glass ribbon on the conveyor, said spray gun and its associated equipment means mounted on said spray gun carrying means for movement along said structure,

pin and slot lost motion connection means for interconnecting said spray gun carrying means and an interconnecting portion of said endless drive chain in a manner that said endless drive chain moves said spray gun carrying means from one side to the other while said interconnecting portion of said endless drive chain is moving from one of said pulleys to the other and that the direction of movement of said spray gun carrying means is reversed when said interconnecting portion of said endless drive chain moves around a pulley,

said spray gun carrying means being so mounted on their associated guide means and interconnected with their associated endless drive chain that said spray gun carrying means on said upstream support structure and said spray gun carrying means on said downstream support structure move in opposite directions past one another at the center of the upstream and downstream support structures and are reversed in direction at the same time;

motor means for supplying a rotational input;

a gear reduction drive;

an input shaft interconnecting said motor means and said gear reduction device;

output shafts interconnecting said gear reduction device and pulleys located at the same end of said upstream and said downstream support structures; and

a flywheel connected to said input shaft for storing energy while said endless drive chains are moving their associated spray gun carrying means between pulleys and for supplying additional input to said gear reduction device and output shafts associated therewith to accelerate said spray gun carrying means to an operating speed after reversal of direction of movement thereof.

4,233,934

GUARD RING FOR TGZM PROCESSING

Thomas R. Anthony, Schenectady, N.Y.; Harvey E. Cline, Stanford, Calif.; David K. Hartman, Manlius, and Mike F. Chang, Liverpool, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

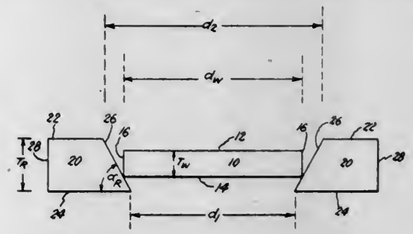
Filed Dec. 7, 1978, Ser. No. 967,285
Int. Cl.[3] C23C *11/00*
U.S. Cl. 118—500 **6 Claims**

1. In an apparatus for processing a wafer of semiconductor material having two major opposed surfaces substantially parallel to each other and an outer peripheral edge area interconnecting said surfaces by thermal gradient zone melting, said apparatus including a heat source adjacent to one major surface of said wafer, a heat sink adjacent to the opposed major surface of the said wafer and means for removably supporting said wafer between said heat source and said heat sink; the improvement wherein the means for supporting said wafer comprises:

a body of semiconductor material having two major opposed surfaces substantially parallel to each other and an outer peripheral edge surface interconnecting said major surfaces;

the semiconductor material of said body having substantially the same thermal conductivity as that of said wafer;

said body having an aperture in the configuration of a frustrum of a right circular cone extending therethrough



forming thereby an inner peripheral surface in said body whereby said wafer can be disposed within said aperture with said major surfaces of said wafer and said body substantially parallel to each other, said wafer being supported under its own weight within said aperture; and

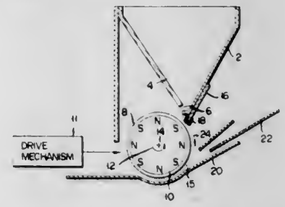
the thickness of said body being greater than the thickness of said wafer.

4,233,935

MAGNETIC BRUSH APPARATUS FOR ELECTROSTATIC PRINTING SYSTEM

Tsutomu Uehara, Yokosuka; Toshihiko Oguchi, Kawasaki; Tsutomu Kubo, Yokohama, and Yukio Suzuki, Ayase, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 4, 1979, Ser. No. 1,003
Claims priority, application Japan, Jan. 14, 1980, 53-3052
Int. Cl.[3] G03G *15/09*
U.S. Cl. 118—657 **7 Claims**



1. A magnetic brush apparatus comprising:

means for supplying a powdered one-component developer composed of particles each including a magnetic material;

a tubular sleeve made of non-magnetic material the surface of which is supplied with powered developer from said supplying means;

a rotatable magnet roller with a number of magnet poles which is disposed within said tubular sleeve;

drive means for rotating said magnet roller in one direction, said rotating magnet roller forming an alternating magnetic field on the surface of said tubular sleeve thereby carrying said powered one-component developer around the surface of said tubular sleeve; and

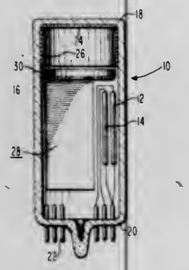
means for restricting the height of said powdered developer to a predetermined level, including a magnetic member one end of which is disposed outside said sleeve surface a predetermined distance such that said developer passes between said one end of the magnetic member and said sleeve surface, said magnetic member disturbing the alternating field on the sleeve surface, thereby restricting the height of said powdered developer moving past said one end of the magnetic member to said predetermined level.

4,233,936

ALKALI METAL DISPENSER

Richard W. Longsderff, and Dale V. Henry, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 8, 1979, Ser. No. 37,117
Int. Cl.³ B44D *1/02*; C23D *1/02*
U.S. Cl. 118—726 **5 Claims**



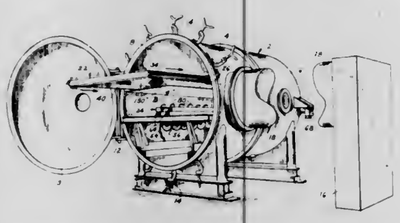
1. An alkali dispenser for vapor depositing an alkali material in the production of a photocathode, said dispenser comprising a non-welded tubular housing of a sheet of thin deformable metal selected from group consisting of tantalum and chromium-nickel-steel spirally rolled upon itself to provide a double walled structure for a substantial portion of the cylindrical circumference thereof, having at a minimum one and one half overlaps, said tubular housing being closed at its two ends.

4,233,937

VAPOR DEPOSITION COATING MACHINE

Kenneth E. Steube, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jul. 20, 1978, Ser. No. 926,561
Int. Cl.² C23C *13/08*
U.S. Cl. 118—727 **17 Claims**



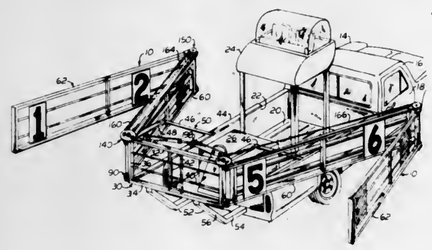
1. A vapor disposition coating machine for applying a coating metal to a workpiece, said machine comprising: an air-tight vessel having walls which enclose a vacuum chamber and define a door opening, the vessel also having a door which when closed seals the door opening and when opened provides access to the vacuum chamber; a rack supported on the vessel within the vacuum chamber for holding a workpiece in a fixed position within the vacuum chamber; a carriage located within the vacuum chamber below the rack, the carriage being substantially narrower than the rack, but about the same length as the rack; means for moving the carriage in translation beneath the rack generally from one side of the vessel to the other; a plurality of evaporator units mounted on the carriage generally along the entire length thereof, each evaporator unit including a boat in the shape of an upwardly opening trough, the boat being formed from a substance that is capable of conducting an electrical current and serving as a resistance type heating element, each evaporator unit also including means for feeding the coating metal in wire form into the trough of the boat for that unit; first and second current conducting means extended between the boats and fixed locations on a wall of the vessel for delivering electrical energy to the boats, the first conducting means being connected to one end of each boat and the second conducting means being connected to the opposite end of each boat, both the first and second conducting means being flexible, at least in part, to accommodate movement of the carriage in the chamber; and means for circulating a fluid coolant along the first and second conducting means to dissipate heat therefrom, the means for circulating the fluid coolant also being flexible so as to flex with first and second conducting means.

4,233,938

FOLDING WING ASSEMBLY

Roger R. Ruetenik, West Lake Rd., Vermillion, Ohio 44089

Filed Oct. 24, 1978, Ser. No. 954,288
Int. Cl.³ A63K *3/02*; A01K *29/00*
U.S. Cl. 119—15.5 A **15 Claims**



1. A foldable wing assembly, comprising:
a. a mount for rotatably supporting a plurality of wing-forming members;
b. a plurality of wing-forming members including:
i. at least one interior wing-forming member, and,
ii. a terminal wing-forming member;
c. rotatable juncture means at the proximal end of each of said wing-forming members joining said members in pivotal serial relationship;
d. primary, fixed pivot means disposed at each of said juncture means for each of said interior wing-forming members;
e. secondary pivot means journalled at the distal end of each of said interior wing-forming members;
f. coupling means, at the distal end of each of said interior wing-forming members and traversing the respective rotatable junctures, for securing said secondary pivot means on one wing-forming member to the proximal end of a next successive wing-forming member, whereby said secondary pivot means are fixed in rotational communication with said proximal ends; and,
g. linkage means providing operative engagement between adjacent primary and secondary pivot means.

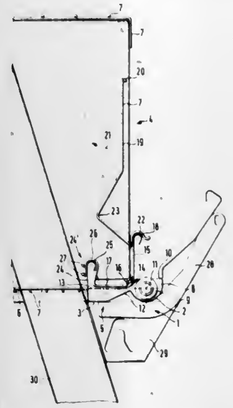
4,233,939

POULTRY CAGE FEEDING SYSTEM

Walter Sauer, Aschaffenburg, and Berthold Gerhart, Mömbris, both of Fed. Rep. of Germany, assignors to Hans Giesbert Kommanditgesellschaft, Mombris, Fed. Rep. of Germany

Filed Mar. 22, 1979, Ser. No. 23,054
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2739747
Int. Cl.³ A01K *39/00*, *39/014*
U.S. Cl. 119—18 **4 Claims**

1. A feeding cage battery having at least one cage for small animals, particularly poultry, and a trough stationary relative to the cage, the trough comprising:
a conveyor trough section removed from the cage and extending along a lower edge of the cage;
a feed trough section located in a recess formed in the bottom of the cage;
inclined barrier means extending between respective bottom portions of the conveyor and feed trough sections, for the length thereof, for permitting only unidirectional flow of feed from the conveyor trough section to the feed trough section; and



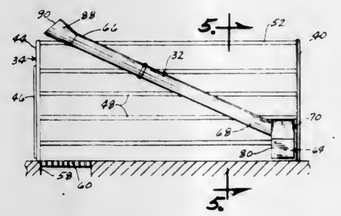
partition means mounted between the relative top portions of the conveyor and feed trough sections for completing, with the barrier means to provide a small gap between the trough sections and said partition means sufficient for feed flow therebetween but insufficient for allowing access to the conveyor trough section by an animal.

4,233,940

LIVESTOCK FARROWING APPARATUS

Rex E. Hennenfent, 1270 Arrowhead Dr., Dubuque, Iowa 52001

Filed Jan. 2, 1979, Ser. No. 126
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 **12 Claims**



1. A hog farrowing apparatus, comprising,
an elongated rectangular crate having forward and rearward ends and elongated opposite sides,
means for opening and closing said rearward end to provide for the entrance of a sow therein with its head positioned toward said forward end,
said opposite sides being sufficiently closely spaced to prevent turning movement of a sow therein to a position with its head disposed toward said rearward end,
an elongated hollow feed tube outside of said crate and on one side of said crate and extending from an upper end adjacent said rearward end of said crate to a lower end adjacent said forward end of said crate, and
a feed trough adjacent said forward end of said crate and in communication with the lower end of said feed tube whereby feed deposited in the upper end of said feed tube outside of said create and will move by gravity to said feed trough.

4,233,941

DISPOSABLE WILD BIRD FEEDER

Ralph K. Webster, Andover, Mass., assignor to H. K. Webster Company, Inc., Lawrence, Mass.

Filed Feb. 26, 1979, Ser. No. 15,046
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—52 R **6 Claims**



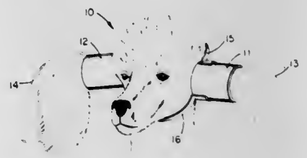
1. An expendable bird feeder comprising:
a cartonized container having a generally rectangular tubular configuration with front, rear and side walls and adapted to enclose a plastic bag of bird seed,
and a bottom closure for said container including a movable perch flap extendable to form a vertical closure wall adjacent said front wall having locking tabs at the sides thereof receivable in corresponding detent openings at the sides of said front wall,
said perch flap having a locking tab at its free edge engageable with a detent opening formed in said front wall to lock said perch flap in a closed vertical position,
a punch-out opening at the bottom of said front wall behind said perch flap and through which bird seed may be metered gravitationally onto the perch surface when said perch flap is moved to said second position,
whereby said panel flap may be locked in a first storage position adjacent said front wall and may be selectively unlatched and pulled down to a second active position forming a horizontal perch surface extending away from the bottom of the enclosure,
said container made of wax coated paper stock,
and a plastic bag of bird seed in said container having a bottom portion opening out of said punch-out opening for selective perforation when ready for use.

4,233,942

ANIMAL EAR PROTECTORS

James D. Williams, 3700 Westfall Dr., Encino, Calif. 91436

Filed Feb. 6, 1979, Ser. No. 9,776
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—96 **1 Claim**



1. A device for protecting animal ears comprising:
a pair of generally tubular protectors each of which is formed of a sheet of self-biasing material which in their free state tend to form themselves into said generally tubular protectors;
each of said protectors being longitudinally openable to allow easy insertion of one of said animal ears; and
positioning means for flexibly joining one end of one protec-

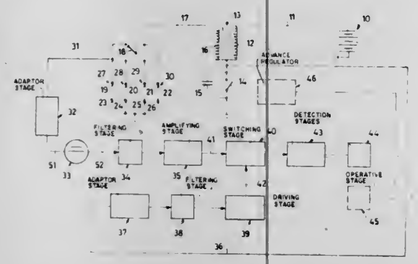
tor in spaced apart relationship with one end of the other protector and for securing said device to the head of said animal such that the longitudinal axis of each protector and a portion of each ear of said animal, are held generally horizontally and approximately perpendicularly to the head of said animal whereby the ends of said animal ears are separated by a distance greater than the width of the head of said animal.

4,233,943

DEVICE FOR DETECTING PREMATURE IGNITION IN AN INTERNAL-COMBUSTION ENGINE

Edoardo Rogora, and Giancarlo De Angelis, both of Milan, Italy, assignors to Alfa Romeo S.p.A., Italy

Filed Mar. 1, 1979, Ser. No. 16,620
Claims priority, application Italy, Mar. 3, 1978, 20888 A/78
Int. Cl.³ F02P 5/14; G01L 23/22
U.S. Cl. 123—425 **4 Claims**



1. A device for detecting the pre-ignition in an internal-combustion engine having a controlled ignition, which is connected to the ignition system of the same engine, said ignition system comprising circuit means for controlling cyclically the sparking at each plug of the engine with an ignition advance variable as a function of the working condition of the same engine, said device comprising first means operatively connected to at least one of the spark plugs of the engine adapted to generate signals indicative of the state of conduction of the same plug, that is of the ionization between its electrodes, the device being characterized in that it comprises second means operatively connected to said circuit means, adapted to detect the operative state of the same plug and adapted to generate signals indicative of the sparking at the plug, and further comprising switching means operatively connected to said first and second means, adapted to generate signals as a function of the signal delivered by said first means exclusively when no signals are generated by said second means.

4,233,944

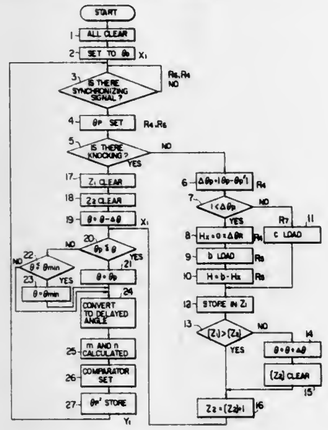
METHOD FOR CONTROLLING IGNITION TIMING OF INTERNAL COMBUSTION ENGINE

Norio Omori; Hideya Fujisawa, both of Kariya; Yutaka Kawashima, Okazaki; Hisasi Kawai, Toyohashi; Kazuo Iwase, Okazaki, and Masakazu Ninomiya, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan, part interest to each

Filed Jun. 12, 1979, Ser. No. 47,932
Claims priority, application Japan, Jul. 4, 1978, 53/81613
Int. Cl.³ F02P 5/14
U.S. Cl. 123—416 **2 Claims**

1. In a method for controlling the timing of ignition spark by repeating, in each rotation cycle of an output shaft of an internal combustion engine, the steps of detecting a presence and absence of knock of said internal combustion engine, and retarding and advancing the timing of ignition spark which is to be supplied in a current rotation cycle of said output shaft relative to the timing of ignition spark which was supplied in a preceding rotation cycle of said output shaft in response to respective outputs of said detection step indicative of said presence and absence of knock, the improvement comprising the steps of:

establishing a desired number of rotation cycles of said output shaft in response to the output of said detection step indicative of said absence of knock, said desired number being varied in accordance with operating conditions of said internal combustion engine;



counting a number of rotation cycles of said output shaft in response to the detection output indicative of said absence of knock; and

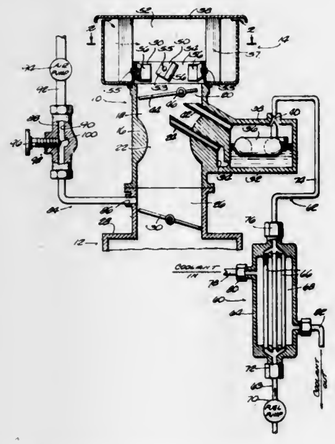
holding, until the counted number of rotation cycles reaches the established desired number of rotation cycles, the timing of ignition spark which is to be supplied in said current rotation cycle of said output shaft unchanged from the timing of ignition spark which was supplied in said preceding rotation cycle.

4,233,945

CARBURETION IN AN INTERNAL COMBUSTION ENGINE

Elden W. Beitz, 262 Main St., Oakfield, Wis. 53065

Filed Sep. 21, 1978, Ser. No. 944,652
Int. Cl.³ F02M 31/00
U.S. Cl. 123—585 **11 Claims**



1. In an internal combustion engine including an intake manifold, a carburetor having a carburetor body with a fluid flow passage therethrough, said passage including one end providing an air inlet and another end connected to said intake manifold, a choke plate positioned in said one end of said passage, means for providing for pivotal movement of said choke plate, means for controlling fluid flow through said passage including a throttle valve positioned in said another end, means for supplying fuel to the carburetor, and an air cleaner positioned on said carburetor body and including a central cylindrical cavity communicating with said air inlet, the improvement comprising in combination,

means for heating fuel supplied to said carburetor,

means for turbulating air flowing through said air inlet, said means for turbulating air flowing through said air inlet including a plurality of blades located in said central cylindrical cavity and adjacent said inlet opening upstream of said choke plate and spaced circumferentially around the periphery of said inlet opening, said blades each extending inwardly from said inlet opening periphery, and

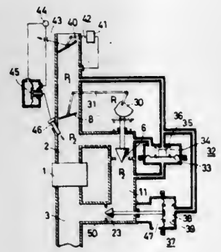
means for injecting air into said fluid flow passage above said throttle valve and closely adjacent said throttle valve.

4,233,946

EXHAUST GAS RECIRCULATION SYSTEM

Keigo Yorioka, Ohbu, and Mikio Minoura, Nagoya, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Apr. 9, 1979, Ser. No. 28,765
Claims priority, application Japan, Apr. 25, 1978, 53-48830
Int. Cl.³ F02M 25/06
U.S. Cl. 123—568 **1 Claim**



1. An exhaust gas recirculation system comprising an exhaust gas recirculating passage connecting the exhaust pipe and a portion of the intake pipe located downstream of the throttle valve, a pressure control valve provided in said passage, a variable constriction provided between said pressure control valve and intake pipe in operative connection to said throttle valve, and a pressure control valve operating means adapted to detect the pressure differential across said variable constriction and operat said pressure control valve in conformity to the detected pressure differential whereby the pressure differential across said variable constriction is maintained constant regardless of the opening of said variable constriction.

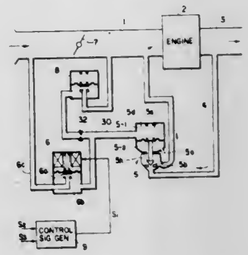
4,233,947

EXHAUST GAS RECIRCULATION SYSTEM HAVING A SOLENOID DUTY COMPENSATION CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Toshimi Abo, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 9, 1979, Ser. No. 55,758
Claims priority, application Japan, Aug. 25, 1978, 53-102949
Int. Cl.³ F02M 25/06; F07B 3/00
U.S. Cl. 123—571 **9 Claims**

1. An exhaust gas recirculation system for an internal combustion engine, including an electromagnetic valve which controls the recirculation rate of the exhaust gas in response to a driving pulse signal the duty cycle of which is controlled by an output signal of a computing circuit, said computing circuit producing said output signal in accordance with engine parameters, wherein the improvement comprises:



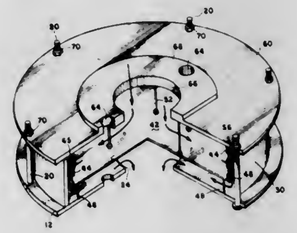
means for modifying the duty cycle of said driving pulse signal in accordance with the deviation of the voltage of said driving pulse signal from a predetermined value.

4,233,948

POLLUTION CONTROL DEVICE FOR AUTOMOBILE CARBURETION

David F. Crumrine, Okmulgee, Okla., assignor to Gaines L. Neal, Okmulgee, Okla., a part interest

Filed Apr. 16, 1979, Ser. No. 29,917
Int. Cl.³ F02M 29/00
U.S. Cl. 123—590 **1 Claim**



1. For use with an international combustion engine having a carburetor and an intake manifold, a fuel vaporizer adapted to be interposed between the carburetor and the intake manifold, comprising:

a circular base plate having a lower surface and an upper surface, the lower surface adapted to rest on an intake manifold, the base plate having a central exit port therein;

a tubular spacing ring of outside diameter less than the diameter of the base plate, having a lower edge and an upper edge, the lower edge resting on the base plate upper surface;

a circular baffle plate of diameter less than the inner diameter of said spacing ring the baffle plate being positioned in the spacing ring providing an annular passageway therebetween, the baffle plate having an upper and lower surface;

an upright perforated tubular collar having a lower edge and an upper edge, the diameter of the perforated collar being less than the diameter of the baffle plate and less than the internal diameter of said spacing ring providing an annular space between the perforated collar and said spacing ring, the bottom edge of the perforated tubular collar resting on the upper baffle plate surface;

means of supporting said baffle plate above said base plate providing a passageway therebetween;

a circular upper plate having a lower surface and an upper surface, the lower surface being attached to the spacing ring upper edge and engaging said perforated collar upper edge, the upper surface of the upper plate adaptable to be

attached to a carburetor, the upper plate having a central inlet port therein, the base plate, baffle plate, perforated collar, spacing ring and trop plate being secured in axial alignment;

fibrous material positioned between the exterior cylindrical surface of said collar and the interior cylindrical surface of said spacing ring;

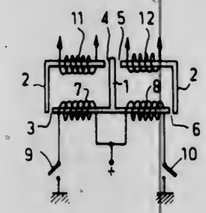
whereby fuel laden air flowing from a carburetor passes through said inlet in said upper plate, through said perforated baffle, through said fibrous material, through the annular opening between said baffle plate and said spacing ring and out through said exit port in said base plate into an intake manifold.

4,233,949

DEVICE FOR PRODUCING AND DISTRIBUTING HIGH TENSION TO THE SPARK PLUGS OF AN INTERNAL COMBUSTION ENGINE

Emmanuel J. Poirier d'Ange d'Orsay, Toulouse, France, assignor to Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France

Filed Oct. 24, 1978, Ser. No. 954,319
Claims priority, application France, Oct. 27, 1977, 77 32449
Int. Cl.³ F02D 3/02
U.S. Cl. 123—634 **17 Claims**



1. A device for the production and distribution of high tension current supply for the sparking plugs of an internal combustion engine, such device comprising:

(a) primary winding means comprising q_1 primary windings where q_1 is an integer at least equal to unity;

(b) secondary winding means comprising q_2 secondary windings where q_2 is an integer not less than two and at least as great as q_1;

(c) a low voltage supply to supply low voltge to said primary winding means;

(d) power switch means effective to connect said low voltage supply to and to disconnect said low voltage supply from the primary winding means;

(e) means connecting said secondary winding means to supply H.T. current from each of said secondary windings to a sparking plug of said internal combustion engine, there being at least as many sparking plugs as there are secondary windings;

(f) means providing a flux link between said primary winding means and said secondary winding means, said flux link means comprising a single magnetic circuit including at least two flux path frames having a common side, a secondary winding on a non-common side of each frame; and

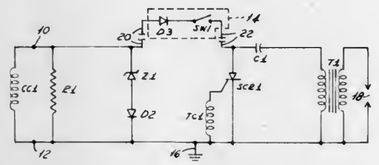
(g) respective means effective to at least partially suppress the magnetic flux in each of said flux paths, each of said flux paths being associated with at least one said primary winding, and at least one said means effective to at least partially suppress the flux in said flux path.

4,233,950

SAFETY INTERLOCK FOR AN ENGINE IGNITION SYSTEM

Kenneth L. Krolski, Cedarburg, Wis., and John N. MacLeod, Ann Arbor, Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 736,315, Oct. 28, 1976, abandoned.
This application Apr. 24, 1979, Ser. No. 32,870
Int. Cl.³ F02P 3/08, 1/08; F02B 77/08
U.S. Cl. 123—630 **12 Claims**



1. In an apparatus including an engine having a capacitor-discharge engine ignition system having a timing cycle including a first component consisting of a charge storage capacitor, means connected to charge said capacitor through a charge path, a second component consisting of a unidirectional current rectifier means connected in said charge path in series with said capacitor to block the discharge of said capacitor through said charge path in the absence of an unsafe condition, and a third component consisting of a discharge triggering means connected to said capacitor through a discharge path and having a control terminal connected to receive a discharge control signal at a preselected time in the timing cycle, said triggering means discharging said capacitor through the discharge path when the discharge control signal is received by said control terminal, spark producing means connected in said discharge path such that said capacitor discharges therethrough and produces an ignition spark, all of said components being inherently essential to the proper operation of said ignition system, the improvement being a safety interlock system for preventing engine ignition upon the occurrence of an unsafe condition comprising: safety switch means movable between open and closed conditions and connected to one of said first, second and third components for disabling said one component to function in said ignition system by electrically isolating said one component from said ignition system when said switch means is one of said open and closed conditions, said switch means and said one component being disposed within an integrally encapsulated structure located remote from the other said components, said switch means being in one of said open and closed conditions on the occurrence of a preselected unsafe condition of said apparatus to electrically isolate the inherently essential component from the ignition system and render the ignition system inoperative.

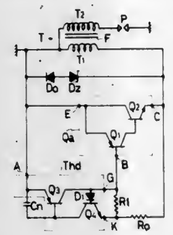
4,233,951

IGNITION CIRCUIT FOR INTERNAL COMBUSTION ENGINES

Hisao Take, Shizuoka, Japan, assignor to Kabushiki Kaisha Kyoritsu Seisakujo, Shizuoka, Japan

Filed Dec. 10, 1979, Ser. No. 102,234
Claims priority, application Japan, Dec. 18, 1978, 53/157766
Int. Cl.³ F02P 1/00
U.S. Cl. 123—625 **6 Claims**

1. An ignition circuit for internal combustion engines characterized in that a diode is connected in parallel to a primary winding of an ignition coil of a magneto, also a composite transistor circuit consisting of two transistors whose forward direction is directed in the reverse direction of said diode, is connected across said primary winding at its collector and emitter, a series circuit of a temperature compensating resistor and a resistor is connected between the base of said composite transistor circuit and one terminal of said primary winding, an anode-cathode path of a thyristor-equivalent circuit in which a collector of a PNP transistor is connected to a base of an NPN transistor and the base of said PNP transistor is connected to the collector of said NPN transistor, is connected between the junction of said temperature compensating resistor and said



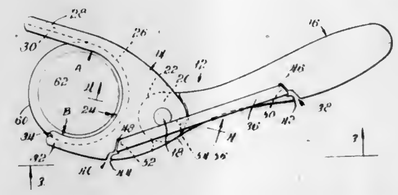
resistor and the other terminal of said primary winding, and the gate of said thyristor-equivalent circuit is connected to the base of said composite transistor circuit so that the gate current of said thyristor-equivalent circuit may be fed by the voltage drop across said temperature compensating resistor.

4,233,952

HAND CATAPULT DEVICE

John A. Perkins, Portage, Mich., assignor to Perky & Me Co., Battle Creek, Mich.

Filed Mar. 30, 1978, Ser. No. 891,614
Int. Cl.³ F41B 3/00
U.S. Cl. 124—5 **10 Claims**



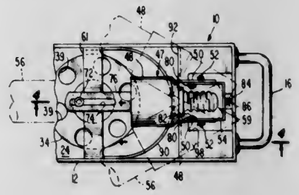
1. A hand catapult device for throwing a flying disc which comprises a yoke constructed of semirigid plastic material pivotally connected to a handle for movement through an angle of not more than about 45 degrees to each side of the longitudinal center line of said handle, said yoke comprising an inner circumferentially channeled, semicircular portion conforming to and adapted to receive said disc and having a long complementarily channeled arm projecting tangentially from one terminus of said semicircular portion and a short complementarily channeled arm projecting circumferentially from the other terminus of said semicircular portion and being stationary relative to said long arm, said short arm projecting a distance just sufficient to offer resistance to the insertion and withdrawal of a disc in the channeled semicircular portion, biasing means for biasing said yoke to the short-arm side of the center line in the uncocked position, and pressure-releasable means for holding said yoke in a position whereby the yoke is on the other side of the long-arm side of the center line in the cocked position, said pressure releasable means being adjusted to be released by the pressure engendered thereon by the tendency of said yoke to rotate from the cocked toward the uncocked position when it is swung in an arc by a person grasping said handle.

4,233,953

PROPULSION DEVICE FOR TENNIS BALLS AND LIKE SPHERICAL OBJECTS HAVING AN IMPROVED PROGRAMMED DISCHARGE OF THE OSCILLATORY TYPE

C. Malcolm Bash, Trenton, N.J., assignor to Prince Manufacturing Co., Inc., Princeton, N.J.

Filed Oct. 30, 1978, Ser. No. 955,852
Int. Cl.³ F41F 1/04; A63B 69/38
U.S. Cl. 124—56 **12 Claims**



1. In a propulsion device for spherical objects, said device being of the type including a portable housing having propulsion means and a hopper for said objects, a rotary distributor adapted to feed a selected number of said objects in successively following order during each rotation of the distributor through a 360° cycle, a tubular receiver into which said objects are fed from the distributor, means for driving the distributor, barrel means communicating with the receiver and providing an outlet through which said objects are discharged by the propulsion means, and a support bracket for the barrel means, an improvement for programming cyclic oscillatory movements of the barrel means as a wholly mechanical function of the rotational cycles of the distributor, the improvement comprising:

(a) means mounting the support bracket upon the housing for oscillating movement about an axis having a vertical component; and

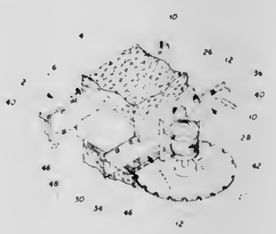
(b) motion-translating means formed wholly as a mechanical driving linkage mechanically driven by the distributor and extending therefrom to the bracket for imparting a predetermined quantum of cyclic oscillatory travel to the barrel means for every cycle of rotation of the distributor, whereby to propel through the barrel means, during the quantum of cyclic oscillatory motion thereof established through the driving linkage, a number of objects equal to the number thereof fed from the distributor during a single rotational cycle thereof.

4,233,954

CONCRETE PILE CUTTING DEVICE

Frederick J. Visser, Glen Rock, N.J., assignor to Von Rohr Equipment Corp., Bloomfield, N.J., a part interest

Filed Feb. 26, 1979, Ser. No. 15,022
Int. Cl.³ B28D 1/04
U.S. Cl. 125—14 **16 Claims**



1. A portable device for cutting a concrete pile which comprises:

a collar adapted for annular supported disposition about said concrete pile, said collar comprising an outer wall defining a tunnel for the reception of said concrete pile, said wall possessing a discontinuous cross-sectional circumference that defines an opening for the lateral placement of said collar about said pile, said collar further comprising closure means attached to said wall for securing said collar in tensioned abutment with the outer surface of said pile;

means attached to said collar for the support of a pile cutting assembly, said pile cutting assembly support means comprising paired, parallel tracks, said tracks mounted in diametric opposition on said outer wall, each of said tracks defined by complementary, parallel brackets, said brackets extending in a longitudinal direction transverse to the axis of said collar, said brackets cooperating with said collar to define in cross-section an essentially C-shape;

at least one planar pile cutting assembly removably mounted in slidable disposition within one of said tracks, said pile cutting assembly comprising a planar, rectilinearly extended slide removably reciprocable within said tracks, a cutting means platform disposed medially along said slide to receive and hold a cutting means in fixed disposition thereon, and a cutting means comprising a rotating circular saw disposed in spaced-apart relation to said collar and adapted to form a cut in said pile having a depth less than the thickness of said pile,

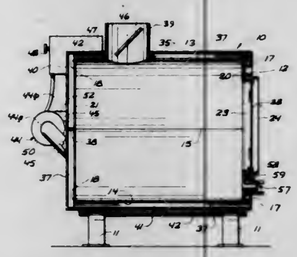
wherein said pile cutting assembly is free to pass through said track, and is removable therefrom, and said cutting means passes tangentially adjacent said pile and forms a cut in said pile generally transverse and perpendicular to the longitudinal axis thereof.

4,233,955

FIREPLACE AND ROOM HEATER

Gerald McCallum, Box 6083 Hillyard Stn., Spokane, Wash. 99207, and Dale A. McCallum, S. 402 McKinnon, Spokane, Wash. 99206

Filed Oct. 10, 1978, Ser. No. 950,139
Int. Cl.³ F24C 1/14; F24B 3/00
U.S. Cl. 126—61 **6 Claims**



1. A fireplace and room heater, comprising:

a firebox defined by (a) an arcuate top surface, (b) an arcuate bottom surface joined at opposed end edges to the arcuate top surface, (c) an upright back wall joining rearward side edges of the arcuate top and bottom surfaces, and (d) an upright front wall joining forward side edges of the arcuate top and bottom surfaces;

an access opening formed in the upright front wall;

a door hinged to the upright front wall operable to selectively seal the access opening;

a flue opening openly communicating with the firebox interior;

a partially enclosed shell outwardly spaced from the upright back wall and the top and bottom surfaces and defining a forwardly facing opening surrounding the periphery of the upright front wall;

a transverse solid bulkhead extending between the shell and firebox, dividing the space between the shell and the firebox into an upper and a lower plenum chamber;

blower means having an air intake for drawing air inwardly and an air discharge for forcing air outwardly; and

duct means openly connecting the air intake of the blower means to the lower plenum chamber and openly connecting the air discharge to the upper plenum chamber;

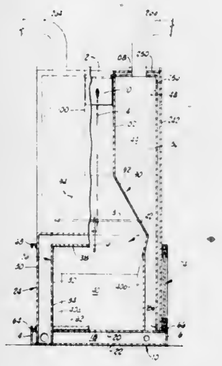
whereby air may be drawn through the lower plenum chamber and forced outwardly through the upper plenum chamber through operation of the blower means.

4,233,956

FIREPLACE SYSTEM

Freddie J. Haynes, Rte. 1, Earlsboro, Okla. 74840

Filed May 24, 1978, Ser. No. 909,290
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 **16 Claims**



1. A fireplace system comprising:

a hollow base pan;

means for introducing combustion air to the base pan;

an air plenum chamber over the base pan and including:

a firewall defining a firebox with the base pan; and

a wall spaced from the firewall and defining with the firewall a portion of an air plenum space;

a shroud supported upon the base pan and defining a combustion air chamber of inverted U-shaped configuration communicating with the interior of the base pan for receiving the combustion air introduced into said base pan, said shroud including a pair of opposed legs extending vertically from the base pan on opposite sides of a fireplace opening;

outlet means in said legs for directing air into said firebox;

a stack extending upwardly from said firebox and surrounded by said air plenum space;

wall means spaced from said wall of said air plenum and defining a moving air insulation zone around said air plenum chamber; said wall of said air plenum having an opening at its upper and lower portion for moving air to and from said air insulation zone; and

a damper means including a damper plate at an elevated location is said stack at a vertical level substantially even with the top of said air plenum chamber.

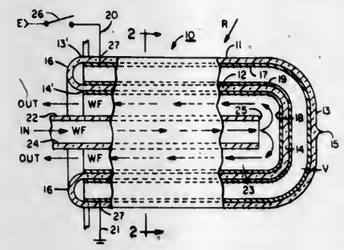
4,233,957

SOLAR ENERGY COLLECTOR

Neal S. Kenny, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,226
Int. Cl.² F24V 3/02
U.S. Cl. 126—443 **7 Claims**

1. A solar energy collector operative to produce thermal energy under impinging solar radiation wherein, an absorber substrate in the form of a tubular member is disposed in spaced relation within a solar window in the form of an outer tubular member, a space between said inner and outer tubular members being evacuated to a selected partial pressure, means for introducing working fluid within the inner tubular member in heat exchange relation with the absorber substrate via an open end of said inner tubular member wherein the improvement comprises: composite coatings disposed on selected surfaces of said absorber substrate and solar window including: an absorber coating of selected absorber material having a relatively high absorptivity characteristic α of at least 0.8, to solar radiation within the wavelength range of about 0.2 micrometers to about



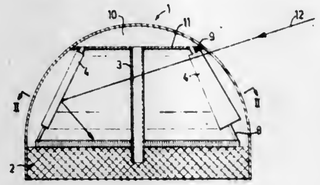
2.0 micrometers, and an emittance reducing coating having a relatively low emissivity characteristic ϵ for infrared radiation within the wavelength range of about 2.0 micrometers to about 20 micrometers deposited on at least one surface of said inner tubular member to surround said absorber coating, said yielding an emissivity characteristic ϵ for the absorber of at most 0.3 in said infrared range; and an electrically conductive window coating disposed on at least one surface of said outer tubular member, said solar window coating having a relatively low emissivity characteristic ϵ therefor of at most 0.3 within said aforementioned infrared range, and means operatively coupled to said window coating for conducting an electrical current through said coating for heating said outer tubular member.

4,233,958

CLIMATE-CONTROLLED BUILDING CONSTRUCTION

Carl-Göran Heden, Solna Kyrkväg 11, S-104 01 Stockholm, Sweden

Filed Jul. 6, 1978, Ser. No. 922,432
Claims priority, application Sweden, Jul. 7, 1977, 7707943
Int. Cl.³ F24J 3/02
U.S. Cl. 126—424 **1 Claim**



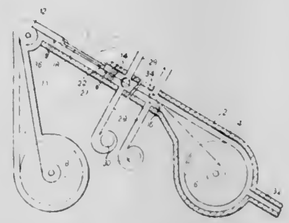
1. Device for carrying out climate control in a building, comprising a heat storage chamber (2), a dome (1) built on top of it with a transparent outer shell (25, 22) and an inner shell composed of flat cassettes (4) rotatably arranged to be able to screen off incident light radiation to a greater or lesser degree in the dome (1) and the escape of light therefrom, there being for heat exchange between the heat storage chamber (2) and the dome (1) a central tube (3) from the heat storage chamber (2) to an upper connecting space (10) in the top of the dome, a hollow, upper axle (9) on each cassette (4) opening into the connecting space (10) and a lower, open end surface on each cassette (4) opening into the dome, the outer shell being made up of an outer layer (25) and an inner layer (22), at least the inner layer being composed of flat plastic containers (22) arranged with an upper and a lower corner, said corners having openings for connection to connecting hoses (26) and adjacent columns of plastic containers (22) being pairwise connected together with connecting hoses (26) to closed circulation loops, said dome (1) being made up of a frame of aluminum beams (20) and strips (24) having grooves (21) in which the plastic containers (22) and the plastic sheets (25) are clamped with plastic moldings (23), said aluminum beams (20) being held together with star-shaped connecting members (30) to form an approximately hemispherical dome frame with a honeycomb structure, said cassettes (4) having a shiny, reflecting side surface (5) and a black, heat-absorbing side surface (6) and being mounted substantially vertically and being rotatable on two axles (8, 9) of which at least the upper axle (9) is hollow and connects the interior of the cassette to the connecting space (10), while the bottom of the cassette is open and in free communication with the dome, a gear (40) controlling the setting of the cassettes on the lower axle (8) of the cassette, a chain (41) running over and in engagement with the gears (40) of all the cassettes and a motor for driving the chain (41) synchronically with the movement of the sun, a magnetic device to move a guide cylinder (45) vertically, a pin (47) on the lower axle (8) of the cassette, which pin can be acted on by the guide cylinder (45), a toothed coupling (42, 48) between the cassette axle (8) and the gear (40) to fix different positions with 90° between them between the gear and the cassette axle when the guide cylinder (45) acts on the axle pin (47), and a chain (43) for triggering the action of the guide cylinder (45), the last-named said chain (45) moving synchronically with the first-named said chain (41).

4,233,959

STORAGE OF THERMAL ENERGY

William R. Laws, Worcester Park, and Geoffrey R. Reed, Tadworth, both of England, assignors to Encomech Engineering Services Ltd., Epsom, England

Filed Feb. 26, 1979, Ser. No. 15,042
Claims priority, application United Kingdom, Feb. 27, 1978, 7752/78
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 **9 Claims**



1. A thermal energy storage apparatus comprising a heat-insulated casing, an elongate flexible heat storage member within the casing, respective rotary mounting members at spaced positions within the casing, opposite ends of the flexible member being attached to the respective mounting members, a path for said flexible member extending within the casing between said mounting members, and drive means connected to said mounting members for rotating said members to displace the flexible member through the casing interior along said path in either direction alternatively to coil the flexible member on either of said mounting members selectively, means disposed in the path of the member at a region intermediate the respective mounting members for the passage of heat from the exterior to said flexible member within the casing as it is progressively passed along said path by said drive means, the thermal energy received by the flexible member being stored in

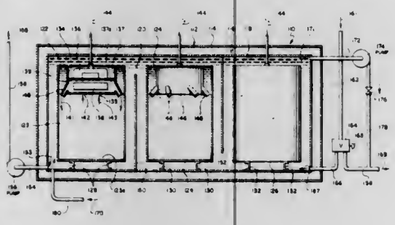
the member while it is collected in the form of a coil on one of said mounting members, and means for the extraction of stored heat from the flexible member comprising inlet and outlet fluid connections to and from the casing and fluid passage means within the casing between said connections for the flow of heat transfer fluid over the flexible member to be heated by said member, said fluid passage means being disposed in the path of the member intermediate the respective mounting members for contact with said flexible member between the mounting members as the flexible member is progressively passed along said path by the drive means.

4,233,960

HEAT STORAGE APPARATUS AND METHOD

Steven A. Johnson, 136 N. First West, Preston, Id. 83772

Filed Jul. 21, 1978, Ser. No. 926,680
Int. Cl.³ F24J 3/02; F24H 7/00; B01F 9/00
U.S. Cl. 126—430 **15 Claims**



1. A heat storage apparatus comprising:
a heat storage medium having a latent heat of reaction as the primary heat storage mechanism;
container means for the heat storage medium;
mixing means in the container comprising a rotatable impeller magnetically coupled to a stator outside of said container for mixing the heat storage medium to inhibit stratification of the heat storage medium;
enclosure means for insulatively enclosing the container means; and
heat transfer means for exchanging heat energy with the heat storage medium.

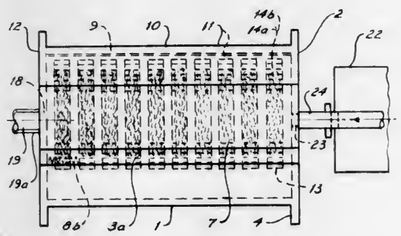
4,233,961

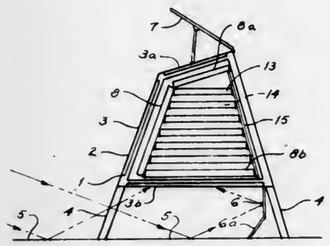
SUSPENDED, HOT-BOX SOLAR COLLECTORS

Donald A. Kelly, 58-06 69th Pl., Maspeth, N.Y. 11378

Filed May 10, 1979, Ser. No. 37,767
Int. Cl.³ F24J 3/02
U.S. Cl. 126—436 **10 Claims**

1. A suspended hot box solar collector comprised of a closed insulated chamber containing front, top and bottom double-glazed transparent windows,
said closed insulated chamber consists of an angular truncated triangular cross section shape which is constructed in any convenient modular length,
said closed insulated chamber is elevated approximately one-third of its total height by four corner posts which are integral with the said closed insulated chamber,
a fixed horizontal reflective surface disposed directly under said closed insulated chamber at base level in a southerly direction in front of said suspended hot box solar collector to a distance nearly equal to one-third the total height of said closed insulated chamber,
a three plane reflective element disposed at the rear bottom of said closed insulated chamber with the lower front edge secured to said fixed horizontal reflective surface,
the opposite top edge of said three plane reflective element angled upward toward the rear lower face of said bottom double glazed transparent window,
an adjustable top reflective surface disposed at an adjustable angle at the rear top northern edge of said top double-glazed transparent window,
a continuous piano type hinge secured at the rear top northern edge of said top double-glazed transparent window and the underside of said adjustable top reflective surface,
twin support rods secured at the sides of said adjustable top reflective surface and fastened to the upper sides of said closed insulated chamber by means of twin locking screws, adjustment means for said twin support rods within said twin locking screws,
a black corrugated metal absorber plate disposed behind the rear face of said front double-glazed transparent window, a horizontal black corrugated metal absorber plate disposed under said top double-glazed transparent window, a horizontal black corrugated metal absorber plate disposed above the inner face of said bottom double-glazed transparent window,
multiple identical perforated metal trays uniformly and horizontally disposed within the interior of said closed





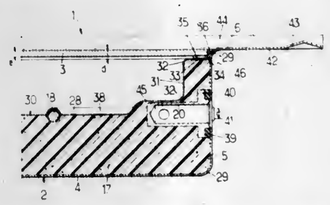
insulated chamber, attachment of the front ends of said multiple identical perforated metal trays to the rear nearly vertical surface of said black corrugated metal absorber plate, attachment of the rear ends of said multiple identical perforated metal trays to a rear metal grid framework within said closed insulated chamber,
eutectic salts uniformly dispersed within each of said multiple identical perforated metal trays,
an inlet air port disposed at the lower rear corner of said closed insulated chamber,
an outlet hot air port disposed at the upper side of said closed insulated chamber opposite from said inlet air port,
a motor driven fan disposed in line with said outlet hot air port on the inside of said closed insulated chamber,
multiple small D.C. motor driven fans uniformly disposed within said closed insulated chamber, multiple silicon photovoltaic solar cells mounted along the outside front strip surfaces of said closed insulated chamber, to power said multiple small D.C. motor driven fans.

4,233,962

PANELS FOR COLLECTING SOLAR ENERGY

Michel Nény, Paris, France, assignor to Societe d'Investissement pour le Developpement des Appareils Menagers, Montrouge, France

Filed Apr. 18, 1978, Ser. No. 897,547
Claims priority, application France, Apr. 20, 1977, 77 11894
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **16 Claims**



1. A solar energy panel for providing heat from solar radiation by heating a liquid circulating in a section of piping in a flat rectangular box formed by the stamping of a metal sheet,
wherein said box is thermally closed by a cover transparent to solar radiation, and
said piping section is in intimate contact in said box with a plate comprised of thermally conductive material disposed in said box parallel to the bottom of said box, and
wherein said plate is separated from the bottom of said box by an insulating pad,
said plate forming a tray having diverging side walls that is formed by stamping a thermally conductive metal sheet to a configuration that is less deep than said rectangular box,
wherein the side walls of said tray are extended towards the exterior by rims parallel to the bottom of said tray and supporting by themselves a transparent cover, the edge of said rims maintaining a space from the wall of said box, wherein said space is filled with a thermally insulating material, and
wherein the side walls of said box are extended towards the exterior by flat rims parallel to the bottom of said box and the rims of said tray are off-set, relative to said flat rims of said box, by a distance d that is slightly greater than the thickness of said transparent cover, and
wherein said box has at each of its four corners a recessed step delimited externally by a flat ledge, of generally triangular or analogous form, off-set by the distance d towards the bottom of said box relative to said flat rims of said box so that each of said ledges serves to support with the interposition of insulation one of the four corners of said transparent cover.

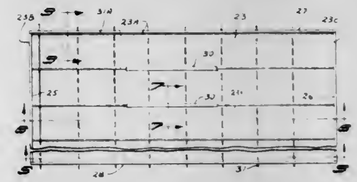
4,233,963

SOLAR HEAT COLLECTOR SYSTEM HAVING MEANS TO ACCOMMODATE THERMAL EXPANSION

Frank D. Werner, Jackson, Wyo., assignor to Park Energy Company, Jackson, Wyo.

Filed Sep. 21, 1978, Ser. No. 944,638
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **5 Claims**

1. A large scale heat collecting system comprising:
a first duct having an elongated central axis;
a plurality of laterally extending ducts having axes extending generally transverse to said first mentioned duct and having first portions on the interior of said lateral ducts in fluid communication with the interior of said first duct;
a radiant energy collector mounted on each of said lateral ducts, each of said radiant energy collectors comprising;
a frame member having spaced side supports and spaced end supports defining a perimeter,
a plurality of elongated strips of perforated sheet material positioned side by side to form a large surface area within the perimeter of said frame member,
means on said frame member to support said strips of sheet material comprising means to fasten said strips of sheet material adjacent first ends thereof to one of the end members of said frame member, and a plurality of resilient members coupled between the other of said end members of said frame member and the opposite ends of each of said strips of sheet material to maintain tension in said strips of sheet material, and



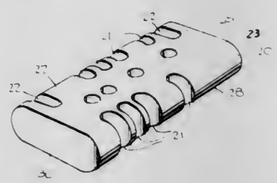
cable means attached to and extending between the side supports of said frame member so that the cable means extend across the lateral width of said strips;
means to cause fluid flow from said laterally extending ducts into said first duct; and
air intake means in each laterally extending duct positioned so that fluid flows through said perforated sheet material in its path of movement from said air intake means to said first duct.

4,233,964

INTERNALLY READABLE IDENTIFYING TAG

Keith B. Jefferts, and Elaine R. Jefferts, both of P.O. Box 425, Shaw Island, Wash. 98286

Continuation-in-part of Ser. No. 845,944, Oct. 27, 1977, abandoned, which is a continuation of Ser. No. 671,530, Mar. 29, 1976, abandoned. This application May 12, 1978, Ser. No. 905,540
Int. Cl.³ G09F 3/00
U.S. Cl. 128—1 R **7 Claims**



1. An identifying tag for implanting in small animals including fish to aid in determining the movement thereof from one habitat to another and which is identifiable by means of X-ray equipment, which comprises a solid one piece generally uniformly shaped metallic elongated member being of a length sufficiently small so as to render said member suitable for implantation into an animal, said metallic member having a substantially oblong cross-sectional shape to facilitate orientation of said tag when implanted in said animal and a longitudinal length significantly greater than the maximum cross-sectional width thereof suitable for maintaining sufficient data storage capacity on said tag, said metallic elongated member having cut in its outer surface a plurality of spaced grooves at least some of which extend only partially about the non-circular peripheral surface of said elongated member to form a predetermined fixed format binary coding system which includes an indexing means to define the reading direction of the coded grooves, said grooves being of a sufficient depth such

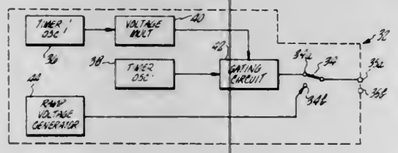
that in profile each of said grooves is readily identifiable as being transparent as distinguished from opaque by means of X-ray equipment while said tag remains implanted in said animal.

4,233,965

METHOD AND APPARATUS FOR THE THERAPEUTIC TREATMENT OF LIVING TISSUE

Everitt E. Fairbanks, Arleta, Calif., assignor to CAS Products, Inc., Los Angeles, Calif.

Filed Jan. 16, 1978, Ser. No. 869,624
Int. Cl.³ A61N 1/42
U.S. Cl. 128—1.5 **27 Claims**



1. A method for the therapeutic treatment of living tissue comprising the steps of

generating a series of rectangular, positive electrical pulses of predetermined amplitude, frequency, and duration,

generating a magnetic field,

positioning a first electrode and a second electrode against the tissue to be stimulated,

applying said electrical pulses to said tissue through said first electrode,

applying said magnetic field in the area of said first electrode and substantially at right angles to the surface of said tissue to aid the penetration of said electrical pulses into said tissue, and

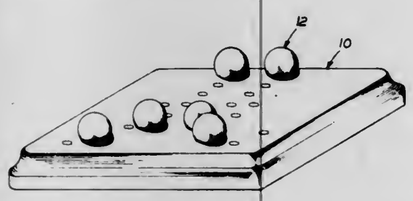
providing an electrical return path from said tissue through said second electrode.

4,233,966

APPLIANCE FOR USE IN ACUPRESSURE THERAPY

George K. Takahashi, 2604 Kelton Ave., Los Angeles, Calif. 90064

Filed Dec. 11, 1978, Ser. No. 968,496
Int. Cl.³ A61H 15/00
U.S. Cl. 128—67 **1 Claim**



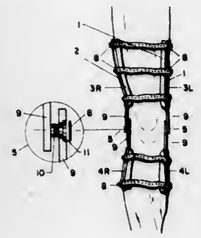
1. An appliance for use in practicing finger pressure therapy, in combination, a first rigid substantially planar member adapted for positioning in proximity to a portion of the human body, a plurality of substantially spherical knob members, said members having stem portions adapting them for fixed securement to said first member, said first member having a pair of groups of openings for receiving said stem portions, said groups being arranged symmetrically on said first member and the openings of one group comprising a generally J-shaped array of openings arranged in mirror-image relation to the openings of the other group with the hook portion of each array extending away from each other and the stems of the arrays being generally parallel.

4,233,967

CUSTOM-FITTED KNEE GUARD AND BRACE

Roy B. Daniell, Jr., 2026 "B" Tycoon Rd., Chamblee, Ga. 30341

Filed Apr. 17, 1978, Ser. No. 896,990
Int. Cl.³ A61F 5/00
U.S. Cl. 128—80 C **2 Claims**



1. A knee guard and brace, which comprises: inside and outside members which are adapted to fit on the inner and outer sides, respectively, of a wearer's leg, each side member comprising a pair of thigh and calf support members; each support member having a rib which runs parallel to the wearer's leg from the knee joint to substantially the distal edges of the support member; means pivotally interconnecting the end portions of the ribs in overlapping engagement; each support member having a pair of semi-rigid flanges which extend laterally from opposite sides of the rib, the flanges being wholly disposed within the portions of the thigh and calf support members which are located above and below the segments of the knee joint at the sides of the knee cap, respectively; a section of each rib disposed between the overlapping end portions and the proximate edges of the flanges being curved, the radius of curvature of the section being such that an arch is formed which longitudinally spans the area of the knee joint at the side of the knee cap when the end portions are interconnected in overlapping engagement, the arch being entirely disposed laterally from the surface of the knee, so that the force of a blow upon the knee guard and brace received at the knee joint tends to be dissipated to the large muscles of the wearer's thigh and calf rather than absorbed by the knee joint; the flanges of the outside member having a plurality of laterally extending straps connecting the upper flanges to each other and the lower flanges to each other, portions of the straps being contiguous with the flanges, the straps having a plurality of equally spaced holes; a plurality of studs attached to the flanges of both the inside and outside members, the studs being aligned with an equal number of holes in the contiguous portions of the straps, and the studs having the same diameter at the interface between the studs and the flanges are the diameter of the holes, so that the straps can be seated over the studs, securing the knee guard and brace and encasing a wearer's leg above and below the knee; the support members being constructed of a thermoplastic material which becomes pliable, upon heating, at temperatures which are sufficiently low that the flanges can be shaped to the contour of a heat protected leg, thereby enabling the knee guard and brace to form a custom-fitted, simi-rigid encasement which inhibits torsional twisting of the leg.

4,233,968

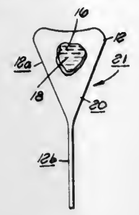
IUD ARRANGEMENT

Seth T. Shaw, Jr., 30036 Via Borica, Rancho Palos Verdes, Calif. 90274

Filed Jul. 26, 1978, Ser. No. 928,093
Int. Cl.³ A61F 5/46
U.S. Cl. 128—130 **32 Claims**

1. In an intrauterine device of the type insertable in the uterus and having a surface contacting the uterus and first walls defining a fluid receiving cavity in at least a portion thereof, the improvement comprising, in combination:

one of a concentrated fluid solution and suspension of a drug in said cavity and said drug of the type providing an antifibrinolytic, an antifertility and an antiproteolytic effect and said drug comprising an amidine; and



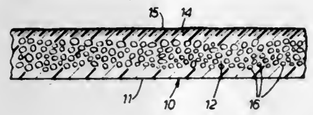
said first walls of said intrauterine device comprising a polymer having a predetermined permeability to said drug, whereby, said predetermined permeability of said first walls controls the release rate of said drug from said cavity.

4,233,969

WOUND DRESSING MATERIALS

Peter M. Lock, 327 Lordswood La., Petrosa, Walderslade, Chatham, Kent, and David R. Webb, 9 Lambourn Way, Lordwood, Chatham, Kent, both of England

Filed Nov. 10, 1977, Ser. No. 850,375
Claims priority, application United Kingdom, Nov. 11, 1976, 47074/76
Int. Cl.³ A61L 15/00
U.S. Cl. 128—156 **10 Claims**



1. A wound dressing material, comprising a non-laminated sheet of a synthetic plastics material which is permeable to water vapour and to air and which is impermeable to liquid exudate, said material having on one side a smooth glazed surface for application to a wound, a closed cell cellular region behind the smooth surface, and a more dense region behind the closed cell cellular region, so that on contact with liquid exudate from a wound the dressing material will absorb a limited amount of exudate but prevent it from passing through the dressing material.

4,233,970

EMERGENCY ESCAPE BREATHING APPARATUS

Max L. Kranz, Brea, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 883,362, Mar. 6, 1978. This application Nov. 16, 1978, Ser. No. 961,291
Int. Cl.³ A62B 7/02
U.S. Cl. 128—201.28 **4 Claims**

1. Breathing apparatus comprising:

a protective hood for fitting about the head of a wearer and for containing an atmosphere of breathing gas, the base of said hood including an elastomeric neck closure adapted to admit the head of the wearer and yieldably seal in a stretched state against the neck of the wearer whereby said neck closure serves as an exhalation valve;

a supply bottle for providing breathing gas for said hood, said supply bottle having a threaded neck; and

flow regulating gas supply valve means including:

(a) a valve body having an internally threaded first bore for engagement with said threaded neck of said supply bottle to receive breathing gas therefrom, said valve body further having means, including an elongated internally threaded receptacle having an outlet port adjacent its inner extremity, for conveying breathing gas to said hood;

(b) a valve insert member threadably received in said receptacle and including at its inner extremity a first chamber in communication with said first bore, said insert member defining with said valve body a second chamber in communication with said outlet port, said valve insert member including an elongated second bore, a pressure control passage extending between said first chamber and said second bore, and a flow control orifice extending between said second chamber and said second bore, the inner end wall of said second bore mounting a valve seat surrounding the adjacent terminus of said pressure control passage;

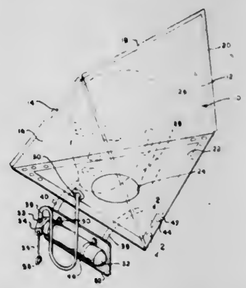
(c) a valve closure member having a piston axially slidable in said second bore and defining with said valve insert member a third chamber in communication with said pressure control passage and said flow control orifice, said piston mounting resilient seal means confronting said valve seat;

(d) first bias means biasing said valve closure member to urge said resilient seal means against said valve seat to seal said pressure control passage;

(e) a ball valve in said first chamber;

(f) second bias means tending to urge said ball valve against the adjacent terminus of said pressure control passage to substantially but not completely block the flow of breathing gas through said pressure control passage; and

(g) a pin axially slidable in said pressure control passage and engaged at one end by said ball valve and at the opposite end by said resilient seal means whereby, upon unseating of said resilient seal means from said valve seat, the axial position of said resilient seal means tends to control the pressure of breathing gas conveyed to said hood.



4,233,971

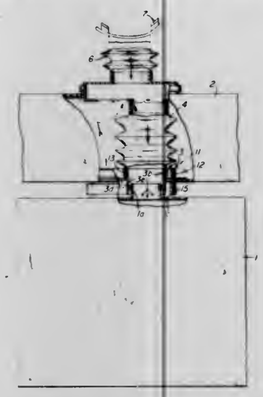
RESPIRATOR

Manfred Gronau; Werner Mascher, and Klaus Pampuch, all of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,732
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2827079
Int. Cl.³ A62B 7/08
U.S. Cl. 128—202.26 **5 Claims**

1. A respirator comprising a breathing bag with an opening in its bottom, a rigid ring-shape connecting member inside the bag at said opening, an elastic sleeve encircling and tightly engaging said connecting member inside the bag, said sleeve being secured to the bag around said bag opening and projecting downwardly out of the bag, said connecting member having a base provided with an opening therethrough, a tubular member rigidly disposed in said base opening and extending above and below it, a chemical cartridge below said bag provided with an upwardly extending ring-shape flange projecting up into said elastic sleeve in sealing engagement therewith,

the top of the cartridge within said flange having an inlet opening therein, a rigid tube extending from said inlet opening up into concentric relation with the lower end of said tubular member, a breathing hose inside the bag having a lower end connected to the upper end of said tubular member, and means



for connecting the upper end of said hose with a breathing hose outside of the bag, said connecting member base being provided with an opening therethrough beside said tubular member, and the top of the cartridge within said flange having an outlet opening beside said tube.

4,233,972

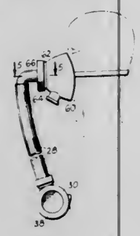
PORTABLE AIR FILTERING AND BREATHING ASSIST DEVICE

Wolfgang Hauff, 235 Keith Rd., West Vancouver, B.C., Canada, and John W. Tidland, 2084 SW. Linnell, Roseburg, Oreg. 97470

Continuation-in-part of Ser. No. 801,655, May 31, 1977, abandoned. This application May 8, 1978, Ser. No. 903,925

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—205.12 **2 Claims**



1. A portable air filtering and breathing assist device comprising

(a) a housing having at least one threaded open end,

(b) perforated threaded cap means removably mounted on the open end of said housing,

(c) filter disc means removably mounted in said cap means,

(d) an outlet on said housing,

(e) a flexible hose having one end connected to said outlet,

(f) power means in said housing,

(g) a blower in said housing driven by said power means,

(h) means in said housing establishing communication of said blower with said perforated cap means and with said outlet whereby said blower is arranged to draw in air to be filtered through said perforated cap means and discharge it out said outlet,

(i) means on said housing arranged to attach it to the body of a person in spaced relation from the head,

(j) a face mask adapted to be worn by a person,

(k) and means on said flexible hose arranged to removably attach the other end thereof to said face mask,

(l) said hose being of a length to extend from such a face mask to the housing when worn by a person at a place spaced from the head,

(m) said respirator mask having an internally threaded front projection and a hollow adapter member with first and second exterior threaded portions, the said first threaded portion being threadedly engaged with said projection, and a threaded cap removably mounted on said projection, said means removably attaching said other end of said flexible hose to the mask including an elbow portion having a swivel connection to said threaded cap and a removable connection to said flexible hose.

4,233,973

APPARATUS FOR ADMINISTERING INTRAVENOUS DRUGS

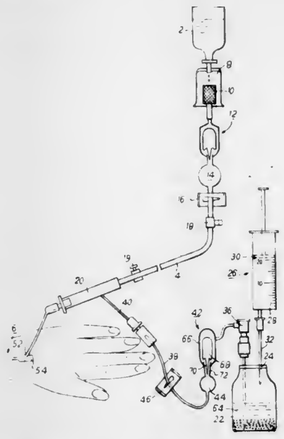
Vishnu S. Shukla, c/o Newcastle General Hospital, Department of Radiation and Oncology, Westgate Rd., Newcastle upon Tyne NE4 6BE, England

Filed May 9, 1979, Ser. No. 37,957

Claims priority, application United Kingdom, May 12, 1978, 19155/78

Int. Cl.³ A61M *5/00;* **A61J** *1/00*

U.S. Cl. 128—214 R **10 Claims**



1. Apparatus for administering intravenously a drug supplied in powdery form, the apparatus comprising an intravenous infusion set having a drip feed including a venipuncture member for feeding intravenous liquid into a patient's vein, a sealed container for the powdery drug, pump means for controlling the flow of fluid to and from the sealed container, said pump means including a piston-cylinder assembly, the cylinder of which is in communication with the upper regions of the sealed container, and a tubular member extending from the lower regions of said container to communicate into the drip feed of the intravenous liquid to the patient, the arrangement being such that withdrawal of the piston in the cylinder of the pump means partially evacuates the sealed container, the removed gaseous content of said container being replaced by intravenous liquid fed under gravity from the infusion set to dissolve the powdery drug into solution, controlled return movement of the piston in the cylinder of the pump means forcing a controlled volume of solution from the sealed container through the tubular member to the infusion set whereby said solution, together with the intravenous liquid from the infusion set, is fed by the venipuncture member to the patient.

4,233,974

SPINAL NEEDLE ASSEMBLY

Vince Desecki, Ingleside, and Carl Filipowicz, Lindenhurst, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 5, 1978, Ser. No. 939,851

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—215 **5 Claims**



1. A spinal needle assembly in which an obturator having an end cap extends into a cannula having a needle bevel at one end and a hub at the opposite end for engagement with said end cap, and means for aligning the obturator and the cannula, the improvement comprising means for bridging said end cap and hub to prevent relative axial movement between said obturator and cannula, said bridging means being adapted for rapid manual removal by an operator and comprising a molded overcap which overlies said end cap and extends over protruding portions of said end cap and hub.

4,233,975

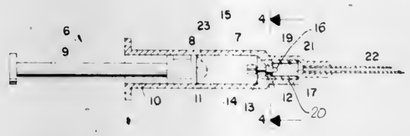
ANTI-DRUG ABUSE SINGLE-USE SYRINGE

Arthur J. Yerman, 123 William Cook Blvd., Manahawkin, N.J. 08050

Filed Oct. 4, 1978, Ser. No. 948,532

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—218 P **3 Claims**



1. A single-use syringe comprising in combination: a tubular element having a plunger reciprocatably mounted in a first open end to tubular space of the tubular element and having an injection needle operably mounted on a remaining opposite end of the tubular element, a hollow portion of needle through-space being in flow communication with tubular space of the tubular element, the improvement being at least one of (a) an interior wall of the tubular element and (b) a circumscribing lengthwise-wall of the plunger, including a male member and the other thereof including a female member preventing retraction of a terminal end-portion of the plunger when the plunger is inserted within the tubular space sufficiently for the male member to become aligned with the female member, at least one of the male member and the female member being movable such that the male member is lockable into the female member, whereby a non-reusable syringe results preventing refilling or reinjection in use thereof, said plunger including a terminal end that blocks further outflow of syringe contents when said male member is mated with said female member, and said plunger including a separable proximal end jointly movably axially to and fro prior to and until said male member is mated with said female member, said proximal end being detachable from said terminal end when withdrawal pressure is applied to said proximal end after the male member is mated with the female member whereby the terminal end continues to block outflow of syringe contents when an effort is made to withdraw the plunger.

4,233,976

STYPTIC DEVICE

Wayne K. Dunshee, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 747,083, Dec. 3, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,488

Int. Cl.³ A61M *7/00*

U.S. Cl. 128—260 **7 Claims**

1. A styptic device capable of causing bleeding to stop in a minor wound when said device is applied to the wound without causing a significant pain sensation in the injured person and without significantly attaching to any clot formed in stopping said bleeding comprising:

(a) a porous web comprising hydrophobic fibers, said web being at least about 50 microns in thickness, and

(b) about 0.05 to 0.90 gram of styptic material per cubic centimeter of web contained within said web, said styptic material being releasably attached in crystalline form to said hydrophobic fibers whereby said bleeding forms a liquid medium allowing said styptic material to diffuse back to the wound site to cause a vascular styptic effect.

4,233,977

CLOSURE MEANS FOR COLLECTION APPLIANCES

Larry J. Mattson, Largo, Fla., assignor to Howmedica, Inc., New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,275

Int. Cl.³ A61F *5/44*

U.S. Cl. 128—283 **10 Claims**



1. In an ostomy collection appliance of the type having at least front and back opposed flexible flat walls, said walls defining a fecal receiving chamber between them and terminating at a drainage opening at the bottom of said appliance, and means for releasably closing said opening, the improvement wherein

said drainage opening closure means consists essentially of a semi-rigid strip securely affixed transversely with respect

to the collection appliance, in spaced relation to said drainage opening and adjacent and parallel to one of said opposed flexible walls so as to leave a gap between said semi-rigid strip and said adjacent flexible walls, said gap being open at both the top and bottom thereof,

whereby said drainage opening may be releasably closed by folding the lower ends of said opposed walls upwardly upon themselves together, and tucking said folded ends downwardly into said gap for snug fit therein.

4,233,978

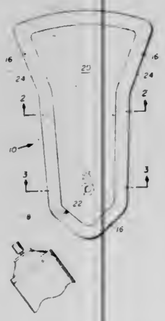
EXTERNAL FEMALE CATHETER

Glen A. Hickey, 706 Wesley, Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 787,549, Apr. 14, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,822

Int. Cl.³ A61F 5/44

U.S. Cl. 128—295 **5 Claims**



1. A female catheter (as recited in claim 4, wherein) for external application, comprising:

a receiving means, said receiving means being substantially flat and elongated in configuration, said receiving means receiving and containing a liquid, said receiving means being constructed from an extremely thin-walled stretchable and expandable material, said thin-walled stretchable and expandable material being capable of readily expanding to provide a greater volume and readily returnable to its original configuration, said receiving means having the edges thereof reinforced by a substantially flat planar thickening of the periphery of said stretchable and expandable material to form a reinforced edge;

an attaching means, said attaching means being applied to the surface on one side of said receiving means at the outer peripheral edges thereof for attaching said female catheter to a female patient; and

a drainage means, said drainage means being formed monolithically with said receiving means said drainage means and said receiving means of said female catheter being thereby of one-piece construction.

4,233,979

METHOD OF SCREWING AN ADAPTER INTO THE HUMAN CRANIUM

Georg Naser, Zirndorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,486

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720455

Int. Cl.³ A61B 17/00

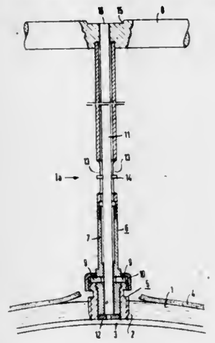
U.S. Cl. 128—303 R **1 Claim**

1. The method of inserting a hollow adapter into an opening in a human cranium, which comprises

(a) temporarily engaging the adapter with one axial end of a hollow tube (7) for joint rotation, and with an interior space of the hollow tube aligned with a hollow space of the adapter, and with a gauge element (11) extending through the aligned interior space and hollow space and terminating in a disk abutment member, so that the adapter and hollow tube can advance axially relative to the gauge element,

(b) positioning the gauge element axially in the tube such that the disk abutment member rests against the dura mater (3) at the opening in the human cranium,

(c) drivingly rotating the tube (7) to rotate the adapter and drive the same into the opening while the disk abutment member continues to rest on the dura mater (3),



(d) continuing the driving of the adapter into the opening until gauging indicia on the gauge element and on the hollow tube indicate that the adapter is flush with the engaging face of the disk abutment member which engages the dura mater, and

(e) thereafter disengaging the hollow tube from the adapter and removing the hollow tube and gauge element from the opening to expose the dura mater for application of a pressure converter to be inserted into the hollow space of the adapter.

4,233,980

HEMOSTATIC COMPRESSIVE DEVICE

Lorin P. McRae, and Mark M. Kartchner, both of Tucson, Ariz., assignors to Narco Scientific Industries, Inc., Fort Washington, Pa.

Continuation of Ser. No. 774,682, Mar. 7, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 967,992

Int. Cl.³ A61B 17/12

U.S. Cl. 128—325 **16 Claims**

1. Apparatus for applying pressure to areas comprising:

(a) bladder means including a first sheet of generally non-elastic flexible material and a second sheet of generally non-elastic flexible material, said first and second sheets being mutually connected about their respective peripheries, wherein said bladder means is inflatable to expand by the mutual separation of the interior regions of said two sheets generally along the direction in which pressure is to be applied to such area;

(b) pressure plate means for contacting one of said sheets for constraining said bladder means;

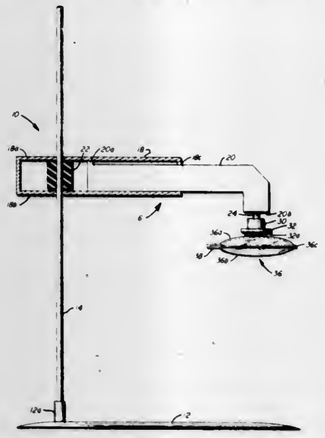
(c) support means for supporting said pressure plate means, including base means and positioning arm means for mounting thereon whereby said pressure plate means may be selectively positioned;

(d) housing means, as part of said positioning arm means, including generally opposed first and second elongate wall means, joined to said base means and selectively moveable, relative thereto, translationally and rotationally;

(e) sliding arm means, as part of said positioning arm means, telescopically moveable generally between and along said first and second wall means whereby said positioning arm means is selectively extensible, and to which said pressure plate means may be selectively connected;

(f) first selectively releasable lock means, including sleeve means positioned between said first and second wall means and frictionally engaging said base means, for selectively maintaining said housing means fixed against motion relative to said base means; and

(g) second selectively releasable lock means, including frictional engagement between at least one of said first and second wall means and said sliding arm means, for selectively maintaining said sliding arm means fixed against motion relative to said housing means.



4,233,981

DEVICE FOR CLOSING SEVERED BODY VESSELS

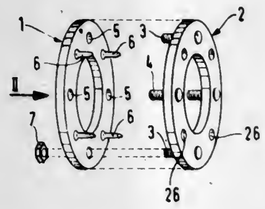
Paul H. Schomacher, Braunsbergstrasse 13, 4400 Münster, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,565

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657255

Int. Cl.³ A61B 17/04

U.S. Cl. 128—334 R **2 Claims**



1. A surgical device for closing severed body vessel walls comprising:

a pair of annular flanges each formed of a material compatible to a human body,

said flanges being positionable to having their planar faces in opposed relationship with vessel walls disposed between said flanges,

pointed pins anchored to one of said flanges and extending through openings in the other flange and piercing the vessel walls between said flanges and retaining their pointed ends,

threaded holding pins mounted on one of said flanges and having threaded portions extending through aligned apertures in the other of said flanges,

and threaded fasteners for threading onto said threaded holding pins to hold said flanges and said pointed pins against separation, said threaded fasteners being turned in one direction on said threaded holding pins to various locations depending on the thickness of the vessel walls, said threaded fasteners being turnable in a direction opposite to said one direction to reduce the clamping pressure on the vessel walls to prevent a necrotic condition.

4,233,982

TROCAR SLEEVES HAVING A BALL VALVE

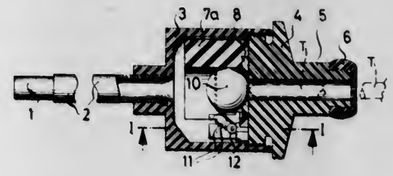
Siegfried Bauer, Heidelsheim, and Manfred Boebel, Oetisheim, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,561

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 7735963

Int. Cl.³ A61B 17/34; F16K 51/00

U.S. Cl. 128—347 **2 Claims**



1. In a trocar sleeve of the kind having a widened part forming a housing between the distal portion of said sleeve and its proximal portion, which latter extends from a plug for said widened housing part, and a ball valve in said widened housing part which ball valve is closable by resilient means and which is openable by a trocar passing through an opening in said plug and said sleeve, the improvement which consists in that said widened part forming the housing receives an insert said insert extending around said ball valve in a generally U-shaped configuration and thus affording a ball-receiving space, said insert is secured to said plug with a peripheral portion of the insert in clamping engagement with an inserted sealing gasket of deformation-resistant plastics material which is apertured to form a valve seating between the plug and insert, and in that the space presented by said insert forms a space for the ball of and thereby allow passage in said trocar sleeve of a trocar therethrough said ball valve to swing into and out of, said ball being biased by a tangentially loaded spring to seat in the aperture of said gasket, said spring being placed under stress by being connected to said insert, and said insert being separably attached to said plug, whereby said spring acts to automatically seat said ball valve against said gasket when said trocar is removed from said trocar sleeve and thereby prevent backflow of fluids through said trocar sleeve.

4,233,983

CATHETER PROVIDED WITH A SAFETY-FIXING MEMBER, REMOTELY ADJUSTABLE AND EXPANDIBLE BY INTRODUCING FLUIDS

Francesco Rocco, Via Fogazzaro, 20, 20100 Milano, Italy

Filed May 22, 1978, Ser. No. 908,382

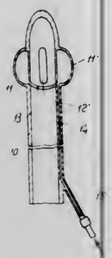
Claims priority, application Italy, May 30, 1977, 21426 A/77; Oct. 26, 1977, 22581 A/77

Int. Cl.³ A61M 25/00

U.S. Cl. 128—349 B **5 Claims**

1. A catheter apparatus which comprises a tuve having a closed forward end portion disposed for insertion into a body cavity to drain fluid therefrom, the wall of said tube circumferentially extending to define a lumen for passage of said fluid; a pair of resilient inflatable bags connected to the wall of said tube at the forward end portion thereof, said bags extending

circumferentially about said tube in diametrically opposed relation to each other and extending lengthwise along the tube over approximately the same length portion of the tube, said bags being limited in circumferential extension to define on the tube wall a pair of spaces each between said bags and disposed in diametrically opposed relation to each other; means defining a pair of opposed oblong open windows in said tube wall, each



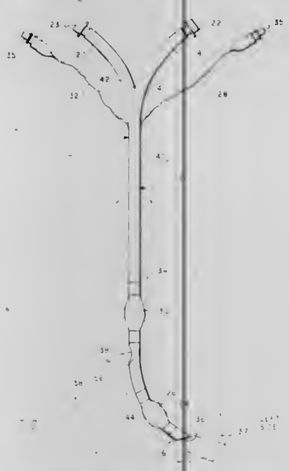
window being located in a respective one of said spaces and extending lengthwise along the tube over approximately the same length portion as extend said bags; a first duct communicating with said bags and extending lengthwise along the tube wall for carrying a fluid to inflate said bags, and a second duct extending circumferentially within said tube wall communicating said bags with each other to equalize the inflation thereof.

4,233,984

RESPIRATORY VENTILATING DEVICE

Peter T. Walling, 14126 Brookridge Cir., Dallas, Tex. 75240

Filed Jun. 30, 1978, Ser. No. 920,723
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—207.14 **3 Claims**



1. A respiratory ventilating device for conducting gaseous materials under slight gaseous pressure differential to and from the lungs of a patient separately or simultaneously, comprising:

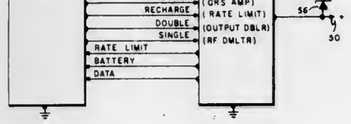
an elongated flexible tube adapted to extend through the patient's trachea to a point within the bronchus of one lung, said tube having walls forming a generally cylindrical interior surface, first means disposed about said tube for forming a gaseous seal in said bronchus, second means disposed about said tube for forming a gaseous seal in the trachea, said tube having a first opening distal to both said seal means and a second opening between said first seal means and second seal means, a thin flexible membrane dividing the interior of said tube into first and second isolated longitudinal passageways, said membrane being sufficiently flexible to respond to differences in pressures of the gasses conducted by said longitudinal passageways by moving toward the passageway corresponding to the lower gaseous pressure, said membrane having a lax transverse dimension approximately equal to one half of the interior surface of said tube and having a thickness dimension much smaller than the thickness of the walls of the tube whereby the passageway corresponding to the higher pressure will occupy substantially the entire cylindrical interior of the tube, said first longitudinal passageway having a distal end communicating with said first opening, said second longitudinal passageway having a distal end communicating with said second opening, said first and second ventilating ports communicating respectively with the proximal ends of said first and second longitudinal passageways.

4,233,985

MULTI-MODE PROGRAMMABLE DIGITAL CARDIAC PACEMAKER

Jerome T. Hartlaub, New Brighton; Ray S. McDonald, St. Paul, and Lawrence W. Shearon, Roseville, all of Minn., assignors to Medtronic Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 958,320
Int. Cl.³ A61N *1/30*
U.S. Cl. 128—419 PG **19 Claims**



1. A progammable cardiac pacemaker pulse generator comprising:

a pair of output terminals adapted to provide signals to and receive signals from the heart;

sense amplifier means responsive to the signals received by said output terminals from said heart for providing a signal manifesting the occurrence of natural heart activity;

program storage means responsive to signals provided external from said pulse generator for providing a signal in one of at least two possible states, which states indicate either a ventricular inhibited or a ventricular synchronous mode of operation; and

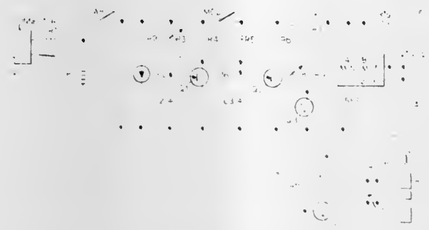
digital timing means responsive to said sense amplifier means signal and said program storage means signal for providing cardiac stimulating signals to said output terminals in accordance with the desired mode of operation, including triggerable oscillator means and gate means, said triggerable oscillator means providing a signal whenever a certain time has passed since the last signal provided thereby or whenever a trigger signal is applied thereto, and said gate means responding to said program storage means signal being in the one state indicating a ventricular synchronous mode of operation by providing said trigger signal to said triggerable oscillator means in response to each sense amplifier means signal, said gate means further responding to said program storage means signal being in the other state indicating a ventricular inhibited mode of operation by blocking the passage of any signals therethrough.

4,233,986

APPARATUS AND METHOD FOR CONTROLLING PAIN BY TRANSCUTANEOUS ELECTRICAL STIMULATION (TES)

Joseph Tannenbaum, Jerusalem, Israel, assignor to Agar Ginosar Electronics and Metal Products, Doar Na Emek, Israel

Continuation of Ser. No. 740,499, Nov. 10, 1976, abandoned. This application Jul. 18, 1978, Ser. No. 925,839
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—421 **10 Claims**



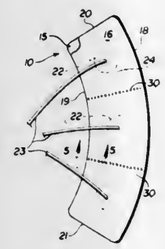
1. Apparatus for controlling pain in a patient by transcutaneous electrical stimulation comprising: a pulse generator for continuously generating periodic electrical pulses of a width of from 68 to 740 microseconds, and a voltage of from 60 to 150 volts; external electrode means including at least a pair of skin electrodes coupled to said pulse generator and adapted to be placed in contact with the skin of the patient for applying said pulses thereto; and a pulse-width modulator for modulating the width of the pulses generated by said generator and applied by said electrodes to the patient's skin.

4,233,987

CURVILINEAR ELECTROCARDIOGRAPH ELECTRODE STRIP

Alfred Feingold, 5310 Maggiore St., Coral Gables, Fla. 33146

Filed Aug. 18, 1978, Ser. No. 934,854
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—639 **5 Claims**



1. An electrode pad comprising a thin, flexible, narrow, generally flat, and elongate strip having two opposite faces bounded by common edges including two curvilinear edges opposite one another and extending the elongate length of the strip, the pad being adapted to be applied to the chest or thorax of a patient as for electrodcardiography, wherein the strip carries a plurality of electrodes spaced apart along such strip on one face thereof, whereby the strip may readily and without stretching assume the curved contour of a patient's body upon application of said strip thereto.

4,233,988

HIGH RESOLUTION ROTATING HEAD ULTRASONIC SCANNER

Donald E. Dick, Boulder; Robert L. Metz, Superior; D. Scott RoJohn, Boulder, and Raymond D. Elliott, Denver, all of Colo., assignors to Life Instruments Corporation, Boulder, Colo.

Filed Jul. 5, 1978, Ser. No. 922,185
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **26 Claims**



1. An ultrasonic scanner comprising:

a body portion;

a scanning head having an axis of rotation;

means for mounting the scanning head on the body portion for rotation about its axis of rotation;

means mounted on said body portion for rotating the scanning head about its axis of rotation;

a plurality of wide apertured focused ultrasonic transducers, each transducer being individually distinct from said other transducers, each transducer having a predetermined focal range different than the predetermined focal ranges of each of said other transducers, said focal ranges being contiguous, each of said transducers when energized producing a beam of acoustic energy having a beam axis, each of the beams of acoustic energy being produced only by one of said distinct energized transducers,

means for mounting the transducers on the scanning head so that the beam axes of said transducers are substantially perpendicular to the axis of rotation of the scanning head, said beam axes substantially lying in the same plane, and the angles between the beam axes being substantially equal; and

means for connecting the transducers to a transmitter/receiver and for energizing the transducers so that the transducers scan a given sector, said sector being divided into contiguous zones with the depth of each zone of the given sector corresponding to the focal range of one of the transducers.

4,233,989

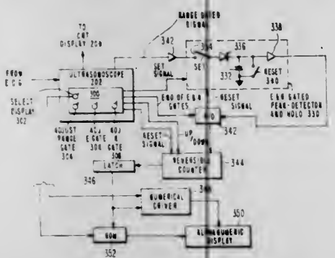
ECHOCARDIOGRAPHIC APPARATUS FOR MYOCARDIAL DISEASE DIAGNOSIS BY A-WAVE QUANTIFICATION

Simon Larach, and David H. R. Vilkomerson, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,456
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—661 **6 Claims**

1. An echocardiographic diagnostic apparatus comprising

pulse-echo ultrasonic means for insonifying the heart of a subject with successive pulses of ultrasonic wave energy synchronized with the heartbeat of said subject and then detecting echoes of said insonified heart of said subject, said detected echoes including those which when displayed on a cathode-ray-tube display appear as an M-wave, said M-wave having a waveform shape specifically determined by both the movement of said subject's heart as a whole and by the movement of the mitral valve within said subject's heart, said specifically-determined waveform of said M-wave including a first-occurring peak followed, in turn, by a valley and then by a second-occurring peak smaller in amplitude than said first-occurring peak; the combination therewith of an A-wave quantification indicator coupled to said pulse-echo ultrasonic means for measuring the difference in amplitude between said first and second peaks of said M-wave detected echoes and selectively deriving, in accordance with the value of said measured difference, an indication in a form that distinguishes subjects suffering from one of myocardial disease and hyperkinetic syndrome from normal subjects.

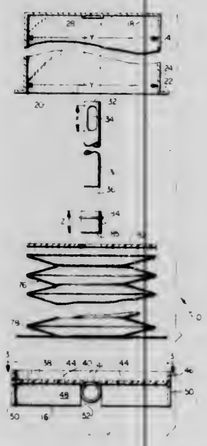


4,233,990

VOLUME AND FLOW-RATE DEPENDENT INSPIRATOR

Lloyd M. Yardley, Decatur, Ga., assignor to Empire Plastics Manufacturing Inc., Decatur, Ga.

Filed Mar. 20, 1979, Ser. No. 22,330
Int. Cl.[3] A61M *16/00*; A63B *23/00*
U.S. Cl. 128—728 **15 Claims**



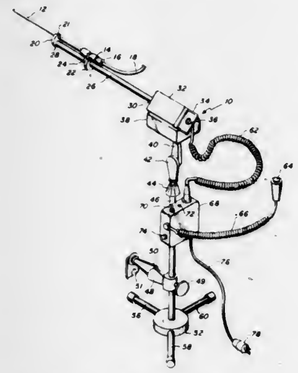
1. A device for measuring inspiratory capacity comprising:
a housing;
dividing means positioned inside said housing for dividing the interior of said housing into a first chamber and a second chamber, at least a portion of the second chamber being positioned above the first chamber;
first means for establishing fluid communication between the first chamber and the ambient environment;
second means for establishing fluid communication between the second chamber and a user of the device so that inhalation by the user through the second means creates a negative pressure within the second chamber;
said dividing means including means responsive to the negative pressure within the second chamber for simultaneously increasing the size of the first chamber and reducing the size of the second chamber; and
means operative after the size of the second chamber has been reduced to a predetermined value for establishing fluid communication between the second chamber and the ambient environment, thereby eliminating the negative pressure within the second chamber.

4,233,991

URETHRAL CATHETER PULLER

William E. Bradley; William M. Klatt, both of Minneapolis; Charles C. Kuyava, Brooklyn Center, and Robert D. Dreher, Roseville, all of Minn., assignors to American Medical Systems, Inc., St. Louis Park, Minn.

Continuation-in-part of Ser. No. 696,318, Jun. 15, 1976, Pat. No. 4,199,916. This application Dec. 18, 1978, Ser. No. 970,465
Int. Cl.[3] A61B *5/10*
U.S. Cl. 128—733 **8 Claims**



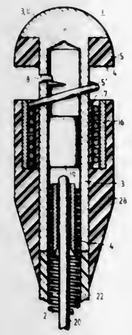
1. A urethral catheter puller comprising:
a boom;
a forward catheter support rigidly attached to said boom and having means thereon for slidably supporting a urethral catheter;
a rearward catheter support mounted on said boom rearwardly of said forward catheter support with respect to the point of exit of a uretheral catheter from a patient's body and having means thereon for firm attachment to a urethral catheter;
drive means for moving said rearward catheter support along the length of said boom at a controlled rate; and
positioning means to allow said boom to assume a plurality of angular orientations and to allow said forward catheter support to be placed in close proximity to the point of exit of a urethral catheter from a body, wherein said boom is mounted on said positioning means.

4,233,992

IMPLANTABLE ELECTRODE

Hans-Jürgen Bisping, Tittardshang 12, D-5100 Aachen-Laurensberg, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,097
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732547; Jul. 19, 1977, 225913[U]
Int. Cl.[3] A61N *1/04*
U.S. Cl. 128—785 **22 Claims**



1. In a body implantable electrode including an electrode head having a stimulation surface at its end, an insulated electrode lead and at least one fastening element for fixing the electrode so as to bring the stimulation surface into contact with body tissue, the improvement wherein: said fastening element is disposed at a location spaced behind said end of said electrode head in the axial direction of said electrode lead; said fastening element is arranged to be in a retracted position, during insertion of said electrode, substantially within the outer contour of said electrode head which is touched by body tissue during insertion, and said fastening element is arranged to be moved essentially in the radial direction, normal to the axial direction of said electrode lead, beyond the outer contour of said electrode head, into an extended position in which it extends laterally beyond such outer contour at a location behind said end of said electrode head, with respect to the direction of insertion of said electrode, so as to penetrate in the body tissue surface and fix said electrode in place; said electrode further comprises fastening element control means guided within said electrode lead and controllable from the end of said electrode lead remote from said electrode head for effecting movement of said fastening element from its retracted position to its extended position, and an intermediate element separate from, and acted on by, said control means for effecting such movement of said fastening element; said electrode head comprises a hollow cylinder connected to said electrode lead; and said intermediate element extends along the inside of said cylinder and movingly and sealingly engages the interior wall of said cylinder to act as a seal against the intrusion of body fluids.

4,233,993

SMOKING MATERIAL

Ralph R. Miano, and Charles H. Keith, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 607,301, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 400,465, Sep. 24, 1973, abandoned, which is a continuation of Ser. No. 216,763, Jan. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 841,969, Jul. 15, 1969, abandoned. This application Mar. 17, 1978, Ser. No. 887,572
Int. Cl.[3] A24B *5/16*; A24D *1/18*
U.S. Cl. 131—2 **10 Claims**

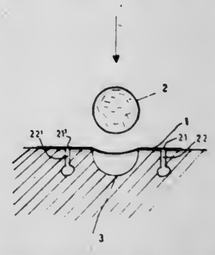
2. The process of claim 1 wherein said combustible material is selected from the group consisting of carboxymethyl cellulose and carboxymethyl cellulose salts.

4,233,994

WRAPPING PROCESS FOR CIGARS WITH NATURAL TOBACCO

Bernard J. Sass, Morlaix, France, assignor to Service d'Exploitation Industrielle des Tabacs, France

Filed Feb. 3, 1978, Ser. No. 874,889
Claims priority, application France, Feb. 9, 1977, 77 03559
Int. Cl.[3] A24C *1/26, 1/28, 1/30*
U.S. Cl. 131—58 **8 Claims**



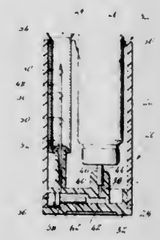
1. In the process of wrapping a premanufactured tobacco core with natural tobacco wrapper in which the circumferential surface of the core is totally surrounded with one or more sections of wrapper joined at their longitudinal edges in a like number of seams so as to form a continuous wrapper about said core, the improvement which comprises maintaining each of said wrapper sections in stretched condition between its longitudinal edges while said core is being surrounded and said seams are being formed.

4,233,995

CIGARETTE/CIGAR TREATMENT DEVICE

Paul M. Kotuby, Naugatuck, and Joseph F. Reed, Bridgewater, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.

Filed Apr. 12, 1979, Ser. No. 29,191
Int. Cl.[3] A24F *47/00*
U.S. Cl. 131—133 R **3 Claims**



1. A device for treating a consumer unit of tobacco, comprising
a generally cylindrical casing open at its lower end and having an end wall partially closing its upper end, said casing having a size and shape adequate to receive in side-by-side relation a valved tubular aerosol dispenser and a tubular receiver for a consumer unit of tobacco;
a molded plastic base received in the open end of said casing and providing a closure for the lower end of said casing;
said base having a pair of parallel passages directed axially of said casing and being in spaced relation to each other, and a transverse passage intersecting said spaced parallel passages and providing communication between them within said base;
said transverse passage being closed at one end and having a restricter plug removably received in the other end said

plug extending axially into said transverse passage to partially restrict communication between said parallel passages;

a first of said parallel passages terminating at its upper end in an upwardly opening socket and being adapted and arranged for coupling thereto in fluid tight manner of a valve stem of a conventional axially operable valve of an aerosol dispenser, and said casing having a receiving aperture at its closed end in axial alignment with said socket for insertion of an aerosol dispenser into coupling engagement with said socket;

said other of said parallel passages having mounted therein a hollow injection needled projecting axially outwardly therefrom, said needle making communication internally with said other passage and thus with said transverse passage and first passage of said base;

a receiver for a consumer unit of tobacco, said receiver having an open upper end and a bottom wall at its other end, said receiver being positioned on said base and having an aperture in its bottom wall to accept the passage therethrough of said injection needle; and

a second aperture in said end wall of said casing providing an access opening for the open end of said tubular receiver.

4,233,996

CUTTING LEAF TOBACCO

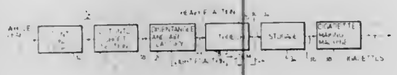
Warren A. Brackmann, Cooksville, and Daniel DiIanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed May 21, 1979, Ser. No. 40,487

Claims priority, application United Kingdom, May 23, 1978, 21640/78

Int. Cl.³ A24B 5/00

U.S. Cl. 131—140 R **8 Claims**



1. A method of forming cigarettes from leaf tobacco, which comprises:

cutting at least a substantial proportion of the tobacco leaf into a plurality of shreds of tobacco by substantially simultaneously subjecting said leaf to a plurality of longitudinal cuts of width about 0.5 to about 0.75 inches to establish the length of said shreds and to a plurality of transverse cuts of width about 0.02 to about 0.05 inches to establish the width of said shreds,

separating said plurality of shreds into a heavier fraction of shreds containing substantially all of said plurality of shreds having leaf stem associated with lamina in an amount which is no more than 20% of said shreds and a lighter fraction of shreds containing substantially all of said plurality of shreds consisting of lamina not having leaf stem associated therewith,

threshing said heavier fraction to separate said leaf stem from the lamina portions associated therewith,

recovering said lamina portions and mixing the same with said lighter fraction to form a cigarette rod-forming operation feed, and

forming cigarettes directly from said feed.

4,233,997

RIB ROLLER FOR PROCESSING TOBACCO RIBS

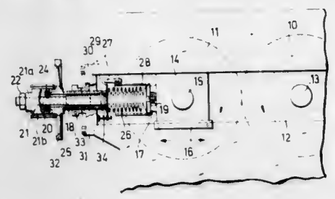
Karl W. Quester; Josef Gontgen, and Adolf Muller, all of Cologne, Fed. Rep. of Germany, assignors to Firm Wilh. Quester, Cologne, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,230

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623825

Int. Cl.³ A24M 5/14

U.S. Cl. 131—147 R **25 Claims**



1. A rib-rolling mechanism for processing tobacco ribs comprising a pair of relatively rotatable rollers having peripheral surfaces defining therebetween a throat through which is adapted to pass tobacco, said rollers having shafts, the shaft of a first of said rollers being journaled for rotation in fixed bearings, the shaft of a second of said rollers being journaled for rotation in movable bearings, means for resiliently urging said second roller toward said first roller, said urging means including a rod connected to each of said movable bearings, a sleeve in external telescopic relationship of each of said rods, spring biasing means coupled between each of said sleeves and said second roller for urging the latter toward said first roller, means for axially shifting said rods to vary the force exerted by said springs in a direction to urge said second roller toward said first roller, means for bodily moving as a unit said second roller, spring biasing means, rods and sleeves; and said bodily moving means including means for effecting rotation of said sleeves without affecting the force of said springs as established by said axially shifting means.

4,233,998

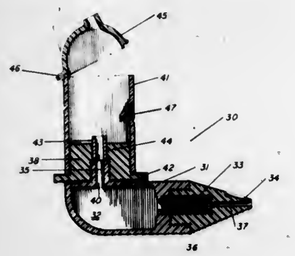
SMOKING APPARATUS

Ross T. Radey, Jr., 947 Clopper Rd., Apt. B-3, Gaithersburg, Md. 20760

Filed Jun. 23, 1978, Ser. No. 918,677

Int. Cl.³ A24F 13/16, 13/12

U.S. Cl. 131—175 **5 Claims**



1. A smoking apparatus comprising in combination:

a chamber and filter casing having a passageway therethrough connecting a chamber therein and a filter holding compartment adjacent to said chamber;

a mouthpiece removably mounted to said chamber and filter casing;

cigarette holding means attached to said chamber and filter casing for mounting a cigarette therein;

a cylindrical sleeve removably mounted to said cigarette holding means for encircling a cigarette mounted in said cigarette holding means to confine said cigarette from wind, and to collect ashes and the like therein;

a hinged lid attached to said cylindrical sleeve by a hinge; and

a whistle slot formed in the side of said cylindrical sleeve whereby drawing upon said smoking apparatus will generate a whistling sound when said hinged lid is closed.

4,233,999

AUTOMATIC CURLING IRON

Louis N. Thomas, 990 NE. 156 Terrace, North Miami Beach, Fla. 33162

Filed Sep. 5, 1978, Ser. No. 939,468

Int. Cl.³ A45D 2/12

U.S. Cl. 132—34 R **10 Claims**



1. An automatic hair curling iron comprising, in combination, a handle member, an elongated tubular heating member fixed with respect to and extending outwardly at one end of said handle member, an electrical heating element within said heating member, an elongated pressing bar, mechanism supporting said elongated pressing bar in spaced relation along the outside of said tubular heating member, said pressing bar supporting mechanism comprising means pivotally supporting the inner end of pressing bar to permit its upward swinging movement for the insertion of strands of hair to be pressed between said pressing bar and said tubular heating member, an electric drive motor, and mechanism interconnecting said electric drive motor with the inner of said pivotally supporting means for automatic rotation of said pressing bar circularly about both said heating member and said handle member upon energization of said electric drive motor.

4,234,000

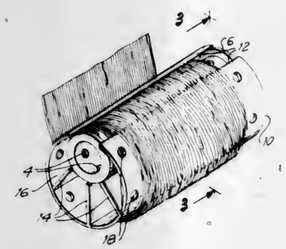
COMPOUND HAIR ROLLER

Carmine P. Pizzino, 251 Westminister Rd., Brooklyn, N.Y. 11218

Filed Nov. 29, 1978, Ser. No. 964,738

Int. Cl.³ A45D 2/02

U.S. Cl. 132—39 **6 Claims**



1. Apparatus for curling a length of hair comprising

A first member of hollow cylindrical configuration adapted to receive a length of hair wound about its circumference and

a second member including a substantially cylindrical shell having a longitudinal slot in its wall defining confronting edges thereof and a plurality of peripherally spaced projections extending longitudinally along and projecting inwardly from the inner surface of said wall and terminating in free edges coinciding with a cylindrical surface, said wall being adapted to admit said first member at least partially through said slot and into engagement with said projections.

4,234,001

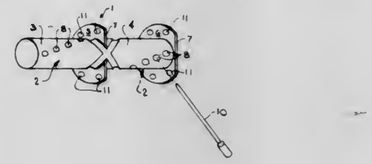
HAIR TREATMENT DEVICE

Joe Morefield, 400 Reynolds St., Springhill, La. 71075

Filed Jul. 23, 1979, Ser. No. 59,517

Int. Cl.³ A45D 2/00

U.S. Cl. 132—40 **10 Claims**



1. A hair treatment device comprising a rod of selected length; at least one partition positioned intermediate the ends of said rod and projecting from said rod in essentially perpendicular relationship and having a first truncated segment intersecting a surface of said rod; a pair of grooves provided in said rod and extending in an arc from opposite sides of said rod on one side of said partition to opposite sides of said rod on the other side of said partition and intersecting at said first truncated segment; and a plurality of apertures in said rod and said partition for receiving pins to secure a curl or tress of hair in place.

4,234,002

ADJUSTING MEANS FOR MONEY HANDLING MACHINES

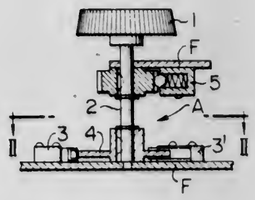
Isamu Uchida, and Kenkichi Watanabe, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,463

Claims priority, application Japan, Dec. 16, 1976, 51-168475; Dec. 27, 1976, 51-176247

Int. Cl.³ B65B 59/00

U.S. Cl. 133—1 A **2 Claims**



1. Money handling machine including adjusting means for accommodating the machine to a desired type of money, said adjusting means comprising a manually operated section which includes three first switches, at least one manually operated switch actuating member having six money selecting positions and means for actuating predetermined ones of the first switches in accordance with the position of said actuating member, an operating section including at least one adjusting member which is movable to a plurality of positions, means for actuating the adjustable member for accommodating the machine to a desired type of money, second switches corresponding in number to the first switches and being so connected that

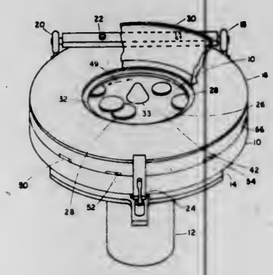
the second switches co-operate with respective ones of the first switches, means for actuating predetermined ones of the second switches in accordance with the position of the adjustable member whereby a change in electrical condition is produced when the second switches take predetermined positions with respect to the first switches, said predetermined positions of the second switches being opposite to the positions taken by the respectively corresponding first switches so that lines through the first and second switches are opened when the adjustable member is moved to a position corresponding to the position of the switch actuating member.

4,234,003

COIN HANDLING MACHINE

Victor G. Ristvedt, Rte. 2, Forestwood Dr., and Roy B. Johnson, Rte. 6, Belmar Cir., both of Manchester, Tenn. 37355

Continuation of Ser. No. 735,060, Oct. 22, 1976, Pat. No. 4,098,280. This application Jun. 30, 1978, Ser. No. 921,063
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.³ G07D *3/00*
U.S. Cl. 133—3 A **5 Claims**



2. A coin sorting apparatus comprising:

a pair of substantially parallel horizontal plates forming a pair of opposed surfaces which have at least portions thereof spaced slightly away from each other to permit coins to slide between the opposed surfaces;

one of said plates being stationary and the other plate being mounted for rotation about an axis that is substantially perpendicular to said opposed surfaces;

the rotatable plate having a resilient biasing surface for urging coins pressed therein toward the opposed surface of the stationary plate; and

the stationary plate having a plurality of recessed areas therein for releasing any coins entering such recessed areas from the biasing pressure of said resilient surface and thereby permitting radial movement of coins between the two plates by rotation of the rotatable plate, said recessed areas being shaped to (1) guide coins in single file along an arcuate path between the plates, and (2) permit coins of different sizes to escape radially from between said plates at different predetermined positions around the periphery of the stationary plate.

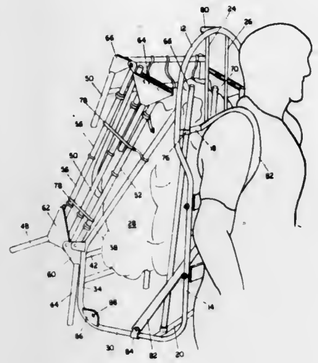
4,234,004
Patent Not Issued For This Number

4,234,005

COMBINATION PACK FRAME, COT, AND TENT

Edward L. Taylor, III, 6345 Kester Ave., Van Nuys, Calif. 90411

Filed Dec. 6, 1978, Ser. No. 966,890
Int. Cl.³ A45F *3/10, 4/02*
U.S. Cl. 135—1 R **9 Claims**



1. A lightweight combination pack frame, cot, and tent comprising:

a tubular A-frame having an open central area having a size approximating a person's back, said A-frame including a lower portion for engaging the ground, and an upper portion for supporting a tent;

a cloth pack for containing conventional back packing equipment, and including means for engaging said tubular A-frame to support said pack in said open central area;

shoulder strap means for supporting said pack and A-frame on the wearer's back;

frame means extending to the rear substantially perpendicular to said A-frame and firmly secured to said A-frame for supporting said A-frame in the upright orientation when it is placed on the ground, and for enclosing said pack;

additional tubular frame means foldably secured to said rearwardly extending frame means for forming a cot when unfolded and for assembly into firm juxtaposition with said A-frame and said rearwardly extending frame means, when folded forward; and

said cot having a much lower elevation than the height of said A-frame, whereby the A-frame provides a tent support to give protection from the elements to a person on said cot, while concurrently permitting access to said pack to the person on said cot.

4,234,006

METHOD OF FORMING AN OPENING IN THE OUTER ENCLOSURE OF A GAS-INSULATED ELECTRICAL APPARATUS

Alan H. Cookson, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

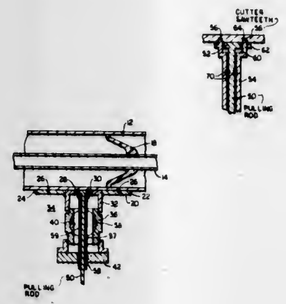
Filed Jan. 11, 1979, Ser. No. 2,631
Int. Cl.³ B23B *41/08*; F16L *41/04*; H01B *9/06*
U.S. Cl. 137—15 **2 Claims**

1. A method for forming an opening in a gas-containing metal enclosure which minimizes the escape of gas comprising the steps of:

fixedly securing a pulling rod to the enclosure at the location of the desired opening;

fixedly securing a support plate having an opening therethrough to said enclosure such that said pulling rod extends through said support plate opening;

securing a movable valve means-containing housing to said support plate adjacent said support plate opening, said movable valve means having an opening therethrough and capable of being in a first position preventing a flow of gas past said valve means and said housing and a second position with said valve means opening being aligned with said support plate opening, said valve means being in said second position with said pulling rod extending through said valve means opening;



securing an end plate having an opening therethrough aligned with said valve means opening when said valve means is in said second position to said housing, said pulling rod extending through said end plate opening;

inserting an elongated hollow tube having sawteeth at one end thereof through said end plate opening, said valve means opening, and said support plate opening to contact said sawteeth against said metal enclosure, said pulling rod being disposed within said tube;

rotating said tube such that said sawteeth cut into said enclosure;

pulling said pulling rod and said tube to remove the metal material cut out from said enclosure;

withdrawing said pulling rod and said tube from said support plate opening and said valve means opening; and

rotating said valve means to said first position.

4,234,007

AUTOMATIC LIQUID FLOW CONTROL DEVICE

Joseph R. Titone; David C. Brissey, and Denny L. Carlson, all of Iowa City, Iowa, assignors to Scientific Applications Incorporated, Mount Pleasant, Iowa

Filed Aug. 14, 1978, Ser. No. 933,625
Int. Cl.³ G05D *11/13*; F04B *39/00*
U.S. Cl. 137—101.19 **5 Claims**

1. An automatic liquid flow control device, comprising,

first metering means for measuring the rate of flow of liquid through a first conduit means,

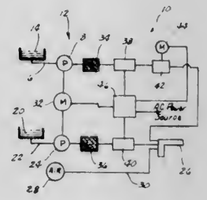
second metering means for measuring the rate of flow of liquid through a second conduit means,

valve means connected to said second conduit means to control the rate of flow of liquid through said second conduit means, and

selectable valve control means operationally connected to said valve means and said first metering means to automatically maintain the rate of flow of liquid through said second conduit means to substantially maintain a preselected ratio of flow rate through said second conduit means to flow rate through said first conduit means,

said valve control means comprising a motor means connected to said valve means to progressively alternately open and close said valve means to selectively progressively increase or decrease the flow rate through said second conduit means,

a selector means to allow selection of a desired ratio to flow rate in said second conduit means to the flow rate in said first conduit means,



a first comparator means electrically connected to said first and second metering means and said selector means to compare the actual ratio of flow rate in said first and second conduit means to the selected ratio of said selector means, and

a motor control means to activate said motor means so that said valve means adjusts the flow rate in said second conduit means whereby said actual ratio of flow rate substantially approaches said selected ratio of flow rate of said selector means, said motor control means being electrically connected to said motor means and said comparator means,

said motor control means comprising a direction control means to control the direction of rotation of said motor means whereby rotation in one direction progressively opens said valve means and rotation in the other direction progressively closes said valve means, and

speed control means to increase the speed of said motor means when said actual ratio of flow rate deviates from said selected ratio by a first predetermined percentage,

said direction control means and said speed control means being electrically interconnected and electrically connected to said motor means and said comparator means.

4,234,008

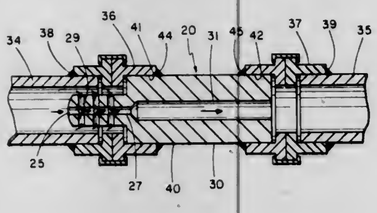
FLUID CHOKE

Ramsey L. Cronfel, 725 Parkview Cir., Elk Grove Village, Ill. 60007

Filed Aug. 24, 1978, Ser. No. 936,330
Int. Cl.² F16T *1/00*
U.S. Cl. 137—182 **8 Claims**

1. A fluid choke assembly for controlling pressurized fluid

flow comprising: an inlet pipe and an outlet pipe, a one-piece choke member having an elongated inlet section having an outer diameter significantly less than the inner diameter of the inlet pipe, an axial orifice extending through the inlet section having a substantially constant diameter, means for reducing the collection of foreign material in the inlet section orifice including a plurality of generally radial openings extending from the orifice to the outer diameter of the inlet section, said choke member having an outlet section communicating with



the outlet pipe, said outlet section having a substantially constant diameter orifice extending therethrough communicating with the inlet section orifice, said outlet section orifice being of greater diameter than the inlet section orifice, said outlet section having a first end adjacent the inlet section and a second end opposite the first end, a first coupling member connecting first end to the inlet pipe, and a separate second coupling member connecting the second end of the outlet section defines the outer diameter of part of the assembly.

4,234,009

STRAIGHT FLOW SEAT VALVE

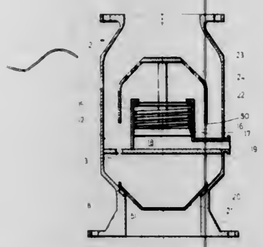
Franz Fuchs, Starnberg, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Sep. 22, 1978, Ser. No. 944,913

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 27449178

Int. Cl.³ F16K *1/12*, *31/122*

U.S. Cl. 137—219 **6 Claims**



1. A straight flow seat valve comprising a valve housing having a chamber extending therethrough between a fluid inlet at one end of said housing and a fluid outlet arranged coaxial with said inlet at the other end of said housing, a control cylinder fixedly supported in said chamber between said outlet and said inlet, a control piston movably disposed in said cylinder, a seating surface defined in said housing adjacent said outlet, a seat body movably mounted in said chamber adapted to matingly seat against said seating surface to close said outlet and being movable away from said seating surface to open said outlet, said seat body having a connecting part extending from one side of said cylinder adjacent said outlet to the opposite side of said cylinder adjacent said inlet, said connecting part being spaced inwardly of said housing, a piston rod carried by said piston rigidly connected to said seat body, spring means engaged with said piston for biasing said seat body against said seating surface, means extending out of said housing for admitting fluid into said cylinder to move said control piston against said spring to move said seat body off of said seating surface, and means supporting said cylinder in said chamber intermediate the length of said housing having an opening therethrough, said seat body including an intermediate tubular portion having a wall extending through said opening.

4,234,010

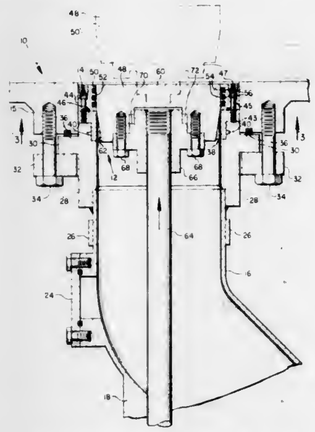
SELF-CLEANING DUMP VALVE FOR CHEMICAL REACTOR TANK

Robert E. Jenkins, Ponchatoula, La., and Claude Acree, Lake Oswego, Oreg., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Oct. 7, 1976, Ser. No. 730,171

Int. Cl.³ F16K *1/42*; F16F *31/14*

U.S. Cl. 137—242 **12 Claims**



1. A dump valve apparatus for removing liquid from a container tank, in which the improvement comprises:

a dump valve having a valve inlet opening and a valve outlet opening;

a valve seat having a discharge passage through which said liquid is drained from said tank, said discharge passage being defined by a substantially vertical inner valve seat surface and being axially aligned with said valve inlet and outlet openings;

a movable valve plug adapted to fit within said discharge passage in a closed position, said valve plug being solid so as to be free of fluid passages therein and having a substantially vertical outer plug surface which slides across said inner seat surface during opening and closing of the valve;

seal means for forming a liquid tight seal between said inner seat surface and said outer plug surface in the closed position of said plug, said inner seat surface and said outer plug surface wiping each other to remove material deposited thereon when said plug slides across said seat surface to enable sealing, said seal means including a plurality of elastic sealing members mounted on said valve seat within a plurality of annular grooves in said inner seat surface, each said groove having a restricted opening at the inner seat surface which is of less width than the groove to retain the sealing member within the groove after it is inserted into said groove through said restricted opening; and

actuator means attached to said valve plug for raising and lowering the valve plug between its open and closed positions.

4,234,011

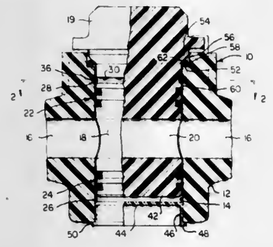
PLUG VALVE CONSTRUCTION

Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 861,249, Dec. 16, 1977, abandoned, which is a division of Ser. No. 636,873, Dec. 2, 1975, abandoned. This application Dec. 5, 1979, Ser. No. 100,316

Int. Cl.³ F16K *23/00*, *5/04*

U.S. Cl. 137—312 **1 Claim**



1. An improved plug valve of the type which includes a valve body having a bore extending therethrough and a pair of passages intersecting said bore and being substantially normal to an axis of said bore; a valve plug disposed within said bore for selective rotation between an opened and a closed position to respectively align and misalign a port through said plug with said passages; and first circumferential sealing means between said plug and said bore axially spaced in one direction from said port and said passages and second circumferential sealing means between said plug and said bore axially spaced in the other direction from said port and said passages to prevent fluid from escaping from an interior of said plug valve and to balance fluid pressure acting on said plug; wherein said improvement comprises:

said body having a peripheral recessed shoulder around a first end of said bore;

said plug having a flared end section adjacent said recessed shoulder to define a circumferential groove therebetween;

said end section and said shoulder having opposed surfaces thereon which are inwardly converging toward a space between said bore and said plug adjacent said first circumferential sealing means and remote from said port; and

a resilient sealing ring being entrapped within said groove and normally compressively engaging said opposed surfaces to prevent ingress of foreign matter into said space and to limit said fluid pressure in said space if said first sealing means should fail.

4,234,012

HOSE SUPPORT BRACKET FOR BACKHOE SWING FRAME

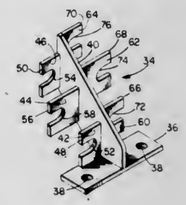
Jesse L. Schupback, Durango, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 27, 1979, Ser. No. 33,771

Int. Cl.³ F16L *13/04*

U.S. Cl. 137—899.1 **9 Claims**

1. In a hydraulically controlled apparatus including first and second members interconnected by a pivot assembly defining a pivot axis extending in a first direction and about which the first member is pivotable in opposite second and third directions from a centered position, at least three hydraulic hoses extending generally through the pivot axis and having first ends supported on the first member and second ends connected to a hose support structure mounted on the second member and projecting therefrom in the first direction, an improved hose support structure comprising: a base portion secured to the second member, a support portion fixed to the base in a generally perpendicular relationship to the plane of the base portion; mounting portion means integral with the support portion and defining at least three notches with first and second ones of the three notches being located at opposite sides of



a plane containing the pivot axis and including the support portion and a third one of the notches being located away from the base a distance in the direction of a support portion axis which is different than the distance at which the first and second notches are spaced from the base; said support portion including said support portion axis and a bulkhead hose fitting releasably fixed in each of the notches and each of the hoses having a fitting at its second end connected to one of the bulkhead hose fittings.

4,234,013

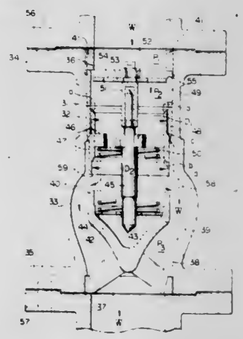
CONTROL VALVE FOR KEEPING THE RATE OF FLOW AT A FIXED VALUE

Sotokazu Rikuta, No. 24-7, 2-chome, Koun-cho, Maebashi, Gumma, Japan

Division of Ser. No. 829,548, Aug. 31, 1977, Pat. No. 4,174,584. This application Jun. 1, 1979, Ser. No. 44,739

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—504 **3 Claims**



1. A constant-flow fluid regulating valve comprising in combination:

a valve casing having inlet and outlet ports at spaced locations therein;

spring means mounted coaxially within said valve casing between said inlet and outlet ports;

a slide member positioned coaxially within said valve casing normally biased by said spring means towards said inlet port, the lower extremity of said slide member defining a first peripherally extending edge of an intermediate flow passage for fluids upstream of said outlet port, said slide member comprising a cylindrical valve plug, a guide bushing being provided within one end of said valve

casing and at least an axially extending portion of said valve plug being positioned concentrically within said guide bushing to slide therewithin, said valve plug having a transversely extending crosspiece secured fixedly therewithin, and the lower circumferentially extending edge of said valve plug comprising said first peripheral edge of said intermediate flow passage;

an orifice plate carried by said slide member for movement therewith within said valve casing and having at least one aperture therein for the flow of fluid therethrough from said inlet port; and

a guide member mounted fixedly and coaxially within said valve casing downstream of said slide member having a surface defining a second peripherally extending edge axially spaced from said first edge and defining therewith said intermediate flow passage, said guide member including a centering and support element fixedly mounted concentrically in said outlet port, a generally bowl-shaped guide element extending upwardly from said centering and support element and terminating in a circumferentially extending edge comprising said second peripheral surface of said intermediate flow passage, a transverse support plate being positioned within said guide element presenting a seat for one end of said spring means, the other end of said spring means bearing against said crosspiece;

whereby the force of said spring means tends to counterbalance fluid pressure differentials acting on the opposed faces of said orifice plate to thereby maintain the cross-sectional area of said intermediate flow passage and the rate of flow of fluid therethrough at a substantially constant value.

4,234,014

BOWL FOR COMPRESSED AIR OR GAS FILTER OR LUBRICATOR

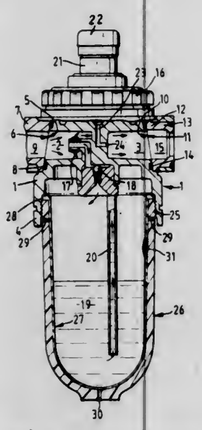
Roger E. Knight, London, England, assignor to IMI Norgren Limited, Warwickshire, England

Filed May 29, 1979, Ser. No. 43,211

Claims priority, application United Kingdom, May 31, 1978, 25373/78

Int. Cl.³ E03B 7/07

U.S. Cl. 137—557 **15 Claims**



1. A compressed gas processing apparatus which includes a body having a gas inlet passage and a gas outlet passage, a bowl assembly supported by the body in fluid communication with the inlet and outlet passages, the improvement in the bowl assembly including:

an outer bowl having an impervious side wall made of high impact strength translucent material, said wall having an extremity at the top of said wall and an extremity at the bottom of said wall;

a thin flexible, impervious, translucent inner bowl having high resistance to chemical attach from chemicals within the processing apparatus, said inner bowl being positioned within and supported by and in substantially total surface contact with said outer bowl against the force of the compressed gas; and

vent means positioned only at at least one of said extremities of said side wall of said outer bowl and being of sufficiently small size that in the event of inner bowl failure, fragments from said inner bowl cannot pass through said vent means and said vent means will provide controlled venting of the compressed gas in the processing apparatus to the atmosphere.

4,234,015

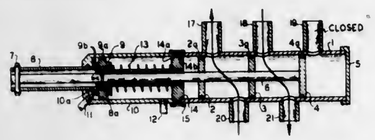
VALVE

Edwin K. Kintner, R.D. 4, Box A 231, Johnstown, Pa. 15905

Filed Dec. 18, 1978, Ser. No. 970,119

Int. Cl.³ F16K 27/04

U.S. Cl. 137—625.18 **1 Claim**



1. A valve assembly for controlling the flow of a plurality of different liquids simultaneously in a single cylinder, comprising a fluid operated power unit housed in a first cylindrical housing portion enclosing an operating piston, a second cylindrical housing portion detachably secured to said first cylindrical housing portion so as to form an enlongated cylinder of the same diameter, three ports on one side and two ports on the other side of said second cylindrical housing portion, three longitudinally spaced pistons rigidly attached to the stem of said power operating piston so as to move in unison therewith and so that the central piston thereof will selectively change the direction of flow through said second cylindrical housing portion of two different liquids alternately outwardly through said two ports, the remaining two pistons being arranged to alternately close the remaining two of said three ports, the central port of said three ports being always the inlet port for one of said liquids while the remaining of said three ports being alternately the outlet port for the other of said liquids, and a sealed cap closing the end of said second cylindrical housing portion, being readily removable from said first cylindrical housing portion for separate cleaning,—said fluid operated power unit being the sole power unit for all three of said pistons.

4,234,016

ACCUMULATOR

Kunio Horino, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 926,388, Jul. 20, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,800

Claims priority, application Japan, Jul. 20, 1977, 52-87142; Oct. 20, 1977, 52-140864

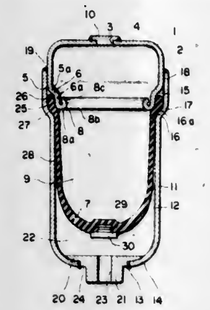
Int. Cl.³ F16L 55/04

U.S. Cl. 138—30 **4 Claims**

1. In an accumulator which comprises a first hollow container having an opening at one end and an inlet for a working fluid at the other end, a second hollow container being jointed by welding at the opening with said first container so as to form a hollow space therewithin, and a flexible member disposed in said hollow space and partitioning said hollow space into two compartments;

the improvement wherein said first container comprises a cylindrical body having said opening at one end thereof, and a bottom portion formed integrally with and extending from the opposite end of said cylindrical body and having said fluid inlet, said cylindrical body and said bottom portion being substantially uniform and identical in thickness, the upper portion of said cylindrical body being formed with a portion bent outwardly and a portion bent and further extending upwardly from said outwardly bent portion, said upwardly extending portion extending generally straightly to said opening;

said second container comprises a cylindrical body having one open end to be snugly inserted upon the inner surface of said first container and a top portion formed integrally with the opposite end of said cylindrical body, said cylindrical body and said top portion being substantially uniform and identical in thickness, said cylindrical body having a portion bent inwardly, a portion adjacent said inwardly bent portion and bent downwardly, and a curled



open end adjacent said downwardly bent portion, said bent portions and curled end of said cylindrical body of said second container being complementary in profile with said outwardly bent portion and said upwardly extending portion of said cylindrical body of said first container respectively so that there is defined an annular space between said first and second containers;

said flexible member having an annular shaped and thickened open end adapted to be held snugly in said annular space defined between said first and second containers;

said one open end of said first container being disposed at a substantial distance in the longitudinal direction toward said top end of said second container away from said annular space, whereby welding heat may be effectively dissipated until it reaches said annular shaped end of said flexible member, and the area near said annular shaped end of said flexible member may be permitted to be deformed smoothly along the smooth surface of said continuously curled end of said second container at the time of inflow of said working fluid through said inlet into said compartment.

4,234,017

ACCUMULATOR DEVICE OR THE LIKE

Jacques H. Mercier, Paris, France, assignor to Normand Trust, New York, N.Y.

Continuation of Ser. No. 919,893, Jun. 28, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,036

Int. Cl.³ F16L 55/04

U.S. Cl. 138—30 **13 Claims**

1. A pressure vessel comprising:

(a) a casing of rigid material having two closed ends with axially aligned ports and an internal vertical planar wall;

(b) a deformable separator disposed inside said casing between said ports to define variable volume fluid chambers on either side of said separator, said separator having a mouth and an annular bead therealong;

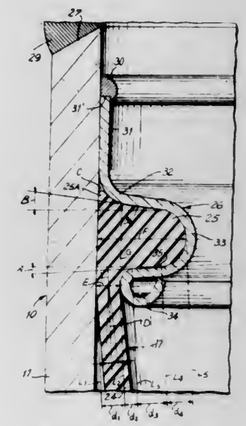
(c) an annular separator supporting member fixed to the internal vertical planar wall of said casing, said supporting member being of sheet material construction substantially thinner than said casing and including:

(i) a substantially cylindrical portion adapted to bear against the internal wall of said casing;

(ii) a smoothly curved hooklike portion defining a radially outwardly opening groove for accommodating said bead of said separator;

(iii) a connecting zone between said substantially cylindrical portion and said hooklike portion defining a wedge-shaped space with said internal wall, said bead being clampingly disposed within said wedge-shaped space in compressed condition to define a fluid-tight seal between said supporting member and said casing; and

(iv) an end portion at the end of said hooklike portion



remote from said connecting zone being radially spaced from said internal wall of said casing a distance equal to or greater than the undeformed wall thickness of said separator so that the portion of said separator between said end portion and said internal wall of said casing is not compressed by said end portion;

(d) said bead including a thickened zone facing said internal wall of said casing such that in undeformed condition it is of greater radial extent than the radial depth of said groove measured to the internal wall of said casing, and said radial depth of said groove having portions which are at least two and one-half times the distance between said end portion and said internal wall of said casing, said bead having a deep cut-away zone facing said end portion of said separator supporting member so that said deep cut-away zone compensates for said thickened zone and allows expansion therein of said bead during compression of said thickened zone so as to prevent pinching of said separator in the course of mounting it in said casing.

4,234,018

FLOW DISTRIBUTION VALVE SYSTEM FOR CONTROL OF EXTRUSION FROM MULTIPLE DIE ORIFICES

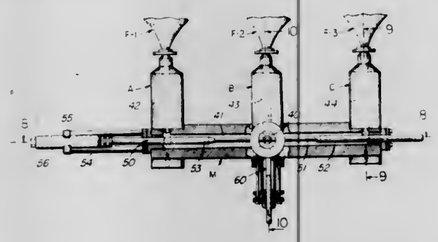
F. John Herrington, Jr., Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 849,050, Nov. 7, 1977, Pat. No. 4,170,450, and a continuation-in-part of Ser. No. 753,747, Dec. 23, 1976, Pat. No. 4,081,231. This application Nov. 24, 1978, Ser. No. 963,549

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.³ F15D *1/06*; B29F *3/06*

U.S. Cl. 138—45 2 Claims



1. In an apparatus for controlling the flow of molten polymer from a common polymer feed source to multiple extrusion die outlets, said apparatus comprising a manifold having at least two extrusion die outlets thereon, a polymer inlet opening intermediate of said extrusion die outlets and a flow channel in communication with said polymer inlet and said outlets, the improvement comprising:

flow restriction means mounted axially in said flow channel, said restriction means comprising a laterally displaceable cylindrical rod, said rod being characterized by a narrower portion and at least one other portion of its length being of increased diameter relative to said narrower portion, the cross-sectional area of each of the respective portions of said rod being substantially constant throughout the length thereof, and said narrower portion gradually tapering at the end thereof to said increased diameter portion;

said portion of increased diameter forming an annular restriction of variable length in said flow channel, each of said restrictions being between said polymer inlet and one of said extrusion die outlets.

4,234,019

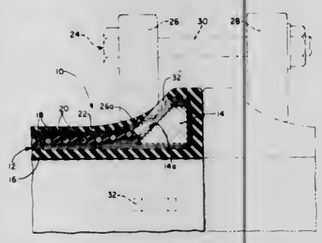
LUG BEAD HOSE

Harold G. Hornor, Cuyahoga Falls, and Karl K. Kluss, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 12, 1979, Ser. No. 2,911

Int. Cl.³ F16L *11/08*

U.S. Cl. 138—109 3 Claims



1. An elastomeric hose adapted to be abutted to like hose and drawn together by external clamping means having a plurality of elastomer impregnated reinforcing plies and including a tapered flanged end which enlarges toward the end of the hose, said tapered end having a bead ring embedded therein which is enveloped by at least one of said reinforcing plies, said bead ring having an outwardly facing conical surface which tapers to a lesser dimension in a direction away from the end of the hose, at least one of said plies extending over said conical surface, said outwardly facing surface having at least two lugs projecting generally perpendicularly therefrom through those plies which extend over said conical surface such that external loading by the clamping means may occur directly on said lugs and be directly transferred to said bead ring.

4,234,020

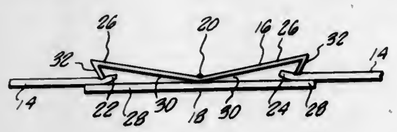
HEAT RECOVERABLE CLOSURE ASSEMBLY AND METHOD

Walter J. Greuel, Jr., Pleasanton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 6, 1978, Ser. No. 967,030

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—166 16 Claims



1. A heat recoverable closure assembly capable of being employed about a substrate for enclosure thereof, comprising

a heat shrinkable closure member extending to edges capable of being brought into nearly abutting relationship; and

fastening means for cooperating with the edges of said closure member to retain the edges in nearly abutting relationship such that tensile loads on said closure member will approach mutual alignment with constraining loads on said closure member from said fastening means including gripping means for retaining the edges of said closure member in nearly abutting relationship, each said gripping means having first and second leg members arranged together to define a channel for receipt of an edge of said closure member, means for forcing said leg members against said closure member near an edge thereof when interposed between said leg members and retaining means positioned within said channel and associated with at least one leg member for gripping said closure member when interposed in said channel.

4,234,021

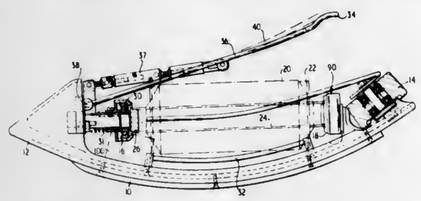
CIRCULAR LOOMS

Andrew K. Clokie, Dewsbury, England, assignor to Greenbat Limited, Leeds, England

Filed Dec. 20, 1978, Ser. No. 971,522

Int. Cl.³ D03D *51/40*

U.S. Cl. 139—371 8 Claims



1. A circular loom, comprising a plurality of shuttles each adapted to traverse the same circular path in the loom, and each having a radio frequency transmitter adapted to issue a weft failure signal, said loom having a radio frequency detector located in a stationary position adjacent to the circular path of said shuttles and being adapted to be excited by a signal from any one of said transmitters, whereby weft failure in any one of said shuttles can be detected without physical contact between parts extending through the warp threads of said circular loom.

4,234,022

WOVEN FABRIC

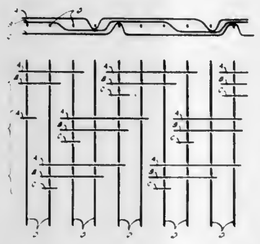
Miyoshi Okamoto, Takatsuki; Syusuke Yoshida, and Shigeru Inada, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 7, 1978, Ser. No. 967,487

Claims priority, application Japan, Dec. 9, 1977, 52-147173

Int. Cl.³ D03D *15/00*

U.S. Cl. 139—420 R 13 Claims



1. A woven fabric comprising a warp and at least three separate wefts woven with said warp, at least two of said wefts being floating wefts each comprising a yarn consisting mainly of extra-fine fibers or filaments having monofilament deniers of less than about 0.7, and another of said wefts comprising filamentary or spun yarn comprising mainly fibers or filaments of about 5–15 denier, and said warp comprising filamentary or spun yarn comprising mainly fibers or filaments of about 5–15 denier, wherein a greater portion of one of said floating wefts is exposed on one surface of said fabric than are the other wefts on said surface and wherein a greater portion of another said floating weft is exposed on the other surface of said fabric than are the other wefts on said other surface.

4,234,023

LIQUID FEEDER FOR AUTOMATIC CULTURE APPARATUS

Shinroku Sogi; Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

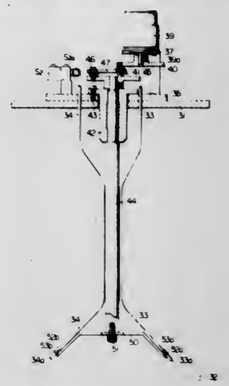
Division of Ser. No. 876,894, Feb. 13, 1978, Pat. No. 4,179,339. This application Dec. 26, 1978, Ser. No. 973,117

Claims priority, application Japan, Mar. 2, 1977, 52-24766; Apr. 5, 1977, 52-41589; Apr. 5, 1977, 52-41592

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—99 5 Claims

1. A dual liquid supply switching system for a liquid feeder of automatic culture apparatus, comprising: a first crankpin disposed at a given eccentricity from an output shaft of a drive motor which is used for switching the liquid being supplied, the crankpin being arranged for rotation about the output shaft as the motor rotates, a driven shaft rotatably mounted on a stationary outer plate of an incubator for supporting respective discharge ports of a pair of liquid supply tubes at a phase difference of substantially 180°, the tubes being adapted to supply mutually different liquids; a second crankpin fixed to the driven shaft at an eccentricity therefrom which is greater than the eccentricity of the first crankpin; a link for interconnecting the first and the second crankpin to cause a reciprocatory rotating motion of the driven shaft about its own axis within an angular extent not greater than 180° as the motor rotates; a pair of microswitches disposed at the opposite ends of the angular extent of the driven shaft for stopping the drive



motor; and a switch operating member fixedly mounted on the driven shaft to operate the microswitches.

4,234,024

VENEER LATHE

Masaru Koike, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Apr. 18, 1979, Ser. No. 31,326

Claims priority, application Japan, Apr. 20, 1978, 53-47457

Int. Cl.³ B27L *5/02*

U.S. Cl. 144—213 19 Claims

1. A veneer lathe for cutting off veneer from a log which comprises

(1) means for rotatably supporting said log about its axis;

(2) a knife provided near said log movably sideways away from and toward the log until the knife edge contacts the log surface in a tangential mode;

(3) a plurality of cylinders vertically juxtaposed in facing relation to the log periphery and each being provided with at least one edged thread thereon, the bottom end of each cylinder being located immediately ahead of the knife edge, said cylinders being adapted for axial rotation and lateral movement to and from the log; and

(4) pressure means provided between each two adjacent cylinders for pressing the log periphery slightly ahead of the knife edge and adapted for lateral movement to and from the log.

4,234,025

GOLF BAG CLUB COVER

Richard W. Berge, Rte. 1, Box 410 J, Gainesville, Va. 22065

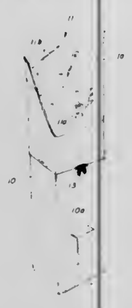
Filed Aug. 3, 1979, Ser. No. 63,526

Int. Cl.³ A63B *55/00*

U.S. Cl. 150—1.5 R 5 Claims

1. In combination with a golf bag, a cover for clubs contained within said bag comprising a flexible sheath with open top and bottom to slip over the top of said golf bag and con-

tained clubs, which sheath is provided with a large notch in a portion thereof with the top of the notch extending the width



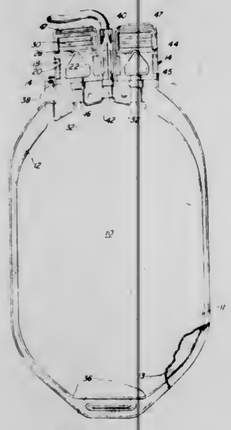
of the sheath to provide easy access to the clubs, and which sheath at the top portion thereof may be flipped downward over said notch and clubs.

4,234,026

SEAL FOR FLEXIBLE CONTAINER

Edward L. Bayham, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 5, 1979, Ser. No. 17,529
Int. Cl.[3] B65D 41/32
U.S. Cl. 150—8 **10 Claims**



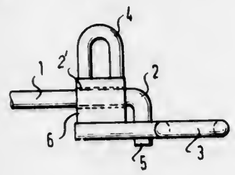
1. An openable seal member for a container, which comprises a tube extending across the sealed area for flow communication between said container interior and the exterior; a flexible plastic pocket member sealingly enclosing the outer end of said tube; tear means for opening said pocket member for access to said tube, said tear means comprising an added flexible sheet attached to said pocket member by a rupturable, essentially annular seal line which defines an outwardly-pointing apex, said added sheet further defining a free tab portion positioned outwardly from said apex, whereby said seal line may be ruptured, beginning at said apex, by pulling said tab portion to open said pocket member, said seal member also including a rupturable diaphragm positioned at the inner end of said tube, whereby the contents of said container cannot become entrapped in said tube prior to rupturing of the diaphragm.

4,234,027

TIRE-CHAIN ASSEMBLY

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to Sesamat Anstalt, Chiasso, Switzerland

Continuation-in-part of Ser. No. 748,547, Dec. 8, 1976, Pat. No. 4,146,075. This application Dec. 20, 1978, Ser. No. 971,373
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2556115; May 17, 1976, 2611273; Nov. 5, 1976, 2650703
Int. Cl.[3] B60C 27/06
U.S. Cl. 152—213 R **22 Claims**



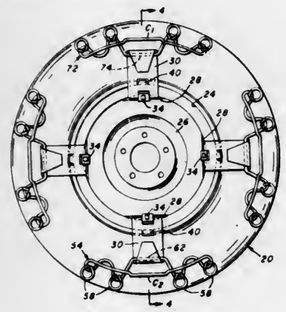
1. A tire-chain assembly for a vehicle-mounted wheel having an inner face and an outer face separated by a peripheral ground-engaging surface, said assembly comprising an outer holder on said outer face; an inner holder on said inner face; at least one traction chain extending back and forth between said holders over the ground engaging surface; tightening means connected to the inner holder and including a flexible substantially non-extensible element for tightening said chain on the groun engaging surface, said flexible element having one end for pulling by a user and another end; and means at least on said inner holder for securing said flexible element so as to arrest said tightening means and including first means mounting said other end of said flexible element for eliminating any longitudinal displacement of said other end relative to said first means when said flexible element is tightened, and second means fixedly located relative to said first means and operative for arresting said one end of said flexible element when the same is tightened.

4,234,028

TRACTION ASSEMBLY FOR VEHICLE WHEELS

Charles J. Leftault, Jr., 5100 Scenic Rd., Murrysville, Pa. 15668

Filed Apr. 7, 1978, Ser. No. 894,382
Int. Cl.[3] B60C 27/02
U.S. Cl. 152—233 **26 Claims**



1. An anti-skid vehicle wheel assembly comprising:
a wheel having a spider portion and a rim portion,
a tire having a pair of sidewalls and an interposed ground engaging portion,
said tire mounted on said wheel,
said wheel and said tire having outer sides adapted to face generally away from said vehicle when mounted thereon,

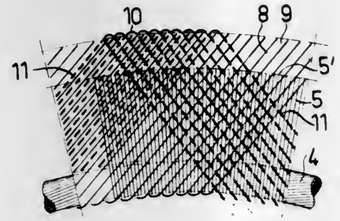
and inner sides adapted to face generally in the reverse direction,
at least two anchor means secured to said spider portion and disposed, at least in part, on said inner side of said wheel,
said anchor means being spaced generally equally circumferentially,
said vehicle wheel assembly having more than one traction means,
a said traction means secured to each said anchor means adjacent the inner tire sidewall,
said traction means extending beyond said tire ground engaging portion to the outer sidewall,
securing means for securing each said traction means adjacent said outer sidewall, and
said securing means being secured to said traction means but not to said wheel and comprising strap means lying in a plane extending generally perpendicular to the axis of said wheel for exerting a radially inward pull on the ends of the traction means adjacent said outer sidewall.

4,234,029

PNEUMATIC VEHICLE TIRE

Julius Peter, Hanover; Heinz-Günter Drössler, Hemmingen, and Willi Bachmann, Isernhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,036
Int. Cl.[3] B60C 9/00, 15/00
U.S. Cl. 152—354 RB **13 Claims**



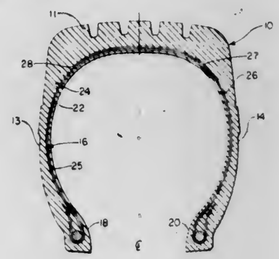
1. A pneumatic vehicle tire which includes bead portions, side walls, and a tread surface, each of said bead portions comprising in combination:
a bead core;
a single layer radial carcass of high strength material having one end portion thereof which is anchored in said bead portion by being looped around said bead core, that portion of said carcass which is looped around said bead core extending laterally outwardly of said bead portion over a portion up to approximately half of the height of the pertaining side wall;
bead reinforcing means located laterally outwardly of and next to said looped around portion of said carcass, said bead reinforcing means having free ends and comprising first strength carriers which are substantially parallel to one another and slanted with regard to the circumferential direction of said tire and to said carcass;
strip means associated with and extending radially inwardly to about the heel of said bead core as well as extending parallel to the radially outwardly lying free end of said bead reinforcing means, said strip means comprising second strength carriers which are substantially parallel to one another and oppositely slanted with regard to the circumferential direction of said tire, said first and second strength carriers crossing one another in such a way as to form a practically non-deformable triangular formation with said looped around portion of said carcass for maintaining the mutual spacing between the respective strength carriers, said practically non-deformable triangular formation providing uniform stiffening effect around bead core as well as over the entire height of said bead reinforcing means located laterally adjoining said bead core.

4,234,030

TIRE CARCASS STRUCTURE

John G. Van Nieuwal; Edward L. Montgomery, and Richard M. Beeghly, all of Cumberland, Md., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 18, 1978, Ser. No. 934,913
Int. Cl.[3] B60C 9/10, 9/18
U.S. Cl. 152—354 R **4 Claims**



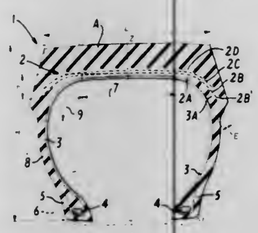
1. A bias ply pneumatic tire comprising:
(a) a carcass of rubberized cord fabric;
(b) annular bead portions;
(c) sidewalls overlying lateral portions of said carcass and terminating at their radially innermost ends of the respective bead portions; and
(d) a tread overlying the carcass in the crown area of the tire, said carcass comprising at least one continuous ply of cord fabric, the cords of which begin near one bead portion and extend continuously from said one bead portion to the other bead portion near to which they terminate, the cords of each said continuous ply extending at an oblique angle relative to the axial direction of the tire, and at least one sectional ply of cord fabric the cords of which extend at an oppositely directed oblique angle relative to the axial direction of the tire, said sectional ply being composed of two sections of like continuous cord fabric, the cords of said sections being of substantially identical angle, one section beginning near one bead portion and extending into the crown beyond the circumferential centerline of the tire and terminating beyond said centerline an amount not exceeding three-fourths of the tire carcass sectional height, the other section beginning near the other bead portion and extending into the crown beyond the circumferential centerline of the tire an amount substantially equal to said one section, the sections of each sectional ply lying on the same side of any adjacent ply, each sectional ply lying nearer to the tread than any said continuous ply.

4,234,031

RADIAL TIRE WITH HIGH ANGLE, LOW ELONGATION PLIES AND LOW ANGLE, HIGH ELONGATION PLIES IN BELT

Jean Pommier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed May 18, 1979, Ser. No. 40,204
Claims priority, application France, May 24, 1978, 78 15673
Int. Cl.³ B60C 9/20, 9/08
U.S. Cl. 152—356 R 13 Claims



1. A tire, particularly for heavy and very heavy carrier vehicles traveling off the road, having a tread, a carcass reinforcement formed of at least one ply of radial wires or cables anchored to at least one bead ring in each bead and a tread reinforcement arranged radially outward of the carcass reinforcement and formed of at least three superimposed plies of wires or cables parallel in each ply and crossed from one ply to the next forming different angles less than 90° with the longitudinal direction of the tire, the carcass reinforcement having an equatorial zone of low meridian curvature connnected on both sides to the sidewalls by a transition zone of high meridian curvature, characterized by the fact that the tread reinforcement is formed of

(a) at least one ply of elastic wires or cables which are parallel to each other in said ply and form an angle of between 5° and 15° with the longitudinal direction of the tire, said ply having an axial width less than that of the tread, and

(b) two superimposed plies of wires or cables of very low elongation which are parallel to each other in each ply and crossed from one ply to the next forming angles of between 50° and 70° with the longitudinal direction of the tire; that ply of wires or cables of very low elongation which is closest to the carcass reinforcement has an axial width greater than the axial width of the tread and extends into said transition zone and is separated from the carcass reinforcement in said transition zone by a layer of rubber whose thickness increases axially in the direction away from said equatorial zone.

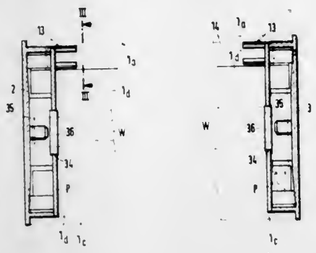
4,234,032

ROLLER BLIND BOX

Gerd Stark, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Dyna Plastik-Werke GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,638
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1978, 7806067[U]
Int. Cl.³ E06B 9/08
U.S. Cl. 160—261 7 Claims

1. A roller blind box comprising four longitudinal walls; two face walls each having four strips projecting from one side thereof, one of said four strips being a lower strip, said two face walls being inserted between said longitudinal walls and kept in contact with said longitudinal walls by said four strips projecting from said one side of each said face wall; a respective spigot projecting from said one side of each said face wall for supporting a roller blind shaft having an axis, said face walls being symmetrical with respect to a vertical central plane substantially perpendicular to and containing the axis of the roller blind shaft; lateral roller blind guide rails and releasable guide members, said face walls being connected to said lateral roller blind guide rails via said releasable guide members; and



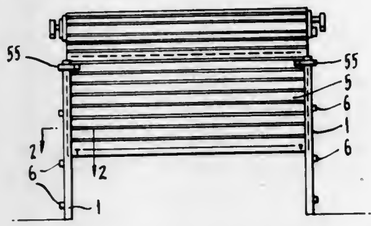
an insert opening in said lower strip of each said face wall in vicinity of corners for receiving a respective one of said guide members.

4,234,033

ROLLER DOOR AND FRAME COMBINATION

Simon Leivenzon, and Steven Leivenzon, both of Caulfield, Australia, assignors to Firmaframe Nominees Proprietary Limited, Cheltenham, Australia

Filed Mar. 7, 1979, Ser. No. 18,005
Claims priority, application Australia, Mar. 8, 1978, 44213/78
Int. Cl.³ E06B 9/08
U.S. Cl. 160—133 6 Claims



1. A roller door and frame combination, said roller door being of the type comprising at least one curtain with a plurality of parallel spaced-apart corrugations arranged parallel with the axis of rolling of the curtain, the frame being of the type having elongate channel members for slidably receiving each side edge of the curtain over a major length of the height of the door opening and wherein the curtain is maintained in its corrugated shape by flexible wearing strips of material fastened to crests on one face of the curtain, at least one wearing strip being near one side edge of the curtain, and at least another being near the other side edge of the curtain, characterized in that there is resilient friction surface carried by the channel members for engaging with the face of the curtain which does not have the wearing strips fastened thereto and being of such size as to restrain the door against lateral back and forth movement in the frame and provide controlled resistance to sliding of the curtain within the channel members should the curtain thickness change.

4,234,034

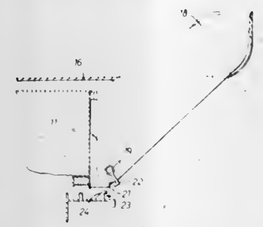
CONTAINER AND COVER ARRANGEMENT

George J. Leitch, Newcastle-upon-Tyne, England, assignor to MacGregor International S.A., Basel, Switzerland

Filed Mar. 14, 1978, Ser. No. 886,400
Int. Cl.³ E05F 11/06; B63B 19/24
U.S. Cl. 160—193 1 Claim

1. A container and cover arrangement, the cover comprising

a plurality of cover elements, hinge means interconnecting adjacent ones of the cover elements adapted to permit pivotal movement of the cover elements outwardly of the container in response to a pulling force, the improvement comprising latching means comprising an engagement portion on the container and a latch element displaceably mounted on a cover element for co-operating latching engagement with the engagement portion, which latch element is displaceable in response to said pulling force prior to said movement of the cover elements to release engagement between the latch element and the engagement portion, pulling means coupled with said cover elements



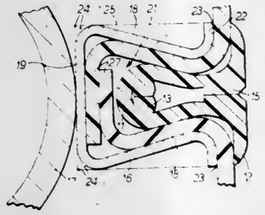
and communicating said pulling force to said cover elements to open the container, direction changing means comprising a pulley mounted on the first cover element through which said pulling means passes, a pulley support arm mounted on said first cover element and carrying said pulley, a pivotal mounting for said pulley support arm on the first cover element at a position spaced from the pivotal axis of said pulley so as to permit pivoting of the arm upon application of a pull on said pulling means, wherein the pivotal mounting of said pulley support arm is arranged such that the weight of the arm and pulley is effective to urge the latching means into a latching position under the action of gravity.

4,234,035

TRIM LOCK

Frederick W. Babbs, Nottingham, England, assignor to Cox of Watford Limited, Nottingham, England

Continuation of Ser. No. 562,944, Mar. 28, 1975, abandoned.
This application Jun. 10, 1976, Ser. No. 694,706
Claims priority, application United Kingdom, Mar. 28, 1974, 13835/74
Int. Cl.² A47H 13/00
U.S. Cl. 160—392 8 Claims



1. An upholstered article comprising:

a frame defined by a structure frame member which extends around a part of the edge of the article and has a hollow section, said frame member having opposing walls having a single sharp edge at the inner side of each wall, said opposing walls defining a slot in the face of said frame member and leading to said hollow section;

trim retained in relation to said frame by having a free, flexible edge contained within said hollow section;

upholstery integral with the trim except at the edge of the trim and retained in relation to the frame by the trim; and

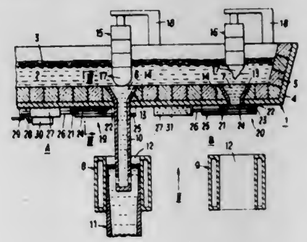
a single external strip pressing said trim against said sharp edges of said inner sides of said wall so as to grip said trim within said slot, said strip having a part extending into said slot and having a cross-section with an external flange for covering the outer face of said trim at a location adjacent said slot, a neck extending into said slot and a head carried on said neck, said head being wider than said neck and positioned on the inside of said slot to define a clearance space between said head and said hollow section wider than the thickness of the trim, said edge of said trim being free in said clearance space beyond the edges of said slot where it is gripped.

4,234,036

ARRANGEMENT AT A CONTINUOUS CASTING PLANT

Ernst Bachner, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 19, 1979, Ser. No. 59,066
Claims priority, application Austria, Aug. 4, 1978, 5671/78
Int. Cl.³ B22D 11/10
U.S. Cl. 164—420 5 Claims



1. In an arrangement at a continuous casting plant of the type including at least two mould cavities, a common tundish functioning as a common distributing vessel for supplying melt to said at least two mould cavities, an outflow opening in said tundish for each one of said at least two mould cavities, a stopper for closing said outflow opening, and a casting pipe reaching from said outflow opening into the mould cavity and including a casting pipe section projecting at the outer side of said tundish, the improvement which comprises shearing means provided at each casting pipe on the outer side of said tundish, said shearing means including a shearing head and a sealing plate following upon said shearing head, and an adjustment drive for moving said shearing means from a waiting position beside said casting pipe into a closing position in which said sealing plate covers said outflow opening on simultaneous shearing off of said casting pipe section projecting at the outer side of said tundish with said shearing head.

4,234,037

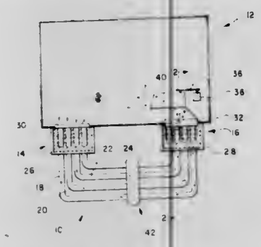
UNDERGROUND HEATING AND COOLING SYSTEM

Walter E. Rogers, Box 636, Lillington, N.C. 27546, and Preston C. Midgett, Rte. 1, Box 522, Spring Lake, N.C. 28390

Filed Feb. 21, 1978, Ser. No. 879,232
Int. Cl.³ F24J 3/02
U.S. Cl. 165—3 2 Claims

1. A method of heating or cooling a structure by utilizing the natural earth as a source of energy to heat and cool, due to the mean temperature lag phenomenon, comprising the steps of: circulating a generally closed system of air through said structure; directing the generally closed system of air from said structure into and through the ground to a depth of approximately five to ten feet; directing the generally closed system of air through elongated conduit means disposed underground and within the natural earth at a depth of generally between five and ten feet and wherein the elongated conduit means extend generally horizontal through the earth within said depth range of approximately five to ten feet deep over a substantial area of earth such that there is substantial surface area contact between said elongated conduit means and the

natural earth; directing the air of said generally closed system through the elongated conduit means that extends generally horizontally through the natural earth within said depth range of approximately five to ten feet; effectuating a heat transfer between the air of said generally closed system of air and the natural earth lying adjacent said elongated conduit means such that the air is cooled when it is warmer than the adjacent earth and is heated when it is cooler than the adjacent earth; draining



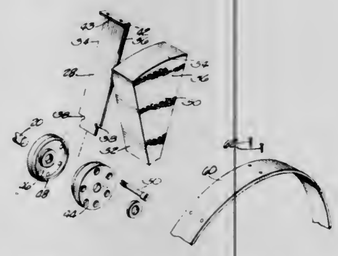
water and condensation from the elongated conduit means while said generally closed system of air is circulated through said elongated conduit means; directing the heated or cooled air of said generally closed system of air back to said structure for effectively heating or cooling said structure; and continuously circulating said generally closed system of air through said structure and through said elongated conduit means so as to continuously heat or cool said structure for a period of time.

4,234,038

TRANSFER WHEEL ASSEMBLY FOR AN AIR CONDITIONER AND METHOD OF MAKING THE WHEEL ASSEMBLY

Konstantins Dravnieks, Thiensville, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Aug. 17, 1978, Ser. No. 934,426
Int. Cl.³ F28D 19/04
U.S. Cl. 165—10 **10 Claims**



1. A transfer wheel assembly comprising, in combination,
a shaft defining an axis of rotation,
hub means operatively, associated with said shaft for rotation about said axis,
a plurality of blades projection radially relative to said axis and being planar in an axial direction and including opposite radially extending planar faces and generally axially facing and oppositely directed side portions,
means for providing engagement between said hub means and said blades, and
a plurality of sectors of condition transfer medium supported by said blade and being pervious to flow of a gaseous medium and capable of providing a condition transfer between itself and the gaseous medium flowing therethrough, each of said sectors being supported between two of said blades, and each of said sectors having opposed generally parallel axially facing faces and a pair of mutually diverging planar sides joining said faces, said planar sides facing said blades and at least one of said sides being cemented to one of said blades, and said blades including means for engaging said sectors and for locating said sectors with respect to said blades.

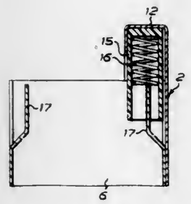
4,234,039

RADIATOR

Rune Almen, Halmstad, Sweden, assignor to Sensotherm AB, Sweden

Filed Mar. 31, 1978, Ser. No. 892,436
Claims priority, application Sweden, Apr. 1, 1977, 7703837
Int. Cl.³ F28F 9/00
U.S. Cl. 165—67 **3 Claims**





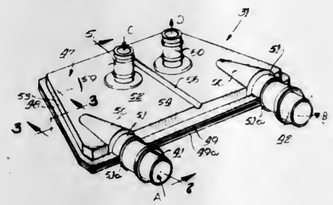
1. Radiator construction for mounting on a wall or like support comprising in combination a heating element and a front panel having an upper horizontal edge and a lower horizontal edge fitted on the front of said heating element and covering same thereat, said heating element having a plurality of projections adapted to be engaged by said front panel, said edges being bent inwardly behind said front panel with a downwardly directed portion extending from said upper horizontal edge and an upwardly directed portion extending from said lower horizontal edge in engagement with corresponding ones of said projections in assembled condition of said panel on said heating element, said front panel being substantially longer than said heating element so that said front panel may fully cover said heating element and also may be displaced laterally with respect thereto without being removed therefrom, wherein at least some of said projections are in the form of transversely offset tongue portions each having an abutment member disposed over a free end and spring means between each of said abutment member and the offset tongue portion associated therewith to thereby urge said abutment member against one of said upper and lower horizontal edges and others of said projections of said heating element are in the form of vertical grooves holding the portion extending from the other of said upper and lower horizontal edges with said spring means while urging said abutment members against said one of said upper and lower horizontal edges are also effective in urging the other of said upper and lower horizontal edges to remain held in said projections which are in the form of grooves.

4,234,040

TWO FLUID HEAT EXCHANGER

Charles S. Argyle, Willowdale; Robert G. Bamsey, Kitchener, and Gregory S. T. Millard, Brampton, all of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 716,628, Aug. 23, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,198
Int. Cl.³ F28F 3/12
U.S. Cl. 165—164 **10 Claims**



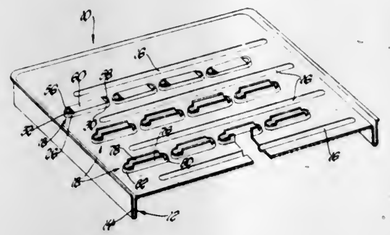
1. A two fluid heat exchanger comprising a generally flat heat exchanger formed of two pairs of metal plates, the inner pair of plates having oppositely disposed dished portions forming a chamber and joined by peripheral flanges, the chamber having an inlet and an outlet adapted to receive a first fluid, a heat transfer surface formed of at least one metal plate received in said chamber, and the outer pair of plates having oppositely disposed dished portions and peripheral flanges generally completely joined to the flanges of said inner plates, said outer dished portions cooperating with said inner dished portions to form a fluid envelope generally encompassing the chamber and having an inlet and an outlet to receive a second fluid therein, at least an oppositely disposed pair of side walls of said outer dished portions are spaced from side walls of said inner dished portions, said flanges of the inner plates extend between said inner and outer side walls to divide said envelope into upper and lower portions and have openings therein to provide communication between said upper and lower envelope portions, said second fluid inlet and outlet being located in one of the outer dished portions, and a central depression is formed in the same dished portion to extend across the dished portion and divide said upper envelope portion between the inlet and outlet into generally equal halves.

4,234,041

RADIATOR TANK HEADSHEET AND METHOD

William Melnyk, Lathrup Village, Mich., assignor to McCord Corporation, Detroit, Mich.

Division of Ser. No. 881,765, Feb. 27, 1978, Pat. No. 4,150,556. This application Nov. 15, 1978, Ser. No. 960,877
Int. Cl.³ F28F 9/16
U.S. Cl. 165—173 **1 Claim**



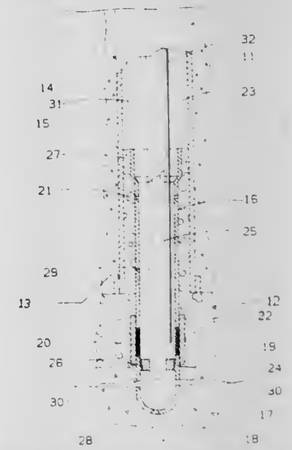
1. A headsheet for the tank of a tube-type heat exchanger comprising: a sheet of material, attachment means around the periphery of said sheet of material for attaching a tank over thereto, and a plurality of elongated apertures in said sheet of material for receiving the ends of flat tubes; each of said apertures including an integral ferrule for engaging the exterior of a tube, said ferrule including a pair of generally parallel sidewalls extending perpendicularly from the sheet of material and endwalls joining said sidewalls at the ends of said aperture, said endwalls joining said sidewalls at positions spaced from said sheet and having a constant height lesser than the height of said sidewalls and being characterized by having relatively few stretch-induced cracks, the height difference between the top of said endwalls at the juncture thereof with said sidewalls and the top of said sidewalls being approximately equal to one half the distance between said sidewalls.

4,234,042

DIRECT COMBUSTION STIMULATION OF A PRODUCING WELL

John W. Kirkpatrick, and Lawrence N. Mower, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 11, 1979, Ser. No. 2,496
Int. Cl.³ E21B 43/243, 43/25
U.S. Cl. 166—261 **6 Claims**
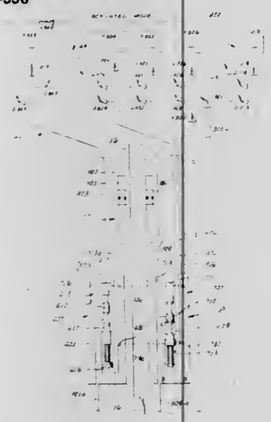


1. A method for direct combustion stimulation of a production well for producing from a heavy oil or tar sand reservoir penetrated by said well, comprising the following steps:
a. placing casing carrying a sand screen into said well with said screen located opposite an upper zone of said reservoir,
b. placing a gravel pack in the space between said casing and said upper zone adjacent said well up to an elevation considerably above the top of said screen, and sealing said space above the top of said gravel pack,
c. establishing fluid communication between the lower part of said casing and a lower zone in said reservoir below said upper zone,
d. dividing the space within said well into two contiguous fluid passages substantially impervious to leakage therebetween, each of said passages communicating with the top of said well, one with said gravel pack and the other with said lower part of said casing, and
e. simultaneously forcing an oxygen-containing fluid through one of said passages and into said lower zone of said reservoir, and an aqueous divertent liquid through the other of said passages, through said gravel packing, and into said upper zone of said reservoir,
whereby organic material in said lower zone and near said well is warmed and its viscosity substantially reduced without thermal damage to said screen, so that at least some of said organic material may be subsequently removed through said well to increase the flow capacity of said well.

4,234,043

REMOVABLE SUBSEA TEST VALVE SYSTEM FOR DEEP WATER

William M. Roberts, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jan. 17, 1977, Ser. No. 843,154
Int. Cl.[3] E21B 7/12
U.S. Cl. 166—336 74 Claims



1. In subsea apparatus adapted to be lowered on a tubular string from the surface of the water through a riser pipe to a position within a blowout preventer stack at the top of a well bore beneath a body of water, said apparatus comprising: a tubular structure connectible in said tubular string, including test valve means engageable in said blowout preventer and having means responsive to control fluid pressure to hold said test valve means open; means for closing said test valve means upon relief of control fluid pressure; releasable latch means connecting an upper portion of said tubular structure to said test valve means and having means responsive to disconnect fluid pressure to disconnect said upper portion of said tubular structure from said test valve means; tubing shut off valve means in said upper portion of said tubular structure and having means responsive to control fluid pressure to hold said tubing valve means open; means for closing said tubing valve means upon relief of control fluid pressure; means for supplying control fluid to said test valve means and to said tubing valve means; means for supplying disconnect fluid to said latch means; and control means for relieving control fluid pressure from said test valve means, relieving control fluid pressure from said tubing valve means, and applying disconnect fluid pressure to said latch means.

4,234,044

CHEMICAL AGENT INJECTION SYSTEM FOR FIRE FIGHTING EQUIPMENT

Mark E. Hollan, and John J. Bayles, both of Oxnard, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 27, 1978, Ser. No. 946,003
Int. Cl.[2] A62C 35/00
U.S. Cl. 169—14 8 Claims

1. A chemical agent injection system for firefighting applications, comprising:

a. a water inlet manifold means operable to be connected to a water supply source;

b. a fire pump means having an inlet and an outlet and operable to pressurize water supplied thereto via said inlet and provide pressurized water via said outlet for downstream delivery;

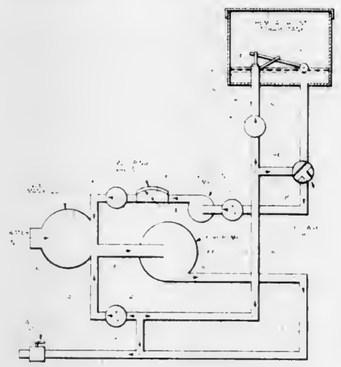
c. the output of said water inlet manifold means being connected to said fire pump means inlet;

d. a chemical agent storage tank operable to supply a chemical agent that can be injected into water from said water supply source at said water inlet manifold means;

e. injection pump means connected via chemical agent conduit means between said chemical agent storage tank and said water inlet manifold means for pumping chemical agents from said storage tank into said water inlet manifold means when desired for mixture therewith with the water;

f. conduit means for transporting pressurized water together with any chemical agents injected therein from said fire pump means outlet downstream delivery point and to a means for recirculating back into the system;

g. said recirculated portion of water and any chemical agent



CHEMICAL AGENT INJECTION SYSTEM FOR A FIRE SPRINKLER SYSTEM WITH STANDOFF REMOTE OPERATIONS CAPABILITY

being fed partially to said water inlet manifold means via a first recirculating conduit means and partially toward said storage tank via a second recirculating conduit means;

h. control means in conjunction with the second recirculating conduit means for selectively directing the flow of recirculating water through said storage tank to said injection pump means in a first mode of operation, and bypassing said storage tank with flow directly to said injection pump means in a second mode of operation; and

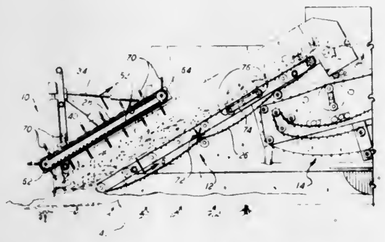
i. said recirculating water passing through said storage tank and injection pump means operating to purge the system of chemical agents; said recirculating water delivered to said injection pump preventing inadvertent dry operation of the injection pump.

4,234,045

HARVESTING MACHINE FEEDER APPARATUS

John R. Porter, Waterloo, N.Y., assignor to Porter-Way Harvester Manufacturing Co., Inc., Waterloo, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,284
Int. Cl.[3] A01D 17/04, 46/00
U.S. Cl. 171—14 8 Claims



1. Tomato harvesting apparatus for movement through a field to gather both vines and fruit for subsequent separation of the fruit from the vines, as well as from dirt, rocks, weeds and other foreign matter, said apparatus comprising:

(a) means for lifting the fruit and vines, together with some foreign matter, from ground level and directing the same upwardly and rearwardly with respect to the direction of movement of the apparatus;

(b) an endless, feed conveyor chain having links spaced more closely than the smallest diameter of fruit to be recovered by the apparatus, and spaced to allow dirt and other small foreign matter to pass through;

(c) guide means establishing a path for said feed conveyor which includes an upper run extending upwardly from a forward end disposed to receive material directed upwardly and rearwardly by said lifting means to an elevated discharge end;

(d) a shaker section including an endless, oscillating conveyor chain having an upper run with one end disposed to receive material discharged by said feed conveyor;

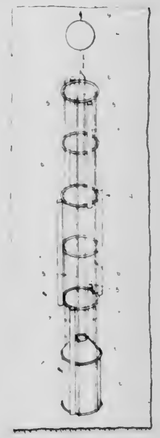
(e) an endless, solid, planar belt having a lower run disposed in spaced, substantially parallel relation to said upper run of said feed conveyor and extending from a position forwardly of said forward end of said feed conveyor for a first portion of the length thereof, said belt including a plurality of cleats extending outwardly from the plane and across the width thereof at spaced intervals, whereby said cleats on said lower run of said belt extend toward said upper run of said feed conveyor to engage the upper portion of vines, and the like, being transported upon said feed conveyor;

(f) means for driving said feed conveyor and said belt in opposite directions with the lower run of said belt and the upper run of said feed conveyor moving in an upward and rearward direction; and

(g) means for imparting an oscillatory, shaking movement to a second portion of said upper run of said feed conveyor, between said first portion and said discharge end thereof to assist in dislodging foreign matter which may fall through said feed conveyor and in separating fruit from vines.

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e. said pump unit also including means for reversing the flow of water and sediment therethrough for backing said



pump unit out of the seafloor together with said space frame and said soil corers.

4,234,047

DISCONNECTABLE RISER FOR DEEP WATER OPERATION

George E. Mott, Metairie, La., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,193
Int. Cl.[3] E21B 7/128
U.S. Cl. 175—5 5 Claims



4,234,046

PRESSURE DIFFERENTIAL SEAFLOOR CORER-CARRIER

Harvey H. Haynes, 690 Mesa Dr., Camarillo, Calif. 93010

Filed Apr. 30, 1979, Ser. No. 34,220
Int. Cl.[3] E21B 7/12
U.S. Cl. 175—6 14 Claims

1. A pressure differential seafloor corer-carrier for obtaining long core samples of seafloor sediments, comprising:

a. a space frame having a longitudinal axis;

b. a plurality of soil corers mounted lengthwise along the longitudinal axis of said space frame;

c. a pressure-differential pump unit connected to said space frame for driving said space frame and corers into the seafloor in a general direction along the longitudinal axis of said space frame;

d. said pump unit including means for pumping water and sediment from the seafloor through the pump unit to force said space frame and said soil corers into the seafloor;

1. In an offshore system for drilling well bores through a well head in the ocean floor, and which includes;

a drilling vessel floatably positioned at the water's surface,

an elongated riser extending between, and connected at its opposed ends to the vessel and to the said well head whereby to define an elongated continuous passage therethrough,

pumping means on said vessel communicated with said riser for circulating a flow of drilling fluid therethrough during a well drilling operation, and opening means in said riser upper end for passing a rotating drill string through said riser to form said well bore in the ocean floor, the improvement therein of;

said riser including separable upper and lower segments,

remotely actuated coupling means being operable to removably engage said upper and lower segments to form said continuous passage, and

buoyancy means positioned on said riser lower segment to externally support said lower segment whereby to main-

tain the latter in a substantially upright position when said lower segment has disengaged from the riser upper segment and regulating means for controlling the amount of drilling fluid which is retained in said riser upper and lower segments respectively during a disconnect of said segments.

4,234,048

DRILL BITS EMBODYING IMPREGNATED SEGMENTS

David S. Rowley, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jun. 12, 1978, Ser. No. 914,449
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **25 Claims**



1. A rotary bit for drilling bore holes in earth formations, comprising a body, a hard metal matrix secured to said body and providing a face adapted to confront the bottom portion of the bore hole, said matrix being fabricated at a temperature above about 2000° F., said matrix having preformed cavities therein opening through said face and produced during fabrication of said matrix, preformed diamond impregnated cutters in said cavities and projecting from said face to drill the bottom portion of the hole upon rotation of the bit, said cutters being fabricated at a temperature below about 1900° F., and means securing said preformed cutters to the walls of said preformed cavities.

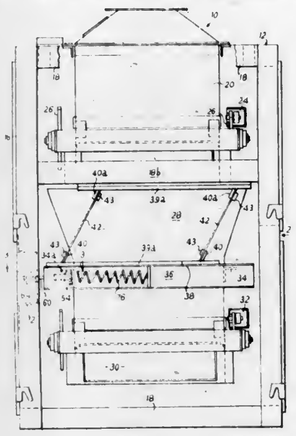
4,234,049

MASS MEASURING APPARATUS

George A. Oliver, P.O. Box 27096, Benrose 2011, Johannesburg, South Africa

Filed Aug. 23, 1978, Ser. No. 935,884
Claims priority, application South Africa, Aug. 23, 1977, 77/5085
Int. Cl.² G01G *13/00*
U.S. Cl. 177—105 **4 Claims**

1. A mass measuring apparatus comprising:
(a) a frame, including a plurality of cross-members;
(b) a hopper located within the frame and being adapted to receive matter the mass of which is to be measured and having closable discharge means at its lower end to discharge matter the mass of which has been measured;
(c) at least four pairs of attachment members secured one of each pair to the frame and the other of each pair to the hopper;
(d) at least four leaf springs extending between and being connected to the said pairs of attachment members respectively, the leaf springs being arranged in parallel disposition inclined to the vertical and the connection between each leaf spring and the attachment members being a two point connection so that the leaf spring cannot swing in its plane;
(e) a load cell operatively carried by the frame; and



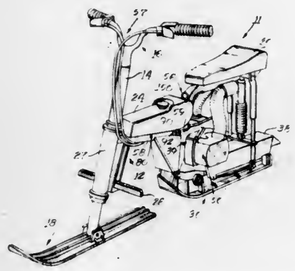
(f) a horizontal link operatively connecting the hopper to the load cell.

4,234,050

SNOW BOB WITH DETACHABLE FUEL TANK

Richard W. Condon, Frankfort, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Nov. 1, 1978, Ser. No. 956,660
Int. Cl.³ B60K *15/02*; B62M *27/02*
U.S. Cl. 180—190 **9 Claims**



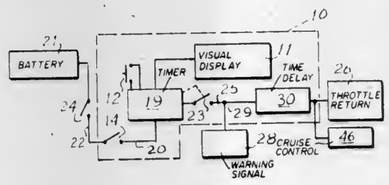
6. In a power driven snow bob having a motor drivingly connected to an endless propulsion track carried by a rear power ski and with a frame carrying a seat at its rear end and having a cross frame portion to be straddled by the operator's legs and adapted to be steered by a steering post having a front ski attached to the lower end thereof, said cross frame having a substantially horizontal section and an angled section extending upwardly and rearwardly from the horizontal section, the improvement comprising a detachable fuel tank resting on an upper side said horizontal section of said cross frame portion and adapted to be straddled by the legs of the operator, said fuel tank having a groove in its underside for receiving therein the upper side of said horizontal section of said frame cross portion and for holding the tank against lateral movement, a releasable forward securing means at the forward portion of the fuel tank securing the forward portion of said tank to the frame, a rearward end of said fuel tank abutted against the upwardly and rearwardly angled section and being held thereby against rearward movement, a releasable rearward securing means securing the rearward portion of the fuel tank to said frame, said forward and rearward securing means constituting a quick connect and disconnect means for assisting in quick attachment or detachment of said fuel tank to said frame cross portion, and means releasably connecting said fuel tank to a fuel line extending to the motor.

4,234,051

DRIVER ALERTNESS DEVICE

Solon S. Morris, Jr., Rte. 1, Box 645, Smiths, Ala. 36877

Filed Jul. 26, 1978, Ser. No. 928,055
Int. Cl.³ B60K *31/00, 28/00*
U.S. Cl. 180—272 **7 Claims**



1. A driver alertness device, for a vehicle having a throttle, a linkage for positioning said throttle, said throttle having an idle position, said driver alertness device comprising counting means for decrementing from a given quantity towards a predetermined quantity, said predetermined quantity being lower than said given quantity, display means for displaying said given quantity and all decremented quantities in readable form, reset means for increasing the quantity of said counting means, said reset means comprising a button selectively operable by said driver for increasing the quantity by a predetermined increment or in multiple increments for selectively establishing a given quantity, switch means operable by said counting means when said counting means reaches said predetermined quantity, and throttle return means for placing said throttle at said idle position in response to the closing of said switch means.

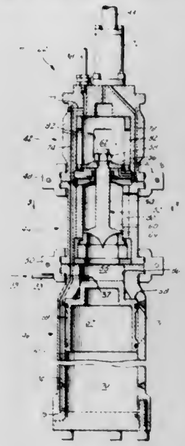
4,234,052

METHOD AND APPARATUS FOR GENERATING SEISMIC IMPULSES USING HIGH PRESSURE WATER PUMP AS THE ENERGIZING SOURCE

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Nov. 13, 1978, Ser. No. 959,562
Int. Cl.³ G01V *1/137, 1/38*
U.S. Cl. 181—120 **21 Claims**

1. A method for generating a powerful seismic impulse in a body of water comprising the steps of:
applying gas pressure in an operating chamber to an operating piston of a reciprocatable shuttle for moving the shuttle to close a charge chamber from at least one liquid discharge port;
pumping a substantially incompressible liquid into said charge chamber to push a piston follower into an energized piston against pressurized gas in a gas-propulsion chamber for compressing that pressurized gas, and subsequently
equalizing the gas pressure on opposite sides of said operating piston for suddenly moving said shuttle into an open position for causing said incompressible liquid to be forced abruptly through said liquid discharge port by said piston follower being driven forwardly from said energized position toward said port by the compressed pressurized gas expanding in said gas-propulsion chamber, and



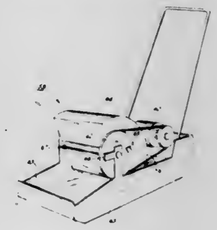
retaining said pressurized gas in said operating chamber and in said gas propulsion-chamber after said expansion has occurred.

4,234,053

SEISMIC EXPLORATION METHOD USING A ROTATING ECCENTRIC WEIGHT SEISMIC SOURCE

Otis G. Erich, Jr., La Habra, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 765,799, Jan. 4, 1977, Pat. No. 4,143,737. This application Nov. 1, 1978, Ser. No. 956,613
Int. Cl.³ G01V *1/14*
U.S. Cl. 181—121 **15 Claims**



1. A method for the seismic exploration of earth strata underlying an earth surface between a sourcepoint and a receiver location, which comprises:
(a) positioning on said earth surface at said sourcepoint a seismic source having (1) a first eccentric element which is rotatable about a first axis of rotation and (2) a position sensor comprised of a first sensor element and a second sensor element;
(b) rotating said first eccentric element and said first sensor element about said first axis of rotation at varying speeds, thereby transmitting into said earth strata a coded energy signal having a frequency variable code;
(c) positioning said second sensor element at a selected position about said first axis of rotation such that said first sensor element passes in close proximity to said second sensor element at and only at the instant at which the center of mass of said first eccentric element passes that angular position about said first axis of rotation at which

said seismic source develops the peak earthward force during each revolution of said first eccentric element;

(d) causing one of said first or second sensor elements to generate a code signal characterized by a substantially interference-free background and a plurality of discrete pulses, each of said pulses corresponding to one of the instants at which said first sensor element passes in close proximity to said second sensor element;

(e) sensing seismic energy returning from said earth strata to said receiver location in order to obtain raw seismic data which is proportional to said seismic energy; and

(f) correlating said raw seismic data with said code signal to thereby form a correlated trace which is indicative of the structure of said earth strata.

4,234,054

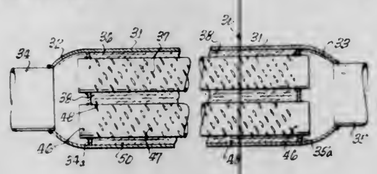
MULTI-DUCT MUFFLER

John S. Chapin, #19 360 Freeport Blvd., Sparks, Nev. 89431

Filed Apr. 18, 1978, Ser. No. 897,333

Int. Cl.³ F01N 1/10

U.S. Cl. 181—252 **8 Claims**



1. A muffler for muffling noises of exhaust from a noise making machine including: (1) an elongated impervious casing having an inlet duct at one end and an outlet duct at the other end; (2) a first plate at a spaced distance from the inlet duct within said casing and fastened thereto around its inner circumference; (3) a second plate at a spaced distance from said outlet duct, and affixed to the interior of said casing about its circumference; (4) a first open-ended perforated tube extending through an opening in each of the first and second plates and intercommunicating between the space existing between each of said plates and their respective inlet and outlet ducts; (5) a second open-ended perforated tube extending through an opening in each of the first and second plates and intercommunicating between the space existing between each of said plates and their respective inlet and outlet ducts; and (6) a packing about said tubes and within said casing of a material having a multiplicity of air pockets.

4,234,055

MOBILE SUSPENSION SCAFFOLD SYSTEM

Gregory L. Beeche, RD #2, Smith Rd., Mechanicville, N.Y. 12118

Filed Sep. 25, 1978, Ser. No. 945,103

Int. Cl.³ E04G 3/10

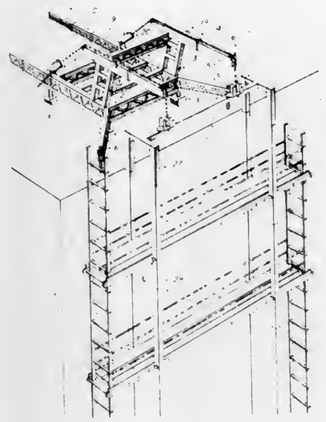
U.S. Cl. 182—63 **19 Claims**

1. A mobile roof vehicle for use with a mobile scaffold system comprising:

a frame mounted on castors to allow universal rolling motion of the frame on the roof surface, said frame having a front, a rear and sides;

at least one telescoping boom attached to the frame and extending beyond the front thereof, said boom being adapted to hold scaffolding suspended therefrom;

means attached to each boom for suspending a scaffold-supporting cable therefrom; and



means attached to each boom for receiving and holding a scaffold-supporting pin.

4,234,056

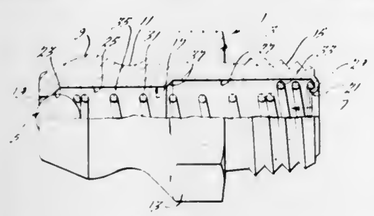
LUBRICATION FITTING

Richard R. Farrell, Verona, Pa., assignor to CTS, Inc., Madison Heights, Mich.

Filed Nov. 2, 1978, Ser. No. 957,102

Int. Cl.³ F16N 23/00

U.S. Cl. 184—105 B **6 Claims**



1. A lubrication fitting comprising a hollow hardened metal housing having a valve seat at one end and an annular flanged closure at the other end and an aperture extending between the seat and closure, said valve seat forming an inlet for lubricant and said closure having an opening in it forming an outlet for lubricant, a ball check valve on said seat, said ball valve being smaller in diameter than said outlet whereby said ball valve may be inserted into the housing through the opening after the closure is formed, a stepped two diameter helical coil valve spring compressed between the ball valve and the closure, said spring having a first diameter section comprising a plurality of uniform diameter coils adjacent the ball valve that are smaller in diameter than the outlet opening and contain the center of gravity of the spring and having a second diameter section comprising a second and smaller plurality of uniform diameter coils adjacent the closure that are larger in diameter than said outlet and adapted to be threaded past the closure during assembly, said coils of said first plurality being of substantially uniform diameter and the coils of said second plurality being of substantially uniform diameter, the coils of said second plurality being substantially in engagement with the wall of the aperture to provide lateral support for the spring, the first plurality of coils having a substantially greater overall length than the second plurality of coils, said housing having a microstructure at said closure produced by formation of said closure

prior to hardening of the housing, the first plurality of coils having at least two coils at the junction with the second plurality substantially engaging each other to provide a relatively stiff seat for a driver tool to apply axial force and torque to the spring in order to thread the second plurality of coils past said closure.

4,234,057

LIFT TRUCK HAVING A LOAD LIFTING ASSEMBLY

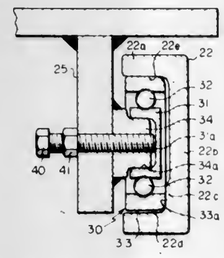
Masao Nakane, Handa, and Masahiko Nishii, Okazaki, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 13, 1978, Ser. No. 941,907

Claims priority, application Japan, Sep. 13, 1977, 52/123251[U]

Int. Cl.³ B66B 9/20

U.S. Cl. 187—9 E **9 Claims**



1. A lift truck having a wheeled body and a load lifting assembly mounted on the truck body, the load lifting assembly comprising:

a pair of laterally spaced-apart outer masts, each being made of a channel member having therein a channel and each being attached to the front end of the truck body;

a corresponding pair of inner masts, each being made of a channel member having therein a channel and each being telescopically fitted in the corresponding one of said pair of outer masts;

a load lifter arranged inwardly with respect to said pair of inner masts, and including a fork member for mounting thereon a load to be lifted and a lift bracket to which said fork member is attached;

a group of lift rollers arranged between said lift bracket and said pair of inner masts to permit said load lifter to move with respect to said pair of inner masts, each of said group of lift rollers comprising an annular outer

race member rotatably fitted in the channel of a corresponding one of said inner masts and having an outer flat surface contacting an inner central surface of said channel of said corresponding one of said inner masts for bearing a thrust force acting on said load lifting assembly during the lifting operation of said load lifting assembly, a cup-like inner race member for mounting each of said group of lift rollers on a support pin rigidly connected to said lift bracket, and a number of balls arranged between said inner race member and said outer race member, said inner race member comprising an annular race portion coaxial with said annular outer race member and an outer round bottom portion arranged on an outer end of said annular race portion; and

first screw means mounted on said bracket of said load lifting assembly for adjustably and outwardly axially pressing said outer round bottom portion of each of said group of lift rollers, so that said inner race member together with said outer race member of each of said group of lift rollers are adjustably and outwardly urged until said outer flat surface of said outer race each of said group of lift rollers contacts said inner central surface of said channel of said corresponding one of said pair of inner masts under an appropriate contact pressure.

4,234,058

WEAR ALARM DEVICE FOR A VENTILATED DISK BRAKE

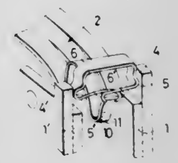
Masachika Yamamoto, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 7, 1978, Ser. No. 931,585

Claims priority, application Japan, Aug. 20, 1977, 52-111520[U]

Int. Cl.³ F16D 66/02

U.S. Cl. 188—1 A **3 Claims**



1. A wear alarm device for a ventilation type disk brake having a ventilated disk with grooves on the outer periphery thereof, of the type in which when frictional brake pads mounted on backing plates reach a use limit in thickness, an elastic contactor is released to contact the peripheral portion of a rotating brake disk to generate an abnormal sound indicating excessive wear of said disk brake pads, the improvement comprising:

said elastic contactor comprising a leaf spring member comprising a first portion secured at a first end at a position radially adjacent the outer periphery of said ventilated disk and having a second end which is movable when released in a plane substantially parallel to the plane of said disk, said first portion being narrower than the grooves in the outer periphery of said ventilated disk to penetrate into said grooves when released, said first portion having a downwardly bent part located between said first and second ends for penetrating into said grooves, said downwardly bent part having a sufficiently large curvature as to prevent excessive penetration into said grooves, and at least one second portion extending from a region between said downwardly bent part and the second end of said first portion in the axial direction of said disk beyond said grooves to engage the disc periphery on opposite sides of the elastic contactor.

4,234,059

BRAKING SYSTEM FOR FREIGHT MODULE ON OVERHEAD GUIDE RAIL

Willi Schaad, Unterentfelden, Switzerland, assignor to Oehler Whylen Lagertechnik AG, Buchs near Aarau, Switzerland

Filed Nov. 17, 1978, Ser. No. 961,830

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751367

Int. Cl.³ B61H 7/12

U.S. Cl. 188—43 **3 Claims**

1. A braking system for a freight or crane module suspened for movement on an overhead guiding rail having the form of an I beam with upper and lower flanges and a vertical web comprising:

a pair of pivoted braking pincers for stopping the movement of said module along said rail, each of said pincers having a brake shoe and an upper arm portion for pushing said brake shoe against a side of the vertical web of the I beam and a lower arm portion which diverges outwardly and downwardly so as to be disposed with the lower arm portions of the pincers in pivotally joined relationship about a pivot pin located below the I beam;

said pivot pin pivotally mounting both upper arm portions about a horizontal axis parallel to the flanges of said I beam;

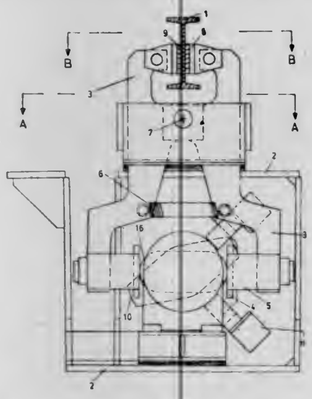
said brake shoes having a lining formed of plastic, one of said brake shoes being attached to each upper arm portion of said braking pincers, respectively, to press said brake lining of each shoe against opposite sides of the I beam and in the released state to have sliding characteristics therewith;

a tension spring connected to said pair of pincers;

said outwardly diverged lower arm portions of said braking pinsers having a first lower portion defining a first open area therebetween in the shape of a triangle and the tension spring engaging the pincers along the base of the triangle;

said outwardly diverged lower arm portions having a second lower portion defining a wider second open area therebetween generally rectangular in shape and lying below the base of the triangular open area;

a generally parallelogram shaped cam disc having contoured arcuate sides for spreading the lower arm portions outwardly by a rotation thereof and acting against the action



of said tension spring, said cam disc thereby providing a non-locking braking action by progressively increasing the brake action and urging said brake shoes against the vertical web of said I beam so that the clamping pressure rises unevenly from zero to a maximum;

base plates, one on each second lower portion, engaging the arcuate ends of said cam disc;

adjustable base plate spring means on said base plates forcing plates against the cam disc to assure quick braking action in a period of about 1 to 3 seconds;

said cam disc overcoming the pressure of said base plate spring means so that its rotation to a maximum clamping force is dampened progressively;

a spacer sleeve means housing said base plate spring means on said second lower portions;

servo motor means including an output shaft for rotating said cam disc between said base plates; and

support means on the freight module for said motor means, cam disc, and tension spring and said braking pincers.

4,234,060

BRAKE EQUIPMENT

Roger Barsted, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

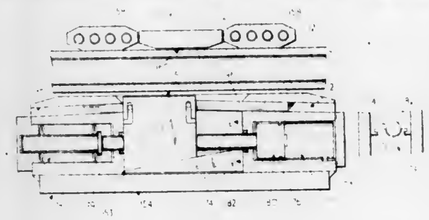
Filed Jun. 29, 1978, Ser. No. 920,502

Claims priority, application United Kingdom, Jul. 1, 1977, 27631/77

Int. Cl.³ F16D *65/06*

U.S. Cl. 188—44 **8 Claims**

1. Brake equipment for a vehicle or mining machine which in use traverses along a path adjacent to a stationary anchored rail, comprising first and second relatively movable jaws respectively providing co-acting first and second brake elements slidable along the rail and respectively mounted on opposite sides of the rail, first resilient means for urging relative movement of the first jaw transversely towards the rail such that, in use, the brake element of the first jaw is urged to contact the rail, and first fluid actuated means for urging the first jaw such that the first brake element is urged out of braking contact with the rail, the second brake element including a wedge assembly having a wedge component and a rail engaging component which, in use, when the second brake element is urged into contact the rail, upon contacting the rail the rail engaging



component is urged by relative movement of the components in the wedge assembly to increase the braking force of the second brake element on the rail, the wedge assembly comprising a resilient bias for urging the rail engaging component of the wedge assembly substantially along the rail relative to the wedge component towards a rail engaging position and second fluid actuated means for urging the rail engaging component of the wedge assembly out of a rail engaging position, when, in use, the first fluid actuated means urges the first jaw to urge the first brake element out of braking contact with the rail.

4,234,061

DISC BRAKES FOR VEHICLES

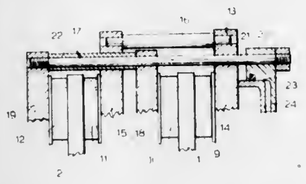
Hugh G. Margetts, and Keith M. Rouse, both of Leamington Spa, England, assignors to Girling Limited, Birmingham, England

Filed Dec. 4, 1978, Ser. No. 966,370

Claims priority, application United Kingdom, Dec. 2, 1977, 50295/77

Int. Cl.³ F16D *55/04*

U.S. Cl. 188—71.3 **8 Claims**



1. A disc brake for vehicles comprising a first axially fixed rotatable disc having an inboard face and an outboard face, a second axially fixed rotatable disc spaced axially from said first disc and having an inboard face and an outboard face, one of said discs being mounted inboard of the other of said discs, a pair of friction pad assemblies for engagement with opposite faces of each of said discs, and actuating means for applying said friction pad assemblies to said discs, wherein said actuating means comprises first and second separate clamp assemblies, the elements of each assembly being rigidly joined together when actuated means for mounting each of said clamp assemblies for relative movement in opposite axial directions, each of said clamp assemblies being adapted to apply one pad assembly of each pair to each of said first disc and said second disc, and a single common actuator acting between both said clamp assemblies to urge said clamp assemblies in said opposite

axial directions to apply all said friction pad assemblies to said discs.

4,234,062

MECHANICAL RELEASE MECHANISM FOR A SPRING-LOADED BRAKE CYLINDER

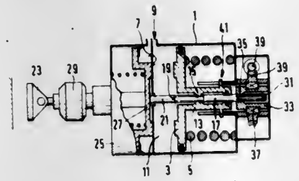
Albert Kerscher, Eching, and Walter Furtner, Rosenheim, both of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,108

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809263

Int. Cl.³ F16D *59/02*

U.S. Cl. 188—170 **2 Claims**



1. In a release mechanism for a spring-loaded brake cylinder particularly in an air braking system on a rail vehicle, a cylinder having a piston therein movable in braking and release directions and having one side acted upon by a spring and another side acted upon by a fluid pressure medium, a spindle shaft having a non-self-locking thread threadedly coupled to said cylinder, an actuating rod adapted to be connected to a brake linkage and engageable by said spindle shaft to be actuable thereby, a sleeve rotatably mounted on said cylinder and non-axially movable with respect thereto, said spindle shaft being axially movably connected to said sleeve and non-rotatable with respect to said sleeve, a drive mechanism operable exteriorly of the brake cylinder, and an overrunning drive means operatively connected between said drive mechanism and said sleeve and locking in driving position when the sleeve is rotated in a direction to unscrew the spindle shaft from said piston in the direction to release the brake.

4,234,063

BRAKE EQUIPMENT

Donald F. Blake, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

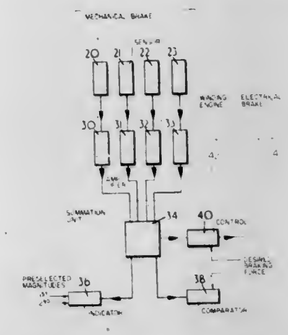
Continuation of Ser. No. 722,604, Sep. 13, 1976, abandoned. This application May 15, 1978, Ser. No. 905,926

Claims priority, application United Kingdom, Oct. 28, 1975, 44325/75

Int. Cl.³ B60T *8/00;* **F16D** *65/38*

U.S. Cl. 188—181 T **2 Claims**

1. Brake equipment for an underground mine winder having electrical brake equipment and mechanical brake equipment, comprising control means for releasing the electrical brake equipment when effective braking force of the mechanical braking equipment exceeds a preselected desired braking force, the mechanical brake equipment having a circular brake member and an assembly on opposite sides of the circular brake member and arranged to act in a calliper-like manner, brake shoes carried on the assembly, and operating means connected to the assembly for urging the assembly inwardly whereby the brake shoes contact and brake the circular brake member and the underground mine winder, plural strain sensing gauge devices mounted on the assembly for sensing strain in the assembly when the mechanical brake equipment is operated and for deriving strain signals when strain is sensed, a summation unit connected to the strain sensing gauge devices for summing derived strain signals to derive a total sensed strain signal indicative of sensed strain in the assembly, which is an effective braking force signal proportional to effective braking force of the mechanical braking equipment, an indicator means connected to the summation unit for receiving the effective braking force signal therefrom, whereby the indicator means indicates a warning when the effective braking force signal is less than a first preselected magnitude or is greater in magnitude than a second preselected magnitude, a comparator connected to the summation means for receiving the effective braking force signal therefrom, a desired braking force signal connected to the comparator, whereby the comparator com-



pares the effective braking force signal with the desired braking force preselected magnitude, the control means being connected to the summation unit, the desired braking force signal and to the electrical braking equipment for permitting release of the electrical braking equipment when the effective braking force exceeds the desired braking force preselected magnitude for ensuring that the electrical braking equipment is not released unless the effective braking force the greater than the desired braking force.

4,234,064

SLACK ADJUSTER MEANS

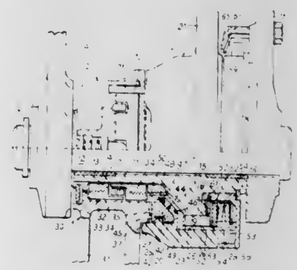
Geoffrey R. Tregoning, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Filed Jan. 8, 1979, Ser. No. 1,420

Claims priority, application United Kingdom, Jan. 6, 1978, 00431/78

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—196 BA **11 Claims**



1. Slack adjusting means to provide for automatic slack adjustment or compensation along an arcuate path, the slack adjustment means comprising an input member movable arcuately in a first plane, an output member movable arcuately in a second plane parallel to or coplanar with the first plane, and a coupling element for transmitting a braking force from the input member to the output member, characterised in that the input and output members are constrained against relative displacement in a direction transverse to the said first and

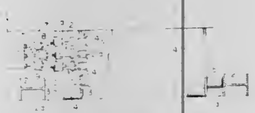
second planes, and in that the element is positively engaged with one of said members via co-operating helical engagement means (e.g. helical keying means) and the element is engageable or engaged with the other of said members via co-operable clutch faces arranged to be retained in force-transmitting engagement by the reaction forces in the co-operating helical engagement means when the said members tend to rotate relatively in one direction, and to be disengageable as said reaction forces are removed or relieved when the said members tend to rotate relatively in the opposite direction thereby to permit relative rotation, corresponding to the slack to be taken up, between said element and said other member.

4,234,065

MEANS FOR FEEDING ELECTRIC POWER TO TRACK GUIDED VEHICLES

Yukio Uozumi, and Masaharu Yagi, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 21, 1979, Ser. No. 41,105
Claims priority, application Japan, May 22, 1978, 53-61193
Int. Cl.[3] B60M *1/34*
U.S. Cl. 191—29 R **6 Claims**



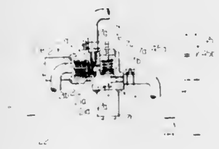
1. Electric power feeding means for a guided vehicle having running wheel means adapted to run along running track means and guide wheel means adapted to run along a pair of guide rail means provided at the opposite sides of the running track means, said power feeding means including three power feed lines located above one of said guide rail means for receiving supply of electric power, said power feed lines being vertically spaced from the other with an intermediate one being transversely inwardly shifted with respect to the other feed lines, collector shoes provided on the vehicle for respectively cooperating with the power feed lines, at least the collector shoe cooperating with the intermediate feed line being offset with respect to the other collector shoes in longitudinal direction of the vehicle, said collector shoes being located so that they lie in tangential planes of an imaginary cylinder and being of such lengths that they are maintained in contact with the cooperating power feed lines when there is an ordinary angle of rolling movement of the vehicle, insulative shoes respectively associated with the collector shoes and coplanar with the associated collector shoes, said insulative shoes being of such lengths that they are maintained in contact with cooperating power feed lines even when there is an abnormally large rolling of the vehicle.

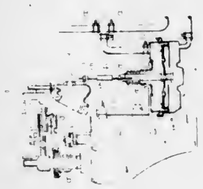
4,234,066

DUAL STAGE FLUID CLUTCH MOTOR WITH ELECTRIC CONTROLS INCLUDING TIME DELAY

Hiroshi Toyota, 1308, Kozukue-cho, Kohoku-ku, Yokohama; Tamio Kawamoto, 1218-6, Fuchinobe, Sagamihara, and Etsusou Takehiro, 788-1, Shirane-cho, Ashai-ku, Yokohama, all of Japan

Continuation of Ser. No. 789,859, Apr. 22, 1977, abandoned. This application May 25, 1978, Ser. No. 909,642
Claims priority, application Japan, May 20, 1976, 51-58254
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—0.092 **5 Claims**





1. Vehicle transmission comprising:
a clutch actuatable by a clutch actuator;
fluid network means connecting said clutch actuator, a source of high pressure and a source of low pressure;
solenoid actuated clutch release valve means having a solenoid for connecting said clutch actuator to said source of low pressure when a solenoid thereof is energized and for connecting said clutch actuator to said source of high pressure when said solenoid is not energized;
solenoid actuated air-on valve means having a solenoid and fluidly disposed in said fluid network means intermediate of said solenoid actuated clutch release valve means and said source of high pressure for opening fluid communication between said solenoid actuated clutch release valve means and said source of high pressure when a solenoid thereof is energized and for blocking fluid communication between said solenoid actuated clutch release valve means and said source of high pressure when the solenoid thereof is not energized and
circuit means whereby said solenoid of said clutch release valve means and said solenoid of said air-on valve means are simultaneously energized but said solenoid of said air-on valve means is kept energized for a predetermined time after said solenoid of said clutch release valve means has been deenergized, said circuit means including delay means for permitting current to be supplied to said solenoid of said air-on valve means for said predetermined time after current to said solenoid of said clutch release valve means has beencut, and a transistor electrically in circuit with said solenoid of said air-on valve means having its base in circuit with said delay means, said delay means comprising a condenser and a resistor, a time constant determined by said condenser and said resistor being said predetermined time.

4,234,067

CLUTCH RELEASE BEARING

Rene Billet, Lamorlaye, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Dec. 27, 1977, Ser. No. 864,803
Claims priority, application France, Dec. 30, 1976, 76 39540; Dec. 9, 1977, 77 37119
Int. Cl.[3] F16C *33/30*
U.S. Cl. 192—98 **14 Claims**



1. A clutch release bearing of the kind comprising an operating element to be coupled to a clutch release fork, a driving element cooperable with a release mechanism for operating a clutch, and an antifriction bearing operatively disposed between said operating and driving elements, and means for mounting said anti-friction bearing on said operating element relative radial movement and for permitting self centering of said anti-friction bearing in the course of normal operation in case of misalignment, and guide means for guiding said clutch release bearing for axial displacement, said guide means being the sole guide means for said clutch release bearing and being disposed exclusively laterally offset from the axis of said clutch release bearing and comprising lateral guide passages formed in said operating element cooperable with fixed guide elements for defining an axial path of displacement of the entire release clutch bearing.

4,234,068

TORSION DAMPING ASSEMBLY ESPECIALLY FOR A FRICTION CLUTCH PLATE ASSEMBLY

Raymond Le Brise, Montmorency, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Aug. 22, 1977, Ser. No. 826,958
Claims priority, application France, Aug. 25, 1976, 76 25666
Int. Cl.[3] F16D *3/66*
U.S. Cl. 192—106.2 **12 Claims**
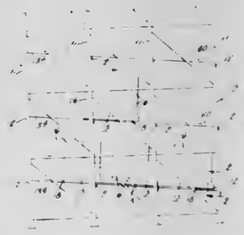


1. A friction clutch plate assembly comprising a hub, a web extending radially outwardly from said hub, two identical annular guiding plates, one said annular guiding plate on each side of said web, cross members interconnecting said annular plates, said annular plates being mounted for predetermined angular displacement relative to said web of said hub, a friction disc secured to a first of said annular plates through a plurality of passages at the outer periphery thereof and carrying friction linings at its periphery, a circumferential array of resilient means interposed between said web and said annular plates, and friction shoe means disposed between said web and the other of said annular plates being operative over at least a portion of the limited relative angular displacement thereof, means for securing said friction shoe means through passages in said other annular plate which are identical with said plurality of passages in said first annular plate.

4,234,069

VEHICLE SPEED CONTROL APPARATUS

Frederick G. Seiz, Telford, and Carl G. Seiz, Hatfield, both of Pa., assignors to Variable Control Systems, Inc., Telford, Pa.

Filed Sep. 7, 1979, Ser. No. 73,445
Int. Cl.[3] B65G *13/00*
U.S. Cl. 193—35 A **51 Claims**



1. Speed control apparatus for a vehicle comprising:
means providing a wheel housing,
at least one control wheel disposed in said housing,
means mounting said control wheel for rotation and axial motion about an axis,
said control wheel having an inner camming surface tapering radially and axially outward from said axis and having a braking surface spaced axially from said camming surface,
friction means carried by said housing for slidably engaging said braking surface as it rotates and for cooperating therewith to apply friction to said control wheel,
rail means engaging said camming surface for urging said braking surface of said one wheel axially outward against said friction means in response to a load, and
at least one reaction wheel carried by said housing for rotatably applying to said housing a reaction force opposite in direction to the outward axial force applied by said control wheel,
whereby the speed of the vehicle is controlled by causing the friction means to retard rotation of the wheel.

4,234,070

VENDING CONTROL APPARATUS

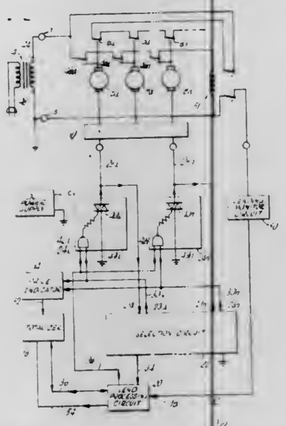
Frederic P. Heiman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.

Filed Oct. 18, 1977, Ser. No. 843,287
Int. Cl.[2] G07F *11/00*
U.S. Cl. 194—1 N **26 Claims**

1. A vending machine comprising a plurality of alternating current actuators, each individually controlled for the dispensing of a customer selected product;
a selection switch for activation by a customer in selecting the desired product;
an alternating current supply for the actuators, having a first output terminal connected to a common terminal;
selection circuit means responsive to a switch signal from the selection switch for generating a selection signal indicating the product category selected;
credit indicating means for producing a signal indicative of the credit to be accorded to the customer;
price indicating means responsive to the selection signal for

producing a signal indicative of the price of the customer selected product;

a calculating section responsive to the credit indicating means and the price indicating means for comparing the amount of customer credit with the price of the selected product and for generating a vend signal in appropriate response thereto;



a direct current power supply for the selection circuit means having one power output terminal connected to the common terminal; and

actuator control means responsive to the vend signal from the calculating section for activating the actuator corresponding to the selected produce to dispense the product, the actuator control means including an electronic power switch for activating the corresponding actuator by connecting the actuator to the common terminal.

4,234,071

DEVICE FOR CHECKING METAL PIECES, PARTICULARLY COINS

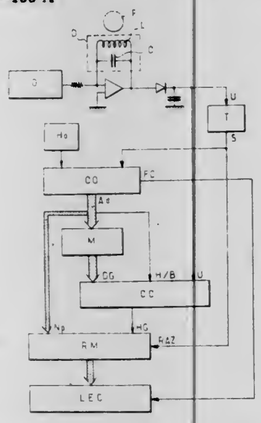
Son Le-Hong, Villebon sur Yvette, France, assignor to Compagnie de Signaux et d'Enterprises Electriques, Paris, France

Filed Nov. 2, 1978, Ser. No. 956,921

Claims priority, application France, Nov. 3, 1977, 77 33014

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **8 Claims**



1. A device for checking metal pieces, particularly coins, characterized in that it comprises, in combination an electromagnetic detector responsive to the passing of metal pieces and formed by a tank circuit fed from an alternating current generator of constant effective output, means for passing pieces adjacent to the detector, means for measuring at predetermined periods of time the voltage value at the detector as influenced by variations in the impedance of the tank circuit as a result of the passing of the pieces, and means for comparing the thus measured voltge values with one or more sets of programmed voltage values previously stored in a memory, each said set defining a time-dependent voltage profile characteristic of a detected known metal piece to determine whether or not each passing piece corresponds to one of the known pieces.

4,234,072

ELECTRONIC COIN TESTER WITH CONTROLLED MECHANICAL TESTING DEVICE

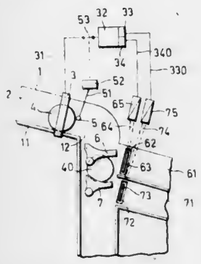
Georg J. Prümm, Koelner Strasse 235, 5275 Bergneustadt, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,302

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753691; Mar. 25, 1978, 2813061; Apr. 3, 1978, 2814258

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **9 Claims**



1. Coin testing apparatus for plural denominations of coins, characterized by the combination of

a. an electronic measuring and evaluating circuit monitoring a guide duct for coins,

(1) said circuit producing an output signal of defined duration and characteristic for a recognized genuine coin,

b. and a mechanically operating sorting device for distinguishing between genuine and nongenuine coins on the basis of an examination of the physical dimensions of the coins,

(1) one of said mechanically operating sorting devices being provided for each denomination of coin being accepted by said coin testing apparatus,

(2) said mechanically operating sorting devices being selectively energized electrically to perform its sorting function by the output of said electronic measuring and evaluating circuit on the basis of the denomination of coin recognized by said circuit.

4,234,073

AERIAL CONVEYOR SYSTEM

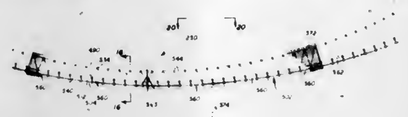
Charles R. Satterwhite, 5539 Harvest Hill, #1121, Dallas, Tex. 75230

Continuation-in-part of Ser. No. 620,929, Oct. 9, 1975, Pat. No. 4,101,019, which is a continuation of Ser. No. 413,537, Nov. 7, 1973, abandoned. This application Jul. 10, 1978, Ser. No. 923,394

The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.

Int. Cl.³ B65G *41/00*

U.S. Cl. 198—304 **19 Claims**



1. An aerial conveyor system, comprising:

a first cable extending from one end at a material receiving zone over an open area to another end at a material discharge zone;

a plurality of conveyor belt support rollers each positioned below and transverse to the first cable, said conveyor belt support rollers defining a course between the material receiving and discharge zones;

an endless conveyor belt supported substantially parallel to and beneath the first cable for movement around the course defined by the conveyor support rollers;

means for maintaining a predetermined minimum tension in the first cable;

means for mounting said support rollers in spaced apart relationship with at least one of the endmost support rollers being movable relative to the other endmost roller in the direction of conveyance for tensioning the conveyor belt;

means for adjustably supporting the conveyor belt support rollers from the first cable such that the support rollers may be raised and lowered relative to the first cable;

means for applying axially outwardly directed forces to opposite ends of the mounting means to urge the endmost rollers apart from each other; and

drive means including one of the endmost conveyor support rollers for driving the conveyor belt around the course.

4,234,074

APPARATUS FOR SEPARATING METAL CUTTINGS FROM LIQUID COOLANTS

William F. Martin, Tulsa, Okla., assignor to James A. Herring, Tulsa, Okla., a part interest

Filed Jun. 30, 1978, Ser. No. 920,658

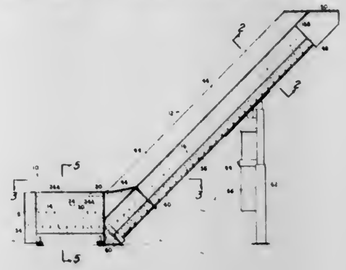
Int. Cl.³ B65G *33/14*; B03C *1/30*

U.S. Cl. 198—558 **8 Claims**

1. In an apparatus for conveying solid objects from a lower to a higher elevation having an upwardly inclined elongated housing having a solids discharge chute at the upper end and means at the lower end for receiving solid objects and having a rotatable auger in the upwardly inclined housing of external diameter slightly less than the diameter of the housing semi-circular bottom, an improved configuration of the housing whereby entangling solids, such as long machine cuttings, are more efficiently moved upward by the auger for deposit of the solids out through the discharge chute, the improvement comprising:

the housing being defined in cross-section by a semi-circular bottom of internal diameter slightly greater than the external diameter of said auger, the semi-circular bottom having opposed upper edges;

a horizontal ledge having one edge affixed to the one of said upper edges of said semi-circular bottom;



a first sidewall having the lower edge affixed to the other of said upper edges of said semi-circular bottom; and

a second sidewall having the lower edge affixed to the other edge of said horizontal ledge, the sidewalls being spaced apart, the top of said sidewalls being above said auger providing an area above said auger for moving solids through said housing.

4,234,075

APPARATUS FOR SEALING A CONNECTION BETWEEN TWO MUTUALLY SHIFTABLE COMPONENTS

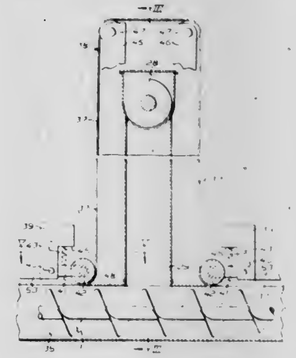
Karl A. L. Tingskog, Helsingborg, Sweden, assignor to AB Siwertell, Bjuv, Sweden

Filed Apr. 25, 1979, Ser. No. 33,642

Claims priority, application Sweden, Apr. 27, 1978, 7804841

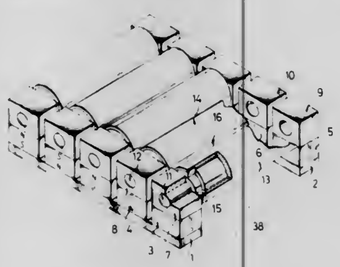
Int. Cl.³ B65G *15/22, 21/10*

U.S. Cl. 199—594 **11 Claims**



1. An apparatus for sealing a connection between a first conveyor and a second conveyor which has a housing with an elongate opening, one of said conveyors being movable relative to the other conveyor in the longitudinal direction of the elongate opening, said first conveyor including a connecting portion which communicates with said second conveyor, a lid device which seals the opening and is formed of a web of flexible material extending in the direction of the elongate opening, said web including a loop which extends around said connecting portion of the first conveyor, guide means connected to and movable with the first conveyor for successively lifting the web away from and laying the web down over the elongate opening in response to relative movement between the conveyors in the longitudinal direction of the elongate opening.

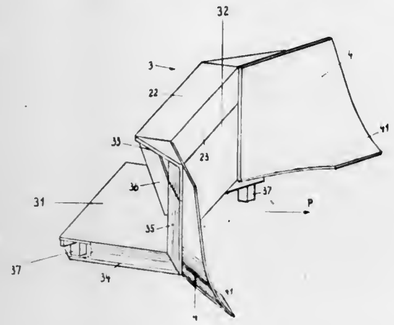
4,234,076
MAGNETIC ROLLER CONVEYOR
Heinrich Spodig, Netteberge 202, 4714 Selm-Bork, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 790,140, Apr. 22, 1977, abandoned. This application May 4, 1977, Ser. No. 793,866
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2617939
Int. Cl.[1] B65G *39/08*
U.S. Cl. 198—690 **21 Claims**



1. A magnetic roller conveyor for transporting magnetically conductive objects, comprising at least two magnetically conductive roller elements each having an axis, each of said roller elements having a first end portion and a second end portion axially spaced from one another; and a magnetic system for polarizing said roller elements including at least a first pair of magnetic elements located adjacent and magnetically connected with each other and to said first end portions of the respective roller elements, and at least a second pair of magnetic elements located adjacent to and magnetically connected with each other and to said second end portions of the respective roller elements, the magnetic elements of each of the pairs being differently polarized with respect to each other, and the magnetic elements of each of said first and said second end portions of the respective roller element being identically polarized with respect to each other, so that said two roller elements and said first and said second pairs of said magnetic elements together form a closed magnetic path; a first magnetically conductive guide member supporting and magnetically connecting with each other the magnetic elements of said first pair, and a second magnetically conductive guide member supporting and magnetically connecting with each other the magnetic elements of said second pair; and at least two magnetically conductive shafts each defining said axis and magnetically connected with the respective roller and the two magnetic elements connected to the end portions of the latter, each of said shafts having two end sections axially spaced from each other, and each of said magnetic elements having one portion supported by the respective guide member and the other portion spaced from said supporting portion, said other portion of said magnetic element being provided with a pole shoe formed as a bearing for the respective end sections of the respective shaft.

4,234,077
EQUIPMENT FOR REMOVING BULK MATERIAL FROM A DUMP
Heinz Berthold, St. Ingbert-Rohrbach, and Karl E. Zimmer, Eiweiler, both of Fed. Rep. of Germany, assignors to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Koln-Zollstock, Fed. Rep. of Germany
Filed Nov. 16, 1978, Ser. No. 961,094
Int. Cl.[1] B65G *17/36*
U.S. Cl. 198—712 **10 Claims**

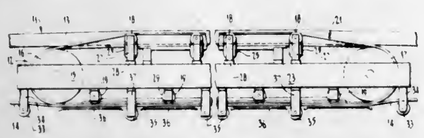
1. A conveyor for removing bulk material from a base portion of an end face of a dump, comprising:
two horizontally spaced apart, parallel endless roller chains forming substantially horizontal upper and lower courses;
drive means for revolving said chains to move in a predetermined horizontal direction of travel along said lower courses; and
a plurality of adjacent carrying elements each comprising a frame which extends transversely between and is connected to each of said endless chains, and a bottom which extends substantially horizontally from the lower end of



said frame in the opposite direction to said predetermined direction of travel, said carrying elements being constructed and arranged to permit free passage of bulk material laterally into carrying spaces each defined by the frame of a first carrying element and the bottom of an adjacent carrying element

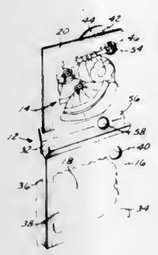
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4,234,078
CONVEYOR BELT DRIVE APPARATUS
Frank J. Nott, 14 Garnet Leary Ave., Black Rock, Victoria, Australia
Filed May 25, 1978, Ser. No. 909,599
Claims priority, application Australia, Jun. 14, 1977, PD0432
Int. Cl.[1] B65G *23/14*
U.S. Cl. 198—833 **9 Claims**



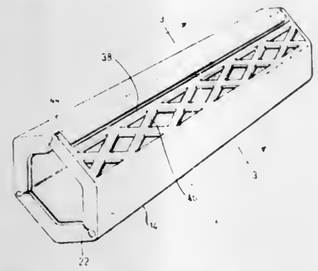
1. Conveyor belt drive apparatus comprising:
an endless flexible traction belt supported in an endless loop and formed of flat belting provided with
(a) longitudinal and transverse ribs standing out from the outer face of the belt and so as to define between them facial pockets occupying a major part of the outer facial area of the belt,
(b) a series of abutments disposed so that a plurality of said abutments stand out from the floor of each pocket, the outer surfaces of the abutments and the outer edge surfaces of the longitudinal and transverse ribs being substantially flush with one another throughout the length of the belt, and
(c) a series of openings spaced longitudinally of the belt and extending transversely through the belt from the inner face of the endless loop to communicate with said pockets;
traction belt drive means to drive traction belt around said endless loop; and
suction means to apply suction to the openings of the traction belt at the inner face of the traction belt as those openings transverse part of the loop whereby to create suction in the associated pockets.

4,234,079
PACKAGING FOR TOY ARTICLES AND THE LIKE
Michiko Otake, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jun. 22, 1979, Ser. No. 51,004
Int. Cl.[1] B65D *25/00*
U.S. Cl. 206—45.34 **2 Claims**



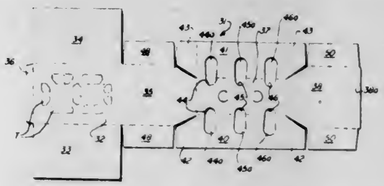
1. In combination a toy doll dress and a package for the toy doll dress, the package comprising:
a substantially flat support member to which the doll dress is fastened;
a packing member having an enclosure adapted to receive the support member and the doll dress, the packing member having a top panel including a transparent member for viewing the doll dress;
a display member rotatably mounted to the support member, the display member having a plurality of illustrations of a doll wearing the doll dress, and
means for selectively exposing to view only a single illustration selected by a viewer at his option, the means including an aperture incorporated in the support member and a cut-away portion of the packing member, the display member being accessible in the cut-away portion for manipulation by a viewer, and the aperture being configured to expose for view only a single selected illustration.

4,234,080
COLLAPSIBLE CONTAINER
Jobst U. Gellert, 11 Newton Rd., Brampton, Ontario, Canada
Filed May 14, 1979, Ser. No. 38,671
Int. Cl.[1] A45C *11/00*; B65D *11/20*
U.S. Cl. 206—0.82 **10 Claims**



1. A manually closable and openable elongated container having first and second ends for holding coins and the like thereinbetween comprising:
(a) a sheet of molded material having first and second parallel side edges and first and second end edges extending between said side edges in respective parallel planes extending substantially perpendicularly to said side edges, the sheet being divided into at least three segments by at least two hinge means running between the end edges of the sheet substantially parallel to the side edges, said segments having a V-shaped cross-section in the open position and the container has a regular polygonal cross-section in the closed position,
(b) releasable engagement means located along the first and second side edges for engaging the side edges when the sheet is bent about the at least two hinge means whereby a container in a releasably closed position is formed, and
(c) ledge means extending inwardly from at least a portion of each of the first and second end edges to form at least partial covers over the ends of the container when in the closed position.

4,234,081
CARRIER FOR A PLURALITY OF ARTICLES
Charles L. Champlin, Rittman, Ohio, assignor to Packaging Corporation of America, Evanston, Ill.
Filed Apr. 30, 1979, Ser. No. 34,332
Int. Cl.[1] B65D *75/04, 75/28*
U.S. Cl. 206—147 **19 Claims**



1. A carrier for foldable sheet material for accommodating a plurality of necked articles arranged in side-by-side relation to form at least one row, said carrier comprising an elongated base panel for subtending and supporting the row of accommodated articles and having opposed first peripheral portions and opposed second peripheral portions; end panels extending upwardly from said opposed first peripheral portions of said base panel, each end panel being positionable adjacent an end article of a row; an elongated top panel interconnecting the upper edge portions of the end panels and disposed in spaced substantially parallel relation with respect to said base panel, said top panel having spaced elongated peripheral portions with engaging means adapted to be in neck-engaging relation with the accommodated articles; upright elongated side panels extending upwardly a distance from said opposed second peripheral portions of said base panel for concealing substantial exterior portions of the accommodated articles, each side panel having an elongated upper edge spaced outwardly and downwardly from the neck-engaging peripheral portions of said top panel; means interconnecting adjacent edge portions of said end and side panels and affecting retention of said panels in predetermined upright angular relation; and a reinforcing member foldably connected to and depending from said top panel peripheral portions and being at least partially positioned under said top panel and intermediate said end panels, said reinforcing member coacting with said top and side panels to form elongated open side spaces for permitting selective axial removal of the articles from said carrier without permanent deformation to said top panel and said reinforcing member.

4,234,082
TWO-WAY CONTAINER PACKAGE
John R. Platt, Wheaton, and Edward L. Benno, Grayslake, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 19, 1979, Ser. No. 31,565
Int. Cl.[1] B65D *77/00*
U.S. Cl. 206—150 **3 Claims**

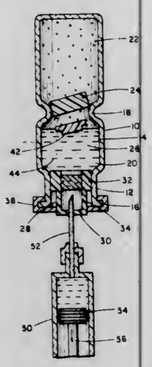
1. In a carrier package for containers or the like which includes features permitting the formation of a secondary package of said containers when their contents have been removed, the combination of a plurality of containers and a carrier device retaining said containers in a primary package configuration relative to each other, a plastic bag having a

volume capacity not less than the total volume of said plurality of containers and of internal dimension sufficient to accept and retain all of said plurality of containers and to permit said bag to be closed with said plurality of containers retained therein, and said plastic bag in an empty collapsed condition releasably



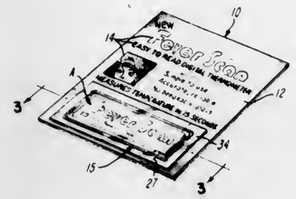
carried in said primary package, said carrier is provided with a pair of spaced finger hole means, said plastic bag being collapsed into a narrow and elongated configuration with each longitudinal extremity thereof being inserted into an associated finger hole.

4,234,083
MIXING AND FILTERING VIAL
Milton J. Cohen, 10823 Burbank Dr., Potomac, Md. 20854
Filed Nov. 13, 1979, Ser. No. 93,759
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—221 **6 Claims**



1. A device for packaging at least two materials which are to be maintained in a separated relation until admixed immediately prior to removal, one of the materials being in a liquid phase, comprising a vial open at one end and having an intermediate restricted portion, a sealing member secured in sealing relation across the restricted portion to sub-divide the vial into an upper compartment in communication with the open end and a lower compartment, with the material in the liquid phase disposed in the upper compartment and with the other material in the lower compartment, a tubular member open at the bottom and closed at the top, said tubular member into the open end portion of the vial to seal the vial with a portion of the tubular member projecting beyond the open end of the vial, a filter member disposed within the tubular member for filtering fluids passing through the tubular member, and a stopper seated in the open end of the tubular member.

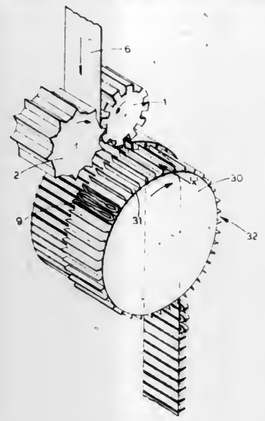
4,234,084
COMBINED DISPLAY PACKAGE AND ARTICLE STORAGE CASE
James E. Hutten, Mason, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio
Filed May 7, 1979, Ser. No. 36,573
Int. Cl.³ ~~A61B 19/02~~; B65D *25/22, 75/36, 75/58*
U.S. Cl. 206—306 **11 Claims**



1. A package system adapted for shipping and displaying an article and for providing a reusable storage case for the article, comprising a backing panel of card-like sheet material adapted to be printed, a first sheet of flexible material substantially smaller than said backing panel, a second sheet of flexible material substantially smaller than said backing panel, means connecting said first and second sheets to form a flexible case defining a pocket for receiving the article, at least one of said first and second sheets extending beyond said case and forming a border portion extending around said pocket, means for positively securing said border portion to said backing panel around said pocket, means defining a line of weakening extending around said pocket between said border portion and said means connecting said first and second sheets and providing for manually peeling said case from said border portion and said backing card after the package and article have been purchased, and means defining an opening within said case after said case is removed from said backing card to provide for conveniently removing and reinserting the article into said pocket.

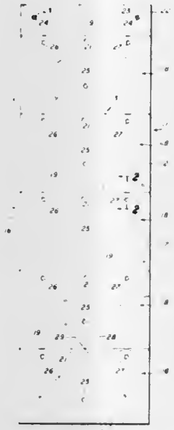
4,234,085
CLIP STORAGE
John D. Baker, Trafagar House, 11, Waterloo Place, London, England
Continuation of Ser. No. 795,919, May 11, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,345
Int. Cl.² F16B *2/20*
U.S. Cl. 206—337 **2 Claims**

1. A flexible carrier tape for resilient clips, said tape comprising a plurality of generally inverted V-shaped pleats extending transversely along the length of said tape and terminating at the edges thereof, and a respective clip on each one of said plurality of pleats, each of said clips comprising a generally U-shaped spring clip having transversely extending arms in facing relationship to each other and a bight portion connecting said arms, each of said clips being positioned on a respective one of said pleats with the arms thereof extending along



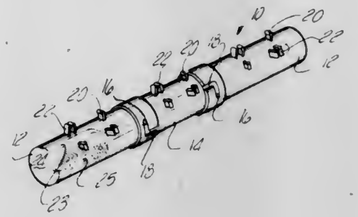
opposite sides of said pleat and with said bight portion extending about an end edge of the associated pleat.

4,234,086
APPARATUS FOR HANDLING SOILED SURGICAL SPONGES
Howard E. Dorton, 108 E. Maxwell St., Lexington, Ky. 40508
Continuation-in-part of Ser. No. 31,839, Apr. 20, 1979, abandoned. This application Oct. 2, 1979, Ser. No. 81,172
Int. Cl.³ B65D *30/22, 33/02, 33/14, 85/00*
U.S. Cl. 206—362 **5 Claims**



1. In an apparatus for handling soiled surgical sponges comprising a plurality of flexible plastic bags arranged in a flat strip and having front and rear panels, open mouths at their tops, and closed bottoms and sides, the improvement which comprises three connections between the front and rear panels of each bag, the first connection being located in the central, lower region of the bag and being easily rupturable, and the other two connections being located in the upper region of the bag at opposite sides of the center of the bag.

4,234,087
COMBINATION TOOTHBRUSH CARRIER AND HOLDER
Zoltan I. Pandak, 53054 Dryden, Utica, Mich. 48087
Filed Feb. 27, 1979, Ser. No. 15,715
Int. Cl.³ B65D *85/00*
U.S. Cl. 206—362.2 **11 Claims**



1. A combination toothbrush container and stand comprising:

an elongated housing comprising:

a first cylindrical tubular portion having a reduced outer diameter portion at one end; a first internal diameter portion at the opposite end; a central outer diameter and a central portion therebetween with a central cylindrical passage therethrough;

a second cylindrical tubular portion having one end with an internal diameter portion adapted to receive the reduced outer diameter portion of said one end of the first cylindrical tubular portion; an opposite end with a second internal diameter portion; a central outer diameter portion therebetween; and a central cylindrical passage therethrough such that said first and second cylindrical tubular portions are joined together by mounting said reduced outer diameter portion of said first cylindrical member into said internal diameter portion on said one end of the second cylindrical tubular portion to form said housing;

a first cap member mounted into said first internal diameter portion at said opposite end of the first cylindrical tubular portion such that said first cap member closes said opposite end of the central cylindrical passage of the first cylindrical tubular portion;

a second cap member mounted into said second internal diameter portion at said opposite end of the second cylindrical tubular portion such that said second cap member closes said opposite end of the central cylindrical passage of the second cylindrical tubular portion and thereby provide a closed container for housing a toothbrush;

a first coupling member mounted to the central outer diameter portion of one of said cylindrical tubular portions; and

a second coupling member mounted to the central outer diameter portion of the other of said cylindrical tubular portions such that when it is desirous to utilize the toothbrush within said container said first and second cylindrical tubular portions of the housing are separated at said one end and said first coupling member is joined to said second coupling member, with said one end of each of said first and second cylindrical tubular portions oriented in an upright direction, thereby providing an upright stand to support the toothbrush to permit drying of the toothbrush in a free air stream after use.

4,234,088
FABRIC HANGER
Irving M. Berkowitz, 500 E. 85 St., New York, N.Y. 10028
Filed May 26, 1978, Ser. No. 909,905
Int. Cl.[3] B65D *85/66*
U.S. Cl. 206—408 24 Claims



1. A fabric hanger for carrying piece length fabric in a pendant roll comprising a support assembly and a hanger assembly removably supported thereon, said hanger assembly having a center point;

said support assembly comprising a base portion, a substantially flat main body portion connected at one end thereof to said base portion and supported therefrom in an upstanding position, said main body portion having substantially longitudinally extending spaced apart edges forming a core for said roll of fabric and said edges being disposed opposite to each other a substantial distance from said hanger assembly center point means at an end of said main body portion opposite said base portion for removably supporting said hanger assembly;

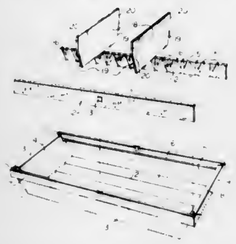
said hanger assembly comprising a main support member, and means carried by said main support member from which fabric may be hung;

attachment means carried by said hanger assembly for supporting said main support member in generally horizontal disposition; and

anchoring means releaseably securing a selvedge of the fabric carried on said support assembly proximate the base portion of said support assembly.

4,234,089
MICROFICHE TRAY
Royden B. Morris, 940 11th Ave. SW., Calgary, Alberta, Canada
Filed Jan. 25, 1979, Ser. No. 6,807
Claims priority, application Canada, Jan. 26, 1978, 295745
Int. Cl.[3] B65D *85/48*
U.S. Cl. 206—456 4 Claims

1. A tray for microfiche cards or other flat articles comprising a bottom wall; side and end walls substantially at right angles to each other extending upwardly from said bottom wall, each of said side walls including a lower portion, an upper portion, and a substantially horizontal shoulder extending outwardly of said side wall at said upper portion, the tray being wider between said upper portions than between said lower portions of the side walls; a side bar for removable mounting on said shoulder on each side of the tray; retaining means for releasably retaining said side bars on said shoulder on each side of said tray; and a plurality of vertical and inclined slots on the interior surface of each side bar for receiving and retaining partitions extending between the sides of the tray,



whereby the partitions can be vertically positioned in parallel relationship to each other or inclined relative to each other.

4,234,090
MARKER SLEEVE ASSEMBLY
Joseph C. Barbieri, Cedarburg, and Gary J. Wirth, Milwaukee, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.
Filed Dec. 26, 1978, Ser. No. 972,662
Int. Cl.[3] B65D *73/00*
U.S. Cl. 206—459 2 Claims



1. A marker sleeve assembly comprising:

(a) a plurality of individual marker sleeves each having an outer wall which defines a hollow generally tubular body which is to be positioned about an article; and

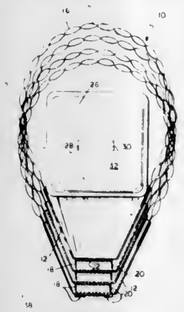
(b) a connecting member joined to the outer wall of each of the marker sleeves and extending longitudinally thereof, the connecting member being formed integrally with the marker sleeves,

(c) a longitudinally extending slit formed in the connecting member closely adjacent each marker sleeve, the slit extending partly through the connecting member, and

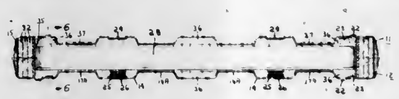
(d) each marker sleeve in the assembly being individually removable from the connecting member along the slit for application to an object while other marker sleeves in the assembly remain joined thereto.

4,234,091
NESTED CONTAINER AND BASE CONNECTION
Roderic M. Koch, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.
Filed Oct. 10, 1978, Ser. No. 949,458
Int. Cl.[3] B65D *21/02*; A01G *9/02*
U.S. Cl. 206—499 3 Claims

1. An upwardly opening container having a shape adaptable for stacking the container within containers of similar construction which includes a lower portion terminating with a centrally-located generally flat and horizontally extending bottom, a downwardly opening base having a shape adaptable for nesting a plurality of said bases within said container when unattached to said container which includes an upper portion terminating with a centrally-located generally flat and horizontally extending top upon which the container rests and a lower portion having an outer perimetral edge generally parallel to said horizontal top of said upper portion, said upper and lower portions of said base being smoothly rounded for nesting, and means for connecting said container to said base with said bottom resting on said top, said top of said base being provided with apertures and said bottom of said container being provided with downwardly extending protrusions insertable through said apertures, the connecting means including said protrusions, said extending protrusions providing spacers for nesting said container.



4,234,092
CONTAINER
Edwin Axel, 8707 Carlisle Rd., Wyndmoor, Pa. 19118
Filed Apr. 17, 1978, Ser. No. 897,770
Int. Cl.[3] B65D *81/02*, *85/30*
U.S. Cl. 206—523 14 Claims



1. A protective container for holding an object to be protected from damaging impact, comprising in combination,

(a) a hollow top section

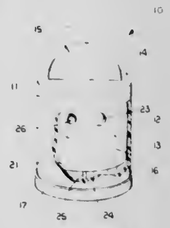
(b) a hollow bottom section comprising a pair of colinearly spaced apart pan shaped end sections each having a base wall and end and side walls and at least one pan shaped central section colinear with said end sections, each end section being joined to said at least one central section by a generally U-shaped trough section, said at least one central section and trough sections each having a base wall and side walls and the pan sections walls being absent at the junctures with the trough sections so that said bottom section is open from one end wall to the other between the side walls, the base walls of at least said end sections being coplanar at a first level and the base walls of said trough sections being coplanar at a second and higher level, whereby when said bottom section is seated flatwise on an underlying surface there exists a vertical clearance between the surface and the base walls of said trough sections,

(c) shock absorbing means secured within said bottom section to which the object to be protected is securable in a free floating position,

(d) shock-absorbing end structures at opposite ends of and within said container positioned to closely face each end of the object to be protected, and

(e) means for fixedly securing said top and bottom sections together to form an enclosing protective shell.

4,234,093
PILL DISPENSER WITH SAFETY FEATURES
Raymond K. Tyson, 406 N. Carr Rd., Plainfield, Ind. 46168
Filed May 21, 1979, Ser. No. 40,896
Int. Cl.[3] B65D *83/04*, *85/56*
U.S. Cl. 206—536 10 Claims



1. A safety container for containing and dispensing particulate matter such as pills and the like, said container comprising:

(a) An exterior member including an end wall, and including a cylindrical side wall defining an exterior side wall aperture;

(b) an interior member including a cylindrical side wall defining an interior side wall aperture, the cylindrical side wall of said interior member being concentric with an slidably engaged in both a longitudinal and a transverse direction with the cylindrical side wall of said exterior member such that said two apertures can be registered with each other, said interior member further including an end wall which is oppositely disposed to the end wall of said exterior member;

(c) grasping means for slidably moving said interior member with respect to said exterior member, said grasping means including a first projection from the end wall of said interior member, and a second projection from the end wall of said exterior member;

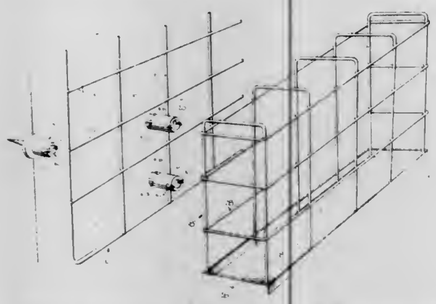
(d) means for preventing said container from being set down when said two apertures are in registration, said means including said first projection being dimensioned such that the placement of said container on a flat horizontal surface, with said container resting upon said first projection and said exterior member, is prevented without said container tipping over, said means further including said second projection extending beyond the side wall of said exterior member when said apertures are in registration, to prevent, in combination with said first projection, said container from being placed in an upright position upon a flat horizontal surface without said container tipping over; and

(e) in which said interior member is slidably movable to a fully closed position in which said second projection is fully contained within a recess defined by said side wall of said exterior member.

4,234,094
GRIDWORKS STORAGE SYSTEM
Carsten Jorgensen, Koge, Denmark, assignor to Copco, Inc., New York, N.Y.
Filed Feb. 27, 1979, Ser. No. 15,581
Int. Cl.[3] A47F *5/01*, *5/08*
U.S. Cl. 211—88 9 Claims

1. A gridworks storage system for a kitchen or other area requiring a wall-mounted storage facility for utensils and other items, the system including at least one grid module formed by a network of intersecting round wires, and a set of brackets to attach said module to a wall, each bracket having a pedestal which lies against the wall and a hollow column formed of resilient material projecting outwardly from the pedestal, said pedestal having a central bore therein to receive a mounting screw or anchor bolt for insertion in the wall, said column

having a split head to define a pair of diametrically-opposed key-hole slots whose inlets have a normal width smaller than the diameter of said wires and whose circular sockets have a



diameter substantially matching the wire diameter, the inlets being dilatable to permit a grid wire at an attachment point to be forced into and locked within said slots.

4,234,095

COLLECTION CONTAINER FOR STERILE LIQUIDS

Albert Saflanoff, Rancho Palos Verdes, Calif., assignor to Alpha Therapeutic Corporation, South Pasadena, Calif.

Filed Feb. 21, 1979, Ser. No. 13,446
Int. Cl.³ B65D *41/20*
U.S. Cl. 215—232 **14 Claims**



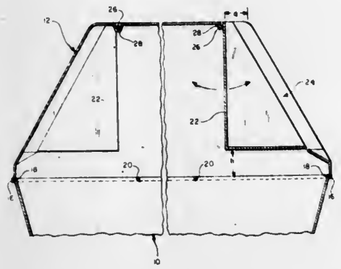
1. A collection container for sterile liquids comprising:
an elongated tapering hollow body of clear thermoplastic material, having a neck portion at an upper end, said neck portion terminating in an opening into the container;
a flat disc-shaped closure fixedly locked to the opening with a sterile liquid tight connection to maintain the interior of the container sterile, said closure having at least one hollow sleeve depending therefrom and extending interiorly of the neck portion for receiving and securely mounting a hollow tube inserted therein to conduct liquid to the interior of the container,
a permanent puncturable seal closing the hollow sleeve at the point of juncture of the sleeve and the closure, and;
filtered venting means formed into the closure communicating between the interior and exterior of the container.

4,234,096

COVER FOR WASTE CONTAINER

Claude Hergaux, 6 & 8 Rue de l'Avenir, 76120 LeGrand Quevilly, France

Filed May 7, 1979, Ser. No. 36,581
Claims priority, application France, Jul. 24, 1978, 78 22065
Int. Cl.³ B65D *23/00, 43/14, 51/04*
U.S. Cl. 220—1 T **5 Claims**



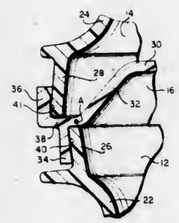
1. A cover for a storage and transport container of waste material, comprising a body having a truncated pyramidal shape provided with a center of symmetry and a pair of perpendicular axes of symmetry passing through said center, said body being closed on its top and open at its base, the base being square, at least one side of said body being provided with an opening for introduction of waste, a door mounted within said opening, said door being formed as an L-shaped member, the long leg of which is pivotably secured at its free end to the top of said body and the short leg of which extends outwardly of said opening, said L-shaped member having a center of gravity acting to maintain said longer leg vertical in the absence of a load thereon, whereby said door is biased in normally closed position with respect to said opening and swingable under a load into an open position with respect to said opening.

4,234,097

SERVING PLATE SET OR THE LIKE

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 733,563, Oct. 18, 1976, abandoned. This application Dec. 10, 1979, Ser. No. 102,060
Int. Cl.³ B65D *21/02, 1/26, 43/08*
U.S. Cl. 220—4 D **1 Claim**



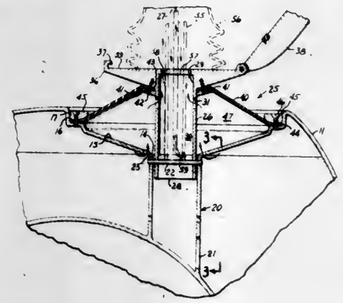
1. A plate set comprising a first plate having a bottom wall and upstanding peripheral walls terminating at an upper edge, a seal plate having a top wall and integral downwardly extending peripheral walls terminating at a lower edge, a flange integral with and extending outwardly from said lower edge, a first rim wall integral with and extending downwardly from said flange, and a second rim wall integral with and extending upwardly from said flange, and slightly offset from said first rim wall, said upper edge having an outer diameter greater than an inner diameter of an inner face of said first rim wall, the upper edge of the first plate being engaged in a liquid tight seal against the inner face of said first rim wall, said first plate and said seal plate being separable from each other and adapted to container consumables when the first plate and the seal plate are sealed together and a second plate having a bottom wall and upstanding peripheral walls terminating at a second upper edge which edge is in engagement with an inner face of said second rim said engaged upper edge and inner face providing a bending moment force for providing a liquid seal between the inner face of said second upper rim wall and said second upper edge.

4,234,098

FUEL TANK FILL PORT EXTENSION

Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif., assignors to Yamaha Motor Corporation, U.S.A., Cypress, Calif.

Filed Mar. 15, 1979, Ser. No. 20,715
Int. Cl.³ B65B *3/00*
U.S. Cl. 220—86 R **19 Claims**



1. In combination: a fuel tank having a wall and a fill port through said wall; and an extension comprising a tube having an axis, an innermost end, and an outermost end, said tube being axially movable in said fill port, with its innermost end inside the fuel tank, its outermost end outside the fuel tank and adapted to be closed by a closure, and a peripheral flexible diaphragm having an inner and an outer periphery, said diaphragm being imperforate between said peripheries, the outer periphery being sealingly attached to said wall, the inner periphery being sealingly attached to said tube adjacent to its outermost end, whereby to make a fluid sealing barrier between said tank and said tube to prevent escape of fluid from said fill port except through said tube, said diaphragm being constructed so as to flex to enable the tube to move axially from a retracted to an extended position relative to said fill port.

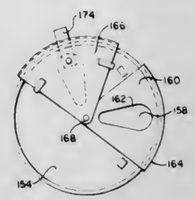
4,234,099

CONTAINER WITH ATTACHED PULL TAB OPENING

Richard E. Tarro, 425 Broadway, Providence, R.I. 02909

Continuation-in-part of Ser. No. 422,265, Dec. 6, 1973, abandoned, and a continuation-in-part of Ser. No. 603,590, Aug. 11, 1975, Pat. No. 4,008,823. This application Sep. 7, 1978, Ser. No. 940,354
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **18 Claims**

1. A pull tab opener device for a container having a metal top comprising a scored portion outlining the opening of a generally oval shape aligning axially with a radius of the top, a pull tab attached to said scored portion adjacent the outer end thereof, means for pivotally attaching said scored portion to the top including a plastic strip having one end pivotally attached to the container top, the other end of said strip being bonded to the inner end of said scored portion, and means for returning said scored portion into the container opening to reclose the opening, said means comprising a thick portion at said scored portion formed by the thickness of said metal and
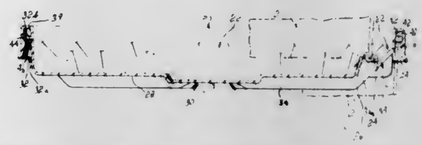


of said plastic to allow said scored portion to be snapped back into the opening to reclose the container.

4,234,100

CONTAINER LID HAVING VENTING MEANS

Jean-Marie Chabot, St. Damien Bellechasse, Canada, assignor to Les Industries Proclaciales Ltee, St. Damien Bellechasse, Canada

Filed Jun. 8, 1979, Ser. No. 46,720
Claims priority, application Canada, May 25, 1979, 328350
Int. Cl.³ B65D *41/16, 43/05, 55/00*
U.S. Cl. 220—306 **8 Claims**



1. A container lid for packaging principally air contaminative products comprising: a generally circular body having a main central portion and a downwardly extending peripheral lip portion adapted to snap over and engage the top rim portion of a container in sealed relationship; said main central portion including a top face and an underface, and terminating at the periphery thereof with an upstanding side wall contiguous with said lip portion, said side wall including an upper peripheral portion inwardly spaced from and defining with said lip portion a rim-receiving portion for said container; said side wall having a lower peripheral portion provided with a series of radially inward and circumferentially spaced cavities opening in said underface so that air and fluid filling said container may be expelled from said container even after said lower peripheral portion has come into engagement with the rim portion of said container; as said container lid is further pressed down into said container, the upper peripheral portion of said side wall sealingly engages the rim portion of said container.

4,234,101

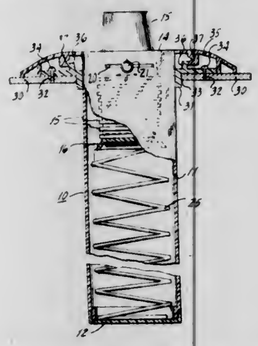
CUP DISPENSER EMPLOYING UNIVERSAL ADJUSTMENT APPARATUS

Ronald Pastore, Bedford, N.Y., assignor to Cal Pak Industries, Inc., Stanford, Conn.

Filed Jul. 13, 1979, Ser. No. 57,351
Int. Cl.³ A47F *1/06*
U.S. Cl. 221—241 **9 Claims**

1. A cup dispenser apparatus employing universal adjustment means, comprising:
(a) a longitudinal tubular housing capable of accommodating a stack of cups to be dispensed,
(b) a rotatable cam ring coupled within the hollow of said housing, said ring having a plurality of cam surfaces about the periphery,
(c) a plurality of flexible arms having a first end coupled to

said housing on said internal wall and a second end coacting with one associated cam surface on one side and for coacting with a cup surface on said opposite side, each of said arms including a flexible central portion having said first end coupled to said housing and a second end top portion having an aperture, an elastomeric member secured within said aperture and having a first central flat region with a top sloping portion, with said central region



of said member adapted to coact with a plurality of said cups in said stack, with said sloped portion responsive to the removal of said first cup to cause said central region to exert a force on stacked cups below said first cup in a direction to tend to retain said cups within said housing,

(d) means coupled to said ring for rotating the same and hence, moving said flexible arms into contact with a cup to be dispensed for retaining said cup within said housing and permitting selective withdrawl of the same by a user.

4,234,102

APPARATUS FOR MEASURING AND DISPENSING CONSTANT WEIGHT PORTIONS OF MATERIAL

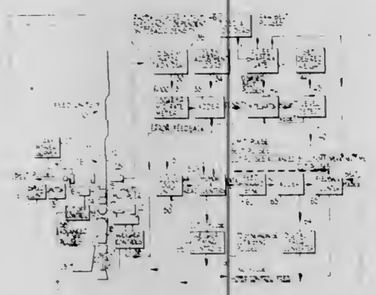
Peter J. C. Spurgeon, Andover, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 22, 1979, Ser. No. 969,605

Claims priority, application United Kingdom, Dec. 16, 1977, 52462/77

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—55 **11 Claims**



1. Apparatus for dispensing material in portions of predetermined weight from a stream of said material of irregular density, comprising:

feed means for feeding material through a measuring region;

variable speed driving means coupled to said feed means;

density determining means for continuously measuring the density of material passing through said measuring region;

speed control means for controlling the speed of said driving means to compensate for variation in the measured density of the material to provide discharge of the portions of predetermined weight from said feed means at regulatly spaced time intervals;

signal generator means for producing a signal representing the speed of travel of said feed means; weight determining means for producing a signal indicative of weight in dependence on the outputs of the density determining means and the speed signal generator means; comparator means for comparing the weight of the portions to provide a position signal representing the position of separation of said portions; separator means positioned adjacent the discharge end of said measuring region for effecting separation of said portions in sequence as they arrive at the separation position; and delay means for producing a delayed output under the control of the position signal to actuate said separation means at the moment the appropriate portion arrives at the separation position;

said speed control means including an error detector for determining ay time error between the actuation of said separator means and the presence of receiving means at the measuring region to provide additional speed control of the driving means in dependence on the error detected.

4,234,103

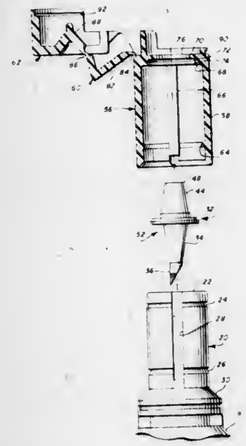
DIAGNOSTIC REAGENT DISPENSING BOTTLE

Frederick P. Strobl, Jr., Cary, Ill.; David A. Winchell, Twin Lakes, Wis., and William A. DeVroom, Crystal Lake, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 31, 1978, Ser. No. 892,346

Int. Cl.³ B67B *7/26*

U.S. Cl. 222—83.5 **1 Claim**



1. A dispensing bottle for accurately and controllably dispensing droplets of a liquid, said dispensing bottle comprising:

(a) a container for holding the liquid which has a flexible containing base portion and an elongated neck extending from said base portion, said neck having a top wall which includes a piercable membrane, and said neck also having cap-positioning-and-guiding means associated therewith, which means includes upper detent means positioned adjacent the top wall of the neck and lower detent means positioned between the base portion and said upper detent means;

(b) spike means having a lower section for piercing said membrane, an upper section which defines a nozzle for accurately and controllably dispensing of droplets of liquid, the nozzle having a conical surface defining an included angle between about 70°-85°, and a fluid passage extending between the upper and lower sections of said spike means, so as to permit liquid flow from said container to said nozzle; and

(c) a cap, which is a separate member from said spike means but carrying said spike means and having (1) a body portion which includes cap-positioning-and-guiding means for cooperation with said cap-positioning-and-guiding means on said neck, in positioning spike means relative to said piercable membrane and for releasably positioning said spike means in a non-piercing shipment position and securely positioning said spike means in a piercing dispensing position, said positioning-and-guiding means on the neck including a pair of diametrically opposed and longitudinally extending guide slots in the surface thereof and the positioning-and-guiding means on the cap including a pair of longitudinally extending guide ribs adapted for sliding cooperation with said guide slots to guide the cap substantially longitudinally as said cap is thrust downwardly, said cap-positioning-and-guiding means of said cap body portion including a single detent engaging rib for cooperation with both said upper and lower detent means so that when the rib engages the upper detent means, the spike is positioned in the non-piercing shipment position and when the rib engages the lower detent means, the spike extends through the piercable membrane and sealingly engages said membrane, (2) cover means for closing said dispensing bottle when not in use, said cover means including sealing means constructed for insertion into said nozzle to prevent dispensing of liquid therethrough when said cover means is closed, and (3) hinge means associated with said body portion and said cover means for selectively maintaining said cover means either in an open or a closed position.

4,234,104

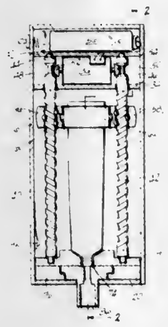
TOOTHPASTE DISPENSER HAVING A SLIP CLUTCH DRIVE MECHANISM

Louis J. Apuzzo, Jr., 52 Fairfield St., New Haven, Conn. 06515, and Frank Acquarulo, Jr., 87 Lenox St., East Haven, Conn. 06512

Filed Jun. 2, 1978, Ser. No. 911,816

Int. Cl.³ B65D *35/28*

U.S. Cl. 222—94 **2 Claims**



1. An apparatus for dispensing toothpaste from a collapsible toothpaste tube onto a toothbrush which comprises:

a housing;

battery powered motor means located within said housing;

means for powering said motor means located within said housing;

output shaft means directly associated with said motor means;

threaded shaft means positioned within said housing;

coupling means directly associated with and integral with said motor output shaft means and said threaded shaft means so as to rotate said threaded shaft means upon rotation of said output shaft means, said coupling means comprising a wheel means on said output shaft means which frictionally engages groove means on said threaded shaft means so as to drive said threaded shaft means and allow for slipping between said wheel means and said groove means in the event of excessive load on said threaded shaft means;

roller means associated with said shaft means so as to move on said shaft means as said shaft means rotates;

outlet means associated with said housing through which said toothpaste from said collapsible tube is expelled;

closure member provided with a through bore positioned beneath said outlet means and reciprocally movable across said outlet means between a first position where said outlet is closed to a second position where said through bore communicates with said outlet means so that said outlet is opened, said closure member further including an extension which lies in a plane substantially perpendicular to the axis of movement of said closure member, said extension being provided with a recess;

first switch means associated with said motor means for actuating said motor means by said power means so as to rotate said shaft means;

a toothbrush received in said recess for moving said closure member from said first position to said second position wherein said closure member directly engages said first switch means so as to actuate said motor means such that said roller means moves on said shaft means and said toothpaste is applied to said toothbrush;

second switch means associated with said motor means for reversing the polarity of said motor means so as to selectively rotate said shaft means in a clockwise and counterclockwise manner upon actuation of said motor means such that said roller means moves in a first direction and a second direction on said shaft means;

third switch means associated with said power means and actuated by said roller means for actuating light indicating means when said roller means has moved in said first direction so as to completely dispense the contents of said collapsible tube; and

further including a baffle wall positioned above said closure member and defining with said housing a chamber in which said closure member reciprocates, said through bore prevents accumulation of toothpaste in said chamber, said baffle wall being provided with a dish-shaped indentation for supporting said toothpaste tube.

4,234,105

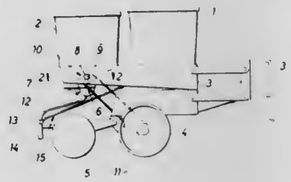
HOPPER AND FEED WHEEL ASSEMBLY FOR A FERTILIZER SPREADER

Jose A. Viramontes, Mesilla Park, N. Mex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 23, 1979, Ser. No. 59,806

Int. Cl.³ G01F *11/20*

U.S. Cl. 222—233 **4 Claims**



1. A hopper and feed wheel assembly for a fertilizer and/or pesticide spreader comprising:

(a) an open-topped hopper having a tapered bottom which is equipped with a bottom discharge opening at its lower most point, said discharge opening being closeable or adjustable in any size by means of a movable plate which is located below and is affixed to the hopper bottom and

which moves over the discharge opening in accordance with calibrated settings;

(b) a horizontally disposed feed wheel made up of a rotatable shaft traversing the width of the hopper and having its longitudinal axis directly above the bottom discharge opening, a longer smaller diameter rod is attached at its ends to the outside peripheral surface of the shaft inside the hopper and said rod extends outward from the peripheral surface of the shaft at the attached ends and is bent back in a direction substantially parallel to the longitudinal axis of the shaft in a series of rod lengths which substantially traverse the length of the shaft inside the hopper, each of said rod lengths being joined endwise to the next adjacent rod length by a series of reverse bends extending substantially around the pheriphery of the shaft, each of said rod lengths traversing the longitudinal axis of the shaft being further bent at various points along the length such that a series of protuberances are formed on each of said rod lengths with the combined number and positioning of the protuberances on all of the rod lengths being such that all points along the rod lengths at a maximum distance from the shaft as defined by apexes of the protuberances are contacted; the rotatable shaft being positioned in the hopper so that the apexes of the rod protuberances closely approach the bottom of the hopper as defined by the bottom discharge opening when the shaft is rotated;

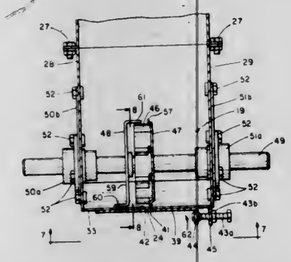
(c) a means for holding the feed wheel in position in the hopper and for imparting rotation on the shaft of the feed wheel.

4,234,106

FUEL DELIVERY SYSTEM FOR A FURNACE OR KILN

Donald E. Rywak, New Kensington; James L. Griffith, Pittsburgh; Frederick D. Rhodes, Saxonburg, and Otto Kovalsics, Pittsburgh, all of Pa., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 1, 1978, Ser. No. 965,627
Int. Cl.³ G01F 11/24
U.S. Cl. 222—239 **19 Claims**



1. For a fuel conveying system providing delivery of particulate fuel to the burners of a furnace a fuel flow regulator adapted to meter the flow of fuel to at least one burner at a preselected flow rate, comprising:

a chute including a fuel reservoir portion opening to said fuel conveying system at one end of said chute and having a fuel feeder housing enclosing the other end of said chute,

said feeder housing having an orifice therethrough accommodating flow of fuel from the reservoir into the burner,

drive shaft means extending into said feeder housing and being supported thereby,

flow metering means carried by said drive shaft means within the housing and including portions radially extending from said drive shaft means defining fuel metering chambers generally aligned above the breadth of said orifice,

said flow metering means further including a plurality of radially extending blade members extending from said drive shaft means adjacent said fuel metering chambers,

feed rotor means mounted on said drive shaft means within said housing, and,

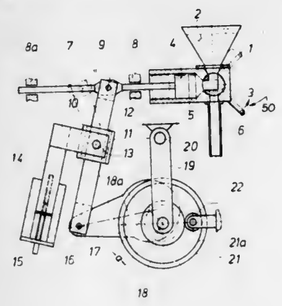
said feed rotor means and said blade members being operatively reactive upon rotation of said drive shaft means to direct particulate fuel towards said metering chambers in said housing and through the orifice into the burner at a preselected rate of fuel commensurate with burner heating requirements.

4,234,107

TUBE FILLING MACHINE HAVING AN ADJUSTABLE STROKE, CAM OPERATED PISTON

Hermann Gernlein, Karlsruhe, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,737
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 7816308[U]
Int. Cl.³ G01F 11/06
U.S. Cl. 222—309 **2 Claims**



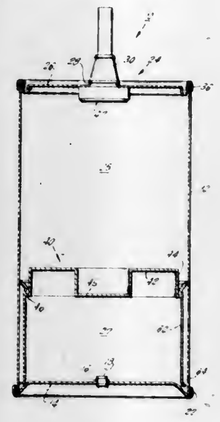
1. A packaging machine, comprising, a material feeding device, including a supply container for the material to be packaged, a metering cylinder having one end with a first connection to the supply container and a filling nozzle discharge second connection for discharging the material which has been drawn into the cylinder, a piston slidable in said cylinder in one direction to draw material from the container into the cylinder and in an opposite direction to discharge it through said discharge connection, a mechanically adjustable valve located between said first and second connections which is shiftable to communicate said cylinder selectively and alternatively with said first and second connections, a crank shaft, a cam plate affixed to said crank shaft for rotation therewith, an arm having one end secured at a fixed location and an opposite end rotatably supporting said crank shaft, a fixed position roller mounted alongside said cam plate in operative engagement therewith, a connecting rod having one end pivotally mounted on said plate at a spaced location from a central axis of said plate and having an opposite end, a link having one end connected to said connecting rod and an opposite end connected to a piston rod connected to the piston, a pivot bearing bushing slidable on said link, a displaceable bearing block having a part pivoted on said link and an opposite end part, and an adjustment means connected to said opposite end part of said bearing block being adjustable to vary the stroke of said piston.

4,234,108

PISTON FOR AEROSOL CONTAINER

George B. Diamond, Anthony & Woodglen Rds., R.D., Glen Gardner, N.J. 08826

Filed Nov. 25, 1977, Ser. No. 854,487
Int. Cl.³ B67D 5/54
U.S. Cl. 222—386 **19 Claims**



1. A barrier piston for an aerosol dispensing container, comprising:

a piston head constructed to sealingly separate the aerosol container into two chambers on opposite sides of said piston; said piston head having an annular support thereabout;

an annular cylindrical collar, having a bottom end that is sealingly attached to said piston annular support; said collar extending up from said piston annular support to a top end of said collar; said collar having an inner surface that is spaced from said piston head, such that said collar may flex without engaging said piston head;

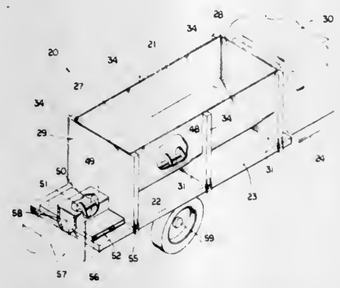
an annular flange sealingly attached to said collar top end and extending up from said collar; said collar being relatively more flexible than said flange; said flange being frusto-conically shaped, flaring outwardly, upwardly from the junction of said flange and said collar at said collar top end to a free end of said flange.

4,234,109

MATERIAL-DISPENSING IMPLEMENT

Robert D. Goodhart, 115 E. Kruzan, Brazil, Ind. 47834

Filed Jun. 17, 1977, Ser. No. 807,357
Int. Cl.³ A01C 15/16, 23/00
U.S. Cl. 222—609 **16 Claims**



1. A material-dispensing implement mountable to a vehicle for distributing dry material when said implement is in a first configuration and liquid when in a second configuration, said implement being repeatedly changeable from one configuration to the other configuration, said material-dispensing implement comprising:

a frame mountable to said vehicle;

an open vessel attachable to said frame for holding dry material in one configuration and liquid in the other configuration;

mean for conveying dry material from within said vessel to a remote location when said implement is in said dry material configuration; and

means for changing said material-dispensing implement from one configuration to the other configuration, said changing means comprising:

(a) a shroud positioned within said vessel and above a portion of said conveying means;

(b) a plurality of gasket members attachable to the periphery of said shroud;

(c) a plurality of adjustable clamping devices attached to said vessel and to said shroud; and

(d) means for securing the periphery of said shroud; with gasket members attached, against the interior surface of said vessel to make sealing contact therewith.

4,234,110

DEVICE FOR FOLDING-DOWN AND PRESSING JACKET COLLARS

André Zaehringer, Strasbourg-Meinau, France, assignor to Vestra-Union, S.A., Paris, France

Filed Oct. 17, 1978, Ser. No. 952,253
Claims priority, application France, Oct. 17, 1977, 77 31871
Int. Cl.³ D06C 15/02
U.S. Cl. 223—57 **5 Claims**

1. A device to facilitate the folding-down of jacket collars, comprising in combination a lower support member (1) for supporting a jacket to which an unfolded collar is attached, a lower plate (2) which is pivotally mounted (7) and controllable by a jack (5) so that it swings down on to the jacket and then the upper edge of the lower plate (2) forms a template against which the lower edge of the collar on the jacket can be located, an upper plate (3) which is pivotally mounted (8) and controllable by a jack (6) so that it swings down and lies against the lower plate (3) and a portion of the upper plate (3) projects above the upper edge of the lower plate (2), the upper edge of the upper plate (3) then forming a template for a fold line of the collar which is located by the lower plate (3), and a pressing or ironing upper member (4) movable to press or iron the said collar after the latter is folded down over the upper plate (3).

4,234,111

DEVICE FOR THREADING STRINGS OR THE LIKE

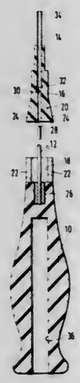
Gebhard Dischinger, Josefstrasse 33, 7710 Donaueschingen, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,912

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1977, 2734441

Int. Cl.[2] **D05B** *85/00*

U.S. Cl. 223—104 **19 Claims**



1. Device for threading strings or the like in a through bore of an anchoring part, frame, or the like, characterized by a handle (**10, 80, 82**), a tube (**14**) connected to the handle, the inside diameter of said tube matching the outside diameter of the string (**50**) to be threaded with play, and by a stylet (**12, 56**) with a tapered rounded tip (**29,58**), said stylet being insertable in the tube (**14**) in such manner that it partially fills the tube and partially projects beyond the forward end (**34, 64**) of the tube.

4,234,112

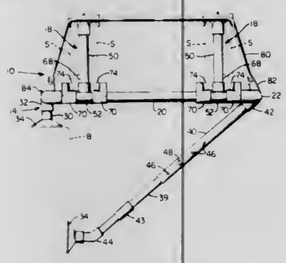
WATER SKI RACK

Guy G. Gallant, 770 W. 100th Pl., Denver, Colo. 80221

Filed Apr. 10, 1978, Ser. No. 894,938

Int. Cl.[3] **B60R** *9/12*

U.S. Cl. 224—42.43 **14 Claims**



1. A ski rack adaptable for mounting on the horizontal top and vertical side external surfaces of a boat and the like comprising:

a frame;

rack securing means extending from said frame including a pair of relatively short, fixed leg support members and a pair of relatively long, telescopically and angularly adjustable leg support members thereon, each of said leg support members having releasable attachment means at its free end for releasably securing said fixed leg support members to said horizontal top surface and said angularly adjustable leg members to said vertical side surface of said boat; and

a ski mount assembly including ski support means adapted to releasably retain the intermediate portions of a pair of skis in edgewise, substantially parallel relation to one another, said ski support means including an upstanding post on said frame, a spring-loaded, enlarged head at one end of said post opposite to said frame, said head having guide channels along the side of said mounting post in facing relation to said frame, each adapted to receive a side edge of a ski and said head being spring-loaded in a direction urging it toward said mounting frame, and a pair of adjustable stop members on said frame in spaced relation to said ski support means, said adjustable stop members being movable into engagement with oppositely facing surfaces of said skis whereby to cooperate with said ski support means in releasably retaining a pair of skis on said rack.

4,234,113

MANUAL SKI CARRIER

Francois J. Nalvarian, 7699 Squirewood Way, San Jose, Calif. 95129

Filed Nov. 20, 1978, Ser. No. 962,380

Int. Cl.[2] **A63C** *11/02*

U.S. Cl. 224—45 S **8 Claims**



1. In a ski carrier for carrying of a pair of skis manually:

main body means for extending laterally of a pair of skis to be carried in parallel bottom-to-bottom facing relation;

side gripping means carried from said main body means for gripping opposite side marginal edges of the skis as the skis are positioned in said parallel relation;

cam means pivotably coupled to said main body means and operatively associated with said side gripping means for operation of said side gripping means for effecting opening and closing of said side gripping means in accordance with pivotable operation of said cam means;

lever means operatively associated with said cam means for effecting operation of said cam means;

said cam means being operatively associated with said side gripping means so that when said lever means is pivoted away from the skis, as positioned in carrying position between said side gripping means, said cam means forces said side gripping means into gripping engagement with the marginal side edges of the skis for clamping the skis together and to said lever means;

said lever means being formed and arranged for extending away from said skis as clamped together in bottom-to-bottom facing relation in a direction generally orthogonally from the longitudinal axis of the skis and generally in a plane parallel to the opposed bottom major faces of said skis as clamped together, said lever means having sufficient length to extend over and to be received over the shoulder of the operator for carrying the skis in a generally vertical orientation when said skis are clamped together by the ski carrier such that the center of gravity of the clamped skis falls generally in a position vertically below the point of engagement of said lever means with the shoulder of the operator.

4,234,114

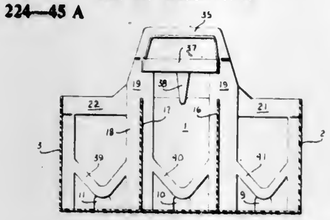
ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 9, 1979, Ser. No. 10,817

Int. Cl.[3] **B65D** *71/00*

U.S. Cl. 224—45 A **6 Claims**



1. An article carrier comprising bottom structure (**23-34**), a pair of side walls (**1,6**) integrally joined respectively to the sides of said bottom structure and extending upwardly therefrom, a pair of end walls (**2,3**) integrally joined respectively to the ends of said bottom structure and extending upwardly therefrom, the ends of said side walls being integrally joined respectively to the adjacent ends of said end walls, transverse partition structure (**14–17**) integrally joined to said side walls and extending therebetween, longitudinal partition structure (**18,19**) integrally joined to said end walls and extending therebetween, said longitudinal partition structure being integrally joined to said transverse partition structure to form multiple article receiving cells, handle structure (**35**) disposed in vertical alignment with said longitudinal partition structure and extending upwardly therefrom, a handle receiving pocket (**20**) defined by said longitudinal partition structure, the transverse width of each of said article receiving cells adjacent said bottom structure being less than the diameter of the corresponding article to be packaged, and characterized by a pair of support strips (**36,37**) being disposed at the base of said handle structure generally parallel to said side walls and offset from the longitudinal medial line of the carrier, a separation tab (**38**) being joined to one of said support strips and extending downwardly therefrom, the bottom portion of said separation tab being yieldable, and a V-shaped separation element (**39–41**) being disposed between adjacent portions of said longitudinal partition structure associated with one of said article receiving cells and the midportion thereof being yieldable.

4,234,115

WATCH BAND ASSEMBLY

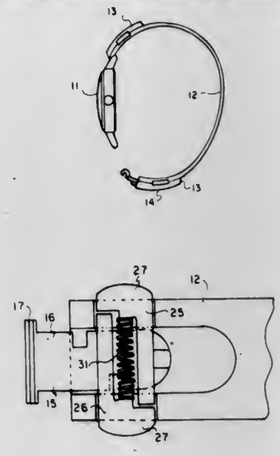
Bill D. Williams, 702 Marion Dr., Madison, Ala. 35758

Filed May 25, 1979, Ser. No. 42,437

Int. Cl.[3] **A44C** *5/00*

U.S. Cl. 224—168 **5 Claims**

1. A resilient watch band, the ends of which can be attached or detached from a respective pin member attached to a watch body without removing the pin member from attachment to the watch body, the watch band including identical latching mechanisms at each end thereof, each latching mechanism including a clasp element having an elongated body portion and a head portion, the head portion being capable of wrapping around a watch body pin member and the body portion of the clasp element being slidable within a longitudinal groove in the end of the watch band so as to allow its head portion to be positioned at a varying distance from the end of the watch band; at least one release button which is capable of either locking the position of said clasp element such that said head portion is at its closest distance from the end of the watch band or when pressed can allow the clasp member to be manually moved along said groove such that the head portion will be at its furthest distance from the end of the watch band; and a cover element which is capable of covering most of said clasp element and each release button, said cover element including an extension flange which extends sufficiently beyond the end of said watch band to lock a pin member in said clasp element head portion when said clasp element is positioned within said groove that its head portion is at its closest distance to the end of said watch band.



4,234,116

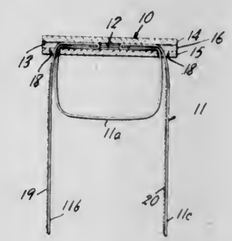
ADJUSTABLE CARRIER

Daniel J. Myers, 89-15 92nd St., Woodhaven, N.Y. 11421

Filed Apr. 13, 1979, Ser. No. 29,668

Int. Cl.[3] **A45F** *5/02*

U.S. Cl. 224—250 **4 Claims**



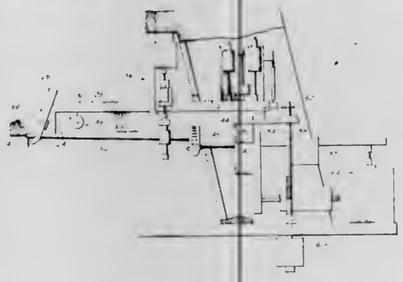
1. An adjustable carrier comprising a support, means for mounting the support to a belt worn by the wearer, said support including a portion exterior to the outer surface of the belt worn by the wearer, an elongated band adjustably coupled with the exterior portion of the support, a pair of vertically extending band-engaging members carried by the support exterior to the outer surface of the belt and around which portions intermediate the free ends of the band are threaded to form an adjustable intermediate span of the band between the members which cooperates with the exterior portion of the support to accommodate an article adjacent said exterior portion and which can be securely held and the span adjusted by tightening the intermediate span with the application of force to the ends of the band, vertically extending slots in the exterior portion of the support and communicating with said pair of vertically extending band-engaging members on opposite sides thereof so that the band can be threaded through the slots and around band-engaging members on opposite sides of the intermediate span of the band, and means for securing the free ends of the bands together to maintain the article in the carrier.

4,234,117

VIBRATION-FREE TAILLESS WIRE BONDER

Richard F. Foulke, Indian Hill Rd., Carlisle, Mass. 01741

Filed May 26, 1978, Ser. No. 909,824
Int. Cl.³ H01L *21/60*
U.S. Cl. 228—4.5 **11 Claims**



1. An improved apparatus for forming a tailless bond between fine electrically conductive wire and electrical contact points of micro-electronic devices including a housing, means to bond the wire to the work piece and a switching mechanism for initiating and sequencing said bonding cycle, wherein the improvement comprises;

a horizontally extending bonding arm pivotally mounted on said housing and supporting said bonding tool for vertical motion;

an electro-mechanical Z-drive linear actuator extending between said bonding arm and said housing which, when actuated, releases said bonding arm permitting it to lower toward the workpiece under its own weight;

a plurality of electro-mechanical search height actuators, mounted on said bonding arm, each of which can be locked in a fully extended state as directed by the switching mechanism, each engaging a mechanical stop. mounted on said housing impeding the downward travel of said bonding arm, until the position of the underlying workpiece can be adjusted accordingly;

a least one electro-mechanical loop height actuator mounted on the housing above the bonding arm engaging a mechanical stop attached to the bonding arm, arranged so as to strike the fully extended loop height actuator when the bonding arm rises after completion of the first bond of the bonding cycle, thereby defining the maximum loop height of the wire above the workpiece;

a clamp motion arm pivotally attached at one end to said bonding arm and extending along the length thereof;

resilient means mounted to pivot the other end of said arm upwardly;

wire clamp means for gripping the wire mounted on said clamp motion arm;

a pair of clamp motion arm actuators mounted on said bonding arm, each of which in its activated, fully extended state pushes against said clamp motion arm, holding it in one of two fixed positions relative to the bonding arm; and the rearmost one in its deactivated, fully retracted state permitting said clamp motion arm, with the wire clamp means attached, to pivot upward due to the force exerted by said resilient means until stopped by contact with the other activated clamp motion arm actuator, and in so doing, changing the position of the wire clamp means relative to the bonding means tool; the motion occurring when said clamp is open and not gripping the wire;

the other clamp motion arm actuator when also retracted allowing said resilient means to further pivot said clamp motion arm, the further motion occurring with the wire clamp closed and gripping said conductive wire such that said conductive wire is separated from said bond, leaving said bond tailless and a precise length of wire forward of the clamp;

said clamp motion arm actuators being operable to pivot said wire clamp means forward toward said bonding tool to feed a precise length of wire to protrude forward of said bonding tool, thereby providing a precisely controlled tail for the next bond;

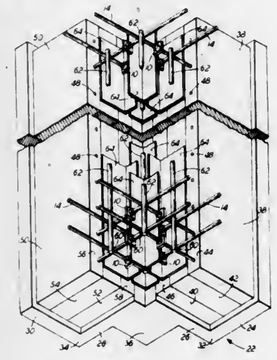
means for controlling the rate of the downward descent of said bonding arm to produce a predetermined maximum downward velocity and a uniform, repeatable force exerted by the impact of the bonding tool upon said conductive wire which is in contact with said workpiece regardless of the height from which said bonding arm is released, said means damping the vibratory moting of said bonding arm and said bonding tool after contact of the bonding tool with the workpiece to eliminate detrimental, counteracting forces at the exact moment of bonding.

4,234,118

APPARATUS FOR SIMULTANEOUS SOLDERING OF A PLURALITY OF DEVICES

Robert B. Bankes, and John W. Grubb, both of Reading, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 873,579, Jan. 30, 1978, Pat. No. 4,146,166.
This application Dec. 18, 1978, Ser. No. 970,728
Int. Cl.³ B23K *1/12*
U.S. Cl. 228—49 R **3 Claims**



1. Apparatus for simultaneously condensation soldering a plurality of devices to one another, wherein each device has a body portion and a plurality of leads extending from said body portion, comprising:

a plurality of carriers, each having at least one opening for receiving a lead of a device to hold the device extending from the carrier in a cantilevered position;

means for positioning the carriers at a fixed angle with respect to one another so that each device extending from the carriers forms a crosspoint with at least one other device such that said crosspoint is sufficient to support an amount of solder thereupon;

means for subjecting the devices and solder to a heated gas to melt the solder at the device crosspoint; and

troughs located under each crosspoint to catch any excess solder which drips off the crosspoint during melting.

4,234,119

METHOD OF MAKING A STRUCTURE IMMUNE AGAINST STRESS CORROSION CRACKING

Isao Masaoka, and Katsuyuki Imai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 14, 1978, Ser. No. 933,555
Claims priority, application Japan, Aug. 12, 1977, 52-96033
Int. Cl.² B23K *31/02*
U.S. Cl. 228—125 **14 Claims**

1. A method of making a structure immune against stress corrosion cracking which comprises forming a groove on the side of a metallic structure opposite to the side thereof that is to be exposed to a corrosive atmosphere, said groove having a bottom that is formed by a part of the metallic structure that underlies the groove, filling-in the groove with layers of weld metal by build-up welding while cooling by holding a liquid coolant in contact with at least said part on the side to be



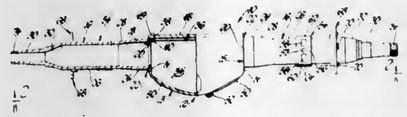
exposed to the corrosive atmosphere, said part having a thickness equal to at least the thickness of the first layer of the weld metal and said groove having a volume necessary for substantially reducing or eliminating a residual tensile stress on the surface of the side to be exposed to the corrosive atmosphere, owing to shrinkage of the weld metal deposited by the build-up welding.

4,234,120

AXLE HOUSING ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 6, 1978, Ser. No. 893,895
Int. Cl.³ B23K *31/02*; B23Q *3/00*; F16H *57/02*
U.S. Cl. 228—173 C **3 Claims**



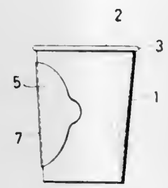
1. A method for making an axle housing including the steps of; forming a cup-shaped center housing having a bottom portion with a cylindrical wall extending about the periphery of said bottom portion from a flat plate and forming flattened portions diametrically opposed from each other on said cylindrical wall of said cup-shaped center housing, forming an opening in each of said flattened portions, connecting a tubular housing to each of said flattened portions by abutting the ends of the tubular housings against the flattened portions and about the openings therein and welding the tubular housings to the flattened portions.

4,234,121

CONTAINER FOR LIQUID

Toshihiko Sasaki, 2-26 Asahigaoka, Nerimaku, Tokyo, 176, Japan

Filed Apr. 2, 1979, Ser. No. 25,888
Int. Cl.³ B65D *41/02, 43/02*
U.S. Cl. 229—1.5 B **4 Claims**



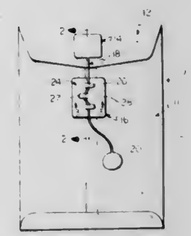
1. A combination of a container and a lid, said container having an open top and a side wall, said lid being sized and shaped to cover said top and formed with at least one radial extension, and said lid having a pressure sensitive adhesive layer provided on one side thereof over at least an area to cover said top but except said extension, the dimension of said side wall being at least as great as the width of said cover so that said cover may normally be attached releasably to said side wall by said adhesive layer, and a strippable backing material sized and shaped corresponding to said lid and fixed to the outside of said side wall for releasable attachment of said lid, whereby during shipment or storage said lid is attached by said adhesive to said backing material on said side and in use said lid is stripped from said backing material and attached by said adhesive to said top.

4,234,122

RECLOSABLE ENVELOPE

Harold R. Lillibridge, San Mateo, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 28, 1979, Ser. No. 16,308
Int. Cl.³ B65D *27/20*
U.S. Cl. 229—77 **6 Claims**



1. A reusable, recloseable envelope comprising:

an enclosed body portion hingedly connected to an overlying flap;

a first tab rigidly connected to the outer surface of said flap by an adhesive;

a second tab rigidly connected to the outer surface of said body portion by an adhesive; and

means for releasably interconnecting said first and second tabs to thereby releasably secure said overlying flap and said body portion, said means including an elongated flexible member;

said second tab including a support portion having upper, central, and lower elongated fingers spaced along said support portion, each said elongated finger having a base and at least two opposed sides, the bottom surface of each said elongated finger being free of adhesive, with said elongated fingers extending generally parallel to each other, and with said central elongated finger being disposed in a direction opposite that of said upper and lower elongated fingers, with the tip of said central elongated finger extending beyond the bases of said upper and lower elongated fingers, and with the longitudinal axis of said elongated fingers being substantially perpendicular to the longitudinal axis of said elongated flexible member, said bases being integral with said support portion and said opposed sides being separated from and laterally bounded by said support portion, whereby said flexible member is capable of being releasably weaved between the bottom surface of said elongated fingers and the top surface of said body portion.

4,234,123

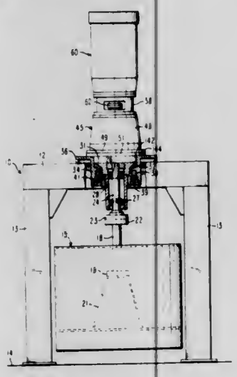
CENTRIFUGE DRIVE SYSTEM

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio

Continuation of Ser. No. 904,765, May 11, 1978, abandoned, which is a continuation of Ser. No. 777,312, Mar. 14, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 54,763

Int. Cl.[3] B04B *9/12, 9/14, 15/02*

U.S. Cl. 233—23 R **8 Claims**



1. In a centrifuge including a rotary container adapted to receive a load of material, means connected to a frame and supporting said container for rotation in suspended relation and providing for gyratory movement of said container generally about a center point located above the center of gravity of said container, an improved drive system for rotating said container, comprising a clutch unit disposed above said container and including a housing supported by said frame and enclosing a generally vertical input shaft disposed above an axially aligned output shaft, means for connecting said output shaft to said container, a motor disposed above said clutch unit and having a generally vertical drive shaft connected to said input shaft, a series of annular clutch plates mounted on said input shaft and interfitting with a series of annular clutch discs connected for rotation with said output shaft, means for compressing said clutch plates and discs together to effect driving of said output shaft and said container by said motor through said input shaft, means for directing a flow of cooling and lubricating oil within said housing between said clutch discs and plates, and means for locating said clutch unit with said center point of gyratory movement of said container generally within said series of clutch plates.

4,234,124

CONTROL SYSTEM FOR GAS KILN

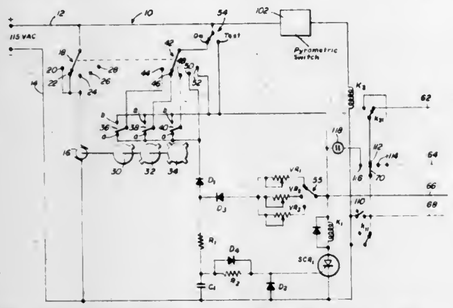
Harry A. Yarrow, 135 S. Sparks St., Burbank, Calif. 92506

Filed Aug. 1, 1978, Ser. No. 929,991

Int. Cl.[3] H05B *1/02*

U.S. Cl. 236—15 BG **13 Claims**

1. A control for a heating device comprising: time delay means including a capacitor, a resistor, and a thyratron device controlled by the electrical discharge from said capacitor through said resistor for providing a heat control signal, said heat control signal being of a predetermined duration; actuation means for actuating said time delay means at predetermined periodic intervals; and means for adjusting said time delay means to vary the duration of said heat control signal,



heat control means responsive to said heat control signal to vary the heat supplied to the heating device.

4,234,125

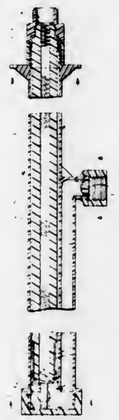
POP-UP SPRINKLER

Calvin A. Lieding, Glendora, Calif., assignor to Irrigation Specialties Company, San Gabriel, Calif.

Filed Oct. 17, 1979, Ser. No. 85,807

Int. Cl.[3] B05B *15/02, 15/10*

U.S. Cl. 239—111 **10 Claims**



1. An irrigation sprinkler, comprising:

a housing having a water inlet passage and an internal wall defining an elongated upright bore connected to the inlet passage;

a riser having upper and lower ends, and a flow passage extending between the ends, the upper end being adapted to receive a sprinkler head, the riser being fitted in the bore to be movable between extended and retracted positions;

resilient means connected between the housing and riser for urging the riser into the retracted position;

seal means mounted adjacent the lower end of the riser for slidably sealing the riser to the internal wall so line-pressure water introduced to the inlet passage and flowing into the bore beneath the riser to elevate the riser is prevented from flowing into an annulus above the seal means and between the riser and the internal wall, the seal means being further configured to open a flow path for static water beneath the riser to flow into the annulus during riser retraction when flow of line-pressure water into the sprinkler is terminated.

4,234,126

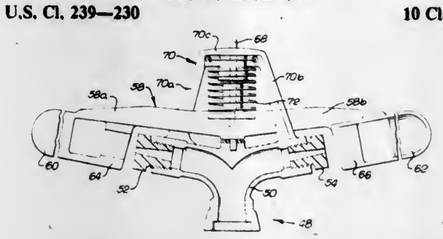
BALANCED, REACTION IMPACT SPRINKLER

Norman D. Morgan, Pasadena, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Continuation-in-part of Ser. No. 843,711, Oct. 20, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 28,708

Int. Cl.[3] B05B *3/00*

U.S. Cl. 239—230 **10 Claims**



1. A water sprinkler of the impact-arm type comprising:

a bifurcated sprinkler body having a substantially vertically oriented intake portion and two symmetrically arranged diametrically opposed discharge portions adapted to receive two nozzles, said sprinkler body being mounted for rotation in a first angular direction about a substantially vertical axis

an impact arm mounted on said sprinkler body for rotation about the same axis as said body, said impact arm having two diametrically opposed portions carrying oppositely facing deflector spoons at the ends thereof;

torsional spring means connected between said impact arm and said sprinkler body to urge said impact arm in said first angular direction; and

abutment means affixed to said body, to limit rotation of said impact arm in said first angular direction;

whereby said deflector arm is deflected in a second angular direction opposite said first angular direction by impingement of water on said oppositely facing deflector spoons, and returns, under the influence of said spring, to impact said abutment means and drive said sprinkler body in said first angular direction, and whereby non-axial nozzle reaction forces or impact arm acceleration forces, and unbalanced gravitational forces acting on the sprinkler are substantially eliminated.

4,234,127

MANUALLY OPERATED SPRAYER

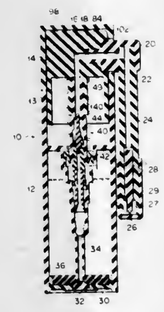
Tetsuya Tada, Tokyo, and Masaharu Amari, Onoda, both of Japan, assignors to Canyon Corporation, Tokyo, Japan

Filed Aug. 9, 1978, Ser. No. 932,404

Claims priority, application Japan, Feb. 1, 1978, 53/10937[U]; Apr. 14, 1978, 53/43265; May 22, 1978, 53/68756[U]

Int. Cl.[2] B05B *9/43*

U.S. Cl. 239—333 **16 Claims**



1. In a manually operated sprayer provided with a pump mechanism for sucking up a liquid received in a container into a cylinder through a primary valve when a piston slides upward, pressurizing the liquid and spraying it through a secondary valve,

the improvement wherein:

said secondary valve of the pump mechanism comprises a valve body normally pressed against a valve seat by a compression spring, the piston being a tubular piston; valve sealing means sliding in liquid-tightness along the inner wall of the tubular piston, thereby temporarily obstructing the flow of the liquid even after the valve body is removed from the valve seat; and valve seal-releasing means for releasing the valve-sealing means from its liquid-tight condition after the valve-sealing means has slid over a prescribed distance; and

said pump mechanism further comprises a pair of skirt-like piston-sealing strips spatially provided on the periphery of the piston to define a retention space therebetween for a mass of pressurized liquid left in the cylinder; and piston seal-releasing means which, when the piston falls to the proximity of its lower dead point, discharges a mass of pressurized liquid left in the cylinder into the retention space by means of a sealing strip disposed on the side of the primary valve, and, when the piston falls for a prescribed distance before reaching its lower dead point, discharges a mass of pressurized liquid remaining in the retention space by means of a sealing strip positioned on the side of the secondary valve section.

4,234,128

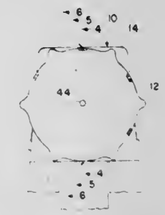
NOZZLE ASSEMBLY

David R. Quinn, Pembroke Pines, and Walter H. Wesner, Plantation, both of Fla., assignors to The AFA Corporation, Miami Lakes, Fla.

Filed Feb. 6, 1978, Ser. No. 875,357

Int. Cl.[3] B05B *1/12*

U.S. Cl. 239—478 **17 Claims**



17. An adjustable nozzle assembly for a hand-operated compression liquid ejection device, the device having a discharge end, a nozzle coupled to and embracing said device discharge end, and device discharge end being relatively adjustable, in sequence, from an OFF position in which said device is disabled, to another one of a plurality of different positions each of which different positions provides an individually characterized device ejection or discharge mode or pattern, said nozzle and said device discharge end each having two contiguous surfaces that are disposed in cooperative relation with the contiguous surfaces of the other, in each of which surface passageways are formed, which passageways when brought into register by relative adjustment of said nozzle and said device discharge end determine the discharge mode of said device.

4,234,129

MOUNTING DEVICE FOR AGRICULTURAL SPREADING MACHINES

Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke H. Dreyer GmbH & Co. KG, Hasbergen-Gaste, Fed. Rep. of Germany

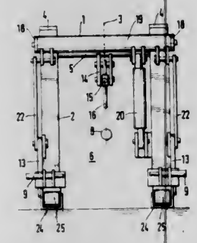
Filed May 19, 1977, Ser. No. 798,524

Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622444

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] A01C *19/00*; B62D *49/02*

U.S. Cl. 239—661 **15 Claims**



1. In a mounting device for an agricultural spreading machine, which has an upright frame equipped with coupling means for mounting of the device on a tractor power lift, and coupling means for mounting of a spreading machine, driven hy a power takeoff shaft of the tractor and equipped with outlet apertures, on the device, and lift means for raising and lowering the elevation of the spreading machine on the device, the improvement which comprises there being only one of said lift means, the upright frame having an open middle area for the free passage and pivoting of a universal shaft connecting the tractor power takeoff to the spreading machine during raising and lowering of the spreading machine on the device, the upright frame having two upright members disposed one on each side at an equal distance from the center line of the mounting device and joined together by a cross member, the lift means being located outside of said open middle area, the mounting device comprising lift arms pivotally connected to the upright frame members and having means for mounting of the spreading machine thereon, the lift means being linked to the lift arms for said raising and lowering of the spreading machine on the mounting device, the linkage of the lift means to the lift arms comprising levers, each pivotally mounted at one end thereof on the upright frame members, the other ends of the levers being joined together by a crossbar, links connecting said other ends to the lift arms, the lift means being operatively connected to the crossbar and the upright frame for said raising and lowering of the lift arms and thereby the spreading machine.

4,234,130

HYDRAULIC CYLINDER ASSEMBLY FOR TWO-STAGE DISCHARGE ON MANURE SPREADER

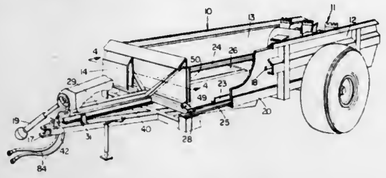
Clarence R. Trott, and David A. Willer, both of Welland, Canada, assignors to Deere & Company, Moline, Ill.

Filed Dec. 4, 1978, Ser. No. 966,030

Int. Cl.[1] A01C *3/06, 19/00*

U.S. Cl. 239—679 **8 Claims**

1. A material-handling implement comprising: a main frame; a material-containing box carried on the frame and open at its rear end and having transversely spaced upright sides, and a floor composed of front and rear sections, the former of which is supported to shift rearwardly to overlie the latter; a transverse beater mechanism supported on the box at its open rear end; a vertical transversely extending wall supported in the box to shift fore-and-aft with respect to and between the front and rear portion of the front section of the floor; a main cylinder between the frame and front floor section and having a cylindrical housing with a closed end and an open end through which a rod may extend and fluid openings in opposite ends of the cylinder; an associated rod contained in the cylinder with the latter extending through the open end of the cylindrical housing, said rod being composed of inner and outer concentric tubes sealed at their respective ends with the inner tube opening into the closed end of the cylindrical housing and the outer tube having a port opening to the rod end of the cylindri-



cal housing; a second double-acting cylinder having a cylindrical housing with a closed end and a rod end in fluid communication external of the main cylindrical housing with the inner tube and outer tube; and a shuttle valve within the main cylindrical housing supported for axial shifting with respect to the outer tube and for closing said port as fluid is introduced to the closed end of the main cylindrical housing and for opening said port as said piston and associated rod approach their fully extended position.

4,234,131

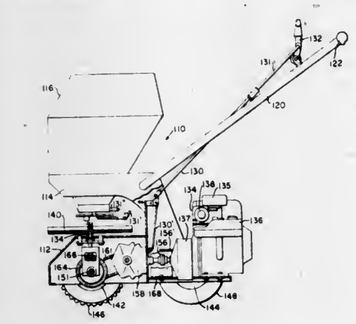
MOTORIZED DRY FERTILIZER SPREADER

Douglas W. Baker, Dayton, Ohio, assignor to Leisure Lawn, Inc., Dayton, Ohio

Filed Jan. 18, 1979, Ser. No. 4,585

Int. Cl.[3] A01C *17/00*

U.S. Cl. 239—685 **20 Claims**



1. In an impeller blade fertilizer spreader exclusively power driven itself and having a large capacity hopper with metering holes in a bottom thereof, the improvement in combination therewith which comprises: a substantially rectangular base frame structure, an engine carried at a rear location of said frame structure, a transmission with opposite outwardly extending output shafts suitably journalled relative to said frame structure, a handle means with rod and lever controls for the operation of the hopper metering holes and transmission, four wheels rotatably journalled in pairs with front and rear axle means on said frame structure, gear reduction means on one side of said engine, a limited slip coupling device operatively connected to said gear reduction means, a first pair of sprocket gears secured to the output shafts respectively, a second pair of sprocket gears secured to front axles means, parallel chain members interconnecting respectively said first pair of sprocket gears and in mesh with said second pair of sprocket gears, an impeller blade on a top end of a vertical shaft rotatably journalled on said frame structure to locate the impeller blade rotatably underneath the metering holes of the hopper, and bevel gear means simultaneously timing and interconnecting rotation of said impeller blade with only front wheel drive of the fertilizer spreader.

4,234,132

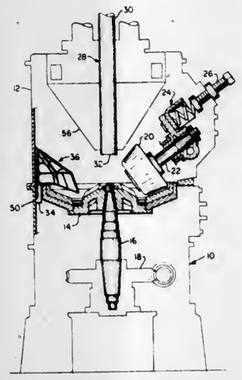
BOWL MILL WITH AIR DEFLECTOR MEANS

Theodore V. Maliszewski, Jr., North Canton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 21, 1979, Ser. No. 41,155

Int. Cl.[3] B02C *15/04*

U.S. Cl. 241—53 **3 Claims**



1. In a bowl mill operable for effecting therewithin the pulverization of material such as coal and including a separator body the inner surfaces of which define a substantially closed chamber therebetween, a grinding table supported for rotation within the separator body, means for rotating the grinding table within the separator body, at least one pair of grinding rolls mounted within the separator body in space relation one to another and in juxtaposed relation to the grinding table so as to coact therewith for purposes of effecting the pulverization of material disposed on the grinding table, material supply means supported on the separator body and operable for discharging onto the grinding table the material to be pulverized within the bowl mill, air supply means provided in the separator body terminating in at least one discharge outlet comprising an annular space formed between the inner surface of the separator body and circumference of the grinding table so as to be operative for purposes of discharging a flow of air through the annular space into the interior of the separator body, the improvement comprising:

a. an air deflector means disposed between the pair of grinding rolls in the path of flow of the air exiting through the annular space and operative deflect this flow of air over the grinding table, said air deflector means including a frame-like structure lined with an abrasive resistant material, said frame-like structure being of sufficient size to encompass the entire annular space so as to thereby effect the capture of all of the air exiting from the annular space, said frame-like structure including at least a first side wall and a second side wall joined to said first side wall, said first side wall extending substantially perpendicular to the plane of rotation of the grinding table and terminating in a free edge, said second side wall extending substantially parallel to the plane of rotation of the grinding table and terminating in a free edge;

b. support means supporting said frame-like structure within the separator body so that at least a portion of said frame-like structure is located in abutting engagement with the inner surface of the separator body preventing thereby the flow of air and material between the inner surface of the separator body and said frame-like structure, said support means also supporting said frame-like structure so that said first side wall is positioned in spaced relation to a first one of the pair of grinding rolls such that said free edge of said first side wall is operative as a leveler to insure the presentation of a uniform layer of material to the first one of the pair of grinding rolls and so that said second side wall is positioned in spaced relation to the second one of the pair of grinding rolls such that said free edge of said second side wall is spaced a sufficient distance from the second one of the pair of grinding rolls in order to thereby inhibit the development of an area of stagnant air therebetween; and

c. means provided in the annular space adjacent the exit end thereof, said means being mounted on the side walls that define the annular space so as to have one end thereof positioned adjacent the exit end of the annular space and the other end thereof located within the annular space at a spaced distance from said one end thereof, said one end of said means projecting inwardly into the annular space to a considerably greater extent than does said other end of said means so as to establish an inclined surface therebetween, said inclined surface lying within the path of flow of air through the annular space so as to be operative to effectuate a peeling away of the air from engagement with the side walls that define the annular space as the flow of air exits from the annular space prior to the engagement of the flow of air with said frame-like structure and the subsequent deflection of the flow of air over the grinding table by said frame-like structure.

4,234,133

DEVICE FOR WINDING TEXTILE THREADS

Heinrich Enneking, Karlsruhe-Waldstadt, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft, Fed. Rep. of Germany

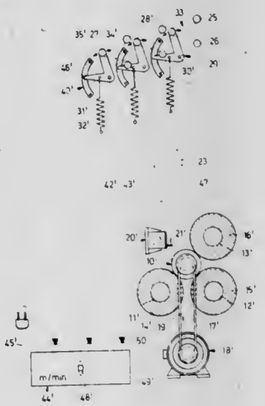
Continuation-in-part of Ser. No. 852,368, Aug. 22, 1969, abandoned. This application Feb. 10, 1972, Ser. No. 225,157

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1968, 1785336

The portion of the term of this patent subsequent to Jun. 18, 1995, has been disclaimed.

Int. Cl.[2] B65H *59/38, 54/20*

U.S. Cl. 242—45 **2 Claims**



1. In a device for winding synthetic resin textile threads on bobbins at a substantially constant winding speed, of the type including a compensating roller engageable with a thread loop and mounted on a movable arm for fine regulation of the thread tension, a drive roller driven by an electric motor, and bobbins interchangeably mounted on bobbin supports and pressed with a predetermined force into frictional engagement with the periphery of the drive roller for rotation thereby to wind a thread thereon, the improvement comprising, in combi-

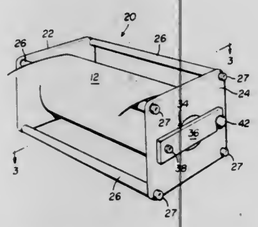
nation, a control device connected to a source of electric potential and to said electric motor and including a motor speed adjusting element controlled by said arm for movement in accordance with variations in thread tension, as determined by variations in said thread loop engaged by said compensating roller, to control continuously the speed of said electric motor to control continuously the peripheral speed of said drive roller to maintain the thread tension constant, said motor speed adjustment element comprising, a potentiometer connected to said device to have a potential from said source impressed thereacross; and an adjustable tap forming part of said potentiometer and connected to said device; said adjustable tap being mounted on said arm for adjustment of said potentiometer, there being plural synthetic resin textile threads each wound on a respective bobbin; each textile thread having the respective thread loop engaged by a respective compensating roller mounted on a respective movable arm, a respective potentiometer associated with each movable arm and including a sliding contact carried by the assoicated movable arm; said control device controlling the speed of said electric motor as a function of the displacements of said movable arms.

4,234,134

PAPER TENSIONING DEVICE

Samuel Rhine, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Feb. 9, 1979, Ser. No. 10,654
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.2 **12 Claims**



1. In a chart recorder, densitometer or other instrument of the type including a supply of paper tightly wound around into a roll in the form of a hollow cylinder, the instrument including a support frame with a pair of spaced apart first and second support walls between which is rotatably supported the supply of paper, the improvement comprising:
- a cylinder tubular core extending through the supply of paper and supporting same;
- a cylindrical plug received in and secured to said tubular core, said plug having a bore;
- an elongated spindle having first and second ends, said spindle extending through the interior of said core and having a length greater than the length of said core;
- the support frame including a socket in said first support wall;
- said spindle including a flange at the second end thereof, said support frame including an aperture in the second support wall to receive said spindle therethrough, said aperture having a countersunk bearing surface to receive said flange;
- said spindle and plug having end portions thereof engaging said socket and aperture provided in the walls of said support frame for rotatably mounting said core and supply of paper in said frame;
- said plug having an internal keyway and said elongated spindle having an axially extending key engaging said keyway for preventing relative rotation of said plug and said spindle;
- said support frame further including means to exert an axial pressure on said spindle adjacent to said second end to urge said flange against said countersunk bearing surface in said second support wall, effective to assist in retarding rotation of said spindle and said plug keyed thereto thereby exerting a drag on said tubular core to resist free rotation and to resist unwinding of the paper from the core.

4,234,135

WEB INSPECTION APPARATUS

William R. Conner, Jr., Shelbyville, Tenn., assignor to Kellwood Company, St. Louis, Mo.

Filed Sep. 10, 1979, Ser. No. 73,996
Int. Cl.³ B65H *19/20, 17/02*
U.S. Cl. 242—56 R **15 Claims**



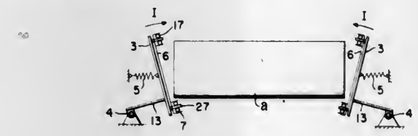
1. Apparatus for feeding a web of material from a supply thereof through an inspection area and winding the web, comprising:
- a frame;
- means mounting the supply on the frame;
- a mandrel for winding the web rotatably mounted on the frame having means for releasably gripping a leading end portion of the web;
- means for rotating the mandrel for winding the web thereon and for feeding the web through the inspection area;
- means for backing the web fed through the inspection area extending along the path of movement of the web between the supply and the mandrel;
- means mounting the backing means on the frame for movement between an operative position relative to the mandrel for starting the winding of the web and a retracted position away from the mandrel, the backing means being engageable with the leading end portion of the web; and
- means for moving the backing means between operative and retracted position;
- the means for releasably gripping the web of material comprising a plurality of holes in the periphery of the mandrel and vacuum means in communication with the holes for drawing air into the mandrel through the holes, the backing means when moved to operative position moving the leading end portion of the web toward engagement with the mandrel for being vacuum gripped by the gripping means, and when in retracted position enabling rotation of the mandrel for the feeding of the web through the inspection area.

4,234,136

APPARATUS FOR THE REPLACEABLE MOUNTING OF A WINDING DRUM FOR WEB-LIKE MATERIAL

Hubert Wenzel, Seelze, and Reinhard Mössinger, Neustadt, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,876
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1978, 2818188
Int. Cl.³ B65H *17/02*
U.S. Cl. 242—68.4 **7 Claims**



1. An apparatus for the replaceable mounting of a winding drum for web-like material, said winding drum having two end faces, said apparatus comprising in combination two supporting carriers for rotatably holding said winding drum at both of said end faces, said carriers being respectively pivotally mounted in said apparatus about substantially horizontal axes, and means normally retaining said carriers in rest position subject to pivotal movement of said carriers being initiated completely automatically as soon as said winding drum to be inserted is lowered into the apparatus until said drum is supported at both end faces whereas an emptied drum can be readily removed whereby said carriers automatically swivel up and cease the rotary movement.

4,234,137

TAPE REEL FOR VIDEO TAPE CASSETTE

Koji Watanabe, Niiza, and Akira Nakagawa, Tokyo, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Aug. 13, 1979, Ser. No. 65,810
Claims priority, application Japan, Aug. 11, 1978, 53-97296
Int. Cl.³ B65H *75/14*
U.S. Cl. 242—71.8 **6 Claims**



1. A tape reel for a video tape cassette, comprising: a hub having first and second end surfaces; a first flange disposed on said first end surface of said hub; first engaging means carried by said hub near said second end surface; a second flange having a plurality of openings and arranged to be positioned against said hub second end surface; a carrier member having a small integrally formed protuberance at the center of one surface ad resilient second engaging means disposed on the other surface thereof, said carrier member being arranged to contact said second flange opposite said hub second end surface with said second engaging means passing through said openings of said second flange and resiliently lockingly engaging said first engaging means of said hub, whereby the locking engagement between said first and second engaging means fixes said second flange between said carrier member and said second end surface of said hub.

4,234,138

THREAD GUIDE AT A WARP CREEL

Rudolf Gehring, Niederuzwil, and Albert Brandenberger, Oberuzwil, both of Switzerland, assignors to Maschinenfabrik Beninger AG, Uzwil, Switzerland

Filed Sep. 4, 1979, Ser. No. 72,191
Claims priority, application Switzerland, Sep. 15, 1978, 9658/78
Int. Cl.³ B65H *49/02*; D02H *1/00*
U.S. Cl. 242—131.1 **7 Claims**

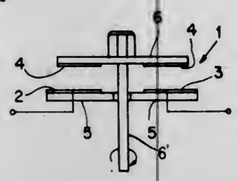


4. A thread guide arrangement at a bobbin creel comprising, in combination:
- a thread tensioning device through which there is essentially linearly guided a thread which is payed-off of a bobbin;
- a deflection device for deflecting the thread, upon its exit from the creel, in the direction of a winding machine;
- said deflection device imparting to the thread only a single deflection during its movement between the bobbin and upon leaving the creel;
- said deflection device comprising a deflection roll having a lengthwise axis and by means of which there is accomplished said deflection;
- bearing means for mounting said deflection roll so as to be freely rotatable with its lengthwise axis extending essentially vertically;
- said deflection roll having a travel groove, the periphery of said travel groove being arranged substantially along the axis of the thread travel from the bobbin until departure from the thread tensioning device and located at the outlet side of the thread from the thread tensioning device,
- said deflection device comprises a plurality of said deflection rolls;
- deflection roll tube means provided for said deflection rolls;
- all of said deflection rolls operatively associated with a vertical bobbin row of the creel being arranged at a deflection roll tube means;
- means for attaching said deflection roll tube means at a part of the creel;
- said creel part serving to house the thread tensioning devices for the threads of all of the bobbins which form a vertical row in the creel;
- each deflection roll tube means comprises tube sections, the length of which is accommodated to the spacing of two neighboring thread tensioning devices; and
- said tube sections being provided at their ends with insert elements by means of which the tube sections can be connected to one another while clamping therebetween a respective deflection roll.

4,234,139
DEVICE FOR THE DETECTION OF THE STATE OF ROTATION OF A SHAFT, IN PARTICULAR FOR TAPE DECKS

Eliseo Porchia, Rome, Italy, assignor to Autovox, Rome, Italy

Filed Feb. 26, 1979, Ser. No. 15,084
Claims priority, application Italy, Mar. 9, 1978, 48256 A/78
Int. Cl.[3] G11B *15/32*; G03B *1/02*; H01G *5/00*
U.S. Cl. 242—191 13 Claims



1. A device for the detection of the state of rotation of a shaft, which device is characterized by the fact that it comprises:

a driven shaft having a tape reel hub carrying disk thereon and rotatable therewith,

a rotating capacitor of variable capacitance, formed by at least two coplanar stationary armatures disposed on a first fixed support, and by

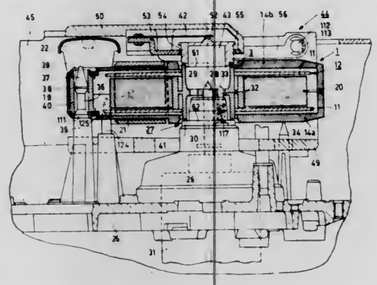
a movable armature disposed on a planar surface of said hub carrying disk and disposed parallel to the plane of said two stationary armatures, said movable armature facing said two stationary armatures,

said movable armature movably driven by the shaft which is being monitored and varying the capacitive coupling between the stationary armatures and thereby creating a tape drive control signal.

4,234,140
MAGNETIC TAPE CASSETTE DRIVE SYSTEM

Cornelis P. Van Nie, Eindhoven, Netherlands; Franz Werner; Gerhard Maryschka, both of Vienna, Austria, and Joannus H. F. C. Sleben, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,645
Claims priority, application Netherlands, Aug. 28, 1978, 7808832
Int. Cl.[3] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—199 9 Claims



1. A magnetic tape cassette apparatus adapted for use with a flip-over magnetic tape cassette having two reel hubs spaced from each other and rotatable about parallel axes of rotation, comprising

a frame,

cassette supporting means connected to the frame for engaging an external surface of a magnetic tape cassette for operative cooperation of the apparatus with magnetic tape in the cassette, said means comprising a cassette holder mounted to the frame for movement between an open position, for inserting or removing said magnetic tape cassette, and a closed position for retaining the cassette in an operating position, and

a drive arrangement comprising first and second drive spindles rotatable about parallel axes; each drive spindle including centering means for engaging a respective reel hub in the cassette for positioning the hub coaxially about the respective spindle rotation axis, and a drive pin disposed at a given radial distance from the respective axis, said pin being adapted to engage a drive aperture in said respective reel hub,

wherein each spindle has a hub axial positioning surface which rotates with the spindle, arranged for engaging an end wall of the reel hub, and

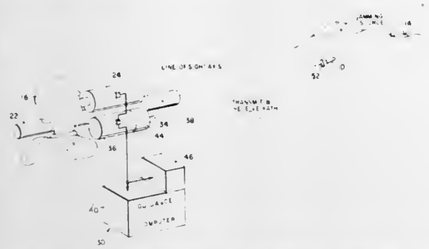
the cassette supporting means includes resilient loading means for urging the respective reel hubs against said axial positioning surfaces when the cassette is in the operating position,

said loading means comprising first and second hub loaders rotatably journalled with axial and radial play in the cassette holder, disposed opposite the respective spindles when the holder is in the closed position, each hub loader having a centering portion arranged for engaging a centering surface on the respective hub; and spring means for engaging the loaders for urging the loaders toward the spindles thereby bringing the loader centering portion into engagement with the centering surface on the hub, each pressure spring cooperating with the respective loader through a point contact at a central location opposite the centering portion.

4,234,141
RANGE GATED RETROREFLECTIVE MISSILE GUIDANCE SYSTEM

Walter E. Miller, Jr.; Jimmy R. Duke; George W. Starkey, and Robert L. Sitton, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 10, 1970, Ser. No. 24,415
Int. Cl.[3] F41G *7/26*
U.S. Cl. 244—3.13 4 Claims

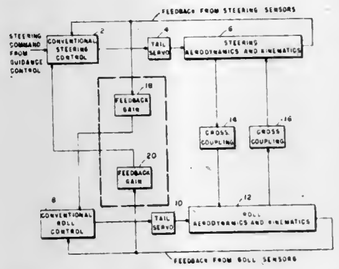


1. A range gated retroreflective guidance system for a missile system comprising: an optically sensitive receiver within the housing of a missile to be tracked for command control of said missile, a tracking station having an optical transmitting means for transmitting a periodic burst of light energy toward said missile optical receiver for providing a missile guidance signal, a telescope at said tracking station for maintaining directional alignment between said target and said tracking station, optically sensitive missile tracking means at said tracking station for following the direction of flight of a missile, and a retrodirective corner-cube prism adjacent said optical receiver for reflecting a portion of said optically transmitted guidance signal from said missile to said optical tracking means.

4,234,142
HIGH ANGLE-OF-ATTACK MISSILE CONTROL SYSTEM FOR AERODYNAMICALLY CONTROLLED MISSILES

David J. Yost, Woodbine; Arthur Arrow, Beltsville, and Robert L. Konigsberg, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1978, Ser. No. 913,981
Int. Cl.[3] F41G *7/00*; G05D *1/08*
U.S. Cl. 244—3.21 18 Claims



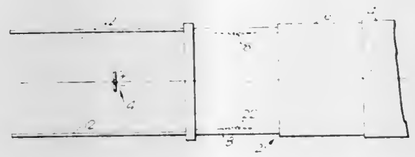
1. A missile control system, which is stable at low and high angles-of-attack, having means for controlling roll tail deflection and means for controlling steering tail deflection and having roll sensors for providing roll signals and steering sensors for providing steering signals, respectively, the improvement comprising:

feedback means for intentionally cross-coupling the roll signals into the steering tail deflection control means which compensate for steering changes due to induced roll at high angles of attack and for intentionally cross-coupling the steering signals into the roll tail deflection control means which compensate for roll changes due to induced steering at high angles of attack.

4,234,143
TRAVERSING AND HOUSING SYSTEM FOR HELICOPTERS

Mario A. Pesando, Mississauga, Canada, assignor to DAF Indal Ltd., Mississauga, Canada

Filed Jan. 19, 1978, Ser. No. 870,698
Claims priority, application United Kingdom, Jan. 20, 1977, 2348/77
Int. Cl.[3] B63B *35/50*
U.S. Cl. 244—116 4 Claims

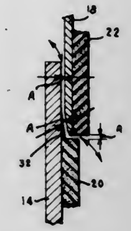


1. A traversing and housing system comprising; a telescopic hangar structure having an enclosure section fixed to a firm base, tracks fixable to the base and extending away from one end of each side of the fixed section, one or more movable enclosure sections movable along the tracks from a retracted position where they are telescoped within one another and within the fixed enclosure section, to an extended position with all the sections substantially in end to end relationship, connecting means coupled to and arranged within a movable section furthest from said fixed section, said connecting means being arranged to secure a movable vehicle enclosed within said movable section when said movable section is at its extended position or being moved.

4,234,144
BASE VENT ASSEMBLY FOR ENTRY SPACE VEHICLES

Ray O. Charette, Fountain Valley, and Elmer J. Yates, Irvine, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 955,062
Int. Cl.[3] B64G *1/62*
U.S. Cl. 244—160 4 Claims



1. In a vehicle which is subject to severe aerodynamic heating and having a base structure and an access opening located within said base structure, the improvement therein being in the form of a base vent assembly which is utilized in conjunction with said access opening, said base vent assembly comprising an access cover, said access cover being of a size sufficient to overlap said access opening within said base structure, means operably attached to said access cover for removably securing said access cover to said base structure, a plurality of spacers, each of said spacers being located adjacent each of said securing means for spacing said access cover a predetermined distance from said base structure, a plurality of wedge-shaped deflector members secured to said base structure interposed between said plurality of spacers, respectively, the portion of said access cover located adjacent said wedge-shaped deflector members having a shape which conforms to the shape of said wedge-shaped deflector members, said access cover being spaced from said wedge-shaped deflector members said predetermined distance, and said predetermined distance being constant throughout.

4,234,145
RADIANT ENERGY QUADRANT DETECTION DEVICE

Teague N. Leiboff, Redondo Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed May 17, 1978, Ser. No. 907,154
Int. Cl.[2] F41G *7/00*
U.S. Cl. 244—3.16 7 Claims



1. A radiant energy detector device for generating output signals representing the departure in altitude and azimuth of a target from a predetermined reference axis, comprising:

a. an array of four radiant energy detectors arranged in a common plane in a substantially square configuration, each of said detectors occupying a separate quadrant of the square,

b. a frame,

c. means for mounting said detector array on said frame,

d. a lens for focusing radiant energy from said target onto the detector array,

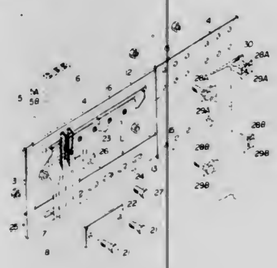
e. means for supporting said lens on the frame,
f. chopper means mounted in the lens supporting means and positioned between the lens and the detector array for chopping the radiant energy focused onto the target array,
g. synchronizing circuit means for generating a synchronous drive signal from said chopper means,
h. a pair of electronic circuit means mounted on said frame in proximity to said detector array, each for directly receiving the outputs of a diagonally opposite pair of the detectors and subtracting each of said paired outputs from each other,
i. summing circuit means mounted on said frame for receiving the outputs of said pair of electronic circuit means and summing said last mentioned outputs together in a predetermined manner to provide a first signal in accordance with the departure in azimuth of the target from a predetermined axis and a second signal in accordance with the departure in elevation of the target from said axis,
j. first and second phase detector circuit means mounted on said frame for receiving said first and second signals respectively and a reference signal from said synchronizing circuit means, and generating pulsating DC signals in response thereto, and
k. first and second filter circuit means mounted on said frame for receiving the outputs of said first and second detector circuit means respectively for producing smooth DC signals representing the departure in azimuth and elevation of the target from said reference axis.

4,234,146

FLAT TYPE CABLE SUSPENSION STRUCTURE

Eiji Shima, Yokohama; Masao Shimizu, Funabashi, and Hiroshi Den, Yotsukaido, all of Japan, assignors to FEBS International, Ltd. and The Fujikura Cable Works, both of Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,474
Claims priority, application Japan, Mar. 14, 1978, 53-28259
Int. Cl.³ E21F *17/02*
U.S. Cl. 248—63 **7 Claims**



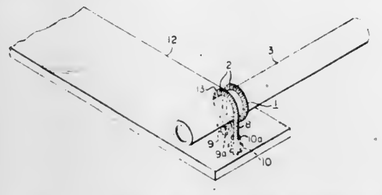
1. An improvement in a flat type cable suspension structure which comprises:
(a) an upper support member;
(b) a lower support member vertically spaced from and rigidly connected to said upper support member; said upper support member and said lower support member being disposed in a vertical plane and fixedly secured with respect to the ground;
(c) a flat type jacketed cable extending in a substantially vertical direction and having on one face a portion abutting against the rear side of said upper support member and on an opposite face a portion abutting against the front side of said lower support member;
(d) a tension member longitudinally extending and buried in the jacket of said flat type cable having an exposed portion partially taken out of said jacket; and
(e) means for securing said exposed portion of the tension member to said upper support member, thereby holding the flat type cable in a suspended fashion, said means being fixedly attached to said upper support member.

4,234,147

SHAFT-CLAMPING DEVICE

Charles M. Cleaveland, North Huntington, and Peter M. Kowalik, Trafford, both of Pa., assignors to Cleaveland/Price Enterprises, Inc., Trafford, Pa.

Filed Jan. 15, 1979, Ser. No. 3,654
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—74 R **11 Claims**



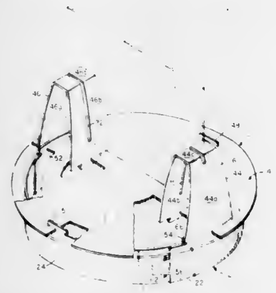
1. A clamping device of the character described for tightly frictionally gripping and releasably clamping a rod-shaped member (3) firmly to a secondary member (12) comprising, in combination, means defining a loop-bolt (1) threaded in its entirety and having a pair of threaded end legs (7, 8) adapted for spirally frictionally encircling the rod-shaped member (3) for thereby exerting a substantially uniform radial inward clamping pressure-load thereon, means defining a secondary member (12) to be frictionally clamped to the rod-shaped member (3) and having a pair of spaced mounting apertures (9a, 10a) provided therein, the free ends of the two leg members (7, 8) of the entirely threaded loop-bolt (1) projecting through the two spaced mounting apertures (9a, 10a) of the secondary member (12), and adjustable fastening means provided on the extremities of the threaded legs (7, 8) of the loop-bolt (1) and located upon the opposite side of said secondary member (12), whereby the threads provided upon the surface of the loop-bolt (1) bite into the outer surface area of the rod-shaped member (3) and thereby prevent relative rotation between the rod-shaped member (3) and the secondary member (12).

4,234,148

DISPLAY STAND

Robert Maddestra, Canton, and David E. Munn, Framingham, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Jan. 19, 1979, Ser. No. 4,705
Int. Cl.² A45D *19/04*; A47G *29/00*
U.S. Cl. 248—174 **10 Claims**



1. A display stand comprising

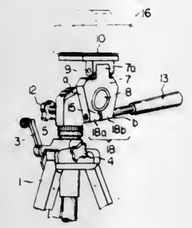
a platform member of sheet stock material, and
a support member of sheet stock material,
said support member having a base element disposed below and in supporting engagement with said platform member and having at least one pedestal-forming arm element with first and second successive sections extending laterally from said base element and projecting through an aperture in said platform member,
said arm element bending back upon itself between said first and second sections at a location above said platform member, and
said second section extending from said bend to an attachment with said platform member.

4,234,149

TILTING ADJUSTING MECHANISM FOR A CAMERA TRIPOD

Michio Kawazoe, 30-11, 5 chome, Higashi Narita Suginami ku, Tokyo, Japan

Filed May 5, 1978, Ser. No. 902,914
Claims priority, application Japan, Dec. 2, 1977, 52-162484
Int. Cl.² F16M *13/00*
U.S. Cl. 248—184 **2 Claims**



1. In a camera tilting adjusting mechanism for a tripod having a vertical elevator shaft and having
a rotatable member rotatable on a first horizontal shaft attached to said rotatable member and extending in the forward and rearward direction, and
a camera-securing plate rotatable on a second horizontal shaft attached to tiltable member and extending in the left and right direction,
the improvement wherein:
said tiltable member contains a bifurcation separating two adjacent portions of the tiltable member;
a hole passing through each of said adjacent portions, said holes being of the same diameter and aligned with each other and having threads of the same pitch and direction
a reversible handle member protruding from the tiltable member, said handle member having a first section threadable to the threads of said holes, a second section of a diameter larger than the diameter of said holes and a third section of a smaller diameter than said holes providing a clearance for said threads and located between the first and second sections so that a shoulder is formed at the junction of said first and third sections;
whereby said shoulder is adapted to abut either of said adjacent portions of the tiltable member when said first section is threaded into the hole remote from the shoulder.

4,234,150

MECHANICAL ARM ASSEMBLY

Francis H. A. Mee, Aurora, and Henry J. Taylor, Willowdale, both of Canada, assignors to Spar Aerospace Limited, Toronto, Canada

Filed Feb. 2, 1979, Ser. No. 9,378
Int. Cl.³ E04G *3/00*
U.S. Cl. 248—281.1 **15 Claims**



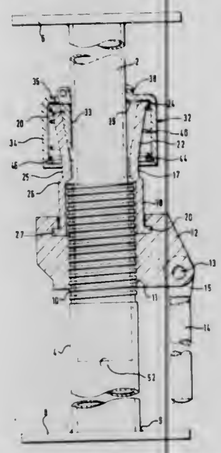
1. A manipulator comprising;
(a) a first arm having a proximal end and a distal end,
(b) a second arm having a proximal end and a distal end,
(c) an elbow member disposed between the distal end of said first arm and the proximal end of said second arm,
(d) said first arm comprising;
(i) a first end support member at the proximal end thereof,
(ii) a first pair of linkage members of equal length, said first pair of linkage members consisting of a first and second link arm each having a proximal end pivotally mounted on said first end support and a distal end pivotally mounted on said elbow member, said first and second link arms extending parallel to one another and cooperating with said first support end and said elbow member to form a first movable parallelogram linkage assembly,
(e) said second arm comprising;
(i) a second end support member at the distal end thereof,
(ii) a second pair of linkage member of equal length and of a length equal to that of said first pair of linkage members, said second pair of linkage members consisting of third and fourth link arms each having a proximal end pivotally mounted on said elbow member and a distal end pivotally mounted on said second end support member, said third and fourth link arms extending parallel to one another and cooperating with said elbow member and said second end support member to form a second movable parallelogram linkage assembly which is of equal proportion to and a mirror image of said first parallelogram linkage assembly,
(f) power transmission means drivingly interconnecting said first arm and said second arm at said elbow member whereby angular movement of said first arm relative to said elbow causes identical angular movement of said second arm relative to said elbow thereby causing the distal end of said second arm to move in a straight line path relative to said proximal end of said first arm as said remote manipulator is extended and retracted,
(g) drive means at one end of one of said link arms operable to change the geometry of its associated parallelogram linkage assembly to thereby effect extension or retraction of the distal end of the second arm with respect to the proximal end of the first arm.

4,234,151

SELF-LOCKING ADJUSTABLE SUPPORT DEVICES

Alfryn I. John, 3 Waubant Rd., Kenfig Hill, Glamorgan, and Jack H. Moxham, 19 Birchwalk, Newton, Porthcawl, Mid Glamorgan, both of Wales

Filed Apr. 30, 1979, Ser. No. 34,379
Int. Cl.³ E04G *25/00*; F16M *13/00*
U.S. Cl. 248—354 S **9 Claims**



1. A self-locking adjustable support device comprising:
(a) two telescopically interfitting members;
(b) a housing;
(c) means connecting the housing to one end of one of said telescopically interfitting members in a manner permitting the housing to be adjusted in position longitudinally relative to said one member;
(d) said housing being formed with a portion having an internal frusto-conical surface arranged to receive therein a plurality of locking elements;
(e) said connecting means permitting rotation of said housing relative to said one member about its longitudinal axis to permit adjustment of the overall length of the support device;
(f) a cover member adapted to circumjace the free end of said housing with said locking elements depending therefrom into a space defined between said internal frustoconical surface of said housing and the outer surface of said other one of said telescopically interfitting members; and
(g) resilient means disposed within said cover member and normally effective to bias said cover member away from said one member and said locking elements to positions within said housing whereat they are in gripping engagement with said other one of said telescopically interfitting members so as to inhibit movement of said other member in one direction longitudinally relative to said one member.

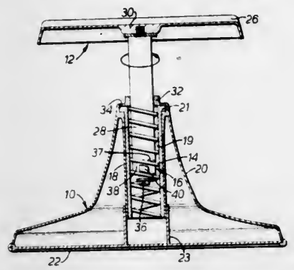
4,234,152

SEATS FOR CHILDREN

Edward Browse, Burwell, England, assignor to Inventec Licensing BV, De Leersum, Netherlands

Filed Feb. 9, 1979, Ser. No. 10,614
Claims priority, application United Kingdom, Feb. 10, 1978, 5502/78
Int. Cl.³ F16M *11/00*; A47C *1/02*; A63G *31/00*
U.S. Cl. 248—415 **12 Claims**

1. A portable child's amusement seat having a base structure, a seat structure, and means for supporting the seat structure on the base structure in overlying relation thereto, wherein the improvement in said supporting means comprises:
a first member connected to the underside of said seat structure and extending vertically downward therefrom towards said base structure; and
co-acting means carried in part by said first member and in part by said base structure for supporting said seat structure over said base structure such that said seat structure



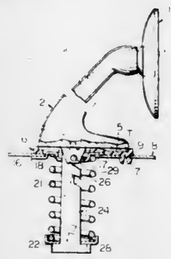
can be raised and lowered relative to said base structure and for causing, in response to the user's weight and/or to the weight of the seat structure, said seat structure to move downwardly and to rotate relative to the said base structure about a vertical axis extending through said seat structure.

4,234,153

DEVICE FOR MOUNTING A MIRROR ON AN AUTOMOBILE PANEL

Takeshi Chihara, and Masanori Kono, both of Hiroshima, Japan, assignors to Delta Kogyo Co., Ltd. and Toyo Kogyo Co., Ltd., both of Hiroshima, Japan

Filed May 23, 1979, Ser. No. 41,782
Claims priority, application Japan, May 26, 1978, 53-71993[U]
Int. Cl.³ B60R *27/00*
U.S. Cl. 248—475 B **5 Claims**



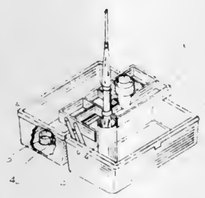
1. Device for mounting a mirror on an automobile panel, said device comprising stay means having one end supporting the mirror, stay seat means adapted to be placed on one side of the panel and providing a seat for the other end of the stay means, plate-like support means having means engageable with said panel at the other side thereof, holding lever means having one end removably connected with said other end of the stay means and extending through said stay seat means, said panel and said support means, resilient biasing means between said holding lever means and support means to bias the holding lever means so that the stay means is forced against the stay seat means to hold the stay means on the stay seat means, said engageable means of said support means being in the form of at least one radially outwardly extending lug, said panel having opening means formed with at least one peripheral cut-off adapted for passing said lug therethrough so that the support means can be placed in position by passing it through said opening means in said panel with said lug aligned with the peripheral cut-off in the opening means and rotating it to have the lug engaged with said other side of the panel, said support means having a retractable finger which is adapted to be engaged with a cut-off formed in said holding lever means so that the holding lever means is temporarily assembled with the support means with the resilient biasing means in compressed condition.

4,234,154

TACKLE BOX ROD HOLDER

Edward A. Walters, 14901 NE. 5 Ct., Apt. 2, N. Miami, Fla. 33161, and James J. Walters, 360 Fiesta Ave., Apt. 214, Jupiter-Tequesta, Fla. 33458

Filed May 21, 1979, Ser. No. 40,885
Int. Cl.³ A01K *97/10*
U.S. Cl. 248—539 **3 Claims**



1. A tackle box rod holder for tackle boxes having a top surface having an opening and a bottom surface having an opening with the openings being aligned and the surfaces being swingable with respect to another, the tackle box rod holder comprising,
a bifurcated generally cylindrical tubular member having a first portion with a first end fixedly connected to and aligned with the top surface opening and a second open end adapted for connection with a fishing rod when the box is in an open position,
the tubular member including a second portion having a first end connected to the bottom surface and a second open end with the portions being aligned such that a rod may extend comfortably through the member unobstructedly when the box is in the closed position,
thereby when the box is in the open position the second open end of the first portion serves as an open end in which a rod may be inserted when the box is in the open position, and
thereby when the box is in the closed position the bifurcated tubular member extends through the tackle box between the openings in the top and bottom portions without obstructing the swingable relation of the top and bottom portions.

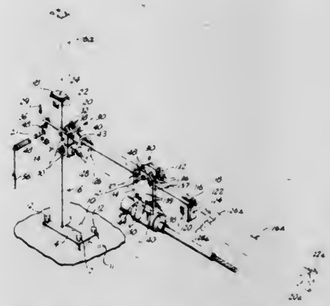
4,234,155

TOOL STAND

Allen L. Destree, 13645 Mukilteo Speedway, Lynnwood, Wash. 98036

Filed Oct. 19, 1978, Ser. No. 952,916
Int. Cl.² F16F *15/00*
U.S. Cl. 248—651 **11 Claims**

1. A stand for holding and aligning a tool such as a core drill comprising:
a. base frame means adapted to be secured to a support surface;
b. a first elongate rectangular beam member projecting from and secured to said base frame means said first beam member having a toothed rack thereon extending the length thereof to receive a first drive pinion; and
c. a first carriage means slidably mounted on said first beam member said carriage means comprising (1) first and second side plates, said first and second side plates each carrying opposed spaced apart roller means mounted for rotation about an axis perpendicular to said plates, one of said roller means mounted for movement toward and away from another of said roller means whereby said beam member is captured between said opposed spaced apart roller means, (2) means to vary the distance between said first and second side plates and to lock said first and



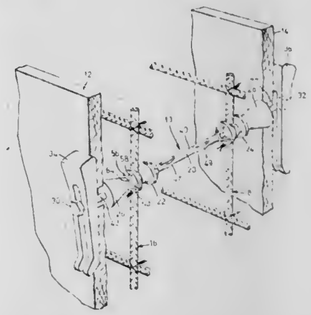
second side plates at a distance apart to receive said column there between (3) a first drive pinion mounted for rotation on an axis perpendicular to the longitudinal axis of said first beam and engaging said rack.

4,234,156

SNAP-TIE

Alfred Wepf, Brampton, Canada, assignor to Acrow-Richmond Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 34, Jan. 2, 1979, abandoned. This application Apr. 24, 1979, Ser. No. 32,811
Int. Cl.³ E04G *9/00*, *17/06*
U.S. Cl. 249—40 **15 Claims**



1. A tie bar for use with forms for forming a wall of a pourable, settable material comprising a bar and two moulded members;
said bar including two stress concentrating notches, a central portion between said two stress concentrating notches and two end portions,
said wherein said moulded members are moulded to said central portion of said bar and comprise a body portion and a flange portion extending radially outwardly from said body portion whereby reinforcing rod may be positioned against said body portion and said flange portion,
said tie bar comprising two moulded spacer portions each having a flat distal facing surface adapted to bear against one of said forms and to positively locate said form with respect to said tie bar;
said spacer portions and moulded members together positively locating a reinforcing rod positioned against said body and flange portion with respect to the surface of said wall.

4,234,157

LIFT-TURN VALVE AND ACTUATOR ASSEMBLY

Herbert H. Hodgeman, and Syed S. Ali, both of Houston, Tex., assignors to Daniel Valve Company, Houston, Tex.

Filed Jul. 20, 1978, Ser. No. 926,283
Int. Cl.[3] F16K *31/528, 31/00*
U.S. Cl. 251—56 **28 Claims**



1. A valve mechanism for controlling the flow of fluid, said valve mechanism comprising:

a valve body structure defining a valve chamber and inlet and outlet flow passages intersecting said valve chamber;

a valve element being located within said valve chamber and being movable with both axial and rotatable components of movement for controlling flow of fluid through said flow passages; said valve element including an elongated generally cylindrical valve stem connected in nonrotatable relation to said valve element and extending in sealed relation through said valve body;

an elongated actuator stem having a circular cross section being interconnected in nonrotatable relation with said valve stem, the outer surface of said actuator stem being formed to define a pair of opposed cam grooves each of said cam grooves defining a pair of linear end portions connected by an intermediate rotary portion of helical form, said linear portions of each cam groove being offset 90° relative to the circumference of the actuator stem from one another and being disposed in parallel relation with the axis of said actuator stem, said actuator stem defining cam surfaces along at least a portion of the sides of said cam grooves;

actuator housing means being connected to said valve body and defining an elongated passage through which said elongated actuator stem means extends;

a pair of opposed cam follower elements being rotatably supported by said actuator housing means and being positioned on opposite sides of said actuator stem, said cam follower means having cam engaging portions thereof extending within respective ones of said cam grooves, said cam follower elements reacting with said cam surfaces of at least the intermediate rotary portions of said opposed cam groove means to induce 90° rotary movement of said actuator stem, valve stem and valve element when said actuator stem is reciprocated; and

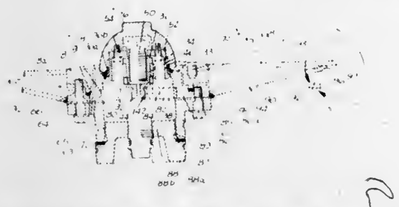
means for imparting linear reciprocal movement to said actuator stem means and allowing rotary movement of said actuator stem means responsive to interaction between said cam follower elements and said helical rotary portions of said cam grooves.

4,234,158

COMBINATION TANK CAR VALVE SKID AND VALVE SEAT WHEREIN THE SKID IS WELDED TO THE VALVE SEAT

Dallas W. Rollins; Gunter R. Behle, both of St. Charles, and Charles E. Reedy, Bridgeton, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 860,987, Dec. 15, 1977, Pat. No. 4,184,663. This application Jul. 16, 1979, Ser. No. 57,870
Int. Cl.[3] F16K *35/00;* **B61D** *5/00*
U.S. Cl. 251—144 **8 Claims**



1. In a bottom operable tank car lading valve assembly a combination skid and lading valve seat for a lading valve closure comprising:

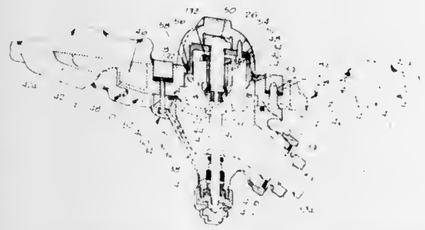
a generally annular body portion having fastening means for attaching the combination skid and valve seat to a tank car universal flange; a generally cylindrical portion extending inwardly and upwardly from said body portion having an opening for lading flow therethrough and including a valve seat for a valve closure; a skid portion welded to said body portion extending longitudinally outwardly from said body portion and abutting the tank bottom at the end portion thereof; the vertical extent of said skid portion decreasing as said skid portion extends outwardly from said universal flange to define a tapered lower skid portion, said fastening means maintaining said skid portion secured in a protective relation without attachment of said skid portion directly to the tank bottom; whereby said skid portion protects said lading valve seat against impacts which might normally cause unseating of the valve closure and escape of the lading in the absence of the skid portion.

4,234,159

COMBINATION TANK CAR VALVE SKID AND VALVE SEAT IN WHICH END PORTIONS ON THE SKID ARE ATTACHED TO THE TANK WITH FASTENERS WHICH DO NOT REQUIRE STRESS RELIEVING OF THE TANK

Dallas W. Rollins; Gunter R. Behle, both of St. Charles, and Charles E. Reedy, Bridgeton, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 860,987, Dec. 15, 1977, Pat. No. 4,184,663. This application Jul. 16, 1979, Ser. No. 58,217
Int. Cl.[3] F16K *35/00;* **B61D** *5/00*
U.S. Cl. 251—144 **20 Claims**



1. In a bottom operable tank car lading valve assembly a

combination skid and lading valve seat for a lading valve closure comprising:

a generally annular body portion having first fastening means for attaching the combination skid and valve seat to a tank car universal flange; a generally cylindrical portion extending inwardly and upwardly from said body portion having an opening for lading flow therethrough and including a valve seat for a valve closure; a skid portion integral with said cylindrical portion and said body portion extending longitudinally outwardly from said body portion and abutting the tank bottom at the end portion thereof; the vertical extent of said skid portion decreasing as said skid portion extends outwardly from said universal flange to define a tapered lower skid portion; skid portion fastening means attaching said skid portion to said tank bottom which do not require stress relieving of the tank body; whereby said skid portion protects said lading valve closure and said lading valve seat against impacts which might normally cause unseating of the valve closure and escape of the lading in the absence of the skid portion.

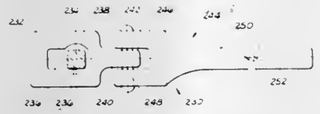
4,234,160

OPERATING HANDLE FOR BOTTOM OPERATED TANK CAR VALVE HAVING MOVABLE CONNECTION PORTION

Gunter R. Behle, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 955,966, Oct. 30, 1978. This application Jan. 14, 1980, Ser. No. 112,040
Int. Cl.[3] F16K *35/02*
U.S. Cl. 251—144 **8 Claims**





1. In a railway tank car bottom outlet lading valve assembly, an operating handle assembly for the lading valve comprising:

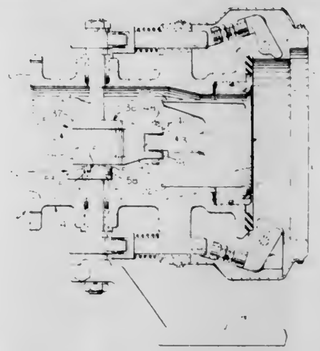
an operating shaft extending vertically within a lading outlet chamber having a non-round shaft tool connection portion near the bottom thereof; an operating handle pivotably mounted on the outlet chamber adjacent said shaft non-round connection portion; said operating handle including a handle connection slot; said connection portion including a curved portion of larger transverse dimensions than said non-round shaft portion; and a non-round connection portion having transverse dimensions adapted to engage said shaft non-round portion; handle support means supporting said handle connection portion for lateral movement relative to said shaft connection portion between an engaged and a disengaged position; in said engaged position said handle non-round portion engaging said shaft non-round portion; and in said disengaged position, said curved slot portion surrounding said shaft engagement portion; a handle-storing bracket for the distal end of the operating handle mounted above said non-round shaft portion adjacent the tank car bottom; removable means for maintaining the distal end of said handle within said bracket, whereby said handle may be pivoted to a generally horizontal position to rotate the shaft through engagement of the handle non-round portion with the shaft non-round portion, and thus move the lading valve between open and closed positions, and whereby after use, the distal end of the handle may be returned to the stored position in the handle-storing bracket.

4,234,161

LINKAGE ASSEMBLY FOR A COUPLER

Paul R. Wilder, and David A. Oberrecht, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 966,852
Int. Cl.[2] F16L *29/00, 37/28*
U.S. Cl. 251—149.9 **13 Claims**



1. A linkage assembly for transmitting a rotary input into a linear output including a first link receiving the rotary input for rotation about an axis of rotation, a yoke, first means to pivotally connect said yoke to said first link for rotation of said yoke about the axis of rotation with said first link for a predetermined amount of rotation, a second link, second means to pivotally connect one end of said second link to linear movable means to supply the linear output, said yoke having means cooperating with said second link to transmit pivotal motion of said yoke about said first pivotally connecting means into linear motion of said second link after the predetermined amount of rotation of said yoke, said second link having bearing means to rotatably support said yoke during rotation of said yoke about the axis of rotation, and means to maintain the center of said bearing means of said second link aligned with the axis of rotation substantially throughout the predetermined amount of rotation of said yoke about the axis of rotation with said first link.

4,234,162

VALVES FOR THE CONTROL OF PRESSURE FLUID

Francis X. Kay, The School House, Addington, Buckinghamshire, England

Filed Apr. 11, 1978, Ser. No. 895,445
Claims priority, application United Kingdom, Apr. 18, 1977, 16077/77
Int. Cl.[1] F16K *11/07, 3/24*
U.S. Cl. 251—175 **7 Claims**

1. A pressure fluid control valve, comprising:

(a) a valve body member having ports therein;

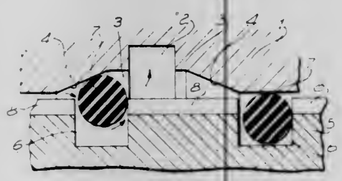
(b) a mobile valve control member movable relative to the valve body member between a port-closing position and port-opening position to control communication between the ports in the valve body member,

(1) one of said members defining a recess having an upstream wall and a downstream wall, and

(2) the other member having a sealing surface facing the recess;

(c) a seal including a sealing element floatingly housed in the recess, said sealing element, sealing surface and recess being dimensioned and positioned such that said sealing element is deformed into sealing engagement with one of the recess walls and with the sealing surface, in the port-closing position of the mobile valve control member, solely by fluid pressure acting on the sealing element; and

(d) a recess vent comprising at least one longitudinal groove formed on the surface of said member defining a recess



and having a vent opening at one end thereof which opens into the downstream wall of said recess, said groove having a depth less than that of said recess and being disposed directly adjacent to said sealing surface, said groove being dimensioned and positioned such that it is covered, and thereby closed, by the sealing element, when the latter is performing its sealing functions, and is uncovered when said sealing ring is subjected to excessive distortion during its movement relative to the valve body member to a port-opening position, under conditions of a high pressure differential acting on the sealing ring, so as to relieve the fluid pressure acting on the sealing element and causing the excessive deformation thereof.

4,234,163

ENGAGEMENT DEVICES

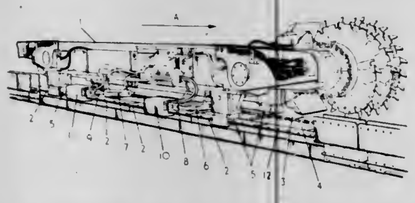
Miltiades Kormendy, Rolleston-on-Dove, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Mar. 3, 1978, Ser. No. 883,105

Claims priority, application United Kingdom, Mar. 15, 1977, 10836/77

Int. Cl.³ B66F *1/04*

U.S. Cl. 254—108 **22 Claims**



1. An engagement device to be used in a ram-driven chainless haulage system including a driving ram and spaced apart abutment portions on a track, the device comprising a movably mounted abutment and a pivotally mounted double acting locking ram, operable to move the abutment into and out of engagement with consecutive abutment portions of the track, and a plate located on the side of the track remote from the locking ram to act as a limiting means to prevent the abutment from protruding too far through any of abutment portions in the track.

4,234,164

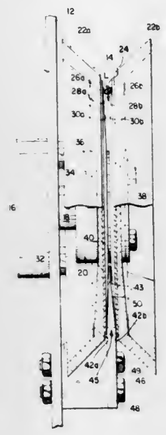
LINE HAULER FOR CRAB POTS AND THE LIKE

Joseph S. Ruark, Rte. 3, Box 233, Cambridge, Md. 21613

Filed Jul. 28, 1978, Ser. No. 928,908

Int. Cl.³ A01K *73/06*

U.S. Cl. 254—371 **9 Claims**



1. A crab pot hauling system comprising in combination, a frame, a drive motor, a shaft drivably coupled to the motor and rotatably supported by the frame, a pair of spaced generally cylindrically shaped flywheels affixed on said shaft for rotation therewith to provide significant rotational inertia, a pair of spaced line hauling inclined light weight sheave members having a disc-like shape and made of wear and corrosion resistant material removably affixed respectively to and between said flywheels, each of said sheave members having an outer rim within the circumference of the flywheels and such that each of said sheave members is circular and engages an inner surface of the flywheels over substantially the entire inner surface of the flywheels, each of said sheave members being spaced to receive and grip frictionally a line between an inwardly converging or V-shaped groove therebetween at a position substantially midway from the outer rim of each sheave member to the shaft to impart a hauling tension to the line, mounting means holding the flywheels and sheave members in fixed relative position for common rotation with the shaft extending through the flywheels and sheave members, and line stripper means mounted on said framework extending between the sheave members thereby to engage a line frictionally held between the sheave members and release the line from the friction grip.

4,234,165

LUMINAIRE LOWERING DEVICE

Omer E. Murray, and Richard L. Thompson, both of Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1978, Ser. No. 931,081

Int. Cl.³ B66C *23/60*

U.S. Cl. 248—404 **8 Claims**

1. Hoist apparatus comprising, in combination, a hollow pole, cable guide means secured at the top of said pole, load support means movable between the top and bottom of said pole, winch means at the lower end of said pole for raising and lowering said load support means on said pole, a winch cable associated with said winch means and having a free end, a plurality of hoist cables passing around said cable guide means and each connected at one end to said load support means in spaced relation to the other hoist cables, said hoist cables extending at their other ends into said hollow pole, transition plate means arranged in said pole, and a plurality of freely

rotatable thrust bearing means respectively securing said other ends of said hoist cables and said free end of said winch cable to said transition plate means, so that said cable ends are individually freely rotatable relative to said transition plate means, whereby twisting and tangling of said hoist and winch cables during raising and lowering of said load support means are avoided.



4,234,166

CLUTCHED WINCH

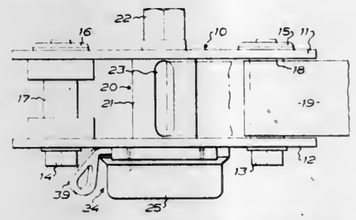
Claes A. Cederblad, Skanör, Sweden, assignor to Spanset Inter AG, Basel, Switzerland

Filed Aug. 4, 1978, Ser. No. 931,096

Claims priority, application Sweden, Aug. 11, 1977, 7709084

Int. Cl.³ A63B *61/04*; B60P *7/06*; B61D *45/00*; B65D *63/10*

U.S. Cl. 24—68 CD **4 Claims**



1. A winch for lines and webbing, comprising a frame consisting of two plates spaced from each other,

cross-pieces between said plates, one of said cross-pieces forming means for anchoring said frame to a stationary object, and another of said cross-pieces forming means for anchoring one end of a line,

a winding roller rotatably journalled in said frame having a line securing portion thereon,

a housing on said frame fixedly mounted to one of said plates, and

a ratchet mechanism for said winding roller disposed in said housing,

said ratchet mechanism comprising two ratchet disks concentric with said winding roller and in abutment with each other, one of said disks being rigidly connected to said winding roller and the other being axially movably journalled in said housing against the action of a spring, ridges which are saw-toothed shaped in cross-section on the sides of said ratchet disks facing each other having radial locking surfaces thereon, a clutch ring rotatably journalled in said housing between said ratchet disks, said ring having clutch portions directed towards its center and there is provided wedge-shaped portions along the periphery of said axially movable disk, said clutch portions being shiftable into engagement with said wedge-shaped portions by the rotation of said clutch ring for shifting of said axially movable disk against the action of said spring such that the locking surfaces of said disks are disengaged from each other, and an operating arm connected to said clutch ring and projecting from said housing adjacent the outwardly facing side of said one plate.

4,234,167

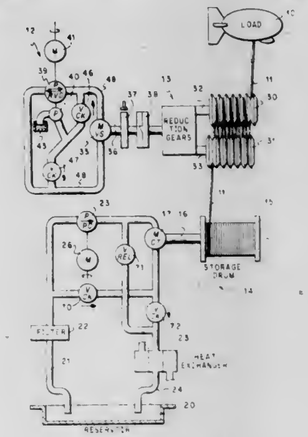
AUTOMATIC INHAUL WINCH SYSTEM

William C. Lane, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 18, 1978, Ser. No. 934,797

Int. Cl.³ B66D *1/76*

U.S. Cl. 254—291 **8 Claims**



1. An improved winch system for paying out and retrieving a flexible line attached to a load having a traction unit and a spooling unit, wherein the improvement comprises:

a. means for operating said spooling unit to impose tension on said flexible line;

b. means for driving said traction unit to control the pay out and retrieve said flexible line; and

c. an overrunning clutch means installed within said driving means and transmitting torque from said driving means in only one direction to retrieve said flexible line whereby said spooling unit can retrieve said flexible line when said load on said flexible line is less than said tension imposed by said operating means.

4,234,168

APPARATUS FOR PRODUCING LOW-OXYGEN IRON-BASE METALLIC POWDER

Yoshihiro Kajinaga; Minoru Nitta, both of Chiba; Ichio Sakurada, Ichihara, and Shunji Ito, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 775,924, Mar. 9, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,374

Claims priority, application Japan, Mar. 12, 1976, 51-26708

Int. Cl.³ C21D *1/40, 1/42*

U.S. Cl. 266—128 **4 Claims**

1. An apparatus of vertical type for producing low-oxygen iron-base metallic powder, which comprises

(a) means for feeding a starting powder composed of iron-bae metallic raw powder to be subjected to a final reduction, which has an apparent density in filled state corresponding to 16-57% of theoretical true density, an oxygen

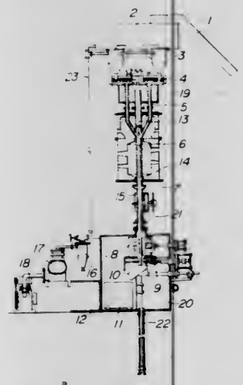
content of not more than 6% by weight and a particle size of not more than 1 mm, and carbon and/or carbonaceous granule to be alloyed in and/or admixed with the iron-based metallic raw powder in an amount corresponding to not more than a target alloying carbon content of a final product (% by weight) + an oxygen content of the powder just before the final reduction (% by weight) × 1.35,

(b) a preheating a sintering device for preheating the starting powder from the feeding means to form a preheated and sintered cake,

(c) an induction heating device for subjecting the preheated and sintered cake to the final reduction by induction heating to form an induction heated cake,

(d) a pushing member for transferring the starting powder downwardly from the feeding means to the preheating and sintering device,

(e) a dummy bar, housed in the bottom portion of said apparatus and extending upwardly therefrom for holding the starting powder in the beginning of the operation, while descending downwardly,



(f) means for holding and descending the induction heated cake,

(g) a synchronous device for synchronizing the dummy bar with the pushing member,

(h) means for adjusting and maintaining at least interiors of the preheating and sintering device and the induction heating device in a non-oxidizing atmosphere having a thermodynamically calculated oxygen partial pressure of not more than 2.1×10^{-1} mmHg and a dew point of not more than +5° C.,

(i) means for cutting the induction heated cake, into a predetermined length,

(j) means for cooling the cut cake, and

(k) means for pulverizing the cooled cake, so as to obtain low-oxygen iron-base metallic powder.

4,234,169

APPARATUS FOR THE DIRECT REDUCTION OF IRON AND PRODUCTION OF FUEL GAS USING GAS FROM COAL

John C. Scarlett, Toledo, Ohio, and Donald Beggs, Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Division of Ser. No. 967,348, Dec. 7, 1978, which is a continuation-in-part of Ser. No. 933,690, Aug. 15, 1978. This application Sep. 24, 1979, Ser. No. 78,537

Int. Cl.³ F27B *1/08*

U.S. Cl. 266—156 **4 Claims**

1. Apparatus for the direct reduction of iron oxide and production of fuel gas comprising:

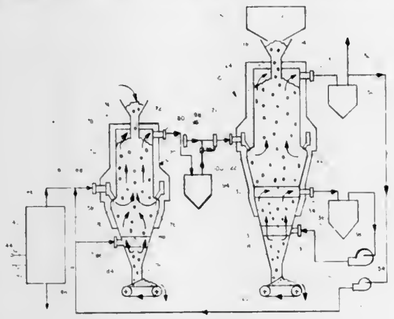
a. a fossil fuel gasifier for producing a gasifier gas;

b. a generally vertically shaft type reactor having means at its upper end for introducing a particulate burden thereto and means for removing particulate material therefrom at its lower end, means intermediate said burden introducing and removal means for introducing gas from said gasifier to the burden in said reactor and means for removing treated gas from said reactor above said burden;

c. conduit means communicating with said gasifier and said reactor for conducting said gasifier gas to said reactor;

d. a generally vertical shaft furnace for the direct reduction of iron, having particle introducing means at the top thereof, particle removal means at the bottom thereof for establishing a descending burden therein, treated gas introduction means between said particle introducing means and said particle removal means and means for removing a spent reducing gas from the top of said furnace;

e. conduit means communicating with said reactor and said furnace;



f. means associated with said conduit for separating said treated gas from said reactor into two streams;

g. means for cooling one of said streams;

h. temperature responsive valve means for introducing said cooler stream to the hotter stream in said conduit between said reactor and said furnace;

i. means communicating with said spent gas removal means for cooling and scrubbing said removed spent reducing gas;

j. means for dividing the cleaned, cooled spent reducing gas into a first gas stream for use as a fuel gas and a second gas stream for use as a tempering gas; and

k. conduit means for conducting said second stream to said reactor.

4,234,170

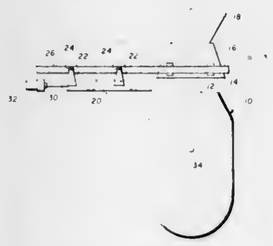
MOVABLE CHARGING EMISSIONS CONTROL HOOD FOR BOF

John R. Suitlas, Wellsburg, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1979, Ser. No. 46,034

Int. Cl.² C21C *5/40*

U.S. Cl. 266—158 **30 Claims**



1. In a metallurgical processing system including a converter vessel having a charging opening at its upper end and being mounted for rotation about a substantially horizontal axis between an upright refining position in which the charging opening is disposed in a substantially horizontal plane at the top of the vessel and a charging position in which the charging opening is displaced laterally and inclined with respect to its refining position, and a fixed gas collection hood mounted above the converter vessel and having an open inlet disposed in spaced, substantially concentric opposed relation with the charging opening in its refining position, the improvement comprising,

movable hood means associated with the fixed hood for capturing emissions discharged from the converter vessel in the charging position and directing the emissions into the open inlet of the fixed hood, the movable hood means including,

a substantially flat, generally horizontal top plate movable between a retracted position spaced laterally from said fixed hood and a use position disposed beneath and in closely spaced relation to the open inlet of the fixed hood, said top plate having a size at least as great as the open inlet in the fixed hood,

an opening in said top plate, said opening being located beneath the open inlet in the fixed hood when the top plate is in the use position,

downwardly extending sidewall means rigidly mounted on said top plate for movement therewith, said sidewall means including a pair of plates mounted one on each side of said top plate means in position to extend adjacent the sides of the converter vessel at the top thereof when the movable hood is in the use position and the converter vessel is in the charging position, and

sealing plate means for engaging the outer surface of said converter vessel on the side thereof opposite the direction to which the charging opening is tilted and cooperating with said converter vessel wall, said sidewall means and said top wall for effectively preventing ambient air from entering said fixed hood from the side of the converter vessel opposite the charging opening when the converter vessel is in the charging position.

4,234,171

MIXING ARRANGEMENT

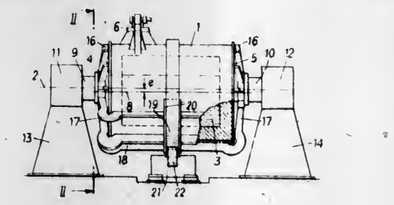
Alexander Patuzzi, Linz; Ernst Riegler, Enns, and Manfred Schmidt, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 5, 1978, Ser. No. 939,885

Claims priority, application Austria, Sep. 29, 1977, 6936/77

Int. Cl.³ C21B *3/00*

U.S. Cl. 266—248 **12 Claims**



1. In a mixing arrangement of the type including: a fixed base; a tiltable large-space pig iron mixer provided with a refractory lining and having a cylindrical mixing chamber of about 10 to 15 meters in diameter, said cylindrical mixing chamber being horizontally arranged and having opposite end walls and a cylindrical jacket; and bearing means including a fixed bearing and an expansion bearing supporting said cylindrical mixing chamber, the improvement comprising:

two aligning carrying trunnions with first and second ends, each trunnion having its first end fixedly connected to a respective one of said end walls so as to be secured against rotation relative to said end walls, one of said two aligning carrying trunnions having its second end rotatably mounted in said fixed bearing, which is mounted on said fixed base, and the other of said aligning carrying trunnions having its second end rotatably mounted in said expansion bearing, which is mounted on said fixed base, so as to support said cylindrical mixing chamber on said fixed base;

reinforcement ribs provided at said end walls and extending from said aligning carrying trunnions radially to the periphery of said cylindrical mixing chamber; and

longitudinal ribs extending along the jacket of said cylindrical mixing chamber parallel to its axis and connecting at least some of said reinforcement ribs arranged on opposite end walls to form a supporting cage for said cylindrical mixing chamber.

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HYDRAULIC SHOCK ABSORBER AND SPRING COMBINATION

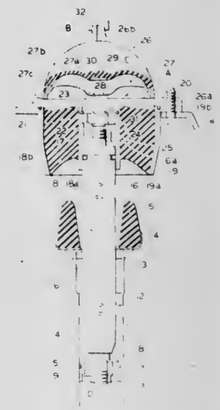
Noriyuki Takahashi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,438

Claims priority, application Japan, Mar. 23, 1978, 53-37258[U]

Int. Cl.³ F16F *13/00*

U.S. Cl. 267—8 R **7 Claims**



1. A hydraulic shock absorber for use on vehicles, comprising:

a cylinder supported adjacent a wheel of the vehicle;

a piston slidably disposed in said cylinder;

a rod connected at the lower end thereof with said piston;

an elastic attachment having a central portion and an outer portion;

said elastic attachment being connected at an inner peripheral surface of said central portion thereof to the upper end of said rod, and at an outer peripheral surface of said outer portion thereof to an annular holder, said annular holder being connected to a vehicle body portion;

a cap sealingly covering said elastic attachment to define a sealed chamber between said elastic attachment and said cap;

a substantially rigid partition disposed in said chamber above said elastic attachment, said partition being provided with a communicating hole;

a flexible membrane disposed above said partition in said chamber to define a first substantially sealed compartment between said membrane and said cap and a second substantially sealed compartment between said membrane and said elastic attachment, said first and second compartments being sealed from each other by said flexible membrane;

said rod being provided with an axial passage therethrough which interconnects opposite sides of said partition through said communicating hole in said second compartment of said sealed chamber with said cylinder;

said second compartment of said sealed chamber, said axial passage, and said cylinder being adapted to be filled with oil which contacts said elastic body within said sealed chamber;

said first compartment of said sealed chamber being filled with pressurized gas; and

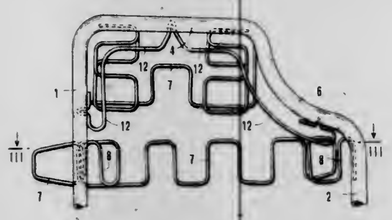
said membrane being movable in response to hydraulic pressure build-up in said second compartment, against the gas pressure in said first compartment, whereby a secondary dampening effect between the vehicle body and said shock absorber is provided by the springing action of gas pressure within said first compartment against said flexible membrane.

4,234,173

STRUCTURE FOR A MOTOR VEHICLE SEAT

Luigi Brandoli, Via Vincenzo Vela 32, I-10.128 Turin, Italy

Filed Sep. 14, 1978, Ser. No. 942,352
Int. Cl.[3] A47C *7/28*
U.S. Cl. 267—103 **1 Claim**



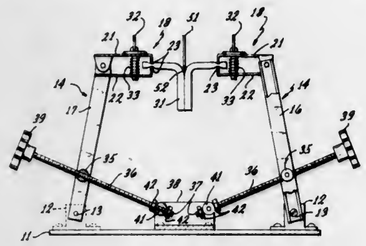
1. A structure for a motor vehicle seat, comprising a perimetrical frame made of a metal tube, a plurality of springing elements disposed between and secured at their ends to opposite portions of said perimetrical frame, each said springing element having near but spaced from each end a cross member situated at a level below the upper limit plane of the perimetrical frame, and wire rods fixed to said perimetrical frame and situated substantially at the same level as said cross members, said cross members of the springing elements and said wire rods providing a complete set of anchorage points for the upholstery of the seat substantially entirely about said frame, said frame having relatively long front and rear sides and relatively short ends, said springing elements extending between said front and rear sides comprising said opposite portions, said wire rods being disposed only adjacent said ends, said wire rods each being secured to said frame at a plurality of points spaced about the frame only adjacent the ends of the frame, said wire rods extending adjacent but spaced from and in general parallelism with said ends of said frame between said spaced points of securement of said wire rods, each said wire rod being only secured to said frame adjacent the ends of the wire rod and at a point intermediate the ends of the wire rods, the points of securement of each wire rod to the frame being on portions of the frame that are out of parallelism to each other, said wire rod being bent double to form said intermediate point of securement.

4,234,174

APPARATUS FOR AIDING THE CUTTING OF A RUBBER MOLD

Angelo Cardono, 11114 New St., Downey, Calif. 90241

Filed May 7, 1979, Ser. No. 36,775
Int. Cl.[3] B25B *1/20*
U.S. Cl. 269—37 **2 Claims**



1. An apparatus for working on a workpiece comprised of:

a base;

a pair of arms;

a pair of blocks mounted on said base in spaced apart relationship;

each of said blocks having a bore and said bores are disposed parallel to each other;

each of said arms comprising of two spaced-apart parallel channels;

one of said blocks being disposed between said two spaced apart channels of a respective one of said arms;

a pin disposed through each one of said bores in said blocks and through said two spaced apart channels of said respective one of said arms so that said arms rotate with respect to said base and substantially in the same plane;

a jaw being pivotably mounted between the channels of each respective one of said arms;

a nut member rotatably mounted between the channels of a respective one of said arms and between said block and said jaw;

said nut member having a threaded hole formed therein disposed at right angles to the axis of rotation of said nut member;

a long bolt threaded through a respective one of said nut member;

anchor means disposed between said blocks for engaging one end of said long bolt so that said bolt is fixed axially and is capable of rotating about its own axis and on another axis, parallel to said pins and disposed passing through said anchor means.

4,234,175

HIGH PRECISION POSITIONING DEVICE

Hiroshi Sato, Tokyo, and Hironori Yamamoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,149
Claims priority, application Japan, Dec. 20, 1977, 52-154170
Int. Cl.[3] B23Q *1/02*
U.S. Cl. 269—73 **2 Claims**

1. A device for effecting high precision positioning with respect to two directions orthogonal to each other in a plane, comprising:

a first guide member for guiding a first guided member in a first direction;

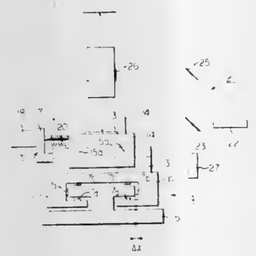
a first gas bearing for floatingly supporting said first guided member relative to said first guide member;

a second guide member secured to said first guided member for guiding a second guided member in a second direction perpendicular to said first direction;

a second gas bearing for floatingly supporting said second guided member relative to said second guide member;

a mechanism for relatively roughly moving said first guided member in the first direction along said first guide member;

means for changing and adjusting the gas pressure of a part of said first gas bearing which part defines a floated position, in the second direction, of said first guided member to relatively finely change and adjust its position in said second direction;



a mechanism for relatively roughly moving said second guided member in the second direction along said second guide member; and

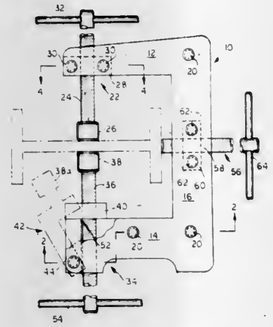
means for changing and adjusting the gas pressure of a part of said second gas bearing which part defines a floated position, in the first direction, of said second guided member to relatively finely change and adjust its position in said first direction.

4,234,176

QUICK RELEASE CLAMP

Otis W. Goff, 5221 Woodmont Dr., Kalamazoo, Mich. 49001, and Melvin J. Goff, 2454 52nd, SW, Wyoming, Mich. 49509

Filed Aug. 17, 1979, Ser. No. 67,621
Int. Cl.[3] B25B *1/10*
U.S. Cl. 269—156 **7 Claims**



1. A quick release clamp comprising

a base member having an upstanding arm unitary therewith, a clamping face associated with said arm,

screw actuated, clamping means projecting from said upstanding arm to said clamping face, holding means for holding a work piece in a position apposed to said clamping face, said clamping means, in the clamping position, being aligned in a centerline essentially normal to said arm and being operative to move said clamping face toward clamping position and to apply pressure to a said work piece, and

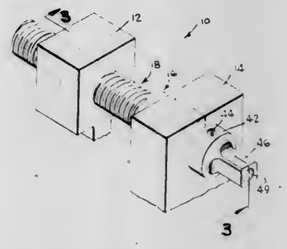
quick release means associated with said clamping means operative to move said clamping face from its normal position to a position in which it is no longer apposed to the work piece and said clamping means is no longer aligned with said work piece, in which said quick release means comprises a pivoted block into which said screw actuated clamping means is threaded, whereby, when said block is rotated about its pivot, said clamping means and said clamping face will be swung out of alignment with the work piece, and in which said pivoted block is L-shaped, in which said screw actuated clamping means is threaded into the short leg of the L, in which the long leg is pivoted adjacent its end, and in which in the aligned position, the short leg abuts the inner side of said arm, whereby the pressure engendered by tightening up said clamping means is transferred through said short leg to the arm on which it abuts, and the bight of said L is so positioned relative to the bottom of the arm to which the block is pivoted, that on rotation of the block about its pivot, the short leg is rotated out of abutment with the inner face of said arm.

4,234,177

DIFFERENTIAL SCREW DEVICE FOR WORKHOLDERS AND THE LIKE

Thomas F. McDougal, 1415 Beech La., Fairmont, W. Va. 26554

Continuation of Ser. No. 869,294, Jan. 13, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 28,926
Int. Cl.[3] B25B *1/10*
U.S. Cl. 269—241 **4 Claims**



3

1. A differential screw device comprising a first member having a threaded bore therein, a screw spindle having a first threaded portion threadingly engageable with the threaded bore in the first member and having a second threaded portion with threads of smaller pitch than the first threaded portion, a second member having a threaded bore therein, threadingly engageable with the second threaded portion of the spindle, a torsion spring fixed at one end to the screw spindle and fixed at the opposite end thereof to the second member, and means for rotating said second member relative to said first member, said screw spindle having a bore extending axially and opening at the end of the screw spindle having the second threaded portion and said torsion spring being a coil spring of diameter slightly less than the bore in the screw spindle and is mounted on said bore.

4,234,178

PROCESS AND APPARATUS FOR THE PRODUCTION OF BOOK BLOCKS

Alexander Beckert, Vienna, Austria, and Ernst Dudziak, Harsewinkel, Fed. Rep. of Germany, assignors to Reinhard Mohn GmbH, Gutersloh, Fed. Rep. of Germany

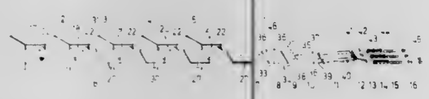
Filed Sep. 11, 1978, Ser. No. 940,978
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741332
Int. Cl.[3] B42C *1/00*
U.S. Cl. 270—45 **22 Claims**

1. Process for production of book blocks of printed sheets comprising:

providing a plurality of stacks of printed sheets in series, one

after another, alongside a continuously running, transversely inclined conveyor belt;

successively feeding one sheet from each stack, one upon another, to form a sheet packet on said conveyor belt, each sheet firstly being fed at a downwardly inclined angle from its stack and in a transverse direction to the running direction of said conveyor belt, and each sheet secondly being accelerated in the running direction of said conveyor belt to obtain same speed as said conveyor belt with a first of the sheets being deposited on said conveyor belt and successive sheets being deposited on a previously deposited sheet to provide the packet, each sheet being downwardly inclined toward said conveyor belt during acceleration and before depositing thereof on said conveyor belt;



continuously forming sheet packets on said conveyor belt so that a finished packet is disposed at one end of said conveyor belt when another packet is first starting to be formed at an opposite end of said conveyor belt, with a number of unfinished packets being disposed therebetween on said conveyor belt;

cutting each finished packet into parallel strips;

centrally folding each of said strips from each finished packet along its longitudinal axis;

transversely cutting each of the folded strips from each finished packet into quires;

scaling off said quires from each finished packet; and

gathering said scaled off quires from each finished packet into a book block blank.

4,234,179

LAUNDRY FOLDING MACHINE

Henry J. Weir, "Alta Vista", 2, Knapton Rd., Monkstown, Dublin, Ireland

Continuation of Ser. No. 779,228, Mar. 18, 1977, abandoned.
This application Apr. 17, 1979, Ser. No. 30,874
Int. Cl.[3] B65H *45/14*
U.S. Cl. 493—14 12 Claims



1. A folding machine for folding a flat article having leading and trailing edges, said machine comprising:

first conveyor means for carrying an article to be folded in a forward direction;

second conveyor means, adjacent and spaced from said first conveyor means by a space, for receiving the leading edge of said article carried on said first conveyor means and carrying said article in the same direction as said first conveyor means, for halting the movement of said leading edge for a predetermined period of time, and for reversing the direction of travel of said leading edge following said halt in movement thereof into said space between said first and second conveyor means;

said space between said first and second conveyor means being a folding gap;

first bridging means at said folding gap for controlling the movement of said article through said folding gap toward said second conveyor means, said first bridging means comprising:

a high pressure air source, and

a hollow lateral tube connected to said high pressure air source and positioned at said folding gap opposite said second conveyor means, said tube having a plurality of openings therein directed toward said second conveyor means across said folding gap;

folding mechanism means spaced from said second conveyor means and adjacent said folding gap for receiving and folding a portion of said article in said folding gap;

second bridging means at said folding gap opposite said folding mechanism means for directing a portion of said article in said folding gap toward said folding mechanism means; and

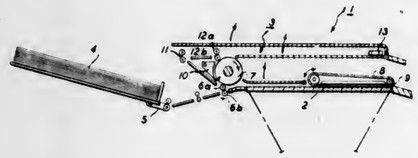
measuring means along said first conveyor means for measuring the distance of travel of said article therealong, and connected to said second conveyor means for controlling the forward movement, halting and rearward movement thereof in relation to the length of travel of said article on said first conveyor means, and connected to said bridging means and said folding mechanism means for controlling the operation thereof in accordance with the length of travel of the article on said first conveyor means.

4,234,180

RECIRCULATING DOCUMENT HANDLER CONFIGURATION

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1979, Ser. No. 52,526
Int. Cl.[3] B65H *1/06, 1/30*
U.S. Cl. 271—3.1 11 Claims



1. In a document handling unit for recirculating original document sheets to and from a set of document sheets in a recirculation path to and from the platen of a copier for selective repeated copying of one or both sides of said document sheets, the improvement wherein:

said document handling unit includes a selectable document inverter in said document recirculation path comprising a generally planar document sheet reversing chute which is generally parallel to and closely overlying said platen to provide a compact and low profile document handling unit, and

wherein said selectable document inverter further comprises a sheet feeder adjacent a first side of said platen for feeding said document sheets from said platen into and out of said reversing chute from said same first side of said platen to invert document sheets in said document recirculation path after they are copied on said platen and before they are returned to said set of document sheets, and

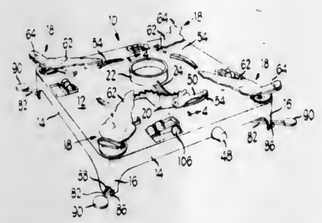
wherein said selectable document inverter further comprises a selectively positionable document sheet deflector gate adjacent said first side of said platen for selectively bypassing said reversing chute to feed document sheets from said platen directly back to said document set or for alternatively feeding document sheets from said platen into said reversing chute for inversion as they are returned to said document set from said platen.

4,234,181

ROUND-ABOUT GAME APPARATUS

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sep. 21, 1978, Ser. No. 944,252
Int. Cl.[3] A63F *9/00*
U.S. Cl. 273—1 R 13 Claims



1. A round-about game apparatus, comprising:

a housing having a platform defining a playing surface;

a striking element mounted on the platform for movement in a predetermined path of travel including drive means for moving the element along said path;

a plurality of playing pieces mounted on the platform in a position with at least a portion of the playing piece lying in a coincident path with the path of travel of said striking element, said playing pieces being mounted for selective movement thereof out of said coincident path of travel; and

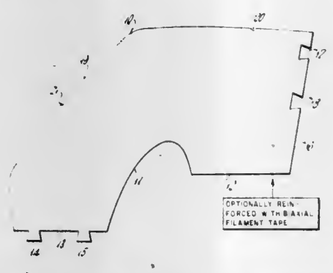
a selectively operable, manually variable, actuator associated with each playing piece for variably moving the portion of the playing piece depending on the intensity of manual operation of said actuator from the coincident path of travel with the striking element, upon timely actuation by the player of the game.

4,234,182

LINER FOR DECK CHUTE

Thomas M. Camilleri, 277 Avenue W, Brooklyn, N.Y. 11223

Filed Jan. 30, 1978, Ser. No. 873,382
Int. Cl.[3] A63D *5/00*
U.S. Cl. 273—42 R 11 Claims



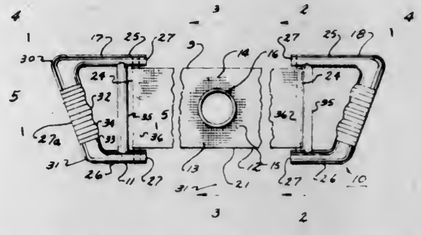
4. A flexible blank adapted to conform to substantially all of the interior surface of a deck chute and to be removably inserted in a deck chute in an automatic pinsetter bowling machine, the blank comprising substantially a planar development of substantially all of the deck chute interior surface to be lined, the blank being formed of a material having a low coefficient of friction with respect to contacting surfaces of a bowling pin, the blank surface contacting the deck chute being provided with a separate, external reinforcing member which imparts strength and resiliency to the lining.

4,234,183

GAME DEVICE

Donald J. Stephens, P.O. Box 630, Roberta, Ga. 31078

Filed Nov. 16, 1978, Ser. No. 961,193
Int. Cl.[2] A63B *65/12*
U.S. Cl. 273—318 3 Claims



1. In a game apparatus utilizing a ball, comprising, in combination, a central net portion of generally rectangular outline adapted to catch a ball including relatively short fastener ends and relatively long horizontal edges;

a pair of complementary substantially planar handles adapted to be connected to opposite fastener ends of said net each including a horizontally elongated upper cantilevered arm portion having an inner end and an outer end, a lower horizontally elongated cantilevered arm portion substantially shorter than said upper arm portion having an inner end and an outer end, with the inner ends of said arms positioned in substantially vertical alignment with each other, and a hand grip portion connected fixedly to said upper arm portion outer end, depending downwardly, obliquely inwardly at an angle arranged and adapted to minimize wrist and arm strain when catching and propelling a ball to a fixed connection with said lower arm portion outer end;

and a vertically arranged elongated traverse pin member fixedly attached between said upper and said lower arm member adjacent their inner ends, said pin arcuately bowed centrally in a plane substantially normal to the handle plane to connect the fastener ends of the net in arcuate relationship to said handles.

4,234,184

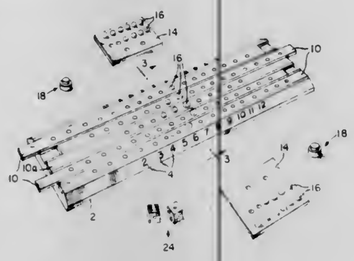
THERMOPLASTIC POLYMER COVER FOR GOLF BALLS AND GOLF BALLS COMPRISING SUCH A COVER

Gerard Deleens, Bernay; Bernard Guerin, Bures sur Yvette, and Rene Kern, Savigny sur Orge, all of France, assignors to ATO Chimie, Courbevoie, France

Filed Feb. 15, 1979, Ser. No. 12,431
Claims priority, application France, Feb. 24, 1978, 78 05285
Int. Cl.[3] A63B *37/12*; C28G *69/44*
U.S. Cl. 273—235 R 15 Claims

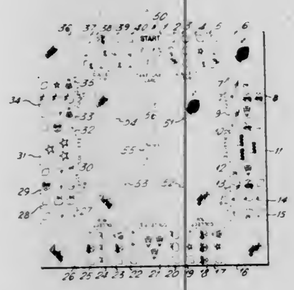
1. A golf ball having a core and a cover of thermoplastic polymeric material surrounding the core which comprises a thermoplastic polymer material comprising a poly(ether-ester-amide) sequenced copolycondensate obtained from the copolycondensation of an α,ω-dicarboxylic copolyamide having an average molecular weight between 300 and 15,000 with an α,ω-dihydroxyl aliphatic polyoxyalkylene glycol of an average molecular weight between 100 and 6,000, the sequenced copolycondensate containing 5 to 85% by weight of polyoxyalkylene glycol moieties and having a melting point between 80° and 150° C. and a Shore D hardness between 35 and 70.

4,234,185
STRATEGY AND PERCEPTION GAME
Bruce F. Alsip, 270 Almak Ct. N.W., Issaquah, Wash. 98027
Filed Jun. 8, 1978, Ser. No. 913,572
Int. Cl.[3] A63F 3/00, 9/00
U.S. Cl. 273—243 **1 Claim**



1. A game of skill and chance comprising:
a plurality of markers for each player,
a game board having discrete indicia means along the edges thereof and including a plurality of parallel elongated slides mounted upon the board for movement along their length, each of said slides having a row of discrete marker receiving positions corresponding to the discrete indicia means along the line of movement of said slide, said slides being limited in movement only by the fact that during play at least one of the marker receiving positions must be adjacent one of the indicia means, said game board further including at least one stationary line of discrete marker receiving positions,
random selection means having indicia corresponding to the indicia on the board such that each player in turn places a marker at a marker receiving position corresponding to the indicia on the random selection means and moves a slide upon which the marker has been placed one position in either direction and tallies the score by counting adjacent markers.

4,234,186
BOARD GAME
Stanley G. Forrest, and Michael C. Spashett, both of Southampton, England, assignors to Guy Colins Co. Limited, Southampton, England
Filed Aug. 28, 1978, Ser. No. 937,605
Claims priority, application United Kingdom, Feb. 14, 1978, 5864/78
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—243 **7 Claims**



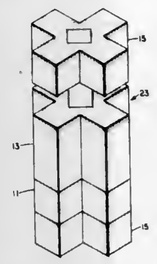
1. Apparatus for playing a game, comprising a plurality of tokens, a board bearing a closed-circuit single-lane track that is sub-divided transversely into a series of playing locations extending around the track, each of a first plurality of said playing locations portraying three fruit machine symbols, said fruit machine symbols being selected from several different fruit machine symbols and adjacent said locations bearing different combinations of said fruit machine symbols, and each of a second plurality of said playing locations portraying one of said tokens, a playing piece for each player, said pieces being movable along said track in accordance with predetermined rules, and aleatory means for determining to which playing location a player moves his playing piece at his turn to play, and a plurality of money symbols, wherein said money symbols are associated with said first plurality of playing locations according to the absence of a given said fruit machine symbol and are awardable to a player whose playing piece attains one of said first plurality of playing locations, and said tokens are awardable to a player whose playing piece attains one of said second plurality of playing locations.

4,234,187
DEVICE FOR MARKING AN ELEMENT OF INFORMATION
Roger Las, 1145 Les Poissons, 92400 Courbevoie, France
Filed Jun. 30, 1978, Ser. No. 921,112
Claims priority, application France, Jul. 8, 1977, 77 21208; Dec. 5, 1977, 77 36566
Int. Cl.[3] A63F 3/00, 9/00
U.S. Cl. 273—248 **7 Claims**



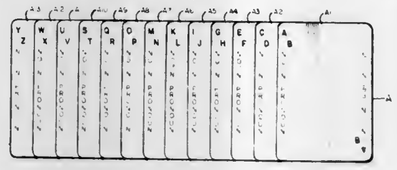
5. A marking device to mark an element of information out of a plurality of sequential elements, said device comprising:
a cylinder at the periphery of which are placed in successive squares, according to a helical sequence of a given pitch, the elements to be marked, said cylinder being fitted with helical thread means of the same pitch, and including bottom means and cover means in order to form a closed box,
a ring fitted on said cylinder having means to cooperate with said thread means and comprising at least one window having substantially the same dimensions as each of said elements to be marked; whereby, by rotating said ring around said cylinder, said elements to be marked sequentially appear in said window,
said cylinder having an end portion forming part of said closed box and extending axially beyond helical sequence,
at least part of said end portion of said cylinder being made of a translucent material, and at least one individual information-carrying element being freely received within said closed box,
whereby in at least a position of said device said information-carrying element may be seen from the outside.

4,234,188
MODULAR CHESS SET
Robert R. Keegan, 1825 Susan Dr., Fayetteville, Ark. 72701
Filed Nov. 5, 1975, Ser. No. 628,475
Int. Cl.[3] A63F 3/02
U.S. Cl. 273—290 **10 Claims**



1. A set of game-pieces comprising at least four groups of pieces, the pieces of the first group being of a first configuration having a cruciform, substantially uniform, horizontal cross-section, the pieces of the second group being of a second configuration different from said first configuration and shaped for engagement with a piece of said first configuration, the pieces of the third group being formed of at least two modules having said first and second configurations, and the pieces of said fourth group being formed of at least three modules having said first and second configurations.

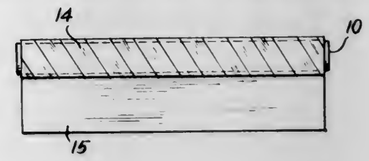
4,234,189
EDUCATIONAL PLAYING CARDS
Robert E. Chunn, 1084 Dayton, #301, Aurora, Colo. 80010
Filed Dec. 26, 1978, Ser. No. 972,991
Int. Cl.[3] A63F 1/00
U.S. Cl. 273—299 **3 Claims**



1. For use in a card game: a deck of fifty-two playing cards divided into four suits of thirteen cards each, each suit being representative of two different forms of speech, and the four different suits being representative of eight different forms of speech, each card in each suit bearing designations of the two different forms of speech represented thereby, each card in each suit displaying two different letters of the alphabet, the thirteen cards in each suit displaying all twenty-six letters of the alphabet, corresponding cards in all four suits displaying the same two letter combinations; and means for determining trump, said trump determining means comprising a complication of words, the selection of one of which determines trump according to the form of speech of the selected word.

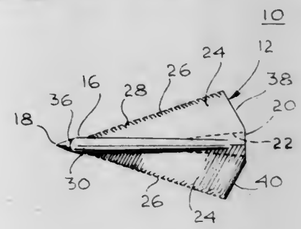
4,234,190
CARBON FIBER-REINFORCED PLASTIC ARROW
Tom P. Airhart, Hurst, Tex., assignor to Skyline Industries, Inc., Fort Worth, Tex.
Filed Feb. 6, 1978, Ser. No. 875,547
Int. Cl.[3] F41B 5/02
U.S. Cl. 273—420 **4 Claims**

1. A carbon fiber-reinforced plastic arrow having a tubular shaft with a length of from 25 to 32 inches, a wall thickness of from 0.022 to 0.032 inch and an internal diameter of from 0.19 to 0.26 inch, the larger internal diameters and greater wall thicknesses being used with the longer arrow lengths to provide a stiffness measured by center deflection under a two pound center load while simply supported at both ends of from 0.25 to 0.7 inch, said tubular shaft being constructed of carbon fiber-reinforced plastic to include an interior section in which the carbon fibers run in two directions, each balanced with respect to the other, of at least 30° to the axis of the arrow, and



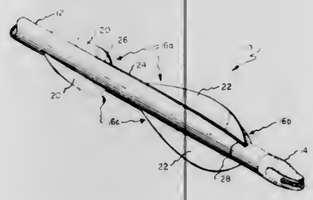
an outer section in which substantially all of the fibers are parallel to the axis of the arrow, said arrow including a head at the forward end of the shaft, said head having a weight of from 45% to 60% of the weight of the shaft, said interior section of said tubular shaft is constituted by two layers of parallel carbon fiber rovings, one layer being wound without overlap at one angle to the axis of the arrow, and the other layer being wound without overlap at the opposite angle to the axis of the arrow.

4,234,191
ARCHERY ARROW HEAD
Roger S. Erlandson, 8600 Rubio Dr., Elk Grove, Calif. 95624
Filed Jan. 31, 1979, Ser. No. 7,904
Int. Cl.[3] F41B 5/02
U.S. Cl. 273—421 **7 Claims**



1. An improved plastic archery hunting arrow head, said head being of unitary integral one piece construction, and including:
a. a main plastic body having a longitudinally extending thickened wedge shaped central core, said body being narrow at the front end thereof and wide at the rear end thereof, said front end terminating in a forwardly directed sharp point, and said rear end defining a central forwardly extending opening in said core adapted to receive an arrow shaft;
b. a pair of plastic blades forming the lateral portions of said body and having rearwardly diverging peripherally disposed serrated cutting edges, the serrations of which are forwardly directed; and,
c. a thick central plastic reinforcing and wedging bar extending throughout said body from said point to adjacent said rear end, extending forward of said blades and projecting above and below the main plane of said blades, said bar having a rounded front end of substantial thickness.

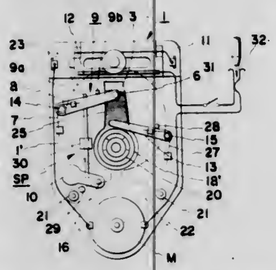
4,234,192
BI-DELTA VANE
Joseph L. Salamone, 25 Dempster St., Buffalo, N.Y. 14206
Filed Sep. 19, 1979, Ser. No. 76,865
Int. Cl.³ F41B *5/02*
U.S. Cl. 273—423 **7 Claims**



4. An arrow having a shaft and a plurality of fletching elements fixed along mounting edges thereof to a rearwardly disposed end portion of said shaft to assume a given angle of helical twist or offset, the improvement comprising in combination:

each of said fletching elements includes a leading guide vane and a trailing guide vane, said leading guide vane being relatively smaller than said trailing guide vane and said leading guide vane having its rear edge disposed essentially in an adjacent annular offset relationship relative to the front edge of said trailing guide vane, as viewed from the rear end of said shaft.

4,234,193
SIMPLIFIED PHONOGRAPH CAPABLE OF SELECTING DESIRED GROOVES ON A RECORD DISC
Yutaka Shiseki, Kawasaki, Japan, assignor to Ozen Corporation, Japan
Filed May 29, 1979, Ser. No. 43,319
Claims priority, application Japan, Feb. 27, 1979, 54-22339
Int. Cl.³ G11B *3/08, 17/06*
U.S. Cl. 274—1 A **7 Claims**



1. A simplified phonograph capable of selecting a record groove on a record disc for sound reproduction which comprises:

(a) a housing;

(b) a record disc having a plurality of record grooves, each groove having a starting point and a terminal point for sound reproduction, the starting point of each groove being radially offset from every other groove and the terminal point of each groove is radially substantially distinct from any starting point;

(c) a driving source for rotating the disc and disposed on that housing;

(d) a tone arm which includes a pick up, the tone arm being swingably mounted on the housing, the tone arm traveling along one of the grooves from the starting point to the terminal point;

(e) means for normally biasing the tone arm toward a starting point of a groove;

(f) a stopper mounted on the housing, the stopper stopping the pickup against a resilient force imparted by the means for biasing, the stopper being positioned at points corresponding to the starting point of each groove, the stopper being constructed such that the pickup can be positioned at a position corresponding to each starting point of each groove, the stopper comprising a movable stopper member retained in the housing, the stopper member being movable in a direction parallel to a plane in which the record disc extends;

(g) a speaker unit housed within the housing, the speaker unit comprising a speaker and a sound transmitter;

(h) means for urging the sound transmitter toward the record disc;

(i) means for actuating the pickup to return the pickup to a starting point, the means for actuating releasing the pickup from a stylus force normally imparted thereto to enable the return of the pickup;

(j) a weight retained in the housing and associated with the movable stopper member, the weight being movably mounted in the housing and being movable with the movable stopper member in the same direction therewith, the weight moving the movable stopper member against the resilient force of the means for biasing to position the movable stopper member in a first position when the phonograph is in a vertical position and the resilient force of the means for biasing moving the weight and the movable stopper member to a second position when the phonograph is in a horizontal position, and

wherein the phonograph selects one record groove to be reproduced when in the horizontal position and a different record groove when in the vertical position.

4,234,194
STYLUS LEAD-IN MECHANISM OF RECORD PLAYER
Hirosi Koyahata, and Nobuo Suzuki, both of 762 Niiharu-cho, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan
Continuation-in-part of Ser. No. 887,558, Mar. 17, 1978, abandoned. This application Dec. 8, 1978, Ser. No. 967,570
Claims priority, application Japan, Mar. 22, 1977, 52/34652[U]; Oct. 4, 1977, 52/119275; Oct. 17, 1977, 52/138129[U]
Int. Cl.³ G11B *17/16*
U.S. Cl. 274—10 R **7 Claims**



1. A record player for playing record discs of at least two sizes, comprising in combination:

(a) a turntable **(43)** disposed for rotation in the horizontal plane, a tone arm spindle **(16)** at some distance therefrom;

(b) a tone arm **(23)** with an inner section and also having an outer end, with a record playing stylus at said other end, the inner section of said tone arm being pivotally disposed on said tone arm spindle **(16)** in a manner that said tone arm **(23)** can swing in the horizontal plane so that the stylus can engage the outer playing portion of a record disc on said turntable **(43)**, said tone arm likewise having at least a limited elevational pivotal movement;

(c) an elongated return lever **(2)** extending between said turntable **(43)** and said tone arm spindle **(16)**, said elongated return lever **(2)** having inner and outer portions;

(d) operating means for operating said tone arm **(23)** including an operating lever **(26)** coupled to a two stage cam **(24)**, an elevation means first operating member **(3)** coupled to said tone arm **(23)** for elevational movement of said tone arm, said first operating member **(3)** having a contacting portion in contact with said cam **(24)**, a change-over lever **(22)** for determining the location of the record playing portion contacted by said stylus, a position restrictive plate **(21)** with a contact end and having at least first and second defined positions **(21*a*, 21*b*)** to determine the aforementioned record playing stylus locations, said position restrictive plate **(21)** having said contact end in contact with said cam **(24)** and an operation plate **(17)** attached to said tone arm spincle **(16)** disposed for reciprocating horizontal motion and having sensing means **(18, 19)** in contact with said position restrictive plate **(21)**;

(e) an elongated slide lever **(30)** with inner and outer ends, adjacent said return lever **(2)** longitudinally moveable along said return lever, the inner end of which is coupled to said operation plate **(17)**;

(e) switch operating means including a switch contact piece **(37)**, intermediate said inner and outer portions of said return lever **(2)**, for longitudinal movement together with the pivotal movement of said tone arm **(23)**, including an operating pin **(2*b*)** on said return lever **(2)**, a start switch **(40)** pivotally supported so as to be swingable between moving positions of said switch contact piece **(37)** and said operating pin **(2*b*)**, a stopper **(41)** at one side of said switch contact piece **(37)** so disposed that said start switch **(40)** can be turned OFF only when said switch contact piece **(37)**, said operating pin **(2*b*)** and said start switch **(40)**, all occupy a predetermined position;

(f) a turntable shaft **(47)**, a drive pinion **(45)** mounted on said turntable shaft, a large gear **(33)** having a cam groove **(33*a*)** and a notch portion **(33*b*)** and link claw means **(31, 32)** which can be caused to engage with said drive pinion **(34)** by the movement of said slide lever **(30)**, the return lever **(2)** outer portion extending into engagement with said cam groove **(33*a*)**; and,

(g) tone arm elevating means including a bent portion **(2*a*)** at the inner portion of said elongated return lever **(2)**; an elevation rod **(1)** in contact with said bent portion **(2*a*)**, and, an operation plate **(17)**, contacted by said elevation rod **(1)** said operation plate **(17)** being pushed by said elevation rod **(1)** to enable said tone arm **(23)** to return from a position where said stylus is engaged with a record to an original position before such engagement.

4,234,195
APPARATUSES FOR REPRODUCING SIGNALS FROM ROTARY RECORDING MEDIUMS
Norio Shibata, Sagamihara, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan
Filed Feb. 21, 1979, Ser. No. 22,515
Claims priority, application Japan, Mar. 24, 1978, 53/32931; Mar. 24, 1978, 53/32933
Int. Cl.³ G11B *3/60*
U.S. Cl. 274—39 R **7 Claims**

1. An apparatus for reproducing a signal from a rotary recording medium comprising:

a turntable driven to rotate by a rotation driving source;

a turntable sheet carried on said turntable and for carrying and supporting the rotary recording medium thereon thereby to rotate therewith, said turntable sheet comprising an upper base surface, a continuous projection disposed along the outer periphery of said rotary structure and for carrying thereon the peripheral edge of said rotary recording medium, a plurality of projections dispersed inward of said peripheral continuous projection and for carrying thereon said rotary recording medium, holes formed to extend in the direction of the thickness of said turntable sheet and open at said upper base surface and grooves formed in the lower surface of said turntable sheet communicatively connected with said holes and extending up to near the center of said turntable, first enclosed spaces being formed between a rotary recording medium carried on said projections and the upper base surface of said turntable sheet and second enclosed spaces being formed between said grooves in said turntable sheet and said turntable;

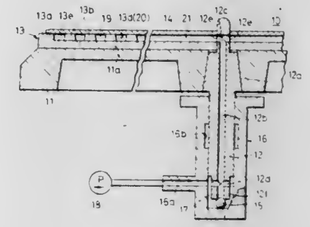
a spindle for the turntable;

air suction means; and

a communication structure communicating said enclosed spaces formed between said turntable sheet and said rotary recording medium to said air suction means, said communication structure comprising a first communication passage formed in said spindle to provide communication to said second enclosed spaces, and a second communication passage for communicatively connecting said first communication passage to said air suction means.

7. An apparatus for reproducing a signal from a rotary recording medium comprising:

a turntable driven to rotate by a rotation driving source;



a turntable sheet carried on said turntable and for carrying and supporting the rotary recording medium thereon thereby to rotate therewith, said turntable sheet integrally comprising an upper base surface, a continuous projection disposed along the outer periphery of said rotary structure and for carrying thereon the peripheral edge of said rotary recording medium, and a plurality of projections dispersed inward of said peripheral continuous projection and for carrying thereon said rotary recording medium,

enclosed spaces being formed between the rotary recording medium carried on said projections and the upper base surface of said turntable sheet;

a spindle for the turntable;

air suction means; and

a communication structure communicating said enclosed spaces formed between said turntable sheet and said rotary recording medium to said air suction means,

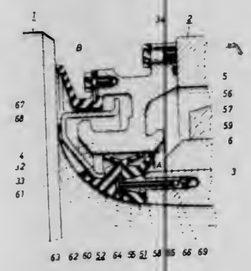
said communication structure comprising an opening formed in said spindle and opening at a position higher than the upper base surface of said rotary structure and communicating to said spaces, a first communication passage communicating to said opening and extending through the spindle, and a second communication passage for communicatively connecting said first communication passage to said air suction means.

4,234,196

ROLL NECK SEALING DEVICE

Yoshimi Iida, Kawasaki, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,161
Claims priority, application Japan, Feb. 21, 1979, 54-21275[U]
Int. Cl.³ F16J *15/32, 15/38*
U.S. Cl. 277—12 **3 Claims**



1. A roll neck sealing device comprising:
a sleeve mounted on an outer surface of a roll at one end;
a bushing mounted on said sleeve for relative rotation with respect to said sleeve;
a housing secured to an outer surface of said bushing for supporting said roll;
a neck seal consisting of an inside neck seal and an outside neck seal, both fitted to an outer surface of a neck portion of said roll;
a seal end plate which is secured to said housing and provides a cylindrical inner surface against which sealing lips of said neck seal bear and slide;
an engagement means consisting of a fixing pin projecting from an end of said sleeve toward said inside neck seal and a hole formed in said inside neck seal; and
a preventive means, one end of which is secured to said outside neck seal and the other end of which extends through said hole into a core hole formed in said fixing pin which is received in said sleeve, said preventive means being adapted for preventing relative rotation between said neck seal and said sleeve;
whereby an axial length over which said preventive means is inserted into said fixing pin is set at a distance greater than the maximum allowable axial play between said sleeve and said bushing that is caused when the sealing member is being replaced.

4,234,197

CONDUIT SEALING SYSTEM

Amareswar Amancharla, League City, Roger A. Weinberg, Houston, both of Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jan. 19, 1979, Ser. No. 4,786
Int. Cl.³ F16J *15/18*; F21B *23/00*
U.S. Cl. 277—124 **9 Claims**

1. In a seal system carriable by a first conduit and sealingly engageable with a second conduit within a well bore for isolating an annular section between said conduits, the improvement comprising: a plurality of longitudinally extending, selectively spaced annular seal assemblies, each of said assemblies being separated one from another by a rigid spacing member, each of said assemblies comprising a plurality of annular seal members wherein each of the outermost seal members adjacent to the spacing member have a coefficient of expansion greater than that of the rigid spacing member and said second conduit and wherein each of the outermost seal members is not extrudable



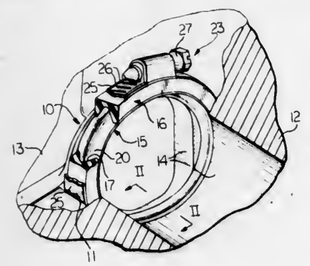
over said rigid spacing member during sealing engagement between the conduits.

4,234,198

WATER SEAL ASSEMBLY FOR ENGINES

Gary G. Martin, Morton, and James C. Smith, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 12, 1976, Ser. No. 731,605
Int. Cl.³ F16J *15/10*
U.S. Cl. 277—145 **6 Claims**



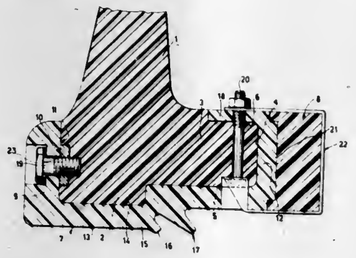
1. A seal assembly comprising
a circumferentially uninterrupted annular ferrule formed as a rigid, one-piece construction, including a generally V-shaped camming portion and a pair of flanges each connected to an end of said camming portion,
a circumferentially uninterrupted annular elastomeric seal circumferentially surrounding said ferrule and having a generally V-shaped groove formed circumferentially thereabout and between sidewalls thereof, the camming portion of said ferrule at least partially disposed in sliding relationship in said groove, and
clamping means circumferentially surrounding said seal for applying a clamping force thereon to expand the sidewalls thereof outwardly away from each other and against the rigid backing of said ferrule.

4,234,199

SEALING ARRANGEMENTS

Michael B. Moncaster, Cumbria, and James D. Rummer, Barrow-in-Furness, both of England, assignors to Vickers Limited, London, England

Filed Feb. 6, 1978, Ser. No. 873,894
Claims priority, application United Kingdom, Feb. 4, 1977, 4769/77
Int. Cl.³ F16S *13/00, 15/10*
U.S. Cl. 277—237 R **1 Claim**



1. In combination,
(A) a open ended member having
(i) a rim at its open end,
(ii) an internal face adjacent the rim, and
(iii) an outwardly extending radial flange adjacent the rim, and
(B) a sealing arrangement for providing a fluid tight seal between the rim of the open ended member and a second member, said sealing arrangement comprising,
(i) a resilient first ring comprising (a) an inner cylindrical portion in contact with the internal face of the open ended member, (b) an outer cylindrical portion including an inwardly directed annular channel fitted over the radial flange of the rim, and (c) an annular portion linking the cylindrical portions, said annular portion having a face in contact with the rim and an opposite annular face for sealing engagement with the second member and having at least one sealing lip protruding therefrom, and
(ii) a resilient second ring concentrically mounted on the first ring and resiliently secured to the open ended member that the second ring is radially displaceable so as to accommodate changes in the dimension of the first ring when the first ring is deformed as a result of the first and second members being urged together under pressure.

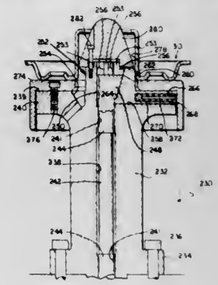
4,234,200

DYNAMIC IMBALANCE DETERMINING SYSTEM

Donald E. Orem, Indianapolis; Vernon P. Holmes, Danville, both of Ind., and Thomas J. Bacsanyi, Novi, Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

Division of Ser. No. 927,760, Jul. 25, 1978, Pat. No. 4,191,055.
This application Sep. 7, 1979, Ser. No. 73,212
Int. Cl.³ B23B *31/16, 31/30*
U.S. Cl. 279—2 A **8 Claims**

1. A chuck for holding a rotary element having a center hole, the chuck comprising a chuck body including an upwardly facing surface and a central hub portion, means defining a plurality of first slideways in the upwardly facing surface, means defining a plurality of cooperating second slideways in the central hub portion, the first and second slideways being arranged to radiate from a central axis of the hub, the first slideways being disposed radially outwardly from associated second slideways, a plurality of chuck jaws, each chuck jaw including means engageable in a respective first slideway to mount the jaws for movement radially of the hub, means engageable in a respective second slideway to provide a tongue for controlling the position of the jaw radially of the hub and means defining a surface for engagement in the center hole to capture the rotary element on the chuck, and a control member movably disposed in the hub and providing a plurality of control surfaces engageable in the second slideways to move into interfering relationship with the tongues, and means for moving the control member upwardly to permit the tongues



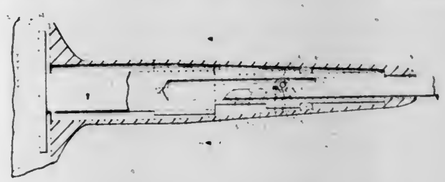
and jaws, and thereby the engaging surfaces, to be moved radially inwardly to release a rotary element center hole, the control member being normally urged downwardly to force the tongues and jaws, and thereby the engaging surfaces, radially outwardly to engage a rotary element center hole and capture the rotary element on the chuck.

4,234,201

CHUCK FOR MINIATURE ROTARY TOOL

Irvin Sorensen, 1015 Manchester St., Arlington, Va. 22205

Filed Jan. 29, 1979, Ser. No. 7,198
Int. Cl.³ B23B *31/08*
U.S. Cl. 279—77 **5 Claims**



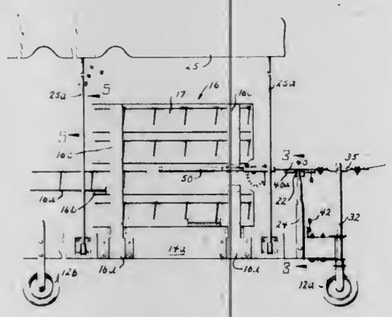
1. A motor driven rotary tool comprising;
a rotatable drive shaft having a longitudinal axis;
a chuck assembly rotatable with said drive shaft and having a longitudinal bore therein extending along the same direction as the longitudinal axis of said drive shaft, said longitudinal bore having diametrically opposed sidewall portions;
a tool bit having a shank portion with a semi-circular cross-section transversely of the longitudinal axis thereof in the provision of a flat surface on said shank portion; and
a U-shaped wire spring having a pair of legs and a central portion, said legs being secured to the external surface of said drive shaft and extending therealong, parallel to said longitudinal axis, said central portion passing transversely through said longitudinal bore and being normally centered in said bore, the cumulative cross-sectional dimension of said shank portion and said central portion of said wire spring being less than the diameter of said longitudinal bore when said flat surface is substantially parallel to said central portion, said cumulative cross-sectional dimension equalling and teding to exceed said diameter of said bore when said flat surface is disposed at a predetermined angle with respect to said central portion;
whereby said tool bit is secured within said bore when said flat surface is twisted to said predetermined angle with respect to said central portion.

4,234,202
SKI POLE
Eberhard Loffelholz, Thurgauerstrasse 13a, Singen, Fed. Rep. of Germany
Filed Feb. 23, 1978, Ser. No. 880,454
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707959
Int. Cl.³ A63C 11/22
U.S. Cl. 280—820 **8 Claims**



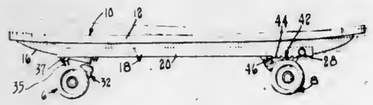
1. The combination of a ski pole and attachment means for detachably connecting said ski pole to the skier in the vicinity of the hand of the skier, said ski pole comprising a tube having a lower pointed end and an upper end, a transverse member on said tube adjacent said pointed end, a hand grip on said tube at said upper end, said attachment means comprising a skier-engagement member and anchoring means of limited elasticity coupling said skier-engagement member with said ski pole in the vicinity of said grip, said anchoring means comprising an anchoring member retractable in and extensible from said ski pole, said anchoring member having one end with means for attachment to said skier-engagement member, and resilient means extending axially within said tube operatively engaging the other end of said anchoring member for biassing said anchoring member to retracted position within said ski pole while permitting extension of the anchoring member from the ski pole and consequent displacement of the skier-engagement member from the ski pole while remaining connected thereto by said anchoring member.

4,234,203
BERRY PICKERS WAGON
Alvin P. Johnson, 617 S. Arthur, Box 123, New Harmony, Ind. 47631
Filed Mar. 26, 1979, Ser. No. 24,165
Int. Cl.³ A01D 67/04
U.S. Cl. 280—32.5 **5 Claims**



1. A crop pickers wagon which straddles a row of crops comprising front wheels and rear wheels mounting a framework supporting a platform for seating a picker at the rear end thereof and affording unrestricted crop access, a steering arrangement disposed at the opposite end of said platform behind said picker and operable by said picker in a seated position, and means forming part of said steering arrangement selectively guiding movement of the wagon in a preselected direction, said guiding means defined by a framework mounted bar having a plurality of notches therein, a centrally disposed pivotal handle controlling movement of a parallelogram shaped operating framework for said front wheels, the latter simultaneously responding to movement of opposite sides of said operating framework, and resilient means selectively positioning said pivotal handle in one of said notches in said bar and locking the direction of said front wheels and wagon movement, where foot action by the picker with the supporting ground propels the wagon in said preselected direction of said steering arrangement and opposite to the direction said picker faces.

4,234,204
SKATEBOARD
Kerry W. Tibbals, 2720 Rosalyn Ct., New Hope, Minn. 55427
Filed Dec. 11, 1978, Ser. No. 968,129
Int. Cl.³ A63C 17/14
U.S. Cl. 280—87.04 A **12 Claims**

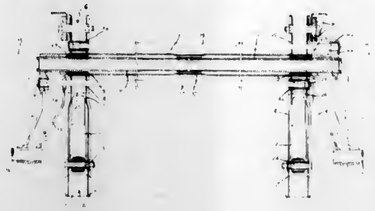


1. An improved skateboard, which comprises:
(a) a multi-part board unit, which includes:
(i) an elongated board member suited for supporting a rider thereon;
(ii) a frame;
(iii) means for pivotably mounting at least a portion of the board member relative to the frame for rotation about a substantially horizontal pivot axis;
(b) at least one wheel support unit carried adjacent and attached to each end of the board unit for rollably supporting the board unit on a ground surface, wherein each wheel support unit has one or more ground engaging wheels; and
(c) wherein one wheel support unit is carried on the pivotal portion of the board member with the wheel or wheels thereof being spaced from the frame when the pivotal portion is in a first position, whereby rotation by the rider of the pivotal portion to a second position causes the wheel or wheels of the one wheel support unit to engage the frame to effect a braking action thereon.

4,234,205
SUSPENSION FOR INDEPENDENT VEHICLE WHEELS
Pierre Thiesce, Velizy, France, assignor to Soclete Anonyme Automobiles Citroen and Automobiles Peugeot, both of, France
Filed Jun. 2, 1978, Ser. No. 912,055
Claims priority, application France, Jun. 10, 1977, 77 17917
Int. Cl.³ B60G 11/20
U.S. Cl. 280—723 **8 Claims**

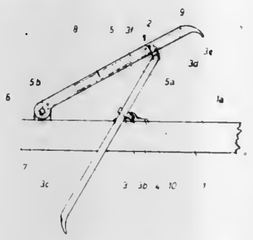
1. In a suspension for a set of independent wheels of a vehicle,
a cross member fixed to the structure of the vehicle,
transverse hub means,
means supporting said hub means on said cross member for rotational and axial translational movement,
an axle arm on each side of the vehicle and each having a first end connected to said hub means wherein said axle arms are axially movable to relative to said cross member,
a pair of wheels, each rotatably supported adjacent a second end of a said axle arm,
a pair of torsion bars spaced from the axis of said hub means and extending transversely of the vehicle, each having one end directly connected to a said axle arm and the other end connected to an element fixed to said structure,

means connecting said torsion bar ends to said axle arms and said elements without rotation and without translation,



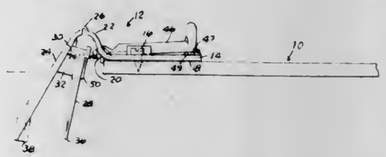
whereby upon movement of a said axle arm about the axis of its hub means, said torsion bars will be subjected to torsion and flexion.

4,234,206
SKI BRAKE
Rupert Hofbauer, Schwechat; Friedrich Leichtfried, Traiskirchen, and Josef Svoboda, Schwechat, all of Austria, assignors to TMC Corporation, Baar, Switzerland
Filed Aug. 11, 1978, Ser. No. 932,789
Claims priority, application Austria, Aug. 18, 1977, 5956/77; Nov. 3, 1977, 7829/77
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **17 Claims**



1. A ski brake for use on a ski, comprising:
mounting means adapted to be mounted to said ski;
pedal means and first pivot support means for pivotally securing said pedal means to said mounting means for movement about a first axis perpendicular to the longitudinal axis of said ski between an upright first position and a second position generally parallel to the under surface of said ski, said pedal means at an end thereof remote from said first pivot support means having a pair of laterally spaced guideways opening outwardly in a bottom surface thereof opposing the upper surface of said ski, said guideways each having at least a pair of angled segments, a first segment of said pair of segments extending in a plane parallel to the longitudinal axis of said ski and a second segment of said pair of segments extending transversely to said longitudinal axis of said ski;
a pair of ski brake arms and second pivot support means for pivotally securing said pair of ski brake arms to said mounting means for movement about a second axis extending parallel to said first axis between a braking position and a retracted position and a third axis orthogonally related to said second axis, each of said ski brake arms having at a first end thereof means adapted to engage the snow and at a second end thereof guide means received in a respective one of said pair of guideways, said second pivot support means being located intermediate said first and second ends, each of said guide means comprising at least one elongated segment extending transversely of the longitudinal extent of said ski brake arm and being slidingly disposed in said first and second segments of said guideway;
means for preventing a separation, during use, of each of said ski brake arms from said guideways in said pedal means; and
resilient means for continually urging said pedal means to said upright first position, the fixed spacing between said first and second pivot support means causing, when said pedal means is in said upright position, said elongated segment on each of said ski brake arms to be located in said first segment of each of said guideways and said first ends of each of said ski brake arms to project below the bottom surface of said ski, a movement of said pedal means against the urging of said resilient means to said second position causing said elongated segment on each of said ski brake arms to slide from said first segment of each of said guideways into said second segment of each of said guideways to cause a positioning of said first ends of each of said ski brake arms over said upper surface of said ski.

4,234,207
SKI BRAKING DEVICE
Walter J. De Vigili, Roseville, Mich., assignor to Louis E. Hough, Roseville, Mich.
Filed Nov. 24, 1978, Ser. No. 963,421
Int. Cl.³ A63C 9/10
U.S. Cl. 280—605 **6 Claims**



1. A braking device for preventing rearward movement of a ski, such as when climbing a hill, comprising, a plate member having a generally flat bottom face adapted to be fixedly mounted on the upper face of a ski at the rear end thereof, a brake member resiliently hinged to the rear end of said plate member, said brake member comprising a pair of downwardly projecting blades integrally connected together adjacent their upper ends in fixed relation adjacent the hinge, said blades having their free ends normally projecting downwardly and rearwardly from the rear end of said plate member and being spaced apart in a direction lengthwise of the plate member, the blade closest the rear end of the plate member being substantially narrower and normally inclined downwardly at a greater angle to the plane of the ski than the blade more remote from the rear end of the ski, said narrower blade being adapted to engage the snow surface over which the ski is travelling, whereby, when the ski tends to move rearwardly on a snow-covered surface, the narrower blade promptly digs into the underlying snow and thereby causes the brake member as a whole to pivot downwardly and forwardly about said hinge so that the wider blade digs progressively deeper into the snow and thereby produces a substantial braking action against rearward movement of the ski, said plate member and said brake member comprising an integral one-piece plastic molding and said hinge comprising a thinned section between the plate member and the brake member.

4,234,208

BINDING FOR SECURING A BOOT OR SHOE ON A TOURING OR CROSS-COUNTRY SKI

Wolf Anderlé, Strasbourg, France, assignor to Adidas Fabrique de Chaussures de Sport, Strasbourg, France

Filed Feb. 5, 1979, Ser. No. 9,151
Claims priority, application France, Feb. 9, 1978, 78 03709
Int. Cl.³ A63C 9/08
U.S. Cl. 280—614 **4 Claims**



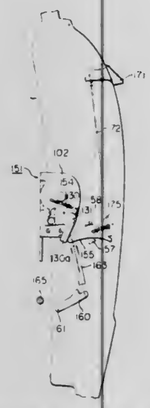
1. A device for fastening a boot on a touring or cross country ski comprising an articulated means for fixing the front of the boot on the ski and a rib disposed along the axis of the ski to engage a longitudinal groove in the bottom of the heel of the boot when the skier rests his heel on the ski, said fastening device including a stationary lower portion fixed to the ski and presenting said rib, and an upper portion comprising, an integral projecting curved flange, inclined at an angle with respect to the horizontal, means connecting the upper portion to the lower portion for rotation with respect to the lower portion between a first position in which said projecting flange engages a transverse groove in the rear face of the heel of the boot above its longitudinal groove, when the rib on the lower portion of the fastening device is engaged in said longitudinal groove of the boot, and at least one second position in which said projecting flange is disengaged from said transverse groove, and return means for pulling said upper portion of the fastening device against its lower portion in each of the said positions, and grippable means on said upper portion for rotating said upper portion to said first and second positions.

4,234,209

SEAT BELT

Haruyuki Ikesue, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,841
Claims priority, application Japan, Nov. 14, 1977, 52-151564[U]; Jul. 4, 1978, 53-80499
Int. Cl.³ A62B 35/02; B65H 75/48
U.S. Cl. 280—803 **14 Claims**



1. A system for making inoperative the emergency locking mechanism of an emergency lock type of retractor when there is no need for emergency locking comprising:

means for taking up a webbing, including a main gear and a subsidiary gear;

inertia sensitive means for directly sensing a change of vehicle speed beyond a predetermined level;

means for locking the take-up means to prevent pull-out of the webbing, said locking means including a subsidiary ratchet member engageable with said subsidiary gear in response to the sensing action of said inertia sensing means and a main ratchet member movable with said subsidiary ratchet member and engageable with said main gear to lock said take-up means; and

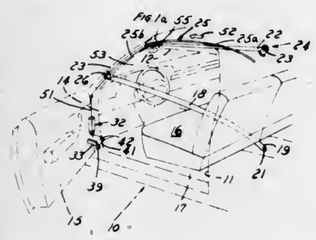
a lever rotatably supported on the retractor and movable between a first position in which said lever allows a free movement of said subsidiary ratchet member and a second position in which said lever restrains the movement of said subsidiary ratchet member, said lever having a recess which engages a projection on the subsidiary ratchet member when the lever is in the second position, and said lever being moved to said second position when there is no need for emergency locking.

4,234,210

PASSIVE RESTRAINT ACTUATOR MECHANISM SYSTEM

Thomas E. McNally, Mt. Clemens; Thomas C. Holka, Farmington Hills, and Harold T. Moreau, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 22, 1979, Ser. No. 68,842
Int. Cl.³ B61R 21/10
U.S. Cl. 280—804 **9 Claims**



1. In combination with a vehicle body having a door opening for ingress/egress to a passenger compartment, the door opening being framed at its upper edge by a roof rail extending longitudinally of the compartment and at its forward edge by a windshield side pillar extending downwardly from the forward end of the roof rail to a vertical hinge pillar to which the door is hinged for swinging movement between opened and closed positions and a floor mounted passenger seat adjacent the door opening,

a passive belt system for restraining a seat occupant within the seat, comprising:

a two-point belt anchored at one end to a vehicle floor fixed attachment means at the inboard side of the seat and at its other end to a retractor mechanism anchored in the vehicle roof rearwardly and outwardly of the seat,

the belt in passenger restraining position extending diagonally over the upper torso of a seat occupant from the floor attachment to the retractor mechanism,

track means paralleling the roof rail and extending from the forward end of the latter downwardly along the windshield pillar,

carriage means movable along the track means having belt engageable means engageable with the belt intermediate the anchored ends of the latter,

and nonelectrical energizing means responsive to the motion of the door when moved to door opening position to energize the belt system,

the energizing means including a lever means swingable in the door opening about a door hinge pivot,

a compressed fluid linear actuator mounted on the vehicle body forwardly of the hinge pillar and coupled to the lever means to swing the same outwardly of the door opening,

and a displacement multiplying multiple-sheave block mounted on the vehicle body forwardly of the hinge pillar operatively interposed between the lever means and the carriage means whereby short linear movement of the piston rod of the actuator swinging the lever means provides multiplied linear movement of the carriage means along the track means,

the carriage means being movable by the energizing means along the track means from the retractor end of the latter to the point at which the track means swings downwardly along the windshield pillar, the carriage means movement terminating at a terminal position near the hinge pillar end of the track means,

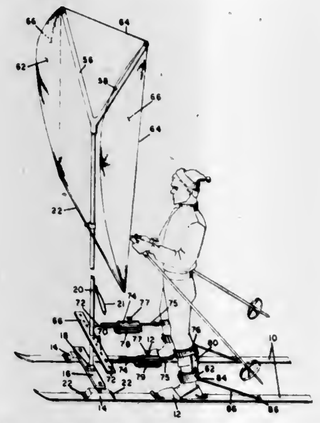
the carriage means during such movement automatically withdrawing the belt forwardly from its passenger restraining position toward the forward end of the compartment to provide unobstructed ingress or egress to the compartment through the door opening.

4,234,211

SKI SAIL APPARATUS

Gregory Lux, 218 School St., Woburn, Mass. 01801

Filed Apr. 27, 1979, Ser. No. 33,553
Int. Cl.³ A63C 11/00
U.S. Cl. 280—810 **2 Claims**



1. A sail apparatus to be utilized with snow skis comprising:

sail means;

means for affixing said sail means to said skis;

control means for the control of said sail means;

wherein said sail means include:

a sail member;

a mast member upon which said sail member is mounted;

pivot means for affixing said sail means to said skis, said pivot means affixed to each of said skis;

a cross member attached to said pivot means;

a mast receipt member affixed to said cross member;

wherein said control means include:

a torsion bar affixed to said mast;

attachment means to interconnect the skier to said torsion bar; and

wherein said attachment means include a rod member adapted to be interconnected to said torsion bar;

leg members adapted to be affixed to the skier's calves; and

shock absorbing means interposed between and interconnected with said rod member and said leg members.

4,234,212

RECORDING SHEET

Hajime Kato, and Yasuhiro Ogata, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 6, 1978, Ser. No. 939,934
Claims priority, application Japan, Sep. 6, 1977, 52-106881
Int. Cl.² B41M 5/16, 5/18, 5/22
U.S. Cl. 282—27.5 **11 Claims**

1. A recording sheet capable of development of color on contact with a substantially colorless electron donating organic compound comprising a support having thereon a coated layer of a dispersion of (1) at least one salt of a polyvalent metal and an aromatic carboxylic acid, (2) at least one water-soluble polymer containing hydroxy groups and (3) a methylated methylalmelamine resin.

4,234,213

CARBONLESS RECORD SYSTEM

Hugh B. Skees, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Oct. 12, 1978, Ser. No. 950,693
Int. Cl.³ B41M 5/22
U.S. Cl. 282—27.5 **10 Claims**

1. A pressure-responsive record transfer sheet comprising:

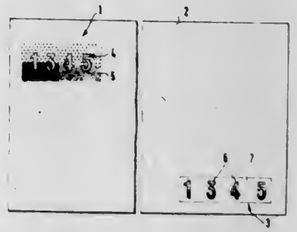
a substrate sheet and a coating on at least one surface of the substrate sheet, wherein the coating is an acidic reactant transfer coating capable of producing useful color when and where brought into intimate reactive contact with an organic, relatively colorless, chromogenic, dye-precursor, and wherein the coating comprises a solid, frangible resin, an organic liquid dye-precursor solvent of low volatility having a boiling point above about 150 degrees centigrade at 10 millimeters of mercury and a vapor pressure below 20 millimeters of mercury at 100 degrees centigrade, and a solid particulate inorganic acidic reactant, wherein the solid acidic reactant is dispersed in a heated mixture of resin and liquid solvent, and wherein the solid acidic reactant is insoluble in the liquid solvent.

4,234,214

DOCUMENT CARRYING A LEGIBLE CODE, AND METHOD AND APPARATUS FOR PRODUCING SAME

Peter D. Lee, Hertford, England, assignor to Governor & Company of the Bank of England, London, England

Filed Aug. 16, 1978, Ser. No. 934,061
Int. Cl.³ B42D 15/00; B41L 27/30
U.S. Cl. 283—57 **11 Claims**



1. A set of banknotes, wherein each banknote carries at a first position a legible code, unique to that banknote, consisting of an arrangement of alphanumeric characters in a negative reverse form within a multi-color background which immediately surrounds said characters and which is printed upon the banknote using printing media of a plurality of different colors,

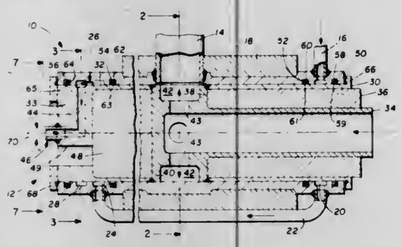
and also carries at a second position a further legible code consisting of said named arrangement of alphanumeric characters in a positive form, and wherein said codes comprise serial numbers by which the banknotes are sequentially numbered.

4,234,215

ROTARY PIPE JOINT

Lee E. Wilson, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jun. 5, 1978, Ser. No. 912,489
Int. Cl.³ F16L 53/00
U.S. Cl. 285—41 **21 Claims**



1. A rotary pipe joint comprising:
(a) a first tubular member having a transversely disposed fluid transmission port,
(b) a second tubular member disposed within said first tubular member and coaxially rotatable relative to said first tubular member,
(c) fluid transmission means having an axis coplanar with the axis of said fluid transmission port and connecting the interior of said second tubular member to said fluid transmission port,
(d) first pressure sealing means disposed between said first tubular member and said second tubular member to one side of the fluid transmission port,
(e) second pressure sealing means disposed between said first tubular member and said second tubular member to the same side of the fluid pressure port as said first pressure sealing means and displaced therefrom,
(f) third pressure sealing means disposed between said first tubular member and said second tubular member to the opposite side of the fluid transmission port as said first and second pressure sealing means,
(g) fourth pressure sealing means disposed between said first tubular member and said second tubular member to the same side of the fluid transmission port as said third pressure sealing means and displaced therefrom,
(h) means for cooling said first and second pressure sealing means by applying a coolant therebetween,
(i) second means for cooling said third and fourth pressure sealing means by applying a coolant therebetween, and
(j) means for interconnecting said first and second means for cooling.

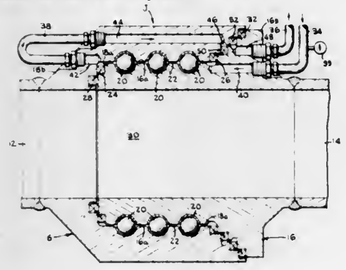
4,234,216

PIPE SWIVEL JOINT FOR SUBMERGED SERVICE

Harold N. Swanson, Anaheim, and Cryssis Pashalis, Fullerton, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 12, 1978, Ser. No. 914,304
Claims priority, application United Kingdom, Jan. 7, 1978, 606/78
Int. Cl.³ F16L 35/00
U.S. Cl. 285—93 **5 Claims**

1. A pipe swivel joint for connecting together a pair of pipes useful for submerged service, said joint comprising:
an annular inner element having an annular groove in the outer surface thereof, said inner element having a radially outward extending flange at one end thereof;
an annular outer element having an annular groove in the inner surface thereof, said outer element having a radially inward extending flange at one end thereof, said outer element surrounding said inner element;
bearing means mounted between said outer element and said inner element, said bearing means comprising a plurality of rollable elements residing in a bearing race chamber that is defined by said grooves in the outer surface of said inner element and in the inner surface of said outer element, said bearing means interacting with said annular grooves to hold said joint together;
a first annular seal mounted between the flange on said outer element and the end of said inner element to provide a fluid-tight seal between said bearing race chamber and an inside of said swivel joint;
a second annular seal mounted between the flange on said inner element and the end of said outer element to provide a fluid-tight seal between said bearing race chamber and an outside of said swivel joint;



an inlet passageway connected to a first end of said bearing race chamber;
an outlet passageway in said outer element connected to a second end of said bearing race chamber;
a lubricant supply line and a lubricant return line;
means for connecting said lubricant supply line to said inlet passageway;
said lubricating supply line providing pressurized lubricating fluid to said bearing race chamber;
an annular lubricant chamber formed in said outer element in the end adjacent said flange of said inner element;
means for connecting said annular lubricant chamber to said outlet passageway;
a return passageway connected between said lubricant return line and said annular lubricant chamber,
said return passageway and said inlet passageway each being formed in said inner element;
and means for connecting said lubricant return line to said return passageway in said inner element.

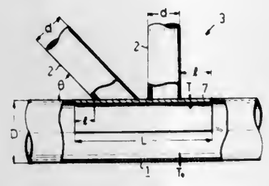
4,234,217

PIPE JOINT CONSTRUCTION

Suguru Sakamoto; Takuzo Nakazato; Tsugio Minoshima, all of Amagasaki, and Tohachiro Tanaka, Tokyo, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1978, Ser. No. 888,275
Claims priority, application Japan, Mar. 22, 1977, 52-31947
Int. Cl.² F16L 13/02
U.S. Cl. 285—150 **5 Claims**

1. A pipe joint construction comprising:
a main pipe of circular external cross section and having a wall with outer diameter D, a major part of the wall being of thickness To and a portion of the wall of said main pipe integral with said major part having a wall thickness T greater than To; and
at least one branch pipe having a circular cross section and an outer diameter d, the end of said branch pipe being welded to said portion of the wall of said main pipe, said portion of the wall of said main pipe subtending an angle ϕ at the center of said main pipe and said central angle being determined by the following relationship:



$$1 > \phi/2\pi \geqq (\alpha^2/k)(d/D)^{1/4}(D/T)^{1/4}(T/To)$$

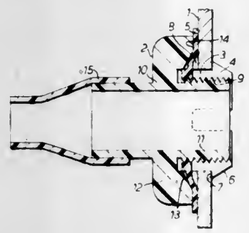
where α represents a rigidity ratio, and k represents a constant depending on the type of joint.

4,234,218

FEEDTHROUGH DEVICE

Albert G. Rogers, Cricklade, England, assignor to Raychem Limited, London, England

Filed Sep. 26, 1977, Ser. No. 836,770
Claims priority, application United Kingdom, Oct. 1, 1976, 40792/76
Int. Cl.² H01B 17/26, 17/30; F16L 5/00
U.S. Cl. 285—162 **20 Claims**



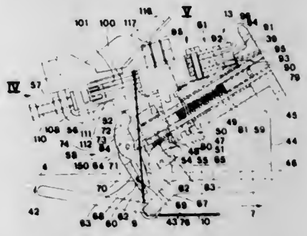
1. A feedthrough device for sealing a supply line within an aperture in a wall member, which comprises
(a) a first tubular member comprising a portion adapted to extend through the aperture, which portion is radially deformable to allow insertion of said portion through the aperture and is provided with a laterally extending shoulder surface adapted to abut one side of the wall to prevent withdrawal of said portion through the aperture, the first tubular member abutting only said one side of the wall;
(b) a second tubular member having a relatively non-deformable portion adapted to engage with the first tubular member to restrain the laterally extending shoulder surface of the deformable portion against radially inward deformation;
(c) an outwardly projecting flange member coaxially disposed in relation to the first tubular member and axially movable with respect thereto to co-operate with the laterally extending shoulder surface to exert an axial clamping action therebetween thereby effecting a seal at the wall member adjacent said flange member, and
(d) a recoverable sleeve adapted, on recovery, to effect a seal between the device and the supply line.

4,234,219

KNOTTER WITH IMPROVED BILLHOOK AND ACTUATION MECHANISM

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 916,371, Jun. 16, 1978, Pat. No. 4,161,097. This application Apr. 23, 1979, Ser. No. 32,204
Int. Cl.³ A01D 59/04
U.S. Cl. 289—2 **9 Claims**



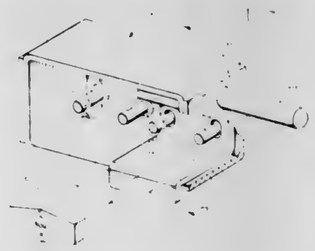
1. In a crop baling machine having an apparatus for tying a knot in primary and secondary portions of twine, said apparatus including a support frame, a twine holding mechanism mounted on said frame, a billhook rotatably mounted on said frame adjacent said twine holding mechanism and an actuation means also mounted on said frame adjacent said billhook to open and close same at selected locations along its rotary path, the improvement wherein:
said actuation means comprises a rotatable cam mounted on a fixed spindle, said spindle being fixed relative to the rotation of said billhook; and
said billhook includes a fixed jaw and movable jaw pivotably mounted on said fixed jaw, said movable jaw further including a cam follower for contacting said rotatable cam and opening and closing said billhook in response to the surface variations of said cam.

4,234,220

EXTERIOR SAFETY LOCK APPARATUS

Harry E. Finch, 5273 Vista del Sol, and Geza J. Szayer, 5335 Canterbury St., both of Cypress, Calif. 90630

Filed Jun. 19, 1978, Ser. No. 916,553
Int. Cl.³ E05C 1/04, 13/02; E05B 65/06
U.S. Cl. 292—148 **25 Claims**



1. A locking assembly for mounting on one of a pair of members to be latched together, comprising:
a housing;
a slidable latch supported by and movable relative to the housing between latched and unlatched positions;
a first pair of shackle pins;
means for mounting said first pair of shackle pins within said housing for engaging a removable padlock body when positioned thereon; and

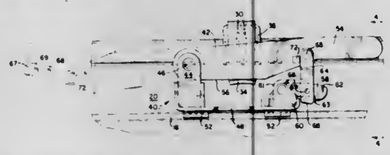
a lockout tab affixed to the slidable latch for movement therewith, said lockout tab serving to block movement of the latch in either direction between said latched and unlatched positions when a padlock body is in position to engage the shackle pins.

4,234,221

TROUGH HATCH LOCKING DEVICE

Thomas L. Przybylinski, and Eugene R. Tylisz, both of Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sep. 11, 1978, Ser. No. 941,347
Int. Cl.³ E05C 3/14
U.S. Cl. 292—256.5 **13 Claims**



1. A locking device for a hopper having a roof provided with a hatch opening surrounded by upstanding coaming, and pivoted hatch cover means rotatable to engage said coaming to close the hatch opening, the improvement comprising;

a pivoted hinge strap with means adjacent said hatch opening for supporting the hinge strap;

said hinge strap including means rotatable in a first plane between a hatch open position away from said hatch cover and a hatch closed position adjacent said hatch cover;

said hinge strap having a locking extension protruding outwardly of said coaming when the hinge is in the hatch closed position;

a locking bar having bracket means mounted on the roof for rotational movement of the bar in a second plane transverse to said first plane, and said locking bar being movable between a locked and unlocked position;

means on the locking bar engaging the hinge strap extension when the locking bar is in said locked position and the hinge strap is in the hatch closed position;

means for securely interconnecting the hinge strap and locking bar;

said means for interconnecting comprising a shackle and a latch hook;

shackle pivot means mounting said shackle intermediate the ends of the locking bar for pivotal movement;

latch pivot means on said bracket means pivotally mounting said latch hook for limited, rotational movement;

stop means with means associated with said latch hook for limiting the rotation of said latch hook between a first position away from the hopper and a second position closer to said hopper;

said latch hook and said shackle including cooperating surface means for automatically pivoting the shackle about the locking end portion of the latch and automatically positioning the shackle and latch in a locked position.

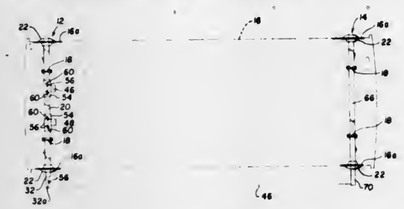
4,234,222

PROTECTIVE DEVICE FOR AUTOMOBILES

Marvin J. Bays, Rte. 1, Box 41AA, Stillwater, Okla. 74047

Continuation-in-part of Ser. No. 901,529, May 1, 1978, abandoned. This application May 29, 1979, Ser. No. 43,367
Int. Cl.³ B60R 19/00
U.S. Cl. 293—124 **5 Claims**

1. A vehicle body protection device comprising: a first pair of arms extending outwardly from the rear side portions of the vehicle and slideably disposed through the side of the body of the vehicle such that the arms are moveable from a first position extended from the side of said vehicle to a position retracted within said vehicle; a second pair of arms extending outwardly from the forward portion of the vehicle, said arms slideably disposed within the side of the vehicle such that the second pair of arms are moveable from a first position extended outwardly from the side of said vehicle to a position wherein they are retracted within the wall of said vehicle; a roller disposed on the end of each of said first pair of arms; a flexible band secured within a storage case such that the band may be



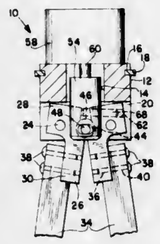
retracted and stored within said case, said band being positioned over said rollers on said first pair of arms and adapted to be pulled from said first pair of arms to said second pair of arms and secured thereto such that the band extends along the side of the body of the vehicle; and means to prevent said band from becoming slack between said two arms such that an object striking said band is slowed or deflected away from the vehicle body.

4,234,223

DRIVE MECHANISM FOR A PICK-AND-PLACE UNIT

James P. O'Neil, Swansea, Mass., assignor to Automation Designs, Inc., Bristol, R.I.

Filed Apr. 30, 1979, Ser. No. 34,940
Int. Cl.³ B66C 1/42
U.S. Cl. 294—88 **7 Claims**



1. A device for driving a pair of jaws pivotally supported from a housing towards and away from each other, said jaws each including an upwardly oriented head from which a leg downwardly depends, said heads and said legs having inner respectively opposed surfaces, an arcuate recess formed in each such inner opposed head surface said recesses cooperatively forming a drive socket, a generally cylindrical bushing laterally disposed between said jaws and supported in said socket and disposed in slidable face to face contact with the opposed surfaces of said recesses, said bushing including terminal ends laterally extending past the opposite sides of said jaws and drive means connected to said bushing ends for reciprocating said bushing up and down with respect to said housing so as to force said jaws to pivotally move towards and away from each other, said drive means including a drive member having segments disposed on either side of said jaws and adapted to receive said bushing ends therein, said housing including a generally centrally disposed vertically oriented bore, said drive member passing through said bore and adapted for reciprocal movement relative thereto, said recesses downwardly spaced from the upper terminus of said head so as to define opposed upper head inner surfaces and stop means adapted to contact one of said upper head inner surfaces so as to directly

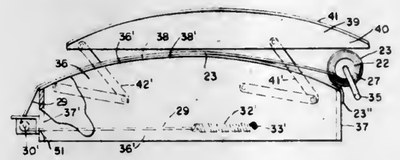
limit the extent of pivotal movement of said jaws relative to each other.

4,234,224

TRUCK BOX COVER DEVICE

Leo Rosenvold, Wildrose, N. Dak.

Filed Nov. 13, 1978, Ser. No. 959,566
Int. Cl.³ B60J 7/08
U.S. Cl. 296—98 **1 Claim**



1. A truck box cover device for attachment to the top of a truck box having side walls and end walls, said device comprising an elongated movable rod positioned adjacent one end of said box and extending across the truck box from above one side wall to a position above the other side wall, a rectangular tarp having one edge attached to said rod and its side edges extending over the side walls with said other end of said tarp fixed to the other end of said box to thereby cover said box, a pulley cable winding means mounted on the ends of said rod for winding and unwinding the cable thereon and movable with said rod means, cable guide means on each side of said box adjacent the one end of said box, a cable on each respective side of said box attached to said cable pulley winding means at their one end and extending from said cable winding means toward and around said cable guide means and fixed at their other ends to said box, each of said cables having spring tension means to provide tension on said cable tending to draw said cable winding pulley means on said rod, and said tarp on said rod toward said one end of said box, means on said rod to rotate said rod, said rotation of said rod in one direction causes said rod and said portion of said tarp on said rod to move by rolling on the top of said box toward said other end of said box and to roll said tarp onto said rod by winding the tarp extending towards the other end of the box onto the rod from beneath the rod, thereby opening the top of the box, the cable winding means moving with the rod and unwinding cable extending to the one end of the box from beneath the rod with the spring tension on the cables acting to keep the tarp taut, and whereby rotating the rod in the opposite direction causes said rod and said portion of said tarp to move by rolling on the top of the box toward the one end of the box, unrolling said tarp from said rod by unwinding said tarp extending towards the other end of the box from beneath the rod, the cable winding means moving with the rod and winding the cable extending to the one end of the box from beneath the rod with the spring action on the cables acting to keep the tarp taut.

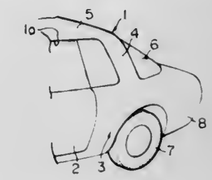
4,234,225

REAR REINFORCEMENT STRUCTURE FOR AUTOMOBILE BODIES

Hayatsugu Harasaki, and Isao Teramoto, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 1, 1979, Ser. No. 62,799
Claims priority, application Japan, Aug. 3, 1978, 53-107122
Int. Cl.³ B62D 25/02
U.S. Cl. 296—185 **7 Claims**

1. An automobile body comprising side door openings formed at the opposite sides thereof, rear side structures extending rearwardly from said door openings and having front ends formed with seating means for receiving rear edges of door panels which are mounted on the body, each of said rear side structures including rear side panel means, rear pillar means extending from the rear side panel means upwardly to roof means of the body, transverse reinforcement means extending between the rear side panel means of the opposite rear side structures rearwards of the rear pillar means, longitudinal reinforcement means attached to each rear side panel means and extending rearwardly from the seating means, said longitudinal reinforcement means extending rearwardly beyond said rear pillar means to the transverse reinforcement means and connected with both said rear pillar means and the transverse reinforcement means at longitudinally spaced portions.

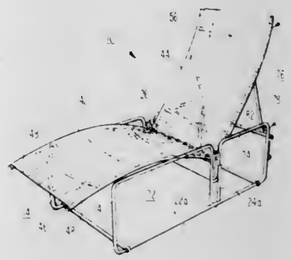


4,234,226

ADJUSTABLE AND COLLAPSIBLE SEATING PIECE

Donald B. Colby, Los Angeles, Calif., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 2, 1978, Ser. No. 947,644
Int. Cl.³ A47C 4/00
U.S. Cl. 297—21 **7 Claims**



1. A seating piece comprising:

a foldable base unit including lower support members and side frame members, said side frame members being rotatable into a generally horizontal, collapsed position, and into a laterally spaced-apart, generally vertical position;

a seating unit including a seat section and a back section rotatably joined together to permit said seat and back sections to be adjusted relative to each other, said seating unit including connecting means for releasably engaging side frame members when said side frame members are in their generally vertical position for releasably connecting the seating unit to the base unit without preventing rotational movement between the seat and back sections.

4,234,227

COLLAPSIBLE CHAIR

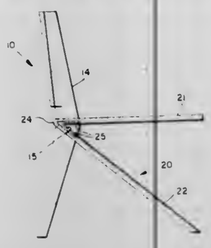
John A. Faust, 3921 Bentley Ave., Culver City, Calif. 90230

Filed Jun. 4, 1979, Ser. No. 45,120
Int. Cl.³ A47C 7/00
U.S. Cl. 297—443 **4 Claims**

1. A collapsible chair comprising:

a unitary backrest and rear leg portion having a compressible brace transversing the width of the unitary structure; and a reversed seven-shaped seat and frontal leg portion

being compatible with the transverse brace portion of the backrest rear leg portion so as to interact with the com-



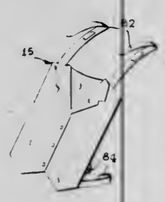
pressible brace to form an interlocking sleeve, whereby a secure chair structure is formed.

4,234,228

MODULAR ARTICULATING SEATING SYSTEM FOR THE HANDICAPPED

Jonathan A. Flamm, 1174 N. Curson St., #7, Los Angeles, Calif. 90046

Filed Aug. 25, 1978, Ser. No. 936,812
Int. Cl.[3] A47C *31/00*; A62B *35/00*
U.S. Cl. 297—464 **7 Claims**



1. A seating system for handicapped persons comprising:
a seat bottom shell;
a lower back shell;
an upper back shell;
a pair of first joint means coupling said lower back shell to said seat bottom shell, for permitting both pivoting and sliding of said lower back shell with respect to said seat bottom shell; and
a pair of second joint means coupling said upper and lower back shells, for permitting both pivoting and sliding of said back shells with respect to each other; and locking at a plurality of relative positions permitted by such pivoting and sliding.

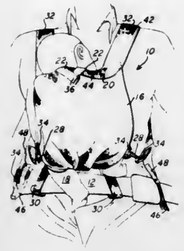
4,234,229

SAFETY HARNESS FOR INFANTS

Jonathan H. Arnold, 609 5th St., Berthoud, Colo. 80513

Filed Apr. 6, 1979, Ser. No. 27,759
Int. Cl.[3] A47C *31/00*
U.S. Cl. 297—467 **6 Claims**

1. The two party harness for use in combination with a lap belt to hold an infant in face-to-face relation against the chest of a seated adult which comprises: a fabric panel of a size and shape effective to cover the back and rump of an infant child, belt-receiving means depending from said panel for detachably connecting same to a lap belt, a first strap subassembly carried by said panel effective to detachably fasten the latter to the infant's back, and a second strap subassembly carried by said panel for detachably securing same in slack relation to the chest of an adult, said belt-receiving means and first strap subassembly cooperating to detachably secure the infant to the lap belt, and said second strap subassembly being effective to



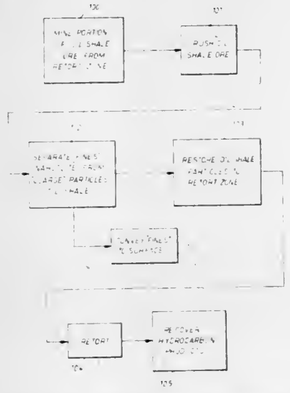
harness an infant thus secured to the chest of an adult held in seated position by said lap belt.

4,234,230

IN SITU PROCESSING OF MINED OIL SHALE

Bernard E. Weichman, Houston, Tex., assignor to The Superior Oil Company, Houston, Tex.

Filed Jul. 11, 1979, Ser. No. 56,595
Int. Cl.[3] E21C *41/10*
U.S. Cl. 299—2 **11 Claims**



1. A method of recovering products from a nahcolitebearing oil shale ore deposit comprising the steps of:
(a) defining a retort zone within the deposit;
(b) mining the nahcolite-bearing oil shale ore from the retort zone;
(c) crushing the mined oil shale ore to form particles comprising substantially nahcolite and particles comprising substantially oil shale;
(d) separating the substantially nacholite particles from the substantially oil shale particles to recover a substantially nahcolite product;
(e) restoring the oil shale particles to the retort zone; and
(f) retorting the oil shale particles to recover hydrocarbon products.

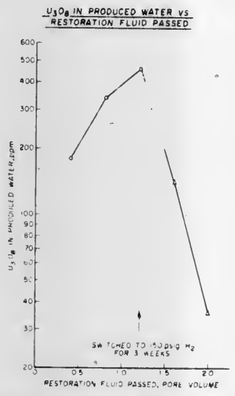
4,234,231

METHOD FOR RESTORING A LEACHED FORMATION

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 966,933
Int. Cl.[2] E21B *43/28*
U.S. Cl. 299—4 **12 Claims**

1. A method of restoring a formation which has had mineral and/or metal values therein oxidized by an oxidant during an in situ leach operation, said formation having at least one injection well and at least one production well completed therein, said method comprising:
a. shutting in said at least one injection well and said at least one production well at the completion of said in situ leach operation, said wells being shut in for a period necessary to exhaust any unreacted said oxidant that may be present in said formation;
b. producing at least one pore volume of fluid from said formation at the end of said shut in period of step a.;



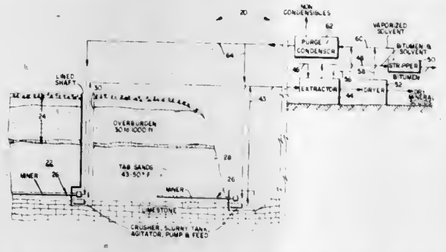
c. injecting into said formation at least one pore volume of a restoration fluid containing a reducing agent capable of reducing said oxidized mineral and/or metal values to their reduced, insoluble state;
d. shutting in said at least one injection well and said at least one production well for a period necessary to provide the reaction time for the reduction of said oxidized mineral and/or metal values; and
e. injecting deaerated water into said formation and producing fluids from the formation until the concentration of oxidized mineral and/or metal values in the produced fluids reach a desired level.

4,234,232

METHODS OF AND APPARATUS FOR MINING AND PROCESSING TAR SANDS AND THE LIKE

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 825,762, Aug. 18, 1977, abandoned, which is a division of Ser. No. 662,890, Mar. 1, 1976, Pat. No. 4,067,616, which is a continuation-in-part of Ser. No. 460,558, Apr. 12, 1974, Pat. No. 3,941,679. This application Oct. 4, 1978, Ser. No. 948,554
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—5 **5 Claims**



1. Apparatus for mining tar sands and the like which includes: a cutter head; a hollow shaft for rotating said cutter head, said shaft being fixed at one end thereof to said cutter head; at least one helical conveyor flight distinct from said cutter head and surrounding said shaft for conveying dislodged material away from said cutter head, said conveyor flight extending from said one end of said shaft toward the other end thereof; a casing surrounding said conveyor flight and extending from said one end of said shaft toward the other end thereof through which dislodged material can be propelled by said conveyor flight; and means for introducing a non-aqueous solvent into said casing to reduce the viscosity of the mined material being conveyed therethrough by said helical conveyor flight, said last mentioned means comprising openings in said hollow shaft adjacent said cutter head and means for circulating said non-aqueous solvent to and through said shaft and for then effecting a discharge of the solvent through said openings into said casing and into contact with the mined material being conveyed therethrough.

4,234,233

CHAIN DRIVEN CUTTING BUCKET FOR USE IN DEEP MINING

Robert L. Hurd, 2063 Manor Dr., Lexington, Ky. 40502, and Donald C. MacGregor, 13 Hunters Trail, Warren, N.J. 07060

Filed Feb. 21, 1979, Ser. No. 13,750
Int. Cl.[1] E21C *35/20*
U.S. Cl. 299—34 **8 Claims**



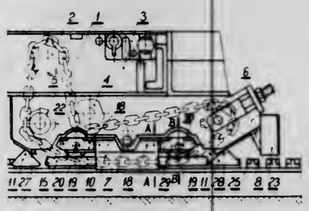
1. A bucket for chipping coal from a coal seam, said bucket having two sides, a front, a back, and a bottom, each of said sides having an inner surface facing the inside of said bucket and an outer surface facing outward from said bucket,
means for hinging said bottom to a first one of said sides at a bottom surface of said first side,
a first set of hinges at the leading edge of said first side,
a second set of hinges at the trailing edge of said first side, said second set of hinges positioned so as to flexibly engage the first set of hinges of a trailing one of said buckets,
a ramp affixed to said outer surface of said first side, and sloping upward from said leading edge to said trailing edge of said first side, the top end of said ramp extending beyond the top surface of said first surface,
a cutting assembly mounted on said outer surface of said first side, said assembly adapted for chipping coal from a coal seam coming into contact therewith, and
wherein said second side, said front, said back and said bottom are rigidly affixed to each other to form a bucket assembly for receiving said chipped coal and wherein said first side is flexibly attached to said bottom by said bottom hinge in a manner such that when upward pressure is placed under said bottom said bucket will contain any coal placed therein and such that when said upward pressure is removed from said bottom said bucket assembly will tilt away from said first side, spilling said contained coal.

4,234,234

DRIVING DEVICE FOR A MINING MACHINE

Janusz Sedlaczek, Gliwice; Andrzej Blazewicz, Tychy; Jacek Cyrulo, Sosnowiec; Marian Krutki, and Tadeusz Wozniak, both of Katowice, all of Poland, assignors to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych Komag, Gliwice, Poland

Filed Feb. 28, 1979, Ser. No. 16,028
Claims priority, application Poland, Mar. 15, 1978, 205358
Int. Cl.³ E21C 29/02
U.S. Cl. 299—43 **4 Claims**



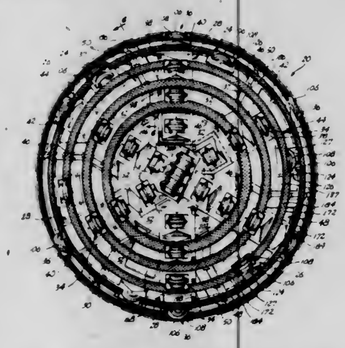
1. An improved device for driving a mining machine which shifts on a conveyor, especially for driving a combine, said device being comprised of, an endless link chain, said chain being extended between a toothed drive wheel and a toothed reversible wheel which are fixed to a combine; a rack fixed alongside the conveyor, said rack is in mesh with said chain and maintained in said mesh by means of a slide skid provided with riding wheels at both its ends; a slipper, said slipper being fixed to the combine and provided with a circular recess enclosing a railing fixed to said conveyor along its whole length, said improvement comprising: having the riding wheels mounted on cranks of axles fixed in the combine, and being provided with recess means formed in the slipper, said recess being larger than the outer dimensions of the railing.

4,234,235

ROTARY CUTTERHEAD FOR AN EARTH BORING MACHINE

Richard J. Robbins, Seattle, and Barry A. Spencer, Redmond, both of Wash., assignors to The Robbins Company, Seattle, Wash.

Filed Feb. 5, 1979, Ser. No. 9,170
Int. Cl.³ E21D 9/10
U.S. Cl. 299—56 **28 Claims**



1. A rotary cutterhead for an earth boring machine, comprising:

a. a main frame having a forward section and a rearward section by which rearward section the cutterhead is mounted onto an earth boring machine for rotation about an axis of rotation;

b. a plurality of roller cutters and cutter mounting means for mounting said roller cutters within said main frame forward section, each of said roller cutters having peripheral cutting edge portions projecting forwardly of said main frame forward section to cut concentric kerfs upon rotation of the cutterhead;

c. a plurality of cut-ground-material passageways formed in said main frame forward section and disposed between said roller cutters, and extending through said main frame; and,

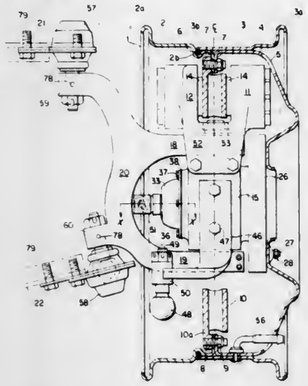
d. a plurality of radially spaced apart face-support-ring members located on the cutterhead, each of said face-support ring members projecting forwardly of said main frame forward section and slightly rearwardly of said roller cutter peripheral edges, and being circumferentially continuous except where such continuation of a face-support-ring member would interfere with the proper placement of a roller cutter.

4,234,236

TWO PIECE WHEEL FOR A CENTERLINE STEERING WHEEL ASSEMBLY

Melvin R. Inbody, Findlay, Ohio, assignor to The Centerline Steering Safety Axle Corporation, Findlay, Ohio

Division of Ser. No. 836,673, Sep. 26, 1977, Pat. No. 4,159,832, which is a continuation of Ser. No. 638,069, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,438, Jul. 29, 1974, Pat. No. 3,963,260. This application Oct. 10, 1978, Ser. No. 949,684
Int. Cl.³ B60B 23/10
U.S. Cl. 301—6 W **6 Claims**



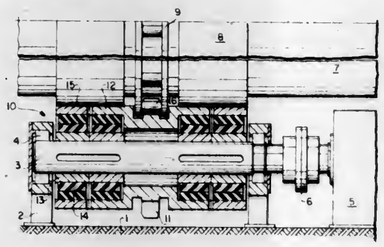
1. A two piece dirigible wheel assembly for a surface vehicle having a rotatable wheel support, said wheel assembly comprising: an inner rim half having an annular groove; an outer rim half overlying a portion of the inner rim half and having an undercut chamfer at its inner edge; an elastic O-ring seal seated in said annular groove and said chamfer overlying the O-ring; a spider extending inside and along the inner periphery of the outer rim half and permanently and directly secured to said outer rim half for attaching the wheel to the rotatable wheel support; an annular radially directed flange at the outer end of the inner tire rim half presenting an outwardly directed surface; an annular radially directed mating flange at the inner end of said spider presenting an inwardly directed surface; an annular element adjacent the flanges; and means for releasably fastening said mating flanges and said annular element together.

4,234,237

BEARING FOR HEAVY STEEL DRUMS, IN PARTICULAR DECORTICATING DRUMS

Kiriazis Kiriazaros, Graz, Austria, assignor to Maschinenfabrik Andritz Aktiengesellschaft, Austria

Filed Mar. 29, 1977, Ser. No. 782,559
Int. Cl.³ F16C 27/00
U.S. Cl. 308—26 **2 Claims**



2. In a shock-proof bearing for a heavy drum which is rotatably supported on a roller and is adapted to be driven by a gear drive, the axial spacing between the drum and the roller or the gear drive remaining constant for every spring-support position,

the improvement comprising that the roller and a driving pinion are integral, and spring support means mounted between a casing of the roller and a hub thereof, said spring support means being a plurality of sheathed, spoke-like resilient inserts equidistantly mounted to the hub in a star-shaped configuration,

sheathed support components positioned in the cavities of said resilient inserts and secured to the interior of the roller casing,

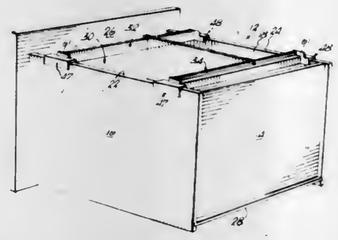
and said sheathed resilient inserts being capable of radial displacement.

4,234,238

FILE SUPPORT STRUCTURE FOR DRAWER

Ruben Figueroa, 75 E. 13 St., Hialeah, Fla. 33010

Filed Apr. 18, 1979, Ser. No. 31,184
Int. Cl.³ A47B 63/00
U.S. Cl. 312—184 **10 Claims**



1. A file support structure for use on drawers of a type having front, rear, and side panels, the rear and side panels having generally common thickness, each panel having an upper terminal edge and the edges in generally common plane, the structure comprising:

the combination of a pair of guide tracks and a first and second adjustable channel adapter pairs,

each adapter comprising a channel including a middle portion defining a web and downwardly extending legs adapted for abutting engagement with the side panel terminal edge, the channel including a middle inner portion having an inwardly extending channel and an upper portion defining an ear stop means for limiting movement adjacent the inwardly extending middle portion,

each guide track comprising a channel of predetermined length with a middle portion defining a web and downwardly extending legs adapted for connection with the inwardly extending middle portion of the channel adapter, the track including an upwardly extending flange defining a rail along the track for hooked-up connection with the file,

each pair of adapters adapted for opposed connection on either side of the side panel terminal edge and the pairs spaced apart a predetermined common distance, and

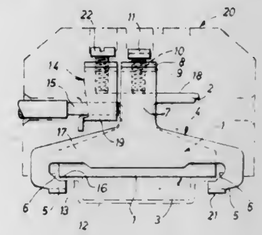
the guide tracks adapted for spanning a respective pair of adapters.

4,234,239

EARTHING TERMINAL

Manfred Wilmes; Rudiger Obst, and Wolfgang Kretzschmar, all of Detmold, Fed. Rep. of Germany, assignors to C. A. Weidmuller KG, Detmold, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,491
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 7811403[U]
Int. Cl.³ H01R 9/26
U.S. Cl. 339—198 GA **5 Claims**



1. An earthing terminal adapted to be mounted on a supporting rail having a channel section with oppositely directed outwardly turned flanges, comprising

(a) a metal member for connection to a conductor and adapted to rest on the upper surfaces of said flanges;

(b) a unitary rigid yoke of sheet metal, shaped to form

(i) a pair of hook portions for engagement with the undersides of respective ones of said flanges of said support rail, each hook portion facing a respective surface portion of said metal member;

(ii) two wall portions between which said metal member is disposed; and

(iii) respective lugs upstanding from said wall portions and having their free ends bent towards one another with one overlying the other and overlying and spaced from said metal member, said free ends having aligned screw threaded bores therein; and

(c) a clamping screw threaded in said bores and extending towards said metal member, the tip of said clamping screw abutting the upper surface of said member;

(d) whereby, on tightening of said screw, said screw will advance toward said metal member, whereby said metal member and said yoke will be relatively moved for clamping said support rail flanges between said hook portions and said facing surface portions of said metal member.

4,234,240

OPTICAL SCANNING SYSTEM WITH UNWANTED REFLECTIONS CONTROLLED

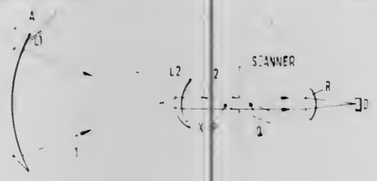
William T. Moore, and Michael T. Sweeney, both of London, England, assignors to The Rank Organization Limited, London, England

Filed Feb. 2, 1977, Ser. No. 764,987

Claims priority, application United Kingdom, Feb. 2, 1976, 4075/76

Int. Cl.³ G02B *27/19*

U.S. Cl. 350—6.1 **11 Claims**



1. In a thermal imaging system comprising scanning means for effecting scanning of a distant scene, a first optical sub-system for collimating radiation from the distant scene and directing the resultant collimated beam on to the scanning means, a detector having a detecting surface, a second optical sub-system for directing radiation from the scanning means to be incident on the detecting surface of the detector effectively normal to said surface, and means defining an aperture stop for passing all the rays from the distant scene to be scanned within a defined field of view, the optical sub-systems comprising optical elements bearing at least one optical surface which gives rise to unwanted reflections of radiation within the system; the improvement wherein said at least one optical surface has its center of curvature or an image thereof in a fixed location at least approximately at the aperture stop means or an image thereof, thereby to cause the unwanted reflections incident on the detecting surface to be of substantially uniform magnitude throughout scanning within the defined field of view.

4,234,241

STEREO LINE SCANNER

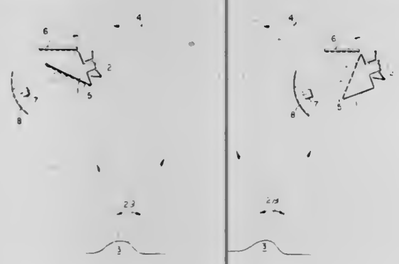
Erich Schmidt, Munich, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Köln-Porz, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,660

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833808

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.9 **7 Claims**



1. A stereo line scanner for optical radiation reception and recording to enable provision of stereoscopic picture-like representation of remote objects from a moving instrument carrier, comprising in combination:

a rotary plane mirror provided with means for causing it to revolve about an axis at an angle of substantially 45° to its mirror plane,

a second plane mirror in the vicinity of the periphery of said rotary mirror and having an elongated mirror surface of which the long dimension is oriented at right angles to the axis of revolution of said rotary mirror and of which the short dimension is oriented at an angle between 0° and 45° to said axis of said rotary mirror,

a radiation detector located on said axis of said rotary mirror for registering radiation received by the scanner and directed toward said detector by reflection from said rotary mirror, and

an optical system for collecting radiation reflected from said rotary mirror in a direction parallel to said axis of rotation thereof so as to provide said collected radiation to said detector,

the inclination of said second plane mirror to said axis of rotation of said rotary mirror and also the inclination of said axis to the direction of movement of said instrument carrier being such, that during one portion of a revolution of said rotary mirror, radiation is receivable from objects disposed on the opposite side of said axis from said second mirror in a beam of primary rays reflected directly by said rotary mirror toward said optical collecting system and during another portion of said revolution of said rotary mirror, radiation is receivable from objects so disposed in a beam of secondary rays reflected first by said second plane mirror and then again by said rotary mirror to proceed toward said optical collecting system and said detector, whereby a line scan of said secondary rays can be correlated with a line scan of said primary rays from the same objects, but taking place after an interval determined by the movement of said carrier past said objects, to provide stereoscopic data regarding the aspect and disposition of said objects.

4,234,242

GAUSS TYPE PHOTOGRAPHIC LENS

Soichi Nakamura, Kamakura, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 30, 1979, Ser. No. 7,775

Claims priority, application Japan, Feb. 3, 1978, 53-10525

Int. Cl.³ G02B *9/60*

U.S. Cl. 350—218 **5 Claims**



1. A Gauss type photographic lens comprising, in the order from the object side, a positive lens component, a positive meniscus lens component having its convex surface facing the object side, a negative meniscus lens having its convex surface facing the object side, a diaphragm, a meniscus lens component comprising a negative lens and a positive lens cemented together and having its concave surface facing the object side, and a positive lens component, wherein the total focal length of the entire system is f, the lens components adjacent to the object side with respect to the diaphragm forms a first convergent lens group having a composite focal length f_1, and the lens components adjacent to the image side with respect to the diaphragm forms a second convergent lens group having a composite focal length f_2, said photographic lens satisfying the following two conditions:

$$0.9f < D < 1.05f \quad (a)$$

$$2.5f < f_1 < 3.0f \quad (b)$$

where D is the distance between the principal points of said two lens groups, said photographic lens further satisfying the following conditions:

$$0.06f_1 < D_1 < 0.08f_1 \quad (c)$$
$$0.16f_2 < D_2 < 0.18f_2 \quad (d)$$
$$\frac{n_3}{n_2} \geqq \frac{n_4}{n_5} \quad (e)$$
$$\left.\begin{aligned} 1.62 < \frac{n_3 + n_4}{2} < 1.70 \\ 27 < \nu_3, \nu_4 < 37 \end{aligned}\right\} \quad (f)$$
$$\left.\begin{aligned} 1.70 < n_1, n_2, n_5, n_6 < 1.90 \\ 40 < \nu_1, \nu_2, \nu_5, \nu_6 < 55 \end{aligned}\right\} \quad (g)$$
$$0.2f_1 < r_4 < 0.3f_1 \quad (h)$$
$$0.5f_1 < r_5 < 0.7f_1 \quad (i)$$
$$0.3|f_2 < |r_7| < 0.37f_2 \quad (j)$$
$$r_8 < 0 \quad (k)$$
$$|3r_7| < |r_8|$$

where D1 represents the length from the foremost lens surface to the rearmost lens surface of the first convergent lens group, D2 the length from the foremost lens surface to the rearmost lens surface of the second convergent lens group, r the curvature radius of each lens surface, n and ν represent the refractive index and the Abbe number, respectively, of each lens, and subscript numbers represent the order from the object side.

4,234,243

REDUCING LENS SYSTEM

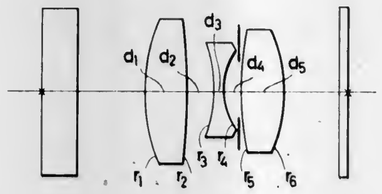
Hiroshi Takase, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,589

Claims priority, application Japan, Feb. 7, 1978, 53/12693

Int. Cl.³ G02B *9/16*

U.S. Cl. 350—226 **6 Claims**



1. A reducing lens system comprising a first lens component of a biconvex lens, a second lens component of a biconcave lens and a third lens component of a biconvex lens, the said lens system satisfying the following conditions:

-continued

(1)	$1.73 > n_3 \geqq n_1 > 1.63$ $1.65 > n_2 > 1.59$
(2)	$61 > \nu_1, \nu_3 > 54$ $36 > \nu_2 > 33$
(3)	$0.76f > f_1 > 0.71f$ $-0.30f > f_2 > -0.35f$ $0.48f > f_3 > 0.44f$
(4)	$0.14f > d_1, d_2, d_5 > 0.11f$ $0.51f > \Sigma d > 0.48f$
(5)	$0.52f > r_1 > 0.49f$ $-6.2f > r_2 > -17.0f$ $-0.43f > r_3 > -0.48f$ $0.38f > r_4 > 0.32f$

wherein the reference symbols n_1 through n_3 represent the refractive indices of the respective lenses, the symbols ν_1 through ν_3 represent the Abbe numbers of the respective lenses, the symbols f_1 through f_3 represent the focal length of the respective lenses, the symbols d_1 and d_5 represent the axial thicknesses of the first and third lens components, the symbol d_2 represents the axial air space between the first and second lens components, the symbol Σd represents the total length of the lens system, the symbols r_1 through r_6 represent the radii of curvature of the respective lens surfaces and the symbol f represents the focal length of the total lens system, respectively.

4,234,244

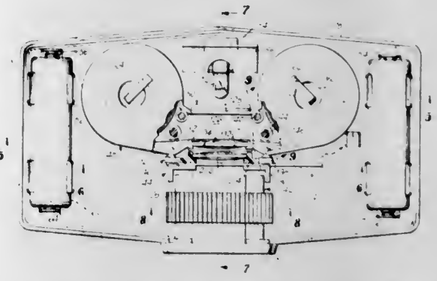
PORTABLE MICROFILM VIEWER

Jeshayahu Klein, 212 Rutledge St., Brooklyn, N.Y. 11211

Filed Dec. 1, 1977, Ser. No. 856,358

Int. Cl.³ G02B *27/02*

U.S. Cl. 350—241 **22 Claims**



1. A portable microfilm viewer for directly viewing microfilm comprising a housing, a lens system mounted in said housing, film transport means secured in said housing for removably receiving and supporting thereon a film cassette containing a microfilm, drive means fixedly mounted on said housing, said drive means having a rotary output, and bidirectional engaging means, fixedly mounted on said housing, for coupling said rotary output of said drive means to said film transport means for selectively transporting the film of the cassette in either of two directions across said lens system for said direct viewing and wherein said film cassette comprises a closed casing having a pair of laterally spaced apart cylindrical chambers, and a channel interconnecting said chambers said channel having front and rear windows therein, a film spool respectively positioned in each chamber, coupling means on said film spools for retaining said spools on said transport means for thereby supporting said cassette and for drivingly interconnecting said spools with said transport means, and guide means in said channel for guiding film from one spool to the other along a path in opposition to said front window and wherein said casing further comprises lens means positioned in said front window and a translucent material positioned in said rear window, and drag means coupled to said film spools for retarding unwinding of film from said film spools.

4,234,245

LIGHT CONTROL DEVICE USING A BIMORPH ELEMENT

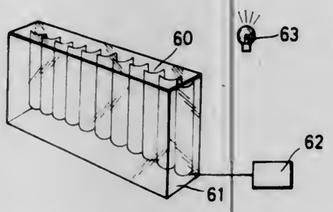
Minoru Toda, and Susumu Osaka, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,538

Claims priority, application United Kingdom, Apr. 22, 1977, 16839/77; May 26, 1977, 22263/77; May 26, 1977, 22266/77

Int. Cl.³ G05D *25/02*; G09F *3/04, 9/37*

U.S. Cl. 350—269 **3 Claims**



1. A device for controlling light comprising a bimorph element including two polyvinylidene fluoride films with a thin layer disposed between said films for securing them together, electrodes being provided on said films for connection to a power source, and means for supporting said bimorph element in a structure with said element moveable between a first position and a second position in accordance with the application of an electric field from said source to thereby control the passage of light,

said structure comprising a panel with a slit formed in the panel, said bimorph element being moveably inserted into the slit and including a first surface which is viewable in one manner with the surface of said panel and a second surface which is viewable in another manner with the surface of said panel, said bimorph element in said first position having said first surface displayed against the surface of said panel and in said second position having said second surface displayed against the surface of said panel.

3. A device for controlling light comprising a bimorph element including two polyvinylidene fluoride films with a thin layer disposed between said films for securing them together, electrodes being provided on said films for connection to a power source, and means for supporting said bimorph element in a structure with said element moveable between a first position and a second position in accordance with the application of an electric field from said source to thereby control the passage of light,

said structure comprising parallel transparent members and a mounting member disposed between said transparent members, one edge of each of a plurality of said bimorph elements being fixed to said mounting member with the free end of each bimorph element in said first position overlapping said fixed edge of an adjacent bimorph element and with the free end of each bimorph element in said second position being spaced from said fixed edge of said adjacent bimorph element.

4,234,246

REMOTE CONTROLLABLE REARVIEW MIRROR

Erich Wunsch; Udo Wunsch, and Eckart Wunsch, all of Im Hofrain 12,, D-7141 Schwieberdingen, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,284

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741290

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—289 **15 Claims**

1. A remote controllable adjusting setting device with rearview mirros, comprising

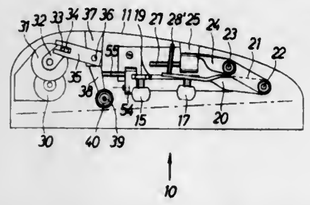
a mirror housing,

a mirror plate,

control means for acting on said mirror plate, said control means being controllable from a remote position,

means constituting pivotal articulations for suspending said mirror plate to said housing without play on at least two suspension points, respectively, each said articulations constituting ball and socket joints, said suspension points being arranged spaced from one another, all said articulations having one part of said ball and socket joints directly mounted on said mirror plate,

the other part of one of said ball and socket joints of one of said articulations of one of said suspension points being stationary and is rigidly connected with said mirror housing, the other part of the other of said ball and socket



joints of the other of said suspension points being displaceable relative to said mirror housing,

swingable arm means for absorbing external forces respectively connected to said other part of said ball and socket joints of the other of said suspension points, respectively, and to said housing and including frictional restraining means for guidably constraining said other part of said ball and socket joints of said other suspension points in a pivot plane thereof through the stationary one of said suspension points and for simultaneously holding said mirror plate fixed relative to said housing against external vehicle movement forces, said ball and socket joints being frictionless relative to said frictional restraining means, said control means for operatively overcoming said frictional restraining means.

4,234,247

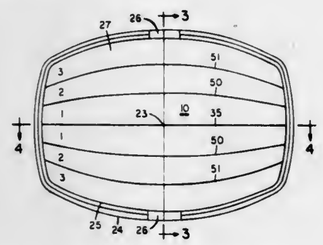
METHOD OF MAKING A REFLECTOR

William H. Dorman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 808,170, Jun. 20, 1977, Pat. No. 4,149,227. This application Oct. 30, 1978, Ser. No. 955,985

Int. Cl.³ G02B *5/10*

U.S. Cl. 350—320 **12 Claims**



1. A method of fabricating a reflector surface for delivering reflected illumination from a light source at one focus of the reflector surface to a limited zone of illumination comprising:

selecting a plurality of sector surfaces from various areas of at least one ellipsoidal base surface, each section having a selected surface curvature;

aligning each sector one next to the other, rotating each surface relative to the aforementioned focus thereof so as to align the reflected illumination at a corresponding

portion of the limited zone of illumination and forming the said aligned surfaces into a continuous surface such that said reflected illumination forms an elongated light pattern.

4,234,248

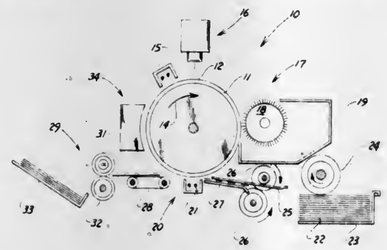
HOT ROLL FUSER

Christian A. Beck, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 4, 1979, Ser. No. 45,169

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **9 Claims**



1. In an electrostatic copying machine in which the fusing apparatus for fixing toner images to a support surface comprises a heated fuser member in pressure contact with a backup member, and fusing is accomplished by passing the support surface with the toner images thereon between the heated fuser member and backup member thereby applying heat and pressure to the toner image, an improved roll type fuser member whose outer surface comprises graphite, said graphite comprising less than about 0.5 percent by weight carbon.

4,234,249

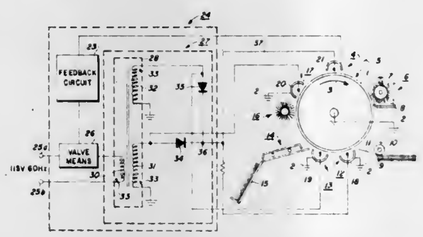
TRACKING POWER SUPPLY FOR AC AND DC COROTRONS

Donald J. Weikel, Jr., Rochester, N.Y., and John Hartman, Reseda, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1978, Ser. No. 956,780

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 CH **32 Claims**



1. A tracking power supply circuit for a mixture of AC and DC corotrons comprising

means for generating a pulsating DC voltage from an AC voltage having a wave shape corresponding to the wave shape of the AC voltage,

means for coupling the pulsating DC voltage to a DC Corotron,

means for coupling an AC voltage having corresponding wave shape to an AC corotron and

feedback means coupled to only one of the corotrons and valve means for varying all the AC and pulsating voltages coupled to the corotrons.

4,234,250

ELECTROPHOTOGRAPHIC PRINTING SYSTEM

Louis D. Mailloux, Webster, and William M. Reilich, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 15, 1977, Ser. No. 816,126

Int. Cl.³ G02B *27/17*

U.S. Cl. 355—4 **8 Claims**

1. Electrophotographic composite printing apparatus comprising

a recyclable photoconductive member and charging means for uniformly, electrostatically charging the surface of the photoconductive member each cycle of the member in preparation for creation of a latent electrostatic image each cycle subsequent to the uniform charging of the surface of the photoconductive member,

composite exposure means for exposing to electromagnetic radiation the charged surface of the photoconductive member for creation of latent electrostatic images thereon, the composite exposure means including optical projection means for exposing a first selected region of the uniformly charged surface during a cycle of the photoconductive member to an electromagnetic radiation image of an original projected onto the first selected region by means including a projection lens for creating a first latent electrostatic image and laser exposure means for exposing a second nonoverlapping region of the charged surface, during the same cycle of the photoconductive member that the first region is exposed, to a data controlled raster scan image created by a moving spot of electromagnetic radiation generated by a laser for creating a second latent electrostatic image which with the first latent image comprises a composite latent electrostatic image,

development means for substantially simultaneously developing with toner material the first and second latent electrostatic images during the same cycle of the photoconductive member that the first and second charged regions are exposed for creating a visible composite toner image corresponding to the composite latent image and

transfer means for transferring the composite toner image to a support member during the cycle of the photoconductive member in which the toner image is created.

4,234,251

AUTOMATIC PICTURE MASKING DEVICE

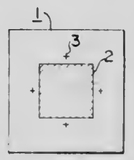
Fumihiko Nishida, Kyoto, and Hiroshi Ijiri, Nagaokakyo, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 29, 1979, Ser. No. 24,975

Claims priority, application Japan, Mar. 31, 1978, 53-37836

Int. Cl.³ G03B *27/58*

U.S. Cl. 355—74 **7 Claims**



1. In a composer having an original picture holder which includes a transparent plate against which an original picture and masking register marks are to be held during the use of the composer, an automatic masking device comprising a plurality of opaque masking sheets each being adapted to move along the surface of the transparent plate to selective masking positions of the original picture; drive means for moving said masking sheets; and a plurality of detectors mounted on at least some of said masking sheets for controlling said drive means,

each detector including means for directing light at and for detecting light reflected from said register marks.

4,234,252

APPARATUS FOR THE SIMULTANEOUS PHOTOMETRIC DETERMINATION OF A PLURALITY OF ELEMENTS IN A LIQUID SAMPLE

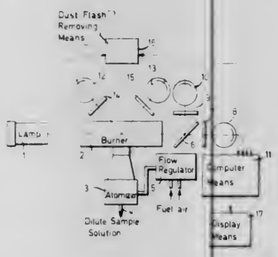
Klaus Böttger, Oberkochen; Dieter Müller, Königsbronn; Karl-W. Schmekel, Oberkochen, and Walter Tausch, Aalen, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 3,124

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802147

Int. Cl.³ G01N *21/72*

U.S. Cl. 356—73 **10 Claims**



1. Apparatus for the simultaneous photometric determination of a plurality of elements in a liquid sample in which each of the elements to be determined has a receiver associated with it and the signals supplied by said receivers are evaluated via a computer, characterized by the combination of the following elements:

(a) at least one hollow-cathode lamp (**1**) whose light contains at least one narrow-band emission line of one of the elements to be determined;

(b) a burner (**2**) for producing an elongated flame (**28**) to which the diluted liquid sample is fed via an atomizer (**3**);

(c) photoelectric receivers (**12, 13**) arranged laterally of the flame (**28**) for measurement in emission;

(d) photoelectric receivers (**8, 10**) arranged behind the flame (**28**) for measuring the radiation of the hollow-cathode lamp (**1**) which penetrates the flame (**28**) in longitudinal direction;

(e) narrow-band filters (**7, 9, 14, 15**) arranged in front of each receiver (**8, 10, 12, 13**) for the passage of a line characteristic of the specific element to be determined;

(f) an arrangement (**16**) for the electronic removal of dust flashes in the flame, said dust-flash removal arrangement being connected to said photoelectric receivers (**12, 13**) arranged laterally of the flame (**28**);

(g) said burner including a double-wall stack (**27**) which surrounds the elongated flame (**28**), one side of which contains openings for the passage of the outer air in the lower part of the outer wall (**29**) and in the upper part of the inner wall (**30**).

4,234,253

ATTENUATION MEASURING SYSTEM

John W. Higginbotham, and Dennis L. Dowden, both of St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 26, 1979, Ser. No. 33,530

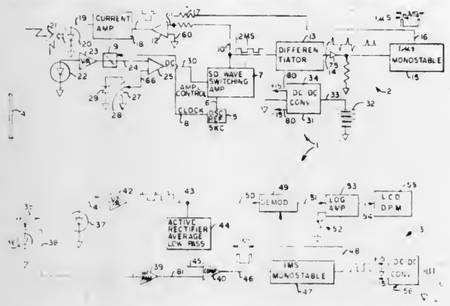
Int. Cl.³ G01N *21/00*

U.S. Cl. 356—73.1 **11 Claims**

1. A device for measuring the attenuation of a fiber optic cable, comprising:

a transmitter means for generating reference signals through a fiber optic cable including means for generating a test signal, means for superimposing a timing signal on said test signal to obtain said referenced signal; and

a receiver including means for receiving said referenced signal, means for recovering the timing signal, means



operatively connected to the timing signal recovery means for providing a demodulating signal for the test signal, means for comparing the demodulated signal to a reference, and means for displaying any difference in said last-mentioned comparision.

4,234,254

UNIT FOR MEASURING PLANENESS

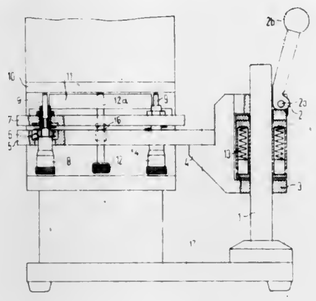
Bodo Dreisbach, Bad Toelz, and Karl Eidling, Egling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,184

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810512

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—244 **6 Claims**



1. A device for use with an interferometer for measuring the planeness of thin, stiff disks comprising:

a suction plate having suction channels connected to a vacuum source and area thereon for holding items to be measured by means of suction;

a reference plate disposed above said suction plate;

a swivel means for moving said suction plate beneath said reference plate; and

adjustment means for moving said suction plate to a desired angle beneath said reference plate.

4,234,255

COMBINED MOTOR MEANS AND ROTATIONAL CELL

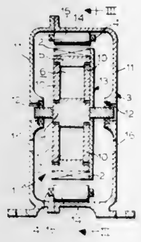
Kozo Ishida; Hiroyuki Amimoto, and Osamu Saitoh, all of Miyanohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Oct. 12, 1978, Ser. No. 950,610

Claims priority, application Japan, Oct. 15, 1977, 52-123798

Int. Cl.³ G05D *25/00*

U.S. Cl. 350—274 **3 Claims**



1. A combined motor rotor and correlative rotational cell, for use in a single sample cell type apparatus for measuring components in a gas, said combined motor rotor and correlative rotational cell comprising:

a rotor having a hollow cylindrical body with a plurality of magnetic poles extending around the periphery thereof, said rotor having at least one diametrically extending partition wall extending across the hollow interior of said body for dividing said body into at least two compartments for containing specified gases therein and the end walls of said body being optically transparent windows;

rotor shaft means mounted on the outside of said end walls of said body;

an outer casing having a peripherally extending wall and opposite end walls, said end walls having bearing means for mounting said rotor shaft means thereon and thereby supporting said rotor within said outer casing, said outer casing further having a plurality of coils mounted around the inside of said peripherally extending wall for interacting with said poles and causing said rotor to rotate and said end walls of said outer casing having aligned apertures for passing light through said end walls of said outer casing and said rotor; and

a light chopper mounted on one side of said rotor, said light chopper being made of ferromagnetic material for increasing the torque being exerted on said rotor.

4,234,256

DETERMINING DEPTH LOCATION OF SEPARATIONS WITHIN A TIRE

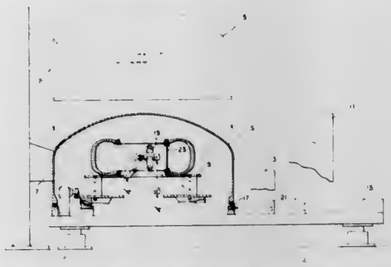
Robert W. Yeager, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 3, 1978, Ser. No. 892,546

Int. Cl.³ G01B *9/021*

U.S. Cl. 356—348 **4 Claims**

3. Method of determining the depth of a separation in a tire which method comprises subjecting the tire to two discrete pressures differing by a predetermined increment of pressure, at least one of said pressures being sub-atmospheric, producing a double exposure holographic film of the surface of the tire making one exposure of the film at each of said two pressures,



and determining from said film the depth of said separation in the tire with respect to the inner surface of the tire.

4,234,257

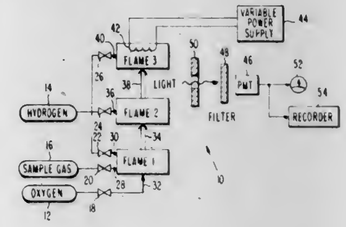
FLAME PHOTOMETRIC DETECTOR ADAPTED FOR USE IN HYDROCARBON STREAMS

Harold V. Carter, and Frederick G. Durfee, both of Falls Township, Bucks County, Pa. assignors to Process Analyzers, Inc., Fallsington, Pa.

Filed Jan. 15, 1979, Ser. No. 3,101

Int. Cl.³ G01J *3/48*

U.S. Cl. 356—417 **22 Claims**



1. An improved flame photometric detector of the type comprising:

(a) a first burner;

(b) means for supplying to said first burner a sample gas, hydrogen, and oxygen;

(c) a first flame holder extending into said first burner, said first flame holder being adapted to act as an ignition means for said first burner and for locating a first flame therein;

(d) a second burner surrounding said first burner, said second burner including means for combining additional hydrogen gas with the combustion products of said first flame;

(e) a second flame holder extending into said second burner, said second flame holder being adapted to act as an ignition means for said second burner and for locating a second flame therein; and

(f) photodetector means for examining the light emissions in the combustion products of said second flame, said photodetector means being responsive to a given wavelength of light emitted by said second flame, said given wavelength of light being characteristic of the presence of the element being detected;

wherein the improvement comprises a third burner located in the stream of combustion products from said second flame, said third burner comprising:

(a) means for combining additional hydrogen gas with the combustion products of said second flame;

(b) an electrically heated filament which also acts as a catalyst for oxidizing gases adjacent said filament; and

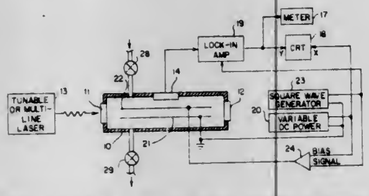
(c) means for supplying a current through said filament.

4,234,258

STARK CELL OPTOACOUSTIC DETECTION OF CONSTITUENT GASES IN SAMPLE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Jack S. Margolis, Pasadena, Calif., and Michael S. Shumate, Pasadena, Calif.

Filed Aug. 31, 1978, Ser. No. 938,297
Int. Cl.³ G01N *21/39*
U.S. Cl. 356—437 **10 Claims**



4. Apparatus for gas analysis using the Stark effect comprising

means for generating a laser beam having at least one predetermined spectral line frequency,

a gas sample cell in the path of said laser beam, said cell having windows for said beam to pass, and electrically isolated plates parallel to said beam and parallel to each other, one plate on each side of said beam,

means for applying a bias voltage to said plates to create an electric field between said plates which will adjust the absorption line of a predetermined constituent suspected to be present in said gas sample into coincidence with said laser spectral line,

means for modulating said bias voltage applied to said plates to move the absorption line of said constituent alternately in and out of coincidence with said laser spectral line,

means for sensing pressure variations of said gas in said cell during modulation of said bias voltage, and

means for displaying said pressure variations as a function of said bias voltage to determine the presence of said constituent from a peak absorption at the absorption line of said constituent, and to determine the parts per million of said constituent from the amplitude of said peak.

4,234,259

MIXING APPARATUS FOR KNEADING OF PLASTIC SUBSTANCES

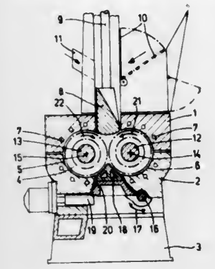
Werner Wiedmann, Stuttgart, and Hanns-Martin Schmid, Korntal, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Jul. 17, 1979, Ser. No. 58,375
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2836940
Int. Cl.³ B01F *7/08*; B29B *1/10*
U.S. Cl. 366—81 **8 Claims**

1. A mixing apparatus comprising:

a housing;

a mixing chamber defined within said housing, said mixing chamber including two counter-rotating parallel shafts on which are disposed radially extending vane means, said vane means including at least one principal conveying and mixing vane on each shaft, the upstream end of said principal vane defining a stream-dividing head which terminates at an axial distance from an end face of said mixing chamber, said axial distance thereby defining a frontal passage of said mixing chamber, and wherein the pitch angle (α) of said vane means is maximally 40°, the ratio of the axial projected length (l) of said vane means to the axial length (L) of the mixing chamber is at least 0.5 and the ratio of the average clearance (S) between the ridge of said vane



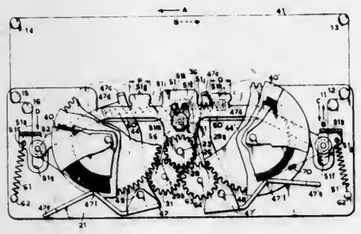
means and the interior walls of said mixing chamber to the diameter (D) of the mixing chamber is at least 0.02.

4,234,260

DEVICE FOR FEEDING INK RIBBON

Masao Kunita, Sayama; Nagao Mizutani, Hachiouji, and Toshio Kurihara, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,622
Claims priority, application Japan, Jan. 24, 1979, 52/56441
Int. Cl.³ B41J *33/40*
U.S. Cl. 400—219.3 **3 Claims**



1. A device for feeding an ink ribbon for use in a printing machine in which said ink ribbon is reciprocally run by rotating reels on which said ink ribbon is wound, said device for feeding said ink ribbon comprising:

a. a main drive member, a drive means coupled to the main drive member for providing driving force thereto;

b. two driven members for rotating said reels on which is wound said ink ribbon;

c. a driving force transmission member which reciprocally moves to selectively transmit the driving force of said main drive member to said two driven members;

d. follower members which move following the winding amount of said ink ribbon while being contacted with pressure onto the outer peripheral surfaces of said ink ribbon wound on each of said reels;

e. a spring for accumulating a force by the movement of said follower members, the accumulated force being used for moving said driving force transmission member; and

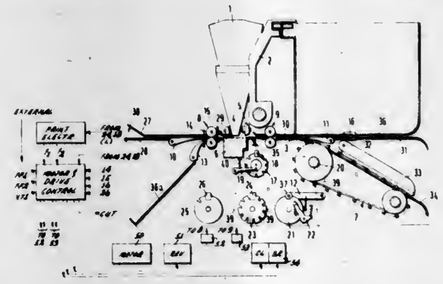
f. a movement control member which usually inhibits the movement of said driving force transmission member and which releases the inhibition of movement for said driving force transmission member when an end portion of the ink ribbon is detected.

4,234,261

PRINTER

Wolfgang Hendrischk, Neu-Ulm; Gerhard Nolte, Ulm, and Gerhard Schrader, Rodgau, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,653
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2715428; Apr. 4, 1977, 2715429
Int. Cl.³ B41J *11/70, 11/42*
U.S. Cl. 400—621 **21 Claims**



1. In a printer for printing individual forms on a web, including a print head and a platen, further including a cutter adjacent to the print head, the improvement

of reversible web advance means disposed upstream from the platen and the print head for moving the web in a particular direction toward and through a space between the platen and the print head and in a direction opposite to said particular direction;

a friction drive disposed downstream from the platen and the print head so that the print head and the platen are located between the friction drive and the advance means;

first control means connected for operating the web advance means (a) for moving the web in said particular direction for the length of a form prior to printing and subsequent to previous printing, and (b) for stepwise retracting the web in the opposite direction during line-by-line printing;

the cutter being operated for cutting a form from the web following printing; and

second control means for the friction drive for advancing the form as cut form in the particular direction, while the web remains stationary.

4,234,262

SINGLE ELEMENT PRINT HEAD

Toshio Nakai; Susumu Kuzuya; Akira Asai; Takayuki Iwase; Hiroshi Onoda, and Kazuo Nakamura, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 3, 1979, Ser. No. 26,676
Claims priority, application Japan, Apr. 28, 1978, 53/58721
Int. Cl.³ B41J *1/60*
U.S. Cl. 400—175 **4 Claims**

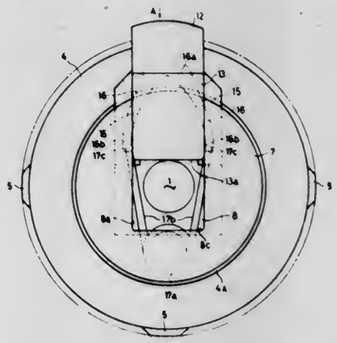
1. In a single print element head releasably attached to a drive shaft, the improvement wherein said print head comprises:

a print head body having a central openind therethrough for receipt of the drive shaft and characters formed on the periphery thereof;

a cap secured on said print head body around one end of said opening;

a manual slide member held by said cap so as to be slidable in a perpendicular direction to the axis of the drive shaft, between a first and a second positions, said manual slide member having a cam means in the bottom portion thereof, said cam means consisting of a pair of cam surfaces which gradually diverge, from the mutually nearest portion towards the mutually farthest portion, each of said cam surfaces having a recess therein adjacent to its said farthest portion; and

a spring disposed in a space formed between said cap and said body, said spring having a pair of arms adapted to move between an open position for releasing said print head body from the drive shaft and a closed position for fastening said print head body to the drive shaft, each of said arms having a free end contacting respectively with each of other cam surfaces each said free end being rested



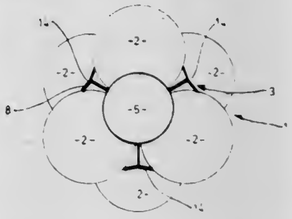
in a respective one of said recesses when said manual slide member is in said second position, said arms being moved from said open position to said closed position when said manual slide member is moved from said second position to said first position and wherein said spring is formed in a hair pin like shape and consists of a base portion and said pair of arms extending from said base portion, each of said arms being bent at its free end so as to be contacted with each of said cam surfaces respectively.

4,234,263

JOINT UNIT PROVIDING MULTIPLE JOINTS

Ward T. Robinson, 68b Creyke Rd., and Richard H. Nokes, 27 Tuirau Pl., both of Christchurch, New Zealand

Filed Jan. 18, 1979, Ser. No. 4,477
Claims priority, application New Zealand, Jan. 30, 1978, 186340; Jul. 11, 1978, 187831
Int. Cl.³ B25G *3/00*; F16B *1/00*
U.S. Cl. 403—405 **14 Claims**

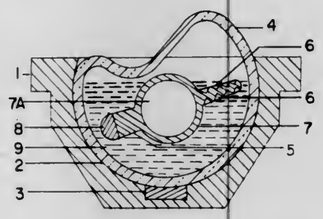


1. A joint unit providing six ball-and-socket joints and comprising: six balls arranged as a substantially close-packed octahedral cluster; and a binder rotatably supporting said balls in position and providing a socket for each ball.

4,234,264
MULTI-DIRECTIONAL MARKING DEVICE OF THE TYPE TO BE USED ON PAVEMENT SURFACES

Michael O. Baldi, 120 Sumner St., Newton Centre, Mass. 02159

Filed Jan. 2, 1979, Ser. No. 342
Int. Cl.[3] E01F 9/00
U.S. Cl. 404—11 4 Claims



1. An improved road marker of the type usually fastened into apertures defined in road pavement surfaces where the improvement comprises:

a base, adapted to fit within said aperture in said road pavement having defined therein an open-topped spherical aperture; and

a deformable resilient sphere coincidentally retained in said open topped spherical aperture, having a portion thereof protruding above said base and said road pavement surface; and

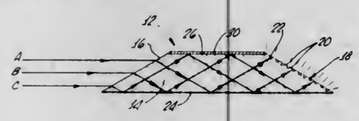
wherein said resilient sphere is free and able to universally rotate in said open-topped spherical aperture; and

wherein said sphere is hollow and includes independent means for reflecting light wherein said means used for the purpose of reflecting light entering said sphere, back outside said sphere, is positioned within said sphere and said sphere is light transmittable thereby allowing light to freely enter said sphere through the wall of said sphere and said means for reflecting light has the capacity to be independently displaced when said sphere is deformed and therefore said means for reflecting light is protected from damage.

4,234,265
LIGHT TRANSMITTING ROADWAY MARKER

George A. Otis, 715 E. Los Angeles Dr., Vista, Calif. 92083

Filed Feb. 28, 1977, Ser. No. 772,455
Int. Cl.[3] E01F 9/04
U.S. Cl. 404—16 3 Claims



1. A roadway marking system to delineate the lane in which a first vehicle is travelling at night comprising a series of light transmitting roadway markers attached at spaced intervals along the surface of a roadway, the illuminated front face of at least one of said light transmitting roadway markers adapted to be visible to the driver of a second vehicle generally ahead of said first vehicle, looking back toward said first vehicle to determine the lane in which said first vehicle is travelling, said light transmitting roadway markers each comprising:

a. a body fabricated of transparent material having a back window at one end to receive light from the headlights of said first vehicle travelling in a lane of said roadway; and,

b. a light scattering front face at its other, opposite end illuminated by the light received on said back window and transmitted through said body.

4,234,266
FLOATING BREAKWATER

Attilio Angioletti, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Filed Dec. 5, 1978, Ser. No. 966,561
Claims priority, application Italy, Jan. 13, 1978, 19226 A/78
Int. Cl.[3] E02B 3/06; B63B 35/34
U.S. Cl. 405—26 5 Claims

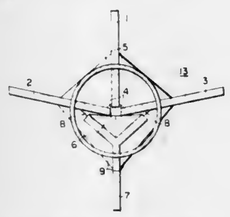


1. A floating breakwater for protecting an area of a body of water from waves comprising at least a pair of cylindrical drum-like members, longitudinally spaced flexible and substantially inextensible strips connected at one end to one of said drum-like members and connected to another of said drum-like members at the other end, closed hollow tubular members of smaller cross section than the cylindrical members fixed to said cylindrical members above the water level and means for anchoring the first and last of said cylindrical members while afloat to the bottom of a body of water.

4,234,267
DRAIN TRAP

Shigeto Kumagai, 7-13, Koyanagi-cho, 3-Chome, Fuchu-shi, Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,850
Claims priority, application Japan, Sep. 22, 1977, 52/114110; Oct. 31, 1977, 52/145020[U]
Int. Cl.[3] E02B 11/00
U.S. Cl. 405—42 10 Claims



1. A water-conveying structure for use in combination with a soil drainage system, including a water-conveying body comprising;

a plurality of essentially planar water-conveying plates also termed upper plates, each of said plates having a straight edge, said plates being radially arranged and disposed for forming narrow slots between said edges for permitting the passage of water therethrough while retaining solid matter;

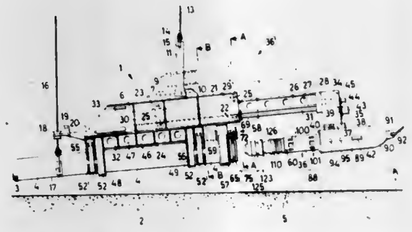
a further water-conveying plate, termed lower plate, and having a Y-shaped section, the arms of said Y forming a water passage, said body being orientable in use for receiving in said water passage water flowing downwardly through said slots, each of said plates having a narrow end for insertion into a drain pipe and for joining said body to said drain pipe; said water passage having a downward slope toward said narrow end when said slots are oriented horizontally; each of said narrow ends having an outer edge; and

packing plate means for blocking solid material from entry into said drain pipe, said packing plate means having therein radial apertures for receiving said narrow ends of said upper plates and an essentially triangular aperture for receiving said narrow end of said lower plate, and permitting flow of water from said water passage into said drain pipe, the periphery of said packing plate means being such that it can be inserted into said drain pipe for blocking entry of solid matter into said drain pipe.

4,234,268
APPARATUS FOR RECOVERING, BY MEANS OF A PIPELAYING CRAFT, PIPES LAID ON DEEP SEA BEDS

Ambrogio Scodino, San Donato Milanese, Italy, assignor to Saipem, S.p.A, Milan, Italy

Filed Mar. 19, 1979, Ser. No. 21,949
Claims priority, application Italy, Jul. 28, 1978, 26236 A/78
Int. Cl.[3] F16L 1/00, 55/12
U.S. Cl. 405—158 5 Claims

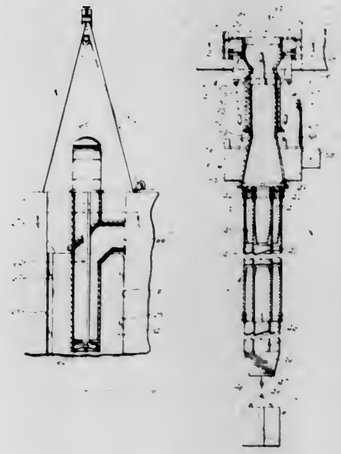


1. An apparatus for recovering, by means of a pipelaying craft, a pipe coated with concrete and laid on deep sea beds, comprising a framework for removably supporting, and inserting into said pipe, a sealing and pulling head traversed axially by a central tube and provided with a transverse bore in proximity to that end thereof to be inserted into the pipe, and provided at its other nose-shaped end with a system for automatically coupling a pulling cable for raising the pipe to be recovered on to the pipelaying craft, said apparatus being guided on to the pipe to be recovered by means of a guide ring releasably mounted to the end of a bracket projecting from one side of said framework, and through which there is inserted a guide cable stretched between the pipelaying craft and said pipe, and being provided at its lower end with two pairs of hydraulically operable jaws for clamping the framework on to the pipe to be recovered, with a cutting device for cutting the possible damaged part of the pipe to be recovered, and with means for perforating the pipe and for inserting a locking pin provided with shoulder teeth into said transverse bore in said sealing and pulling head when this latter has been inserted into the pipe to be recovered, wherein said framework extends longitudinally with a square cross-section, in which a beam is slidably supported axially by means of four pairs of running wheels disposed in opposing pairs, and terminates at one end in the form of a shoulder plate or stop, from which a pivot extends outwards for rotating an upwardly projecting bridge which at its upper end supports, releasably by remote control, said sealing and pulling head disposed longitudinally, said bridge being made to rotate about said rotation pivot by a remote controlled hydraulic motor fixed thereto, on the drive shaft of which there is keyed a gear wheel which engages with a second gear wheel keyed on to said rotation pin, said beam being made to slide longitudinally by a remote controlled double acting hydraulic cylinder disposed longitudinally and supported by said framework, its piston being rigidly connected to said shoulder plate or stop of said beam by means of a rod.

4,234,269
DEPLOYMENT, RELEASE AND RECOVERY OF OCEAN RISER PIPES

Abraham Person, Los Alamitos; Sherman B. Wetmore, Westminster, and James F. McNary, Santa Ana, all of Calif., assignors to Global Marine, Inc., Los Angeles, Calif.

Filed Aug. 21, 1978, Ser. No. 935,672
Int. Cl.[3] F02D 21/00
U.S. Cl. 405—195 29 Claims



1. An elongate pipe assembly adapted to be disposed substantially vertically in an ocean with its end coupled to a structure adjacent the ocean surface for support of the assembly with its lower end located above the ocean floor, the pipe assembly comprising an elongate pipe construction having upper and lower ends, and floatation means connected to the construction at the upper end thereof, the assembly overall having net negative buoyancy with the floatation means having sufficient positive buoyancy to cause the center of buoyancy of the assembly to be located closer to the floatation means than is the center of mass of the assembly so that the assembly, in the event of loss of support thereof, sinks to the ocean floor and assumes a substantially upright attitude with the upper end of the construction located above the ocean floor.

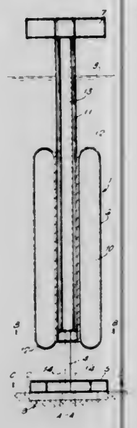
4,234,270
MARINE STRUCTURE

Trygve Gjerde; Kjell Vigander, both of Jar; Dag N. Jenssen, As, and Bjorn Hjertas, Sandefjord, all of Norway, assignors to A/S Hoyer-Ellefsen, Oslo, Norway

Continuation-in-part of Ser. No. 964,964, Nov. 20, 1978, abandoned, which is a continuation of Ser. No. 829,133, Aug. 30, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 597
Int. Cl.[3] E02B 17/02
U.S. Cl. 405—202 8 Claims

1. A marine structure comprising a base which is intended to be founded to the sea bed, at last one elastic prestressed column which is rigidly fixed to and extending up from the base and a buoyant, rigid structure comprising a submerged part and a part projecting up above the sea level to support a deck superstructure, the lower end of the submerged part being rigidly fixed to the upper end of the at least one elastic, prestressed column, the cross sectional area of the at least one elastic, prestressed column being substantially smaller than the cross sectional area of said lower end of the submerged part and the dimensions and elasticity of said column being such as to produce a first natural period of the complete installed structure which is longer than the significant exciting wave periods whereby said column will deflect in a curved manner when the

buoyant rigid structure is subjected to environmental forces and the main structure will oscillate about its vertical equilibrium when subjected to waves and wind, thereby behaving as an articulated tower.



4,234,271

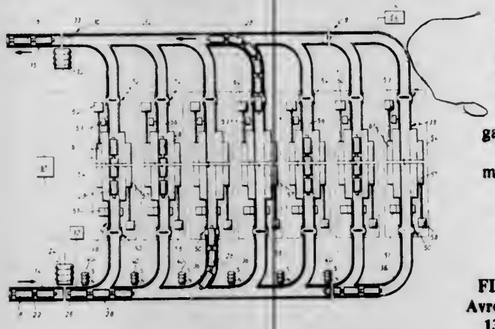
METHOD AND APPARATUS FOR LOADING AND UNLOADING PIPELINE CAPSULES

Alexander I. Kalina, 12439 Millbanks, Houston, Tex. 77031

Continuation-in-part of Ser. No. 923,512, Jul. 17, 1979, abandoned. This application Sep. 4, 1979, Ser. No. 72,318

Int. Cl.³ B65G *51/26*

U.S. Cl. 406—1 **25 Claims**



11. A pipeline capsule transportation system for transporting a continuous link of capsules, the system comprising a first elongated pipeline along which a continuous link of capsules is to be transported, a loading station for loading capsules, and an unloading station for unloading capsules, the loading station comprising a handling zone, displacement means for displacing capsules from the handling zone to the first pipeline, and coupling means for coupling capsules entering the first pipeline to a trailing end of a continuous link of capsules moving along the first pipeline during use.

4,234,272

MATERIAL CONVEYOR

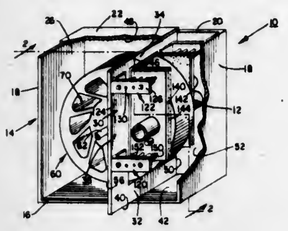
Douglas E. Laseter, 312 Sterling Towers, Jackson, Miss. 39202

Continuation-in-part of Ser. No. 897,338, Apr. 18, 1976, Pat. No. 4,179,232. This application Oct. 6, 1978, Ser. No. 949,137

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ B65G *53/46*

U.S. Cl. 406—64 **9 Claims**



1. A device for conveying granular material comprising:

a housing having a material entrance defined therein;

an induction wheel rotatably mounted on said housing, said wheel having a plurality of elongate open-ended chambers defined therein;

a pair of wipers mounted on said housing adjacent said wheel and located so that said wheel passes between said wipers to gently remove excess material from the ends of said chambers without damaging that removed material, said pair of wipers including wipers spaced from each other to define a material escape path through which said gently removed material passes;

sealing means mounted on said housing to sealingly cover said chamber ends, said sealing means including an arcuate housing surrounding said wheel and secured to said housing, a pair of pad members secured to said housing, a pair of pad backing members secured to said arcuate housing and springs biasing said pads against said wheel in a secure manner, said sealing means being separate from and spaced apart from said wipers to be located so that a chamber on said induction wheel passes between said pair of wipers prior to passing said sealing means, said wipers removing excess material from adjacent the ends of a chamber before such chamber is sealed by said sealing means so that material does not interfere with any seal formed between said sealing means and said chamber ends such that said chambers are securely closed to minimize loss of any gas introduced into said chambers for moving material out of said chambers;

gas introducing means connected to said sealing means to introduce gas from a source into a chamber; and

material transport means connected to said sealing means to receive gas and material from said chambers for transporting said material away from said induction wheel.

4,234,273

FLUIDIZABLE MATERIAL HANDLING APPARATUS

Avrom R. Handleman, and Charles S. Alack, both of P.O. Box 13151, St. Louis, Mo. 63119

Division of Ser. No. 801,865, May 31, 1977, Pat. No. 4,149,755. This application Mar. 1, 1979, Ser. No. 16,517

Int. Cl.² B65G *53/36*

U.S. Cl. 406—90 **14 Claims**

1. A pallet for supporting a load of granular, particulate, powdered or other fluidizable material and for fluidizing the load for unloading it from the pallet, said pallet comprising:

a plurality of legs engageable with the ground for supporting the pallet and the load, said legs being spaced for accommodating the tines of a forklift vehicle to facilitate forklift transport of the pallet and said load;

an upwardly facing deck for supporting said load, said deck sloping downwardly toward one side of the pallet;

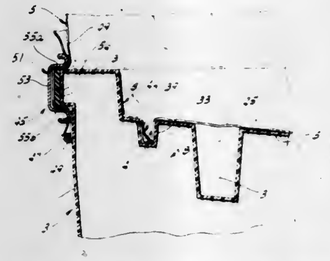
a peripheral wall extending around the pallet joining the said upper deck and said legs;

a porous diaphragm overlying said deck and defining a plenum between said diaphragm and said deck;

an inlet adapted for the introduction of air under pressure into said plenum for fluidizing the load bearing on said porous diaphragm; and

an outlet extending through said peripheral wall for communication from the space above said porous diaphragm to the exterior of the pallet, said outlet having an inner end disposed at said one side of said pallet adjacent an edge of said deck and being generally flush with said deck, said outlet angling downwardly from its innner end whereby said fluidized load flows down said inclined deck toward the inner end of said outlet and thence down said outlet;

and further comprising means for sealably securing a bag of limp synthetic resin film, coated fabric, or the like to said pallet and for preventing air pressure from within said bag present during fluidization of said load from pulling said bag from said pallet, said peripheral wall having an outwardly projecting flange therearound, said bag having a hem on its bottom end and a limp cord within said hem, said bag being adapted to fit over the outside of said flange with said cord disposed below said flange, said securing means comprising a hoop clamp extending around said pallet and fitting over said flange on the outside of said bag, said hoop clamp being channel shaped in cross section and having a generally vertical web and radially inwardly projecting upper and lower flanges, the lower flange of the hoop clamp extending beneath the flange on the pallet, the upper flange of the hoop clamp extending over the flange on the pallet for preventing the weight of the fluidizable material from pushing the hoop clamp down past the flange of the pallet, said securing means further comprising means for circumferentially and adjustably tightening said hoop clamp on said bag and on said flange on the pallet for clamping said bag to said pallet in sealing engagement whereby upon pressurization of said bag and upon said bag being pulled upwardly relative to the pallet, said cord is confined below the lower flange of the clamp and prevents the bag from being pulled off the pallet.



4,234,274

FILTER DEVICE FOR FIBROUS MATERIALS

Tom C. Hoshall, 4005 N. Pennsylvania, Oklahoma City, Okla. 73112

Filed May 24, 1979, Ser. No. 42,000

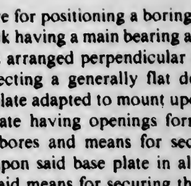
Int. Cl.³ B65G *53/28*

U.S. Cl. 406—93 **7 Claims**

1. A fibrous materials filter device for use in combination with a power driven centrifugal blower apparatus of the type having an axial materials input and tangential materials output, comprising:

housing means having top, bottom and sides and forming an enclosure, and including an input opening in generally tangential direction to said enclosure as formed at a side bottom location, and an output opening in axial direction to said enclosure as formed centrally through said top;

an orifice formed in said input opening adjacent its tangential juncture to said enclosure; and



means for connecting said housing means output to said blower apparatus materials input.

4,234,275

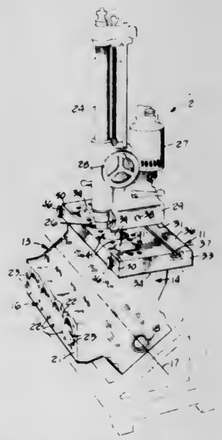
METHOD AND APPARATUS FOR MOUNTING AN ENGINE BLOCK BORING MACHINE

Michael H. Clement, 4797 Myrtle Dr., Concord, Calif. 94521

Filed Jul. 26, 1978, Ser. No. 928,268

Int. Cl.³ B23B *41/12*

U.S. Cl. 408—19 **2 Claims**



1. A boring fixture for positioning a boring machine in place upon an engine block having a main bearing axis and a plurality of cylindrical bores arranged perpendicular to the main bearing axis and intersecting a generally flat deck of the block, comprising a base plate adapted to mount upon the deck of the block, said base plate having openings formed in alignment with the cylinder bores and means for securing the boring machine in place upon said base plate in alignment with the cylindrical bores, said means for securing the boring machine comprising a T-shaped slot formed in the base plate for receiving a T-shaped bar on the boring machine and clamping means for fixing the position of the boring machine upon the base plate, adjustable means arranged for interaction between said base plate and the deck of the engine block in order to selectively adjust the position of said base plate upon the deck and thereby place said base plate in precise parallel alignment with the main bearing axis, said adjustable means comprising a slidable wedge-shaped element arranged in a wedge-shaped cavity formed in each end of said base plate with means for adjusting said wedge-shaped elements between said wedge-shaped cavities and a surface portion of the engine block to permit alignment of said base plate with respect to the main bearing axis to perform a boring operation, and means for

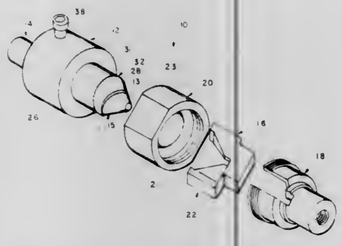
selectively securing said base plate upon the deck of the engine block, said means for securing said base plate upon the deck of the engine block comprising bolts for engaging threaded openings in the block in order to produce distortion of the block about the bores similar to distortion conditions experienced in the block during engine operation, the base plate also being engagable with the engine block by means of said distortion producing bolts to permit accurate finishing of the cylindrical bores.

4,234,276

DRESSER FOR OFFSET ELECTRODE

George D. Meier, Jr., Wyoming, Mich., assignor to Electrode Dressers Incorporated, Mich.

Filed Apr. 2, 1979, Ser. No. 25,895
Int. Cl.[3] B23B *39/00, 41/00, 51/00*
U.S. Cl. 408—104 **17 Claims**



1. An offset tip collar for retaining a rod-shaped member in a manner as to expose an area of the member tip which is to be dressed by a dressing tool for producing a member with an offset tip, said offset tip collar comprising:

a base including guide means for guidably receiving a dressing tool, said base including a longitudinally extending aperture extending through said base and radially offset from the longitudinal axis of said base; and

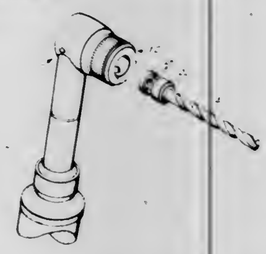
means for securing a rod-shaped member in said base and within said aperture.

4,234,277

MOTOR QUICK-CHANGE CHUCK SYSTEM FOR TOOL HAVING CYLINDRICALLY SHAPED ADAPTER PORTION

Richard L. Benson, Mercer Island; Horace E. Hill, Renton, and Mark S. Soderberg, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 932,593, Aug. 8, 1978, which is a continuation of Ser. No. 799,406, May 23, 1977. This application May 19, 1979, Ser. No. 21,532
Int. Cl.[3] B23B *51/00*
U.S. Cl. 408—226 **1 Claim**



1. A tool for use in a quick change tool-holding chuck having locking means including a plurality of spherically shaped balls for securing the tool,

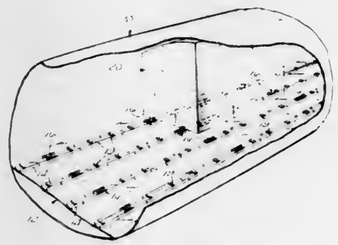
comprising an elongated cylindrically shaped body member, said tool having a working surface at a first end thereof and an adapter portion body member, said adapter portion having a beveled end surface (**58**) facing said working surface at said first end of said elongated cylindrically shaped body member, said adapter portion further including a circumferential recess around the outer surface of said adapter portion, said adapter portion having a plurality of spherically shaped dimples equiangularly disposed about the central axis of said tool in said circumferentially recessed surface of said adapter portion, said adapter portion having a further beveled end surface (**303**) at said other end of said elongated cylindrically shaped body member and, said beveled end surface (**58**) having a flat angle relative to said further beveled end surface (**303**).

4,234,278

LOCKING DEVICES FOR CARGO AND THE LIKE

Ray E. Harshman, Anaheim, and Archie C. Landry, Canoga Park, both of Calif., assignors to Electro-Pneumatic International GmbH, Hansham, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,373
Int. Cl.[3] B60P *7/08;* **B64D** *9/00;* **B61D** *45/00*
U.S. Cl. 410—69 **9 Claims**



1. In a cargo locking device having a pair of spaced supports, first and second locking pawls each pivotally mounted between said supports for movement between a generally flat position and a generally upright position with said first and second locking pawls carrying locking dogs extending in opposed directions when said first and second locking pawls are in their said generally upright position and means for locking the movement of said first and second locking pawls in said generally upright position, the improvement which comprises:

spring means bearing only upon said second locking pawl biasing said second locking pawl towards a generally upright position; and

at least one restraining member carried by said first locking pawl and engaging said second locking pawl when in said generally flat position to overcome the force of said spring means and thereby retain both said locking pawls in said generally flat position between said supports, said restraining member of said first locking pawl disengaging from said second locking pawl as said first locking pawl is pivotally moved to said generally upright position whereby said spring biased locking pawl also moves pivotally upward to said generally upright position under the urging of said spring means.

4,234,279

AUTOMATIC APPARATUS FOR DISCHARGING LOOSE PRODUCTS IN BINS

Nevio Lotti, Cesena, Italy, assignor to Sorma S.n.c. di Pieri-Lotti & C., Cesena, Italy

Filed Dec. 13, 1978, Ser. No. 968,984
Claims priority, application Italy, Jun. 29, 1978, 3482 A/78
Int. Cl.[3] B65G *60/00, 65/34*
U.S. Cl. 414—33 **17 Claims**

1. Automatic apparatus for discharging loose products contained in bins, particularly fruit, vegetables and the like, comprising on a fixed frame:

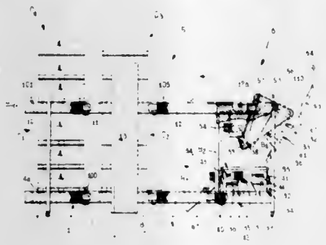
a lower platform for feeding in full bins and an upper platform for discharging empty bins;

an oscillating frame for receiving the full bins and positioned in the region of said lower platform and able to be tipped alternately from a virtually horizontal non-operative position in alignment with said lower platform, to a position in which the discharge of the products contained in the bins is prepared, said latter position requiring a rotation of more than 90° with respect to the non-operative position;

means for causing the oscillating frame to be tipped in one direction or the other;

means mounted on said oscillating frame for restraining the products inside the bins at the time said frame is in an inclined position;

first transfer means mounted on said oscillating frame for lifting the full bins while said frame is in the inclined position:



a fixed discharge aperture placed a certain height above said oscillating frame, in alignment with an open side of the bins when they are in the inclined position in which the products are discharged;

a second transfer means mounted on said fixed frame, above said oscillating frame, for lifting the bins further up and tightly against said discharge aperture, after the lifting operation performed by said first transfer means;

locator means placed in the region of said second transfer means and said upper discharge platform, for overturning the empty bins from the inclined position to the virtually horizontal position, above said upper platform, in which the orientation of the empty bins corresponds to that of the full bins being fed in;

and means for detecting various positions adopted gradually by the bins, so as to coordinate the operation of said transfer means and said means for tipping the oscillating frame.

4,234,280

PALLETIZER

Bernard P. Donnelly, and Roland W. Van Slooten, both of Holland, Mich., assignors to The Lithibar Company, Holland, Mich.

Filed Jun. 8, 1978, Ser. No. 913,565
Int. Cl.[3] B65G *57/30*
U.S. Cl. 414—35 **18 Claims**

1. An apparatus for stacking a plurality of layers of articles on top of each other, comprising:

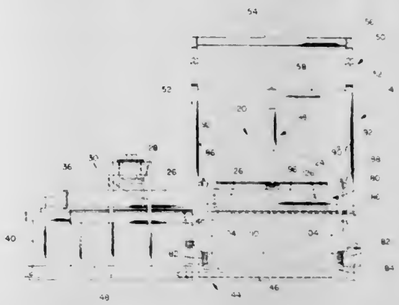
a fixed frame supporting a plurality of spaced, parallel rollers;

a carriage support frame supported by said fixed frame for vertical movement relative thereto;

a pair of opposed carriages slidably supported on said carriage support frame for movement towards and away from each other and from said rollers along the axis of rotation of said rollers, said carriges each supporting a plurality of spaced, parallel tines, said tines lying in the same horizontal plane and extending between said rollers as said carriages move towards said rollers and towards each other;

clamp means mounted on said carriage support frame for clamping a layer of articles placed on said rollers; and

means for simultaneously shifting said carriages towards each other and said rollers to position said tines under a



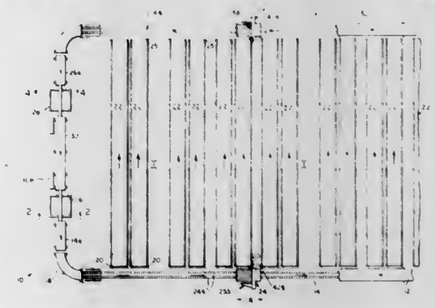
layer of articles and for lifting said carriage support frame to bring said tines into engagement with said articles above said rollers to lift said articles vertically and for actuating said clamp means.

4,234,281

AUTOMATIC BREAD PAN CONTROL SYSTEM

William E. Lanham; William E. Lanham, Jr., and Gene C. Miller, all of Decatur, Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Continuation of Ser. No. 584,026, Jun. 4, 1974, abandoned, which is a continuation of Ser. No. 325,108, Jan. 17, 1973, Pat. No. 3,937,335, which is a continuation-in-part of Ser. No. 243,074, Apr. 11, 1972, abandoned. This application Sep. 8, 1977, Ser. No. 831,482
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.[2] B65G *57/04, 60/00*
U.S. Cl. 414—37 **5 Claims**



1. A pan handling apparatus comprising an infeed conveyor for supplying individual pans to the apparatus, a storage station at which stacks of pans may be stored, pan stacker means for receiving said individual pans from the infeed conveyor and placing said pans in a stack, stack conveyor means for transporting the formed stack from said stacker means to said storage station, means for selectively removing stacks of pans from said storage station and supplying the stacks to an unstacking station, pan unstacker means at said unstacking station for receiving said stacks of pans and sequentially removing individual pans therefrom, and feed conveyor means for transporting individual pans away from said unstacker for use;

said means for supplying pan stacks to said unstacking station including a stack transport conveyor for supplying stacks from said storage station to the lower end portion of said unstacker means, and said unstacker means compris-

ing a frame, a selectively operable endless conveyor mounted at the bottom of said frame for receiving a stack of pans from said transport conveyor and selectively operable means for lifting a stack of pans on said endless conveyor to a predetermined position with respect to the top of the frame;

said unstacker means including an unstacker head mounted adjacent the top of said frame and having a pan discharge conveyor and means for lifting the top pan from a stack of pans at said predetermined position into engagement with said discharge conveyor for removal from said unstacker;

said discharge conveyor and said unstacker means comprising a selectively operable and reversibly driven endless conveyor and an elongated magnet mounted between the flights of said discharge conveyor for holding said pans against said discharge conveyor for movement therewith;

means for controlling the operation of said stack lifting means to prevent actuation thereof when a pan is supported on said discharge conveyor; said means for lifting a stack of pans in said unstacker comprising a pair of vertically extending conveyors having opposed stack support lugs mounted thereon and means for varying the spacing between said vertically extending conveyors whereby said unstacker means is adapted to accommodate bread pans of different widths; and means for moving said vertically extending conveyors in a predetermined direction to raise said stack of pans thereon a predetermined distance each time a pan is removed from the top of the stack by said unstacker head;

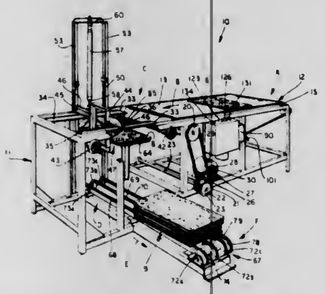
said means in said unstacker head for lifting the topmost pan from said stack of pans comprising a pair of sprockets rotatably mounted in said unstacker head, along parallel horizontal axes, an endless chain trained about said sprockets and means for reversibly moving said chain, said sprockets each having a crank arm secured thereto for rotation therewith; a reciprocal frame member having a plurality of slots formed therein and receiving the free ends of said crank arms, thereby to be reciprocated in a vertical direction upon rotation of said crank arms, and at least one elongated magnet secured to said reciprocal frame for vertical movement therewith.

4,234,282

CARPET SAMPLE STACKER

Michael A. Lewallyn, P.O. Box 1361, Dalton, Ga. 30720

Filed Dec. 11, 1978, Ser. No. 968,267
Int. Cl.[3] B65G 57/03
U.S. Cl. 414—45 **7 Claims**



1. An apparatus for automatically stacking carpet samples and like sheets of material, comprising:

a first surface conveyor means for moving the sheets of material along a first horizontal path from a first end to a second end of said first surface conveyor means;

a second surface conveyor means positioned at the second end of said first surface conveyor means and below said first surface conveyor means and extending at a right angle with respect to the first horizontal path of said first surface conveyor means for moving the sheets of material along a second horizontal path;

a platform means for moving the sheets of material vertically from the second end of said first surface conveyor means to said second surface conveyor means, said platform means being movable between a top position adjacent the second end of said first surface conveyor means and a bottom position adjacent said second surface conveyor means;

a pair of spaced apart horizontally oriented sheet suspending means positioned at the end of the first horizontal path and extending from and beyond the second end of said first surface conveyor means and defining a space therebetween vertically above said platform means;

a stop member positioned in the space between said sheet suspending means and spaced from the second end of said first surface conveyor means whereby sheets are pushed by the first surface conveyor means out onto the spaced sheet suspending means until the sheet is stopped by the stop member and falls through the space between said suspending means and accumulate in a stack on said platform means;

material sensing means for sensing the presence of sheets of material stacked at a predetermined minimum height above said top position of said platform means on said platform means and for emitting a signal in response to said sensing; and

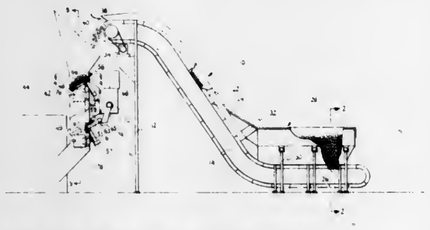
platform moving means for intermittantly lowering said platform means in response to said signal from said sensing means.

4,234,283

SCRAP METAL FED SYSTEM FOR A CLOSED ROTARY KILN OR HEATING OVEN

Noel H. Twyman, Newport Beach, and Robert F. Jenkins, Laguna Niguel, both of Calif., assignors to Automated Production Systems Corporation, Tustin, Calif.

Continuation-in-part of Ser. No. 771,967, Feb. 25, 1977, abandoned. This application Apr. 18, 1978, Ser. No. 897,381
Int. Cl.[3] B66C 17/08
U.S. Cl. 414—171 **4 Claims**



1. A scrap metal feed system which comprises:

an endless variable speed conveying means,

said conveying means including a surface for supporting materials,

said surface having flights extending outwardly from said surface at periodic intervals along the length of said surface,

a first hopper means,

a second hopper means,

said conveying means extending horizontally beneath the bottom of said first hopper means and then upwardly at an angle to the horizontal greater than about 50 degrees and less than about 80 degrees and terminating over the top of said second hopper means,

said conveyor being exposed to the interior of said first hopper as it extends upwardly to said angle to the horizontal so that material can move back along said conveyor means into said first hopper as said conveyor is operated,

said conveyor being positioned near the top opening of said second hopper means so that the material conveyed by said conveying means is deposited into said second hopper means,

chute means,

said chute means having an upper end and a lower end, said upper end integrally connected with the bottom of said second hopper means, the lower end opening into a kiln,

said chute means having two flapper gate means interposed between said upper end and said lower end, said flapper gate means having an open and a closed position,

coordinated activating means opening and closing said flapper gate means such that when one of said flapper gates is in an open position, the other is not,

each of said flapper gate valves including a shaft pivotally mounted in said chute and a plate attached to said shaft along one side of said plate such that said plate opens and closes in said chute as said shaft pivots, and a counterweight means attached to one end of said shaft for reversibly maintaining said flapper gate in a closed position,

said coordinating activating means including a lever arm attached to the other end of said shaft and

abutting means which sequentially abuts against said lever arm opening said flapper gate valves,

motor means activating said abutting means,

said lever arm includes a roller on the end thereof,

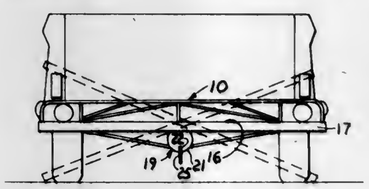
said abutting means includes a striking arm, said motor means connected to said striking arm such that said striking arm engages said roller on said lever arm displacing said lever arm as said striking arm rotates.

4,234,284

UTILITY PLATFORM

Joe Hauff, 65 Bonanza Dr., Pasco, Wash. 99301

Filed Apr. 24, 1978, Ser. No. 899,537
Int. Cl.[2] B60R 9/00; B60P 1/24
U.S. Cl. 414—462 **4 Claims**



1. A utility platform mountable to a vehicle, comprising:

a central support beam adapted to be mounted to the vehicle in a stationary and horizontal position thereon;

a support panel;

bearing means mounting the support panel to the central support beam for free pivotal movement of the support panel about a horizontal axis between a loading position wherein the support panel is tipped to one side of the horizontal axis and a carrying position wherein the support panel is horizontal;

the support beam and bearing means being centered across the support panel so that the support panel is balanced thereon when at its carrying position; and

manually relesable detent means interconnecting the support beam and support panel for allowing pivotal movement of the support panel about said horizontal axis to its loading position and automatically operable for locking the support panel in its horizontal carrying position as the support panel is pivoted about said horizontal axis to a horizontal position;

the detent means comprising:

a locking lever mounted to the support panel for pivotal movement therewith about the horizontal axis;

a plate mounted to the central support beam having an arcuate surface formed about the horizontal axis for slidably engaging the locking lever;

an indentation positioned along the arcuate surface of the plate to receive and releasably lock the locking lever and support panel against pivotal movement about the horizontal axis when the support panel is at its carrying position; and

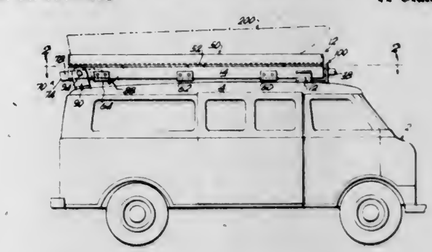
biasing means operatively connected between the support panel and locking lever for continuously urging the locking lever inwardly toward the arcuate surface of the plate.

4,234,285

ROOF TOP CARRIER

Evidio Martinez, 6875 Tamiami Canal Rd., Miami, Fla. 33126

Filed May 21, 1979, Ser. No. 40,884
Int. Cl.[1] B60P 3/10; B60R 9/08
U.S. Cl. 414—462 **11 Claims**



1. An apparatus for carrying an article on the roof top of a motor conveyance and for conveniently loading and unloading the article, comprising:

a main frame including a pair of parallel side runs spaced a predetermined distance from each other, the runs including front and rear ends, the runs spanned by at least one cross member located a predetermined distance from the rear ends, and a hinge means fixedly connected to the top of the motor conveyance adjacent the rear ends, the main frame rotatably connected to the hinge means at the rear ends swingable to an inclined position away from its normal horizontal position,

a sliding frame including a pair of parallel side runs spaced a predetermined distance from each other, sized and shaped for sliding movement with the main frame, each run having a front end comprising a post and a rear end comprising a rear sliding frame end zone, the rear end zone including spring-loaded means for locking the sliding frame against sliding movement relative to the main frame,

a carrier means fixedly connected to the sliding frame,

a front bracket fixedly mounted to the conveyance opposite the hinge means, sized and shaped for engagement with the sliding frame posts, comprising front locking means for preventing rotational movement of the apparatus, whereby the spring-loaded lock may be released and the sliding frame moved relative to the main frame and away from the front bracket, thereby the apparatus may be swung about the hinge and the sliding frame may slide relative to the main frame to an inclined and extended position such that the rear end zone is proximate and adjacent a loading and unloading point.

4,234,286

VEHICLE BODY

Miles J. Hamilton, Laguna Beach, Calif., assignor to DEC International, Inc., Madison, Wis.

Filed Aug. 30, 1978, Ser. No. 938,213
Int. Cl.[1] B01F 7/08
U.S. Cl. 414—512 **21 Claims**

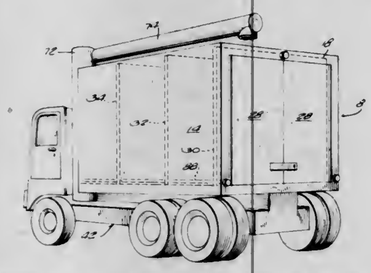
1. A vehicle body comprising:

an outer shell including side walls, end walls and a floor;

a discharge means for discharging material from inside said outer shell to the exterior thereof, said discharge means including a discharge recess located inside said outer shell;

a movable bulkhead means mounted in said shell, said movable bulkhead means including a plurality of vertically positioned, spaced apart bulkhead members, each of said bulkhead members having a bulkhead drive engagement means thereon;

a bulkhead drive means for driving said bulkhead members toward and away from said discharge recess, said drive



means including a plurality of threaded power screws having a threaded portion in threaded engagement with said bulkhead drive engagement means on said bulkhead members, said power screws each having an unthreaded portion at one end thereof adjacent said discharge recess so that as each bulkhead member slides over said discharge recess it will become disengaged from the threaded portions of said power screws, said drive means further including a motor drive unit for driving said power screws in synchronization.

4,234,287

LOAD HANDLING RAILROAD VEHICLE

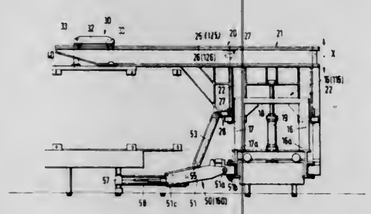
Harry Lässig, and Anton Grosshauser, both of Hamburg-Schenefeld, Fed. Rep. of Germany, assignors to Fördertechnische Forschungsgesellschaft mbH, Hamburg-Schenefeld, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,843

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834163

Int. Cl.³ B60P *1/54*; B66C *7/10*

U.S. Cl. 414—542 **3 Claims**



1. A railroad vehicle for transferring containers and the like onto sidings positioned laterally of the vehicle, particularly below the overhead lines for electrically operated locomotives and units, characterized in that the combination of the following features is provided:

(a) a railroad vehicle platform capable of being moved along railroad tracks, a transfer mechanism supported on said vehicle platform and including two spaced vertically disposed, gantry-shaped supporting frames extending transversely of the direction of movement of said vehicle platform along railroad tracks, a platform trackway supported on and extending in the direction of each of said supporting frames, a crane bridge supported on and extending between said platform trackways with a loading frame movably mounted on said crane bridge.

(b) a jib supported on at least one side of each of said supporting frames adjacent said trackway thereon, each said jib being swingable about a vertical axis between a swung-in position extending in the direction of movement of said vehicle platform along railroad tracks and a swung-out position extending laterally outwardly from said vehicle platform and transversely of the direction of movement of said vehicle platform along railroad tracks, each said jib having a jib trackway which aligns with and connects to one of said platform trackways in the swung-out position for laterally moving a container,

(c) means associated with said supporting frames so that said jib trackways together with said platform trackways in the swung-in position of said jibs can be raised and lowered,

(d) movable base support devices on said vehicle platform which can be swung in and out with said jibs,

(e) each said base support device includes a horizontally directed support arm with a support head at an end thereof which can be placed on a siding or subsidiary track,

(f) each base support device comprises a swivel arm articulated to said vehicle platform in the vicinity of each said supporting frame and is laterally pivotable with said pivotable jib, a hydraulic cylinder mounted on one end of said swivel arm, each said pivotable jib having a lower swivel hinge, the other end of said hydraulic cylinder attached to said lower swivel hinge, and the end of said swivel arm spaced from said vehicle platform is articulated to said support arm with said support head.

4,234,288

APPARATUS FOR TRANSPORTING ELONGATED CYLINDRICAL WORKPIECES

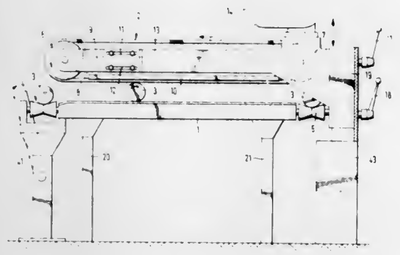
Heinz Hartkopf, Solingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 569

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1978, 2800694

Int. Cl.³ B65G *35/02*

U.S. Cl. 414—745 **13 Claims**



1. Apparatus for transporting elongated generally cylindrical workpieces comprising: a workpiece supporting surface along which elongated generally cylindrical workpieces are rollable, an elongated flexible belt having an elongated lower belt run spaced above said supporting surface and extending therealong substantially parallel thereto, said belt being positioned adjacent one end of said supporting surface and having a relatively narrow width for engaging a workpiece over a short portion of its length adjacent one end thereof, and belt drive means for driving said belt, whereby workpieces gripped between said supporting surface and said lower belt run are rolled along said supporting surface by action of said belt.

4,234,289

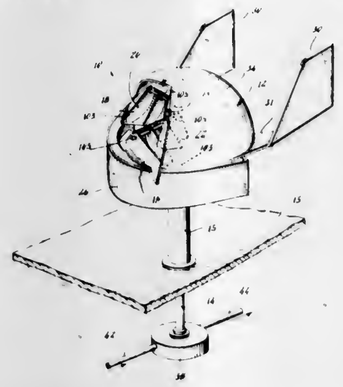
FLUID TURBINE

Barry A. Lebost, 1116 Warburton Ave., #1K, Yonkers, N.Y. 10701

Filed Sep. 5, 1978, Ser. No. 939,264

Int. Cl.³ F03D *1/04*

U.S. Cl. 415—2 R **16 Claims**



1. A fluid turbine, comprising:

a plurality of rotor blades mounted on a shaft for rotation in a reference plane about the longitudinal axis of said shaft when exposed to a source of flowing fluid.

a housing enclosing said plurality of rotor blades therein and having interior sidewalls spaced above said rotor blades and inclined with respect to said reference plane for creating a fluid swirl area in upper regions of said housing,

said housing including a fluid entrance passage therein lying within said reference plane in alignment with said plurality of rotor blades, said housing further including a fluid exit passage therein spaced from said swirl area and beneath said plurality of rotor blades, said fluid exit passage extending essentially coextensive with the area swept by said rotor blades upon rotation of the latter,

each of said rotor blades having an upper and lower edge extending from said shaft radially outward from said longitudinal axis, the upper edge of each of said blades leading the lower edge thereof in the direction of rotation of said blades.

4,234,290

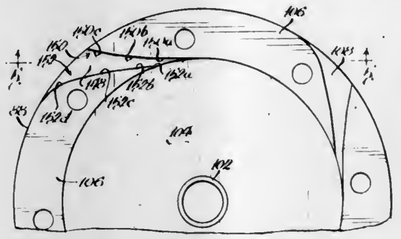
TURBINE PUMP

James L. Lobach, Broomfield; David A. J. Outteridge, Denver, and Gary D. Colwell, Boulder, all of Colo., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Nov. 30, 1978, Ser. No. 965,173

Int. Cl.³ F04D *27/00, 29/44*

U.S. Cl. 415—145 **15 Claims**



2. A pump for delivering coating material under pressure to coating equipment at one or more coating stations, comprising a housing having a chamber therein, an inlet to said chamber for connection with a supply of coating material, and outlets from said chamber for connection with the coating equipment; an impeller within said chamber, said impeller having a plurality of blades and being rotatable to move edges of said blades past said outlets to pump coating material from said inlet through said outlets, said outlets having fluid flow areas which increase with increasing distance from said chamber, whereby with a constant speed of rotation of said impeller coating material is pumped from said outlets to the coating equipment at substantially a constant pressure despite variations in the flow rates thereof; and bypass valve means for bypassing a selected portion of the coating material away from the edges of said impeller blades and around said outlets to control the pressure of the coating material delivered to the coating equipment, each said outlet having a top wall, a bottom wall and a pair of side walls, said top and bottom walls being generally parallel and said side walls being generally straight and parallel from said chamber to a first point along said passage, said side walls being generally straight and diverging at a first angle from said first point to a second point along said passage, said side walls being generally straight and diverging at a second and greater angle from said second point, one of said side walls being generally straight from said second point to an end of said passage from said chamber, the other of said side walls being generally straight from said second point to a third point along said passage and being curved away from said one side wall from said third point to said end of said passage, wherein neither of said side walls is planar between said chamber and said end of said passage away from said passage.

4,234,291

WEAR LINING

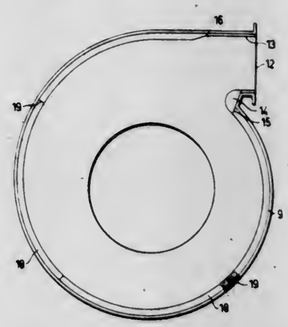
George P. Hurst, Jackson, Calif., and Assar N. Svensson, Ersmark, Sweden, assignors to Skega Aktiebolag, Ersmark, Sweden

Filed Jun. 14, 1979, Ser. No. 48,596

Claims priority, application Sweden, Jun. 16, 1978, 7806952

Int. Cl.³ F04D *7/02, 29/02*

U.S. Cl. 415—174 **12 Claims**



1. In a curved wear lining for a curved surface facing the center of curvature of the type including a layer of wear rubber rigidly combined with a support plate and with a wearing surface facing said center of curvature and means included in the layer of wear rubber and increasing the wear resistance of the wear lining, the improvement wherein said means comprise metal pins arranged within the layer of wear rubber in one or more reciprocally separated layers and spaced from each other, which pins are oriented in radial planes extending from the center of curvature and at least across the wear surface, said layer of rubber being in compression with the compression increasing from the support surface towards the wear surface as a result of bending of the wear lining from a substantially plane state to the intended curved shape.

4,234,292

FUEL INJECTION PUMP, ESPECIALLY FOR INTERNAL COMBUSTION ENGINES

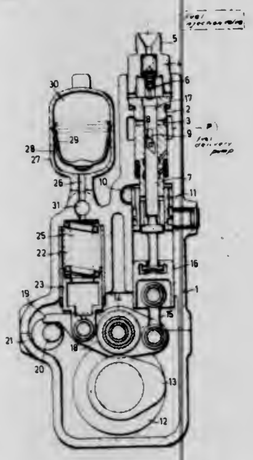
Josef Berg, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,578

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723969

Int. Cl.³ F04D *49/02*; F02M *59/10*

U.S. Cl. 417—214 **13 Claims**



1. A fuel injection pump, especially for an internal combustion engine having a cam shaft, which includes in combination:

a pump housing having a pump chamber therewith,

a cylinder arranged in said pump housing and provided with control passage means for controlling the supply of fuel to said cylinder,

a pump piston axially displaceable in said cylinder and turnable for controlling the fuel quantity to be injected, said pump piston having its circumferential surface provided with an oblique control groove for cooperation with said control passage, a cam rotatable by the cam shaft, a roller engageable with the cam, said roller being unaligned with the pump piston and displaceable by said cam relative to the axis of said cam shaft,

a two arm rocker having one arm pivotally connected to said pump piston and having said roller mounted thereon intermediate the ends thereof,

spring means operatively connected to the other arm of said rocker, and

a stop mounted on said housing, said spring means continuously urging the other arm toward said stop whereby the pump piston continues to rise as the cam on the cam shaft rises so long as the pressure in the pump chamber is less than the pressure exerted by said spring means and whereby the pump piston does not rise when the pressure in the pump chamber exceeds the pressure exerted by the spring in which case the rocker rotates about the cam compressing the spring means.

4,234,293

AXIAL BALANCING SYSTEM FOR MOTOR DRIVEN PUMPS

John R. Lightle, Cypress, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 27, 1979, Ser. No. 24,358

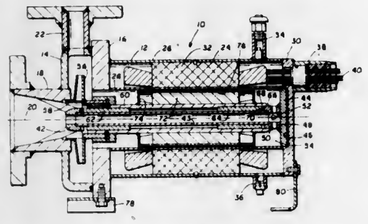
Int. Cl.³ F04B *17/00, 35/04*

U.S. Cl. 417—365 **3 Claims**

1. An improvement to an axial balancing system for a motor driven centrifugal pump including a pump and motor housing, a hollow mandrel having one end mounted in the pump housing, a hollow rotor shaft rotatable and axially movable on the mandrel, a bearing located near each end of the mandrel between the shaft and mandrel, said improvement comprising:

a support plate located in the motor housing;

a hollow lug projecting from said plate toward said mandrel, said lug having an outer diameter sized to movably receive the rotor shaft and an interior sized to fixedly receive the other end of the mandrel, and said lug having a



plurality of ports therein providing fluid communication between the interior of the motor housing and the interior of the mandrel, said ports being located in positions to be covered and uncovered by the rotor shaft during axial movement thereof as axial thrust is generated by the pumping of fluid by the motor pump; and,

said lug having an annular end face engageable with one of the bearings to limit the axial movement of the shaft toward said support plate.

4,234,294

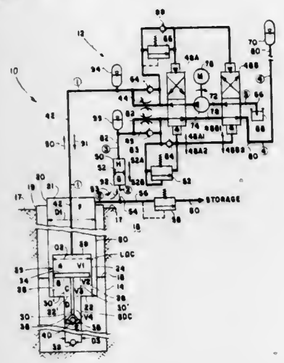
DEEP WELL HYDRAULIC PUMP SYSTEM USING HIGH PRESSURE ACCUMULATOR

James B. Jensen, Rte. 2, Coffeyville, Kans. 67337

Filed Feb. 12, 1979, Ser. No. 11,400

Int. Cl.³ F04B *9/10*

U.S. Cl. 417—377 **4 Claims**



1. An hydraulic pump system for pumping liquids from deep wells, comprising:

(a) a down hole pump attached to the bottom end of a tubing string of inner diameter D1, hung from the surface and immersed in well liquid, comprising;

(1) a large diameter cylinder (LDC) closed at the top and open at the bottom and of diameter D2 less than D1;

(2) a small diameter cylinder (SDC) open at the top of diameter D3 less than D2, with a foot check valve in the bottom of said SDC; said LDC and SDC connected together at their open ends;

(3) a large piston in said LDC is connected to a small piston in said SDC by means of a common piston rod, and there is a traveling check valve in said small piston;

(4) the bottom end of said LDC and the top end of said SDC communicating with the tubing, whereby liquid lifted by said small piston can flow into and up said tubing;

(b) first pipe means extending from the surface inside said tubing through the closed end of said LDC;

(c) said tubing closed at the surface of the earth and second pipe means connected between the top of said tubing and a first end of a third cylinder enclosing a free traveling piston;

(d) third pipe means connected into the second end of said third cylinder;

(e) high pressure accumulator means, and fourth pipe means connected to said high pressure accumulator means;

(f) sump means and fifth pipe means connected to said sump means;

(g) continuous motor-driven liquid pump (MDLP) means;

(h) valve means adapted to move back and forth between a first position and a second position and wherein;

(1) when said valve means is in said first position, said (MDLP) is connected at its input to said fifth pipe means, and on its output to said first pipe means, and said third pipe means is connected to said fourth pipe means; and

(2) when said valve means is in said second position, said (MDLP) is connected at its input to said fourth pipe means, and on its output to said third pipe means; and said first pipe means is connected to said fifth pipe means;

(i) first pressure sensitive valve means connected to said second pipe means; and

(j) means responsive to the volume flow of liquid to move said valve means between said first and second positions.

4,234,295

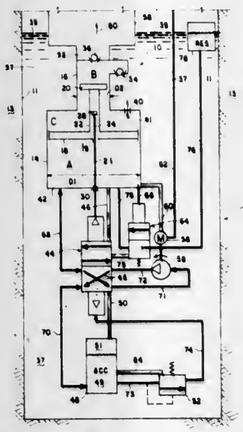
SUBSURFACE HYDRAULIC PUMP USING HIGH PRESSURE ACCUMULATOR

James B. Jensen, Rte. 2, Coffeyville, Kans. 67337

Filed Feb. 1, 1979, Ser. No. 8,419

Int. Cl.³ F04B *9/10*

U.S. Cl. 417—390 **3 Claims**



1. In a well having a tubing string supported from the surface, a subsurface hydraulic pump using high pressure accumulator, comprising;

(a) a subsurface hydraulic reciprocating first pump, comprising

(1) a large diameter cylinder (LDC) open at one end and first piston;

(2) a small diameter cylinder (SDC) open at one end and second piston;

(3) said first and second pistons connected by a common piston rod;

(4) said LDC and SDC connected together at their open ends, the space between said pistons open to well liquids;

(b) said hydraulic pump supported by said tubing at the bottom end thereof;

(c) an inlet check valve in the closed end of said SDC, permitting inflow of well liquid into said SDC;

(d) an outlet check valve in the closed end of said SDC, permitting outflow of liquid from said SDC into the bottom of said tubing;

(e) second pump and motor means for producing pressurized control liquid to operate said first piston in said LDC;

(f) high pressure accumulator means;

(g) first valve means operable from a first position, in which liquid is drawn from said LDC and pumped under pressure into said accumulator, thereby lowering said first and second pistons; to a second position in which liquid is pumped from said accumulator to said LDC, raising said first and second pistons; and

(h) means to apply electrical power to said motor driving said second pump.

4,234,296

SCREW COMPRESSOR

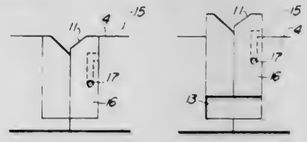
Katsumi Matsubara; Shigekazu Nozawa; Masaharu Ishii, and Mitsuhiko Miyagawa, all of Shimizu, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 6, 1979, Ser. No. 46,025

Claims priority, application Japan, Jun. 14, 1978, 53-70945

Int. Cl.³ F01C *1/16*; F04C *2/00*

U.S. Cl. 418—201 **4 Claims**



1. A screw compressor comprising:

a male rotor and a female rotor in meshing engagement with each other and forming a pair;

a rotor casing enclosing said pair of rotors and cooperating therewith to define a working chamber for compressing gas;

an axial discharge port and a radial discharge port formed such that the former is smaller in area than the latter; and

a slide valve mounted at one part of said rotor casing for axial movement, said slide valve being operative to return gas from said working chamber to the low pressure side of the compressor;

wherein the improvement comprises a duct formed in said slide valve for establishing communication between the working chamber and the discharge port side of the compressor only when the compressor operates in a controlled capacity mode.

4,234,297

APPARATUS FOR BLOW MOLDING

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 886,488, Mar. 14, 1978. This application Jan. 9, 1979, Ser. No. 2,146

Int. Cl.³ B29C *17/07*

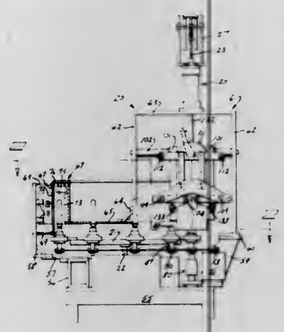
U.S. Cl. 425—174.4 **6 Claims**

1. In a blow molding apparatus, conveying means adapted to

traverse a plurality of spaced operating stations in stepwise fashion,

a plurality of spaced parison support elements carried by said conveying means and adapted to support parisons at the same spacing as said stations, the parisons being located at said stations in succession as the conveying means traverses said stations,

separate infrared radiant heaters located at some of said



stations, blow molding means located at another of said stations,

a fixed heating tunnel enclosing the parisons located at all of the heating stations having said radiant heaters, and

blower means for introducing air under pressure into said tunnel for flow past all of said heating stations, said blower means being operatively associated with said tunnel to blow air counter-current to the path that said conveying means traverses said stations.

4,234,298

APPARATUS FOR REMOVING A CYLINDER FROM A SCREW EXTRUDER

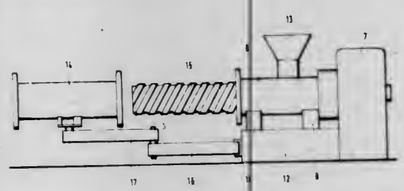
Horst Spielhoff, Aligse, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,813

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726963

Int. Cl.³ B30B *15/28*

U.S. Cl. 425—186 **1 Claim**



1. Apparatus for removing a cylinder of a screw extruder comprising

(a) a base;

(b) a first cylinder, and means for fixedly mounting said first cylinder on said base;

(c) a second cylinder adapted to be aligned with and connected to said first cylinder for receiving an extruding member;

(d) a first supporting arm;

(e) means for pivotally mounting one end of said first supporting arm on said second cylinder;

(f) a second supporting arm;

(g) means for pivotally mounting one end of said second supporting arm to the other end of said first supporting arm;

(h) means for pivotally mounting the other end of said second supporting arm to said base of said extruder, whereby said second cylinder can be swung clear of said first cylinder and the remaining parts of the screw extruder, and

(i) adjusting means disposed between second cylinder and said first supporting arm for adjusting the height and inclination of said cylinder with respect to said first supporting arm, said adjusting means comprising a plate mounted on said one end of said first supporting arm, adjusting set-screws screwed into said plate and adapted to bear against said second cylinder, and securing screws extending through said plate and engaged in screw threaded apertures in said second cylinder for maintaining the same in its adjusted position.

4,234,299

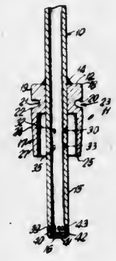
BLOW PIN CONSTRUCTION IN A PLASTIC BOTTLE BLOW MOLDING MACHINE

Ernest O. Kuenzig, Glen Head, and Frank L. Pennino, Farmingdale, both of N.Y., assignors to Forest Mechanical Products Corp., Kew Gardens, N.Y.

Filed Jun. 19, 1979, Ser. No. 49,914

Int. Cl.³ B29C *17/07, 17/10*

U.S. Cl. 425—292 **9 Claims**



1. A blow pin for use in a blow molding machine;

said blow molding machine forming plastic containers with integral handles by extruding a hot tubular plastic parison around a blow pipe, the blow pipe having a lower free end within a blow mold and the blow mold being closed to form the plastic container from the parison and opened to remove the formed container, the blow pipe at selected times carrying compressed air to expand the parison into the closed blow mold, the blow pin being secured to the blow pipe near the lower free end of said blow pipe and said blow pin being moved to shear the parison after the blow mold is closed;

said blow pin being a right cylindrical member centered on an imaginary axis and having an external wall seal portion which cooperates with a portion of the blow mold to form a seal when the mold is closed, and a tubular portion having a tapered external wall shear portion with a cutting edge which cooperates with a portion of the blow mold to sever the formed parison upon shearing movement of the blow pin; said tubular portion forming a skirt having a bottom edge and spaced from said blow pipe;

characterized in that said blow pin includes a tube means which descends below said skirt bottom edge; said tube means being connected to said blow pipe so that it expels compressed air to cool the blow pin and to expand said parison; a portion of said tube means being positioned within said skirt and having a plurality of orifices to expel air directed at said skirt; said tube means having a plurality of guide orifice means below said skirt portion and adjacent said integral handles to properly form the integral handles, each of said guide orifice means being directed upwardly in the range of 25° to 45° and having their orifice means centers positioned in the range of between 2.0 and 3.5 inches from said shear portion cutting edge.

4,234,300

EDGE EMBOSSING DEVICE

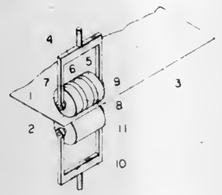
Kikuo Yamagisi; Hiroshi Okuyama, and Hideo Kawaguchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 28, 1978, Ser. No. 964,404

Claims priority, application Japan, Nov. 28, 1977, 52/142470

Int. Cl.³ B29C *15/00*

U.S. Cl. 425—363 **5 Claims**



1. In an embossing device for deforming a lateral edge of a molded thermo-plastic sheet by mechanical means, the improvement comprising, first and second embossing rollers disposed in an opposed relationship on opposite sides of said sheet, said rollers having solid cylindrical outer walls having an exterior embossing pattern thereon composed of a plurality of small, raised surface projections, and at least one of said rollers having at least one intermediate circumferential stripe of a relatively smooth surface devoid of said raised projections, said rollers having a width equal to the width of the lateral edge portion of the sheet being embossed.

4,234,301

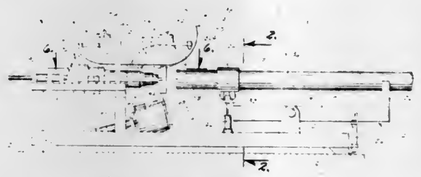
GASKET FEEDING APPARATUS FOR AN INPLACE GASKET BELLING MACHINE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906-10th Ave., Lewiston, Id. 83501

Division of Ser. No. 902,443, May 3, 1978. This application Mar. 19, 1979, Ser. No. 21,584

Int. Cl.³ B29C *17/00*; B23Q *7/10*

U.S. Cl. 425—392 **6 Claims**



1. In an inplace gasket belling machine, an apparatus for automatically placing annular gaskets onto an elongated belling mandrel comprising,

a gasket magazine including a plurality of gasket receiving compartments,

means for supporting said gasket magazine on the machine adjacent said mandrel,

said gasket magazine having an opening adapted for registration with a compartment for dispensing a gasket from said compartment through said opening,

means for advancing said compartments within said magazine for sequentially registering each compartment with said opening,

a gasket holding device positioned for receiving a gasket dispensed from said magazine,

said gasket holding device having an aperture therethrough adapted for registration with an annular gasket held therein, and

support means for supporting said device on the machine with said aperture in longitudinal alignment with the mandrel for receiving the mandrel through said aperture and annular gasket.

4,234,302

APPARATUS FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

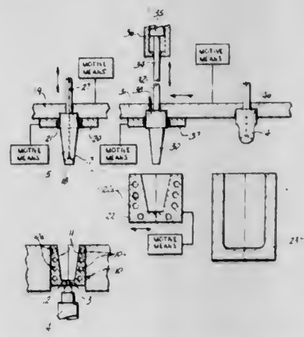
Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 911,339, Jun. 1, 1978, which is a continuation-in-part of Ser. No. 641,638, Dec. 17, 1975, Pat. No. 4,115,494, which is a division of Ser. No. 479,287, Jun. 14, 1974, Pat. No. 3,970,419, which is a continuation-in-part of Ser. No. 473,580, May 28, 1974, Pat. No. 3,966,378. This application Jan. 24, 1979, Ser. No. 5,962

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

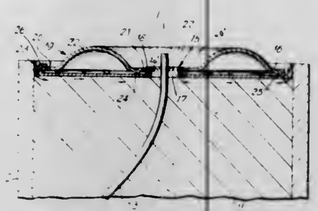
Int. Cl.³ B29C *17/07*

U.S. Cl. 425—526 **6 Claims**



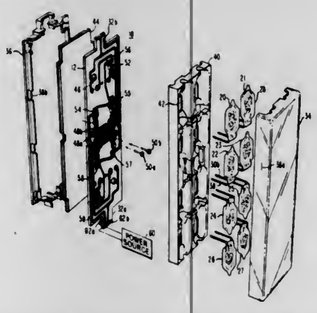
1. A blow molding apparatus for forming a plurality of oriented, blown, hollow plastic articles of moldable plastic material which comprises: a plurality of first molds for tempering a plurality of parisons in spaced relationship to each other and having a first center spacing; a plurality of first cores engageable with said first molds and being in fixed, spaced relationship to each other corresponding to said first center spacing; a plurality of blow molds in spaced relationship to said first molds for forming said tempered parisons into oriented, blown, hollow plastic articles, said blow molds being in spaced relationship to each other and having a second center spacing greater than said first center spacing; a plurality of second cores in spaced relationship to said first cores and to each other corresponding to said first center spacing, said second cores being spaced from and engageable with said first molds; means operatively associated with said second cores for moving said second cores away from and towards each other to change the center spacing thereof from said first center spacing to said second center spacing so that said second cores are aligned with said first molds for engagement therewith and are aligned with said blow molds for engagement therewith; means including said plurality of first cores for providing a parison in each of said first molds; means operatively associated with said second cores for placing said second cores in said first molds and in said parisons; means operatively associated with said second cores for removing said second cores with parisons contained thereon from said first molds at the end of the tempering cycle prior to orienting and blowing; and means operatively associated with said second cores for placing said second cores with parisons thereon in said blow molds.

4,234,303
COMBUSTION APPARATUS
Fernando M. Neugart, 32-21 37th St., Astoria, N.Y. 11103
Filed Oct. 10, 1978, Ser. No. 949,662
Int. Cl.³ F23D 1/16
U.S. Cl. 431—293 6 Claims



1 A combustion apparatus for use with a low temperature meltable solid fuel, such as paraffin, comprising, in combination, a bottom, generally planar conductor plate formed of metal and having a high thermal conductivity factor, said plate including a central bore extending transversely therethrough and defining a wick receiver aperture, a cover plate member substantially congruent to said conductor plate and secured thereto in overlying relation to the upper surface of said conductor plate, said cover plate including a central portion defining an aperture in registry with and disposed adjacent the aperture in said conductor plate, an outer peripheral portion in registry with and disposed adjacent the periphery of said conductor plate, and a central portion spaced from said conductor plate, said conductor plate and said cover plate defining therebetween a substantially continuous, radially directed flow passage for molten fuel heated adjacent said central aperture, whereby an annular convective flow path for heated fuel is created between said plates to augment the heating of said bottom plate, with consequent improved heat transfer to the fuel below said bottom plate.

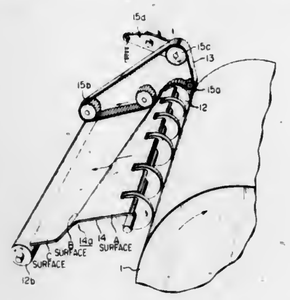
4,234,304
CIRCUIT BOARD HAVING CONDUCTOR RUNS RESISTANT TO FORMATION OF NON-CONDUCTIVE LOCALIZED AREAS AND METHOD
Herman R. Heytmeijer, Hanover Township, Morris County, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 11, 1978, Ser. No. 923,596
Int. Cl.³ F21K 5/02; G03B 15/02; H01B 1/20
U.S. Cl. 431—359 17 Claims



1. In combination with a circuit board comprising a non-conductive substrate having electrical circuitry affixed thereto, the improvement which comprises:

electrical conductor runs forming a part of said electrical circuitry adhered to and carried on said substrate, said conductor runs comprising small vitreous bead-like particles having a thin silver coating carried thereon with the surface of said silver-coated bead-like particles comprising a triazole-silver water-insoluble reaction product, said bead-like particles adhered to said substrate by a matrix of organic polymer binder, and the relative proportion of said bead-like particles to said polymer binder being such that adjacently positioned bead-like particles are in electrically conductive relationship with one another to provide a resistivity of less than about 0.03 ohm-cm for said runs, whereby said triazole reacted surface of said bead-like particles substantially inhibits the formation of non-conductive localized areas in said conductor runs.

4,234,305
TRANSFER SHEET GUIDING DEVICE
Hiroyuki Miyake, Inagi; Kazumi Umezawa, Kawasaki; Hiroshi Ogawa, Yokohama; Hitotoshi Kishi, Tokyo; Seiji Sagara, Kawasaki, and Hiroshi Hara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,780
Claims priority, application Japan, Nov. 24, 1977, 52/141003; Dec. 1, 1977, 52/144310; Feb. 15, 1978, 53/15374
Int. Cl.³ F27B 9/28; B65H 29/16, 29/56
U.S. Cl. 432—59 10 Claims



1. A transfer sheet guiding device for guiding a transfer sheet along a predetermined path, comprising:

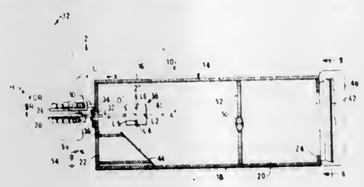
a separating member for separating one lateral side of a transfer sheet from an image carrying member;

a rotary body, located adjacent said one lateral side, for gripping the separated side of the transfer sheet and guiding the same in a direction away from the image carrying member;

a guide member provided downstream of said rotary body and having a stepped portion which extends across the transport path of said transfer sheet in such a manner that the position of said stepped portion is progressively disposed further downstream in the advancing direction of the transfer sheet from the side where said rotary body is provided to the opposite side; and

a rotary member which extends along said rotary body and said guide member adjacent said one lateral side for gripping the separated side of the transfer sheet and guiding it at least along said stepped portion in cooperation with said rotary body and guide member.

4,234,306
METHOD AND APPARATUS FOR SENSING JAW POSITION AND MOVEMENTS AND UTILIZING SENSED DATA
James H. Hamada, Los Altos; Jeffrey R. Bender; Earl T. Price, both of San Jose, all of Calif., and Dennis A. Ingebretsen, Oakton, Va., assignors to HBTI, San Jose, Calif.
Filed Jul. 18, 1979, Ser. No. 58,689
Int. Cl.³ A61C 11/02
U.S. Cl. 433—55 21 Claims



1. Dental apparatus for use in obtaining jaw movement information comprising,

relatively movable indicia-bearing and light responsive means,

image-forming means for providing images of indicia at said indicia-bearing means on said light responsive means, and

means for attaching said indicia-bearing and light responsive means to a patient's jaws to provide jaw position data at said light responsive means upon relative movement of the patient's jaws and attached indicia-bearing and light responsive means.

4,234,307
OCCLUSAL PLANE ORIENTATION GUIDE
Frederick E. Draheim, 4781 Surfwood Dr., Milford, Mich. 48042
Filed Feb. 8, 1979, Ser. No. 10,446
Int. Cl.³ A61C 19/04
U.S. Cl. 433—73 2 Claims

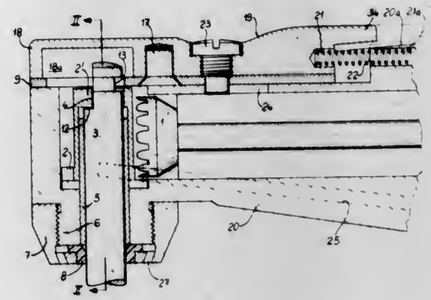


1. A guide for use in orienting the occlusal plane of a denture set to the cranial anatomy of a patient comprising:

a thin planar plate having a central curved bite piece and a pair of laterally and distally extending wings projecting in opposed directions from the proximal end of the bite piece and adapted to extend in the occlusal plane over the opposed cheeks of the patient when the bite piece is engaged by the opposed denture sections;

and a pair of guide wire extensions, each extension having one end section slidably supported within an aperture in the wing formed laterally to the plane of the plane and an opposite end section projecting parallel to the wings of the plates whereby the parallel end sections of the extensions may be aligned with the ala-tragus line or the patient by sliding and rotation of the first end sections in their supporting wing apertures to allow proper orientation of the occlusal plane with respect thereto.

4,234,308
DEVICE FOR LOCKING A TOOL IN A DENTAL HANDPIECE
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France
Filed Apr. 20, 1978, Ser. No. 898,022
Claims priority, application France, Jun. 7, 1977, 77 17974
Int. Cl.³ A61C 1/14
U.S. Cl. 433—127 1 Claim



1. A dental handpiece of contra-angle type comprising a housing including a head for receiving a tool having a shank with a groove near the end of the shank, means in said housing for driving said tool, said housing having in its upper portion an opening through which said grooved shank end of a tool extends, and longitudinally extending grooves on opposite sides of said opening,

means for locking a tool in said handpiece comprising an elongate flat locking plate slidable lengthwise in said longitudinally extending grooves of said housing and having in a forward end portion a key-hole opening having a forward portion of a size to receive the shank of a tool and an elongate rearward portion engageable in said groove in the shank of a tool to retain the tool in said handpiece,

an elongate control member overlying and fixed to said locking plate, said control member having in a forward end portion a downwardly opening recess overlying said opening of said locking plate, and a rear end portion which is thicker than said forward end portion, and has an upper surface between said forward end portion and rear end portion which is inclined rearwardly and upwardly,

said housing having an upward projection rearwardly of said control member, and said upward projection of the housing and the rear end of said control member having aligned longitudinally extending bores, a compression spring received in said bores and acting between said control member and said upward projection of the housing to urge said control member and locking plate forwardly to bring said elongate portion of said opening in the locking plate into engagement with said groove of the shank of a tool received in said head to retain said tool, and means for limiting longitudinal movement of said locking plate and control member relative to said housing,

said locking plate being moveable rearwardly against the action of said spring to release a tool by digital pressure on said upwardly and rearwardly inclined surface of said control member,

said control member having a rearwardly extending tail portion which overlies and thereby covers said spring and, in a rearward position of said control member, overlies said upward projection of the housing, and

said means for limiting longitudinal movement of said locking plate and control member comprising a screw extending through a threaded hole in a mid-portion of said control member and having an inner end portion extending

into an elongate recess of limited length in the upper surface of said housing,

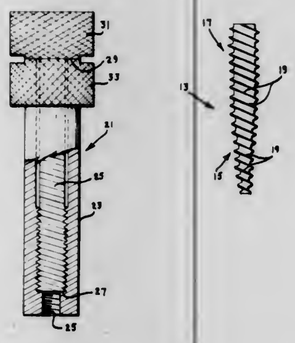
whereby said locking plate, control member and spring are assembled on said housing by sliding said locking plate in said grooves, positioning said spring in said bores, moving said locking plate and control member rearwardly to compress said spring, and screwing said screw inwardly to engage its inner end in said recess of the housing, whereupon said screw serves the dual function of limiting longitudinal movement of said locking plate and of retaining said locking plate, control member and spring assembled with said housing.

4,234,309

DENTAL TWIST LOCK PIN AND WRENCH

Wm. Ralph Sellers, 35B Codd Blvd., Langley AFB, Va. 23665

Filed Jun. 22, 1979, Ser. No. 51,316
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—225 **2 Claims**



1. In combination, a twist-lock pin for insertion into a tapered hole drilled into sound tooth structure and a wrench for holding the pin during insertion, said twist-lock pin having a left-hand thread on the outer surface thereof, said twist-lock pin having a tapered lower portion for engagement with the drilled tooth and a straight threaded upper portion for threadable engagement with the wrench; and said wrench comprising a wrench body of substantially cylindrical configuration with a left-hand threaded opening in the lowermost end thereof, the upper portion of said twist-lock pin being in threadable engagement with the left-hand threaded opening in said wrench body, the lower portion of the inner surface of said wrench body having right-hand threads thereon, a limiting screw having right-hand threads on the outer surface of the lower portion thereof for engagement with the right-hand threads in the lower portion of said wrench body, means for limiting the travel of said limiting screw in said wrench body so that the lowermost surface of said limiting screw is in direct contact with the uppermost surface of said twist-lock pin thereby allowing positive control over said twist-lock pin during insertion into the drilled hole in the tooth and easy separation of the wrench from the pin without loosening the pin from its position in the tooth.

4,234,310

POROUS CERAMIC DENTAL FILLING INSERT

Paul E. Leuthard, Bahnhofstrasse 26, Zürich, Switzerland

Filed Feb. 14, 1978, Ser. No. 877,654
Claims priority, application Switzerland, Feb. 25, 1977, 2437/77
Int. Cl.³ A61K *5/01*
U.S. Cl. 433—228 **7 Claims**



1. In a dental filling including a conventional plastic filling material adapted to be located in a cavity drilled in a tooth, the improvement comprising:

a preformed, abrasive resistant, porous ceramic insert embedded in the conventional plastic filling material,

said insert having an outer shape different from and unrelated to the shape of the cavity,

said insert having an exposed surface adapted to be aligned with the surface of the tooth to improve resistance of the dental filling to abrasion,

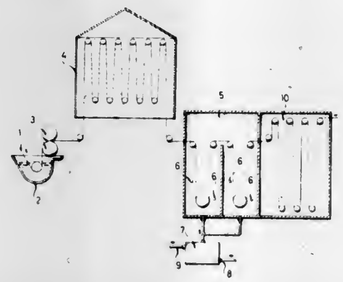
said insert being impregnated with a plastic material which forms a firm bond with the plastic filling material.

4,234,311

PROCESSES FOR REMOVING IMPURITIES FROM TEXTILE MATERIALS

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 861,532, Dec. 19, 1977, abandoned. This application Jun. 27, 1979, Ser. No. 52,349
Int. Cl.³ D01C *3/02*; D06L *1/06*; B08B *3/08*
U.S. Cl. 8—138 **25 Claims**



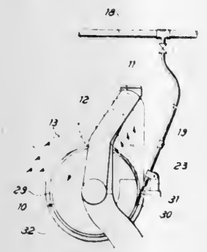
1. A process for removing polymeric impurities from textile material comprising applying to said material an aqueous solution in which said impurities are soluble or degradable; exposing said material to saturated steam after the application of the aqueous solution for a period of between 10 seconds and 10 minutes while avoiding the depositing of said material in folds; and subsequently physically displacing said aqueous solution together with said impurities from said material by spraying into said material an organic solvent having a specific gravity greater than that of water and being immiscible with water.

4,234,312

PROCESS AND DEVICE FOR THE CONTINUOUS SPINNING OF VISCOSE RAYON

Ugo Paoletti, Monza, and Alessandro Volterra, Milan, both of Italy, assignors to Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Oct. 12, 1978, Ser. No. 950,611
Claims priority, application Italy, Oct. 25, 1977, 28923 A/77
Int. Cl.³ D06B *1/00*
U.S. Cl. 8—151.2 **8 Claims**



1. In a process for the continuous spinning of viscose rayon yarns, wherein each of a plurality of yarns is caused to travel as coils in a substantially helicoidal path, partly over a treatment roller and a respective advancing roller, while being subjected to a plurality of liquid treatment operations followed by a drying treatment, the improvement of eliminating a portion of the liquid carried by said yarns from said liquid treatment operation before passage to said drying treatment, said improvement comprising:

directing a blade-shaped jet of air having a maximum dimension extending in a direction parallel to the axis of said treatment roller against at least one coil of each of said yarns, at a position thereof in contact with said treatment roller, and against said treatment roller, said jet of air being directed in a direction substantially tangential to said treatment roller and to said substantially helicoidal paths of said yarns at said position, and said jet of air contacting said yarn coils and said treatment roller at a location immediately preceding said drying treatment.

4,234,313

DEVICE AND METHOD FOR QUANTITATIVE URIC ACID TESTING

Douglas E. Faulkner, Bexleyheath, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 630,814, Nov. 11, 1975, abandoned. This application Jun. 5, 1978, Ser. No. 912,349
Claims priority, application United Kingdom, Nov. 11, 1974, 48714/74; Nov. 11, 1974, 48715/74
Int. Cl.³ G01N *33/52, 21/78, 31/22*
U.S. Cl. 23—230 B **21 Claims**

1. A quantitative uric acid testing device comprising:

(a) a solid, physically and chemically inert, support in the form of a strip;

(b) a coloured indicator means for comparing the concentration of uric acid in an aqueous test sample with a preselected concentration limit of uric acid within the range of 5 to 9 mg/100 ml sample, said means being capable of being reduced into a colourless form and being provided on said support in an amount adjusted so as to be equivalent to said preselcted concentration limit so that when said support is saturated with the test sample, said indicator completely loses its colour if the uric acid concentration in said sample is equal to or higher than said preselected concentration limit of uric acid, the colour loss being in consequence of other than a change in pH; and

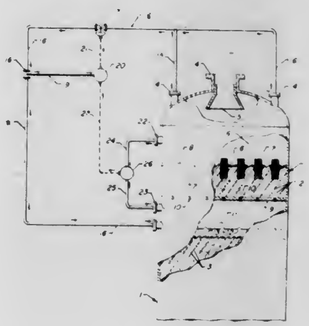
(c) protective means for preventing particles suspended in said test sample coming into contact with said support and said indicator.

4,234,314

GUARD-BED VAPOR BYPASS TO OVERCOME PRESSURE DROP IN MIXED-PHASE REACTIONS

Evan A. Jones, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 25, 1978, Ser. No. 945,767
Int. Cl.³ G01N *7/00*; G01D *7/00, 16/00*
U.S. Cl. 23—230 A **4 Claims**



1. In a catalytic hydrocarbon conversion process in which (1) a mixed-phase hydrocarbon reactant stream initially contacts a guard bed of particulate matter disposed above and spaced from one or more beds of catalyst particles in a reaction zone, the guard bed and the one or more beds of catalyst being disposed in vessel means, and, (2) the pressure drop across the

guard bed increases during the processing period, the method of reducing the overall reaction zone pressure drop which comprises the sequential steps of:

(a) introducing said mixed-phase hydrocarbon reactant stream into the upper portion of said reaction zone above said guard-bed and distributing the reactant stream across the upper surface of the particulate matter therein;

(b) sensing the pressure differential across said guard-bed, comparing the sensed pressure differential with the pressure differential designated and predetermined by an adjustable set point of a differential pressure controller and developing a signal representative of the resulting comparison;

(c) withdrawing a vaporous reactant stream from the upper portion of said reaction zone above said guard bed and external to said vessel means and regulating the quantity thereof in response to said signal, and,

(d) reintroducing the withdrawn vaporous reactant stream into the space within said reaction zone between said guard-bed and the catalyst bed below the guard-bed.

4,234,315

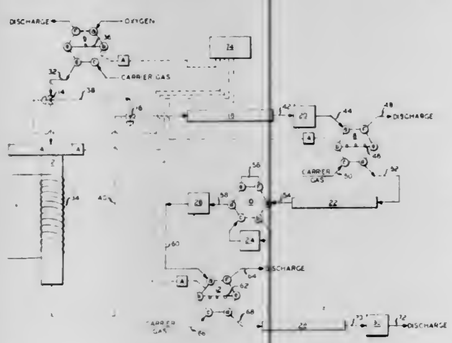
GAS CHROMATOGRAPHIC ANALYSIS METHOD AND APPARATUS

Richard L. Scott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 779,411, Mar. 18, 1977, abandoned, and Ser. No. 735,359, Oct. 26, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,231.

Int. Cl.³ G01N *31/08, 31/12*

U.S. Cl. 23—230 PC **116 Claims**



70. A method for determining at least the elemental carbon, hydrogen and nitrogen content of a sample which comprises in combination, the steps of:

a. introducing an oxygen source into a closed, heated combustion chamber,

b. introducing a measured sample into said chamber,

c. oxidatively decomposing said sample whereby the resulting reaction product mixture contains as its principal components a carbon dioxide group, a water group and a nitrogen group,

d. retaining said reaction product mixture in said chamber until combustion of the sample is substantially complete,

e. sweeping substantially all of the reaction product mixture from said chamber with a first inert carrier gas at a predetermined flow rate,

f. passing said reaction product mixture and said inert gas through a first gas chromatographic column whereby said mixture is separated into said carbon dioxide group, said nitrogen group and said water group, said carbon dioxide group and said nitrogen group being eluted substantially simultaneously and prior to said water group,

g. passing the water group effluent eluting from said first column through a first detecting means to detect the quantity of water in said water group,

h. passing the carbon dioxide group and the nitrogen group effluent eluting from said first detecting means to a second gas chromatographic column,

i. introducing a second carrier gas at a predetermined flow rate to the inlet of said second column thereby passing said carbon dioxide group and said nitrogen group through said second column whereby said nitrogen group and said carbon dioxide group are further separated,

j. venting said water group eluting from said first detecting means,

k. passing the effluent from said second chromatographic column through a second detecting means to detect the quantities of carbon dioxide in said carbon dioxide group and nitrogen in said nitrogen group, and

l. separately determining from the quantity of said water, said carbon dioxide and said nitrogen the quantities of elemental hydrogen, carbon and nitrogen of said sample.

4,234,316

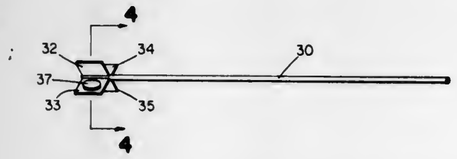
DEVICE FOR DELIVERING MEASURED QUANTITIES OF REAGENTS INTO ASSAY MEDIUM

Richard C. Hevey, Rockport, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 2, 1979, Ser. No. 25,997

Int. Cl.³ G01N *33/50*

U.S. Cl. 23—230 R **11 Claims**



1. A device for precise quantitative introduction of a plurality of reagents into a liquid aqueous assay medium; said device comprising a water-impervious solid support member which is chemically inert to the reagents and to the material to be assayed,

secured to one or more faces of said support member two or more discrete and separate elements consisting essentially of carrier solid organic binder which is soluble or dispersible in water, and dispersed in said solid binder a measured quantity of water-soluble or dispersible reagent, the reagent in each said element being reactive with at least one reagent in another element or with at least one constituent in said assay medium,

said support member being a stiff elongated member having one portion constructed and arranged as a handle for said device, and having said discrete elements secured to portions thereof removed from said handle, said handle facilitating contact of said discrete elements with liquid assay medium to permit each said reagent and binder to dissolve completely and be mixed in said medium.

4,234,317

APPARATUS AND METHOD FOR FRACTIONATION OF LIPOPROTEINS

Flordeliza F. Lucas, Daly City, and Ronald B. Smernoff, Belmont, both of Calif., assignors to Analytical Products, Inc., Belmont, Calif.

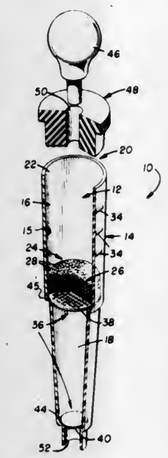
Filed May 24, 1979, Ser. No. 42,011

Int. Cl.³ G01N *31/00*

U.S. Cl. 23—230 B **16 Claims**

11. A method of fractionating a plasma or serum blood sample comprising:

adding said sample having a low density lipoprotein content and a high density lipoprotein cholesterol content to a first chamber within a column, said first chamber having a plurality of inert members having a large surface area coated with a substantially dry reagent aliquot, said sample being within a predetermined volumetric range sufficiently small for said reagent aliquot to substantially completely flocculate said low density cholesterol and to form a reacted plasma sample including a flocculant having



substantially all of the low density lipoprotein cholesterol and a supernatant of substantially unchanged high density lipoprotein cholesterol concentration and being substantially low density lipoprotein cholesterol depleted;

transferring said reacted plasma sample from said first chamber to a second chamber, said second chamber having flocculant separating means therein; and

collecting said supernatant which has been separated from said flocculant from said second chamber.

4,234,318

PROCESS FOR GRANULATION OF SULFUR

John T. Higgins, Trail, and Gordon C. Hildred, Calgary, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Feb. 6, 1978, Ser. No. 875,369

Claims priority, application United Kingdom, Feb. 4, 1977, 04566/77

Int. Cl.³ B01J *2/12, 2/16;* B05D *1/02*

U.S. Cl. 23—293 S **4 Claims**

1. A process for producing granular sulfur which comprises the steps of forming and maintaining in a rotating horizontally elongated granulating vessel a bed of continuously moving solid particles of sulfur by adding finely divided solid particles of sulfur to said bed, advancing said particles through said granulating vessel, spraying molten sulfur at a spray pressure in the range of about 100 to 400 kPa and at a temperature 10° to 40° Celcius degrees above the sulfur melting temperature onto said bed and into a continuously cascading curtain of solid particles extending substantially the length of said granulating vessel, simultaneously contacting the continuously cascading curtain of particles with a current of substantially inert cooling gas flowing countercurrently to the direction of the advance of said particles, passing said particles from said granulating vessel to a rotating horizontally elongated cooling vessel, advancing said particles through said cooling vessel, forming a bed of continuously moving solid particles of sulfur and a continuously cascading curtain of solid particles in and extending substantially the length of said cooling vessel, simultaneously contacting the advancing particles in said cooling vessel with a current of substantially inert cooling gas flowing countercurrently to the direction of advance of said particles, withdrawing cooled solid particles from said cooling vessel, separating cooled solid particles within a predetermined size range from said withdrawn cooled solid particles as product granules, recycling cooled solid particles smaller than those within said predetermined size range as finely divided solid particles of sulfur to said granulating zone at ratios in the range of from 4:1 to 2:1 of finely divided particles to product granules, said withdrawing, separating and recycling being carried out in the presence of substantially inert cooling gas, said substantially inert cooling gas containing not more than 8% by volume of oxygen and being circulated by an integrated and closed gas system comprising said granulating vessel, said cooling vessel and a gas cooler, cooling said cooling gas in said gas cooler to a temperature in the range of about 10° to 50° C., introducing said cooled cooling gas into said cooling vessel, passing said cooling gas through said coolng vessel, cooling a portion of said cooling gas from said cooling vessel to a temperature in the range of about 10° to 50° C., passing said cooled portion of said cooling gas through said granulating vessel, combining the remaining portion of cooling gas from said cooling vessel with cooling gas passed through said granulating vessel and passing said combined cooling gas to said gas cooler.

4,234,319

PROCESS FOR CHANGING CAKING COALS TO NONCAKING COALS

Justin L. Beeson, Woodridge, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 25, 1979, Ser. No. 33,076

Int. Cl.³ C10L *9/02, 9/06*

U.S. Cl. 44—1 R **3 Claims**

1. A method of rendering caking coals noncaking by treating with a water slurry of an alkaline earth metal hydroxide, consisting of:

forming an aqueous slurry mixture of coal and alkaline earth metal hydroxide at about 1 atmosphere pressure in air with the alkaline earth metal hydroxide being about 1-10 weight percent of the amount of coal included therein;

maintaining said slurry mixture in contact with air at about 1 atmosphere pressure and at a temperature near to its boiling point for about 1 hour;

removing the water from said slurry mixture by mechanical dewatering followed by heating to dryness in contact with air at about 1 atmosphere pressure and at about the slurry boiling temperature whereby slurry solids remain; and

heating the slurry solids to a temperature of about 300° F. in contact with air at about 1 atmosphere pressure for about 1-2 hours to form a dry noncaking carbonaceous material.

4,234,320

PROCESS FOR THE AGGLOMERATION OF SOLIDS

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1979, Ser. No. 32,063

Int. Cl.³ C10L *5/14, 5/16;* C22B *1/14*

U.S. Cl. 44—23 **10 Claims**

1. A process for the agglomeration of finely divided solids in an aqueous suspension, said solids being selected from the group consisting of ores and coal, comprising:

passing the suspension through a first zone where it is subjected to turbulence in the presence of a hydrocarbon binder having a softening point between 30° C. and 120° C. which causes loose agglomerates to be formed;

substantially separating the agglomerates from the water; and,

passing the agglomerates to a second zone containing hot water and subjecting the agglomerates to turbulence in the presence of a hydrocarbon binder having a softening point between 30° C. and 120° C.

4,234,321

FUEL COMPOSITIONS CONTAINING DEPOSIT CONTROL ADDITIVES

Jennifer E. Lilburn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 8, 1978, Ser. No. 931,233
Int. Cl.³ C10L 1/22
U.S. Cl. 44—72 **23 Claims**

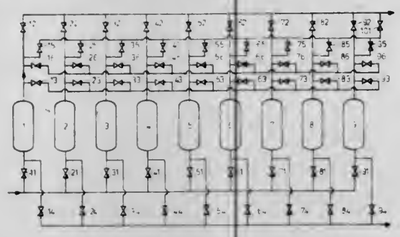
1. A fuel compostion comprising a major amount of hydrocarbons boiling in the gasoline range, and from 30 to 2,000 ppm of a hydrocarbylpoly(oxyalkylene) ureylene carbamate of molecular weight from about 600 to 10,000; wherein said hydrocarbylpoly(oxyalkylene) moiety is composed of oxyalkylene units selected from 2 to 5 carbon oxyalkylene units of which at least a sufficient number are branched chain oxyalkylene units to render said carbamate soluble in said fuel composition, and said hydrocarbyl group contains from 1 to 30 carbon atoms.

4,234,322

PRESSURE SWING ADSORPTION PROCESS

Herman De Meyer, Ekeren; Roland Doclo, Schilde-'s Gravenwezel, and Jan Seynaeve, Brasschaat, all of Belgium, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,662
Claims priority, application Fed. Rep. of Germany, May 27, 1978, 2823211
Int. Cl.³ B01D 53/04
U.S. Cl. 55—18 **6 Claims**



1. In an adiabatic pressure swing adsorption process for separation of gas mixtures by adsorbing at least one gas component in each of at least eight phase staggered operated adsorbent beds;

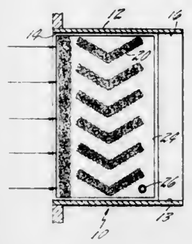
wherein each of the adsorbent beds is cyclically operated in subsequent operation steps including adsorption, at least two depressurization steps, countercurrent purging, and at least two; repressurization steps; depressurization and repressurization being established by pressure equalization with another adsorbent bed being operated in the operation step repressurization depressurization respectively of adjacent pressure range by means of a number of connecting tubes and valves opening from said adsorbent beds to said connecting tubes; the valves being switched according to a predetermined first valve operation pattern; switching of valves being initiated when a first characteristic physical quantity has reached a predetermined value; the improvement comprising periodically compairing measured actual values with predetermined corresponding nominal values of a second physical quantity characteristic for each operation step; in the case of deviations of the actual values from the nominal values, identifying any valve being potentially defective and therefore potentially responsible for said deviations in any of subsequent operation steps after the first occurence of deviation; identifying the actual defective valve as being the sole valve being identified as potentially defective in any of a sufficient number of operation steps to exclude other valves being also identified as potentially defective in said operation step of first occurance of a deviation; excluding the adsorption bed to which the defective valve belongs from operation by continuing operation of the remaining adsorption beds according to a second valve operation pattern predefined for a such reduced number of adsorption beds.

4,234,323

COLLECTOR FOR WATER SEPARATOR

John F. Maher, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 564,405, Apr. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 475,324, May 31, 1974, abandoned. This application Sep. 29, 1978, Ser. No. 947,213
Int. Cl.³ B01D 45/16
U.S. Cl. 55—97 **4 Claims**



1. The method of removing water from the airstream entering a jet type power plant powering marine vessels so as to remove the corrosive elements in the airstream where the airstream flows at substantially 20 feet per second comprising the steps of:

mounting a plurality of vane-like elements formed from a low porosity material disposed at a predetermined angular relationship to the stream ahead of the inlet of the engine, and each vane-like element spaced relative to each other to form open ended passages where the material of said vane-like element is formed from an array of nonabsorbent fibers prematted into a preformed vane-like element having a thickness between ¼ to 1 inch;

passing the air through said low porosity material such that more than 10% of said air by volume passes through said material and the remaining air passes through said passages at a pressure drop not exceeding substantially 1.0 inch of water; and

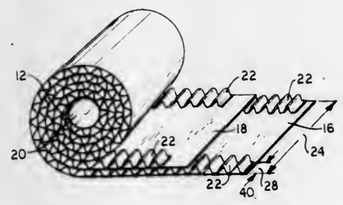
collecting by gravity the water entrained in said material.

4,234,324

ELECTROSTATIC FILTER

Cleveland E. Dodge, Jr., Quarry Hill Farm, Pownal, Vt. 05261

Filed Dec. 4, 1978, Ser. No. 965,847
Int. Cl.³ B03C 3/45
U.S. Cl. 55—156 **1 Claim**



1. A filter, comprising:

(a) a first planar electrode made of a very thin sheet of resinous material with a much thinner layer of conductor deposited thereon and having a length much longer than its width and having planar surfaces and positioned, curvedly configured and dimensioned in such a manner that portions of a planar surface of said first planar electrode face other portions of its planar surfaces;

(b) a second planar electrode made of a very thin sheet of resinous material with a much thinner layer of conductor deposited thereon and having a length much longer than its width and having planar surfaces positioned, curvedly configured and dimensioned to be supported between said facing portions of said planar surfaces of said first planar electrode with portions of its planar surfaces in facing relationship to facing portions of said first planar electrode to define a plurality of paths parallel to the width of said first and second planar electrodes; and

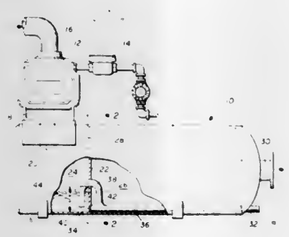
(c) spacer means secured to said first planar electrode to make portions of said first planar electrode substantially rigid with respect to other portions of said first planar electrode and for substantially rigidly securing points on said second planar electrode to said first planar electrode said spacer means comprising a pair of resilient insulative ribbons having a width much less than the width of said planar electrodes which have been corrugated and which are adhered to said first and second planar electrodes.

4,234,325

SILENCER-SEPARATOR WITH INTERNAL TRAP FOR LIQUID SEAL BLOWERS OR THE LIKE

Wayne E. Rea, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 19, 1979, Ser. No. 21,389
Int. Cl.³ B01D 19/00
U.S. Cl. 55—185 **2 Claims**



1. An improved silencer-separator for liquid-sealed gas blowers or the like including a discharge and being provided with water injection means, said silencer-separator including:

a hollow tank having an inlet in communication with the blower discharge, a gas outlet and a liquid drain near the lowermost portion of the tank;

a partition between said inlet and outlet dividing said tank into a first chamber including the inlet and a second chamber including the outlet and the drain;

a gas passageway in said partition located above the anticipated water level in the tank;

an overflow conduit extending through said partition and having an entry end located in the first chamber adjacent the lower portion of the tank and below the water level when the blower is operating and having an outlet end, connected with said liquid drain; and,

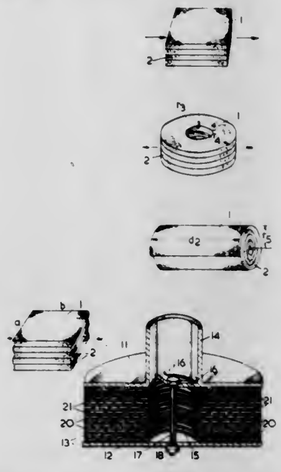
wherein said overflow conduit extends through said partition at a height measured from the lowermost portion of the entry end of the overflow conduit that is greater than the anticipated maximum pressure differential expressed in inches of water between said first chamber and atmospheric pressure.

4,234,326

FILTER ASSEMBLIES WITH LAYERS OF ACTIVATED CARBON FIBROUS CLOTH

Alan Bailey, and Frederick A. P. Maggs, both of Salisbury, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 539,105, Jan. 7, 1975, abandoned, which is a continuation of Ser. No. 376,159, Jul. 3, 1973, abandoned. This application Jul. 26, 1978, Ser. No. 928,145
Claims priority, application United Kingdom, Jul. 5, 1972, 31475/72
Int. Cl.² B01D 46/60, 39/04
U.S. Cl. 55—278 **8 Claims**



1. A gas adsorption filter comprising

(a) a gas inlet,

(b) a gas outlet, and

(c) a plurality of layers of charcoal cloth composed of activated fibrous carbon, the layers of charcoal cloth being arranged to lie in and substantially parallel to the direction of gas flow between the gas inlet and the gas outlet and being separated from each other by layers of an air permeable material selected from the group consisting of glass fiber, wood fiber, and open celled foam.

4,234,327

COMPRESSED AIR SYSTEM HAVING AN AIR DRYER

Bill R. Wills, 4522-77th, Lubbock, Tex. 79424

Filed Jun. 4, 1979, Ser. No. 45,300
Int. Cl.³ B01D 46/42, 50/00
U.S. Cl. 55—310 **10 Claims**

1. In a compressed air system having

a. an air compressor, and

b. equipment using compressed air; wherein the improvement comprises an air drier including:

c. a vessel having

(i) a cylindrical shell with

(ii) two arcuate heads,

(iii) the cylindrical shell having a vertical axis,

d. the height of the vessel being about two and one half times the diameter,

e. a diametrical baffle in the vessel about two-thirds diameter from the top of the vessel,

f. said baffle extending over most of the cross sectional area of the vessel,

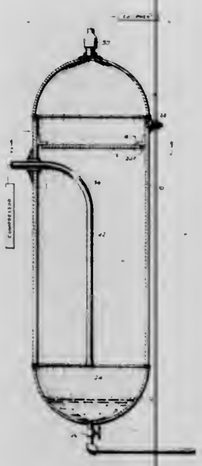
g. a pressure relief valve on the tank above the baffle,

h. an entry pipe entering the vessel below the baffle,

j. the air compressor connected to the entry pipe,

k. the entry pipe terminating with a restricted downward

pointing terminal to assist in the forming of droplets of liquid about one-half diameter from the bottom of the tank,



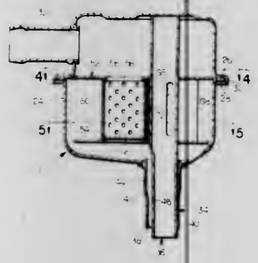
m. a manual drain valve on the bottom of the tank,
n. an outlet connected to the equipment using air, and
o. a filter in the outlet at the top of the tank.

4,234,328

OIL SEPARATOR DEVICE

Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Toledo, Ohio

Filed Mar. 12, 1979, Ser. No. 19,886
Int. Cl.[3] B01D *45/12*
U.S. Cl. 55—447 **13 Claims**



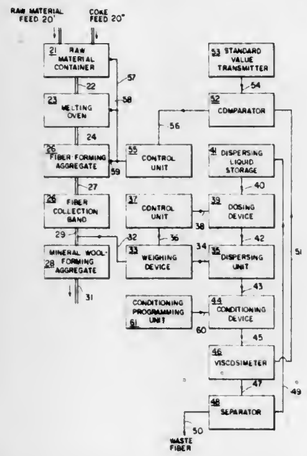
1. A device for separating oil from a stream of oil laden gaseous fumes, said device comprising: a cannister, upper and lower partition members inside said cannister dividing its interior into top, intermediate and bottom chambers, a oil laden fume stream inlet tubular member which extends from below the cannister bottom through all three chambers to the top of the cannister said stream inlet member has an elongated side aperture which opens into said intermediate chamber and extends from adjacent to the upper partition to adjacent to the lower partition, a vane means in said intermediate chamber for directing said stream towards the outer portions of the intermediate chamber away from the center to produce a vortex region in said center, an aperture in the upper partition above the vortex region, an elongated opening in the lower partition adjacent to the cannister sidewall, a tubular oil drain outlet from the bottom chamber and a tubular fume outlet from the top chamber.

4,234,329

METHOD FOR THE PRODUCTION OF MINERAL FIBERS WITH UNITARY FIBER LENGTH CHARACTERISTICS

Gunnar M. T. Söderqvist, and Ulf L. Aberg, both of Sköde, Sweden, assignors to Rockwool Aktiebolaget, Skövde, Sweden

Filed Mar. 1, 1979, Ser. No. 16,382
Claims priority, application Sweden, Mar. 2, 1978, 02388/78
Int. Cl.[3] C03B *37/04, 37/02*
U.S. Cl. 65—2 **31 Claims**



1. In a method of producing mineral fiber in which mineral fiber is produced from a melt under operating conditions which, if changed, cause a change in the length characteristics of fiber being produced, the improvement which comprises:
obtaining a sample of the mineral fiber being produced;
admixing the sample of mineral fiber and a dispersing liquid to form a dispersion of said fiber in the dispersing liquid;
determining the viscosity of said dispersion;
and adjusting at least one of said operating conditions in dependence upon the determined viscosity of said dispersion to cause a change in the length characteristics of the fibers being produced.

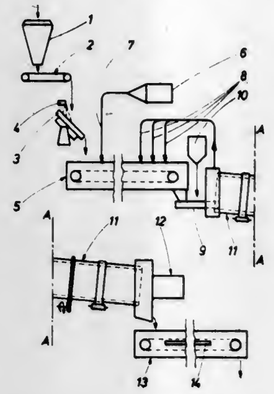
4,234,330

PROCESS OF MAKING CELLULATED GLASS BEADS

Pierre Taupin; Michel Glineur, and Jean Florean, all of Maubeuge, France, assignors to BFG Glassgroup, Paris, France

Continuation of Ser. No. 902,693, May 4, 1978, abandoned. This application Aug. 15, 1979, Ser. No. 66,852
Claims priority, application United Kingdom, May 19, 1977, 21153/77
Int. Cl.[3] C03B *19/10, 19/08*
U.S. Cl. 65—21 **27 Claims**

1. A process of making cellulated glass beads of fully cellulated structure by forming a mixture comprising glass particles and cellulating agent into nodules, heat treating the nodules to cause fusion of glass and evolution of gas from the cellulating agent to form cellulated glass beads, and cooling the cellulated glass beads to a rigid condition, the improvement which comprises the steps of utilizing as the cellulating agent an agent having the characteristic of creating expansion forces due to the evolution of gas during heat treatment which are generated wholly or mainly while the glass viscosity is within the range $10^{6.5}$ to $10^{8.5}$ poises, and carrying out the heat treatment with a quantity of cellulating agent at a maximum cellulation temperature which is not above the temperature corresponding with a glass viscosity of $10^{5.5}$ poises and for a time such that the beads immediately following the heat treatment are populated with cells throughout the volume thereof including the exterior surface thereof, and after cooling have a bulk density of not more than 0.5 g/cm^3 and a water-permeability of



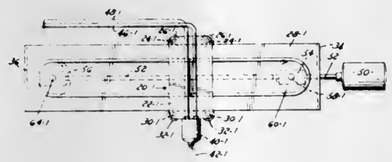
less than 15% by volume determined by the immersion test herein specified.

4,234,331

COATING METHOD

Dorian R. Gray, Nashville, Tenn.; Salvatore Guerra, Melvindale, and John H. Meyer, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 935,036, Aug. 18, 1978, abandoned. This application May 29, 1979, Ser. No. 43,552
Int. Cl.[3] C03C *17/00*
U.S. Cl. 65—60 R **4 Claims**



1. A method of applying a coating to a moving ribbon of glass having a right edge and a left edge, the ribbon of glass having a thickness of about 7/32 inch and being at a temperature in the range of 950° F. to 1150° F., the ribbon of glass moving at a rate of 225 to 325 inches per minute, which method comprises the steps of:
(a) establishing a first spray zone at the right edge of the moving ribbon;
(b) establishing a second spray zone at the left edge of the moving ribbon; said first and said second spray zones being spaced from one another a short distance along the direction of travel of the ribbon of material so that there is no overlap of said spray zones, each of said spray zones applying a spray solution of metal acetylacetonates have the following composition: cobalt—66.5 to 68.5%; iron—18.5 to 20.5%; and chromium—12 to 14% dissolved in a suitable solvent with a solids content of 5 to 20%, the rate of application of said spray solution in each of said spray zones being in a range from 480 cc/min. to 2790 cc/min;
(c) moving said first spray zone from the right edge to the left edge of the moving ribbon while moving said second spray zone from the left edge to the right edge of the moving ribbon as said first spray zone is being moved so that said two spray zones pass one another at a location over the moving ribbon, said spray zones being moved at a rate of 5000 to 10,000 inches per minute;
(d) reversing the direction of movement of said spray zones when they reach the edge of the ribbon towards which they were being moved;
(e) returning said spray zones to the edge of the ribbon at which they started so that said zones once again pass one another at a location over the moving ribbon; and
(f) repeating steps (c), (d) and (e) as the ribbon of material is moved so as to apply a coating to the moving ribbon.

4,234,332

AQUEOUS FERTILIZER SOLUTIONS CONTAINING DICYANDIAMIDE

Horst Michaud, Trostberg; Georg Rieder, Grobenzell, and Josef Seeholzer, Trostberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 877,873, Feb. 15, 1978, abandoned, and Ser. No. 870,322, Jan. 18, 1978, abandoned. This application Jan. 23, 1979, Ser. No. 5,791
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702284; Feb. 23, 1977, 2707639
Int. Cl.[3] C05C *7/00, 9/00*
U.S. Cl. 71—30 **14 Claims**

1. A fertilizer composition which is an aqueous solution of a nitrogen-containing compound selected from urea, ammonium nitrate, ammonia and mixtures thereof and dicyandiamide in an amount such that the dicyandiamide nitrogen is 10% or more by weight of the total nitrogen of said solution.

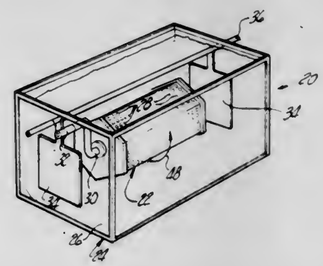
6. A fertilizer composition consisting essentially of an aqueous solution of at least one commonly used nitrogen-containing fertilizer compound selected from urea, ammonium nitrate, ammonium sulfate and ammonia, said solution having micronutrients dissolved therein and containing a stabilizing amount of dicyandiamide to maintain said micronutrients in solution.

4,234,333

PROCESS FOR RECOVERING METAL CARBIDE POWDER FROM CEMENTED CARBIDES

Mohammad H. Ghandehari, Salt Lake City, Utah, and Mortimer Schussler, Buffalo Grove, Ill., assignors to Fansteel, Inc., North Chicago, Ill.

Filed Apr. 25, 1979, Ser. No. 33,037
Int. Cl.[3] C22B *23/00*; C25B *1/00*; C25C *1/08*; C25F *3/00*
U.S. Cl. 75—0.5 BA **57 Claims**



1. A process for recovering metal carbide powder from cemented carbide comprising metal carbide grains and a binder phase, such process comprising submerging a plurality of pieces of cemented carbide in a conductive aqueous electrolyte having an anode and a cathode therein, said electrolyte comprising a corrosive agent which in the absence of an applied electrolytic current will corrode and dissolve the binder phase of the cemented carbide pieces while having little if any corrosive effect on the metal carbide grains of such pieces, maintaining at least some of said cemented carbide pieces in contact with said anode, passing an electric current between said anode and cathode, controlling at least one of the amperage and potential of said electric current to electrochemically and

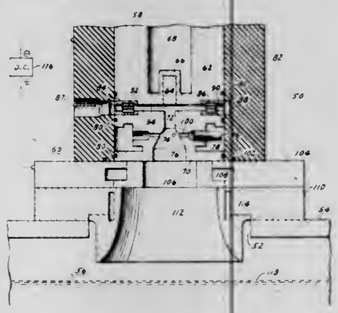
selectively dissolve at least a portion of the binder phase of said cemented carbide pieces without significant dissolution of the metal carbide grains of said cemented carbide pieces, and recovering metal carbide grains from which the binder phase has been dissolved.

4,234,334

ARC CONTROL IN PLASMA ARC REACTORS

Donald R. MacRae, Bethlehem, and Richard G. Gold, Coopersburg, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 10, 1979, Ser. No. 2,288
Int. Cl.³ C22B *5/52, 4/00*
U.S. Cl. 75—10 R **14 Claims**



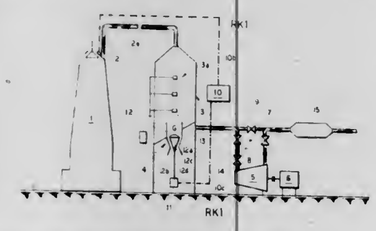
1. A process for controlling the electrical arc in a plasma arc reactor having a first and a second electrode in which a reaction layer covers the first electrode and is a point of arc attachment, which reaction layer is characterized as non-conductive in that the reaction layer at some point during the reaction causes an electrical arc struck between the reaction layer-covered first electrode and the uncovered second electrode to short circuit, which process comprises adding to the reaction layer a material that is more electrically conductive than the reaction layer whereby the arc is stabilized between the uncovered second electrode and the reaction layer-covered first electrode.

4,234,335

GAS CLEANING METHOD AND APPARATUS

Helmut Weissert, Bochum-Hiltrop; Theodor Niess, Mühlheim-Ruhr, and Karl-Rudolf Hegemann, Essen-Bergerhausen, all of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,107
Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719625
Int. Cl.³ C21B *5/00*
U.S. Cl. 75—41 **2 Claims**



1. A method of operating a gas-cleaning plant in which:
a scrubber having adjustable throttle means downstream of a gas-washing zone, adapted to generate a controllable pressure differential across a gap of variable width, is connected to a gas outlet of a high-pressure blast furnace,
an expansion turbine for the recovery of energy is connected to the scrubber downstream of said gap;
a bypass is connected across the turbine downstream of said gap and is provided with a control valve adjustable to vary the discharge pressure of the blast furnace;
a first control circuit **RK1** responsive to the discharge pressure of the blast furnace is provided to operate said throttle means for varying the width of said gap;
a second control circuit **RK2** responsive to the discharge pressure of the blast furnace is provided to operate said control valve; and
a third control circuit **RK3** responsive to the pressure differential across said gap is provided to adjust said throttle means independently of said discharge pressure;
said method comprising the steps of:
(a) establishing operating regions A and B on a diagram for the plant, having the form of FIG. **3**, in which the discharge pressure of the blast furnace is plotted along the ordinate and volume rate of flow of gas from the blast furnace is plotted along the abscissa, region A being defined between a turbine-insertion characteristic curve TE representing pressures and volumes below which the turbine is ineffective for energy recovery and by a turbine-operating characteristic curve TA representing pressures and volumes beyond which the turbine is no longer able to consume the total gas quantity generated by the blast furnace, region B being defined between said turbine-operating characteristic curve TA and a gas-cleaning characteristic curve GR which parallels a furnace-operating characteristic curve H and is transposed from the latter by said pressure differential;
(b) controlling the discharge pressure of said blast furnace when the plant has an operating point in said region A, with the aid of said throttle means, solely by varying the width of said gap by said first control circuit **RK1** in response to said discharge pressure while keeping said second and third control circuits **RK2, RK3** inoperative and blocking said bypass with the aid of said control valve whereby all the gas traversing said scrubber flows through said turbine;
(c) controlling the discharge pressure of said blast furnace when said operating point is in said region B by varying the cross-section of said bypass, with the aid of said control valve, by said second control circuit **RK2** in response to said discharge pressure while keeping said first control circuit **RK1** inoperative and continuing the flow of gas from said scrubber through said turbine; and
(d) while said operating point is in said region B, varying the width of said gap by said third control circuit **RK3** in response to said pressure differential and independently of said discharge pressure;
said first, second and third control circuits **RK1, RK2, RK3** being selectively activated by a common controller responsive to said discharge pressure and to said volume rate of flow.

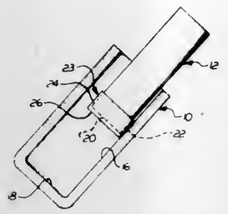
4,234,336

METHOD OF CHARGING A CRUCIBLE

Francis J. Rechin, Chagrin Falls, and Edward J. Vargo, Massilon, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Feb. 15, 1979, Ser. No. 12,318
Int. Cl.³ C22B *23/00*
U.S. Cl. 75—65 R **6 Claims**

1. A method of charging an empty crucible having a refractory wall with a bar of metal, said method comprising the steps of covering only one end portion of the bar with a material which is softer than the material of which the crucible is formed and which has no substantial adverse effect on the chemical composition of the molten metal to be poured from the crucible, inserting the bar into the empty crucible with the one end portion of the bar leading to enable the covering to engage the inner surface of the empty crucible before molten material is held in the crucible thereby to reduce the extend to which particles of refractory material are dislodged from the



walls of the crucible as the bar is inserted, and then disintegrating the covering and melting the bar to fill the crucible with molten material.

4,234,337

METHOD OF PRODUCING SINTERED FRICTION LAMINAE

Hermann Pütz, Schongau, Fed. Rep. of Germany, assignor to Hoerbiger & Co., Schongau, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 965,995
Claims priority, application Austria, Dec. 2, 1977, 8646/77
Int. Cl.³ B22F *3/00, 5/00*
U.S. Cl. 75—208 R **3 Claims**

1. In a method of producing sintered friction laminae for use in clutches and brakes wherein a metal powder is first scattered over a steel substrate and then is sintered thereon in a sintering furnace which contains a nitrogen-containing protective atmosphere, the improvement wherein said protective atmosphere comprises a continuous stream of ammonium-containing protective gas which flows around said steel substrate with metal powder scattered thereon, wherein the temperature of said sintering furnace is controlled to be above that which causes the ammonia in said protective gas to decompose into nitrogen and hydrogen adjacent said steel substrate with metal powder scattered thereon, and wherein the amount of ammonia in said protective gas and the flow rate of said protective gas around said steel substrate with metal powder thereon is controlled so as to create an excess of nitrogen therearound such that nitrogen will diffuse into the surfaces of the steel substrate and form nitrides, thereby increasing the life and wear resistance of the steel substrate of the formed sintered friction laminae.

4,234,338

THERMAL SHOCK RESISTANCE CERAMIC INSULATOR

Chester S. Morgan, Oak Ridge, and William R. Johnson, Maynardville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1978, Ser. No. 973,846
Int. Cl.³ B22F *1/04*
U.S. Cl. 75—235 **11 Claims**

1. A process for fabricating a cermet exhibiting thermal shock resistance and electrical insulating properties and containing 0.1–20 vol.% metal present as a discontinuous phase, said process comprising the steps of:
(a) providing a first solid phase mixture of a ceramic powder and a metal precursor;
(b) heating said first solid phase mixture above the minimum decomposition temperature of said metal precursor for no longer than about 30 minutes and to a temperature sufficiently above said decomposition temperature to cause the selective decomposition of said metal precursor to said metal to provide a second solid phase mixture of particles of said ceramic powder and discrete metal particles with the latter adhering to the surfaces of said ceramic particles, said metal particles having a mean diameter no more than ½ the mean diameter of said ceramic particles, and
(c) densifying said second solid phase mixture to provide a cermet having 0.1–20 vol.% metal present therein as a discontinuous phase at the boundaries of the ceramic particles.

5. The process of claim **1** wherein the ceramic is Al_2O_3 and the metal precursor is $PtCl_4$ and said heating step (b) is performed to at least 850° C.

8. The cermet prepared by the method of claims **1** or **5**.

4,234,339

CORROSION-RESISTANT DENTAL ALLOY

Joseph Aliotta, Newton, Mass., and Louis F. Alcuri, Matawan, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 760,182, Jan. 17, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,669
Int. Cl.³ B22F *1/00*
U.S. Cl. 75—255 **8 Claims**



1. A corrosion-resistant dental alloy mixture for use as a filling for dental cavities after amalgamation with mercury, consisting essentially of a substantially uniform mixture of a first corrosion-resistant alloy comprising a mixture of silver, tin and copper, said first alloy being in the form of spherical particles having a mean particle size of from about 20 to 26.5 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said spherical particles having a surface area of about 0.21 m^2/gm, a second corrosion-resistant alloy comprising a mixture of silver, tin and copper, said second alloy being in the form of randomly shaped particles having a mean particle size of from about 20 to 26.5 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said randomly shaped particles having a surface area which, exclusive of both spherical particles and flake-like particles as herein defined, ranges from about 0.23 to 0.26 m^2/gm, and a third alloy comprising a mixture of silver, tin and copper, said third alloy comprising flake-like particles having a mean particle size of between about 25 and 30 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said particles having a surface area of about 0.33 m^2/gm, said third alloy comprising not more than about 25% by weight of the dental alloy mixture.

4,234,340

ANTIFOULING MARINE COATING COMPOSITION CONTAINING AGAR, A PLASTICIZER AND A STRENGTHENING AGENT

Michael A. Pellico, 10753 Palms, Los Angeles, Calif. 90034

Filed May 11, 1979, Ser. No. 38,335
Int. Cl.³ C09D *5/14*
U.S. Cl. 106—15.05 **10 Claims**

1. A marine coating composition comprising from about 8 to about 15 wt.% agar, from about 10 to about 40 wt.% of a polyol plasticizer having at least three carbon atoms and at

least two hydroxyl groups, from about 0.2 to about 2 wt.% of a strengthening agent selected from the group consisting of sodium borate, potassium borate, calcium sulfate, zinc sulfate and mixtures thereof, and water to 100 wt.%.

4,234,341

S-TRIAZINE, PROCESS FOR PRODUCING IT AND ITS USE FOR FIREPROOFING POLYESTER FIBER MATERIALS

Armin Hiestand, Binningen, and Peter Rohringer, Schönenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

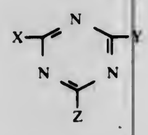
Division of Ser. No. 808,009, Jun. 20, 1977, Pat. No. 4,165,435. This application Apr. 18, 1979, Ser. No. 31,237

Claims priority, application Switzerland, Jun. 25, 1976, 8156/76

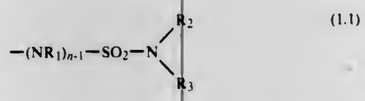
Int. Cl.[2] **B32B** *27/36;* **B05D** *3/02;* **C09D** *5/18;* **C09K** *3/28*

U.S. Cl. 106—18.22 **3 Claims**

1. A process for fireproofing fiber materials made from polyester, which process comprises treating these materials with a preparation containing a s-triazine of the formula

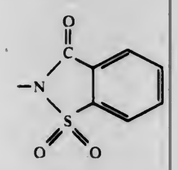


wherein X is a radical of the formula



(1.1)

wherein n is 1 or 2, R_1 is phenyl substituted by methyl, ethyl, sulphonamido or carboxylamido, or unsubstituted phenyl or hydrogen, R_2 and R_3 each have the meanings given for R_1 or are benzyl, phenylethyl, cyclohexyl, or alkyl with 1 to 4 carbon atoms and which is unsubstituted or substituted by hydroxyl, methoxy or ethoxy, or R_2 and R_3 together are alkylene having 4 to 5 carbon atoms or ethyleneoxyethylene, or X is a radical of the formula



(1.2),

and Y and Z each have the meanings given for X or are alkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl group, and, if n is the formula (1.1) is 2, Y and Z also are alkoxy with 1 to 8 carbon atoms, phenoxy alkylphenoxy with 1 to 4 carbon atoms in the alkyl group, benzyloxy, halogen or hydroxyl, and subjecting the materials treated in this manner to a heat treatment.

4,234,342

GLASS COMPOSITION

Isao Wakasa; Shuichi Yamazaki, both of Fukushima, and Hideo Taguchi, Nihonmatsu, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Nov. 22, 1978, Ser. No. 963,164

Claims priority, application Japan, Nov. 30, 1977, 52-143725

Int. Cl.[3] **C03C** *13/00, 3/04*

U.S. Cl. 106—50 **3 Claims**

1. A glass composition consisting essentially of the following compounds and respective weight percents:

SiO_2: 55.5–58.0
ZrO_2: 13.5–15.5
Na_2O: 13.0–14.5
MnO: 7.0–10.5
CaO: 3.0–6.5

wherein the total weight of MnO and CaO equals or exceeds 11% by weight and the weight of MnO equals or exceeds the weight of CaO.

4,234,343

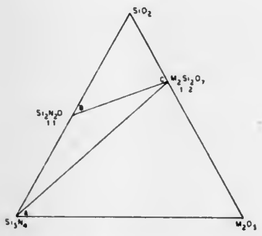
STRUCTURAL SILICON NITRIDE MATERIALS CONTAINING RARE EARTH OXIDES

Clarence A. Andersson, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1979, Ser. No. 1,033

Int. Cl.[3] **C04B** *35/50, 35/58*

U.S. Cl. 106—73.2 **7 Claims**



1. A ceramic composition suitable for use as a high-temperature structural material, said composition being within the triangular area defined by the points ABCA of the Si_3N_4-SiO_2-M_2O_3 ternary diagram depicted in FIG. 1, M being selected from the group consisting of alloys having Yb, Y, Er, or Dy as a first component and Sc, Al, Cr, Ti, (Mg+Zr) or (Ni+Zr) as a second component, said alloy having an effective ionic radius less than 0.89 A.

4,234,344

LIGHTWEIGHT CEMENT AND METHOD OF CEMENTING THEREWITH

John M. Tinsley, and Larry T. Watters, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 18, 1979, Ser. No. 40,254

Int. Cl.[3] **C04B** *7/02*

U.S. Cl. 106—88 **38 Claims**

1. In a process for cementing a bore hole intersecting a subterranean formation in which the cementing composition may be at an elevated temperature using an aqueous hydraulic cement slurry, the improvement of adding to the cement slurry to decrease its thermal conductivity, to decrease its density and to provide high strength at the elevated temperature, the components comprising a fine particulate crystalline silica having a particle size of less than about 10 mesh and a lightweight inorganic material which does not absorb a substantial quantity of water and which lowers the density of said slurry to about 8.5–13.0 pounds/gallon under well cementing conditions.

4,234,345

METHOD FOR PRODUCING HARD PLASTER OF PARIS

Fritz Fässle, Limburgerhof, Fed. Rep. of Germany, assignor to Guilini Chemie GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,834

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844266

Int. Cl.[3] **C01F** *11/46;* **C04B** *11/00*

U.S. Cl. 106—110 **15 Claims**

1. A method for producing fast-setting alpha calcium sulfate hemihydrate from calcium sulfate dihydrate, comprising:

(a) hydrothermally recrystallizing, at a pH less than or equal to 3, in the presence of a substance which influences the tendency to form crystals, calcium sulfate dihydrate, to form a mixture comprising 95% to 99% by weight of alpha calcium sulfate hemihydrate having an axial ratio of 1:8 to 1:12, and 1% to 5% calcium sulfate dihydrate;

(b) treating the mixture by drying said hemihydrate and calcining the dihydrate to form beta calcium sulfate hemihydrate while leaving a remainder of dihydrate, said calcining leaving no more than 0.5% by weight of the total calcium sulfate in dihydrate form; and

(c) grinding the treated mixture to an average grain size of 10μ to 20μ.

13. Hard plaster of paris grain comprising 95% to 99% by weight alpha calcium sulfate hemihydrate, 0.5% to 4.5% by weight beta calcium sulfate hemihydrate, and calcium sulfate dihydrate, the calcium sulfate dihydrate being present in a maximum of 0.5% by weight calcium sulfate dihydrate, the hard plaster of paris having an average grain size of 10μ to 20μ.

4,234,346

HIGH STRENGTH MODIFIED ASPHALT PAVING COMPOSITION

Laurence Latta, Jr., Portola Valley, and John B. Leonard, Jr., Hillsborough, both of Calif., assignors to Chem-Crete Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 780,862, Mar. 24, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,293

Int. Cl.[2] **C08L** *95/00*

U.S. Cl. 106—281 R **19 Claims**

1. A paving composition comprising at least 85 percent by weight aggregate, substantially unblown and unoxidized asphalt cement which is neither cut-back nor emulsified and which has bitumens as its predominant constitutent, and a strength improving agent comprising an organic manganese compound, either alone or in combination with organic-cobalt or organic-copper compounds, said strength improving agent being present in a form sufficient to make it substantially soluble in said asphalt cement and in an amount sufficient to provide manganese, manganese and cobalt or manganese and copper ion concentrations, based upon the total weight of said ions, in the range of about 0.01 to 0.50 percent by weight of said asphalt cement.

4,234,347

BINDER FOR CHEMICALLY RESISTANT CONCRETE AND PROCESS FOR PRODUCING THIS BINDER

Vsevolod P. Kirillshin, ulitsa Zhanny Leburb, 6, kv. 4, Odessa, U.S.S.R.

Filed Aug. 30, 1979, Ser. No. 71,056

Int. Cl.[3] **C09K** *3/00*

U.S. Cl. 106—286.7 **17 Claims**

1. A binder for a chemically resistant concrete, comprising from 30 to 80% by weight of a finely divided quartz sand having a specific surface area of from 1000 to 5000 cm^2/g and from 20 to 70% by weight of at least one crystalline modification of silica selected from the group consisting of tridymite and cristobalite and containing on the surface of its particles from 0.5 to 6 mol percent at least one R_2O oxides, wherein R is sodium or potassium.

4,234,348

PROCESS FOR THE PRODUCTION OF IRON OXIDE RED PIGMENTS

Horst Brunn; Heribert Bade, and Franz Hund, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,466

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 2826941

Int. Cl.[3] **C09C** *1/24*

U.S. Cl. 106—304 **5 Claims**

1. In the production of an iron oxide red pigment by reducing nitrobenzene with metallic iron in the presence of an acidic iron (II) salt solution, separating off the iron oxide pigment obtained from the reaction medium by washing out, and calcining the pigment at a temperature in the range of about 600° to 1100° C., the improvement which comprises adding an aluminum salt solution over a period of about 5 to 360 minutes at a temperature of about 20° to 100° C. to the iron oxide suspension accumulating during reduction of the nitrobenzene, the suspension containing about 150 to 500 g of iron/l and a residual iron (II) chloride content of about 20 to 160 g/l expressed as iron, the initial pH-value of the iron oxide suspension of about 3 to 5 being adjusted over a period of about 5 to 180 minutes to a final pH-value of about 5.5 to 6.5.

4,234,349

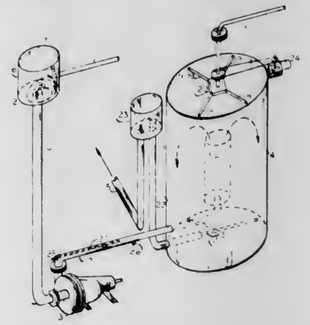
APPARATUS FOR THE PURIFICATION OF EVAPORATED SUGAR SOLUTIONS

Norland L. C. Suzor, Paauhau, Hi., assignor to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd., Paauilo, Hi.

Filed Apr. 16, 1979, Ser. No. 30,169

Int. Cl.[3] **C13D** *3/16;* **B01D** *21/00*

U.S. Cl. 127—12 **8 Claims**



1. Apparatus for separating minute hydrophobic particles of non-sugars from an evaporated sugar solution containing such particles in an in-line continuous process which comprises in combination:

a. a first tank;

b. a first inlet means operably connecting the inside of said first tank to the atmosphere so as to admit air into said first tank;

c. an outlet means centrally located in the bottom of said first tank;

d. a vertical standpipe operably connected below said first tank to said outlet means;

e. a second inlet means operably connecting the interior of said first tank with a source of said solution containing minute hydrophobic non-sugar particles so as to direct said liquid into a revolving path about and into the outlet of said first tank and down said standpipe thus forming a vortex at the outlet of said first tank drawing air into said vortex formed in said revolving body of solution;

f. a semi-open impeller centrifugal pump having an inlet and

an outlet means and being of the type having the impeller mounted on the end of a drive shaft with the blade side of the impeller being opposite to and centered on the inlet means, the central portion of said impeller when shaft-mounted being substantially flat so as to not interfere with the formation of a vortex in the eye of the impeller, the blades of which impeller being substantially straight and radial;

g. drive means operably connected to said drive shaft so as to rotate said impeller at a blade tip speed of about 100 feet per second or more;

h. means operably connecting said standpipe to the inlet means of said pump whereby said solution containing air having passed through said standpipe will enter said pump through said inlet means whereby said impeller when turning at high speed will reduce the basic particle size, break up any agglomerates of particles and break the air into micron size bubbles, thoroughly mixing the air, solution and particles so that the particles will leave the solution and cling to the bubbles; and

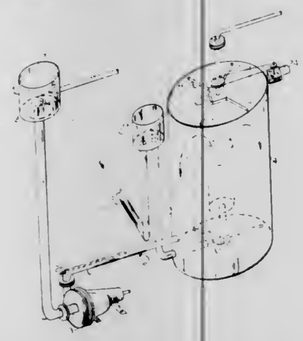
i. separation means operably connected to said outlet means of said pump whereby hydrophobic particles of non-sugars clinging to air bubbles are separated from the evaporated sugar solution.

4,234,350

PROCESS FOR THE PURIFICATION OF EVAPORATED SUGAR SOLUTIONS

Norland L. C. Suzor, Paauhau, Hi., assignor to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd., Paauilo, Hi.

Filed May 7, 1979, Ser. No. 36,834
Int. Cl.² B01D *21/00;* **C13D** *3/16, 3/00*
U.S. Cl. 127—48 **11 Claims**



1. An in-line continuous process for the purification of an evaporated non-sugar particle containing sugar solution without using chemical additives prior to introducing air therein which comprises the steps of:

a. introducing air into said solution to form a mixture of air and said solution;

b. transforming the mixture into a creamy liquor having non-sugar particles appregated to minute interspersed air bubbles;

c. separating the aggregated non-sugar particles and bubbles from the transformed mixture; and

d. recovering as product the sugar solution so separated from the aggregated non-sugar particles.

4. A process as claimed in claim 1 also consisting of an additional step of adding an anionic partially hydrolized polyacrylamide at a low controlled rate following step b and before step c.

4,234,351

PROCESS FOR FABRICATING GLASS-ENCAPSULATED SOLAR CELL ARRAYS AND THE PRODUCT PRODUCED THEREBY

Czeslaw Deminet, Kent, and Richard E. Oettel, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 14, 1978, Ser. No. 924,733
Int. Cl.² H01L *31/04, 31/18*
U.S. Cl. 136—251 **12 Claims**



7. The product formed by a process for fabricating solar cell arrays which comprises the steps of:

a. forming a base layer of glass;

b. forming a pattern of indentations bounded by ridges in said base layer;

c. forming an electrically conducting first connecting element on said base layer, wherein said first connecting element extends from a given indentation to a point on an adjacent ridge;

d. positioning a solar cell in said given indentation so that the lower surface of said solar cell is in electrical contact with the one end of said first connecting element in said given indentation;

e. forming an electrically conducting second connecting element to extend between the other end of said first connecting element on said adjacent ridge and the top surface of a solar cell in an adjacent indentation; and

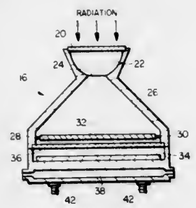
f. forming a top layer of glass on the product of steps a-e above by heating glass sufficiently until it flows, applying the flowing gas to the upper surface of the product of steps a-e above so that it fills in the irregularities thereof, and applying sufficient pressure to create an intermolecular bond between said top layer of glass and the exposed portions of the glass base layer, the solar cells and the connecting elements, the application of pressure being sufficiently time-limited to prevent migration of the PN junction in the solar cell.

4,234,352

THERMOPHOTOVOLTAIC CONVERTER AND CELL FOR USE THEREIN

Richard M. Swanson, Los Altos, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto and Stanford University, Stanford, both of, Calif.

Filed Jul. 26, 1978, Ser. No. 928,103
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—253 **17 Claims**



1. A thermophotovoltaic conversion system comprising:

(a) means for collecting and concentrating solar radiation,

(b) means for receiving said concentrated solar radiation and re-radiating energy and including a housing having a radiation receiving window, a chamber for confining said concentrated radiation, and a radiator element within said chamber for receiving said concentrated radiation and re-radiating energy, and

(c) a photovoltaic cell for receiving said re-radiated energy and generating an electrical voltage, said cell including a monocrystalline semiconductor substrate having first and second opposing surfaces, said substrate being positioned with respect to said means for re-radiating energy whereby said re-radiated energy is received by said first surface, a first plurality of rows of doped regions of a first conductivity type in said second surface, a second plurality of rows of doped regions of a second conductivity type in said second surface, said first plurality of rows being interleaved with said second plurality of rows, each of said rows comprising a plurality of spaced apart doped regions occupying a minimal area of said second surface, first optically reflective conductive means electrically interconnecting said first plurality of rows of doped regions, a reflection enhancement layer provided between said first conductive means and said second surface except at said first plurality of doped regions, and second conductive means electrically interconnecting said second plurality of rows of doped regions whereby said electrical voltage is generated between said first and second conductive means.

4,234,353

PROCESS FOR PREPARING PHOTOVOLTAIC CELLS HAVING INCREASED ADHESION OF THE SEMI-CONDUCTING LAYER AND PRODUCED THEREBY TO THE CONDUCTING LAYER

Lee F. Donaghey, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 887,081, Mar. 16, 1978, abandoned.
This application Apr. 9, 1979, Ser. No. 27,979
Int. Cl.² H01L *31/06;* **B05D** *5/12*
U.S. Cl. 136—258 **7 Claims**

1. In a process for preparing a thin film polycrystalline photovoltaic cell which comprises deposition of a semi-conducting layer on a conducting electrode layer, the improvement which comprises increasing the adhesion of the semi-conducting layer to the conducting layer by incorporating from about 0.01 to about 0.0001 mol of the element or elements of the conducting layer per mol of metallic or major component in the semi-conducting layer.

6. An improved cadmium sulfide photovoltaic cell comprising a thin film polycrystalline cadmium sulfide semi-conducting layer on a conducting electrode layer wherein the cadmium sulfide semi-conducting layer comprises from about 0.01 to about 0.0001 mol of the element or elements of the conducting layer per mol of metallic or major component of the semi-conducting layer.

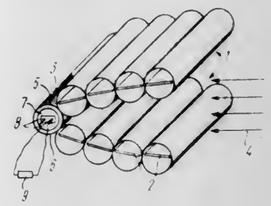
4,234,354

SOLAR POWER UNIT

Nikolai S. Lidorenko, 3 Mytischinskaya ulitsa, 14a, kv. 127; Tatyana A. Litsenko, ulitsa Trubnaya, 11, kv. 12; Valery N. Potapov, ulitsa Timiryazevskaya, 13, kv. 213; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64, and Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17, all of Moscow, U.S.S.R.

Filed Apr. 20, 1979, Ser. No. 31,983
Int. Cl.³ H01L *31/04;* **F24J** *3/02*
U.S. Cl. 136—246 **4 Claims**

1. A solar power unit comprising: a solar energy collector in the form of a mirror reflector assembly, said mirror reflector assembly including a plurality of flat mirror facets, each of said mirror facets being enclosed within a respective one of a plurality of hermetically sealed convexly shaped shells formed of a material which is transparent to radiation, and wherein each of said shells is filled with a reducing agent in intimate contact with said mirror facet enclosed therewithin; and a solar energy



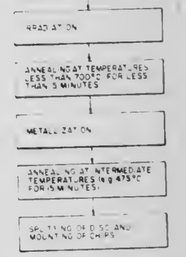
receiver; said receiver adapted to be exposed to a radiation flux reflected by said collector.

4,234,355

METHOD FOR MANUFACTURING A SEMICONDUCTOR ELEMENT UTILIZING THERMAL NEUTRON IRRADIATION AND ANNEALING

Horst Meinders, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,039
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755418
Int. Cl.² H01L *21/263*
U.S. Cl. 148—1.5 **14 Claims**



1. In a method for manufacturing a semiconductor element from a single crystal semiconductor body having a crystal lattice and at least one surface, said method comprising the steps of

subjecting said single crystal semiconductor body to at least one high temperature process for creating a pn junction,

then irradiating said semiconductor body with thermal neutrons at a rate of $2 \cdot 10^{11}$ neutrons/cm^2-s for about 15 hours to create homogeneously distributed recombination centers;

then applying a metallization to said semiconductor body to constitute an electrode;

and then subjecting said semiconductor body with said metallization to an annealing process at an intermediate temperature between 180° and 600° C. for joining said metallization to said surface of said semiconductor body;

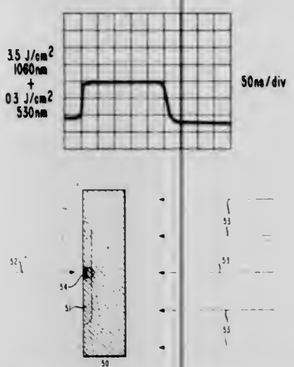
said step of subjecting said semiconductor body to said annealing process also partially healing said lattice dislocations.

4,234,356

DUAL WAVELENGTH OPTICAL ANNEALING OF MATERIALS

David H. Auston, Mountainside; Jene A. Golovchenko, Basking Ridge, and Thirumalai N. C. Venkatesan, Highland Park, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 964,193, Nov. 28, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,663
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 19 Claims



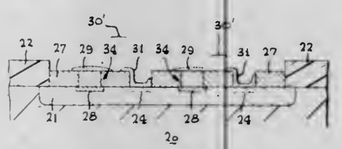
1. A process for annealing damaged material comprising exposing a damaged layer, overlying a single crystal material, to light thereby rendering the damaged region and at least a portion of the underlying material molten, and thereby annealing the damaged layer, the invention characterized in that the light comprises two portions, of different wavelengths, a first melt-initiating portion, which is absorbed by the solid layer rendering at least a portion of it molten, and a second drive in portion which extends the molten region to at least the depth of the single crystal material.

4,234,357

PROCESS FOR MANUFACTURING EMITTERS BY DIFFUSION FROM POLYSILICON

James E. Scheppele, Garden Grove, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Jul. 16, 1979, Ser. No. 57,694
Int. Cl.[3] H01L *7/00*
U.S. Cl. 148—1.5 12 Claims



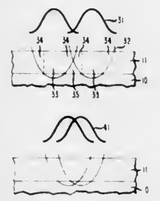
1. A process for forming a semiconductive electronic translation device comprising the steps of:
- forming a base region on a semiconductive silicon wafer;
- depositing a polysilicon layer over said base region;
- forming a protective covering on said polysilicon layer directly over selected closely spaced sites of said base regions, said sites including plural sites for making an electrical contact with said base region and plural emitter sites;
- replacing the polysilicon not under said protective covering with silicon dioxide;
- removing the polysilicon over said base contact sites to expose portions of the base region; and
- diffusing a conductivity-determining impurity previously placed in the polysilicon overlaying said emitter sites into said base region to form emitter regions within said base region.

4,234,358

PATTERNED EPITAXIAL REGROWTH USING OVERLAPPING PULSED IRRADIATION

George K. Celler, Lawrenceville; Lionel C. Kimerling, Westfield; Harry J. Leamy, New Providence; John M. Poate, Summit, and George A. Rozgonyi, Chatham, all of N.J., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1979, Ser. No. 27,274
Int. Cl.[3] H01L *21/268, 21/26*
U.S. Cl. 148—1.5 23 Claims



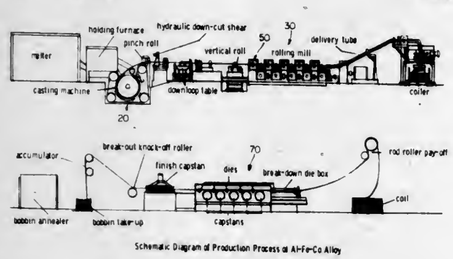
1. A method comprising
- irradiating a first region of material, which adjoins a single crystal material, with a pulse of energy which is absorbed at least in part by the material; and
- irradiating subsequently a second region of material adjacent to the first region; the invention characterized in that the irradiated regions overlap each other sufficiently, and the energy of the irradiating pulse and the absorptivity of the irradiated material are of such values that each region of the material which is irradiated is seeded by adjacent single crystal material and is epitaxially regrown to an essentially single crystal structure, thereby defining an essentially continuous single crystal pattern.

4,234,359

METHOD FOR MANUFACTURING AN ALUMINUM ALLOY ELECTRICAL CONDUCTOR

Enrique C. Chia, and Roger J. Schoerner, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 632,982, Nov. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,300, Jan. 2, 1974, Pat. No. 3,920,411, which is a continuation of Ser. No. 199,729, Nov. 17, 1971, abandoned, which is a division of Ser. No. 54,563, Jul. 13, 1970, abandoned. This application Jan. 19, 1978, Ser. No. 870,651
Int. Cl.[3] C22F *1/04*
U.S. Cl. 148—2 13 Claims



Schematic Diagram of Production Process of Al-Fe-Co Alloy

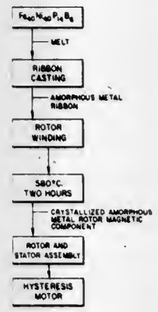
1. Method of manufacturing an aluminum alloy electrical conductor having a minimum conductivity of 58% IACS, a minimum yield strength of 12,000 PSI, and a minimum ultimate tensile strength of 18,000 PSI, comprising:
- (a) alloying a minimum of 93.5% by weight molten aluminum, having normal trace impurities associated therewith, with from about 0.4 to about 6.5 percent by weight total at least one additional alloying element selected from the group consisting essentially of cobalt, iron and other elements capable of yielding intermetallic precipitates during subsequent thermomechanical processing without reducing the conductivity of the conductor below said 58% IACS;
- (b) rapidly casting the melt into a bar having an as-cast structure of pure aluminum dendrites with an interdendritic eutectic network consisting of an aluminum matrix and intermetallic precipitates of aluminum and said at least one alloying element;
- (c) hot-working said cast bar, in the as-cast condition, into rod in a series of deformations to reduce the cross-sectional area thereof and convert the aluminum matrix into a fine subgrain structure; and
- (d) wherein said step of hot-working includes increasing the dislocation density in the matrix during the first of said series of deformations sufficiently to form a substantially well-defined subgrain structure therein, thereby maximizing a refinement of said subgrain structure by permitting breaking-up thereof in each of the subsequent deformations.

4,234,360

METHOD OF MAKING HYSTERESIS MOTOR ROTOR USING AMORPHOUS MAGNETIC ALLOY RIBBONS

Peter G. Frischmann, Scotia; Fred E. Luborsky, Schenectady, and Russell E. Tompkins, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,919
Int. Cl.[1] C21D *1/04*; H01F *1/00*; C22B *43/00*
U.S. Cl. 148—121 5 Claims



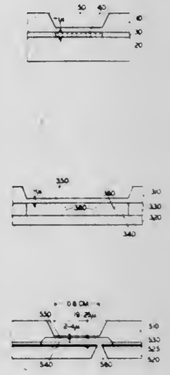
1. The method of making a hysteresis motor rotor assembly having a predetermined hysteresis loop area, which comprises the steps of
- casting a magnetic alloy composition in the form of a ductile amorphous metal ribbon having a value of coercive force in the range of from about 0.01 to about 0.1 oersted,
- tightly winding said ductile ribbon on a rotor member,
- affixing the wound ribbon to said rotor member to form a rotor assembly,
- preselecting a value of coercive force in the range of from about 10 to about 300 oersteds to be provided to said wound ribbon,
- heating said rotor assembly to a preselected temperature above the crystallization temperature for said magnetic alloy composition, and
- maintaining said rotor assembly at said preselected temperature for a period of time at least sufficient to develop said preselected coercive force in said wound ribbon.

4,234,361

PROCESS FOR PRODUCING AN ELECTROSTATICALLY DEFORMABLE THIN SILICON MEMBRANES UTILIZING A TWO-STAGE DIFFUSION STEP TO FORM AN ETCHANT RESISTANT LAYER

Henry Guckel, Madison, Wis., and Steven T. Larsen, Albany, Oreg., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 944,637, Sep. 21, 1978, which is a continuation of Ser. No. 739,583, Nov. 8, 1976, abandoned. This application Jul. 5, 1979, Ser. No. 54,815
Int. Cl.[3] H01L *21/223, 21/225, 21/306, 29/06*
U.S. Cl. 148—186 10 Claims



1. A process for producing mechanically stable thin membranes in a crystalline silicon substrate suitable for incorporation in integrated circuits, comprising the steps of:
- (a) diffusing boron into one of the opposite sides of a silicon substrate in a deposition furnace for a period of time not greater than approximately 90 minutes, with the boron being supplied in an amount sufficient and at a temperature sufficient to form a layer in the silicon substrate having boron atom concentrations greater than 10^{21} per cubic centimeter;
- (b) transferring the diffused silicon substrate from the deposition furnace to a drive furnace while substantially excluding absorption of water vapor by the silicon substrate;
- (c) heating the substrate in the drive furnace in an ambient gas which is substantially oxygen and water vapor free for a selected period of time at a temperature sufficient to drive the diffused boron to a desired depth in the silicon substrate;
- (d) masking the side of the substrate opposite to the boron diffused layer to expose a selected area of silicon at a portion of the surface having selected lateral dimensions; and
- (e) applying a silicon etchant to the exposed unmasked surface area until sufficient silicon is dissolved to expose the diffused boron layer and be retarded from further etching thereby, the exposed portion of the etchant resistant layer thereby forming a thin membrane.

4,234,362

METHOD FOR FORMING AN INSULATOR BETWEEN LAYERS OF CONDUCTIVE MATERIAL

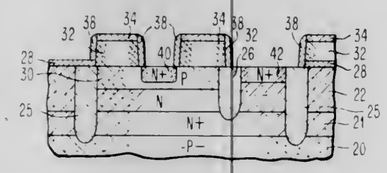
Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,606
Int. Cl.[3] H01L *21/22, 21/306*
U.S. Cl. 148—187 23 Claims

8. A method for forming bipolar integrated circuit devices having an insulator between conducting layers comprising:
- providing a silicon body having a pattern of monocrystalline silicon regions isolated from one another;

forming a base region in said monocrystalline regions;
providing an insulator over the surface of said body having said pattern with openings for the base contacts to said base regions;
despositing a layer of polycrystalline silicon over said insulator and said openings therein;
forming an insulator coating upon said polycrystalline silicon layer;
removing said insulator coating and said polycrystalline silicon layer from where said emitter and collector reach-through are to be formed which results in regions of said polycrystalline layer with said insulator coating thereon having substantially horizontal surfaces and substantially vertical surfaces;
forming a conformal insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;
reactive ion etching said conformal insulating layer to substantially remove said horizontal conformal insulating layer and to provide a narrow dimensioned vertical insulating region on said polycrystalline layer;
forming the emitter and collector reach-through regions within said monocrystalline silicon regions; and
forming a conductive layer over said vertical insulating region and said insulator coating.

16. A method for forming a field effect device integrated circuit structure comprising:
providing a monocrystalline silicon body;
forming a first insulator layer having the desired thickness of the gate insulator on the surface of said body;



forming a first polycrystalline silicon layer over said insulator layer;
forming a second insulator layer on the surface of said first polycrystalline silicon layer;
removing said second insulator layer and said first polycrystalline silicon layer from portions of said first insulator layer to form part of the gate electrode and which results in regions of said polycrystalline layer with said second insulator layer thereon having substantially horizontal surfaces and substantially vertical surfaces;
forming a conformal insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;
reactive ion etching said conformal insulating layer to substantially remove said horizontal conformal insulating layer and to provide a narrow dimensioned vertical insulating region on said polycrystalline layer;
forming a second polycrystalline silicon layer over said vertical insulating region, said exposed first insulator layer and said second insulator layer;
forming a third insulator layer on said second polycrystalline layer;
removing said third insulator layer and said second polycrystalline layer in the desired pattern to connect the said field effect devices in said integrated circuit;
removing said second insulator layer and said first polycrystalline layer in the areas where diffused regions are required for said field effect devices and to fully define the said gate electrode pattern; and
forming said diffused regions.

4,234,363
SOLID PROPELLANT HYDROGEN GENERATOR

Joseph E. Flanagan, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 371,928, Jun. 11, 1973, abandoned. This application Jul. 2, 1975, Ser. No. 593,599
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **5 Claims**

1. A solid propellant hydrogen generator comprising:
an oxidizer selected from the group consisting of triaminoguanidine nitrate, diazidodinitrazahexane, diazidotrinitrazaheptane, ammonium nitrate, and cyclotetramethylene tetranitramine;
a fuel selected from the group consisting of triaminoguanidine-5-amino tetrazole and the double salt of triaminoguanidine and azotetrazole;
and a binder selected from the group consisting of polyesters, polyethers and polybutadiene;
said oxidizer, fuel and binder being formulated to maximize hydrogen exhaust components while maintaining the oxygen to carbon stoichiometry at about 1/1 and providing flame temperatures above 1200° K.

4,234,364
CROSSLINKED DOUBLE BASE PROPELLANT BINDERS

Anderson E. Robinson, Jr., Destin, Fla., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 30, 1978, Ser. No. 910,792
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **9 Claims**

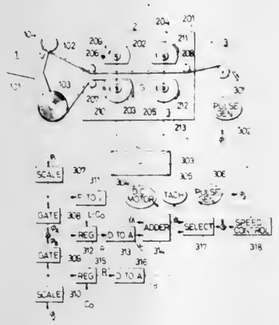
1. A crosslinked binder suitable as the binder portion of a crosslinked double base propellant composition in which the crosslinked binder is a urethane rubber comprising the reaction product of:
(a) nitrocellulose having a nitrogen content of from about 11.0% to 13.4%, an intrinsic viscosity of at least about 0.55 dl./gram to about 2.0 dl./gram.;
(h) a polymeric diol selected from the group consisting of polyester diols, polyether diols and polyester and polyether diols which have been chain extended by reaction with a diisocyanate, said polymeric diol having a hydroxyl functionality of from about 1.9 to about 2.1 and a molecular weight of from about 1,000 to 10,000; and
(c) a polyfunctional isocyanate having an NCO functionality of at least three; in which the weight ratio of nitrocellulose to polymeric diol is from about 0.15 to about 0.001 and the ratio of isocyanate functional groups to the combined hydroxyl functionality of the nitrocellulose and polymeric diol is from about 1/1 to about 1.5/1.

7. In a crosslinked double base propellant composition comprising an energetic liquid nitrate ester plasticizer, nitrocellulose, organic and inorganic oxidizing agents, fuels, and a crosslinked binder, the improvement comprising as the crosslinked binder a urethane rubber comprising the reaction product of:
(a) nitrocellulose having a nitrogen content of from about 11.0% to 13.4%, and an intrinsic viscosity of at least about 0.55 dl./gram to about 2.0 dl./gram.;
(b) a polymeric diol selected from the group consisting of polyester diols, polyether diols and polyester and polyether diols which have been reacted with a diisocyanate, said polymeric diol having a hydroxyl functionality of from about 1.9 to about 2.1 and a molecular weight of from about 1,000 to 10,000; and
(c) a polyisocyanate having an NCO functionality of at least three;
in which the weight ratio of nitrocellulose to polymeric diol is from about 0.15 to about 0.001 and the ratio of isocyanate functional groups to the combined hydroxyl functionality of the nitrocellulose and polymeric diol is from about 1/1 to about 1.5/1 and in which the weight ratio of said plasticizer to binder is from about 2/1 to less than about 4.5/1.

4,234,365
WEB BUTT-JOINING SYSTEM

Shigehisa Shimizu; Sanshiro Fukuhara, both of Minami-ashigara; Noboru Shinmura, and Hisahiro Tanigawa, both of Yokohama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 28, 1978, Ser. No. 974,273
Claims priority, application Japan, Dec. 28, 1977, 52/157360
Int. Cl.² B26D *5/00*
U.S. Cl. 156—64 **19 Claims**



1. A method of butt-joining comprising the steps of:
feeding a pair of webs to be joined into a cutting and joining section having cutting and joining drums operable by the selective driving of a D.C. motor,
overlapping and cutting said pair of webs on said cutting drums,
butting and joining the ends of said cut webs,
controlling the rotational speed of said D.C. motor during said cutting and joining steps in response to a signal indicating both the web running speed and the relative positions between the drums and webs such that the running speed of said webs corresponds to the circumferential speed of said cutting and joining drums during the cutting and joining steps, and
stopping said cutting and joining drums at predetermined positions following completion of the cutting and joining steps.

9. A web butt-joining system comprising:
a feeding section having rolls for feeding a pair of new and old webs, a cutting and joining section having cutting drums and joining drums, a drive control section having a driving D.C. motor commonly coupled to said cutting drums and joining drums and a calculation control circuit for selectively controlling said driving D.C. motor in response to signals indicative of both the running speed of said old web and the positional relationship between said old web and said cutting and joining drums, said drive control section being operated to cut said new and old webs fed from said feeding section with said cutting drums and to butt-join the ends of said webs thus cut with bonding tapes provided on said joining drums.

4,234,366
WALL AND FLOOR COVERINGS COMPRISING A SUBSTRATE FORMED FROM COMMINUTED, RECYCLED, FIBER-REINFORCED FOAM-CONTAINING SHEETS

Douglas M. Brewer, Dundee; Alan Mawson, Fife, and William S. Carter, Kirkcaldy, all of Scotland, assignors to Nairn Floors Limited, Lune Mills, England

Continuation-in-part of Ser. No. 761,195, Jan. 21, 1977, Pat. No. 4,122,224, which is a continuation-in-part of Ser. No. 639,519, Dec. 10, 1975, abandoned. This application Sep. 1, 1978, Ser. No. 940,791
Claims priority, application United Kingdom, Dec. 12, 1974, 53709/74
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.³ B29H *19/00*; B32B *5/18, 5/20, 25/08*
U.S. Cl. 156—79 **14 Claims**

1. A method of making a floor or wall covering comprising making a sheet material comprising fibrous reinforcement, a layer of foamed vinyl resin and pigmented decoration, wherein the fibrous reinforcement is selected from reinforcing fibres in the foamed layer and fibrous support beneath the foamed layer, comminuting this sheet into a mass of particles, softening the mass of particles, forming the softened mass into a substrate sheet and bonding a decorative opaque surface layer to the sheet.

11. Floor or wall covering formed by the method of claim 1 comprising a decorative opaque surface layer bonded to a substrate sheet.

4,234,367
METHOD OF MAKING MULTILAYERED GLASS-CERAMIC STRUCTURES HAVING AN INTERNAL DISTRIBUTION OF COPPER-BASED CONDUCTORS

Lester W. Herron, Hopewell Junction; Raj N. Master, and Rao R. Tummala, both of Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,112
Int. Cl.³ B32B *31/24*; C03B *32/00*; C04B *39/00*
U.S. Cl. 156—89 **16 Claims**



1. A method of forming a glass-ceramic composite structure with copper based metallurgy comprising:
forming at least one green sheet comprised of a thermoplastic organic binder having dispersed therein particles of a crystallizable glass having a crystallization temperature below the melting point of copper;
forming on a surface of a first said green sheet a pattern of a nonrefractory copper based conductor forming composition wherein the predominant component of said conductor is copper;
superimposing a second said sheet on said surface of said first sheet to sandwich said pattern therebetween;
laminating said superimposed sheets together;
heating said laminate in an ambient of hydrogen and H_2O in a ratio of H_2/H_2O = about 10^{-4} to about $10^{0.5}$ to a burn-

out temperature in the range between the anneal and softening points of said glass and maintained thereat for sufficient time to decompose and eliminate said binder, substituting an inert atmosphere for said ambient; and

heating said laminate to the crystallization temperature of said glass for coalescence of said glass particles and crystallization thereof into a glass-ceramic structure have a copper-based conductor pattern extending within the interior thereof.

4,234,368

METHOD OF MAKING A PIPE COUPLING

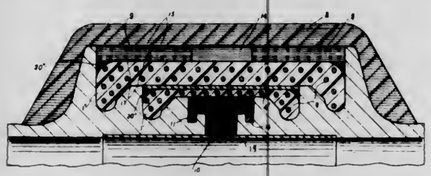
Walter Schwarz, Engerthstr. 237b, A-1020 Wien II, Austria (A-1020)

Division of Ser. No. 818,321, Jul. 22, 1977, Pat. No. 4,147,381. This application Dec. 7, 1978, Ser. No. 967,374

Claims priority, application Austria, Jul. 23, 1976, 5452/76

Int. Cl.[2] B32B *7/08;* **F16L** *21/00;* **H01R** *43/00*

U.S. Cl. 156—91 **3 Claims**



1. A method of connecting a terminal portion of a conduit, having a plurality of peripheral grooves bounded by peripheral ribs whose height decreases toward the free end of said extremity, with an external member axially spaced from said terminal portion, comprising the steps of enveloping said terminal portion and part of said external member with a first shell of filament-reinforced thermosetting material which overlaps the peripheral rib closest to said free end, providing said first shell with an inner peripheral bead received in a peripheral groove lying just beyond said closest rib, enveloping said first shell with a second shell of filament-reinforced thermosetting material having an axial tensile strength greater than that of said first shell, extending said second shell past said closest rib and the next-following rib, forming on said second shell an inner peripheral bead received in a peripheral groove lying just beyond said next-following rib, and maintaining a relative axial shiftability and independent deformability between said shells.

4,234,369

METHOD FOR REPAIRING AND RETREADING VEHICLE TIRES

Wilhelm Schelkmann, Witten, Fed. Rep. of Germany, assignor to Vakuum Vulk Holdings Limited, Nassau, The Bahamas

Continuation of Ser. No. 576,863, May 12, 1975, abandoned. This application May 11, 1978, Ser. No. 904,737

Claims priority, application Fed. Rep. of Germany, May 13, 1974, 2423062

Int. Cl.[2] B29H *17/36*

U.S. Cl. 156—95 **12 Claims**

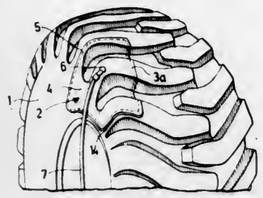
1. A method for repairing a void in a portion of a vehicle tire comprising the steps of:

placing unvulcanized rubber in the void;

covering and enclosing the unvulcanized rubber and at least the portion of the tire immediately surrounding the portion to be repaired with a flexible enclosure;

attaching the edges of said enclosure to the tire around the portion to be repaired in gas-tight relationship by means of a plastically deformable adhesive that remains effective at the elevated temperature necessary for complete vulcanization of the unvulcanized rubber;

applying gas pressure conditions to the space between said enclosure and the tire so as to evacuate air and gas occlusions from the space and apply said enclosure tightly against the tire so that said enclosure deforms into tight fitting relationship with the surface contours of the tire; and



heating the unvulcanized rubber placed in the void to raise its temperature and effect complete vulcanization thereof.

4,234,370

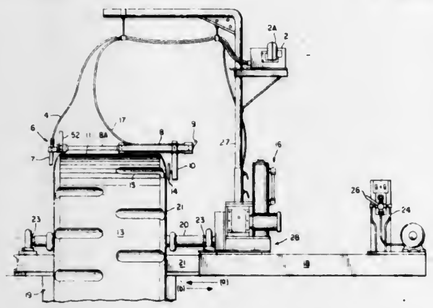
METHOD FOR RECAPPING TIRES

John C. McDonough, Essex Fells; James K. Rary, Orange; Arden Birth, Lake Parsippany, and John J. Kuzma, Jr., Wharton, all of N.J., assignors to Bandag, Incorporated, Muscatine, Iowa

Division of Ser. No. 844,788, Oct. 25, 1977, Pat. No. 4,157,727. This application Dec. 29, 1978, Ser. No. 974,252

Int. Cl.[2] B29H *17/36*

U.S. Cl. 156—95 **8 Claims**



1. A method for recapping a tire, comprising the steps of:

preparing the tire tread surface including buffing, skiving and filling tread cuts;

smoothing the prepared tire tread surface including applying prepared rubber around the circumference of the tread surface to a predetermined depth;

supporting the tire on rotatable means, with portions of the tire beads contacting the rotatable means and the rotatable means thereby carrying the weight of the tire for rendering the tire rotatable therewith;

carrying the rotatable means on longitudinally displaceable means and longitudinally displacing the longitudinally displaceable means for spanning a pit and thereby suspending the tire in the pit;

rotating the rotatable means for indexing the tire suspended in the pit to a predetermined position;

positioning a displaceable grooving head having a grooving blade on the tread surface of the indexed tire;

heating the grooving blade and displacing the grooving head across the tread surface of the tire with the grooving blade thereupon cutting a groove; and

curing the tire after grooves have been cut around the circumference thereof.

4,234,371

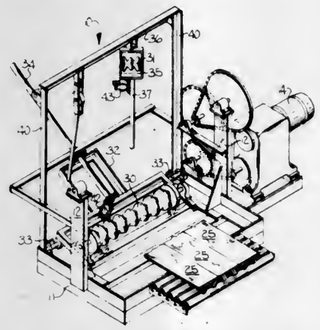
METHOD AND APPARATUS FOR APPLYING A CIRCUMFERENTIAL TREAD TO A TIRE CARCASS

Harold E. Christman, Santa Cruz, Calif., assignor to Brad Ragan, Incorporated, Spruce Pine, N.C.

Continuation-in-part of Ser. No. 849,663, Nov. 8, 1977. This application Apr. 17, 1978, Ser. No. 896,714

Int. Cl.[2] B29H *17/36*

U.S. Cl. 156—96 **2 Claims**



1. A method for applying a peripheral circumferential tread to the carcass of a pneumatic tire, said method comprising:

providing an elongate elastomeric tread strip having a substantially flat back and a contoured tread face with at least two longitudinally extending ribs and an intervening valley on the opposite side thereof,

laying the flat back of one end portion of at least one such tread strip against and generally tangent to the peripheral outer surface of the carcass, and

rotating the carcass about its axis to wrap the tread strip therearound, while

pressingly engaging the contoured tread face of the strip with a rotating, rapidly vibrating, continuous contoured surface having a contour which is a solid of revolution and which at least substantially matches the at least two longitudinally extending ribs and intervening valley of the tread strip as by having longitudinally spaced apart rib engaging portions and an intervening, enlarged diameter valley engaging portion to cause the same to uniformly contact the carcass throughout the width of the tread strip.

4,234,372

APPARATUS FOR AUTOMATICALLY SEALING INSULATION GLASS PANELS

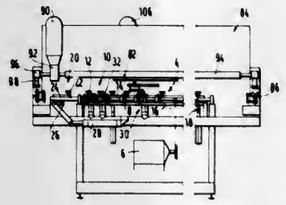
Rudolf Bernhard, and Hans Bonjour, both of Bützberg, Switzerland, assignors to Glasmatec AG, Thun, Switzerland

Filed Mar. 2, 1979, Ser. No. 17,030

Claims priority, application Switzerland, Mar. 2, 1978, 2781/78

Int. Cl.[1] C03C *27/06;* **B32B** *31/00*

U.S. Cl. 156—356 **26 Claims**



1. A mechanism for automatically sealing the joint of the four rectangular edges of multiple glazed units which comprises

(a) conveying means for advancing the multiple glazed units along a conveying path,

(b) a positioning device (**10**, **20**) and a retaining device (**30**) provided at an operation site located in said conveying path by means of which devices (**10**, **20**; **30**) each of said advancing units (**2**) can be positioned and retained in an adjusted position in which two opposite edges extend in an adjusted direction at a predetermined angle to the conveying direction (x) of said conveying means,

(c) a nozzle (**44**) fed with sealing compound by a supply device (**144**),

(d) a movement device (**82**, **84**) for moving said nozzle in said adjusted direction (x) and perpendicularly (y) to it, and

(e) a rotation device (**80**), holding said nozzle (**44**) in a rotatable position to said movement device (**82**, **84**), by means of which the nozzle (**44**) can be rotated four times to 90° with respect to said adjusted direction.

4,234,373

METHOD AND APPARATUS FOR VACUUM LAMINATION OF FLEX CIRCUITS

Joseph A. Reavill, Mira Loma, and John M. Arachi, Riverside, both of Calif., assignors to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Dec. 4, 1978, Ser. No. 965,976

Int. Cl.[2] E06B *7/16;* **B30B** *5/02;* **B32B** *31/00;* **B29B** *5/04*

U.S. Cl. 156—382 **9 Claims**

1. A laminating fixture assembly comprising:

an upper plate having a planar face;

a lower plate having a planar face;

a seal receiving groove formed in and extending around the periphery of each of said plates;

a unitary resilient seal for seating in said grooves and having a height for extending between and holding said plates apart with an extended space therebetween for sealing said space between said plates; and

a vacuum port formed in one of said plates and communicating with the area bound by said groove for connection to a vacuum source.

4,234,374

BI-DIRECTIONAL STEP-OVER TAPE APPLICATOR HEAD

Ed Frank, Glenolden, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 10, 1978, Ser. No. 949,476

Int. Cl.[3] B31F *1/00;* **B44C** *7/00*

U.S. Cl. 156—459 **12 Claims**

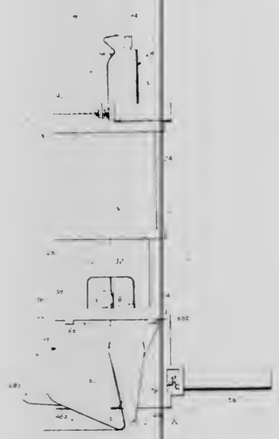
1. A tape applicator head for dispensing tape in two opposing directions onto a working surface, while maintaining the orientation of the head unchanged, comprising:

mounting means;

a pair of dispensing blocks adjacently mounted to the mounting means, the dispensing blocks having spaced symmetrically oriented tape engaging surface portions between which the tape passes and which alternately engage the tape during movement of the head in the two opposing directions, the head imparting a tension through the dispensing blocks to the tape for drawing the tape past the dispensing blocks and onto the working surface; and

control means connected to the dispensing blocks for shift-

ing the dispensing blocks in unison, for alternately engaging the dispensing block tape engaging portions with the



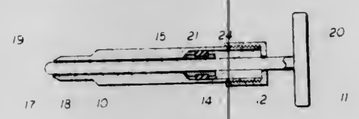
tape, and in the process, producing a localized tension relieving loop in the tape.

4,234,375

CUTTER-VACUUM-PLUNGER APPLICATOR

Richard Ciccarello, 9 Park Ave., Glen Cove, N.Y. 11542

Filed Mar. 19, 1979, Ser. No. 21,934
Int. Cl.[1] B26B *27/00*; B26F *1/32*
U.S. Cl. 156—530 **1 Claim**



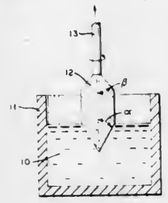
1. A triple action cutting, suction and plunger applicator to cut a dise of planar material and thereafter apply the cut dise to a concave cavity of a golf ball surface, comprising a barrel element having a dual diameter borehole centrally disposed therein and having a suitably sloped annular wall critically disposed therebetween, the small diameter of said borehole barrel being provided with a bottom circular cutting edge and the exterior of the barrel at the larger diameter borehole end being provided with screw threads; an integral plunger shaft element adapted to slidingly fit into the small diameter of said barrel and provided with a critically round end adapted to snugly fit a golf ball cavity, said shaft element having an integral collar critically located thereon and adapted to be disposed in the larger borehole, said collar having a pair of annular spaced-apart walls adapted to receive a flexible rubber ring, said collar having also a sloped wall adapted to mate with said sloped wall of said barrel upon innermost movement of said plunger element, said plunger element being further provided with handle means for effecting the movement thereof; a rubber pneumatic ring disposed slidingly and captively within said collar between the annular walls thereof; and an apertured interiorly screw threaded cap disposed slidingly upon said plunger shaft element adjacent said handle means to lockingly retain said shaft element to said barrel element.

4,234,376

GROWTH OF SINGLE CRYSTAL BERYLLIUM OXIDE

Robert C. Linares, Sherborn, Mass., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 1, 1979, Ser. No. 80,371
Int. Cl.[1] C30B *15/14*
U.S. Cl. 156—617 SP **12 Claims**



1. A process for growing beryllium oxide single crystals comprising the steps of:
(a) preparing a mixture comprising beryllium oxide and a second metal oxide wherein beryllium oxide comprises about 45 to 80 mol percent of said mixture,
(b) providing over said mixture a gaseous atmosphere substantially free of oxygen and water vapor,
(c) heating said mixture to a temperature at which the mixture becomes molten,
(d) lowering the temperature of said molten mixture to an intermediate temperature of about 1850° C. to 2050° C.,
(e) placing into the surface of said molten mixture a beryllium oxide seed crystal having an orientation within about 15° C. of (0001),
(f) rotating said seed crystal at about 1 to 15 rpm,
(g) pulling said seed crystal from said molten mixture at a rate of about 0.005 to 0.6 mm/hr and
(h) lowering the temperature at a rate of about 0.1° C./hr to 10° C./hr while heating said molten mixture using an induction heating frequency less than about 100 kHz so that beryllium oxide from said molten mixture grows on said seed crystal.

4,234,377

ASBESTOS TREATMENT

Paul A. Pezzoli, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 2, 1976, Ser. No. 737,888
Int. Cl.[1] C03B *37/00*
U.S. Cl. 162—3 **26 Claims**

1. A method of treating asbestos comprising depositing on at least a portion of the asbestos a sufficient amount of a material consisting essentially of at least one metal ferrocyanide to reduce the hemolytic activity of the asbestos to at least about 9 percent hemolysis.

4,234,378

MAGNET PAPER SHEET AND A METHOD FOR MANUFACTURING THE SAME

Susumu Iwasaki, Sakai; Osamu Nagasawa; Tatsuo Takano, both of Osaka, and Seiji Matsumoto, Sakai, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Filed Apr. 27, 1979, Ser. No. 34,007
Claims priority, application Japan, Apr. 27, 1978, 53-51718
Int. Cl.[1] D21H *3/78*
U.S. Cl. 162—138 **4 Claims**

1. A method for manufacturing a magnet paper sheet which comprises:
(a) adding to a slurry of paper forming fiber about 70–90 parts by weight of at least one ferrite powder selected from the group consisting of magnetoplumbite barium ferrite and magnetoplumbite strontium ferrite essentially consisting of particles of a primary particle size of about 0.1–2 microns and of secondary particle size smaller than about 20 microns;
(b) adding to the resultant slurry a cationic synthetic polymer electrolyte selected from the group consisting of a polyacrylamide, a polyamine, a polyamine-epichlohydrin condensation polymer and a polyethyleneimine;
(c) then adding to the resultant slurry of step (b) an anionic synthetic latex containing about 1–10 parts by weight of a synthetic polymer selected from the group consisting of a styrene-butadine copolymer, an acrylonitrile-butadiene copolymer, a polyvinyl acetate a polyacrylate, an acrylate-butadiene copolymer, an acrylate-acrylonitrile copolymer, an acrylate-styrene copolymer, a vinyl acetate-acrylate copolymer, a polyvinyl chloride, and an ethylene-vinyl acetate copolymer; the amount of the cationic synthetic polymer electrolyte being about 2–10% by weight of the dry weight of the anionic synthetic polymer latex;
(d) forming the thus obtained slurry into a paper sheet of about 0.1–2 mm in thickness; and
(e) magnetizing the paper sheet.

4,234,379

PROCESS FOR PRODUCING A UNIFORM FIBER DISPERSION AND MACHINE MADE LIGHT WEIGHT GLASS FIBER WEB MATERIAL

Bernard W. Conway, Holyoke; Nelson L. Fegley, Wilbraham, both of Mass., and James Moran, Simsbury, Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Continuation-in-part of Ser. No. 762,492, Jan. 26, 1977, abandoned. This application Jun. 2, 1978, Ser. No. 910,881
Int. Cl.[1] D21H *5/18*; D21F *11/00*
U.S. Cl. 162—145 **17 Claims**



1. A process of continuously producing a uniform fiber dispersion for wet papermaking operations from bundles of long fibers comprising the steps of: (1) providing an initial fiber slurry consisting essentially of a dispersing liquid having a viscosity of at least about 2 cps and long fibers in the form of at least partially unopened fiber bundles, the fibers in said bundles having a fiber length of about ¼ inch and more and a length to diameter ratio of about 400:1 to 3000:1; (2) continuously flowing said fiber slurry through an in-line dispersing chamber provided with a plurality of nonstapling impellers having an impeller blade diameter size relative to the capacity of the chamber of at least 0.1 in./gal., said impellers being adapted for generating trailing regions of reduced pressure and flow disruptive turbulence of high intensity, said slurry being fed continuously through said chamber at a throughput rate sufficiently faster than conventional papermaking fiber dispersing chambers to provide a chamber dwell time of only about ten minutes and less and a dispersion factor greater than 0.005, said factor being the quotient of said relative impeller size and the throughput rate of said slurry in tons per day; (3) subjecting said slurry to said regions with said turbulence being of sufficient intensity to rapidly open the fiber bundles and disperse the individual fibers during said dwell time within said chamber; and (4) removing the dispersed fibers and liquid from the chamber as a substantially uniform and homogeneous fiber dispersion for subsequent sheet formation in a wet papermaking operation.

8. A continuous water-laid machine-made light weight inorganic fibrous web of uniform fiber formation comprising inorganic fibers having a fiber length of about ¼ inch or more and up to about 15% by weight of a binder for the inorganic fibers; said web having a basis weight of about 5–30 grams per square meter, a microvariation in basis weight of less than 10%, a macrovariation in basis weight of less than 5%, an isolated fiber bundle defect count of less than 10 per 100 square feet wherein each multi-fiber defect is an agglomeration of fibers causing a local difference in web thickness of 0.5 mils and more, and a visually perceptible uniform fiber distribution essentially devoid of "cloud effect" fiber density variations.

4,234,380

POLYMERIC SILICATE MATERIAL AND A METHOD OF MANUFACTURING THE SAME

Per G. Kihlstedt, Bromma; Hedvig E. B. Hässler, Enskede, and Kai Ödeen, Lidingö, all of Sweden, assignors to Advanced Mineral Research AB, Stockholm, Sweden

Filed Jul. 7, 1978, Ser. No. 922,662
Claims priority, application Sweden, Jul. 8, 1977, 7707999
Int. Cl.[1] C04B *43/02*
U.S. Cl. 162—152 **23 Claims**

1. A particulate silicate material having substantially a fibre- or flake-like microstructure which is suitable for use as an insulating material and as a substitute for organic fibres in paper- and board-like webs and sheets, said particulate silicate material being formed by hydrothermally treating a slurry of a pulverent staring material at a temperature of approximately 175° to 325° C. and at a pH of at least 9 in the presence of water or condensed steam, said starting material having a specific surface of at least 40,000 cm^2/cm^3 (measured according to Blaine) and consisting essentially of a natural or synthetic silicate material having a hardness exceeding 6 on the Moh's hardness scale and being at least one of the compounds having the general formulae

$$2(R^{I}O).SiO_2$$

wherein R^I may be the same or different and is selected from the group consisting of Mg and Fe; and

$$3(R^{II}O).R_2{}^{III}O_3.3SiO_2$$

wherein R^{II} may be the same or different and is selected from the group consisting of Mg, Fe, and Ca, and R^{III} is Al or Fe.

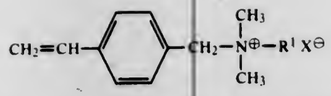
4,234,381

FIBROUS MATERIAL MADE WITH POLYMERS STABILIZED BY POLYMERIZABLE VINYL BENZYLTRIALKYL AMMONIUM SALT SURFACTANT

H. Scott Killam, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

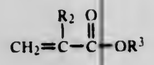
Division of Ser. No. 741,599, Nov. 15, 1976, Pat. No. 4,152,201, which is a division of Ser. No. 405,221, Oct. 10, 1973, Pat. No. 4,017,440. This application Feb. 1, 1979, Ser. No. 9,971
Int. Cl.[1] D21H *3/40*
U.S. Cl. 162—158 **9 Claims**

1. A sized fibrous product made by a method comprising the steps of applying a latex of an addition polymer of ethylenically unsaturated monomers to fibrous material, and curing the polymer, characterized in that the polymer has a molecular weight of between about 250,000 and 1,000,000, and is one which comprises 0.25 to 5.0% of the total polymer composition of a polymerized vinylbenzyltrialkyl ammonium salt having the formula:



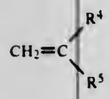
wherein R^1 is alkyl of from 8 to 22 carbon atoms and $X^{\ominus}$ is an anion, and which is emulsion copolymerized with one or more of monomers selected from:

(a) a monomer of the formula:



wherein R^2 is hydrogen or alkyl and R^3 is a straight chain, branched chain or cyclic alkyl, alkoxyalkyl, alkylthioalkyl, ureido, hydroxy lower alkyl, 2,3-epoxypropyl, amino lower alkyl, mono- or di- lower alkylamino, lower alkyl or hydroxyalkyl lower alkylamino lower alkyl, and

(b) a monomer of the formula:



wherein R^4 is hydrogen, methyl or halo and R^5 is hydrogen, halo, lower alkylanoyloxy, formyl, phenyl, N-hydroxyethyl, tolyl, methoxyethyl, 2,4-diamino-s-triazinyl, lower alkyl, or epoxy, said vinylbenzyltrialkyl ammonium salt being the sole surfactant in the latex.

4,234,382

FORMER FOR A PAPER MACHINE

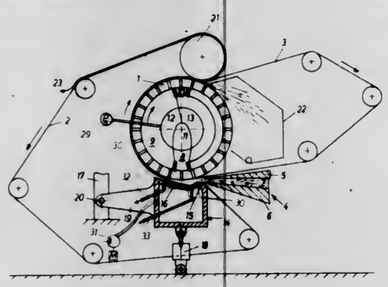
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,482

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754622

Int. Cl.³ D21F 1/36, 1/52

U.S. Cl. 162—263 **28 Claims**



1. A former for a paper machine, comprising:

a rotatable forming cylinder having a peripheral surface;

an inner belt and an outer belt, both being wrapped about said peripheral surface; said belts being so supported with respect to a section of said peripheral surface as to define between said belts a generally wedge-shaped inlet slot;

a nozzle for emitting a fiber suspension of pulp; said nozzle having an outlet opening of the width of said forming cylinder; said nozzle outlet opening being directed into said inlet slot;

a supporting device for said outer belt having the width of said forming cylinder, located downstream of said nozzle and generally at said inlet slot; said supporting device having a concave support surface, which is curved around an axis that is generally parallel to the axis of said forming cylinder, and said concave surface facing toward said outer belt, whereby as said outer belt runs into said inlet slot, said outer belt runs in contact with at least part of said concave surface;

said supporting device having an convex support surface, which is also curved around an axis generally parallel to the axis of said cylinder, and said convex surface facing toward said outer belt and being located upstream of said concave surface with respect to the flow from said nozzle, said convex surface being so placed and said nozzle outlet opening being so placed that fiber suspension emitted from said nozzle is emitted toward said inlet slot in the vicinity of said convex surface, whereby as said outer belt runs into said inlet slot, said outer belt first runs in contact with said convex surface before running in contact with said concave surface; said concave and said convex support surfaces being so placed and shaped that upon said outer belt passing over said convex support surface, said outer belt is held by said convex surface nearer to said forming cylinder peripheral surface and upon said outer belt passing over the portion of said concave surface adjacent to said convex surface, said outer belt is guided by said concave surface further from said forming cylinder peripheral surface.

4,234,383

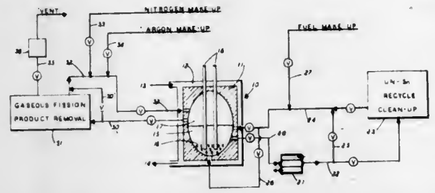
ACTINIDE NITRIDE-FUELED REACTOR AND CONTINUOUS METHOD OF OPERATING THE SAME

Robert N. Anderson, Palo Alto, and Norman A. D. Parlee, Los Altos Hills, both of Calif., assignors to Parlee-Anderson Corporation, Redwood City, Calif.

Continuation of Ser. No. 438,880, Feb. 1, 1974, abandoned, which is a continuation of Ser. No. 270,305, Jul. 10, 1972, abandoned, which is a division of Ser. No. 825,651, May 19, 1969, Pat. No. 3,843,765. This application May 15, 1978, Ser. No. 905,745

Int. Cl.² G21C 7/02, 15/00, 19/00

U.S. Cl. 176—37 **7 Claims**



1. A nuclear reaction process which comprises establishing, in an inert, refractory reactor vessel, a critical fuel system made of at least a mass comprising at least one nitride of an actinide fuel metal in solid form and, in contact therewith, a solution of the actinide fuel metal in a molten tin solvent, said solid actinide nitride fuel being disposed at the bottom portion of the reactor vessel, maintaining the critical fuel system so that fission continuously occurs, dissolving the metal fission products in said tin solution at a concentration below a critical level, maintaining the fuel system under an atmosphere of nitrogen under conditions of nitrogen pressure ranging from about 0.02 to about 2 atmospheres and of temperatures ranging from about 300° C. to 2000° C. sufficient to precipitate from solution an amount of actinide fuel nitride substantially equal to the loss of actinide fuel metal nitride from fission occurrence.

4,234,384

SUPPORT STRUCTURE FOR THE CORE OF A HIGH CAPACITY GAS COOLED HIGH TEMPERATURE REACTOR

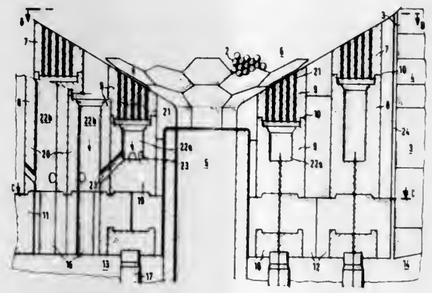
Rolf Fritz, Oftersheim, and Karl-Friedrich Kissel, Hemsbach, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,400

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718493

Int. Cl.² G21C 3/44

U.S. Cl. 176—58 PB **5 Claims**



1. Support structure for the core of a gas cooled high temperature, high capacity reactor said core comprising a bed of spherical fuel elements and being surrounded by an annular side reflector, said support structure comprising:

a plurality of layers of prismatic graphite blocks, arranged upon each other, said layers being constructed as a closed unit without expansion gaps with the blocks of one layer being interkeyed with the blocks of adjacent layers, and with the upper layers being composed of a plurality of preferably hexagonal graphite blocks;

a plurality of spherical fuel element removal passageways through the support structure;

a plurality of passages through said blocks for the cooling gas of the reactor;

a plurality of support units disposed as the lower layer of the support structure and consisting of several support segments fitted together to preferably form a hexagonal cross section;

a plurality of round columns supporting said support unit and having a column head and carrying a limited number of the hexagonal graphite blocks of said layers; and

a plurality of cooling gas channels disposed in locations of the bottom layer, representing the juncture of three support units.

4,234,385

NUCLEAR FUEL ELEMENT

Satoru Ozaki, Ichikawa; Yoshiharu Ochi, Yokohama, and Kazuo Matsumura, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 20, 1978, Ser. No. 898,373

Claims priority, application Japan, Apr. 22, 1977, 52/45805

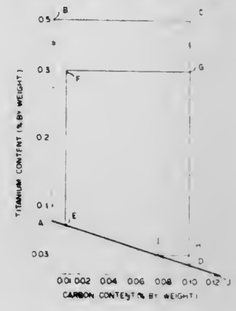
Int. Cl.² G21C 3/58

U.S. Cl. 176—68 **8 Claims**

1. A nuclear fuel element comprising a fuel body formed of nuclear fuel material and a clad covering the fuel body, the clad being formed of an austenitic stainless steel consisting essentially of nickel, chromium, silicon in an amount of more than 0 to less than 0.7% by weight, carbon and titanium in amounts satisfying the relationship:

$$17[C] + 27[Ti] \geq 2.1$$

where [C] represents the carbon content in % by weight and [Ti] the titanium content in % by weight, with the carbon content falling within the range 0.01 to 0.1% by weight and the titanium content falling within the range 0.03 to 0.5% by



weight, and the balance of iron, wherein said austenitic stainless steel is subjected to a final heat treatment at a temperature enough to permit the carbon and titanium to be formed substantially completely into a solid solution.

4,234,386

CONTINUOUS COKE MAKING

Harold T. Stirling, 39 Hoodridge Dr., Mount Lebanon, Pa. 15228

Filed Mar. 22, 1979, Ser. No. 22,872

Int. Cl.³ C10B 47/00, 53/08

U.S. Cl. 201—6 **6 Claims**

1. A method of preparing metallurgical reductants from coal comprising the steps of mixing a feed consisting essentially of an organic binder and one dry particulate coal capable of coalescing upon heating, compacting the resulting mixture into shaped forms, and heat-treating the shaped forms in a sequential temperature increasing regimen that limits the volatile matter expulsion to a maximum of 0.05 percent per minute while raising the temperature at a rate of less than 10° F. per minute during that period of time at which the coal is at a temperature at which there is a tendency for the coal to soften.

4,234,387

COKING POOR COKING COALS AND HYDROCRACKED TAR SAND BITUMEN BINDER

Biswa N. Nandi; Keith Belinko; Lynn A. Ciavaglia; Barry B. Pruden, all of Ottawa, and Jean-Marie D. Denis, Munster, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed Oct. 24, 1978, Ser. No. 954,322

Claims priority, application Canada, Apr. 28, 1978, 30227

Int. Cl.³ C10B 55/02

U.S. Cl. 201—23 **10 Claims**

1. In a process for manufacturing metallurgical coke which comprises adding binder pitch to particles of poor coking coals

and subjecting the coal with binder pitch added thereto to carbonization, the improvement which comprises utilizing as



the binder pitch a bitumen residue obtained from hydrocracking of bitumen from tar sands.

4,234,388

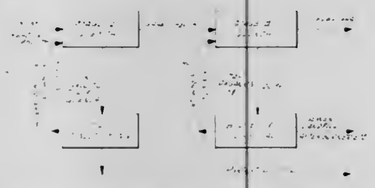
REMOVAL OF CHLORINE FROM PYROLYTIC OILS

George M. Mallan, Los Angeles, and George T. Preston, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 863,857, Dec. 20, 1977, abandoned, which is a continuation of Ser. No. 684,644, May 10, 1976, abandoned. This application Aug. 10, 1979, Ser. No. 65,737

Int. Cl.[3] C10B *57/02*; C10G *9/16*

U.S. Cl. 201—25 30 Claims



1. In a process for the pyrolysis of solid organic wastes which includes solid organic wastes which yield hydrogen chloride upon pyrolysis, and wherein dried, comminuted solid organic waste is passed through a pyrolysis zone maintained at a temperature from about 600° F. to about 2000° F. to form a pyrolysis product stream which comprises char and a gaseous component comprising water vapor, hydrogen chloride, and organic constituents comprising biodegradable organic constituents, a condensible pyrolytic oil and hydrocarbons, the method of recovering the condensible pyrolytic oil and a gaseous residue substantially free of hydrogen chloride which comprises:

(a) separating the char from the pyrolysis product stream to form a char-free pyrolysis effluent;

(b) contacting the char-free pyrolysis effluent with a hydrocarbon quench fluid which is substantially immiscible in pyrolytic oil in a pyrolytic oil quench zone to cool the char-free pyrolysis effluent to a temperature above the dew point of water and below the condensation temperature of a substantial portion of the condensible pyrolytic oil to form a two-phase immiscible liquid mixture of pyrolytic oil and the hydrocarbon quench fluid and leave a gaseous residue comprising hydrogen chloride, water vapor and organic constituents;

(c) separating the hydrocarbon quench fluid from the pyrolytic oil to recover the pyrolytic oil and recycling the separated hydrocarbon quench fluid to the pyrolytic oil quench zone; and

(d) passing the gaseous residue to a hydrogen chloride quench zone where the gaseous residue is contacted with an aqueous hydrogen chloride quench solution to cool the gaseous residue below the dew point of water to condense water vapor and extract hydrogen chloride from the gaseous residue.

4,234,389

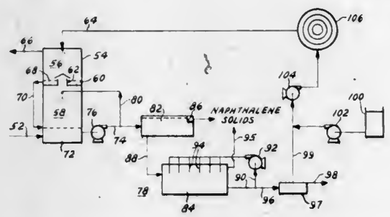
COOLING NAPHTHALENE-BEARING WATERS AND GAS STREAMS

James B. Lynn, Bethlehem; Otto A. Homberg, and Kenneth R. Burcaw, Jr., both of, Easton, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 21, 1979, Ser. No. 13,583

Int. Cl.[2] C07C *15/14*, *7/00*

U.S. Cl. 201—30 20 Claims



1. A method for cooling a naphthalene-bearing water stream that avoids heat exchanger blockage comprising

(a) providing a naphthalene-bearing water stream which contains less than about 225 ppm suspended naphthalenic solids,

(b) injecting an amount of a substantially water immiscible solvent for naphthalene into the naphthalene-bearing water stream which amount is effective to prevent blockage of a downstream indirect heat exchanger,

(c) mixing the solvent and water stream to afford a dispersion of the solvent in the water stream, and

(d) cooling the water stream containing the dispersed solvent in the indirect heat exchanger.

4,234,390

SYSTEM FOR CONTROL OF A COKING PLANT

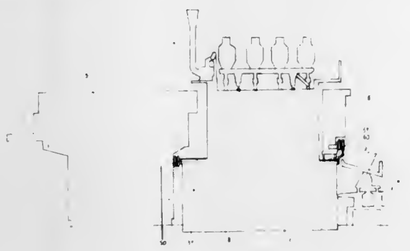
Jacobus H. Van Egmond, Alkmaar, and Lichtenveldt, Castricum, both of Netherlands, assignors to Hoogovens IJmuiden, B. V., IJmuiden, Netherlands

Filed May 3, 1978, Ser. No. 902,369

Claims priority, application Netherlands, May 11, 1977, 7705188

Int. Cl.[3] C10B *5/00*, *27/04*, *45/00*

U.S. Cl. 202—262 1 Claim



1. In a coking plant having a row of coking chambers for the coking of coal by dry distillation, a coke pusher machine movable along the row for pushing coke out of each chamber after coking of a charge of coal therein, a coke leveller member mounted on the coke pusher machine and movable to level the coke charge in a chamber before coking, induction coils arranged on the row of chambers and on the coke pusher machine for use in ascertaining by means of said induction coils the correct alignment of the coke pusher machine in relation to a given chamber, central data processing means which effects interlocking of operations in the coking plant, coking time control and coke oven selection, an ascension pipe for each chamber for the discharge from the chamber of the gases evolved during coking, means for injecting steam into the ascension pipe through a steam valve controlling passage of steam into the pipe, which valve is controlled by an electromagnetically operated air valve so as to create a sub-atomospheric pressure in the chamber and timing means for control of said injecting means, which timing means, after a chamber has been charged with coal, stops the injection of steam to the ascension pipe of that chamber when a period of time has elapsed following the commencement of the coking process in the chamber,

the improvement wherein the said timing means is electrically operated, is arranged and constructed to be actuated to start timing a said period of time by a command transmitted from the coke pusher machine via the said induction coils in the form of a series of electrical pulses, the timing means being connected to the data-processing means which is arranged so that the timing means cannot be actuated to start timing a said period in respect of a selected oven until the coking plant is in a desired condition for charging of that chamber, the timing means comprising a pulse counter and a pulse frequency generator which is adjustable to vary the frequency, there being a bistable flip-flop circuit between the said pulse counter and the said air valve, which circuit controls the air valve.

4,234,391

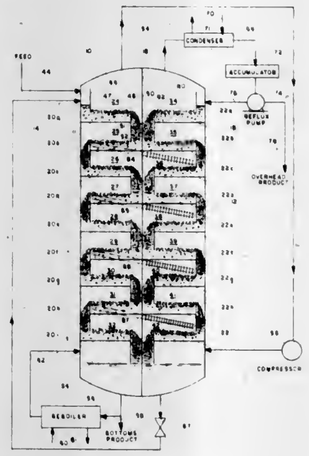
CONTINUOUS DISTILLATION APPARATUS AND METHOD

Junior D. Seader, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Oct. 13, 1978, Ser. No. 950,969

Int. Cl.[3] B01D *3/32*, *1/28*

U.S. Cl. 203—26 5 Claims



1. A distillation apparatus comprising:

a vertical column;

a longitudinal divider completely segregating the column into a stripping section and a rectifying section, the divider allowing each of the stripping section and the rectifying section to be maintained at different pressures; and

a plurality of heat pipes transecting the divider and extending between the stripping section and the rectifying section for transferring thermal energy from the rectifying section to the stripping section

3. A method for improving thermodynamic efficiency during the continuous distillation of multicomponent fluid mixtures comprising:

vertically orienting a closed vessel;

segregating the vessel with a longitudinal divider into a stripping section and a parallel rectifying section, the divider accommodating maintaining different pressures in the stripping section and the rectifying section,

forming a plurality of vapor/liquid contact stages in each of the stripping section and the rectifying section;

mounting a plurality of heat pipes between the stripping section and the rectifying section thereby thermally interconnecting at least some of the vapor/liquid contact stages of the stripping section with at least some of the vapor/liquid contact stages of the rectifying section with the plurality of heat pipes;

introducing a multicomponent fluid mixture into the stripping section adjacent the upper end of the stripping section as a feed stream;

separating vapor from the multicomponent fluid mixture in the stripping section during passage through the vapor/liquid contact stages, said vapor representing a lower boiling point fraction of the feed stream;

operating the rectifying section at a first pressure and at a higher temperature than the stripping section by removing said vapor from the stripping section and compressing said vapor to a second pressure prior to introducing said vapor into the rectifying section;

condensing vapor from the rectifying section and recycling a portion of the condensed vapor as a reflux liquid into the rectifying section; and

transferring thermal energy from the rectifying section to the stripping section with the plurality of heat pipes thereby conserving energy during the continuous distillation of said feed stream.

4,234,392

OIL SOLUBLE PHOTOGRAPHIC COUPLER RECLAMATION PROCESS

Sugihiko Tada; Kazuhiko Yanagihara, and Jun Arakawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 24, 1978, Ser. No. 927,202

Claims priority, application Japan, Aug. 3, 1977, 52-93231

Int. Cl.[2] B01D *3/12*; G03C *1/08*

U.S. Cl. 203—91 10 Claims

1. A process for reclaiming a photographic coupler from an aqueous oil-in-water emulsion of a coupler solvent oil having an oil-soluble photographic coupler dissolved therein comprising separating the coupler solvent oil containing the photographic coupler dissolved therein from the aqueous oil-in-water emulsion, and subjecting the separated coupler solvent oil containing the photographic coupler dissolved therein to a high vacuum molecular distillation whereby only the coupler solvent oil is removed as a distillate.

4,234,393

MEMBRANE PROCESS FOR SEPARATING CONTAMINANT ANIONS FROM AQUEOUS SOLUTIONS OF VALUABLE METAL ANIONS

Malcolm T. Hepworth, Golden, and John M. Laferty, Wheatridge, both of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Apr. 18, 1979, Ser. No. 31,325

Int. Cl.[3] C25C *1/22*

U.S. Cl. 204—1.5 28 Claims

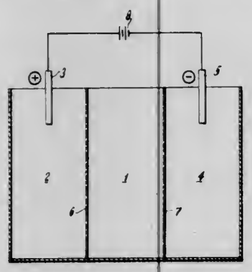
1. A process for refining a pregnant solution containing alkali metal cations, at least one oxyanion of a valuable metal selected from the group consisting of molybdenum, tungsten, vanadium, and uranium, and at least one contaminant anion

selected from the group consisting of PO_4^{-3}, SO_4^{-2}, NO_3^-, Cl^-, ClO_3^-, and ClO_4^-, which comprises:

(a) providing a first electrolytic cell having an anode compartment equipped with an insoluble anode, a cathode compartment equipped with an insoluble cathode, and a feed compartment separating the anode compartment from the cathode compartment, said anode compartment being separated from said feed compartment by an anion-permselective membrane and said cathode compartment being separated from said feed compartment by a cation-permselective membrane;

(b) establishing an aqueous solution in the anode compartment so that the anode is immersed therein;

(c) establishing an aqueous solution in the cathode compartment so that the cathode is immersed therein;



(d) feeding to the feed compartment pregnant solution having a contaminant anion concentration of at least about 50 grams per liter and a valuable metal oxyanion content of between about 25 and 200 grams per liter;

(e) adjusting the pH of said pregnant solution in said feed compartment to a value between about 0.5 and about 4; and

(f) impressing an electric potential of at least about 10 volts between the anode and cathode until the contaminant anion concentration in the pregnant solution is lowered by at least about 25 grams per liter, whereby contaminant anions from said pregnant solution migrate preferentially to the anode compartment to generate a strong acid solution, the alkali metal cations migrate to the cathode compartment to generate a strong caustic solution.

4,234,394

METHOD FOR PRODUCING AN INFORMATION CARRIER DISC

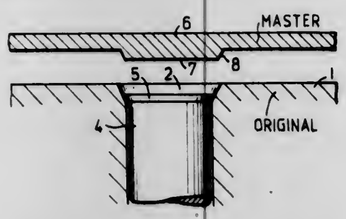
Heinz Borchard, Nortorf, Fed. Rep. of Germany, assignor to Teldec Telefunken-Decca Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,573

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821297

Int. Cl.³ C25D *1/10*

U.S. Cl. 204—5 **11 Claims**



1. In a method for producing a record copy disc by cutting a spiral groove into an original provided with centering means centered relative to the spiral groove, electrochemically transferring the groove pattern from the original to a master and forming the copy disc from the master, the improvement wherein said step of transferring comprises reproducing the centering means electrochemically on the master, and said step of forming the copy disc comprises forming centering means on the copy disc from the reproduced centering means on the master.

4,234,395

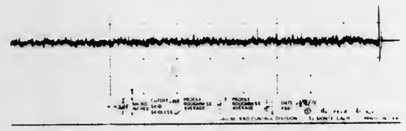
METAL COMPOSITES AND LAMINATES FORMED THEREFROM

Betty L. Berdan, Willowick, and William M. King, Mentor, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 652,139, Jan. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 431,060, Jan. 7, 1974, abandoned. This application Oct. 18, 1978, Ser. No. 952,512

Int. Cl.³ C25D *1/04, 5/44*

U.S. Cl. 204—12 **2 Claims**



1. A method of forming a metal composite for use as a component of a laminate for printed circuits comprising:

(a) mildly and uniformly etching an aluminum alloy surface with an aqueous solution of an alkaline etchant, said alloy consisting of at least about 99 wt. % aluminum, up to about 1.00 wt % silicon plus iron, from about 0.05 to about 0.20 wt. % copper, up to about 0.05 wt. % manganese and up to about 0.10 wt. % zinc,

(b) electrocathodically depositing directly on said etched surface a foil of copper to a thickness within the range of about 0.1 to about 0.4 mils, the uniformity of etching performed in step (a) being characterized by the copper foil being uniformly adhered to the aluminum alloy surface, and

(c) electrocathodically overplating the exposed face of the copper foil with a coating of a material selected from the group consisting of zinc and indium, said coating having a thickness within the range of about 10 to about 25 microinches and providing a peel strength between the copper foil and said aluminum alloy surface with a value within the range of about 0.3 to about 2 lbs./in. of width of copper foil, after bonding the overplated face of the copper foil by heat and pressure to a resinous substrate.

4,234,396

CHROMIUM PLATING

Mark Perakh, 110 E. Talpiot; Hana Ginsburg, 413 Neve Yaacov; Erna Salomon, 2/9 Mavo Kzia St.; Valentina Shargorodsky, 28/6 Ramot, and Liuba Rubinstein, 116/19 Chevroni St., all of Jerusalem, Israel

Filed Mar. 7, 1979, Ser. No. 18,365

Claims priority, application Israel, Mar. 8, 1978, 54230; Mar. 8, 1978, 54231

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 **12 Claims**

1. A plating bath for electroplating various metals with chromium, consisting essentially of the composition resulting from the combination of 100–1600 g/l of chromium trioxide and one or more of the following:

0.3–15 weight % Cl or Cl^- based on the chromium trioxide, and

0.5–10 weight % I or I^- based on the chromium trioxide.

4,234,397

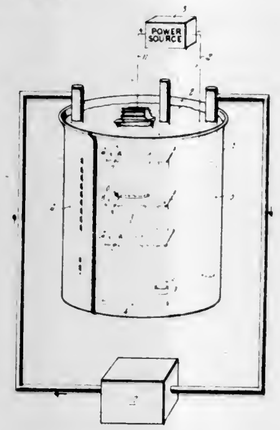
NONDESTRUCTIVE METALLOGRAPHIC EXAMINATION OF GAS TURBINE COMPONENTS

Charles T. Torrey, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 15, 1978, Ser. No. 933,945

Int. Cl.³ C25F *3/02, 5/00*

U.S. Cl. 204—129.35 **3 Claims**



1. A nondestructive method for examining gas turbine engine components, of the type having a superalloy substrate and a protective aluminide coating thereon, after service including the steps of:

a. mechanically abrading the blade surface to remove any oxide coating;

b. immersing the blade in an electrolytic solution in which an electrode is also immersed;

c. applying a voltage between the blade and the electrode, through the electrolytic solution, so that the blade is positive respect to the electrode;

d. regulating the voltage to cause electropolishing of the component until the aluminide coating is essentially removed to expose the substrate;

e. changing the voltage by means external to the electrolyte-blade-electrode combination, to cause electroetching of the underlying substrate;

f. examining the etched substrate, by optical or electron microscopy techniques to determine the metallographic structure and gamma prime morphology so as to determine the condition of the substrate and its suitability for further use.

4,234,398

CARBON FIBER SURFACE TREATMENT

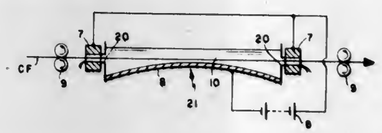
Ryuichi Yamamoto, Ehime, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,880

Claims priority, application Japan, Apr. 12, 1978, 53-42098

Int. Cl.³ C01D *7/34;* **B01K** *1/00*

U.S. Cl. 204—130 **15 Claims**



1. In a method for continuously surface treating a carbon fiber, wherein the fiber is connected electrically to an anode current input having a predetermined location and conducted on the run with successive portions of said fiber moving toward or away from said input and through an electrolytic treatment bath which contains an electrolyte and a cathode, wherein said cathode is positioned along the fiber path in the bath and wherein the fiber is subjected to electrolytic oxidation treatment in the bath, the method step selected from the group consisting of

(a) conducting moving portions of the fiber closer to the cathode in the bath as said fiber portions move away from the anode current input, and

(b) moving the fiber portions farther from the cathode in the bath as they move toward said anode current input, whereby the current density applied to the fibers is maintained substantially constant along the fiber path through said bath.

4,234,399

RADIATION CURABLE COMPOSITIONS CONTAINING ACYLOIN URETHANE COMPOUNDS

John R. McDowell; Dennis D. Howard, and Vincent J. Pascarella, all of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Division of Ser. No. 950,970, Oct. 13, 1978. This application Jun. 18, 1979, Ser. No. 49,664

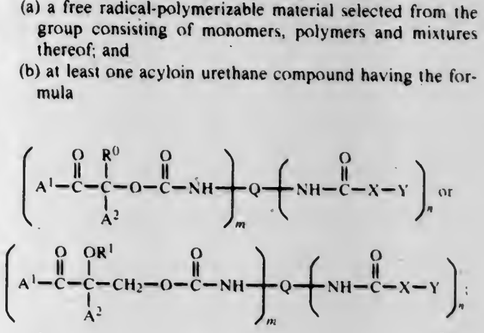
Int. Cl.³ C08F *2/46*

U.S. Cl. 204—159.15 **25 Claims**

1. A coating composition comprising

(a) a free radical-polymerizable material selected from the group consisting of monomers, polymers and mixtures thereof; and

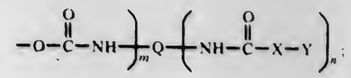
(b) at least one acyloin urethane compound having the formula



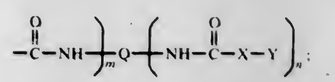
wherein

A^1 and A^2 are the same or different and each is benzenoid or nonbenzenoid aromatic radical;

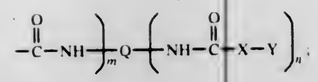
R^0 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms, or $—OR^2$, or



R^1 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms, or $—R^3—O—R^4$, or

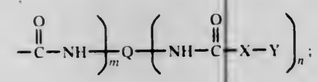


R^2 is a hydrogen, or an aliphatic, cycloaliphatic or aromatic radical having from 1 to 9 carbon atoms, or $—R^3—O—R^4$, or



R^3 is a divalent aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms;

R^4 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical having from 1 to 9 carbon atoms; or



Q is the monovalent or polyvalent residue of a monomeric aliphatic, cycloaliphatic or aromatic isocyanate compound having at least one isocyanate group or of an isocyanate-functional polymeric material characterized by the presence of at least one isocyanate group, which residue remains after reaction of all isocyanate groups of such monomeric compounds and polymeric materials with at least one saturated or unsaturated compound containing at least one isocyanate-reactive active hydrogen atom;

X is selected from the group consisting of —O—, —S— and >N—R^5, wherein R^5 is hydrogen or an alkyl group having from 1 to 9 carbon atoms;

Y is hydrogen or the organic residue of a saturated or unsaturated organic compound containing at least one isocyanate-reactive active hydrogen atom, which residue remains after reaction of at least one such active hydrogen atom with an isocyanate moiety;

m is a number in the range from 1 to f, wherein f is the total number of isocyanate groups per molecule of isocyanate compound; and

n is equal to f-m.

4,234,400

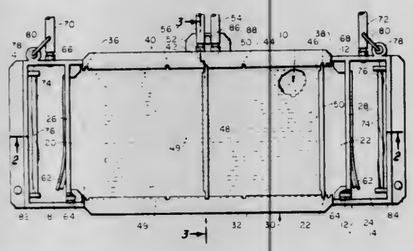
HORIZONTAL SLAB GEL ELECTROPHORESIS

Donald A. Kaplan, Topanga Canyon, and Gary L. Wilcox, Malibu, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 873,448, Jan. 30, 1978, Pat. No. 4,151,065. This application Jan. 26, 1979, Ser. No. 6,826

Int. Cl.[2] **G01N** *27/26, 27/28*

U.S. Cl. 204—180 G **8 Claims**



1. An electrophoresis method comprising:

forming vertical wicks of a gel;

hardening said vertical wicks;

forming a horizontal slab of gel between said vertical wicks and in contact therewith;

forming a plurality of sample wells simultaneously with the formation of said horizontal slab;

applying an electric current to said horizontal slab through said vertical wicks whereby sample molecules migrate into said horizontal gel and are resolved from each other on the basis of size and/or charge.

4,234,401

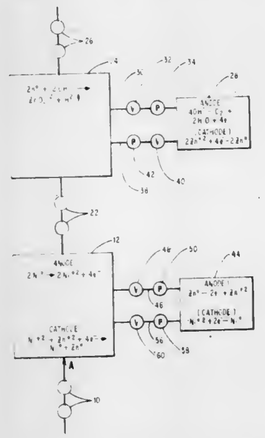
METHOD FOR RECOVERY AND USE OF ZINC FROM A LEACH SOLUTION

James R. Brannan, Perry, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 22, 1979, Ser. No. 51,053

Int. Cl.[3] **C25C** *1/08, 1/16, 1/24*

U.S. Cl. 204—149 **6 Claims**



1. In a process for the deposition of an active nickel-zinc alloy coating on cathode substrates to be utilized in electrolytic processes wherein a nickel-zinc alloy is electrodeposited on said cathode from a plating solution containing nickel ions and zinc ions and utilizing a nickel anode followed by the leaching of the zinc component of the alloy deposit into a solution of 50-400 grams per liter sodium hydroxide, a process for the recovery of zinc from the leach solution comprising the steps of:

transferring a portion of the leach solution to a remote tank;

immersing a cathode substrate in said leach solution in said remote tank;

immersing an insoluble anode in said leach solution in said remote tank;

electrically connecting said anode and said cathode to a source of direct current and electrolyzing said leach solution, and

removing zinc metal deposited on said cathode from said remote tank.

4,234,402

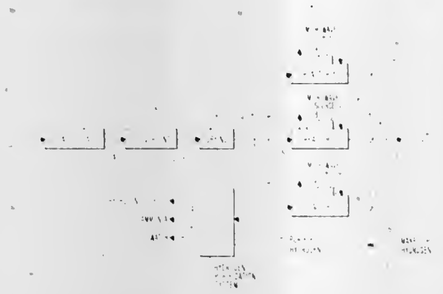
SULFUR REMOVAL FROM CRUDE PETROLEUM

Chalmer G. Kirkbride, 13 Elk Forest, R.D. #2, Elkton, Md. 21921

Division of Ser. No. 831,170, Sep. 7, 1977, Pat. No. 4,123,230. This application Oct. 24, 1978, Ser. No. 954,302

Int. Cl.[3] **C07C** *3/24*

U.S. Cl. 204—162 R **8 Claims**



1. Process for reducing the sulfur content of crude petroleum which comprises subjecting a mixture of said crude petroleum having a free moisture content below 0.5 weight percent and hydrogen to microwave energy.

4,234,403

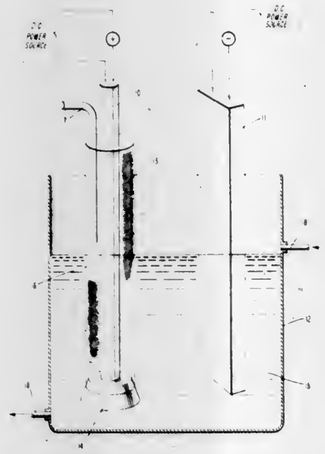
ELECTROLYTIC PROCESS FOR THE PRODUCTION OF STANNOUS CHLORIDE PRODUCTS

John A. Franks, Jr., Vermilion, Ohio, assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Jun. 15, 1979, Ser. No. 48,829

Int. Cl.[3] **B01D** *13/02;* **C25C** *1/14*

U.S. Cl. 204—180 P **14 Claims**



1. An electrolytic process for the production of stannous salts in an electrolytic cell, comprising an anode compartment and a cathode compartment and a cationic permselective barrier between the anode and cathode compartments comprising introducing stannic anions into the cathode compartment of the electrolytic cell, providing an electrolyte in the anode compartment, applying direct current to the anode and cathode to produce stannous ions in the cathode compartment while substantially simultaneously preventing migration of stannous anions between the cathode and anode compartments by maintaining an electrolyte fluid impermeable cationic permselective barrier between the anode and cathode, removing produced gas from the anode compartment and removing the stannous ions from the cathode compartment.

4,234,404

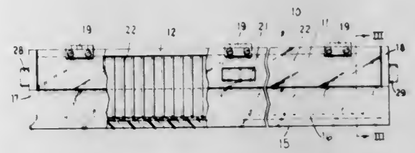
HORIZONTAL ELECTROPHORESIS OR ISOELECTRIC FOCUSING APPARATUS

Paul S. Satoh, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 11, 1979, Ser. No. 29,063

Int. Cl.[3] **G01N** *33/16, 27/26*

U.S. Cl. 204—299 R **7 Claims**



1. An electrophoresis or isoelectric focusing apparatus comprising:

an elongated, electrically non-conductive, horizontal vessel having wall means defining an impermeable side wall and a pair of impermeable end walls; a pair of horizontally spaced-apart electrodes disposed inside said vessel close to the opposite ends thereof and adapted to be connected to a source of electrical potential for electrophoresis or isoelectric focusing; said vessel having therein a multiplicity of electrically non-conductive, impermeable, upright, generally parallel, horizontally spaced-apart partitions extending from one portion of said side wall transversely to the longitudinal axis of said vessel and partway across the cross section of said vessel, said partitions terminating at locations transversely spaced from the portion of said side wall that is opposed to said one portion of said side

wall, so as to divide the space within said vessel into an unobstructed zone defined by the remainder of the cross section of said vessel and which extends from one longitudinal end to the other longitudinal end of said vessel and a multitude of separate horizontally spaced-apart compartments the inner ends of which compartments are open to said unobstructed zone, said compartments otherwise being isolated from each other, whereby a layer of starting species and an electrophoresis or isoelectric focusing medium can be placed in said unobstructed zone and subjected to electrophoresis or isoelectric focusing therein and then fractions of said starting species can be moved into said compartments by turning said vessel about the horizontal longitudinal axis thereof.

4,234,406

NONPLATING CATHODE AND METHOD FOR PRODUCING SAME

Richard A. Bird, and Lowell W. Austin, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 921,674, Jul. 3, 1978, Pat. No. 4,160,703, which is a division of Ser. No. 830,834, Sep. 6, 1977, Pat. No. 4,145,267. This application Apr. 5, 1979, Ser. No. 27,450

Int. Cl.³ C25D *17/10*

U.S. Cl. 204—292 **1 Claim**

1. A lead cathode intrinsically having a surface which is immune to plating zinc thereon when immersed in an electrolytic galvanizing bath.

4,234,405

ELECTRODE FOR ELECTROCHEMICAL PROCESSES

Bernard Hesketh, Frodsham, and Nicholas W. J. Pumphrey, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 450,200, Mar. 11, 1974, which is a continuation-in-part of Ser. No. 289,742, Sep. 15, 1972, abandoned. This application Nov. 8, 1979, Ser. No. 92,507

Claims priority, application United Kingdom, Sep. 16, 1971, 431901/71; Oct. 26, 1973, 49898/73

Int. Cl.³ C25B *11/06, 1/36*

U.S. Cl. 204—290 F **13 Claims**

1. In an electrode suitable for use as an anode in a mercury cathode cell which comprises a support member made of a film-forming metal or a film-forming metal alloy and an electrocatalytically active coating thereon comprising an electroconducting material selected from the group consisting of platinum group metals, oxides thereof and mixtures of at least one such metal or oxide with one or more non-noble metal oxides, said coating being obtained by thermally decomposing a precursor for each component thereof, the improvement whereby said coating consists of a matrix of said electroconducting material having embedded therein a non-conducting refractory material in discrete form and having a resistivity greater than about 10 ohms-cm, said embedded refractory material being selected from the group consisting of:

(a) particulate non-conducting refractory material wherein the particles have a size range of up to 200 microns,

(b) fibrous non-conducting refractory material wherein no dimension of individual fibers exceeds 1 mm and

(c) mixtures of such fibrous and particulate refractory material, the embedded refractory material being present in particulate and/or fibrous form in admixture with the precursors for said coating before said precursors are thermally decomposed to form said coating and remaining in said form throughout the preparation of said coating, the proportion of embedded refractory material embedded in the coating being 5% to 95% by volume calculated on the total volume of the components in the coating, said embedded refractory material modifying the surface characteristics of the coating and thereby increasing the electrical contact resistance thereof to mercury with consequent reduction in undesirable shorting effects, said embedded refractory material comprising zirconium silicate.

4,234,407

REACTOR AND METHOD FOR HYDROCRACKING CARBONACEOUS MATERIAL

Dennis A. Duncan, Downers Grove; Justin L. Beeson, Clarendon Hills, both of Ill.; R. Donald Oberle, Hammond, Ind., and Henry A. Dirksen, Harvey, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1979, Ser. No. 15,257

Int. Cl.³ C10G *1/00;* **C10B** *1/04*

U.S. Cl. 208—8 R **14 Claims**

1. A method of cracking solid carbonaceous material in the presence of a reducing gas containing hydrogen comprising:

entraining said carbonaceous material as particles in the reducing gas containing hydrogen to form a cocurrent flow of gas and carbonaceous solids;

preheating said cocurrent flow to a temperature of at least 800° F.;

injecting a first quantity of oxygen containing gas into the cocurrent flow at a temperature above the ignition temperature of the resulting mixture to react within a combustion zone to raise the temperature of the carbonaceous particles to above their decomposition temperature and form hydrocarbon products;

injecting at least a second quantity of oxygen containing gas into the cocurrent flow at a location downflow of said first injection to again produce at least another combustion zone and a cocurrent flow temperature of about 1400°–1800° F. at a pressure of about 1500–2500 psig to decompose and hydrogenate carbonaceous material to form hydrocarbon products;

quenching the cocurrent flow of gas and solids to below the temperature at which dehydroxylation and dealkylation of aromatics proceeds toward increasing benzene concentration; and

recovering the hydrocarbon products from the process.

4,234,408

PROCESS FOR HYDROCRACKING CARBONACEOUS MATERIAL IN LIQUID CARRIER

Dennis A. Duncan, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1979, Ser. No. 29,963

Int. Cl.³ A45C *11/02;* **B65D** *85/18*

U.S. Cl. 208—8 R **7 Claims**

1. A method of hydrocracking solid carbonaceous material in the presence of hydrogen gas to produce hydrocarbon products comprising in combination:

mixing recycled liquid with feed particles of carbonaceous solids to form a slurry;

injecting hydrogen gas into a flow of said slurry to form a flow of multiphase mixture including carbonaceous particles, liquid and hydrogen gas;

heating said multiphase flow to a temperature of 600°–1200° F. to dissolve agglomerating bitumins and polynuclear aromatics into the liquid phase;

heating said flow to a temperature of 1200°–1800° F. to vaporize said liquid and form a substantially liquid-free gas-solids flow and to decompose and reduce the concentration of polynuclear aromatics within said gas-solids flow;

quenching said gas-solids flow to a temperature below 1200° F. to condence and separate liquid along with remaining carbonaceous char solids from the remaining gases;

fractionating said condensed liquid to form at least three fractions according to boiling point comprising light oil (**39**), relatively high boiling point liquid (**38**) and heavy oil (**37**);

withdrawing said light oil (**39**) as a hydrocarbon product;

recycling said relatively high boiling point liquid (**38**) to slurry said feed particles of carbonaceous material;

reacting said heavy oil (**37**) along with said remaining carbonaceous char solids with steam and oxygen at gasifier conditions to produce hydrogen gas, said char and heavy oil containing about one-half the carbonaceous material introduced in said carbonaceous feed particles; and

returning said hydrogen gas to inject into said slurry flow of carbonaceous feed particles and liquid.

4,234,409

PROCESS FOR THE PRODUCTION OF LUBRICATING BLEND STOCKS

Richard D. Schieman, Rocky River, and John H. Steffens, Lynhurst, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Feb. 28, 1979, Ser. No. 16,046

Int. Cl.³ C10G *71/00, 73/02*

U.S. Cl. 208—28 **6 Claims**

1. In a process for the production of lubricating oil blend stocks in which a refinery stream comprising an atmospheric distillation column residue is vacuum distilled, extracted and dewaxed; the improvement comprising including in said refinery stream a hydrogenated gas oil having at least 80% boil off in the range of 500° to 1200° F.

4,234,410

TEMPERATURE CONTROL OF EXOTHERMIC REACTIONS

Carl S. Kelley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1979, Ser. No. 23,355

Int. Cl.³ B01J *8/04;* **C07C** *7/167*

U.S. Cl. 208—57 **36 Claims**



19. A method for removing a first constituent in a feed stream, wherein said feed stream is supplied to at least two reaction zones in series, comprising the steps of:

establishing a first signal representative of the concentration of said first constituent in said feed stream being supplied to the first reaction zone of said at least two reaction zones in series;

establishing a second signal representative of the percentage of said first constituent, in said feed stream flowing to said first reaction zone, which should be removed in said first reaction zone;

establishing a third signal representative of the desired concentration of said first constituent in said feed stream flowig from said first reaction zone to the second reaction zone of said at least two reaction zones in series in response to said first signal and said second signal;

establishing a fourth signal representative of the actual concentration of said first constituent in the feed stream flowing from said first reaction zone to said second reaction zone;

establishing a fifth signal, representative of the temperature of said feed stream entering said first reaction zone necessary to maintain the desired concentration of said first constituent in the feed stream flowing from said first

reaction zone to said second reaction zone, in response to said third signal and said fourth signal;

establishing a sixth signal representative of the actual temperature of the feed stream flowing to said first reaction zone;

comparing said fifth signal and said sixth signal and establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

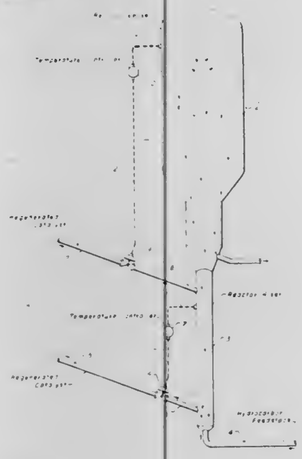
manipulating the temperature of said feed stream flowing to said first reaction zone in response to said seventh signal.

4,234,411

FLUID CATALYTIC CRACKING PROCESS

Gregory J. Thompson, Waukegan, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 15, 1979, Ser. No. 20,771
Int. Cl.³ C10G *11/18, 37/02*
U.S. Cl. 208—74 **1 Claim**



1. A process for catalytically cracking a hydrocarbonaceous feedstock wherein fluidizable cracking catalyst that has become deactivated with coke deposits is withdrawn from a hydrocarbon cracking reaction zone, stripped of volatile material, passed to a regeneration zone for removal of said coke deposits and recycled thereafter in divided streams to a reactor riser situated upstream of said hydrocarbon cracking reaction zone, wherein said manner of recycling said stripped and regenerated catalyst to said reactor riser is controlled by:

(a) contacting a first portion of said divided regenerated catalyst recylce stream with said hydrocarbonaceous feedstock in said reactor riser at a flow rate of said first portion of regenerated catalyst responsive to a first temperature determined within said reactor riser intermediate said first portion of catalyst admixture with said hydrocarbonaceous feedstock and entry of a second portion of said regenerated catalyst; and

(b) contacting a second portion of said regenerated catalyst with said admixture comprising said feedstock and said first portion of regenerated catalyst in said reactor riser at a flow rate of said second portion of regenerated catalyst responsive to a second temperature determined within said hydrocarbon reaction zone situated downstream of said reactor riser containing said first temperature determination point and both said first and second regenerated catalyst recycle entry points.

4,234,412

PROCESS FOR UPGRADING OF FISCHER-TROPSCH PRODUCTS

Michael A. M. Boersma, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1979, Ser. No. 39,247
Claims priority, application Netherlands, May 22, 1978, 7805494
Int. Cl.³ C10G *59/06*
U.S. Cl. 208—80 **8 Claims**

1. A process for upgrading a Fischer-Tropsch hydrocarbon synthesis reaction product which comprises:

Separating from said reaction product at least:

(a) a light fraction consisting substantially of gaseous and/or liquid components boiling at a temperature below about 250° C., and

(b) a heavy fraction, a major portion of which has an atmospheric boiling point above 200° C.; and

Contacting at least one of said light and heavy fractions at a temperature in the range from about 200° to about 550° C., a pressure below 100 bar and a space velocity in the range from about 0.1 to about 50 liters per liter per hour with a catalyst containing a crystalline silicate which

(i) is thermally stable to temperatures above 600° C.,

(ii) after dehydration at 400° C. in vacuum, is capable of adsorbing more than 3%w water at 25° C. and saturated water vapor pressure, and

(iii) in dehydrated form, has the following overall composition, expressed in moles of the oxides:

$(1.0\pm0.3)\ (R)_{2/n}O.[a\ Fe_2O_3.b.Al_2O_3.cGa_2O_3].\ y(d\ SiO_2.eGeO_2O)$, where:

R=one or more mono or bivalent cations,

$a>0.5$

$b\geqq0$

$c\geqq0$,

$a+b+c=1$,

$y=10-600$,

$d\geqq0.1$,

$e\geqq0$,

$d+e=1$, and

n=the valency of R,

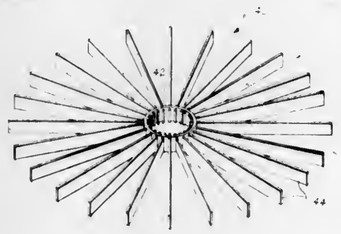
whereby in the case of said light, an aromatic gasoline product is obtained and in the case of said heavy fraction, a fuel oil product having a lower pour point than that of said heavy fraction is obtained.

4,234,413

METHOD AND APPARATUS FOR SELF-CLEANING DRILLING MUD SEPARATION SYSTEM

Don D. Summers, P.O. Box 30179, Lafayette, La. 70503

Continuation-in-part of Ser. No. 863,475, Dec. 23, 1977, Pat. No. 4,152,253. This application Feb. 1, 1979, Ser. No. 8,751
Int. Cl.³ B03B *7/00*
U.S. Cl. 209—17 **3 Claims**



1. In a system for separating drill solids from drilling mud comprising a frame, a support base, a means for imparting vibration to said system, a separator vessel and a self cleaning screen assembly comprising separator screen and a lower support device, the improvement comprising

an assemblible screen cleaning device for use with said screen assembly, said device comprising:

(1) A central member having a plurality of slots therein, each for receiving an elongated screen cleaning member;

(2) a plurality of elongated screen cleaning members, one of each of which is loosely inserted into 1 of each of said slots in said central member for enabling freedom of movement, each of said members extending radially outwardly and forming a plane with said central member; and

(3) said screen cleaning device being positioned between said lower support device and said separator screen, for continually wiping, unclogging and cleaning said separator screen as said screen cleaning device vibrates vertically and rotates about said vibration imparting means in said plane.

4,234,414

PHOSPHATE BENEFICIATION PROCESS

Robert E. Hefner, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1978, Ser. No. 946,487
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **7 Claims**

1. In a process for beneficiating a siliceous phosphate ore by froth flotation with a collector system for the flotation of siliceous matter, wherein fuel oil is present during flotation as an adjuvant to the collector, the improvement wherein the collector system comprises an enhancing amount of a condensate or an acid salt of a condensate of a polyethylene polyamine corresponding to the formula

$$H_2N-C_2H_4NH-_xC_2H_4-NH_2$$

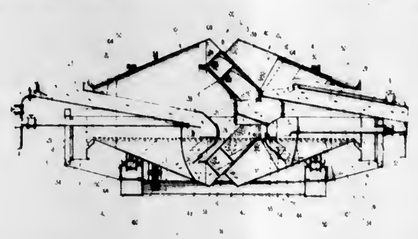
wherein x is an integer of 4 to 11, with a tall oil fatty acid or tall oil fatty acid ester.

4,234,415

APPARATUS FOR SEPARATING SOLIDS

Enrique de Tuya Casuso, Juan de Badajoz, 11-2°, IZQ, Leon, Spain

Filed Feb. 12, 1979, Ser. No. 11,638
Int. Cl.³ B03B *5/42*
U.S. Cl. 209—172.5 **37 Claims**



1. Apparatus for separating mixed solids of two different specific gravities by means of a liquid medium having a specific gravity between said two specific gravities, comprising:

rotatable means defining a frustro-conical separation chamber, said chamber having a lighter solid outlet at one end defining the liquid medium level in said chamber and a heavier solid outlet at the other end; and said chamber having its least cross section adjacent said lighter solid outlet;

transverse wall means stationarily mounted in said separation chamber for dividing a lower portion of said separation chamber into a lighter solid zone and a heavier solid zone, said wall means having a substantially arcuate lower surface complementary with, and adjacent, the surface of said frustro-conical separation chamber at least the outer ends of said wall means being positioned between the minimum and maximum cross sections of said frustro-conical separation chamber;

means for supplying the mixed solids and liquid medium to said chamber, said liquid medium overflowing through said lighter solid outlet;

means at least in said arcuate lower surface for passage of solids through said wall means;

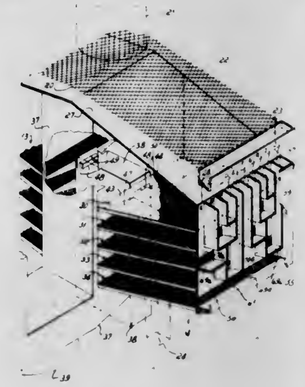
means for removing solids accumulating in said heavier solid zone through said heavier solid outlet.

4,234,416

FEED STREAM SPLITTER FOR MULTIPLE DECK SCREENING MACHINE

William E. Lower, Cincinnati; Stephen C. Mitchell, West Chester, and Jeremy F. Simpson, Cincinnati, all of Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Filed Aug. 23, 1979, Ser. No. 68,908
Int. Cl.³ B07B *1/28*
U.S. Cl. 209—247 **11 Claims**



1. In a multiple deck screening machine wherein particulate material to be screened falls into a series of chutes which divide it into fractions and direct the respective fractions onto screens in a stack,

a feed splitter comprising,

a series of vertically extending dividers positioned in the path of the falling particulate material, the dividers defining channels between them, the dividers dividing the falling material into separate fractions as it falls into the respective channels,

each channel leading downwardly to a separate chute which directs the respective fraction from the channel onto a screen of the stack, the chutes being at different vertical positions according to the vertical positions of the screens to which they lead,

the lower chutes including portions extending laterally from their respective channels into the areas below upper chutes, to provide flow areas which are wider than the respective channels which feed them, thereby providing wider entrances onto the respective screens.

4,234,417

FIBROUS STOCK SCREEN

W. Thomas Gauld, and Eigild S. Thomsen, both of Mobile, Ala., assignors to Gauld Equipment Manufacturing Co., Theodore, Ala.

Filed Mar. 29, 1979, Ser. No. 25,285
Int. Cl.³ B07B *1/20*
U.S. Cl. 209—306 **12 Claims**

7. An improved apparatus for screening fibrous stock of the type including a hollow housing member having an inlet port

for allowing fibrous stock to be introduced into the interior thereof and having an outlet port for allowing screened fibrous stock to be discharged therefrom; a cylindrical, open ended screen member positioned within said housing member; said housing member including structure means for fixedly mounting said screen member within said housing member and for isolating the outer side of said screen member to divide the interior of said housing member into a first chamber and a second chamber with the boundary between said first and second chambers defined in part by said screen member, said inlet port communicating directly with said first chamber and said outlet port communicating directly with said second chamber; a rotatable shaft member located substantially along the longitudinal axis of said screen member; wherein the improvement comprises: a rotor means for causing fibrous stock within said first chamber to pass through said screen member



into said second chamber and out said outlet port, said rotor means including a cylindrical body member fixedly attached to said shaft member for rotation therewith and including a plurality of blade members attached to and spaced substantially evenly about the circumference of said body member and radiating outwardly therefrom, each of said bade members having a leading side and a trailing side and having an outer side joining said leading and trailing sides, said leading and trailing sides being parallel to one another, said outer side having a leading portion that is substantially perpendicular to said leading and trailing sides and having a trailing portion that slopes inwardly toward said body member, the intersection between said leading side and said outer side being farther from said body member than the intersection between said trailing side and and said outer side being spaced from said screen member to permit forming of a mat of stock between said blade member and said screen member.

4,234,418

DIP-HANDLING APPARATUS

Claude M. Boissicat, Sunnyvale, Calif., assignor to Contrel Corporation, Sunnyvale, Calif.

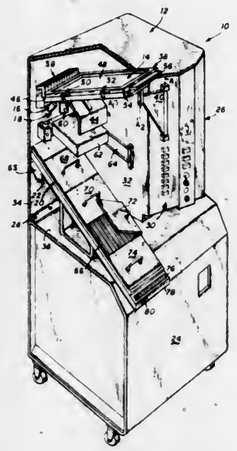
Filed Jun. 23, 1978, Ser. No. 918,609
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—542 **20 Claims**

1. A DIP-handling apparatus comprising:

input tray means having at least one input track disposed to lie in an inclined plane and for receiving DIPs at one end of said tray means in a first particular disposition relative to said track and for discharging said DIPs at the other end thereof;

test station means having a test track lying in a vertical plane intersecting said inclined plane and adapted to receive a DIP to be tested, and including test means for engaging said DIP as it is passed along said test track and for performing diagnostic tests thereupon;

metering and reorienting means disposed between said input tray means and said test station means and including a rotating member having a recess for receiving a DIP discharged from said input tray, and means for rotating said member about an axis bisecting an intersecting angle of said inclined plane and said vertical plane, said member being rotated between a DIP receiving position, wherein said recess is aligned to receive a DIP discharged from said input tray means, and a DIP discharging position, wherein said recess is aligned with said test track, whereby a DIP carried in said recess between said receiving position and said discharging position is reoriented such that the end thereof that first entered said recess at said receiving position is the last to leave the recess at said discharging position and such that the DIP is discharged



onto said test track with a second particular disposition relative thereto;

output tray means having a plurality of DIP sorting tracks;

shuttle means for receiving a tested DIP discharged from said test track and for depositing it onto one of the DIP sorting tracks of said output tray means; and

means responsive to a signal developed by said test means and operative to cause said shuttle means to deposit the tested DIP onto a particular one of said DIP sorting tracks.

4,234,419

PROCESS FOR THE REMOVAL OF INORGANIC SALTS FROM A WATER STREAM

Dudley W. Coillet, 12 Ross Rd., Belmont, Mass. 02178

Filed Oct. 9, 1979, Ser. No. 82,725
Int. Cl.[3] C02F 1/42
U.S. Cl. 210—664 **20 Claims**

1. A process for the removal of inorganic salts from an unpotable feed water stream containing said salts, said process comprising the steps of:

(a) passing said feed water stream sequentially through at least two ion exchange beds, one of which is in the anion form and the other of which is in the cation form, to remove a significant portion of the anions and cations in the stream, and to form a filtrate stream,

(b) regenerating at least a portion of the anion exchange bed by passing an aqueous sodium ion-containing regenerant stream through the anion exchange bed portion while step (a) is discontinued with respect to it, to form a spent anion exchange regenerant stream, including ions from said unpotable water previously retained in said anion exchange bed,

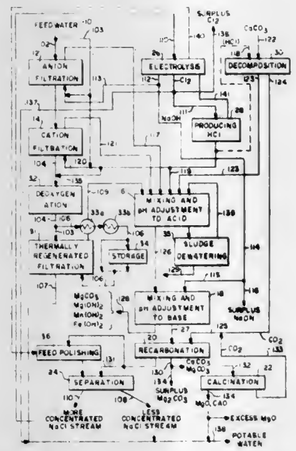
(c) regenerating at least a portion of the cation exchange bed by passing an aqueous chloride ion-containing regenerant stream through the cation exchange bed portion while step (a) is discontinued with respect to it to form a spent cation exchange regenerant stream including ions from

said unpotable water previously retained in said cation exchange bed.

(d) mixing said spent anion and cation exchange regenerant streams together with an acidifying agent in the presence of soluble calcium ion to precipitate a calcium salt of at least one anion selected from the group consisting of sulfate, phosphate, silicate and fluoride, in the spent anion exchange regenerant stream, the amount of said soluble calcium being maintained in excess of equivalency to the sum of the sulphate, phosphate, silicate and fluoride remaining in said spent regenerant stream,

(e) separating the product stream of step (d) into a precipitate portion and a soluble regenerant stream portion,

(f) mixing said soluble regenerant stream portion from step (e) with a causticizing agent in the presence of carbonate



ion to precipitate at least one cation selected from the group consisting of calcium, magnesium, ferrous or manganous, in the insoluble hydroxide or carbonate form, the amount of the said carbonate being maintained in excess of equivalency to the sum of the said calcium, magnesium, ferrous and manganous cations,

(g) separating the product stream of step (f) into a soluble sodium chloride solution stream and a precipitate portion,

(h) separating the soluble sodium chloride stream into a more concentrated sodium chloride stream and a less concentrated sodium chloride stream,

(i) electrolyzing said more concentrated sodium chloride stream to form an aqueous sodium hydroxide stream, and an aqueous hydrochloric acid stream, and

(j) recovering said less concentrated sodium chloride stream as a purified product water stream.

4,234,420

METHOD AND APPARATUS FOR POLLUTANT SPILL CONTROL

Joseph E. Turbeville, 4303 Jetton, Tampa, Fla. 33609

Continuation of Ser. No. 792,583, May 2, 1977, abandoned. This application May 3, 1979, Ser. No. 35,681
Int. Cl.[2] B01D 15/06; B03C 1/30
U.S. Cl. 210—671 **19 Claims**

1. A surface going aquatic vessel for the distribution, collection, treatment and redistribution of resilient sorbent particles in the collection of a liquid pollutant dispersed on the surface of an aquatic medium, said vessel comprising the following components:

a. a pollutant storage tank

b. a rotatably mounted cylindrical drum with its axis of rotation substantially normal to the direction of travel of said vessel and positioned such that the lowermost portion of said drum is immersed in said aquatic medium;

c. means for rotating said drum about its axis;

d. a plurality of circular magnetic bands mounted on the cylindrical surface of said drum in parallel spaced relation to each other, each of said bands defining a plane substantially normal to said axis of said drum;

e. means for wiping said cylindrical surface of said drum, comprising (1) a wiper blade extending along the length of said drum immediately adjacent the surfaces of said magnetic bands and positioned forward of the axis of said drum, and (2) a take-off chute extending forwardly and downwardly from said wiper blade;

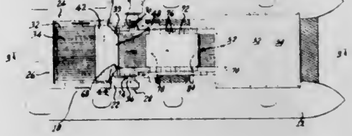
f. means for momentarily compressing resilient sorbent particles

g. a storage and distribution hopper having a lowermost portion spaced above the aquatic medium, and an uppermost portion for receiving resilient sorbent particles and positioned forward of said compressing means, said lowermost portion including an elongated opening substantially parallel to said axis of said drum;

h. particle discharge means mounted along the length of said elongated opening;

i. conveying means communicating from a point beneath the forward end of said take-off chute through said compressing means to said uppermost portion of said distribution hopper;

j. means for actuating said discharge means, said conveying means, and said compressing means;



k. an elongated pollutant sump comprising a drain chute coextensive with and positioned beneath said conveying means and terminating in a drain sump;

l. a pollutant conduit communicationg said drain sump with said pollulant storage tank; and

m. means for propelling said vessel along the surface of said aquatic body.

13. A continuous method for the collection and recovery of liquid pollutant floating on the surface of an aquatic medium comprising the steps of:

a. distributing buoyant, magnetically susceptible, oleophillic, resilient sorbent particles on the surface of said liquid pollutant;

b. providing a sorbent-pollutant contact time sufficient for the sorbent to attract and sorb a portion of the liquid pollutant;

c. magnetically collecting the pollutant-containing sorbent particles;

d. passing said particles through a compression zone to expel the majority of said pollutant

e. collecting said expelled pollutant

f. allowing said compressed sorbent particles to expand to recover at least a portion of their original uncompressed volume;

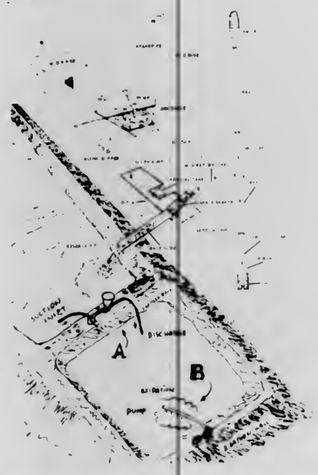
g. redistributing said sorbent particles on the surface of the remaining pollutant; and

h. repeating the steps of providing, magnetically collecting, passing, collecting, allowing and redistributing for a number of cycles sufficient to to collect and recover said liquid pollutant.

4,234,421
LAND RESTORATION FOLLOWING OIL-WELL DRILLING

Virgil L. Dover, Jr., 501 Marie Antoinette St., Lafayette, La. 70506

Filed Mar. 5, 1979, Ser. No. 17,558
Int. Cl.³ C02F *1/56*
U.S. Cl. 210—728 **1 Claim**



1. A process of separating, into good-quality water and high-density solids, an admixture of waste drill cuttings, drilling fluid and by-products of rotary drilling, the admixture containing an anionic colloid selected from the group consisting of drilling-fluid grade lignosulfonate and alkaline-soluble lignite, which process comprises:

(a) combining the admixture with an effective amount of flocculant having from 24 to 49 parts by weight of aluminum sulfate per part by weight of polyacrylamide homopolymer having from 130 to 300 pendant amide groups per pendant carboxylic-acid or carboxylic-acid-salt group and with a molecular weight in the range of from 10,000 to 5 million, to flocculate solids in said admixture

(b) aerating the product obtained by step (a)

(c) separating water from the flocculated solids.

4,234,422
PROCESS FOR REMOVAL OF MERCURY AND MERCURY COMPOUNDS FROM AQUEOUS SOLUTIONS AND INDUSTRIAL WASTE LIQUORS

Egon Falbesaner, Burghausen, Fed. Rep. of Germany; Josef Bichler, Duttendorf, Austria, and Eberhard Wimmer, Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

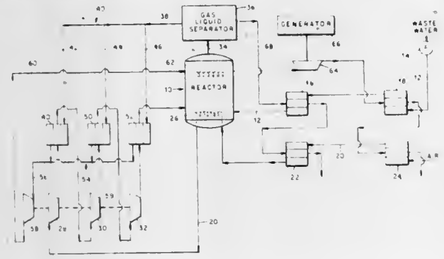
Filed Apr. 30, 1979, Ser. No. 34,314
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2819153
Int. Cl.³ C02F *1/70*
U.S. Cl. 210—713 **5 Claims**

1. A process for the removal of mercury and mercury compounds from aqueous solutions, particularly industrial waste liquors, by reduction and filtration, wherein after reduction the liquors are cleared by letting the mercury particles and dirt particles flow into a settling basin, and subsequently subjecting the supernatant aqueous solution from the settling basin to a single depth filtration through a deep filter containing a filtering medium consisting essentially of sand having a grain size of 0.02 mm to 2 mm, whereupon the mercury is returned to the settling basin by reverse rinsing of the filter and is deposited in the settling basin for final removal, the mercury residues remaining in the single and final filtrate amounting to less than 0.05 mg/liter liquor.

4,234,423
ENERGY RECOVERY SYSTEM

Albert S. Moore, and Francis H. Verhoff, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1979, Ser. No. 25,639
Int. Cl.³ C02F *1/74, 11/08*
U.S. Cl. 210—758 **6 Claims**



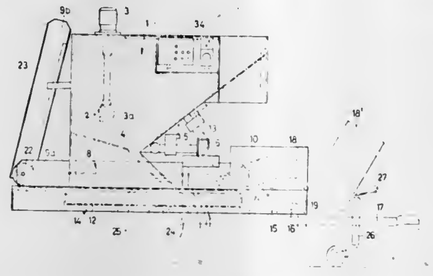
1. A wet air oxidation system comprising in combination, a reactor, first and second conduit means for respectively conveying air and waste water containing organic matter into said reactor, air compressing means disposed in the first conduit means for pressurizing the air prior to the introduction thereof into the reactor, pump means in the second conduit means for pumping the waste water into the reactor, separating means arranged to receive gaseous and liquid products of wet combustion from the reactor and adapted to separate said gaseous and liquid products into separate streams, first heat exchange means disposed in said reactor for heating the air in the first conduit means to substantially the reaction temperature prior to the air entering the air compressing means, second heat exchange means coupled to said first conduit at a location downstream of at least a portion of the air compressing means, further conduit means coupled to said second heat exchange means and to said separating means for conveying the gaseous stream therefrom through said second heat exchange means to extract heat from the compressed air, and prime mover means disposed downstream of and coupled to the second heat exchange means and adapted to be driven by the heated gaseous stream.

5. An improved wet air oxidation method for reducing the chemical oxygen demand of organic matter in waste water while simultaneously recovering energy in excess of that required for practicing the method, comprising the steps of pumping the waste water into a reactor, providing the reactor with a volume of air sufficient to support wet combustion of the organic matter at a temperature in the range of about 450° to 600° F. and at a pressure in the range of about 500 to 1800 psig, pressurizing the air to a pressure at least as great as that in the reactor, separating gaseous and liquid products of combustion from the reactor into separate streams, directing the gaseous stream into prime mover means for the operation thereof; the improvement comprising the steps of heating the air to a temperature substantially equal to that present in the reactor prior to the pressurization thereof, further heating the air to a temperature substantially greater than that present in the reactor during the pressurization thereof, and heating the gaseous stream with the further heated air to a temperature greater than that of the gaseous stream exiting the reactor prior to the introduction of the gaseous stream into the prime mover..

4,234,424
APPARATUS FOR THE PURIFICATION OF OILY EMULSIONS, SOLUTIONS, AND INDUSTRIAL WASTE WATERS

Ralf F. Piepho, Deisterstr. 58, 5015 Wennigsen, BRD, Fed. Rep. of Germany

Continuation of Ser. No. 827,250, Aug. 28, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,706
Int. Cl.² B01D *33/32*
U.S. Cl. 210—771 **2 Claims**



1. A method for the treatment, separation and air drying of sludge from a liquid-sludge mixture comprising the steps of:

treating the liquid-sludge mixture in a container means so as to separate the sludge from the liquid-sludge mixture;

discharging the liquid-sludge mixture under gravity from the container means into an elongated spreading trough means located beneath the container means;

discharging a lateral spread of the liquid-sludge mixture under gravity from the laterally elongated spreading trough means onto only a portion of a napped filter strip that is moving beneath the trough means while resting on the upper course of a continuously moving conveyor means, the conveyor means including a moving, endless, foraminous conveyor belt trained over laterally spaced rollers, thereby providing the upper, elongated belt course adapted to move from a first end toward a discharge end and a lower elongated belt course, below said upper belt course, adapted to return from said discharge end to said first end;

removing the liquid component of the liquid-sludge mixture by permitting said liquid component to pass by gravity through the filter strip and foraminous conveyor belt courses to expose the liquid-sludge residue to air for a substantial portion of the elongated belt course so as to provide a substantially dry sludge residue by the time the moving filter strip reaches the discharge end of the upper belt course;

receiving in an elongated filtrate-receiving container, positioned to lie beneath the lower course of said endless belt, filtrate that has passed through the filter strip and through both courses of the foraminous conveyor belt; and

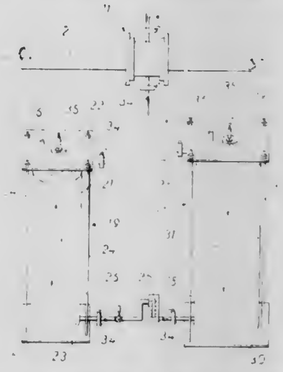
discharging the filter strip with dried sludge residue thereon from the discharge end of the upper course of the endless belt as the endless belt completes its transport of the filter strip along the upper course of the belt.

4,234,425
FLUORIDATION SYSTEM

John N. Leo, 9101 Hannett, NE., Albuquerque, N. Mex. 87112

Filed Apr. 23, 1979, Ser. No. 32,396
Int. Cl.³ B01J *8/04*
U.S. Cl. 210—88 **5 Claims**

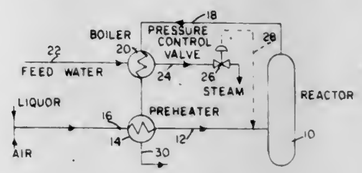
1. A fluoridation system including a venturi inserted into a water line along the length thereof, said venturi including a throughbore having a diminishing tapered section followed by an increasing tapered section in the direction of liquid flow, a passage intersecting said throughbore and extending substantially perpendicularly thereto, means associated with said venturi for withdrawing water from said water line, a first conduit means including an inlet end for transferring water from said withdrawing means to and through a chamber containing a water softening material for softening the water passing through said first conduit means, flow rate measuring means in said first conduit means, flow control means in said first conduit means, said first conduit means including an outlet end connected to a fluoride chamber containing a water-soluble fluoride salt, said outlet end of said first conduit means being connected adjacent the bottom of said fluoride chamber, a second conduit means connected adjacent the top of said fluoride chamber, said second conduit means connecting said fluoride chamber with said passage of said venturi which is substantially perpendicular to said throughbore thereof, flow control means in said second conduit means, said fluoride chamber including a transparent portion for inspection of the contents thereof.



4,234,426
WET COMBUSTION SYSTEM INCORPORATING AUTOREGULATION

Allan R. Wilhelmi, Wausau, Wis., and Daniel C. Troy, Litchfield, N.H., assignors to Sterling Drug Inc., New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,553
Int. Cl.³ C02F *1/72*
U.S. Cl. 210—149 **3 Claims**



1. A wet combustion system comprising a reactor to oxidize an influent liquor admixed with an oxygen containing gas, a boiler, an effluent line from the reactor, said effluent line leading to the boiler, the latter cooling the reactor effluent in part, a process stream, means to heat said process stream by recovering residual energy from said partially cooled reactor effluent, said process stream leading to said heating means, an effluent line from the boiler to said heating means, a feed water source for the boiler, an exit line from the boiler for steam generated therein, a pressure control valve in the exit line, means sensing the temperature of the process stream, said means being coupled to and regulating the pressure control valve, and means to autoregulate the amount of heat extracted by the boiler.

4,234,427

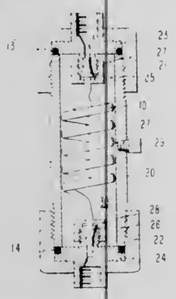
PULSE DAMPER

Detlef R. Boehme, Walnut Creek, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 911,853, Jun. 2, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,033

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198 C **16 Claims**



1. In a liquid chromatography system comprising a reciprocating pump, a chromatographic column, a flow line connecting said pump to said column for delivering fluid from said pump to said column, and a pulse damper coupled into said flow line for damping high pressure pulsations in said flow line, said pulse damper comprising:

a flexible tubular member in series with said flow line;

a liquid-tight housing structure surrounding said tubular member, said structure being completely filled with a compressible liquid;

said tubular member having a first flattened non-circular cross-sectional configuration in the absence of said pulsations, said member being capable, upon occurrence of a high pressure pulsation, of assuming a second cross-sectional configuration of area greater than said first configuration of area greater than said first configuration, with the circumference of said tubular member experiencing minimal expansion;

said tubular member in said second cross-sectional configuration displacing an additional differential displacement volume dV as compared to the original volume displaced by said member in said first configuration;

the volume V and compressibility X of said compressible liquid being related to said differential volume dV such that dV/XV is greater than the highest anticipated pressure change in said flow line;

whereby said tubular member accommodates high pressure fluid pulsations without risk of bursting, sustaining only minimal circumferential expansion, and whereby the energy of said high pressure pulses is stored primarily as a compressive force in said liquid, to effect said damping.

4,234,428

DUAL MEMBRANE MASS TRANSFER DEVICE

William J. Schnell, Wheeling, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 12, 1978, Ser. No. 950,535

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321 B **9 Claims**

1. In an apparatus for the treatment of blood by hemodialysis, having a stack of membrane support plates which support membranes on opposite sides therof and form open volumes between the membrane support plates and the membranes supported thereon, the improvement comprising, in combination:

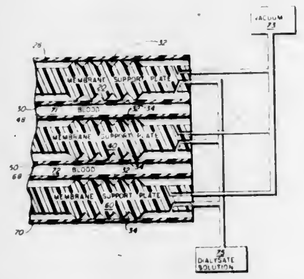
a first membrane support plate; a first relatively high flux membrane, with relatively high hydraulic permeability, supported on one side of said first membrane support plate and forming an open volume between said first relatively high flux membrane and said first membrane support plate;

a first relatively low flux membrane supported on the opposite side of said first membrane support and forming an open volume between said first relatively low flux membrane and said first membrane support plate;

a second membrane support plate spaced from said first membrane support plate, with a blood path formed in the spacing between said first and second membrane support plates;

a second relatively high flux membrane, with relatively high hydraulic permeability, supported on one side of said second membrane support plate and forming an open volume between said second relatively high flux membrane and said first membrane support plate;

a second relatively low flux membrane supported on the



opposite side of said second membrane support plate and forming an open volume between said second relatively low flux membrane and said second membrane support plate;

said open volume between said relatively high flux membranes and the respective membrane support plates comprising a low pressure path to provide significant ultrafiltration;

said open volume between said relatively low flux membranes and the respective membrane support plates comprising a dialysate solution path to provide significant dialysis and relatively insignificant ultrafiltration; and

said membrane support plates segregating said open volume between said relatively high flux membranes and the respective membrane support plates from said open volume between said relatively low flux membranes and the membrane support plates.

4,234,429

SYSTEM FOR SEPARATING PARTICULATE MATTER INTO SOLUBLE AND INSOLUBLE PORTIONS

Cecil C. Rhodes, Farmington Hills, and Robert S. Kozar, Livonia, both of Mich., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Feb. 26, 1979, Ser. No. 15,455

Int. Cl.² B01D *37/00*

U.S. Cl. 423—109 **4 Claims**



1. A method of separating portions of particulate matter collected pursuant to environmental air quality control requirements so that said particulate matter may be more readily disposed of, said particulate matter comprising a soluble chloride portion and an insoluble metallic oxide portion, said method comprising the steps of:

(1) dispensing a controlled amount of said particulate matter over a substantial area forming an upper end of an inclined trough receiving a controlled volume of a flow of a dissolving liquid comprising substantially water wherein said particulate may be wetted by said liquid,

(2) agitating said particulate and said liquid in a dissolving tank connected to a lower end of said trough,

(3) forming a slurry of said particulate and said liquid by pumping for proximately 10 minutes said particulate and said liquid in a closed loop path connecting with said dissolving tank, said pumping and said agitation causing said soluble portion of said particulate to dissolve in said liquid and form a solution and suspending said insoluble portion in said slurry,

(4) pumping a portion of said slurry into a charge tank to fill said charge tank with a selective volume of said slurry,

(5) flowing said slurry in said charge tank into an inlet chamber formed by an upper shell portion of a filtering device further defined by an outlet chamber separated from said inlet chamber by a horizontally disposed section of filter media,

(6) applying sufficient air pressure to said inlet chamber of said filter device to cause said solution to flow through said filter media and said insoluble portion to collect on said media to form a continuous passage-free cake thereon without said air flowing through said cake,

(7) sensing a drop in said air pressure upon a substantial amount of said solution having flowed to said outlet chamber,

(8) activating venting means to decrease said air pressure in said inlet chamber to an ambient value upon sensing said pressure drop,

(9) filling said charge tank with a selective volume of a rinsing liquid, said rinsing liquid volume being proximately one-half of said slurry volume,

(10) flowing said rinsing liquid in said charge tank into said inlet chamber of said filter device,

(11) applying sufficient air pressure to said inlet chamber to cause said rinsing liquid to flow through said cake and said filter media to rinse said continuous passage-free cake and remove any further residue of said solution entrapped in said cake,

(12) sensing a drop in said air pressure upon a substantial amount of said rinse liquid having flowed to said outlet chamber, and activating a timing device thereupon, (13) flowing air through said cake to dry said cake for a selective time period as regulated by said timing device, and

(14) lifting said upper shell portion of said filter device from said section of filter media to allow said section of filter media and said cake carried thereon to be indexed from said filter device and be disposed of accordingly.

4,234,430

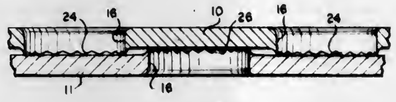
FILTERING SEPTUM

George J. Peer, Mt. Kisco, N.Y., and Robert C. Bradley, Paramus, N.J., assignors to Multi-Metal Wire Cloth Inc., Tappan, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,420

Int. Cl.² B01D *25/18*

U.S. Cl. 210—489 **5 Claims**



1. In a filtering septum of the type having a single pair of metal sheets in superposed contacting relation, each sheet having a multiplicity of perforations therein, the perforations in each of said sheets being of like generally uniform diameter and arranged in the same spatial pattern, said pattern being such that adjacent each perforation there is an unperforated area larger than said perforation, said superposed sheets arranged in a relationship in which the perforations of one sheet are completely out of registry with those of the other sheet, the improvement wherein both of said metal sheets comprise:

marginal burrs on the inner face of each of said sheets defined by said perforations such that when said two sheets are secured in inner-face-to-inner-face relationship, the burrs of each of said sheets bear against unperforated areas of the other sheet along lines of imperfect contact pervious to a restricted flow of liquid.

4,234,431

MEMBRANE FILTRATION TYPE HOLLOW FIBERS AND METHOD FOR THE PREPARATION OF SAME

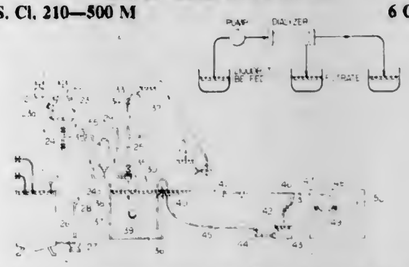
Mashahiro Mishiro, Moriyama; Tokio Nishikawa, Hikone; Shigeyasu Ohashi, Moriyama, and Yasuo Yokokawa, Tanashi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 657,346, Feb. 11, 1976, abandoned. This application Sep. 7, 1977, Ser. No. 831,198

Claims priority, application Japan, Feb. 15, 1975, 50-18426

Int. Cl.³ B01D *13/04, 31/00*

U.S. Cl. 210—500 M **6 Claims**



1. A cellulose acetate membrane filtration type hollow fiber comprised of a single material phase, wherein the cylindrical wall defining said hollow fiber represents a three-dimensional net-like structure of fine filtering passages of 0.01 to 1 micron, said structure occupying the whole mass of said wall when seen in any cross-section of said wall, providing thus on effective and active filtering zone, the pore rate amounting to at least 55%, active points of the filtering passages for governing minimum passable sizes of said passages for solids included in a filtering liquor to be treated being distributed at random throughout at least said active zone, said passages being nearly uniform.

4,234,432

POWDER DISSEMINATION COMPOSITION

William B. Tarpley, Jr., West Chester, Pa., assignor to Energy and Minerals Research Co., Kennett Square, Pa.

Filed Oct. 26, 1977, Ser. No. 845,683

Int. Cl.³ A62D *1/00*

U.S. Cl. 252—8 **21 Claims**

1. A nonaqueous thixotropic composition of matter for use with disseminating apparatus comprising powder having at least a bimodal particle size distribution, a gelled liquid, the powder comprising about 30 to about 70 volume percent of the composition and being substantially insoluble in the gelled liquid.

4,234,433

RECOVERY OF PETROLEUM WITH CHEMICALLY TREATED HIGH MOLECULAR WEIGHT POLYMERS

John S. Rhudy, Littleton, and Connie L. Gibb, Evergreen, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 812,973, Jul. 5, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,610

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **11 Claims**

1. In a process of flooding an oil-bearing subterranean formation in communication with injection means and production means, wherein an aqueous, high molecular weight polymer solution is injected into the formation to displace oil toward the producing means, the improvement comprising:

(a) reacting in an aqueous solution a polymer-oxidizing oxidant selected from the group consisting of peroxides and compounds of the formula MOX wherein M is an alkali metal or ammonium and X is a halogen with a polymer of average molecular weight sufficiently high to cause substantial plugging of the reservoir on injection in aqueous solution to reduce the polymer to an average molecular weight which does not cause substantial plugging during injection into the reservoir,

(b) thereafter reacting a reducing agent with the polymer of reduced average molecular weight to terminate degradation by the oxidant at a predetermined average molecular weight,

(c) injecting an aqueous solution of the degraded polymer into the reservoir through the injection means, and

(d) displacing said aqueous degraded polymer solution a substantial distance into or through said formation.

4,234,434

STABILIZATION OF HYDROCRACKED OILS WITH CERTAIN NITROGEN-CONTAINING AROMATIC COMPONENTS

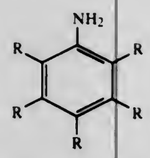
Thomas F. Wulfers, Hazel Crest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Feb. 14, 1979, Ser. No. 11,839

Int. Cl.² C10M *1/34*

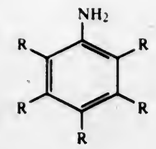
U.S. Cl. 252—50 **12 Claims**

1. A composition of matter comprising a major amount by weight of a hydrocracked lubricating oil and a minor amount by weight of at least one added nitrogen-containing aromatic component having a structure:



wherein such R is independently selected from the group consisting of H and substantially aliphatic monovalent hydrocarbonaceous radicals containing 1 to about 24 carbon atoms such that two of said R's are substantially aliphatic monovalent hydrocarbonaceous radicals; said nitrogen-containing aromatic component being present in an amount effective to reduce the susceptibility to sunlight deterioration of said hydrocracked oil.

8. A method of inhibiting a hydrocracked lubricating oil from deterioration caused by sunlight comprising combining with said oil an inhibiting amount of at least one nitrogen-containing aromatic component having structure:



wherein each R is selected from the group consisting of H and substantially aliphatic monovalent hydrocarbonaceous radicals containing 1 to about 24 carbon atoms such that two of said R's are substantially aliphatic monovalent hydrocarbonaceous radicals.

4,234,435

NOVEL CARBOXYLIC ACID ACYLATING AGENTS, DERIVATIVES THEREOF, CONCENTRATE AND LUBRICANT COMPOSITIONS CONTAINING THE SAME, AND PROCESSES FOR THEIR PREPARATION

Norman A. Meinhardt, Lyndhurst, and Kirk E. Davis, Euclid, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 772,161, Feb. 25, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,510

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A **65 Claims**

1. A lubricating composition comprising a major amount of oil of lubricating viscosity and a minor amount of one or more carboxylic derivative compositions produced by reacting at least one substituted succinic acylating agent with a reactant selected from the group consisting of (a) amine characterized by the presence within its structure of at least one H—N< group, (b) alcohol, (c) reactive metal or reactive metal compound, and (d) a combination of two or more of any of (a) through (c), the components of (d) being reacted with said one or more substituted succinic acylating agents simultaneously or sequentially in any order, wherein said substituted succinic acylating agents consist of substituent groups and succinic groups wherein the substituent groups are derived from polyalkene, said polyalkene being characterized by a Mn value of 1300 to about 5000 and a Mw/Mn value of about 1.5 to about 4, said acylating agents being characterized by the presence within their structure of an average of at least 1.3 succinic groups for each equivalent weight of substituent groups.

4,234,436

MOLTEN SALT SYNTHESIS OF MODIFIED ALKALI NIOBATE POWDERS

Ronald H. Arendt, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,912

Int. Cl.³ C04B *35/00*; C01G *23/00*

U.S. Cl. 252—62.9 **8 Claims**

1. A process for producing a modified alkali niobate having the formula $(A_{2x}B_{1-x})Nb_2O_6$ wherein A is alkali atom selected from the group consisting of Na, K and mixtures thereof, B is cation selected from the group consisting of Pb, Cd and mixtures thereof, and x has a value ranging from an effective amount up to but less than 1, which consists essentially of providing in stoichiometric amount an alkali oxide selected from the group consisting of Na_2O, K_2O and mixtures thereof or particulate precursor therefor, providing in stoichiometric amount cation oxide selected from the group consisting of PbO, CdO and mixtures thereof or particulate precursor therefor, providing in stoichiometric amount particulate Nb_2O_5 or particulate precursor therefor, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said alkali oxide or precursor therefor, said cation oxide or precursor therefor, said Nb_2O_5 or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said alkali oxide, cation oxide, Nb_2O_5 and chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said alkali oxide, cation oxide and Nb_2O_5, maintaining said reaction temperature dissolving and reacting said alkali oxide, cation oxide and Nb_2O_5 in said molten salt and precipitating said modified alkali niobate, and recovering said precipitated modified alkali niobate by dissolving said chloride salt and separating said precipitated modified alkali niobate from the resulting salt solution.

4,234,437

SUSPENSION OF SOLID PARTICLES IN A LIQUID

Stig E. Friberg, and Kelvin Roberts, both of Saltsjö-Boo, Sweden, assignors to Arbman Development AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 490,695, Jul. 22, 1974, abandoned, which is a continuation of Ser. No. 238,514, Mar. 27, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,709

Claims priority, application Sweden, Mar. 30, 1971, 4136/71

Int. Cl.³ C09D *5/02*; H01F *1/28*

U.S. Cl. 252—62.51 **7 Claims**



1. In a suspension of solid particles in an organic or aqueous liquid and a stabilizing agent, the improvement which comprises said stabilizing agent being a lyotropic liquid crystal.

4,234,438

MAGNETIC RECORDING MEDIUM

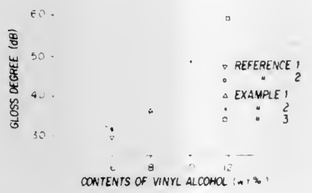
Eiji Horigome; Hiroshi Ota, and Hitoshi Azegami, all of Tokyo, Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed May 10, 1979, Ser. No. 37,779

Claims priority, application Japan, May 18, 1978, 53/58299

Int. Cl.³ H01F *1/373*; B05D *5/12*

U.S. Cl. 252—62.54 **6 Claims**



1. A magnetic recording medium useful as a magnetic coating composition prepared by a process, comprising:

removing alcohol from an alcohol impregnated nitrocellulose composition;

impregnating said alcohol free nitrocellulose with a vinyl chloride-vinylacetate-vinylalcohol copolymer having a vinyl alcohol content of at least 8 wt.%;

blending a magnetic powder, a cross-linkable polymer and a solvent with the impregnated nitrocellulose; and

adding a cross-linking agent to said blended mixture.

4,234,439

DIELECTRIC MATERIAL FOR INFLUENCING ELECTRIC FIELDS, AND STRESS CONTROL DEVICES MADE THEREFROM

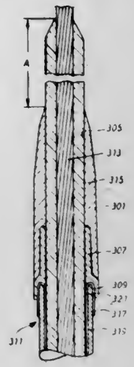
Dieter Kehr, and Juergen Goebell, both of Hamburg, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1979, Ser. No. 37,669

Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2821017

Int. Cl.³ H02G *15/02*, *15/08*; H01B *17/64*, *3/04*

U.S. Cl. 252—63.2 **8 Claims**



1. A dielectric composition for influencing electric fields comprising a dielectric base material having distributed therein electrically conductive platelet-shaped particles in an amount below a limit concentration at which the composition exhibits an electrical volume resistivity characteristic for insulating materials, and also distributed therein platelet-shaped particles of an insulating material different from said base material and having a higher electrical breakdown voltage than said base material, the number and size of said particles of insulating material being comparable with said platelet-shaped electrically conductive particles.

4,234,440

HYDROXYBENZOIC ACID AS PH BUFFER AND CORROSION INHIBITOR FOR ANTIFREEZE CONTAINING ORGANOSILICONE-SILICATE POLYMERS

Stanley T. Hirozawa, Birmingham, Mich.; Edward F. O'Brien, Cromwell, Conn., and Joe C. Wilson, Belleville, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 2, 1979, Ser. No. 349

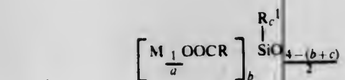
Int. Cl.² C09K *15/32*

U.S. Cl. 252—76 **7 Claims**

1. A single-phase antifreeze and coolant concentrate consisting essentially of an alcohol selected from the group consisting of methanol, ethanol, propanol, ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol and glycerol, an organosilicone-silicate polymer corrosion inhibitor and a hydroxybenzoic acid pH buffer and corrosion inhibitor composition capable of buffering the pH in the range of above about 9 to about 11, wherein said pH buffer is selected from the group

consisting of ortho hydroxybenzoic acid, para hydroxybenzoic acid, and mixtures thereof and is present in the amount of about 0.1 to about 1.5 percent by weight based upon the weight of said antifreeze, wherein said organo-silicone-silicate polymer corrosion inhibitor is present in an amount of 0.01 percent to 10 percent by weight of said concentrate, and wherein said polymer consists essentially of:

(A) from 10 to 90 parts by weight of siloxane groups represented by the formula:



(I)

wherein M is a cation that forms a water-soluble silicate selected from the group consisting of the sodium, potassium, lithium, rubidium and tetra(alkyl)ammonium cations, a is the valence of the cation represented by M and is an integer having a value of at least one, R is a member selected from the group consisting of the unsubstituted divalent hydrocarbon groups,

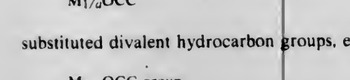
$M_{1/a}OCC$

substituted divalent hydrocarbon groups, each

$M_{1/a}OCC$ group

is connected to the silicon atom through at least 2 carbon atoms of the group represented by R, R^1 is a monovalent hydrocarbon group, b is an integer having a value from 1 to 3 inclusive, c is an integer having a value from 0 to 2 inclusive and (b+c) have a value from 1 to 3 inclusive and

(B) from 10 to 90 parts by weight of groups represented by the formula:



(II)

wherein M and a have the above-defined meanings and d is an integer having a value from 1 to 3 inclusive, said parts by weight of said groups being based on 100 parts by weight of the organosilicone-silicate polymer.

4,234,441

SILICONE OIL COMPOSITIONS CONTAINING SILICATE CLUSTER COMPOUNDS

Robert N. Scott, Wallingford; David F. Gavin, Cheshire, and Frank J. Milnes, Guilford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 27, 1979, Ser. No. 33,767
Int. Cl.³ C09K 5/00; C07F 7/04, 7/18
U.S. Cl. 252—78.3 **13 Claims**

1. A functional fluid composition comprising a silicone oil and an effective proportion of a silicate cluster compound selected from the group consisting of alkoxysilane cluster compounds, alkoxysilanol cluster compounds, halogenated alkoxysilane cluster compounds, alkoxysilane multiple cluster compounds, and silicone-bridged alkoxysilane cluster compounds.

4,234,442

FEED UNIT OF A DETERGENT COMPOSITION BASED ON ALKALI CARBONATE

Emery G. P. Cornelissens, Nootdorp, Netherlands, assignor to Akzo N.V., Netherlands

Filed Jul. 14, 1978, Ser. No. 924,551
Int. Cl.² C11D 7/08, 7/12, 17/00, 17/04
U.S. Cl. 252—90 **7 Claims**

1. A sachet having two compartments containing a detergent composition comprising:

(a) 5-65 percent by weight of an alkali carbonate;

(b) 5-30 percent by weight of one or more solid acids which form water-soluble calcium salts and magnesium salts or complexes, the acids having a pK_1-value in the range of from 2.8 to 4.8;

(c) the remainder of the composition consisting of usual solid detergent constituents including surfactants and optionally including alkaline builders; the total amount of alkaline material being present in stoichiometric excess relative to the amount of the acid, the acid being present in one of the compartments and the alkaline constituents being present in the other compartment of the sachet, the compartment containing the acid releasing its contents when brought into water before the compartment containing the alkaline constituent releases its contents.

4,234,443

COMPOSITION AND A METHOD USEFUL FOR MAKING A FOUNTAIN SOLUTION FOR LITHOGRAPHIC PRINTING OPERATIONS

Ralph D. Canale, Long Island City, and Albert S. Canale, Bayside, both of N.Y., assignors to Michael A. Canale, Long Island City, N.Y.

Filed Mar. 24, 1978, Ser. No. 890,018
Int. Cl.² C11D 3/08, 7/16
U.S. Cl. 252—135 **20 Claims**

1. A composition adapted for use in a fountain solution which consists essentially of 2 to 66 percent by weight trisodium phosphate; 0.5 to 26.0 percent by weight sodium metasilicate; 2 to 67 percent by weight tetrapotassium pyrophosphate; 2 to 25 percent by weight of a nonionic detergent selected from the group consisting of condensation products of ethylene oxide with dialkylphenols, the dialkyl moieties which are of from 2 to 20 carbon atoms, and of ethylene oxide with monohydric hydrocarbon alcohols of from 12 to 20 carbon atoms, the molar ratio of ethylene oxide units to each dialkylphenol unit or monohydric hydrocarbon alcohol unit in each said condensation product being of from 9:1 to 150:1; and 0.02 to 10.00 percent by weight dialkylpolysiloxane.

4,234,444

NONIONIC TENSIDE DETERGENT COMPOSITIONS

Ingo Wegener, Düsseldorf; Johann Glasl, Solingen, and Achim Werdehausen, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,542
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829697
Int. Cl.³ C11D 1/72, 1/66
U.S. Cl. 252—174.22 **2 Claims**

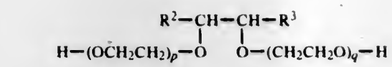
1. A detergent composition consisting essentially of

(a) from about 40 to 60% by weight of compounds of formula

(I)

wherein R^1 represents a saturated or unsaturated radical of a fatty alcohol having from about 6 to 18 carbon atoms, and n is an integer of from 4 to 15; and

(b) from about 60 to 40% by weight of compounds of formula



(II)

wherein R^2 and R^3 each independently represent an alkyl radical having from about 1 to 17 carbon atoms, the total number of carbon atoms in R^2 and R^3 being from about 8 to 18, and p and q each independently represent a number from 0 to 15, the sum of p plus q being from about 4 to 15.

4,234,445

POLYURETHANE SPRAY COMPOSITION CONTAINING LACTONE VISCOSITY MODIFIER

Edward L. Hagen, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 924,105, Jul. 12, 1978, Pat. No. 4,195,148. This application Jan. 25, 1979, Ser. No. 6,406
Int. Cl.³ C08G 18/12, 59/56, 59/62
U.S. Cl. 252—182 **4 Claims**

1. A composition comprising a mixture of:

(b) curative for a polyurethane prepolymer which gives a tack-free time of 15 seconds to 5 minutes; and

(c) a lactone having the formula:



wherein R represents an alkylene radical having from 4 to 6 carbon atoms,

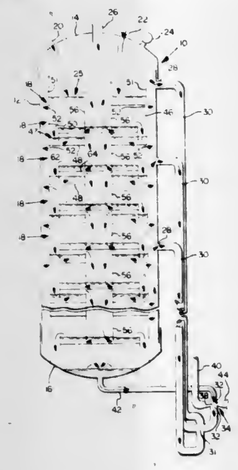
the curative (b) being dissolved in the lactone (c) and the ratio of curative (b) to lactone (c) being from 1:10 to 100:1, by weight.

4,234,446

METHOD AND APPARATUS FOR PRODUCING CHLORINE DIOXIDE

Daniel Ramras, Seattle, Wash., assignor to Kenneth T. Place, Corvallis, Oreg.

Filed Oct. 9, 1979, Ser. No. 82,989
Int. Cl.³ C01B 11/02
U.S. Cl. 252—187 R **7 Claims**



1. A continuous-flow method for manufacture of chlorine dioxide, comprising:

(a) supplying a continuous flow of solutions of each of a chlorite and a hypochlorite and an acid into the first of a plurality of reaction chambers arranged in order of descending height;

(b) allowing liquid reactants from each except the bottom one of said reaction chambers to overflow into the next lower reaction chamber;

(c) preventing gaseous reaction products from flowing from one reaction chamber to another; and

(d) removing gaseous reaction products from each reaction chamber.

4,234,447

MIXING METHOD AND CONTAINER THEREFOR

Robert A. Hay, II, and Harold E. St. Louis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 17, 1978, Ser. No. 925,016
Int. Cl.³ G21F 9/16, 5/00
U.S. Cl. 252—301.1 W **8 Claims**



1. In a method for the disposal of low-level radio-active wastes by encapsulation of the radio-active waste within a hardenable resin, the steps of the method comprising providing a disposable container and an agitator selectively disposable within the container and external to the container, the container having a generally open upwardly-facing end, adding to the container a pre-determined quantity of hardenable resinous material and radio-active waste, agitating the mixture of hardenable resin and radio-active waste until the radio-active waste is encapsulated within the hardenable resin, closing the open end of the container during the mixing process with a container cover, the container cover being maintained in a generally fixed relationship to the agitator, the container cover having a disposable splash guard generally adjacent to the disposable container, subsequently removing the agitator from the container, permitting the contents of the container to harden and transporting the container to an approved disposal site, the improvement which comprises providing a generally annular membrane partially closing the open end of the disposable container and permitting passage of the agitator therethrough, the membrane being deflected by and generally conforming to the splash guard, the membrane serving to reduce the amount of resin and radio-active material splashing directly on the splash guard.

4,234,448

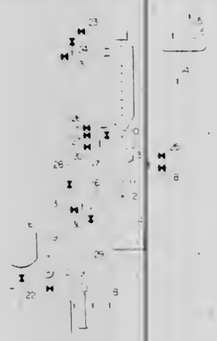
METHOD AND APPARATUS FOR TREATING RADIOACTIVE WASTE

Mikio Hirano, and Susumu Horiuchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 27, 1977, Ser. No. 846,251
Claims priority, application Japan, Nov. 1, 1976, 51-130527
Int. Cl.² G21F 9/08, 9/20
U.S. Cl. 252—301.1 W **16 Claims**

1. A method for treating aqueous solutions and suspensions of radioactive waste containing sodium sulfate, which comprises heating and drying the aqueous solutions and suspensions of radioactive waste in a drier thereby obtaining radioactive waste powders; transfering the powders from the drier to

a hopper; measuring a water content of the powders retained in said hopper; when the measured water content satisfies a predetermined condition, transfering the powders from the hopper to a pelletizer; and pelletizing the powders therein; or when the measured water content of the powders fails to satisfy the predetermined condition, introducing a washing solution comprising hot water under pressure to the bottom of the hopper, thereby causing a stirring action between the



washing solution and the powders and forming an admixture of an aqueous solution of the powders and an aqueous slurry of the powders; then discharging the washing solution and the radioactive waste powders from the hopper in the form of the admixture of the aqueous solution of the powders and the aqueous slurry of the powders; and thereafter drying the inside of the hopper whereby the hopper is made ready for storage of another batch of radioactive waste powders.

4,234,449

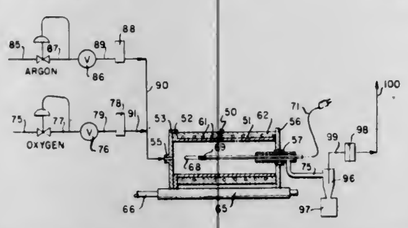
METHOD OF HANDLING RADIOACTIVE ALKALI METAL WASTE

Raymond D. Wolson, Lockport, and Charles C. McPheeters, Plainfield, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 30, 1979, Ser. No. 43,855

Int. Cl.³ G21F *9/28*

U.S. Cl. 252—301.1 W **13 Claims**



1. A method of treating radioactive aklali metals or radioactive solid salts thereof, said method comprising mixing particulate silica substrate material having a particle size such that the majority of the substrate material passes through a 200 mesh sieve and the radioactive material in a rotary drum calciner and converting the radioactive material to alkali metal monoxide by reaction with oxygen present in a diluent at a temperature sufficient to initiate the reaction thereby forming particulate substrate particles coated with alkali metal monoxide, said reaction temperature being controlled by the amount of oxygen present in the diluent to ensure the reaction product remains flowable for easy handling.

4,234,450

PREPARATION OF NON-FLUIDIZABLE COMPOSITION

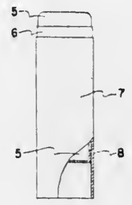
Masami Hirayama; Tadataka Nakata, and Michiko Kagayama, all of Nara, Japan, assignors to Rohto Pharmaceutical Co. Ltd., Japan

Filed Mar. 9, 1978, Ser. No. 884,992

Claims priority, application Japan, Mar. 12, 1977, 52/27213

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—314 **15 Claims**



1. A process for preparing a non-fluidizable composition readily convertible into a fluidizable composition by slight stress or pressure, which comprises the steps of cooling an emulsion consisting essentially of a water-immiscible saturated fatty acid, water within a range of from 60–80% by weight of the emulsion, and an emulsifier selected from the group consisting of a non-ionic surfactant, a solubilizing aid and a mixture thereof, said solubilizing aid being selected from the group consisting of a hydroxy group-containing amine and an alkali hydroxide from a temperature sufficient to keep the emulsion in a fluidizable state while stirring, stopping the stirring at a temperature not lower than the temperature 50° C. below the congealing temperature of the emulsion and continuing further the cooling to room temperature.

4,234,451

PROCESS OF PRODUCING A REDUCING GAS

Heinz Jockel, Klein-Gerau; Friedrich W. Möller, Seulberg; Hans J. Renner, Nieder-Erlenbach, and Hagen Krumm, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 782,471, Mar. 28, 1977, abandoned, which is a continuation of Ser. No. 589,652, Jun. 23, 1975, abandoned, which is a continuation of Ser. No. 421,565, Dec. 4, 1973, abandoned. This application Aug. 14, 1978, Ser. No. 933,353

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263343

Int. Cl.² C07C *1/02*

U.S. Cl. 252—373 **1 Claim**

1. A process for producing a reducing gas for the reduction of ore, said reducing gas containing essentially carbon monoxide and hydrogen and oniy small amounts of water vapor, carbon dioxide and methane, which comprises mixing vaporized normally liquid hydrocarbons with 0.05 to 0.1 standard cubic meter of hydrogen per kilogram hydrocarbons and subjecting the resulting mixture to a hydrogenating desulfurization, adding water vapor to the gaseous product of the desulfurization and reacting the mixture containing 1.4 kg. water vapor per kilogram hydrocarbons in a one-part shaft reaction zone at temperatures in the range of 350°–550° C. and at a pressure of 2–16 kilograms per square centimeter in the presence of a catalyst containing 35–70% by weight nickel on a support selected from the group consisting of magnesium silicate and magnesium spinel hereby producing a high-methane gas, reacting said high-methane gas in a tubular reaction zone at temperatures in the range of 950°–1100° C. and at a pressure of 2–16 kilograms per square centimeter in contact with an indirectly heated catalyst containing 10–30% by weight nickel on a support thereby producing said reducing gas.

4,234,452

HIGH PRESSURE OXYGEN AQUEOUS PHASE CATALYST DEMETALLIZATION

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, Flossmorr; Jui-Yuan Sun, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 26, 1979, Ser. No. 23,559

Int. Cl.³ B01J *29/38, 21/20*; C10G *11/05, 11/04*

U.S. Cl. 252—419 **8 Claims**

1. A process for maintaining the catalytic activity of a chemical conversion catalyst comprising:

(a) removing from a chemical conversion zone a catalyst which at least in part has carbonaceous deposits thereon and at least in part contains contaminating metals picked up during the conversion of a hydrocarbon feed containing such metal contaminants;

(b) regenerating said catalyst to remove at least a portion of said carbonaceous deposits to form a regenerated catalyst;

(c) sulfiding said regenerated catalyst to form a sulfided catalyst containing sulfur compounds of at least a portion of said contaminating metals;

(d) contacting an aqueous slurry comprising said sulfided catalyst with an oxygen-containing gas, wherein the molecular oxygen partial pressure is above about 10 psig. at a temperature and for a time sufficient to permit at least a portion of the metal contaminants to transfer from said sulfided catalyst into the aqueous portion of said aqueous slurry to produce a catalyst having a reduced content of metal contaminants.

4,234,453

OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 558,504, Mar. 14, 1975, Pat. No. 3,985,676. This application Sep. 20, 1976, Ser. No. 724,484

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

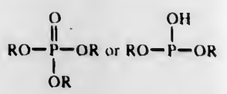
Int. Cl.³ C08F *4/02, 4/22, 4/78*

U.S. Cl. 252—428 **13 Claims**

1. An olefin polymerization catalyst system consisting essentially of:

(a) a solid inorganic support material having surface hydroxyl groups,

(b) an organophosphoryl chromium reaction product of chromium trioxide and a phosphorus compound having the formula:



wherein R is alkyl, aralkyl, aryl, cycloalkyl or hydrogen, but at least one R is other than hydrogen,

(c) an aluminum compound deposited on said support, said aluminum compound being capable of reacting with said surface hydroxyl groups,

said supported chromium containing compound and aluminum compound having been heated in a non-reducing atmosphere at a temperature above 300° C. up to the decomposition temperature of the support material.

4,234,454

DIOLEFIN DIMERIZATION CATALYST AND METHOD FOR PRODUCING NITROSYL HALIDES OF IRON TRIAD METALS

Daniel J. Strope, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 964,326, Nov. 29, 1978, Pat. No. 4,181,707, which is a division of Ser. No. 817,471, Jul. 20, 1977, Pat. No. 4,144,278. This application Jul. 27, 1979, Ser. No. 61,123

Int. Cl.³ B01J *31/22, 31/24, 27/24*

U.S. Cl. 252—429 R **8 Claims**

1. A catalyst system formed by contacting components consisting essentially of (1) at least one elemental metal selected from the group consisting of manganese, tin, and zinc with (2) at least one nitrosyl metal halide selected from the group consisting of nitrosyl metal halides having the formulas $[Fe(NO)_2X]_y$, $[Co(NO)_2X]_y$, $[Ni(NO)X]_y$, $Fe(NO)_2(L)X$, $Ni(NO)(L)X$, and $Co(NO)_2(L)X$, wherein X is selected from the group consisting of chloride, bromide, and iodide, y is 1 or 2 for Co and Fe and 1, 2, 3, or 4 for Ni, and wherein (L) is selected from the group of compounds having the formulas

R_3M, $(RO)_3M$, SR', R—S—R, R_3MO, OR', and R—O—R

wherein each R is individually selected from the group consisting of hydrocarbyl aromatic radicals, hydrocarbyl aliphatic radicals, halo-substituted hydrocarbyl aromatic radicals, halo-substituted aliphatic hydrocarbyl radicals, alkoxy-substituted hydrocarbyl aromatic radicals and alkoxy-substituted aliphatic hydrocarbyl radicals having up to about 20 carbon atoms, wherein R' is a divalent saturated or olefinically unsaturated hydrocarbyl radical having 3 to 7 carbon atoms, and wherein M is phosphorus, antimony, or arsenic.

4,234,455

CATALYST PREPARATION

Edwin H. Homeier, Maywood, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 9, 1979, Ser. No. 28,631

Int. Cl.³ B01J *31/22*

U.S. Cl. 252—430 **14 Claims**

1. A catalyst prepared by admixing a metal phthalocyanine with a solid support material, shaping the resulting admixture, calcining the shaped material at a temperature of from about 400° C. to about 700° C., and recovering the resultant catalyst.

4,234,456

IODINE ADSORBENT

Kunio Kamiya, Hitachi; Hideo Yusa, Katsuta; Masao Kitamura, Hitachiota; Masaki Takeshima, Hitachi, and Toshio Ishidate, Mito, all of Japan, assignors to Hitachi, Ltd. and Nippon Engelhard Ltd., both of, Japan

Filed Jun. 13, 1978, Ser. No. 915,136

Claims priority, application Japan, Jun. 15, 1977, 52-69856

Int. Cl.² B01J *23/14, 23/50, 23/72, 27/24*

U.S. Cl. 252—438 **12 Claims**

1. An iodine adsorbent which consists essentially of a carrier having a large number of pores having a mean pore size of 200–2,000 Å, and an iodine-adsorbing material selected from the group consisting of Ag, Cu, Pb and an iodine-adsorbing salt of Ag, Cu, or Pb, supported on the carrier.

4,234,457

CRYSTALLIZED SILICA-ALUMINA COGEL AND CATALYST EMPLOYING THE SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 935,628, Aug. 21, 1978, Ser. No. 3,879, Jan. 16, 1979, Ser. No. 9,487, Feb. 5, 1979, Ser. No. 718,167, Sep. 9, 1976, Pat. No. 4,058,484, Ser. No. 402,448, Oct. 1, 1973, Pat. No. 4,065,069, Ser. No. 869,856, Feb. 3, 1978, Pat. No. 4,192,778, and Ser. No. 874,754, Feb. 3, 1978. This application Jun. 1, 1979, Ser. No. 44,324

Int. Cl.[3] B01J *27/24, 27/02, 29/06*

U.S. Cl. 252—438 15 Claims

1. A process of forming a host $(SiAl)O_4$, alumino silicate complex containing an in situ generated crystalline phase characterized by d spacings of Table 1 not present in the said host which comprises heating a silica alumina gel in the presence of an acid solution of rare earth cations at an autogenous superatmospheric pressure above about 250° F. and generating said crystalline phase in said host.

4,234,458

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 886,329, Mar. 13, 1978, Pat. No. 4,148,715. This application Apr. 23, 1979, Ser. No. 32,590

Int. Cl.[3] B01J *27/08, 27/10*

U.S. Cl. 252—441 15 Claims

1. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, catalyst components consisting essentially of about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % lanthanide series metal, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and lanthanide series metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the lanthanide series metal is present in a positive oxidation state; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,234,459

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 905,907, May 15, 1978. This application Jun. 8, 1979, Ser. No. 46,883

Int. Cl.[3] B01J *27/08, 27/10*

U.S. Cl. 252—441 12 Claims

1. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tantalum, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group, catalytically available cobalt, and tantalum components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the tantalum component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state or in a mixture of these states.

4,234,460

ADSORBENT FOR ETHYLENE AND PROCESS FOR PREPARATION THEREOF

Yasushi Nishimura, Tokyo; Yasuo Uehara, Iruma, and Tamio Haga, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sep. 12, 1978, Ser. No. 941,681

Claims priority, application Japan, Sep. 22, 1977, 52-114057

Int. Cl.[3] B01J *21/18, 23/70;* B01D *53/04*

U.S. Cl. 252—447 7 Claims

1. An adsorbent for removing ethylene from a gas containing ethylene, said adsorbent containing active carbon and from 0.01 to 20% by weight of copper, said adsorbent having been obtained by

(a) contacting an active carbon with copper or a salt thereof in the presence of nitric acid;

(b) heating the resultant mixture at a temperature of 150° to 900° C. in an inert gas atmosphere whereby the desired adsorbent is obtained.

4,234,461

OXIDATION CATALYSTS

Dev D. Suresh, Macedonia; Noel J. Bremer, Stow, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to Standard Oil Company (Ohio), Cleveland, Ohio

Continuation-in-part of Ser. No. 778,658, Mar. 17, 1977, abandoned, which is a division of Ser. No. 602,343, Aug. 6, 1975, Pat. No. 4,052,418. This application Mar. 30, 1978, Ser. No. 891,786

Int. Cl.[3] B01J *23/10, 21/02, 21/00, 23/16*

U.S. Cl. 252—462 3 Claims

1. A catalyst composition having the empirical formula:

$$A_aV_bD_cO_x$$

wherein

A is arsenic and at least one element selected from the group consisting of an alkali metal, zinc, cadmium, copper, cerium, thorium, manganese and iron;

D is at least one element selected from the group consisting of chromium and antimony;

and wherein

a is a positive number less than or equal to 5;

b and c are 0.1 to 5; and

x is a number as determined by the combined valence requirements of the elements other than oxygen present in the catalyst.

4,234,462

PROCESS FOR ACTIVATING A CATALYST

Petr G. Bondar, prospekt Kosmonavtov, 15, kv. 12, and Anna S. Zavadskaya, ulitsa Lenina, 26, kv. 10, both of Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

Filed Jan. 5, 1979, Ser. No. 1,371

Claims priority, application U.S.S.R., Jan. 5, 1978, 2558401

Int. Cl.[3] B01J *21/04, 23/26, 23/34, 23/74, 23/06, 23/72*

U.S. Cl. 252—463 22 Claims

1. A process for activating a catalyst including, as an active ingredient, at least one of the following metals: copper, chromium, nickel, cobalt, manganese, zinc, and aluminum, which process consists essentially of the steps of:

mixing the catalyst with a reducing agent selected from the group consisting of C_8-C_{35} saturated hydrocarbons, C_8-C_{19} unsaturated hydrocarbons, C_8-C_{29} alicyclic hydrocarbons, C_8-C_{10} aromatic hydrocarbons, C_{11}-C_{13} aliphatic-aromatic hydrocarbons, C_5-C_{30} monohydric alcohols, C_2-C_6 polyhydric alcohols, phenols, C_7-C_{18} aliphatic aldehydes, C_7-C_{18} aromatic aldehydes, C_7-C_{35} aliphatic ketones, C_6-C_{29} alicyclic ketones, C_2-C_{31} aliphatic carboxylic acids, C_2-C_{31} esters of aliphatic carboxylic acids, aromatic acids, carbohydrates, vegetable oils, animal fats, waxes, polyvinyl alcohol, polyvinyl acetate, polyethylene and polybutadiene, in an amount of 4 to 15 wt.% per weight of the active ingredient of the catalyst; and subsequently heating the resulting mixture to a temperature ranging from 200° to 800° C. in an atmosphere inert to the catalyst.

4,234,463

CYCLOHEXENE METHANOL DERIVATIVES IN PERFUME

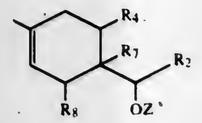
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 048,904, Jun. 15, 1979, which is a division of Ser. No. 012,695, Feb. 16, 1979, Pat. No. 4,195,100, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Nov. 16, 1979, Ser. No. 95,087

Int. Cl.[3] C11B *9/00;* A61R *7/46*

U.S. Cl. 252—522 R 4 Claims

1. Process for augmenting or enhancing the aroma of a perfume composition comprising the steps of intimately admixing with a perfume base an aroma augmenting or enhancing quantity of at least one cyclohexane methanol derivative having the structure:



wherein R_2 is C_2-C_5 alkyl or alkenyl; R_4 is hydrogen, methyl or ethyl; R_7 is hydrogen or methyl; and R_8 is hydrogen or methyl with the proviso that R_7 and R_8 are not both hydrogen or when R_4 and R_8 are hydrogen R_7 is methyl.

4,234,464

DETERGENT BAR COMPOSITION AND BINDER THEREFOR

Fred S. Morshauser, Pequannock, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,192

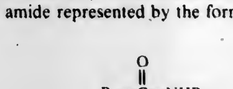
Int. Cl.[3] C11D *1/02, 7/32, 17/00*

U.S. Cl. 252—544 8 Claims

1. A detergent bar binder composition comprising the following combination of ingredients:

(a) fatty acid or alcohol component having an iodine number less than about 20 and a melting point of at least about 50° C. and being selected from the group consisting of fatty acids or alcohols having from 12 to 22 carbon atoms, mono-, di- or tri-glycerides of such fatty acids, fatty acid esters of such fatty alcohols and mixtures thereof and;

(b) alkyl amide represented by the formula:



where R_1 represents a straight chain alkyl radial containing from 10 to 22 carbon atoms and R_2 represents hydrogen or an alkyl radical containing from 1 to 3 carbon atoms, said alkyl amide being present in an amount between about 2 and about 30 wt% of said binder composition and said fatty acid or alcohol component being present in an amount between about 70 and about 90 wt% of said binder composition.

3. A detergent bar comprising the following combination of ingredients:

(a) between about 20 and about 70 wt% of the binder composition of claim 1; and

(b) between about 30 and about 80 wt% anionic foaming and foam boosting detergent.

4,234,465

DETERGENT COMPOSITION

Teruo Magari, Funabashi; Toyoyuki Sato, Tokyo, and Masayoshi Nakamura, Koshigaya, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1979, Ser. No. 24,204

Claims priority, application Japan, Mar. 30, 1978, 53-37041

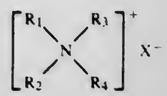
Int. Cl.[3] C11D *1/62, 3/26, 7/32*

U.S. Cl. 252—547 4 Claims

1. A detergent composition consisting essentially of, as essential ingredients,

(i) 5 to 40% by weight of at least one component selected from the group consisting of a magnesium salt of anionic surface-active agents having a sulfonic acid group of sulfuric acid ester group, and

(ii) 2 to 7.5% by weight of at least one component selected from the group consisting of quaternary ammonium compounds having the general formula:



wherein R_1 and R_2 independently represent an alkyl or alkenyl group having 10 to 22 carbon atoms, R_3 and R_4 independently represent an alkyl group having 1 to 3 carbon atoms and X represents a chlorine atom.

4,234,466

PROCESS FOR PREPARATION OF SOLID PIGMENT RESIN DISPERSION

Mitsuru Takahashi, Hirakata; Yukio Omori, Kobe; Shuji Ikeda, Osaka, and Hiroyoshi Kataoka, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Continuation of Ser. No. 630,612, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 406,173, Oct. 12, 1973, abandoned. This application Dec. 1, 1977, Ser. No. 856,803

Claims priority, application Japan, Oct. 14, 1972, 47-103103

Int. Cl.[2] C08L *1/14, 1/28*

U.S. Cl. 260—17 A 14 Claims

1. A process for preparing a solid pigment dispersed composition which comprises subjecting

A. a liquid composition comprising:

i. at least one ethylenically unsaturated polymerizable compound selected from the group consisting of monovinyl aromatic hydrocarbons, ethylenically unsaturated carboxylic esters, acrylonitrile, methacrylonitrile, glycidyl vinyl compounds, ethylenically unsaturated compounds having at least one hydroxyl group, ethylenically unsaturated carboxylic acids, ethylenically unsaturated amides and ethylenically unsaturated compounds having at least one blocked isocyanate group, and

ii. at least one resin dissolved or dispersed therein, said resin being selected from the group consisting of natural resins, rosin esters, cellulose acetate, cellulose acetate butyrate, cellulose acetate propionate, cellulose methyl ether, cellulose ethyl ether, xylene resins, toluene resins, petroleum resins, silicon resins, polyurethane resins, phenol resins, aminoplast resins, epoxy resins, blocked polyisocyanate resins, acrylic resins, methacrylic resins and alkyd resins having at least one mercapto group to be grafted with the ethylenically unsaturated compound, and

B. at least one pigment dispersed in said liquid composition, to suspension or bulk polymerization to form a reaction mixture and recovering the product from suspension or bulk polymerization reaction mixture, the suspension

polymerization being performed in the presence of a suspension stabilizer to produce a spherical particulate product,

said liquid composition being color matched to said pigment before said suspension or bulk polymerization.

4,234,467

BINDER FOR PRESSURE SENSITIVE ADHESIVE

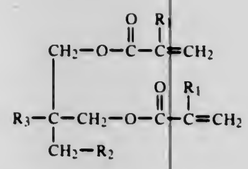
Lars-Olof Ryrfors, Perstorp, and Mats S. O. Hassander, Lund, both of Sweden, assignors to Hoechst-Perstorp AB, Perstorp, Sweden

Filed Feb. 22, 1979, Ser. No. 14,085
Claims priority, application Sweden, Mar. 3, 1978, 7802418
Int. Cl.³ C08L *33/02*
U.S. Cl. 260—29.7 H **5 Claims**

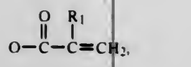
1. Process for the production of a binder for a pressure sensitive adhesive by emulsion polymerization of:

(A) 65–99.4 percent by weight of at least one acrylic ester with 4–18 carbon atoms in the alcohol part of the ester, the esters being selected whereby polymerization of only the selected esters produces a tacky polymer with a Tg-value below 0° C.;

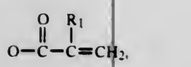
(B) 0.1 to 2 percent by weight of a polymerizable compound selected from the group consisting of a compound of the formula



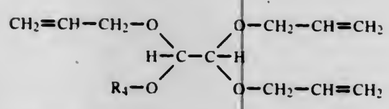
where R_1=H or CH_3,
R_2=H or



and
R_3=CH_3, C_2H_5, OH, CH_2OH or



or a compound with the formula



where R_4=CH_3 or CH_2CH=CH_2

(C) 5–0.5 percent by weight of at least one ethylenically unsaturated acid

and

(D) 28–0 percent by weight of one or more compounds selected from the group consisting of an alkyl acrylate, a hydroxyalkyl acrylate, a lower alkyl methacrylate, a hydroxyalkyl methacrylate with 1–3 carbon atoms in the alcohol part of the ester, acrylonitrile or styrene, said process comprising first copolymerizing the compounds from the groups (A), (C) and (D) in water at a temperature of about 40°–90° C. for ¼ to ¾ of the total reaction time, and then mixing therewith a compound from group (B) and completing the reaction.

4,234,468

COPOLYMER SOLUTION CONSISTING OF ACRYLIC RESIN, PROCESS FOR ITS MANUFACTURE AND THE USE THEREOF IN REACTIVE LACQUERS

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 789,661, Apr. 21, 1977, Pat. No. 4,163,739, This application Feb. 21, 1979, Ser. No. 13,243
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618809
Int. Cl.³ C08F *4/38, 8/30*; C08K *5/00, 5/04*
U.S. Cl. 260—31.2 R **5 Claims**

1. A coating composition containing as an essential ingredient

(A) a copolymer solution of (I) 10 to 30% by weight of inert organic solvent and (II) 70 to 90% by weight—both percentages of (I) and (II) to 100% by weight—of copolymers containing hydroxyl groups which have been manufactured by heating to 150° to 180° C., in the presence of a mixture of diacyl peroxides or peresters and alkyl hydroperoxides or dialkyl peroxides as polymerisation initiators, a mixture of inert solvents having a boiling range of 150° to 180° C. and (a) 5–24% by weight of glycidyl esters of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids of the following empirical formula $C_{12-14}H_{20-26}O_3$, or of a mixture of glycidyl esters of α,α-dialkylalkanemonocarboxylic acids having a content up to about 10% by weight of the mixture of glycidyl esters of α-alkylalkanemonocarboxylic acids of the said empirical formula and having an epoxide equivalent of 240 to 250, to which a mixture of (b) 12–30% by weight of hydroxyethyl acrylate and/or hydroxyethyl methacrylate, (c) 1–10% by weight of acrylic acid, (d_1) 20–50% by weight of styrene and (d_2) 5–35% by weight of methyl methacrylate has been added, the components a, b, c, d_1 and d_2 having been employed in such quantities that their total is 100% by weight and the polymerisation and condensation reactions having proceeded simultaneously and jointly and the components a, b and c having been employed in such quantities that the copolymers have a hydroxyl group content of 3.5 to 6.5% by weight and

(B) a further component B_1 or B_2,

said components A and B being applied in a ratio of 60 to 80% by weight of component A and 20 to 40% by weight of component (B_1) which is an organic polyisocyanate or in a ratio of 20 to 80% by weight of component A and 80 to 20% by weight of component (B_2) which is a thermoplastic copolymer prepared from 98 to 99.5% by weight of methyl methacrylate, ethyl methacrylate or both and 0.5 to 2% by weight of methacrylic or acrylic acid, the sum of the percentages of (B_2) and the components (A) and (B) always being 100% by weight.

5. A coating which dries by physical means in the air and which contains, as the binder, a mixture consisting of:

(A') 20–80% by weight of copolymers which contain hydroxyl groups and which have been manufactured by heating to 150° to 180° C., in the presence of mixtures of diacyl peroxides or peresters and alkyl hydroperoxides or dialkyl peroxides as the polymerization initiators, a mixture of inert solvent having a boiling range of 150° to 180° C. and the component to be esterified, that is to say (a) 5–24% by weight of glycidyl esters of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids of the following empirical formula $C_{12-14}H_{20-26}O_3$, or a mixture of glycidyl esters of α,α-dialkylalkanemonocarboxylic acids having a content up to about 10 percent by weight of the mixture of glycidyl esters of α-alkylalkanemonocarboxylic acids of the said empirical formula, the mixture having an epoxide equivalent of 240 to 250, with the slow, uniform addition of (b) 12–30% by weight of hydroxyethyl acrylate and/or hydroxyethyl methacrylate, (c) 1–10% by weight of acrylic acid, (d_1) 20–50% by weight of styrene and (d_2) 5–35% by weight of methyl methacrylate, the components a, b, c, d_1 and d_2 having been employed in such quantities that their sum adds up to 100% by weight and the polymerisation and condensation reactions proceeding simultaneously and jointly and the additional condition applying that the components a, b and c have been employed in such quantities that the copolymers have a hydroxyl group content of 3.5 to 6.5% by weight, and

(B") 80–20% by weight of thermoplastic copolymers manufactured from 98–99.5% by weight of methyl methacrylate and/or ethyl methacrylate and 0.5–2% by weight of methacrylic acid or acrylic acid, it being necessary that the components A' and B" add up to 100% by weight.

4,234,469

FLAME RETARDING POLYOLEFIN RESIN BLEND COMPOSITION

Yuzo Ohta, Ichihara; Norio Sugi, Sodegauro; Osamu Isogai, Ichihara; Takahiro Hirai, and Hidehiko Kaji, both of Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 759,625, Jan. 17, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,184
Claims priority, application Japan, Jul. 29, 1976, 53-89682
Int. Cl.² C08L *23/06, 23/12*
U.S. Cl. 260—42.46 **3 Claims**

1. A composition consisting essentially of from 30 to 80 percent by weight of polypropylene having a melt index of from 0.5 to 15.0 grams per 10 minutes (temperature: 230° C., load: 2.16 kilograms), from 5 to 25 percent by weight of polyethylene having a melt index of from 0.01 to 2.0 grams per 10 minutes (temperature: 190° C., load: 2.16 kilograms), from 20 to 40 percent by weight of at least one inorganic filler selected from the group consisting of powdered talc, kaolinite, sericite, silica and diatomaceous earth, from 5 to 35 percent by weight of an organic halide flame retarder, and an inorganic antimony compound as a flame retarding assistant in an amount of from ¼ to ½ of the amount of said flame retarder, in which the amount of each component is based on the total amount of polypropylene, polyethylene and inorganic filler, said composition containing no chlorinated polyalkanes.

4,234,470

CATALYTIC NITRATION OF AROMATIC COMPOUNDS

Frederick R. Lawrence, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1979, Ser. No. 32,346
Int. Cl.³ C07C *79/10*
U.S. Cl. 568—939 **9 Claims**

1. In the process for the continuous catalytic vapor-phase mononitration of an aromatic compound, in which the aromatic compound, a nitrating agent and a particulate α-fluorosulfonic acid polymer catalyst are brought together under conditions suitable for nitration, the improvement which comprises admixing the catalyst, before it is used, with at least 10%, by volume of the catalyst, of a particulate complement, inert to the nitration reaction, dimensionally stable under the reaction conditions, and having a particle size of −U.S.S. 3½ +U.S.S. 325.

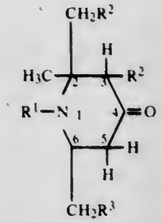
4,234,471

NOVEL POLYALKYL-PIPERIDINE POLYMERS, THEIR PREPARATION AND USE

Hartmut Wiezer, Gersthofen; Helmut Korbanka, Adelsried, and Gerhard Pfahler, Augsburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

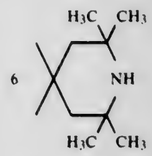
Filed Sep. 7, 1979, Ser. No. 73,540
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839711
Int. Cl.³ C08K *5/16*; C08G *12/26*
U.S. Cl. 260—45.8 N **4 Claims**

1. A process for the preparation of polyalkyl-piperidine/formaldehyde polymers which comprises reacting a polyalkyl-piperidone-4 of the formula (I)



(I)

in which
R^1 is hydrogen, oxygen or C_1–C_{12}-alkyl,
R^2 and R^3 are either identical and represent hydrogen or a C_1–C_5-alkyl group,
R^4 being a methyl group in this case; or
R^2 is hydrogen or C_1–C_5-alkyl, and
R^3 and R^4 together with the carbon atoms linked to them form a C_5 or C_6 cycloalkyl group, or a group of the formula



with the 0.5- to 1.1-fold molar amount of paraformaldehyde at a temperature of from 50° to 180° C. in the presence of an aliphatic C_1–C_{10}-monoalcohol and of an alkaline base,

and subsequently optionally hydrogenating the product obtained either completely or partially according to known processes.

3. A process for stabilizing synthetic polymers against the damaging influence of light, which comprises adding to the polymer from 0.01 to 5 parts by weight, relative to the polymer, of a polymer stabilizer as claimed in claim 2, optionally in addition to hitherto known stabilizing substances.

4,234,472

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer D. Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 1, 1979, Ser. No. 16,582
Int. Cl.³ C08K *3/22*
U.S. Cl. 260—45.75 M **5 Claims**

1. A smoke retardant composition consisting essentially of a vinyl chloride or vinylidene chloride polymer containing a predominant amount of vinyl chloride or vinylidene chloride together with a smoke retardant amount of cobaltous oxide (CoO).

4,234,473

DODECYL-1,12-DIAMMONIUM DIMOLYBDATE AND COMPOSITION CONTAINING SAME

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 30, 1979, Ser. No. 62,444
Int. Cl.³ C07F *11/00*
U.S. Cl. 260—45.75 R **4 Claims**

1. Dodecyl-1,12-diammonium dimolybdate having the empirical formula $H_2(CH_2)_{12}(NH_2)_2Mo_2O_7$ and having major

x-ray diffraction peaks at "d" spacings of 18.4A, 9.03A and 4.27A.

4,234,474

TRIBENZYLAMMONIUM OCTAMOLYBDATE AND COMPOSITION CONTAINING SAME

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 30, 1979, Ser. No. 62,445
Int. Cl.³ C08K *00/00*
U.S. Cl. 260—45.75 R **4 Claims**

1. Tribenzylammonium octamolybdate having the empirical formula $[H(C_6H_5CH_2)_3N]_6(Mo_8O_{27}).4H_2O$ and having major x-ray diffraction peaks at "d" spacings of 13.0 A, 9.09 A, 4.80 A and 4.27 A.

4,234,475

REACTING PROTEIN WITH ORGANIC ACID

Phillip E. Sokol, Rockville, Md., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 15, 1975, Ser. No. 605,166
Int. Cl.³ C08H *1/06*
U.S. Cl. 260—112 R **4 Claims**

1. The method of making a surface active agent which comprises heating at a temperature from 210° but not exceeding 260° C., a mixture of one to ten equivalent weights of a protein with one equivalent weight of a reagent which is a member of the group consisting of aromatic carboxylic acids, alkylated aromatic carboxylic acids in which each alkyl group has from 1 to 6 carbon atoms, halogenated aromatic carboxylic acids, and saturated and unsaturated aliphatic carboxylic acids having from 6 to 54 carbon atoms.

4,234,476

APPLICATION OF PROTEIN-PROTEIN INTERACTION AS AN ASSAY FOR THE DETECTION OF CANCER

Edsel T. Bucovaz; John C. Morrison, both of Memphis; William C. Morrison, Germantown, and Walter D. Whybrew, Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 727,633, Sep. 29, 1976, Pat. No. 4,160,817. This application Mar. 7, 1978, Ser. No. 884,288
Int. Cl.² A23J *1/18*; C07G *7/03*
U.S. Cl. 260—112 R **1 Claim**

1. Purified CoA-SPC Bakers' yeast extract characterized by a molecular weight of greater than 200,000 and by utilizing the substrates L-cysteine, D-pantothenic acid and ATP to produce CoA.

4,234,477

α-N-ACETYL-L-PHENYLALANYL-L-ARGININE ETHYL ESTER

Franz Fiedler, Munich, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,702
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813772
Int. Cl.³ C07C *103/52*; C12Q *1/36*
U.S. Cl. 260—112.5 R **7 Claims**

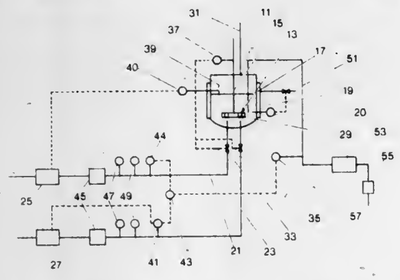
1. Acetylphenylalanyl-arginine ethyl ester or an acid addition salt thereof.

4,234,478

PROCESS AND APPARATUS FOR THE DIAZOTIZATION OF AMINES

John H. Atherton, and Ian Hodgkinson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 8, 1979, Ser. No. 10,478
Claims priority, application United Kingdom, Feb. 14, 1978, 581978/78; Nov. 20, 1978, 45292/78
Int. Cl.³ C07C *113/00*
U.S. Cl. 260—141 **10 Claims**



1. A process for the diazotisation of a heterocyclic or a weakly basic benzenoid amine which comprises reacting together in a continuous manner, in a reaction zone from which a product stream containing diazotised amine is continuously removed, the amine and an aqueous solution of nitrite ions in the presence of sulphuric acid, the proportions and concentrations of the amine, the aqueous solution of nitrite ions and the sulphuric acid beig so arranged as to provide a working acid concentration in the reaction zone in which the diazotised amine is stable.

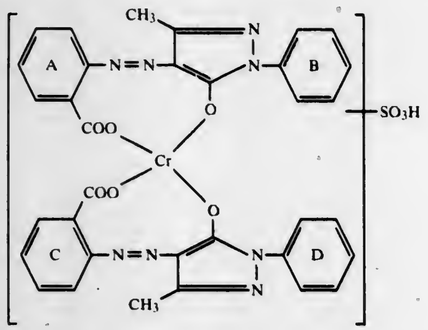
4,234,479

CHROMIUM MIXED COMPLEX DYESTUFFS OF PHENYL-AZO-PYRAZOLE COMPONENTS

Winfried Mennicke, Leverkusen; Walter Scholl, Cologne, and Karl-Heinz Schündehütte, Opladen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 452,929, Mar. 20, 1974, abandoned. This application Jan. 26, 1977, Ser. No. 762,480
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1973, 2313722
Int. Cl.² C09B *45/02, 45/06, 45/16*; D06P *1/10*
U.S. Cl. 260—145 B **2 Claims**

1. Unsymmetrical chromium mixed complex dyestuff which in the form of the free acid has the formula



wherein

SO_3H is bonded to one of the rings A, B, C or D; the rings

A and C are phenyl or phenyl substituted by nitro, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_2-C_5-alkyl-carbonylamino, C_2-C_5-alkylcarbonyl or carboxyl; and

the rings B and D are phenyl; phenyl substituted by nitro, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_2-C_5-alkylcarbonylamino, C_2-C_5-alkylcarbonyl or carboxyl; or naphthyl.

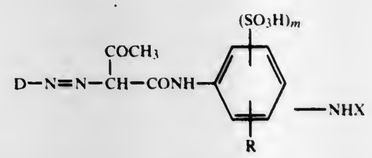
4,234,480

WATER-SOLUBLE AZO DYESTUFFS

Erich Krämer, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,493
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738510
Int. Cl.³ C09B *29/22*
U.S. Cl. 260—157 **4 Claims**

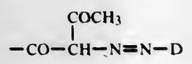
1. Azo dyestuffs which, in the form of the free acid, correspond to the general formula



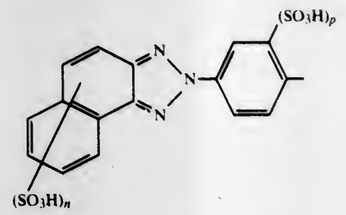
(1)

in which

X denotes a radical of the formula



D denotes a radical of the formulae



R denotes hydrogen, methyl, ethyl, methoxy, ethoxy or chlorine,

m, p, q and r denote 0 or 1 and

n denotes 1 or 2,

with the proviso that the dyestuffs contain at least 2 sulphonic acid groups.

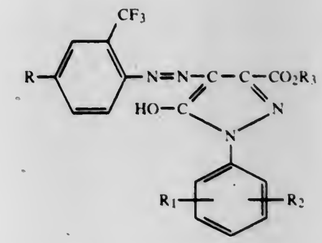
4,234,481

YELLOW PYRAZOLONE ESTER DYES FOR HEAT TRANSFER PRINTING

Russell I. Steiner, Reading, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 30, 1977, Ser. No. 847,892
Int. Cl.³ C09B *29/22, 29/36, 29/50*
U.S. Cl. 260—163 **9 Claims**

1. A compound of the formula



where R is hydrogen or halogen, and R_1 and R_2 independently of one another are hydrogen, or halogen, and R_3 is lower alkyl.

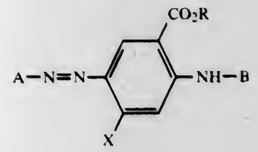
4,234,482

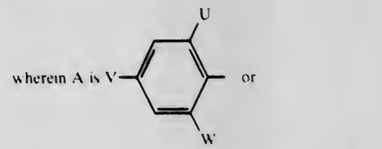
SUBSTITUTED 3-CARBALKOXY 4-ALKYLAMINO-AZOBENZENE COMPOUND AS DISPERSE DYESTUFFS FOR SYNTHETIC FIBERS

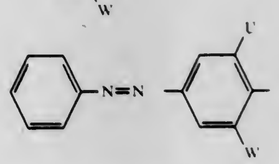
Claude M. H. E. Brouard, Sotteville les Rouen, and Jean-Pierre H. Stiot, Saint Pierre les Elbeuf, both of France, assignors to Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle, Paris, France

Filed Jul. 8, 1975, Ser. No. 594,405
Claims priority, application France, Aug. 7, 1974, 74 23605
Int. Cl.³ C09B *29/04, 29/36, 33/16*; D06P *3/54*
U.S. Cl. 260—187 **2 Claims**

1. A dyestuff represented by the formula:







U is chlorine, bromine, cyano, nitro, carbomethoxy, carbethoxy or mesyl,

V is cyano, nitro or mesyl,

W is hydrogen, chlorine, bromine, cyano or nitro,

R is alkyl containing 1 to 4 carbon atoms,

X is hydrogen, bromine, chlorine, acetylamino, benzoylamino, alkoxycarbonylamino containing 2 to 5 carbon atoms, phenoxycarbonylamino, alkylsulfonylamino containing 1 to 4 carbon atoms or phenylsulfonyamino, and

B is

β-chlorethyl,
β,γ-dichloropropyl,
3,3,4,4,4-pentafluorobutyl,
alkyl containing 1 to 4 carbon atoms unsubstituted or mono-substituted by cyano, nitro, phenyl, phenoxy, alkoxy containing 1 to 4 carbon atoms, carbophenoxy, alkylsulfonyl containing 1 to 4 carbon atoms, phenylsulfonyl, acetyl, cyanalkoxy containing 2 to 5 carbon atoms or carbalkoxy containing 2 to 5 carbon atoms, said carbalkoxy being unsubstituted or mono-substituted by cyano, acetyl or carbalkoxy containing 2 to 5 carbon atoms,
or $-(CH_2)_n-OR'$ wherein n is a whole number from 1 to 4 and R' is hydrogen, acetyl, propionyl, butyryl, benzoyl, carbalkoxy containing 2 to 5 carbon atoms, carbophenoxy, alkylsulfonyl containing 1 to 4 carbon atoms or phenylsulphonyl.

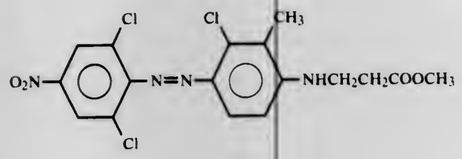
4,234,483

N-(3-CHLORO-4-[2,6-DICHLORO-4-NITROPHENYL-)AZO]-2-METHYL PHENYL)-β-ALANINE, METHYL ESTER

Raouf Botros, Beech Creek, and Ivan E. Riggle, Lock Haven, both of Pa., assignors to American Color & Chemical Corporation, Charlotte, N.C.

Filed Aug. 11, 1976, Ser. No. 713,619
Int. Cl.³ C09B 29/08; D06P 3/04, 3/24, 3/52
U.S. Cl. 260—207.1 **1 Claim**

1. The azo compound represented by the formula:



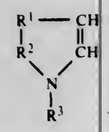
4,234,484

PROCESS FOR THE PREPARATION OF CYCLIC ENAMIDES

Michael Mitzlaff, Bad Homburg, and Klaus Warning, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,783
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718666
Int. Cl.³ C07B 3/00; C07D 202/20, 207/27, 223/04
U.S. Cl. 260—239 BE **18 Claims**

1. A process for the preparation of a cyclic enamide of the formula



in which R^1 is a single bond or alkylene of from 1 to 8 carbon atoms

R^2 is $-CH_2-CH_2-$,

$-CH=CH-$,

$-CH_2-CH-$ (with CH_3)

or

-continued

$-CH_2-C-$ (=O)

in which the carbon atom carrying the CH_3 or the oxygen radical is bound to the ring nitrogen atom:
R^3 is a hydrogen atom, secondary or tertiary alkyl of 3 or 4 carbon atoms,

$-C(=O)-OR^4$ or

$-C(=O)-R^{4'}$

in which R^4 is alkyl of from 1 to 6 carbon atoms; phenyl; phenyl substituted by at least one member of the group consisting of alkyls of from 1 to 4 carbon atoms, fluorine, chlorine and bromine; benzyl; or benzyl substituted by at least one member of the group consisting of alkyls of from 1 to 4 carbon atoms, fluorine, chlorine and bromine; and $R^{4'}$ has the same meaning as R^4 or is hydrogen; provided that either one or the other, but not both, of the radicals R^2 and R^3 contains a

$-C(=O)-$ group,

which comprises heating a cyclic amide of the formula



in which R^1 and R^3 are as defined previously, and $R^{2'}$ is

$-CH_2-CH_2-$,

$-CH_2-CH_2-$ (with CH_3),

$-CH_2-C(=O)-$ or

$-CH_2-CH-$ (with OR^5),

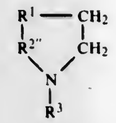
the carbon atom carrying the CH_3, O or OR^5 radical being bound to the ring nitrogen atom and R^5 being a primary or secondary alkyl of from 1 to 4 carbon atoms, provided that either one or the other, but not both, of the radicals $R^{2'}$ and R^3 contains a

$-C(=O)-$ group,

to a temperature of from about 100° to 250° C., in the presence of a catalyst selected from the group consisting of tetraalkylammonium salts of tetrafluoroboric acid, alkali metal salts of tetafluoroboric acid, tetraalkylammonium salts of hexafluorophosphoric acid and alkali metal salts of hexafluorophosphoric acid, and mixtures

thereof, distilling off the detached alcohol R^5OH, and isolating the enamide.

2. A process as claimed in claim 1, which further comprises producing a cyclic amide by anodically alkoxylating a cyclic nitrogen compound of the formula



R^1 and R^3 being as defined previously and $R^{2''}$ being

$-CH_2-CH_2-$,

$-CH_2-CH_2-$ (with CH_3) or

$-CH_2-C(=O)-$

the carbon atom carrying the CH_3 or the oxygen radical being bound to the ring nitrogen atom, provided that either one or the other, but not both, of the radicals $R^{2''}$ and R^3 contains a

$-C(=O)-$ group,

in an alcohol R^5OH, R^5 being as defined previously, in the presence of a supporting electrolyte which is selected from the group consisting of tetraalkylammonium salts of tetrafluoroboric acid, alkali metal salts of tetrafluoroboric acid, tetraalkylammonium salts of hexafluorophosphoric acid and alkali metal salts of hexafluorophosphoric acid, and mixtures thereof, heating the cyclic amide in the presence of a catalyst which is identical with said electrolyte, and distilling off the alcohol R^5OH.

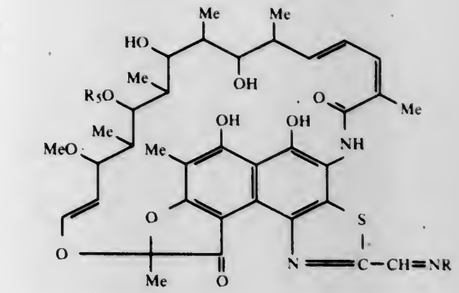
4,234,485

PROCESS FOR PREPARING 4-DESOXY-THIAZOLO[5,4-C]RIFAMYCIN DERIVATIVES

Renato Cricchio, Varese, and Marisa Berti, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Division of Ser. No. 21,866, Mar. 19, 1979. This application Oct. 29, 1979, Ser. No. 88,977
Claims priority, application Italy, Apr. 27, 1978, 22738 A/78
Int. Cl.³ C07D 51/20; A61K 31/425
U.S. Cl. 260—239.3 P **4 Claims**

1. A process for preparing a 4-desoxy-thiazolo[5,4-c]rifamycin of the formula

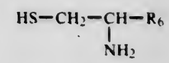


wherein R stands for a group $-OR_1$, or $-NH-CO-R_4$ wherein R_1 represents alkyl having 1 to 8 carbon atoms per group and no substitution or halo, amino, mono- or di- (C_{1-4}) alkylamino, C_{1-4} alkoxy, C_{5-8} cycloalkoxy, phenoxy phenyl (C_{1-4}) alkoxy, nitro, cyano, hydroxy, carboxy, carbo (C_{1-4}) alkoxy or carbamoyl substitution; alkenyl having up to 8 carbon atoms per group which contains one or two double bonds, alkynyl having up to 8 carbon atoms per group which contains one or two triple bonds, cycloalkyl having a cycloaliphatic ring containing from 5 to 8 carbon atoms and having up to two C_{1-4} alkyl substituents, aryl or aralkyl wherein aryl as such or in a compound term designates phenyl or phenyl having halo, C_{1-4} alkyl, halo (C_{1-4}) alkyl, C_{1-4} alkenyl, C_{5-8} cycloalkyl, amino, mono- or di- (C_{1-4}) alkylamino, C_{1-4} alkoxy, methylenedioxy, cyano, carboxy, hydroxy, carbo (C_{1-4}) alkoxy, carbamoyl or nitro substitution,

R_2 and R_3 are independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and aralkyl, as defined above, or R_2 and R_3 taken together with the adjacent nitrogen atom may form a 5-7 membered heterocyclic ring wherein the hetero atoms are nitrogen, and

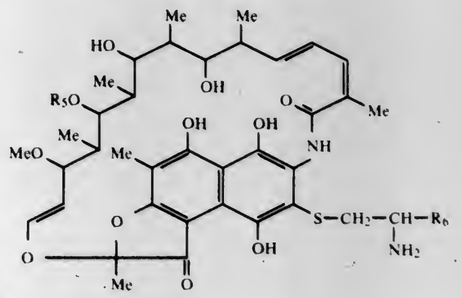
R_5 is hydrogen or acetyl;

which comprises reacting rifamycin S or its 25-desacetyl derivative with a cysteine derivative of formula III



III

wherein R_6 stands for —H or —COOH in a water-miscible organic solvent, at a temperature comprised between room temperature and the boiling temperature of the reaction mixture whereby a 3-[(2-substituted ethyl)thio]rifamycin derivative of formula V



V

is obtained wherein

R_5 and R_6 are as defined before, and contacting said derivative with about a equimolar amount of a compound of formula H_2NR wherein R is as defined before and at least the stoichiometric amount of an oxidizing agent.

4,234,486

PROCESS FOR PREPARING METAL PHTHALOCYANINE COMPOUNDS

Robert G. Brinkley, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

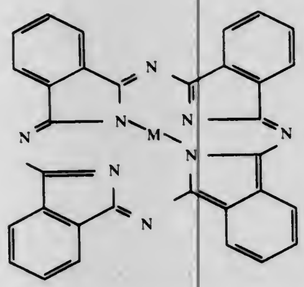
Filed Dec. 29, 1978, Ser. No. 974,222

Int. Cl.³ C09B *47/24*

U.S. Cl. 260—314.5 **6 Claims**

1. A process for forming metal phthalocyanine compounds which comprises

(a) reacting a compound represented by the formula:

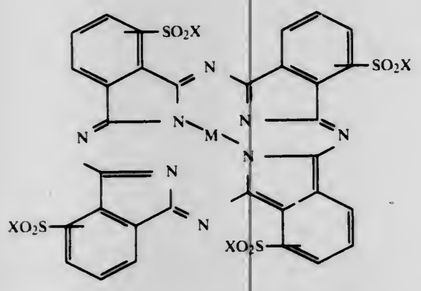


where M is a metal chosen from the group consisting of cobalt, nickel, copper, chromium, magnesium and zinc with compounds represented by the formulas:

X SO_3 H and SO X_2

where X is a halogen to form a compound represented by the formula:

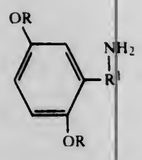
(II)



(b) without isolating compound (II) from the reaction mixture, adding a partial solvent for compound (II) and water to said reaction mixture in quantities effective to form an emulsion, wherein said partial solvent is not miscible with water; and

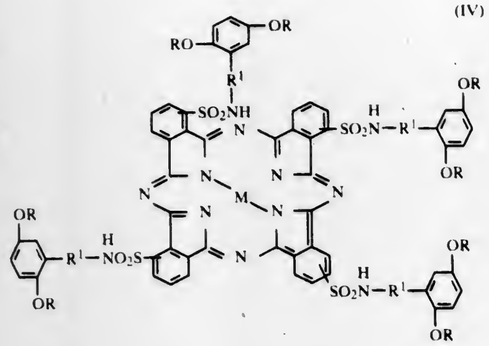
(c) reacting compound (II) in said emulsion with a compound represented by the formula:

(III)



where R is alkyl having from 1 to 6 carbon atoms and R^1 is alkylene having from 1 to 6 carbon atoms to form a compound represented by the formula:

(IV)



(I)

4,234,487

PROCESS OF MAKING A CARBAZOLE ACETIC ACID

Leo Berger, Montclair, and John W. Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 972,142, Dec. 21, 1978, Pat. No. 4,179,443, which is a division of Ser. No. 914,465, Jun. 12, 1978, Pat. No. 4,146,542. This application May 3, 1979, Ser. No. 35,669

Int. Cl.³ C07D *209/82*

U.S. Cl. 260—315 **1 Claim**

1. A process for preparing 6-chloro-α-methylcarbazole-2-acetic acid and esters thereof which comprises the steps of (a) reacting 6-chloro-1,2,3,4-tetrahydrocarbazole-2-one with trilower alkyl-α-methylphosphonoacetate in the presence of a strong base, and (b) aromatizing the reaction product of step (a), prior to or after saponification, to yield 6-chloro-α-methylcarbazole-2-acetic acid or ester.

4,234,488

BENZ-[C,D]-INDOLYL COMPOUNDS

Horst Harnisch, Cologne, and Alfred Brack, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

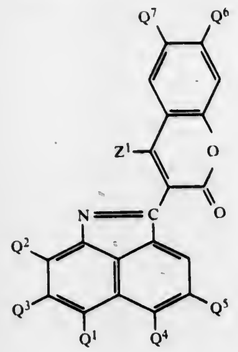
Division of Ser. No. 890,688, Mar. 27, 1978, Pat. No. 4,147,865, which is a continuation of Ser. No. 763,142, Jan. 27, 1971, abandoned. This application Dec. 29, 1978, Ser. No. 974,609

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603592

Int. Cl.³ C07D *405/04*

U.S. Cl. 260—326.27 **10 Claims**

1. Dyestuff of the formula



wherein

Z^1 represents OH or NT^1T^2;

T^1 represents H; or C_1-C_4-alkyl which is unsubstituted or substituted by C_1-C_2-alkoxy or chlorine;

T^2 represents H; or C_1-C_4-alkyl which is unsubstituted or substituted by C_1-C_2-alkoxy or chlorine;

Q^1 represents H; fluorine; chlorine; bromine; iodine; hydroxyl; C_1-C_4-alkoxy; cyclohexyloxy; benzyloxy; phenoxy; phenylsulphonyloxy; sulphydryl; C_1-C_4-alkylmercapto unsubstituted or substituted with OH, Cl, Br, CN, C_1-C_2-alkoxy, benzyloxy or C_1-C_2-alkoxycarbonyl; benzylmercapto; p-tolylmethylmercapto; phenylmercapto unsubstituted or substituted with C_1-C_4-alkyl, C_1-C_2-alkoxy, CF_3, chlorine, bromine, amino, C_1-C_2-alkylcarbonylamino, C_1-C_2-alkylsulphonylamino, chlorosulphonyl, $Q^8O—SO—$, $Q^9Q^{10}N—SO_2—$ or nitro; naphthylmercapto; amino monosubstituted or disubstituted with C_1-C_4-alkyl or benzyl or monosubstituted by phenyl; C_1-C_4-alkylcarbonylamino or -sulphonylamino unsubstituted or substituted with chlorine; C_1-C_4-alkylureido; phenylureido; C_1-C_2-alkoxycarbonylamino; phenoxycarbonylamino; benzoylamino unsubstituted or substituted with methyl, methoxy, or chlorine; nitro; C_1-C_4-alkylsulphonyl unsubstituted or substituted with chlorine or hydroxyl; phenylsulphonyl or phenylsulphinyl unsubstituted or substituted with C_1-C_4-alkyl, chlorine, or bromine; chlorosulphonyl; $Q^8O—SO_2—$; $Q^9Q^{10}N—SO_2—$; $Q^9Q^{10}N—CO—$; $Q^{11}O—CO—$; or cyano;

Q^2 represents hydrogen, chlorine, bromine, phenylmercapto, or ethyl;

Q^3 represents hydrogen or bromine;

Q^4 represents hydrogen, C_1-C_2-alkoxy, chlorine, bromine, or phenylmercapto;

Q^5 represents hydrogen or bromine;

Q^6 represents hydrogen, methyl, hydroxyl, C_1-C_4-alkoxy, benzyloxy, di-(C_1-C_2-alkyl)-amino, chlorine, or bromine;

Q^7 represents hydrogen; methyl; C_1-C_2-alkoxy; chlorine; or bromine; or, conjointly with Q^6, represents methylenedioxy or —CH=CH—CH=CH— which is linked to position 5 of the coumarin ring system;

Q^8 represents H; C_4-C_8-alkyl; cyclohexyl unsubstituted or substituted with methyl; or phenyl-C_1-C_3-alkyl;

Q^9 represents unsubstituted C_1-C_6-alkyl; C_1-C_3-alkyl which is substituted by OH, Cl, CN, C_1-C_2-alkoxy, di-(C_1-C_2-alkyl)-amino, or tri-(C_1-C_2-alkyl)-ammonium, or phenyl-C_1-C_2-alkyl, cyclohexyl or cyclohexylmethyl; and

Q^{10} represents H; unsubstituted C_1-C_4-alkyl; or C_1-C_2-alkyl which is substituted by OH, Cl, CN or C_1-C_2-alkoxy;

Q^{11} represents H; C_1-C_2-alkyl; phenyl-C_1-C_2-alkyl; or phenyl; or an acid salt of the dyestuff with organic or inorganic colorless acids when $Z^1 = NT^1T^2$.

4,234,489

PYROGLUTAMIC ACID DERIVATIVES AND ANALOGS

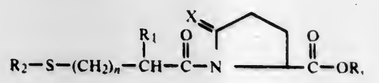
Miguel A. Ondetti, Princeton; Eric M. Gordon, Pennington, and Denis E. Ryono, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 25, 1979, Ser. No. 51,772

Int. Cl.³ C07D *207/36*; A61K *31/40*

U.S. Cl. 260—326.42 **17 Claims**

1. A compound having the formula



or a salt thereof, wherein

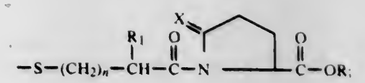
R is hydrogen, alkyl or diphenylmethyl;

R_1 is hydrogen, alkyl or trifluoromethyl;

R_2 is hydrogen,



or



R_3 is hydrogen, alkyl, phenyl, or phenylalkyl;

X is oxygen or sulfur; and

n is 0 or 1 wherein "alkyl" refers to groups of 1 to 7 carbon atoms.

4,234,490

INTERMEDIATES IN THE SYNTHESIS OF VITAMIN E

Richard Barner, Witterswil, and Max Schmid, Brugg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,361, May 12, 1978, Pat. No. 4,153,614. This application Jan. 18, 1979, Ser. No. 4,503

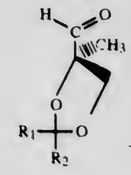
Claims priority, application Luxembourg, May 16, 1977, 77344

Int. Cl.³ C07D *317/10*

U.S. Cl. 260—340.9 R **1 Claim**

1. A compound of the formula

XI



wherein R_1 and R_2 each are lower alkyl or R_1 is phenyl and R_2 is hydrogen.

4,234,491

STEROID SYNTHESIS PROCESS USING MIXED ANHYDRIDE

Gary F. Cooper, Menlo Park, and Albert R. Van Horn, Los Altos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

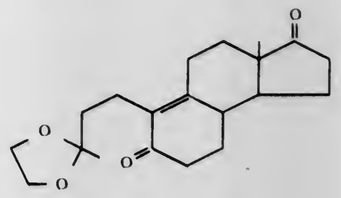
Division of Ser. No. 916,443, Jun. 19, 1978, Pat. No. 4,158,012. This application Mar. 22, 1979, Ser. No. 22,667

Int. Cl.³ C07D *317/12*

U.S. Cl. 260—340.9 AS **8 Claims**

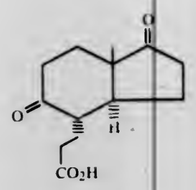
1. A process for the preparation of the compound represented by the formula

(I)



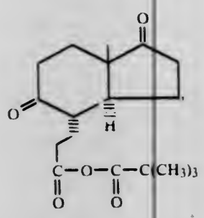
which comprises

(a) treating a compound represented by the formula



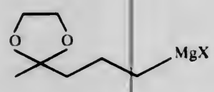
(II)

with pivaloyl chloride in the presence of a tertiary amine to afford a mixed anhydride represented by the formula

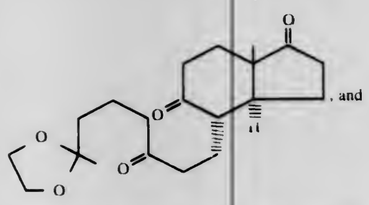


(III)

(b) treating said mixed anhydride with a Grignard reagent of the formula



wherein X is chloro or bromo, in an ether solvent at a temperature between $-55°$ and $-80°$ C., followed by treatment with water, to afford a triketoketal compound represented by the formula

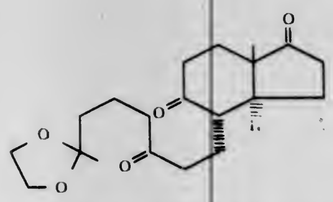


(IV)

, and

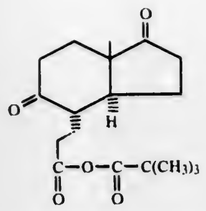
(c) treating said triketoketal compound with base in an aqueous medium at a temperature between about 50° and 80° C. to afford said compound of formula (I).

6. A process for the preparation of the compound represented by the formula



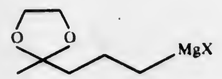
(IV)

which comprises treating a mixed anhydride of the formula



(III)

with a Grignard reagent of the formula



wherein X is chloro or bromo, in an ether solvent at a temperature between about $-55°$ and $-80°$ C., followed by treatment with water.

4,234,492

2-DECARBOXY-2-AMINOMETHYL-9-DEOXY-6,9α-EPOXYMETHANO-5,6-DIDEHYDRO-PGF$_1$ COMPOUNDS

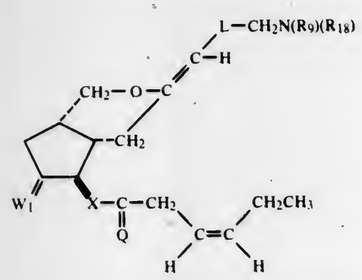
Robert C. Kelly, Kalamzoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,392, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 16, 1979, Ser. No. 67,493

Int. Cl.[3] C07D *311/02*

U.S. Cl. 260—345.2 **13 Claims**

1. A 5E compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;
wherein L is
(1) $-(CH_2)_d-C(R_2)_2$,
(2) $-CH_2-O-CH_2-Y-$, or
(3) $-CH_2CH=CH-$,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,
wherein Q is oxo, α-H:βH, α-OH:βR_8 or α-R_8:β-OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_9 is hydrogen, methyl, or ethyl;
wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive; and
wherein X is
(1) trans—CH=CH—,
(2) cis-CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

4,234,493

9-DEOXY-6,9α-EPOXYMETHANO-5,6-DIDEHYDRO-PGF$_1$, AMIDE

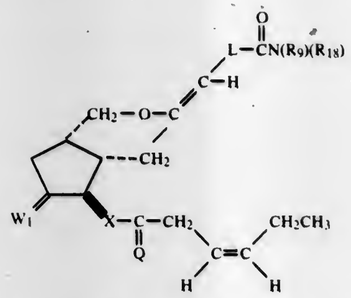
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,392, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 16, 1979, Ser. No. 67,492

Int. Cl.[3] C07D *311/02*

U.S. Cl. 260—345.2 **13 Claims**

1. A 5E compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;
wherein L is
(1) $-(CH_2)d-C(R_2)_2$,
(2) $-CH_2-O-CH_2-Y-$, or
(3) $-CH_2CH=CH-$,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,
wherein Q is oxo, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_9 is hydrogen, methyl, or ethyl;
wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

4,234,494

FORMATION, PURIFICATION AND RECOVERY OF PHTHALIC ANHYDRIDE

Hobe Schroeder, Warrenville, and David A. Palmer, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 29, 1979, Ser. No. 70,662

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.7 **7 Claims**

1. A process for the formation, purification and recovery of phthalic anhydride from a mixture, comprising on a weight basis, from 70 up to 90 percent o-phthalic acid, from 1.5 up to 21 percent water, from 0.3 up to 13 percent benzoic acid, from 0.2 up to 2 percent o-toluic acid, from 0.1 up to 2 percent phthalide, from 0.2 up to one percent 2-carboxybenzaldehyde, and from 1.3 up to 4 percent higher boiling compounds; which process comprises subjecting said mixture as a liquid to the sequential steps of (a) rapid dehydration of o-phthalic acid to its anhydride under conditions for rapid evaporation of said anhydride wherein a mixture of vapors of said anhydride, water, and oxygen-containing aromatic compounds comprising benzoic acid, o-toluic acid, phthalide and 2-carboxybenzaldehyde is formed; (b) contacting the vapor mixture obtained from step (a) with a noble metal catalyst; (c) separating water vapor from said mixture of vapors by contacting in a fractionation zone such mixture of vapors in countercurrent flow with a reflux liquid at a temperature below the boiling temperature of said anhydride which liquid is inert to the components of said mixture of vapors, a solvent for said anhydride at a temperature between its freezing point and its melting point, remains liquid at and below the freezing point temperature of said anhydride, boils at a temperature below the boiling point temperature of said anhydride, is substantially immiscible with water and does not form an azeotrope with said anhydride; (d) a zeotrope removal of phthalide from the resulting water free mixture of said anhydride and said oxygen-containing aromatic compounds by heating to a temperature above 250° C. such mixture of said anhydride and oxygen-containing aromatic compounds in the presence of an alkali metal hydroxide having a molecular weight of at least 56 until the presence of phthalide is no longer detectable; and (e) fractionation of the mixture resulting from step (d) to remove: as a first fraction containing substantially all of the benzoic acid, o-toluic acid and 2-carboxybenzaldehyde; as a second fraction product phthalic anhydride and leaving as a third fraction the compounds boiling higher than phthalic anhydride.

4,234,495

PROCESS FOR PREPARING 1α-HYDROXYVITAMIN D COMPOUNDS FROM 1α-HYDROXY-3,5-CYCLOVITAMIN D COMPOUNDS

Hector F. DeLuca; Heinrich K. Schnoes; David E. Hamer, all of Madison, and Herbert E. Paaren, Verona, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 10, 1979, Ser. No. 73,839

Int. Cl.[3] C07J *9/00*

U.S. Cl. 260—397.2 **12 Claims**

1. A process for preparing 1α-hydroxyvitamin D compounds which comprises
solvolizing, in the presence of an acid catalyst, a 1α-hydroxy-3,5-cyclovitamin D compound corresponding to the 1α-hydroxyvitamin D compound which it is desired to obtain, whereby an 0-acyl group is introduced at least at carbon-3 of the molecule
exposing the solvolysis reaction products to actinic radiation in the presence of a photosensitizing agent
recovering the 1α-hydroxylated 0-acylated vitamin D product.

4,234,496

COMPLEX ORGANO-METALLIC COMPOUNDS OF BORON OR PHOSPHORUS

Samuel E. Harson, Warrington, England, assignor to Manchem Limited, Manchester, England

Filed May 22, 1979, Ser. No. 41,418

Claims priority, application United Kingdom, May 26, 1978, 23007/78

Int. Cl.[3] A23J *7/00*; C07F *9/02*; C11C *3/00*

U.S. Cl. 260—403 **12 Claims**

1. Solid compounds comprising three atoms of a divalent metal selected from the group consisting of iron, cobalt, and manganese, linked through oxygen atoms to an atom selected

from the group consisting of a boron atom and a phosphorus atom having an oxo oxygen bonded thereto, and a monocarboxylic acid bonded thereto, and a monocarboxylic acid radical having 7 to 11 carbon atoms attached to each divalent metal atom, at least one of said monocarboxylic acid radicals having from 7 to 9 carbon atoms, and at least one other of said monocarboxylic radicals having 10 or 11 carbon atoms.

4,234,497

ISO-PALMITATE POLYOL ESTER LUBRICANTS

Milton L. Honig, Bronx, N.Y., assignor to Standard Lubricants, Inc., New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,387
Int. Cl.³ C09F 5/08; C10M 1/24
U.S. Cl. 260—410.6 **10 Claims**

1. An iso-palmitate polyol ester lubricant base stock, comprising the reaction product of:

(a) one or more aliphatic polyhydric alcohols containing from 2 to 8 primary hydroxyl groups;

(b) a minor amount of iso-palmitic acid;

$$CH_3(CH_2)_5CH(CH_2)_7CH_3; \text{ and}$$
$$\quad\quad\quad

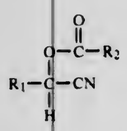
4,234,508

PROCESS FOR PREPARING CYANOHYDRIN ESTERS

James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 1, 1979, Ser. No. 80,957
Int. Cl.[3] C07C *121/38, 121/46, 121/75*
U.S. Cl. 260—465 D 11 Claims

1. A process for preparing cyanohydrin esters represented by the formula



wherein R^1 and R^2 may be the same or different and each represents an alkyl, alkenyl, cycloalkyl, aryl, aralkyl, alkylphenyl ether or polyphenyl radical, or a radical made up of any combination thereof; and may contain an inert substituent selected from the group consisting of halogen, alkyl and alkoxy; said radical having a total number of carbon atoms ranging from 1 to about 30; which comprises reacting a carboxylic acid anhydride represented by the structure



wherein R_1 and R_2 have the aforedescribed meaning, with an alkali metal cyanide and an alkali metal borohydride.

4,234,509

PROCESS FOR THE MANUFACTURE OF FATTY ACID NITRILES AND GLYCEROL FROM GLYCERIDES, ESPECIALLY FROM NATURAL FATS AND OILS

Siegfried Billenstein, Burgkirchen; Bruno Kukla, Gendorf, and Herbert Stühler, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 933,955, Aug. 15, 1978, abandoned. This application Apr. 24, 1979, Ser. No. 32,753
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737607; Mar. 25, 1978, 2813204
Int. Cl.[3] C07C *120/00, 120/08, 120/10*
U.S. Cl. 260—465.2 9 Claims

1. A process for producing simultaneously glycerol and saturated or olefinically unsaturated fatty acid nitriles without isolating intermediates by treating fatty acid glycerides or mixtures of fatty acid glycerides with gaseous ammonia at elevated temperatures in the presence of catalysts, wherein the improvement comprises contacting the liquid fatty acid glyceride at temperatures of from about 220° to about 300° C. with a flow of at least 200 liters ammonia per kilogram of fatty acid glyceride per hour in the presence of metal salt of a carboxylic or sulfonic acid as a catalyst, wherein in said metal salt the metal cation is lead, cadmium, iron, cobalt, zinc, tin, titanium, zirconium, chromium, antimony, manganese, or nickel and the anion is selected from the group consisting of saturated aliphatic mono- and polycarboxylic acids; olefinically unsaturated aliphatic mono- and polycarboxylic acids; mono-, di-, and trialkylated benzene and naphthalene mono- and polycarboxylic acids; alkane mono- and disulfonic acids; fluorosubstituted alkane monosulfonic acids; monohydroxy-substituted alkane monosulfonic acids; mono-, di-, and trialkylated benzene- and naphthalene- mono- and polysulfonic acids; and (monocarboxy)alkyl and (dicarboxy)alkyl benzene and naphthalene mono- and polysulfonic acids; or mixtures of said catalysts; removing a product mixture containing said nitriles, glycerol, and water formed from the liquid fatty acid glycerides, and subjecting the product mixture to a phase separation into a nitrile phase and a glycerol/water phase.

4,234,510

RECOVERY OF ACRYLONITRILE OR METHACRYLONITRILE BY CONDENSATION

Hsin C. Wu, Parma, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Jun. 7, 1973, Ser. No. 367,840
Int. Cl.[3] C07C *120/00, 120/14, 121/32*
U.S. Cl. 260—465.3 9 Claims

1. In the process for the recovery of acrylonitrile or methacrylonitrile obtained in the reactor effluent of ammoxidation reaction of propylene or isobutylene, the improvement comprising cooling the reactor effluent to a temperature between about 40° and about 100° C. using direct contact cooling wherein an aqueous stream is contacted with the reactor effluent in such a manner that little or none of the acrylonitrile or methacrylonitrile is condensed to obtain a gaseous stream containing acrylonitrile or methacrylonitrile and cooling the gaseous stream obtained using indirect contact cooling to condense and separate about 10 to about 90% of the acrylonitrile or methacrylonitrile from the gaseous stream.

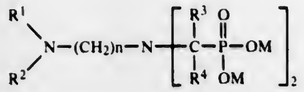
4,234,511

DIALKYLAMINO-N,N-BIS(PHOSPHONOALKYLENE)ALKYLAMINES AND USE IN AQUEOUS SYSTEMS AS PRECIPITATION AND CORROSION INHIBITORS

John D. Buckman, Memphis, Tenn., assignor to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Jul. 26, 1979, Ser. No. 61,168
Int. Cl.[3] C07F *9/38*; C09K *3/00*; C23F *11/10*
U.S. Cl. 260—502.5 5 Claims

1. As a new composition of matter a compound having the formula



wherein R^1 and R^2 represent an alkyl group containing 1 to 4 carbon atoms, R^3 and R^4 represent hydrogen or an alkyl group containing 1 to 4 carbon atoms, M represents hydrogen, alkali metal or ammonium, and n is an integer varying from 2 to 6 and the hydrochloride salts thereof.

4,234,512

CYCLOPROPANE DERIVATIVES

Johannes Van Berkel, and Hendrik C. Kelderman, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 9, 1979, Ser. No. 55,857
Claims priority, application United Kingdom, Jul. 19, 1978, 30338/78; Jul. 19, 1978, 30340/78
Int. Cl.[3] C07C *47/293, 43/305*
U.S. Cl. 568—420 5 Claims

1. 2-(2,2-Dimethoxyethyl)-3,3-dimethylcyclopropanecarbaldehyde.

3. 2-[2-(2,2-Dihalovinyl)-3,3-dimethylcyclopropyl]ethanal dimethyl acetal wherein each halo independently is chloro, fluoro or bromo.

4,234,513

PROCESS FOR THE PREPARATION OF MONOARYL THIOUREAS

Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 7, 1979, Ser. No. 36,687
Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820321
Int. Cl.[3] C07C *157/09, 69/14, 69/78*
U.S. Cl. 564—26 6 Claims

1. In a process for the preparation of a monoaryl thiourea compound by reacting a salt of an arylamine with ammonium rhodanide or an alkali metal rhodanide in an aqueous medium, the improvement which comprises carrying out the reaction in a reaction mixture which at the start contains a higher amount by weight of the salt of the arylamine than of water and from 1 to 1.25 times the equivalent amount of the ammonium rhodanide or alkali metal rhodanide calculated on the arylamine, and does not contain any excess acid, and carrying out the reaction at a temperature which is below the boiling point of the reaction mixture by at least 5° C.

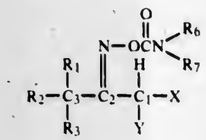
4,234,514

METHOD OF PREPARING KETOXIME CARBAMATES

Russell Buchman, Madison, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Dec. 4, 1978, Ser. No. 966,389
Int. Cl.[3] C07C *131/00*
U.S. Cl. 564—255 3 Claims

1. A method of preparing compounds at a temperature from about 0° C. to about 150° C. of the formula:



where:

R_1 = hydrogen, R_2R_3 or X;

R_2-R_3 = lower alkyl, lower alkenyl, or lower alkynyl, with the proviso that R_2 and R_3 may be connected to form a cycloaliphatic ring;

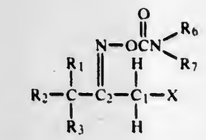
R_6-R_7 = hydrogen, lower alkyl, lower alkenyl, or lower alkynyl;

X-Y = X and Y may be the same or different and each is selected from the group consisting of SR_8.$S(O)R_8$, SO_2R_8, OR_8, or NR_8R_9;

R_8 = hydrogen, lower alkyl, lower alkenyl, lower alkynyl, or aryl; and

R_9 = hydrogen or lower alkyl

which comprises halogenating a compound of the formula:



to form a halogenated intermediate, and reacting said intermediate with a compound of the formula HY in the presence of a hydrogen halide acceptor.

4,234,515

PREPARATION OF N,N-DIFLUOROAMINES

Derek H. R. Barton, London, England, and Robert H. Hesse, Cambridge, Mass., assignors to Research Institute for Medicine & Chemistry Inc., Cambridge, Mass.

Continuation of Ser. No. 591,762, Jun. 30, 1975, abandoned, which is a continuation of Ser. No. 373,732, Jun. 26, 1973, abandoned. This application May 9, 1978, Ser. No. 904,338
Claims priority, application United Kingdom, Jun. 27, 1972, 30128/72
Int. Cl.[3] C07C *85/18*
U.S. Cl. 564—114 20 Claims

1. A process for the preparation of an N,N-difluoroamine of the formula

where R represents a hydrogen atom or an organic group, comprising reacting a compound of the formula

where R is as defined for formula I, R^1 represents an organic group and R^2 represents a hydrogen atom or an organic group with a fluorinating agent selected from the group consisting of elemental fluorine and hypofluorites in which the fluoroxy group is bonded to an inert electron attracting group; with the proviso that if neither R^1 nor R^2 is a group capable of releasing electrons the reaction is effected in the presence of a nucleophilic compound.

4,234,516

METHOD OF ISOMERIZING HUMULONE TO ISOHUMULONE BY CATALYTIC ACCELERATION WITH METAL SALTS

Horst Koller, Munich; Alfons E. Hartl, Germering near Munich, and Gerhard Kirchner, Grobenzell near Munich, all of Fed. Rep. of Germany, assignors to Atlantic Research Institute Limited, Nassau, The Bahamas

Continuation of Ser. No. 356,785, May 3, 1973, Pat. No. 3,952,061, which is a continuation-in-part of Ser. No. 725,458, Apr. 30, 1968, abandoned. This application Jun. 2, 1975, Ser. No. 582,774
The portion of the term of this patent subsequent to Jun. 10, 1992, has been disclaimed.
Int. Cl.[3] C07C *45/00*
U.S. Cl. 568—341 13 Claims

1. A method for preparing isohumulone products, comprising:

providing a mixture of (1) a salt productive in an aqueous medium of an anion and a cation, said anion being inert to the starting material and inert to the isohumulone products under the operating conditions of the present method, and said cation being an element selected from the group consisting of Group II*a* or II*b* elements, Fe group elements, cerium and manganese, (2) humulone or a humulone-containing material, and (3) a liquid medium, inert to the starting materials and to the isohumulone produced under the operating conditions of the present method, said liquid medium being one in which said salt dissociates to form said anion and said cation and said humulone or humulone-containing material dissociates to form humulate anion; and

isomerizing at an elevated temperature, at a pH below 9 and greater than that pH at which humulone forms humulate anion in solution;

wherein said salt is present in an amount sufficient to accelerate said isomerization.

4,234,517

2-(2',2'-DIHALOVINYL)-CYCLOBUTANONES AND 2-(2',2',2'-TRIHALOETHYL)-CYCLOBUTANONES

Hans Greuter, Eiken; Pierre Martin, Basel, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

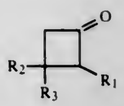
Division of Ser. No. 891,413, Mar. 29, 1978, abandoned. This application Mar. 16, 1979, Ser. No. 21,273

Claims priority, application Switzerland, Mar. 31, 1977, 4072/77; Feb. 23, 1978, 1975/78

Int. Cl.[3] *C07C 49/39*

U.S. Cl. 568—381 **2 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents $-CH=CX_2$ or $-CH_2-CX_3$, and X in each case represents chlorine or bromine,

one of R_2 and R_3 represents methyl and the other hydrogen or methyl, or

R_2 and R_3 together represent alkylene having 2-4 C atoms.

4,234,518

KETONES AND ORGANOLEPTIC USES THEREOF

Takao Yoshida, West Long Branch, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 932,649, Aug. 10, 1978, Pat. No. 4,169,109. This application Jun. 7, 1979, Ser. No. 46,390

Int. Cl.[2] *C07C 45/00*

U.S. Cl. 568—377 **10 Claims**



1. A mixture of 3-methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-3-penten-2-one; 3-methyl-5-(2,6,6-trimethyl-2-cyclohexen-1-yl)-3-penten-2-one; 3-methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4-penten-2-one; 3-methyl-5-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-penten-2-one; 6-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4-hexen-3-one; 6-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-hexen-3-one and 6-(2,6,6-trimethyl-1-cyclohexen-1-yl)-5-hexen-3one; 6-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-hexen-3-one and 6-(2,6,6-trimethyl-2-cyclohexen-1-yl)-5-hexen-3-one prepared by intimately admixing a mixture of 2,6,6-trimethyl-1-cyclohexene acetaldehyde and 2,6,6-trimethyl-2-cyclohexene acetaldehyde, methyl ethyl ketone and zinc acetate dihydrate and heating the resulting mixture at a temperature of about 190° C. for a period of about 8 hours and then distilling the resulting product at temperatures in the range of 116°-121° C. at 1.3 mm Hg pressure.

4,234,519

RECOVERY OF METHACROLEIN

Neil Yeoman, Merick, and Sidney S. Stern, New York, both of N.Y., assignors to Halcon Research and Development Corp., New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,824

Int. Cl.[3] **C07C** *45/35, 47/21*

U.S. Cl. 568—492 **5 Claims**

1. A process for recovering methacrolein from effluent gases produced by the vapor-phse catalytic oxidation of isobutylene and/or tertiary butyl alcohol with molecular oxygen in the presence of a catalyst at a temperature of 300°-500° C. and supplying said methacrolein to a subsequent catalytic oxidation to methacrylic acid comprising:

(a) cooling and condensing said effluent gases by direct contact with water to provide a gas stream and an aqueous solution of methacrolein;

(b) stripping said aqueous solution of (a) with recycle gas vapors derived from the recovery of said methacrylic acid precedent to the use of said vapors in said subsequent catalytic oxidation of methacrolein to methacrylic acid to desorb substantially all of the methacrolein absorbed in (a), whereby said methacrolein is added to said vapors as feed to said subsequent oxidation.

4,234,520

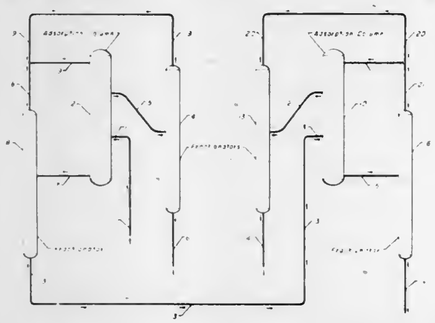
PROCESS FOR THE SEPARATION OF ISOMERS OF CHLORONITROBENZENE

James W. Priegnitz, Elgin, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 14,656, Feb. 23, 1979. This application Apr. 16, 1979, Ser. No. 30,407

Int. Cl.[3] **C07C** *79/12*

U.S. Cl. 568—937 **9 Claims**



1. A process for separating the ortho, meta and para isomers of chloronitrobenzene from a feed mixture comprising said isomers, which process comprises contacting in a first adsorption stage at adsorption conditions said mixture with an adsorbent comprising a type X or type Y zeolite containing at the exchangeable cationic sites one or more cations selected from the group consisting of Groups IA, IIA and the transition metals of the Periodic Table of Elements, selectively adsorbing the ortho-isomers to the substantial exclusion of the meta and para isomers, recovering high-purity ortho-chloronitrobenzene as a first extract product and said meta and para isomers as a raffinate stream, contacting in a second adsorption stage at adsorption conditions said raffinate stream with an adsorbent selective for either said meta or para isomer and comprising a type X or type Y zeolite containing at the exchangeable cationic sites one or more cations selected from the group consisting of Group IA, IIA and the transition metals of the Periodic Table of Elements, selectively adsorbing said meta or para isomer as the selected isomer, to the substantial exclusion of the non-selected isomer and recovering high-purity selected isomer as a second extract product and high-purity non-selected isomer as a raffinate product.

4,234,521

PHOSPHORUS DERIVATIVES OF AMINOTHIOCARBAMOYL HALIDES

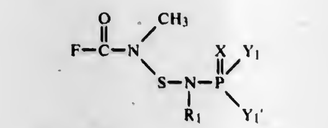
Stephen J. Nelson, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 1, 1979, Ser. No. 43,276

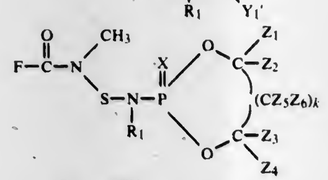
Int. Cl.[3] **C07F** *9/24*

U.S. Cl. 260—937 **72 Claims**

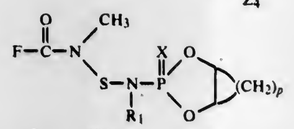
1. A compound having the formula selected from the group consisting of:



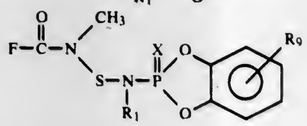
II$_1$



II'



II''



II'''

wherein R_1 is selected from the group consisting of lower-alkyl, phenyl, substituted phenyl, phenyl lower-alkyl, and cycloalkyl; X is oxygen or sulfur; Y_1 and Y_1' are the same or different and are selected from the group consisting of lower-alkyl, lower-alkoxy, lower-alkylthio, cycloalkyl, phenyl, substituted phenyl, phenoxy, substituted phenoxy, thiophenoxy, and substituted thiophenoxy; wherein Z_1 through Z_6 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl; and k is 0 or 1, p is three or four and R_9 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy an halogen.

4,234,522

VARIABLE DIFFUSER FOR CARBURETORS

Pierre Fontanet, Versailles, and Georges Desjardins, Rueil-Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Continuation of Ser. No. 745,836, Nov. 30, 1976, abandoned. This application Nov. 3, 1978, Ser. No. 957,448

Claims priority, application France, Dec. 3, 1975, 75 36951

Int. Cl.[3] **F02M** *9/12*

U.S. Cl. 261—23 A **2 Claims**

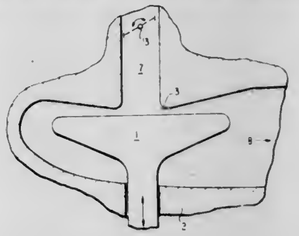
1. In a carburetor body of an internal combustion engine, a variable section, sonic flow diffuser, comprising:

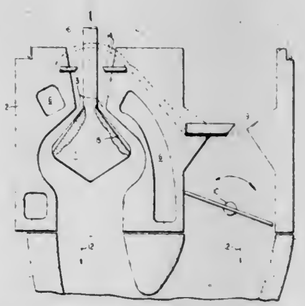
means for defining a circular intake passage in the carburetor body and a circular, fixed, divergent wall into which said circular intake passage opens;

an obstacle in the form of a body of revolution and of a maximum diameter greater than that of said intake passage being disposed in said carburetor body in said circular, fixed, divergent wall, coaxial with said divergent wall and said intake passage;

means for adjusting the position of said obstacle along the axial path of said intake passage and said circular divergent wall;

such that a sonic flow, circular, divergent nozzle is formed, the annular throat of which is formed between the exit periphery of said intake passage and the nearest portion of the surface of said obstacle, and the variation in the gas flow cross-section of which is due to the variation of the radius of such section with respect to the flow axis wherein said obstacle has a plane circular surface oriented perpendicular to the axis of said intake passage, facing said passage, the fixed circular wall of said carburetor opposite said surface diverging slightly with respect thereto and wherein said intake passage forms the first barrel of a two-barrel carburetor, the air flow of which is controlled by the axial adjustment of said obstacle, said means for adjusting the position of said obstacle comprising an axial





control rod extending through the air filter of said carburetor for axially adjusting said obstacle.

2. In a carburetor body of an internal combustion engine, a variable section, sonic flow diffuser, comprising:

means for defining a circular intake passage in the carburetor body and a circular, fixed, divergent wall into which said circular intake passage opens;

an obstacle in the form of a body of revolution and of a maximum diameter greater than that of said intake passage being disposed in said carburetor body in said circular, fixed, divergent wall, coaxial with said divergent wall and said intake passage;

means for adjusting the position of said obstacle along the axial path of said intake passage and said circular divergent wall;

such that a sonic flow, circular, divergent nozzle is formed, the annular throat of which is formed between the exit periphery of said intake passage and the nearest portion of the surface of said obstacle, and the variation in the gas flow cross-section of which is due to the variation of the

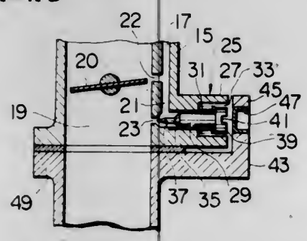
radius of such section with respect to the flow axis, the fixed ciruclar wall of said carburetor opposite said surface diverging slightly with respect thereto and wherein said intake passage forms the first barrel of a two-barrel carburetor, the air flow of which is controlled by the axial adjustment of said obstacle, said means for adjusting the position of said obstacle comprising an axial control rod extending through the air filter of said carburetor for axially adjusting said obstacle wherein said obstacle has radial grooves of increasing flow section disposed on its circular diverging surface forming a wall of said nozzle, allowing a minimum sonic intake flow to be maintained even when said obstacle is drawn by said control rod up against the wall of said carburetor to thereby close said nozzle throat.

4,234,523

ADJUSTMENT PREVENTION MECHANISM FOR CARBURETOR

Keiichi Onuki, Hitachi; Tohru Nakagawa, Mito, and Shigeyuki Kenma, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 11, 1979, Ser. No. 2,800
Claims priority, application Japan, Jan. 11, 1978, 53-1139
Int. Cl.[3] F02M *3/08*
U.S. Cl. 261—41 D **8 Claims**



1. Apparatus for preventing unauthorized readjustment of an adjustment device of a carburetor, comprising:
blocking means disposed opposite to the adjustment device,
adjustment accommodating means on said blocking means for accommodating adjustment of the adjustment device,
and adjustment preventing means forming part of said blocking means and being mountable on said blocking means after an adjustment operation to thereby prevent unauthorized readjustment of said adjustment device, wherein said adjustment device of said carburetor adjusts the amount of fuel supplied from a slow speed fuel passage to an air-fuel induction passage of the carburetor,
wherein said blocking means is formed as a stationary covering member supported independently from the carburetor body and disposed so as to face an operating portion of the adjustment device of the carburetor body,
wherein the adjustment accommodating means is a hole through said covering member for accommodating insertion and operation of an adjustment means therethrough, and
wherein said adjustment preventing means is a plug rigidly insertable in said hole to prevent the usual users from operating the adjustment means.

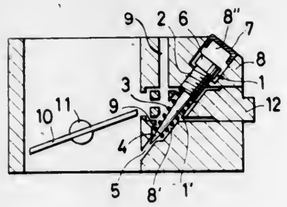
4,234,524

IDLE ADJUSTING SCREW IN CARBURETOR

Hisaharu Arai, Nagoya, Japan, assignor to Aisan Industry Co., Ltd., Aichi, Japan

Filed Apr. 26, 1979, Ser. No. 33,665
Claims priority, application Japan, May 9, 1978, 53/54603
Int. Cl.[3] F02M *3/08*
U.S. Cl. 261—41 D **6 Claims**

1. In an idle adjusting screw device for carburetors having a mixture adjusting screw fitted into a carburetor body such that a needle portion at the forward end section of the screw is in an idle port of the carburetor body, the improvement wherein
the screw consists of:
an enlarged head portion,
a rod portion having a smaller diameter than that of said head portion,
a threaded portion connected to and between said head portion and said rod portion and having a diameter intermediate to that of said head portion and that of said rod portion,
said threaded portion forming a lower end step surface connecting said rod portion, and
a needle portion narrowing from a bottom free end of said rod portion;
a carburetor body defining:
an intake passage,
a cavity having an outer free end portion,
an elongated insertion hole,
a threaded bore connected between said insertion hole and said cavity,
a fuel passage directly communicating with said insertion hole at an intermediate portion of the latter and at an acute angle relative thereto, and
an idle port communicating with a free end of said insertion hole and said intake passage,



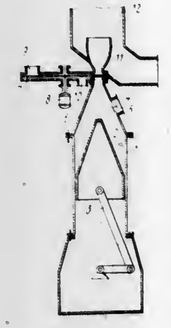
said cavity, said insertion hole, said threaded bore and said idle port are integrally formed in said carburetor body and are aligned defining an inclined common axis,
said screw is fitted into said carburetor body such that said needle portion extends into said idle port, said rod portion extends in said insertion hole, said threaded portion engages in said threaded bore, and said head portion is positioned completely disposed inside of said cavity spaced from said outer free end portion,
said insertion hole has a lower end narrowing surface connecting said insertion hole with said idle port,
a coil compression spring is disposed around said rod portion in said insertion hole engaging said step surface of said threaded portion and said narrowing surface of said insertion hole so as to urge said screw in a direction counter to a screw insertion direction, said spring being exposed to said fuel passage,
a detachable closed plug fitted in said outer free end portion of said cavity extending solely into said cavity so as to cover said head portion of said screw,
said head portion has a special shape constituting means for permitting said screw to be turned only with a specially correspondingly shaped tool,
said plug and said special shape head portion constituting double means for preventing random turning of said screw.

4,234,525

APPARATUS FOR SPRAYING FLUID AND PASTE-LIKE MATERIALS

Georgy P. Piterskikh, ulitsa Garibaldi, 4, korpus 1, kv. 11; Stanislav A. Sukhov, Gostinichny proezd, 4a, kv. 71; Vladimir B. Slobodchikov, ulitsa Tukhachevskogo, 33, kv. 21, and Gleb F. Rybalchenko, ulitsa Festivalnaya, 12, kv. 20, all of, Moscow, U.S.S.R.

Filed Mar. 13, 1979, Ser. No. 20,082
Int. Cl.[3] B05B *9/043*; B05C *1/14*
U.S. Cl. 261—89 **7 Claims**



1. An apparatus for spraying a starting material, such as a fluid or a paste-like material by a pulsating flow of a gaseous atomizing agent, comprising: a generator for providing a pulsating flow of a gaseous fluid or atomizing agent; an exhaust pipe communicating with said generator and forming therewith a circular passage along which said gaseous atomizing agent is fed; a nozzle for retaining the starting material to be sprayed is arranged between said generator and said exhaust pipe; said nozzle is perpendicular to said passage and is rotatable about an axis that is parallel to the axis of the passage along which the gaseous atomizing agent is fed; a pipe positioned outside said passage and communicating with said nozzle for feeding starting material to said nozzle; said nozzle having non-perforated and perforated portions with said perforated portions being filled with the starting material to be sprayed; and said nozzle, when rotated into said circular cross-section of said passage during the pause between successive pulsations of said gaseous atomizing agent, is sealed about the peripheral edge of said cross section of said passage with a sealing device.

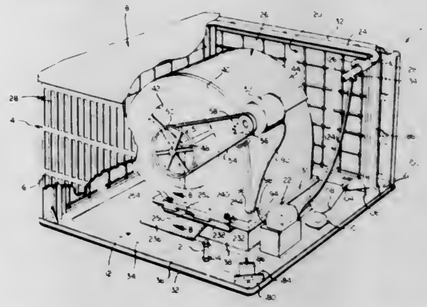
4,234,526

EVAPORATIVE COOLER

Frederick G. Mackay, Tarzana, and Spencer L. Mackay, Canoga Park, both of Calif., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jan. 9, 1979, Ser. No. 2,125
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—106 **7 Claims**

1. An evaporative cooler comprising in combination:
an outer housing comprising (a) a one-piece, frameless shell having open top and bottom ends and first and second pairs of opposed side walls having openings for admitting air into said housing, adjacent ones of said side walls defining corners of said shell, (b) a bottom pan closing the open bottom end of said shell, and (c) a top cover adapted to close the open top end of said shell;
means comprising a plurality of vertical rails generally T-shaped in cross section, each of said rails being secured in said shell at a corresponding one of said corners and angled with respect to the side walls adjacent said corner to define a V-shaped track for each of the adjacent side walls at said corner, the rails at adjacent ones of said corners cooperating to define opposed V-shaped tracks between adjacent corners of said shell, said opposed tracks being spaced inwardly from said side walls;
a plurality of evaporative media means adapted to be received through the open top end of said shell in slidable engagement between corresponding ones of said opposed V-shaped tracks and held thereby in spaced relation to the corresponding side walls, each of said evaporative media means having a pair of peripheral track engaging sides having V-shaped outer surfaces complementary to said V-shaped tracks;



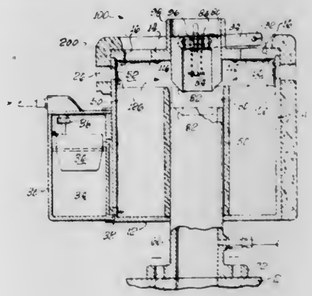
means for supplying water to said evaporative media means to wet said evaporative media means; and
air moving means mounted in said housing and having a discharge outlet opening through said housing, said air moving means drawing ambient air into said housing through said side wall openings and said wetted evaporative media means to cool said air by evaporation of water from said wetted evaporative media means, said air moving means discharging the cooled air through said discharge outlet.

4,234,527

EVAPORATIVE CARBURETOR FOR COMBUSTION ENGINES

Richard D. Anderson, 419 Columbiana Dr., San Dimas, Calif. 91773

Continuation-in-part of Ser. No. 896,934, Apr. 17, 1978, abandoned. This application Aug. 21, 1979, Ser. No. 68,462
Int. Cl.[3] F02M *21/04*
U.S. Cl. 261—102 **9 Claims**



1. An improved evaporative carburetor for internal combustion engines operating on liquid gasoline fuel, comprising:
an annular evaporative chamber defined by concentric inner and outer cylinders extending upwardly from a baseplate sealingly encompassing the gap between the cylinders, with said inner cylinder extending upwardly through the baseplate to an elevation below the upper edge of the outer cylinder,

cover plate means sealingly affixed above the upper edge of the outer cylinder,
a mixing chamber defined by said outer cylinder and said cover plate means, superposed on said evaporative chamber,
fuel metering means to maintain a predetermined fuel level in said annular chamber,
wick means in the annular evaporative chamber extending from close proximity to said baseplate to an elevation no higher than the upper edge of said inner cylinder,
manifold means interconnecting the inner cylinder with the intake manifold of an internal combustion engine,
inlet valve means responsive to reduced pressure within said mixing chamber for the admission of atmospheric air into said carburetor,
throttle plug means for controlling flow rate into said inner cylinder from said annular chamber, and
throttle operating means for controllably varying the axial location of said throttle plug relative to a seat therefor, defined in the upper edge of said inner cylinder.

4,234,528

ASYMMETRICAL ULTRAFILTRATION MEMBRANE BASED ON CELLULOSE HYDRATE

Dietmar Nussbaumer, and Horst Perl, both of Göttingen, Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,804
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1978, 2816085
Int. Cl.³ B01D *13/00, 31/00;* **B29D** *27/04*
U.S. Cl. 264—41 **13 Claims**

10. A process for the production of an asymmetrical dry ultrafiltration membrane, comprising:
preparing a casting solution consisting essentially of:
8 to 20% by weight of cellulose acetate comprising cellulose triacetate or a mixture of cellulose triacetate and cellulose diacetate,
1 to 30% by weight, based on total solid content, of hydrophobic silicic acid,
acetone and dioxane at a ratio of 2:1 to 1:2 with respect to each other, and
0.8:1 to 4:1, based on the solid content, of a lower alkyl amide;
casting the membrane according to the precipitating bath process using ice water as precipitating agent, wherein prior to the precipitation in ice water the cast membrane is subjected to evaporation for 2 to 90 seconds; and
saponifying the precipitated but not dried membrane for several minutes in an alkali solution to a hydrate membrane.

4,234,529

METHOD AND APPARATUS FOR SHAPING PLASTIC FOAMS

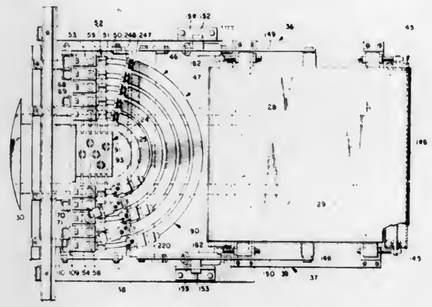
Arthur L. Phipps, Los Osos, Calif., assignor to Condec Corporation, Old Greenwich, Conn.

Filed Dec. 18, 1978, Ser. No. 970,377
Int. Cl.² B29D *27/00;* **B29F** *3/012*
U.S. Cl. 264—51 **69 Claims**

1. A method of controlling and shaping a foaming extrudate exiting from a die orifice comprising the steps of adjustably positioning opposed sets of rolls each on opposite sides of the extrudate immediately downstream of the die orifice, and driving the rolls of at least one set for controlled rotation independently of the other rolls of said one set, said rolls being arcuate to extend substantially transversely of the path of the extrudate, and maintaining the plane of curvature of each roll parallel to the extrudate flow.

13. In combination, a foam extrusion die having an orifice therein, shafts on opposite sides of the extrude path and downstream of such orifice, and a plurality of thin wafers rotatably mounted on each shaft operative to form the extrudate as it is extruded from such orifice.

65. In combination, an extrusion die having an orifice therein, shafts on opposite sides of the extrude path and downstream of such orifice, and a plurality of thin wafers on said shafts rotatably mounted thereon operative to form the extrud-



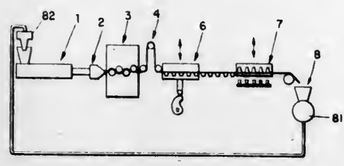
ate as it is extruded from such orifice, such orifice being in the form of an arcuate slot, said shafts being also arcuate and each having a radius struck substantially from the center of curvature of such orifice, there being two sets of arcuate shafts on opposite sides of the extrudate path, and the plane of curvature of each set of arcuate shafts being parallel to the plane of curvature of the die orifice.

4,234,530

METHOD FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF CRYSTALLINE THERMOPLASTIC MATERIAL

Alfons W. Thiel, Uferstrasse 15, Mainz, and Barbara Geppert, Schonbergstrasse 75, Wiesbaden, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 818,876, Jul. 25, 1977, abandoned. This application Sep. 27, 1978, Ser. No. 946,393
Int. Cl.³ B29F *3/08*
U.S. Cl. 264—151 **18 Claims**



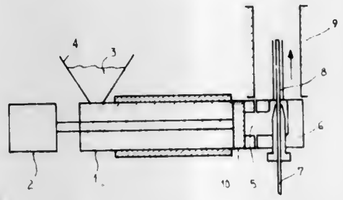
1. A method for manufacturing thin-walled articles from crystalline thermoplastic material by thermoforming in a web or sheet of said thermoplastic material while reducing the web or sheet thickness, said thermoplastic material having a critical crystalline melting temperature range and said method further including a temperature conditioning of said web or sheet to suitable temperature conditions for thermoforming and cutting out the shaped articles from said web or sheet, characterized thereby that said temperature conditioning involves providing at the inner core of said web or sheet a temperature higher than the upper limit of said critical crystalline melting temperature range and providing at the outer surface regions of said web or sheet a temperature lower than the lower limit of said critical crystalline melting temperature range, and that in said thermoforming step the said thermoplastic material in the said core of the web or sheet or in the said shaped article wall, respectively, in combination with the said reduction in thickness of said web or sheet and subsequently of said reduction in thickness, is rapidly cooled down through the said critical crystalline melting temperature range while growth of crystals in the said core material is controlled.

4,234,531

METHOD FOR EXTRUDING A CROSS-LINKED MATERIAL

Robert Jocteur, Moret sur Loing, France, assignor to Societe Industrielle de Liaisons Electriques-Sliec, Paris, France

Filed Feb. 1, 1979, Ser. No. 8,574
Claims priority, application France, Feb. 2, 1978, 78 02942
Int. Cl.³ B29F *3/10*
U.S. Cl. 264—174 **11 Claims**



1. A method for continuously extruding in a closed environment an insulating material cross-linked by the separate addition of a cross-linking agent, which method comprises the following steps:
(1) passing a cross-linkable insulating material through an extrusion machine provided adjacent its outlet end with a filtering means and at said outlet end with an extrusion head, said extrusion machine being heated to a temperature between about 200° and 220° C., said temperature being about the maximum temperature admissible for said material, so as to bring said material in a substantially fluid condition;
(2) cooling the thus filtered material to a temperature between about 140° and 150° C. which temperature is slightly lower than the reaction temperature of the cross-linking agent;
(3) injecting said cross-linking agent into said thus cooled material; and
(4) conveniently mixing said cross-linkable material and said cross-linking agent; and thereafter
(5)elevating the temperature of the mixture of step (4) to a temperature about the maximum temperature admissible for the extrusion of said extrudate before it leaves said extrusion head.

4,234,532

METHOD OF MANUFACTURING POLYESTER FILMS

Masahiko Motegi, Hikone; Ikukazu Kimata, Shiga, and Saburo Fujita, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,451
Claims priority, application Japan, Aug. 15, 1978, 53-99387
Int. Cl.³ B29C *17/02, 25/00*
U.S. Cl. 264—235.8 **26 Claims**

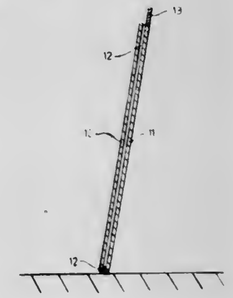
1. In a process for preparing highly tensilized polyester film having F-5 values over 14 kg/mm² in both MD and TD, the steps which comprises stretching a polyester film to an extent of at least 2.6 times its dimensions in MD and TD, simultaneously stretching the resulting film in the range of 1.05 to 1.9 times its dimensions in MD and 1.0 to 1.9 times its dimensions in TD at a linear rate of stretch speed under 8,000 percent per minute at a temperature between $T_g+10°$ C. and $T_m-40°$ C., and heat setting said film at a temperature between $T_g+50°$ C. and $T_m-10°$ C.

4,234,533

METHOD OF BONDING SPACED SHEETS BY MOLDING RESIN THEREBETWEEN

James W. Langlands, Glasgow, Great Britain, assignor to Mary Frances Theresa Langlands, Glasgow, Great Britain

Continuation-in-part of Ser. No. 895,637, Apr. 12, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,427
Claims priority, application New Zealand, Oct. 31, 1978, 188781
Int. Cl.² B32B *31/06*
U.S. Cl. 264—261 **10 Claims**



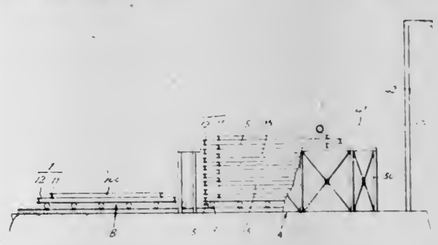
1. A method of producing a laminate comprising placing a pair of sheets of frangible material in face-to-face relationship, introducing between the sheets a liquid which on solidifying forms a polymer of greater resistance to fracture than the sheets and adheres to the sheets, forming around the periphery of the sheets a continuous tape-like barrier to passage of the liquid thereby to retain the liquid between the sheets, wherein at least part of the barrier is gas-permeable, expelling air from the intersheet space through the barrier so as to cause the liquid to fill the intersheet space, and solidifying the liquid to form a bonded laminate.

4,234,534

METHOD AND APPARATUS FOR MANUFACTURING ARTICLES OF HYDRAULIC SUBSTANCES

Yasuro Ito, No. 4-38-16, Numabukuro, Nakano-ku, Tokyo, Japan; Hideharu Kaga, Tokyo, Japan; Yasuhiro Yamamoto, Kawasaki, Japan, and Tadayuki Sumita, Tokyo, Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Continuation of Ser. No. 558,165, Mar. 13, 1975, abandoned. This application Apr. 25, 1978, Ser. No. 899,849
Claims priority, application Japan, Mar. 13, 1974, 49/28025; Feb. 14, 1975, 50/19736[U]; Feb. 14, 1975, 50/19737[U]; Feb. 17, 1975, 50/18709; Feb. 25, 1975, 50/23035
Int. Cl.³ B28B *1/24*
U.S. Cl. 264—328.8 **32 Claims**



1. A continuous method of sequentially manufacturing articles made of hydraulic cement wherein a plurality of moulds are vertically stacked with a plurality of hollow beds alter-

nately disposed therebetween, said stack having a feed side and a discharge side, said moulds being interconnected for resisting pressure changes and wherein sealing members are interposed between said beds and the moulds throughout the stack for air-tightly closing said moulds, said method consisting essentially of introducing the hydraulic cement into said mould at the feed side of the stack by utilizing the pressure difference between the inside and the outside of the mould, introducing a heating medium into said hollow beds surrounding said moulds for gradually uniformly and indirectly heat curing the poured hydraulic cement from the feed side of the discharge side of said stack, said curing temperature being rapidly increased above 60° C., during which the pressure in the mould is increased higher than the expansion pressure of the cement, advancing each mould and adjacent beds by one step at a time through said stack from the feed side to the discharge side thereof, so that each mould occupies the position of the preceding mould as it advances through said stack, the curing of said hydraulic cement taking place at different stages throughout said stack of said moulds, removing one mould containing an article made of hydraulic cement which has been sufficiently cured from the discharge side of said stack of said plurality of moulds and preparing a fresh mould and bed at the feed side of the stack where said mould is recharged with said hydraulic cement, thus continuously manufacturing said articles.

4,234,535

PROCESS FOR PRODUCING POROUS POLYTETRAFLUOROETHYLENE TUBINGS

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

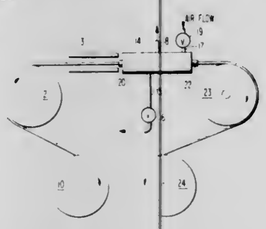
Continuation of Ser. No. 853,792, Nov. 21, 1977, abandoned, which is a division of Ser. No. 751,876, Dec. 17, 1976, Pat. No. 4,082,893. This application Jun. 11, 1979, Ser. No. 47,470

Claims priority, application Japan, Apr. 29, 1976, 51/49671; Dec. 17, 1977, 52/155226

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—519 **11 Claims**



11. A process of producing a porous polytetrafluoroethylene tubing which comprises forming a tubing of a mixture of an unsintered polytetrafluoroethylene containing a liquid lubricant, stretching the tube at least in the longitudinal direction, and heating the tube in a stretched state in such a manner that the outer surface of the tube is heated at a temperature higher than about 327° C. and the inner surface of the tube is heated at a temperature lower than the temperature of the outer surface of the tube, said heating being carried out in a manner such that only the outer surface of the tube is sintered and the inner surface of the tube remains unsintered.

4,234,536

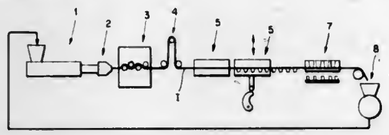
METHOD FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF CRYSTALLINE THERMOPLASTIC MATERIAL

Alfons W. Thiel, Uferstrasse 15, Mainz, and Barbara Geppert, Schonbergstrasse 75, Wiesbaden, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 818,876, Jul. 25, 1977, abandoned. This application Sep. 27, 1978, Ser. No. 946,392

Int. Cl.³ B29D *7/20;* **B29F** *3/08*

U.S. Cl. 264—522 **18 Claims**



1. A method for manufacturing thin-walled articles from crystalline thermoplastic material by thermoforming the articles in a web or sheet of said thermoplastic material and removing the shaped articles from said web or sheet, said thermoplastic material having a critical crystalline melting temperature range with a lower limit temperature T_C and an upper limit temperature T_M and said method further including temperature conditioning of said web or sheet for thermoforming, characterized in that said temperature conditioning involves at least two steps; namely:

(a) developing by heating and/or cooling a preliminary temperature profile across the thickness of said web or sheet in which the core material of the web or sheet is at a temperature close to but lower than the critical crystalline melting temperature range of the said crystalline thermoplastic material and wherein said core is elastically deformable and the outer surface regions of the web or sheet are at lower temperatures than the core material and not thermally formable; and

(b) developing a final temperature profile for the thermoforming step by reheating one or both of said outer surface regions of said web or sheet to a temperature within said critical crystalline melting range whereby the said crystalline thermoplastic material of the outer surface regions becomes elastically deformable, whereas the said core material is retained in an elastically deformable state at a temperature adjacent to but lower than said critical crystalline melting temperature range.

4,234,537

STERILIZATION OF PARTICULATE SOLID MATERIALS

Albert C. Hersom; John E. Brittain, both of Beaconsfield, and Raymond Darlington, Crawley, all of England, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 17, 1978, Ser. No. 906,775

Claims priority, application United Kingdom, Dec. 23, 1977, 53759/77

Int. Cl.³ A23L *3/16;* **A61L** *2/06, 2/26*

U.S. Cl. 422—26 **11 Claims**

1. A batch process for the sterilization of particulate solid materials, in which a batch of particulate solid material to be sterilized is introduced with a small amount of lubricant liquid into a rotary vessel shaped so that rotation of the vessel imparts a tumbling action to the solid material; the solid material is heated in the vessel by direct introduction of pressurized steam into the vessel to condense therein while rotating the vessel to subject the material to a tumbling action; additional lubricant liquid is added to the heated solids by injection under pressure into the pressurized vessel at a temperature in excess of the temperature of the solids and above the atmospheric boiling temperature of the lubricant liquid but below the boiling temperature corresponding to the pressure in the vessel; the lubricant liquids and solid material are held at a sterilization temperature while maintaining the tumbling action; and the sterilized solid material is withdrawn from the vessel under aseptic conditions.

4,234,538

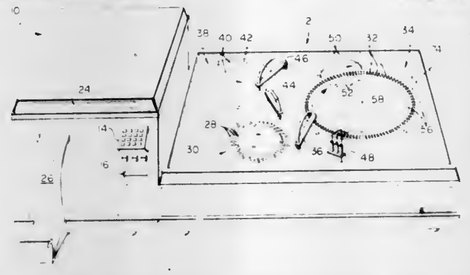
APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 808,168, Jun. 20, 1977, abandoned. This application Oct. 28, 1977, Ser. No. 846,337

Int. Cl.² G01N *21/24, 1/14*

U.S. Cl. 422—64 **12 Claims**



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises:

A. support means,

B. a rotor mounted on said support means for rotation thereon on an axis,

C. a turntable mounted coaxially with the rotor for rotation relative to said support means, a plurality of radiant-energy-transmissive cuvettes mounted to the turntable and disposed in a circular arrangement coaxially with said axis and adapted to have sample substances producing chemical reactions carried in at least some of said cuvettes,

D. first drive means for rotating the turntable on its axis in a first program of rotation whereby the cuvettes describe an annular path as the turntable rotates,

E. second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time,

F. photometer means mounted on the rotor and defining at least one beam path for radiant energy which extends at least through said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said cuvettes which intersects such beam path during rotation of the turntable,

G. the photometer means including means responsive to any radiant energy projected along said beam path to produce electrical signals as the cuvettes intersect the beam path, which signals are related to chemical conditions of the sample substances, if any, which may be contained in said cuvettes, there being two radiant energy detectors and means for dividing the beam path into two parts and directing the parts through different strata of the cuvettes,

H. means for generating usable data from any such signals, and

I. means for coupling at most all of the electrical signals from said photometer means to said data generating means.

4,234,539

APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

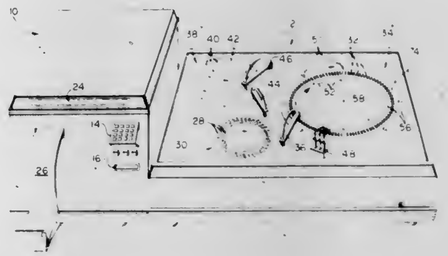
Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 846,337, Oct. 28, 1977, which is a continuation-in-part of Ser. No. 808,166, Jun. 20, 1977, abandoned. This application Aug. 23, 1979, Ser. No. 69,111

The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.

Int. Cl.³ G01N *21/24, 1/14*

U.S. Cl. 422—64 **5 Claims**



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises.

A. a support structure,

B. a horizontally disposed cuvette carrier having a plurality of cuvettes disposed thereon in a circular array around the periphery of the carrier and the array having a central vertical axis, the cuvette carrier being nonrotatably mounted on the support structure,

C. a rotor horizontally disposed parallel with the cuvette carrier and mounted for rotation on the said axis,

D. a plurality of photometers arranged on said rotor and each including a photoresponsive element and there being radiant energy source means serving all of the photoresponsive elements and directing a direct rectilinear beam of radiant energy to each of them whereby there is at least one beam for each element, the source means and elements being geometrically arranged in a radial configuration around the rotor, and the beams being so located that each will cut through all of the cuvettes in sequence during rotation of the rotor,

E. means for driving the rotor in a rotary movement,

F. the photoresponsive elements being responsive to the beams to produce electrical signals when intercepted by cuvettes, the signals being related to the chemical conditions of sample substance, if any, carried by the respective cuvettes,

G. means for generating usable data from any such signals associated with said support structure and non-rotatable, and

H. means for coupling the signals from the rotor to said last mentioned means.

4,234,540

APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

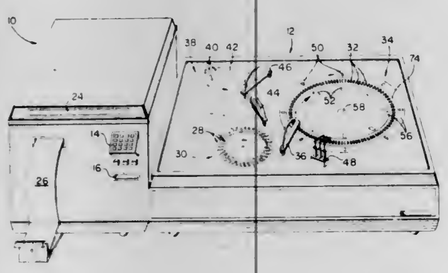
Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 846,337, Oct. 28, 1977, which is a continuation-in-part of Ser. No. 808,166, Jun. 20, 1977, abandoned. This application Aug. 24, 1979, Ser. No. 69,256

The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.

Int. Cl.³ G01N *21/24, 1/14*

U.S. Cl. 422—64 **13 Claims**



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises:

A. support means,

B. a rotor and a turntable mounted coaxially on the support means and capable of rotation relative to the support means and relative to one another, one of said rotor and turntable being journalled on the other, said other being journalled on said support means,

C. a plurality of radiant-energy-transmissive cuvettes mounted to the turntable and disposed in a circular arrangement about said axis and adapted to have sample substances producing chemical reactions carried in at least some of said cuvettes,

D. first drive means for rotating the turntable on its axis in a first program of rotation whereby the cuvettes describe an annular path as the turntable rotates,

E. second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time,

F. photometer means mounted on the rotor and defining at least one beam path for radiant energy which extends at least through said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said cuvettes which intersects such beam path during rotation of the turntable or rotor,

G. the photometer means including means responsive to any radiant energy projected along said beam path to produce electrical signals as the cuvettes intersect the beam path, which signals are related to chemical conditions of the sample substances, if any, which amy be contained in said cuvettes,

H. means for generating usable data from any such signals and

I. means for coupling at most all of the electrical signals from said photometer means to said data generating means.

4,234,541

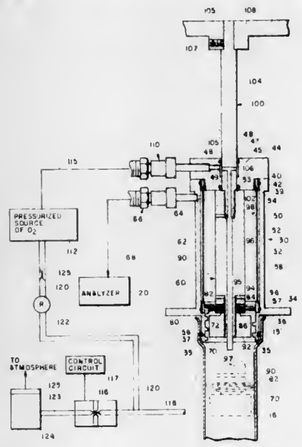
COMBUSTION CHAMBER CLEANING APPARATUS

Roger L. Bredeweg, and George J. Sitek, both of Stevensville, Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 2, 1979, Ser. No. 16,975

Int. Cl.³ G01N *31/12*; B01D *41/04*; B08B *1/04*; F23J *3/00*

U.S. Cl. 422—78 **14 Claims**



1. For use with a combustion chamber for combusting solid or liquid specimens for subsequent analysis of gases therefrom, a cleaning system for cleaning the combustion chamber comprising:

a cylindrical housing for rotatably and slideably supporting a cleaning brush;

a cleaning brush rotatably and slideably supported by said housing and including shaft means for moving said brush between a retracted position within said housing and from an end of said housing to operative cleaning positions extended from said housing, a plug mounted to said shaft adjacent said brush on a side of said brush adjacent said end of said housing when said brush is retracted within said housing; and

said end of said housing including internal thread means extending inwardly and aligned with and radially spaced from said plug when said brush is in a retracted position within said housing to form a spiral pathway for gas exiting from a combustion chamber.

4,234,542

THIN COAT TEMPERATURE COMPENSATED RESISTANCE OXIDE GAS SENSOR

Donald J. Romine, Fostoria, Ohio, assignor to Bendix Autolite Corporation, Fostoria, Ohio

Filed Jan. 29, 1979, Ser. No. 7,134

Int. Cl.³ G01N *27/12*

U.S. Cl. 422—98 **5 Claims**

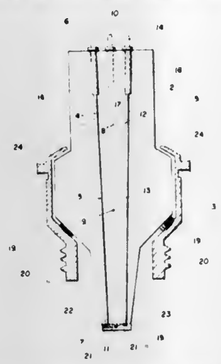
1. A temperature compensated electrochemical oxygen sensing element for determining the oxygen content in an exhaust gas of an internal combustion engine, comprising:

(a) an insulating ceramic support having first, second and third electrodes disposed, in spaced relation to each other, on the surface of the ceramic support that is to be exposed to the exhaust gas;

(b) a layer of a first resistance material, the resistance of which varies as a function only of temperature, said layer covering the first electrode and a portion of the second electrode; and

(c) a layer of a second resistance material, the resistance of which varies as a function of temperature and the partial

pressure of oxygen in the gas to which it is exposed, said layer covering the third electrode, the remaining portion



of the second electrode and said layer of first resistance material.

4,234,543

FLUID-WALL REACTOR FOR HIGH TEMPERATURE CHEMICAL REACTION PROCESSES

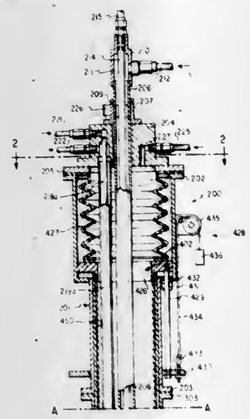
Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Continuation of Ser. No. 792,858, May 2, 1977, which is a continuation of Ser. No. 606,222, Aug. 20, 1975, abandoned, and a continuation-in-part of Ser. No. 271,560, Jul. 13, 1972, Pat. No. 3,933,434. This application Oct. 30, 1978, Ser. No. 955,530

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.³ B01J *3/00, 19/08*

U.S. Cl. 422—109 **6 Claims**



1. In combination with a high temperature chemical reactor wherein substantially all of the heat is supplied by radiation coupling including:

(a) a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, the outlet end being in communication with a reactor outlet,

(b) means for generating an annular envelope of an inert fluit which is substantially transparent to radiation radially inwardly of the inner surface of the reactor tube to constitute a protective blanket for the inner surface,

(c) means for introducing at least one reactant into the reactor chamber through the inlet end of the reactor tube in a predetermined path axially of the reactor tube, the reactants being confined by the protective blanket substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube, and

(d) electrical means for directing high intensity radiant energy into the reactor chamber to coincide with at least a portion of the predetermined path of the reactants;

a variable profile, counterflow heat exchanger being secured at an inlet end to the outlet of the reactor for receiving high temperature reaction products, the heat exchanger comprising an inner tubular wall of refractory material, the interior of the inner tubular wall defining a passageway which extends from an inlet opening to an outlet opening of the heat exchanger, an outer tubular wall of refractory material spaced concentrically outwardly from the inner wall, and a spiral baffle of refractory material disposed between the inner and outer walls to define a spiral, annular coolant channel; and, at least one coolant inlet extending through the outer wall in communication with the coolant channel, the coolant being discharged at an outlet of the spiral, annular channel adjacent the inlet end of the heat exchanger.

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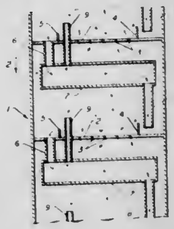
LIQUID-LIQUID EXTRACTION APPARATUS

William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 934,243, Aug. 16, 1978. This application Jun. 25, 1979, Ser. No. 51,776

Int. Cl.³ B01D *11/04, 12/00*; C10G *21/00*

U.S. Cl. 422—256 **6 Claims**



1. A liquid-liquid extraction apparatus which comprises:

(a) a cylindrical outer vessel having a vertical major axis, a cylindrical internal volume and a first and a second lateral half;

(b) a plurality of horizontal perforated liquid support trays extending across the internal volume of the outer vessel at vertically spaced intervals, including an upper first tray and a vertically contiguous lower second tray;

(c) a plurality of liquid downcomers operably connected to the liquid support trays, including a first downcomer attached to said first tray which comprises:

i. a first vertical conduit having a first cross-sectional area and connected to an opening through said first tray located in the first lateral half of said outer vessel, said first vertical conduit extending downward and terminating at a lower end located below said first tray;

ii. a liquid separation chamber having a first and a second end, an internal volume, a substantially horizontal major axis and a cross-sectional area at least twice as large as said first cross-sectional area, with said lower end of said first vertical conduit being connected to said liquid separation chamber, and with the first end of said liquid separation chamber being located in said first lateral half of said outer vessel and said second end of said liquid separation chamber being located in said second lateral half of said outer vessel;

iii. a second vertical conduit having an upper end connected to said liquid separation chamber and an open lower end located at a point in the second lateral half of said outer vessel and above said second tray, said sec-

ond vertical conduit having a smaller cross-sectional area than said liquid separation chamber; and,

(d) a third vertical conduit having a lower open end in communication with the internal volume of the liquid separation chamber, the third vertical conduit extending upward from the liquid separation chamber and through said first tray and having an upper open end located at a point above said first tray.

4,234,545

PROCESS FOR THE RECOVERY OF COBALT VALUES

Moustafa El-Chahawi, Troisdorf, and Uwe Prange, Niederkassel-Ranzel, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,904

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745377

Int. Cl.³ C01G *51/02, 51/04*

U.S. Cl. 423—138 **8 Claims**

1. A process of recovering cobalt values from a cobalt-containing residue containing from 0.01 to 10% by weight cobalt obtained from a carbonylation process catalyzed by a cobalt-containing catalyst which consists essentially of heating said cobalt-containing residue in a combustion chamber at a temperature of 800° to 1200° C. for two to five seconds in the presence of an amount of oxygen or oxygen-containing gas to convert the cobalt contained therein to cobalt oxide.

4,234,546

LIQUID/LIQUID EXTRACTION OF NICKEL VALUES

Abraham J. van der Zeeuw; Peter Koenders, and Riekert Kok, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

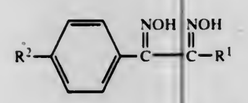
Continuation of Ser. No. 884,054, Mar. 6, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,679

Claims priority, application United Kingdom, Mar. 7, 1977, 9468/77

Int. Cl.³ C01G *53/00*

U.S. Cl. 423—139 **11 Claims**

1. The liquid/liquid extraction process for the separation of nickel values from an aqueous solution containing nickel values and having a pH between 1.6 and 3.0 which comprises contacting the aqueous solution with an organic extractant comprising a substantially water-immiscible organic solvent and one or more alpha, beta-dioxime compounds of the general formula I



(I)

where R^2 represents an alkyl group of from 7 to 20 carbon atoms, and R^1 represents an alkyl group having less than ten carbon atoms or a hydrogen atom, thereby forming an organic extract phase containing nickel values in solution and an aqueous raffinate phase.

4,234,547

FLUE GAS TREATMENT

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 7, 1979, Ser. No. 36,932

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. In a process for the absorptive removal of sulfur dioxide from a gaseous mixture by contacting said gaseous mixture in a scrubbing zone with a scrubbing liquor comprising a buffered solution of an alkali metal sulfite and bisulfite, the alkalinity of said scrubbing liquor being maintained by the addition thereto of an aqueous alkaline reagent solution comprising sodium carbonate or sodium bicarbonate having a relatively high ph with respect to said scrubbing liquor, said aqueous alkaline reagent solution having dissolved therein an undesirable quantity of silica contaminant which, upon the addition of said aqueous alkaline reagent solution to said scrubbing liquor tends to precipitate from solution and form deleterious deposits which interfere with the functioning of said process, the improvement which comprises the addition of particles of finely divided solid material comprising fly ash or solid material obtained from said scrubbing liquor or both to said aqueous alkaline reagent solution prior to the addition of said aqueous alkaline reagent solution to said scrubbing liquor thereby effecting the formation of an agglomeration of precipitate of silica contaminant with said particles upon the addition of said alkaline reagent solution to said scrubbing liquor, said agglomeration having a minimum deleterious effect and relatively minor interference with the functioning of said process.

4,234,548

CONTROL OF NITROGEN OXIDES FROM STATIONARY SOURCE EFFLUENTS

Laurence K. Burnell; James D. Hyde, both of Troy; Nicholas P. Kolak, Latham, and Richard E. Gibbs, Troy, all of N.Y., assignors to Nox Research Corp., New York, N.Y.

Division of Ser. No. 792,473, Apr. 29, 1977. This application Jul. 12, 1978, Ser. No. 923,902

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—235 **9 Claims**

1. In a process of removing nitrogen oxides from flue gases containing nitrogen oxides, the improvement which comprises contacting the flue gases with a scrubbing solution consisting essentially of: from about 0.01 molar to about 2 molar of an inorganic basic compound; from about 0.05 molar to about 2 molar of a sulfite anion source; from about 5×10^{-4}% to about 5% by weight of the solution of a surface-active agent selected from the group consisting of anionic, cationic, nonionic, and ampholytic surface-active agents; and water.

4,234,549

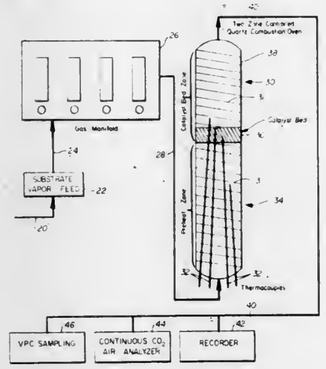
NOVEL COMBUSTION PROCESS FOR AN ORGANIC SUBSTRATE

Priscilla B. Stanley, Pleasantville, and James S. Ritscher, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,194

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—245 **19 Claims**



1. A process for the combustion of an organic substrate wherein said process comprises intimately contacting said organic substrate, at a temperature below the temperature of ignition of the organic substrate, with an organophilic catalyst bed comprised of a metal-containing zeolite having a silica to alumina ratio of at least 10, wherein the metal is at least one of platinum, palladium, copper, nickel, chromium and manganese; and combusting the organic substrate by an adiabatic temperature rise in the catalyst bed, in the presence of an oxygen-containing gas, after sufficient organic substrate has been adsorbed by the catalyst bed.

4,234,550

METHOD FOR TREATING A PARTICULATE NUCLEAR FUEL MATERIAL

William R. DeHollander, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Nov. 8, 1976, Ser. No. 739,716

Int. Cl.² C01G *43/02*

U.S. Cl. 423—261 **14 Claims**

1. A method of treating a particulate uranium oxide composition containing from about 3 to about 15 percent by weight of an ammonium diuranate precursor, with or without fluoride impurities, comprising the steps of

(a) contacting said composition with a sufficient amount of an ammonium hydroxide solution to convert said precursor to ammonium diuranate, convert any fluoride compounds to ammonium fluoride, and form a treated composition containing solid agglomerates, and

(b) heating the treated composition under a controlled atmosphere at a temperature of from about 300° C. to about 700° C., said temperature being sufficient to dry the agglomerates, sublime any ammonium fluoride, and convert the ammonium diuranate to uranium dioxide yielding a particulate composition comprised substantially of uranium dioxide, said composition being capable of compaction into unsintered structures of increased strength.

4,234,551

EUROPIUM CARBOXIDE AND METHOD OF PREPARING THE SAME

Alfred J. Darnell, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 812,022, Jun. 30, 1977, abandoned. This application Apr. 23, 1979, Ser. No. 32,058

Int. Cl.³ C01F *17/00*

U.S. Cl. 423—263 **13 Claims**

1. A composition of matter comprising a europium carboxide represented by the formula, Eu_2CO.

2. A method of preparing a lanthanide carboxide having the general formula, M_2CO, wherein M is at least one lanthanide element having an atomic number of from 57 through 71, inclusive, comprising introducing into a reaction zone a particulate mass of at least one selected elemental lanthanide and carbon monoxide in an amount sufficient to provide about the stoichiometric amount to form the carboxide and in the absence of other reactive gases, and maintaining a temperature in the reaction zone of from about 400° to 1500° C., for a time sufficient to form the desired lanthanide carboxide and recovering the lanthanide carboxide.

4,234,552

STABILIZATION OF SULPHUR

Grahame L. Stanley, Ockbrook, England, assignor to Courtaulds Limited, London, England

Filed Sep. 28, 1979, Ser. No. 79,940

Claims priority, application United Kingdom, Oct. 18, 1978, 41114/78

Int. Cl.³ C01B *17/12*

U.S. Cl. 423—268 **7 Claims**

1. Sulphur, of which at least 30 percent by weight is insoluble in carbon disulphide at 20° C., characterised in that the sulphur has incorporated therewith as stabiliser a dixanthogen of the formula



where R and R^1 are each independently an alkyl, cycloalkyl, aralkyl or aryl group and may be substituted by halogen or alkoxy and n is 2 or 4.

4,234,553

PROCESS AND APPARATUS FOR THE PREPARATION OF AMMONIA AND HEAVY WATER

Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

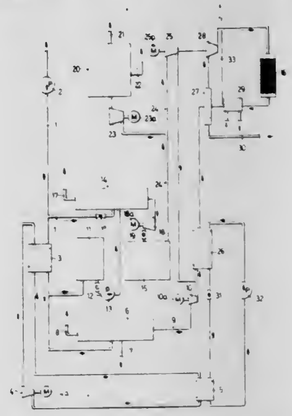
Filed May 12, 1977, Ser. No. 796,308

Claims priority, application Switzerland, May 13, 1976, 6019/76

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—359 **6 Claims**



1. An apparatus for the production of ammonia and heavy water comprising

a nitrogen-producing means for generating a flow of nitrogen;

a monothermal isotope exchanger for enriching water of a natural deuterium concentration with deuterium;

a heavy water preparation plant connected to said exchanger for receiving a portion of the deuterium-enriched water and preparing heavy water therefrom;

an electrolyzer for electrolytically dissociating water to produce hydrogen;

an enriched-water storage tank connected to said exchanger for receiving and storing a second portion of the deuterium-enriched water, said tank being selectively connected to said electrolyzer to deliver stored deuterium-enriched water to said electrolyzer;

a hydrogen storage tank selectively connected to said electrolyzer to receive hydrogen produced in said electrolyzer; and

an ammonia synthesizing plant connected to said nitrogen producing means and connected to said heavy water preparation plant and said hydrogen storage tank for receiving a synthesis gas mixture of nitrogen from said nitrogen producing means and hydrogen from said heavy water preparation plant and said hydrogen storage tank.

5. A process for the production of ammonia and heavy water, said process comprising the steps of

enriching a flow of water with deuterium in a monothermal isotopic process;

supplying a first portion of the deuterium-enriched water to

a heavy water preparation plant to produce heavy water and hydrogen;
storing a second portion of the deuterium-enriched water substantially without interruption during the colder half of a year;
electrolytically dissociating the stored deuterium-enriched water substantially without interruption during the warmer half of a year to form hydrogen;
storing a portion of the electrolytically-produced hydrogen during said warmer half of a year;
generating a flow of nitrogen; and
supplying the flow of nitrogen, the hydrogen from the heavy water preparation plant and the stored hydrogen to a synthesizing plant during said colder half of a year while supplying the flow of nitrogen, the hydrogen from the heavy water preparation plant and the remainder of the electrolytically-produced hydrogen to the synthesizing plant during said warmer half of a year.

4,234,554

STABLE CRYSTALLINE LITHIUM NITRIDE AND PROCESS FOR ITS PREPARATION

Albrecht Rabenau; Ulrich von Alpen, both of Stuttgart; Erich Schönherr, Leonberg, and Gertraude Müller, Leonberg-Ramtel, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur forderung der Wissenschaften e.V., Göttigen, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 929,143

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750607

Int. Cl.³ C01B *21/06*

U.S. Cl. 423—409 **5 Claims**

1. Crystalline lithium nitride, stable in air, having the following characteristics:
sodium content of less than 5×10^{-2} wt%
potassium content of less than 10^{-2} wt%
magnesium content of less than 1×10^{-2} wt%
silicon and iron content of 10^{-2} to 10^{-3} wt%
in the form of hexagonal crystals having a layered structure containing Li_2N layers with interposed lithium ions.

4,234,555

REMOVAL OF URANIUM FROM AQUEOUS HF SOLUTIONS

Howard Pulley, West Paducah, and Steven F. Seltzer, Paducah, both of Ky., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1978, Ser. No. 920,525

Int. Cl.³ G21F *9/12*; **C02F** *1/62*

U.S. Cl. 423—484 **10 Claims**

1. The method of decreasing the uranium content of an aqueous HF solution containing uranium to provide a product aqueous HF solution of increased purity, said method comprising:
mixing particulate calcium fluoride with said solution to form uranium-bearing particulates,
permitting said particulates to sediment from said solution, and
separating the resulting aqueous HF solution from the settled particulates.

4,234,556

METHOD OF PRODUCING CALCIUM BROMIDE

Clara J. del Vaile, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 817,938, Jul. 22, 1977, abandoned. This application Oct. 5, 1979, Ser. No. 83,051

Int. Cl.³ C01F *11/34*

U.S. Cl. 423—497 **10 Claims**

1. In the method of producing calcium bromide wherein hydrogen bromide is reacted with calcium hydroxide in the presence of water and carbonates, the improvement comprising acidifying the reaction mixture to a pH of from about 1 to about 3, and maintaining such pH range for a sufficient time to convert at least a portion of the carbonates to carbon dioxide, thereby removing carbonates from the reaction mixture.

4,234,557

MOLTEN SALT SYNTHESIS OF ALKALI NIOBATE POWDERS

Ronald H. Arendt, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,911

Int. Cl.³ C01G *33/00*

U.S. Cl. 423—593 **6 Claims**

1. A process for producing alkali niobate powder which consists essentially of providing particulate niobium pentoxide in stoichiometric amount or particulate precursor therefor, providing particulate alkali oxide in stoichiometric amount or particulate precursor therefor, said alkali oxide being selected from the group consisting of sodium oxide, potassium oxide, lithium oxide and mixtures thereof, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said niobium pentoxide or precursor therefor, said alkali oxide or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said niobium pentoxide, alkali oxide and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said niobium pentoxide and alkali oxide, maintaining said reaction temperature dissolving and reacting said niobium pentoxide and alkali oxide in said molten salt and precipitating said alkali niobate, and recovering said precipitated alkali niobate by dissolving said chloride salt and separating said precipitated alkali niobate from the resulting salt solution.

4,234,558

MOLTEN SALT SYNTHESIS OF ORTHORHOMBIC LEAD METANIOBATE POWDER

Ronald H. Arendt, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,921

Int. Cl.³ C01G *33/00*

U.S. Cl. 423—593 **4 Claims**

1. A process for producing a reaction product powder containing orthorhombic lead metaniobate in excess of 50% by volume of said reaction product, which consists essentially of providing particulate PbO in stoichiometric amount or particulate precursor therefor, providing particulate Nb_2O_5 in stoichiometric amount or particulate precursor therefor, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said PbO or precursor therefor, said Nb_2O_5 or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said PbO and Nb_2O_5 and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and byproduct gas, said chloride salt in molten form being a solvent for said PbO and Nb_2O_5, maintaining said reaction temperature dissolving and reacting said PbO and Nb_2O_5 in said molten salt and precipitating said reaction product powder, and recovering said precipitated reaction product powder by dissolving said chloride salt and separating said precipitated reaction product powder from the resulting salt solution.

4,234,559

PROCESS FOR THE MANUFACTURE OF COARSE ALUMINUM HYDROXIDE

Otto Tschamper, Volketswil, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 24, 1979, Ser. No. 87,663

Claims priority, application Switzerland, Nov. 7, 1978, 11428/78

Int. Cl.³ C01F *7/14*

U.S. Cl. 423—629 **10 Claims**

1. A process for the manufacture of coarse aluminum hydroxide having a maximum of 15 weight percent of particles with a diameter less than 45 micrometers by a two stage decomposition of a supersaturated alkaline aluminate solution, by the addition of aluminum hydroxide seed material of different quality to said aluminate solution in each of said two stages, which comprises
(a) distributing the quantity of aluminum hydroxide seed material as follows: adding to said aluminate solution a first addition of fine seed material (primary seed material) in a first stage of the decomposition, where the quantity thereof is so calculated that the ratio between the supersaturation in grams of Al_2O_3 per liter of aluminate liquor and the surface area of said seed material expressed in square meters per liter of aluminate liquor lies between 7 and 25 grams per square meter; and
adding to said aluminate solution a second addition of coarse seed material (secondary seed material) in a second stage of the decomposition after an interval of approximately two hours after the first addition such that the total amount of seed material (primary and secondary seed material) is at least 130 grams $Al(OH)_3$ per liter of aluminate liquor; and
(b) regulating the temperature of the decomposition in the following manner:
conducting said first stage of the decomposition in a temperature range of 77 degrees Celsius to 66 degrees Celsius; and
conducting said second stage of the decomposition at a reduced temperature which can be down to approximately 40 degrees Celsius.

4,234,560

PROCESS FOR TREATING A LIQUID WITH A GAS AND FOR PREVENTING THE PHASE SEPARATION OF UNREACTED GAS AND LIQUID, IN A CIRCULATORY REACTOR

Heribert Kuerten; Otto Nagel, both of Neustadt, and Peter Zehner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

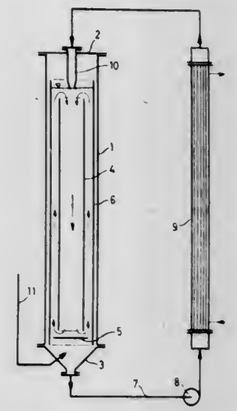
Filed Sep. 30, 1977, Ser. No. 838,356

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645780

Int. Cl.³ B01D *47/02*; **C01D** *15/06*

U.S. Cl. 423—659 **10 Claims**

1. A process for treating a liquid and a gas and substantially preventing phase separation of unreacted gas and liquid in a circulatory reactor containing a liquid-immersed circulation tube, the ratio of reactor height:reactor diameter being 2:1 to 30:1 and the ratio of diameter of the circulation tube:diameter of the reactor being from 0.1:1 to 0.7:1, wherein: the gas is introduced into and finely dispersed in the liquid by one or more jets of liquid which issue from one or more nozzles arranged above the circulation tube with the nozzle orifice positioned at about the level of the circulating liquid; said gas is entrained downwards in the circulation tube by the circulating gas-liquid stream, which exits from the bottom end of said tube and rises in the annular space immediately surrounding the tube, the velocity of the liquid in the circulation tube being from 1 to 6 times as great as the velocity in the annular space; and any gas remaining in the liquid after the liquid rises in the annular space very largely remains entrained in the liquid, which is drawn over the upper edge of the circulation tube



from the annular space and thence downward again into the circulation tube.

4,234,561

ANTIGEN FOR EARLY PREGNANCY TEST AND CONTRACEPTIVE VACCINE

Om P. Bahl, Williamsville, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,497

Int. Cl.² G01N *33/16*; **A61K** *43/00*

U.S. Cl. 424—1 **8 Claims**

1. A radioimmunoassay procedure for detecting the presence of hCG in body fluids which comprises contacting said body fluids with a complex comprising radioactively tagged hCG and an antibody; subsequently separating the complex from said body fluid and measuring the radioactive of either said complex or said body fluid wherein said antibody comprises an antiserum generally selective in reactivity to hCG to a distinguishing degree from the luteinizing hormone, which is produced by the process which comprises:
isolating the β-subunit of human chorionic gonadotropin, reducing and cleaving six of the intrachain disulfide bonds of said β-subunit;
alkylating the thus reduced intrachain disulfide bonds and conjugating said β-subunit with a protein or hapten;
isolating said antigen;
administering said antigen to a host animal whereby said animal generates an antibody response to said antigen; and extracting said antiserum from said animal.

4,234,562

RADIOGRAPHIC SCANNING

Andrew J. Tofe, and Marion D. Francis, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 701,478, Jun. 30, 1976, abandoned, which is a continuation of Ser. No. 462,477, Apr. 19, 1974, Pat. No. 3,983,227, which is a continuation-in-part of Ser. No. 363,286, May 23, 1973, abandoned. This application Mar. 20, 1978, Ser. No. 888,599

Int. Cl.³ A61K *29/00*

U.S. Cl. 424—1 **11 Claims**

1. A composition for the preparation of an improved bone scanning agent comprising a dry mixture of:
(a) methanehydroxydiphosphonic acid and pharmaceutically-acceptable salts, and mixtures of salts, thereof; and
(b) an amount of an anhydrous hydrochloric or sulfuric acid salt of a metal selected from the group consisting of fer-

rous, chromous and stannous and mixtures thereof sufficient to produce a molar ratio of metal to phosphonate of from about 1:15 to about 1:80.

4,234,563

INSOLUBILIZED DEOXYRIBONUCLEIC ACID (DNA)

Delfin F. Rippe, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 2, 1978, Ser. No. 911,865
Int. Cl.[2] G01N *31/22, 21/52, 33/16*
U.S. Cl. 424—8 **12 Claims**

1. A method of detecting antibodies to native deoxyribonucleic acid in serum comprising:

A. incubating an insoluble conjugate of methylated bovine serum albumin -native deoxyribonucleic acid with a serum from a patient with systemic lupus erythematosus for a sufficient period of time, thereby forming a serum flocculate;

B. washing said serum flocculate mixture and separating therefrom the supernatant fluid;

C. adding a fluorescein labeled anti-immunoglobulin antibody to the washed flocculate and incubating the labeled mixture for a sufficient period of time;

D. washing said incubated flocculate and separating therefrom the supernatant fluid; and

E. suspending the incubated flocculate in a washing medium and determining the fluorescence thereof, which is proportional to the concentration of antibodies to said native deoxyribonucleic acid.

7. A method for detecting antibodies to calf thymus nuclear extracts in serum comprising:

A. incubating an insoluble conjugate of methylated bovine serum albumin and calf thymus nuclear extracts with a serum from a patient for a sufficient period of time, thereby forming a serum flocculate:

B. washing said serum flocculate mixture and separating therefrom the supernatant fluid;

C. adding a fluorescein-labeled anti-immunoglobulin antibody to the washed flocculate and incubating the labeled mixture for a sufficient period of time;

D. washing said incubated flocculate and separating therefrom the supernatant fluid; and

E. suspending the flocculate in a washing medium and determining the fluorescence thereof, which is proportional to the concentration of antibodies to said calf thymus nuclear extract.

4,234,564

HEPATITIS B CORE ANTIGEN COMPOSITION

William J. McAleer, Ambler; William J. Miller, North Wales, and Edward H. Wasmuth, Telford, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 789,033, Apr. 20, 1977, Pat. No. 4,102,996. This application Dec. 19, 1977, Ser. No. 861,809
Int. Cl.[3] A61K *39/29*; C12N *7/00*; G01N *33/54*
U.S. Cl. 424—12 **1 Claim**

1. A composition for use in a diagnostic assay or in the preparation of a therapeutic composition comprising hepatitis B core antigen in a carrier comprising bovine serum albumin containing Tris, $MgCl_2$ and NaCl having a pH of 7.6, the ingredients in said carrier being in proportions suitable for storing the composition in a liquid nitrogen freezer.

4,234,565

POLYMER

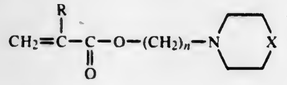
Per G. M. Flodin, Täby; Peter G. Komlos, Märsta, and Bengt G. Ranby, Djursholm, all of Sweden, assignors to Astra Chemical Products AB, Sodertalje, Sweden

Division of Ser. No. 892,869, Apr. 3, 1978. This application Mar. 2, 1979, Ser. No. 16,815
Claims priority, application Sweden, Apr. 4, 1977, 7703901
Int. Cl.[3] A61K *9/32*
U.S. Cl. 424—33 **15 Claims**

1. Product in the form of particles, which particles have been coated with a layer of polymer having pH dependent solubility characteristics in aqueous media, formed by the polymerization of

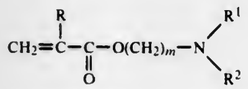
(a) methylmethacrylate,

(b) at least one monomer selected from the group consisting of a monomer of the general formula



I

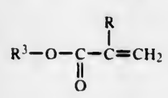
wherein R is selected from the group consisting of hydrogen and methyl, X is selected from the group consisting of $-CH_2-$ and --O, and n is an integer of from 1-4, and a monomer of the general formula



II

wherein R is selected from the group consisting of hydrogen and methyl, R^1 and R^2 are each selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, isobutyl, t-butyl, and n-butyl, whereby R^1 and R^2 are not both hydrogen, and m is an integer of from 1-4; and wherein the monomer according to formula I, when present, is 30-50 mol-% of the amount of monomers charged; and wherein the monomer of formula II, when present, is 20-30 mol-% of the amount of monomers charged; and

(c) at least one monomer of the general formula



III

wherein R^3 is a straight or branched alkyl group having 4-18C, and R^4 is hydrogen or methyl, and wherein the monomer according to formula III is 0.5-6.0 mol-% of the amount of monomers charged; and

wherein the polymer has pH dependent solubility such that the compound is essentially water insoluble above pH = 5, but essentially water permeable at pH = 3; and

wherein the nitrogen content of the polymer is 2.5-3.3%.

4,234,566

ANTIHISTAMINE AND METHODS FOR USE THEREOF

Elias W. Packman, 214 Sycamore Ave., Merion, Pa. 19066, and Ruth Jeffkin, 259 Richards Ave., Lansdowne, Pa. 19050

Division of Ser. No. 741,298, Nov. 12, 1976. This application Jun. 29, 1979, Ser. No. 53,399
Int. Cl.[3] A61K *7/00, 7/32, 7/34, 7/36*
U.S. Cl. 424—47 **21 Claims**

6. The method of controlling perspiration which comprises administering topically to a human, a synergistic antiperspirant composition comprising an antihistamine selected from the group consisting of an ethanolamine, an ethylenediamine, an alkylamine, a phenothiazine and a piperazine, or a physiologically acceptable salt thereof, in conjunction with a metal salt having astringent properties, and a pharmaceutically acceptable carrier, the combined amounts of the antihistamine and the metal salt act together to produce a synergistic effect and being in an amount effective to control the perspiration.

4,234,567

WASP AND HORNET SPRAY COMPOSITION

Lloyd T. Flanner, 4175 Americana Dr., Apt. A-12, Stow, Ohio 44224

Filed Jan. 8, 1979, Ser. No. 1,706
Int. Cl.[3] A61L *9/04*; A01N *37/00, 37/08, 43/02*
U.S. Cl. 424—45 **3 Claims**

1. A wasp and hornet spray composition formed from about 50% of a mixture of pyrethrins, piperonyl butoxide, carbaryl, petroleum distillates and inert ingredients and about 50% of a propellant solvent composition consisting of 1,1,1 trichloroethane and carbon dioxide; there being a synergistic action obtained between the 1,1,1 trichloroethane and the active ingredients of pyrethrins, piperonyl butoxide, carbaryl and petroleum distillate which are present in about 0.075; 0.188; 0.500 and 24.222 parts by weight, respectively, and where about 25 parts by weight of inert ingredients are present in the complete spray composition, and where about 7.5 parts of carbon dioxide are dissolved in about 92.5 parts of the 1,1,1 trichloroethane to form the spray-solvent mixture.

4,234,568

METHOD AND COMPOSITION FOR INHIBITING PLAQUE

Frances C. Benkwitt, Yonkers, and Fawzy G. Sherif, Stony Point, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 30, 1979, Ser. No. 25,440
Int. Cl.[3] A61K *7/22*
U.S. Cl. 424—54 **6 Claims**

1. An oral composition for inhibiting plaque formation on teeth which contains an effective amount of from about 0.05% to about 5.0% of a compound formed by reacting a long chain aliphatic alkylene primary amine having from about 16-18 carbon atoms and trimetaphosphoric acid having a molar ratio of from about 2.9-3.1 of the amine to about 0.9-1.1 of the acid wherein the effective amount of the compound is based on the weight of the composition.

4,234,569

PRODUCTION OF ALDEHYDE-TREATED ALLERGEN-CONTAINING SUBSTANCES

David G. Marsh, Overlea, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 550,535, Feb. 18, 1975, which is a continuation-in-part of Ser. No. 289,284, Sep. 15, 1972, abandoned, which is a continuation of Ser. No. 865,481, Oct. 10, 1969, abandoned. This application Oct. 4, 1978, Ser. No. 948,409
Int. Cl.[3] A61K *39/35, 39/36*; C07G *7/00*
U.S. Cl. 424—91 **48 Claims**

1. A process for producing an aldehyde-treated allergen of low allergenic reactivity in allergic humans and which retains the desired immunizing properties of the native allergen leading to amelioration of the symptomatology of allergic individuals and concomitant production of blocking antibody considered to be associated with, but not necessarily uniquely responsible for, such relief of symptoms, and which is capable of inducing in mammals the formation of blocking antibodies against the native allergen in significant concentration which comprises allowing allergens from which essentially all low molecular weight, non-allergenic substances have been removed to react chemically under mild conditions with an aldehyde solution selected from the group consisting of formaldehyde, lower saturated aliphatic di-functional aldehydes and combinations thereof, in at least two steps with the provisos that any formaldehyde reactions are carried out in a non-phenolic environment and wherein said mild conditions comprise a reaction step which is carried out at a temperature of from just above the freezing point of the solution to 15° C., and at least one subsequent step which is carried out at a temperature of from about 25° C. to 40° C., with any combination of formaldehyde, said dialdehyde or mixture thereof in each of the successive steps, to form a product having intra- or intermolecular crosslinking induced by said aldehydes and the allergenic determinant groups are modified to result in substantial reduction of allergenic properties while largely retaining the desired immunizing properties.

20. The product of the process of claim 1.

4,234,570

PROTEINIC ACTIVE SUBSTANCES

Yoshinori Kanbayashi, Ohtsu; Michio Ui, Sapporo; Koichi Hosoda, Shiga; Akira Ito; Shigeki Kurokawa, both of Ohtsu; Akio Terashima, Shiga; Isamu Takahashi, Ohtsu; Motoyuki Yajima, Ohtsu; Chikanori Tomioka, Ohtsu; Tsutomu Nakamura, Ohtsu; Katsumi Nogimori, Kyoto, and Taira Okamoto, Kusatsu, all of Japan, assignors to Kakenyaku Kako Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,665
Claims priority, application Japan, Jun. 10, 1977, 52-69154
Int. Cl.[3] A61K *37/00*; C07C *103/52*; C12P *21/00*
U.S. Cl. 424—177 **14 Claims**

1. A protein fraction which is selected from the group consisting of KS-I, KS-II and KS-III which is prepared by the process of

culturing a pathogenic strain of *Bordetella pertussis*,

isolating from the cultured cells or culture medium a protein which has a molecular weight of 77,000±6,400 as determined by gel filtration and has insulin secretion promoting activity for a mammal, which protein in 0.1 M phosphate buffer (pH 7.0) is adsorbed on a hydroxyapatite column and eluted therefrom with 0.1 M phosphate buffer of pH 7.0 containing 0.5 M NaCl and which protein in SDS-polyacrylamide-gel electrophoresis, wherein an incubated mixture of 1% SDS, 1% mercaptoethanol and 4 M urea with 50 μg/tube of said protein is applied to 10% polyacrylamide-gel containing 1% SDS in 4-hour current application of 8 mA/gel, gives three main peptide-bands,

mixing said protein into a solution of protein denaturant to dissociate it and

recovering from the resultant mixture said protein fraction characterized by the following properties:

KS—I

molecular weight: 63,000±5,200 as determined by gel filtration;

chemical composition: protein content as determined by the Lowry's method being ocer 97% by weight, the glucide content by the phenol-H_2SO_4 method being about 1% by weight and the lipid content being lower than the limit of detection,

the amino acids composition of the protein moiety: asparatic acid 8.1%; threonine 8.5%; serine 7.9%; glutamic acid 9.6%; proline 5.0%; glycine 10.0%; alanine 9.5%; cystine/2 1.1%; valine 6.2%; methionine 1.8%; isoleucine 4.5%; leucine 6.5%; tyrosine 7.6%; phenylalanine 2.8%; lysine 2.1%; histidine 1.6% and arginine 7.3%;

isoelectric pH value of 5.6±0.3, and

disc electrophoretic pattern, using acrylamide (polyacrylamide concentration, 7.5%; 1 N KOH-glacial acetic acid buffer (pH 4.3)) disc electrophoresis, giving a very sharp single band on the anode side;

KS—II

molecular weight: 31,000±4,500 as determined by gel filtration;

chemical composition: protein content as determined by the

Lowry method being over 95% by weight, the glucide content by the phenol-H_2SO_4 method being about 1% by weight and the lipid content being lower than the limit of detection;

the amino acid composition of the protein moiety: asparatic acid 9.3%; threonine 7.7%; serine 9.8%; glutamic acid 11.8%; proline 4.6%; glycine 9.8%; alanine 11.3%; cystine/2 N.D.; valine 7.4%; methionine 1.9%; isoleucine 4.0%; leucine 5.3%; tyrosine 6.2%; phenylalanine 2.5%; lysine 1.9%; histidine 1.1%; and arginine 5.4%;

isoelectric pH value of 5.4±0.4 and

disc electrophoretic pattern, using acrylamide (polyacrylamide concentration 7.5%; 1 N KOH-glacial acetic acid buffer (pH 4.3)) disc electrophoresis, giving a very sharp single band on the anode side;

KS—III

molecular weight: 12,000±1,500 as determined by gel filtration,

chemical composition: protein content as determined by the Lowry method being over 96% by weight the glucide content by the phenol-H_2SO_4 method being about 1% by weight and the lipid content being lower than the limit of detection,

the amino acids composition of the protein moiety: asparatic acid 5.3; threonine 4.8%; serine 6.2%; glutamic acid 9.6%; proline 9.3%; glycine 8.1%; alanine 9.3%; cystine/2 2.3%; valine 10.2%; methionine 6.0%; isoleucine 2.2%; leucine 8.6%; tyrosine 2.5%; phenylalanine 4.5%; lysine 5.8%; histidine 0.5%; and arginine 4.8%;

isoelectric pH value of 8.3±0.3, and

disc electrophoretic pattern using acrylamide (polyacrylamide concentration 7.5%; 1 N KOH-glacial acetic acid buffer (pH 4.3)) disc electrophoresis, giving a very sharp single band on the cathode side.

4,234,571

NONAPEPTIDE AND DECAPEPTIDE DERIVATIVES OF LUTEINIZING HORMONE RELEASING HORMONE

John J. Nestor, San Jose; Gordon H. Jones, and Brian H. Vickery, both of Cupertino, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 11, 1979, Ser. No. 47,661
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **15 Claims**

1. A compound of the formula

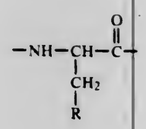
(pyro)Glu-His-V-Ser-W-X-Y-Arg-Pro-Z (I)

and the pharmaceutically acceptable salts thereof wherein:

V is tryptophyl, phenylalanyl or 3-(1-naphthyl)-L-alanyl;

W is tyrosyl, phenylalanyl or 3-(1-pentafluorophenyl)-L-alanyl;

X is a D-amino acid residue



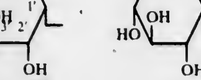
wherein R is

(a) a carbocyclic aryl-containing radical selected from the group consisting of naphthyl, anthryl, fluorenyl, phenanthryl, biphenylyl, benzhydryl and phenyl substituted with three or more straight chain lower alkyl groups; or

(b) a saturated carbocyclic radical selected from the group consisting of cyclohexyl substituted with three or more straight chain lower alkyl groups, perhydronaphthyl, perhydrobiphenylyl, perhydro-2,2-diphenylmethyl and adamantyl;

Y is leucyl, isoleucyl, nor-leucyl or N-methyl-leucyl;

Z is glycinamide or —NH—R^1, wherein R^1 is lower alkyl, cycloalkyl, fluoro lower alkyl or



wherein

R^2 is hydrogen or lower alkyl.

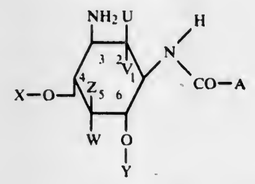
4,234,572

1-N-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINO-CYCLITOL DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Uwe Petersen, Leverkusen; Eckart Voss, Cologne; Karl G. Metzger, Wuppertal, and Peter Stadler, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,205
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753769
Int. Cl.³ A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 **23 Claims**

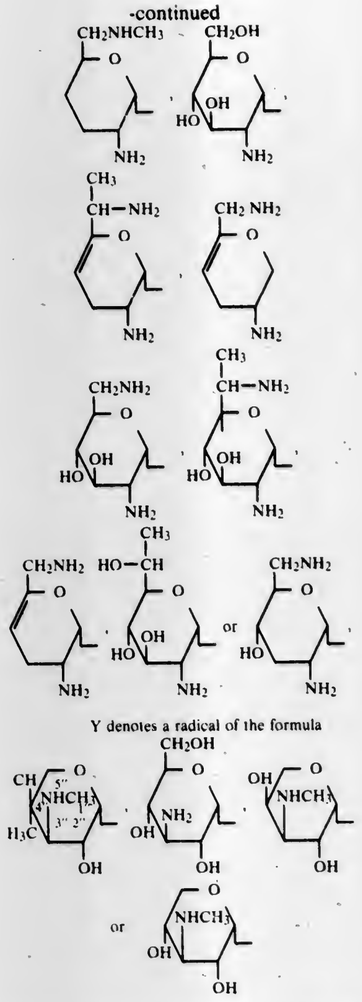
1. A compound of the formula


(I)

or a pharmaceutically acceptable salt thereof, in which

X denotes a radical of the formula

-continued

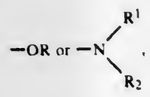


Y denotes a radical of the formula

U, V, and W independently denote a hydrogen atom or a hydroxyl group, but U and V cannot be OH simultaneously

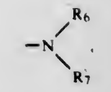
Z denotes a hydrogen atom or a hydroxyl or amino group, and

A denotes a radical



in which

R denotes an alkyl radical with 1 to 10 carbon atoms, which is unsubstituted or substituted by 1 or 2 substituents selected from halogen; hydroxyl; mercapto; cyano; carboxyl, trifluoromethyl; alkoxy and alkylthio with 1 to 6 carbon atoms; allyloxy; phenoxy; alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl radical and cycloalkyl with 3 to 6 carbon atoms in the ring; and a radical of the general formula



in which

R_6 denotes a hydrogen atom, a C_1 to C_8 alkyl group or an allyl group and

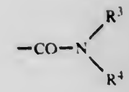
R_7 denotes a hydrogen or a C_1 to C_8 alkyl, C_5 to C_7 cycloalkyl, C_5 to C_7 cycloalkyl-C_1 to C_4 alkyl, phenyl, phenyl-C_1 to C_4 alkyl or allyl group, and

in which

the alkyl, cycloalkyl and phenyl radicals R_6 and R_7 are unsubstituted or substituted by one or two substituents selected from alkoxy with 1 to 4 carbon atoms, amino, monoalkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group in each case and hydroxyl; or R denotes an alkenyl radical with 3 to 7 carbon atoms; or denotes an alkinyl radical with 3 or 4 carbon atoms; or denotes a monocyclic or bicyclic cycloalkyl radical with 3 to 7 carbon atoms, which is unsubstituted or contains 1, 2 or 3 substituents selected from alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, hydroxyl, amino and alkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group, or denotes a phenyl radical or benzyl radical, which is unsubstituted or substituted by nitro, halogen or alkoxy with 1 to 4 carbon atoms; or denotes a piperidinyl, tetrahydropyranyl, tetrahydrofuryl, 1,3-dioxolanyl or 1,3-dioxolano[d,b]tetrahydrofuryl radical, which is unsubstituted or substituted by 1 or 2 radicals selected from alkoxy with 1 to 4 carbon atoms, hydroxyl, alkyl with 1 to 4 carbon atoms and 2,2-dimethyl-1,3-dioxolan-4-yl; or denotes a 1,3-dioxolanylalkyl, tetrahydrofurylalkyl, tetrahydropyranylalkyl, oxetanylalkyl, 1,3-oxathiolanylalkyl, 1,3-dithiolanylalkyl, 1,4-dioxaspiro[4,5]decanyl, alkyl, oxiranylalkyl, piperidinylalkyl, tetrahydropyridinylalkyl or aziridinylalkyl radical in which the alkyl radical contains 1 to 4 carbon atoms and which is unsubstituted or carries 1 or 2 substituents selected from alkyl with 1 to 4 carbon atoms, phenyl and alkoxy with 1 to 4 carbon atoms, and

R^1, independently of R, has any of the meanings indicated for R or denotes a hydrogen atom; and

R^2 independently of R has any of the meanings given for R or denotes a hydrogen atom or a 1-B-tetra-O-ocetyl-D-glucosyl, 1-B-D-glucosyl, tetrahydropyridinyl, morpholino, piperidino, alkoxy with 1 to 4 carbon atoms, cyclopentyloxy, cyclohexyloxy, benzyloxy which is optionally substituted by halogen, tetrahydropyranyloxy, tetrahydrofuranyloxy, hydroxyl, amino, alkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl radical, or allyloxycarbonyl group or a group of the formula



in which

R^3 independently of R^1 has any of the meanings given for R^1, and

R^4 denotes a hydrogen atom, an alkyl radical with 1 to 10, carbon atoms, which optionally carries 1 or 2 substituents selected from halogen, hydroxyl, mercapto, cyano, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, allyloxy, phenoxy, amino, alkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group, the alkylamino groups mentioned being unsubstituted or substituted by —OH, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl

radical and cycloalkyl with 3 to 6 carbon atoms in the ring, or denotes a monocyclic or bicyclic cycloalkyl radical with 3 to 7 carbon atoms, which can contain 1, 2 or 3 substituents selected from alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, hydroxyl, amino or alkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl group; or denotes a hydroxyl, alkoxy with 1 to 4 carbon atoms, or amino group or an alkylamino or dialkylamino group with 1 to 4 carbon atoms per alkyl group, or R^1 and R^2 or R^3 and R^4, including the N atom to which they are bonded, form a pyrrolidino, piperidino, morpholino, piperazin-4-yl, hexamethyleneimino, isoxazolin-2-yl or tetrahydroisoxazin-2-yl ring, which optionally carries 1 or 2 alkyl groups with 1 to 4 carbon atoms, which can be substituted by hydroxyl.

19. A method of combating bacterial infections in warm-blooded animals which comprises administering to the animals an antimicrobially effective amount of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,234,573

1-TRIMETHYLSILYLPHENYL-3-MONO- AND -DI-HALOBENZOYL-UREAS, INSECTICIDAL COMPOSITIONS CONTAINING THEM AND THEIR USE IN CONTROLLING INSECT PESTS

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

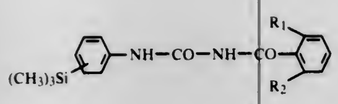
Filed Jun. 7, 1979, Ser. No. 46,288

Claims priority, application Switzerland, Jun. 15, 1978, 6533/78

Int. Cl.³ A01N *55/00;* **C07F** *7/02*

U.S. Cl. 424—184 **8 Claims**

1. A compound of the formula I



(I)

wherein R_1 is fluorine or chlorine and R_2 is hydrogen, fluorine or chlorine.

4,234,574

SILOXANES

Stephen Westall, Barry, Wales, assignor to Dow Corning Limited, London, England

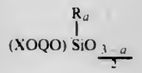
Filed Jun. 8, 1979, Ser. No. 47,192

Claims priority, application United Kingdom, Jun. 23, 1978, 27799/78

Int. Cl.³ C07F *7/18;* **A01N** *9/00;* **A61K** *31/695*

U.S. Cl. 424—184 **4 Claims**

1. A siloxane having at least one structural unit represented by the general formula

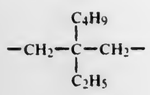


(I)

any remaining units in the siloxane being those represented by the general formula

$$R'_bSi\,O_{(4-a)/2} \qquad (II)$$

wherein X represents a hydrogen atom or a chemical bond linking the adjacent oxygen atom to the silicon atom of a silyl or siloxy group (with the proviso that both of the oxygen atoms in the XOQO— group are not attached to the same silicon atom), Q represents a group selected from



and

$$-CH(C_3H_7)CH(C_2H_5)CH_2-$$

each R and each R′ represents a chlorine atom, a hydrogen atom, there being not more than one hydrogen atom attached to any silicon atom, or an organic group, other than the group XOQO—, which is attached to the silicon atom through a silicon carbon, silicon-oxygen-carbon or silicon-nitrogen linkage, a has a value of 0, 1 or 2 and b has a value of 0, 1, 2 or 3.

4,234,575

PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS

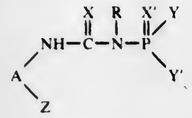
W. David Weir, Levittown, and Edward E. Kilbourn, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 842,645, Oct. 10, 1977, Pat. No. 4,183,921, which is a division of Ser. No. 625,998, Oct. 28, 1975, Pat. No. 4,076,809, which is a continuation-in-part of Ser. No. 354,629, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,378, Jun. 5, 1972, abandoned. This application Jan. 31, 1979, Ser. No. 7,881

Int. Cl.³ C07F *9/02;* **A01N** *57/00;* **A61K** *31/66*

U.S. Cl. 424—204 **41 Claims**

1. A compound of the formula:



wherein A is a divalent arylene group optionally substituted with

(a) halogen;
(b) cyano;
(c) nitro;
(d) di(C_1-C_{18})alkylamino;
(e) vicinal alkylene of from 2 to 6 carbon atoms; or
(f) a group of the formula: $R^1(A')_a$

wherein R^1 is

1. an alkyl group of from 1 to 4 carbon atoms;
2. a substituted or unsubstituted aromatic group containing from 6 to 10 atoms in the aromatic ring;

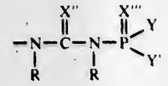
A′ is oxygen, sulfur, sulfinyl, sulfonyl or carbonyl; and a is an integer of 0 to 1;

R is

(a) hydrogen;
(b) (C_1-C_{10})alkyl;
(c) (C_1-C_{10})haloalkyl;
(d) (C_3-C_6)cycloalkyl;
(e) (C_2-C_{11})alkoxyalkyl;
(f) (C_1-C_{10})cyanoalkyl;
(g) (C_3-C_6)alkenyl;
(h) (C_3-C_6)haloalkenyl;
(i) (C_3-C_6)alkynyl;
(j) (C_3-C_6)haloalkynyl;
(k) optionally substituted aralkyl of up to 11 carbon atoms; or
(l) substituted or unsubstituted (C_6-C_{10})aryl;

Y is R′, OR′, N(R′)$_2$ or SR′ and

Y′ is OR′, N(R′)$_2$ or SR′ wherein R′ is alkyl(C_1-C_4), substituted alkyl(C_1-C_4), aralkyl(C_7-C_{10}), alkenyl (C_1-C_4), substituted alkenyl(C_1-C_4), phenyl, substituted phenyl, naphthyl or substituted naphthyl;
X is oxygen or sulfur;
X′ is oxygen or sulfur; and
Z is a group of the formula:



wherein
R is as above defined;
X″ is oxygen or sulfur, provided that when X″ is sulfur, X is oxygen;
X‴ is oxygen or sulfur; and
Y and Y′ are as above defined; or a pharmaceutically acceptable salt of said compound.

11. An anthelmintic composition for oral administration comprising an anthelmintically effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,234,576

PHENOXYBENZYLPHOSPHONIUM SALT PESTICIDES

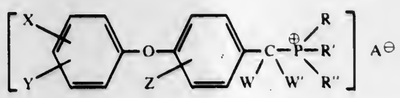
Michael J. Brown, Randolph Township, Morris County, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 861,204, Dec. 16, 1977, Pat. No. 4,162,313. This application Apr. 5, 1979, Ser. No. 27,609

Int. Cl.² A01N *9/36*

U.S. Cl. 424—211 **15 Claims**

1. A process for controlling plant insects which comprises contacting said insects with an insecticidally effective amount of a compound having the formula:



wherein A⊖ is a halogen anion; X, Y and Z are each independently hydrogen, a halogen atom or haloalkyl group of from 1 to 4 carbon atoms; R, R′ and R″ are each independently phenyl, halophenyl, haloalkylphenyl of from 7 to 12 carbon atoms or alkyl of from 1 to 6 carbon atoms, optionally substituted with halogen; W is —CHO or —CHN(R‴)$_2$ where each R‴ is independently hydrogen or alkyl of from 1 to 4 carbon atoms, optionally substituted with halogen; and W′ is hydrogen or represents a bond forming a double bond between C and W.

4,234,577

ERGOSTADIENTRIOLS, COMPOSITIONS CONTAINING SAME, AND METHODS OF PREPARING AND USING SAME

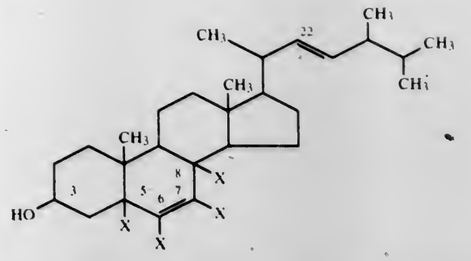
Fritz W. Zilliken, Remagen, Fed. Rep. of Germany, assignor to Z-L Limited Partnership, Janesville, Wis.

Continuation-in-part of Ser. No. 804,594, Jun. 8, 1977, Pat. No. 4,157,984. This application Mar. 19, 1979, Ser. No. 22,202

Int. Cl.³ A61K *31/56;* **A01N** *45/00*

U.S. Cl. 424—238 **17 Claims**

1. A composition useful as an antioxidant which comprises an effective antioxidative amount of a compound having the structure:



wherein X may be hydrogen or a hydroxyl group provided that X twice be hydroxyl and a carrier selected from the group consisting of edible foods, fats and oils.

4,234,578

AMINOETHYL-METHOXY-CEPHALOSPORIN COMPOUNDS

Beat Müller, Reinach; Peter Schneider, Basel; Heinrich Peter, and Hans Bickel, both of Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

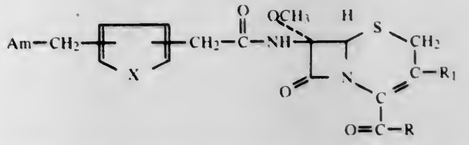
Continuation of Ser. No. 592,497, Jul. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,887, Sep. 13, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,822

Claims priority, application Switzerland, Oct. 1, 1973, 14034/73; Jan. 21, 1974, 785/74; Jul. 12, 1974, 9640/74; Jul. 12, 1974, 9641/74; Feb. 7, 1975, 1551/75

Int. Cl.³ C07D *501/57*

U.S. Cl. 424—246 **16 Claims**

1. A compound of the formula



wherein Am represents an unsubstituted amino, lower alkylamino or di-lower alkyl-amino, wherein lower alkyl contains up to 4 carbon atoms, X represents oxygen or sulphur, and the Am-methyl-substituted radical represents Am-methyl-2- or -3-thienyl, or Am-methyl-2-furyl, wherein R_1 denotes lower alkoxy or the group of the formula $-CH_2R_2$, in which R_2 denotes hydrogen, lower alkanoyloxy, carbamoyloxy, N-lower alkyl or N-halogeno-lower alkylcarbamoyloxy unsubstituted or substituted heterocyclylthio, wherein heterocyclyl represents a monocyclic, five-membered aromatic heterocyclic radical, which is bonded to the thio sulphur atom via a ring carbon atom and which contains 2 or 3 ring nitrogen atoms or additionally a ring oxygen atom, a ring sulphur atom or a ring nitrogen atom, said radical being unsubstituted or substituted by lower alkyl, or wherein heterocyclyl represents an unsaturated monocyclic, six-membered heterocyclic radical, which is bonded to the thio sulphur atom via a ring carbon atom and which contains 2 ring nitrogen atoms, and in which either a ring nitrogen atom carries an oxido group or a ring carbon atom carries an oxo group, said heterocyclyl radical being unsubstituted or substituted by lower alkyl, lower alkoxy or halogen, or R_2 denotes a pyridinium radical, which can be substituted by carboxyl, carbamoyl or hydrazinocarbonyl, and wherein R represents hydroxyl, and pharmaceutically acceptable salts thereof.

7. A pharmaceutical preparation comprising an antibiotically effective amount of a compound of claim 1 and a pharmaceutically utilizable excipient.

4,234,579

PENICILLANIC ACID 1,1-DIOXIDES AS β-LACTAMASE INHIBITORS

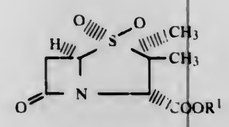
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 890,451, Mar. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 879,381, Feb. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 804,320, Jun. 7, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,700

Int. Cl.[3] **C07D** *277/60*

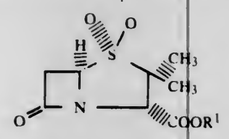
U.S. Cl. 424—246 **26 Claims**

1. A compound of the formula



and the pharmaceutically-acceptable base salts thereof, wherein R^1 is selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms, 1-methyl-1-(alkanoyloxy)ethyl having from 5 to 10 carbon atoms, alkoxycarbonyloxymethyl having from 3 to 6 carbon atoms, 1-(alkoxycarbonyloxy)ethyl having from 4 to 7 carbon atoms, 1-methyl-1-(alkoxycarbonyloxy)ethyl having from 5 to 8 carbon atoms, N-(alkoxycarbonyl)aminomethyl having from 3 to 9 carbon atoms, 1-(N-[alkoxycarbonyl]-amino) ethyl having from 4 to 10 carbon atoms, 3-phthalidyl, 4-crotonolactonyl, γ-butyrolacton -4-yl, tetrahydropyranyl, benzyl, 4-nitrobenzyl, benzyhdryl, 2,2,2-trichloroethyl, t-butyl and phenacyl.

10. A pharmaceutical composition useful for treating bacterial infections in mammals which comprises (A) a β-lactam antibiotic and (B) a compound of the formula



or a pharmaceutically acceptable base salt thereof, the weight ratio of (A) to (B) being 1:3 to 3:1, R^1 being selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms, 1-methyl-1-(alkanoyloxy)ethyl having from 5 to 10 carbon atoms, alkoxycarbonyloxymethyl having from 3 to 6 carbon atoms, 1-(alkoxycarbonyloxy)ethyl having from 4 to 7 carbon atoms, 1-methyl-1-(alkoxycarbonyloxy)-ethyl having from 5 to 8 carbon atoms, N-(alkoxycarbonyl)aminomethyl having from 3 to 9 carbon atoms, 1-(N-[alkoxycarbonyl-]amino)ethyl having from 4 to 10 carbon atoms, 3-phthalidyl, 4-crotonolactonyl and γ-butyrolacton-4-yl, and said β-lactam anti-biotic being selected from the group consisting of:
6-(2-phenylacetamido)penicillanic acid,
6-(2-phenoxyacetamido)penicillanic acid,
6-(2-phenylpropionamido)pencillanic acid,
6-(D-2-amino-2-phenylacetamido)pencillanic acid,
6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)penicillanic acid,
6-(D-2-amino-2-[1,4-cyclohexadienyl]acetamido)penicillanic acid,
6-(1-aminocyclohexanecarboxamido)penicillanic acid,
6-(2-carboxy-2-phenylacetamido)penicillanic acid,
6-(2-carboxy-2-[3-thienyl]acetamido)penicillanic acid,
6-(D-2-[4-ethylpiperazin-2,3-dione-1-carboxamido]-2-phenylacetamido)penicillanic acid,
6-(D-2-[4-hydroxy-1,5-naphthyridine-3-carboxamido]-2-phenylacetamido)-penicillanic acid,
6-(D-2-sulfo-2-phenylacetamido)penicillanic acid,
6-(D-2-sulfoamino-2-phenylacetamido)penicillanic acid,
6-(D-2-[imidazolidin-2-one-1-carboxamido]-2-phenylacetamido)penicillanic acid,
6-(D-[3-methylsulfonylimidazolidin-2-one-1-carboxamido]-2-phenylacetamido)penicillanic acid,
6-([hexahydro-1H-azepin-1-yl]methyleneamino)penicillanic acid,
acetoxymethyl 6-(2-phenylacetamido)penicillanate,
acetoxymethyl 6-(D-2-amino-2-phenylacetamido)penicillanate,
acetoxymethyl 6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)-penicillanate,
pivaloyloxymethyl 6-(2-phenylacetamido)penicillanate,
pivaloyloxymethyl 6-(D-2-amino-2-phenylacetamido)penicillanate,
pivaloyloxymethyl 6-(D-2-amino-2-[4-hydroxyphenyl-]acetamido)penicillanate,
1-(ethoxycarbonyloxy)ethyl 6-(2-phenylacetamido)penicillanate,
1-(ethoxycarbonyloxy)ethyl 6-(D-2-amino-2-phenylacetamido)penicillanate,
1-(ethoxycarbonyloxy)ethyl 6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)penicillanate,
3-phthalidyl 6-(2-phenylacetamido)penicillanate,
3-phthalidyl 6-(D-2-phenylacetamido)penicillanate,
3-phthalidyl 6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)-penicillanate,
6-(2-phenoxycarbonyl-2-phenylacetamido)penicillanic acid,
6-(2-tolyloxycarbonyl-2-phenylacetamido)penicillanic acid,
6-(2-[5-indanyloxycarbonyl]-2-phenylacetamido)penicillianic acid,
6-(2-phenoxycarbonyl-2-[3-thienyl]acetamido)penicillianic acid,
6-(2-tolyloxycarbonyl-2-[3-thienyl]acetamido)penicillanic acid,
6-(2-[5-indanyloxycarbonyl]-2-[3-thienyl]acetamido)penicillanic acid,
6-(2,2-dimethyl-5-oxo-4-phenyl-1-imidazolidinyl)penicillanic acid,
7-(2-[2-thienyl]acetamido)cephalosporanic acid,
7-(2-[1-tetrazolyl]acetamido-3-(2-[5-methyl-1,3,4-thiadiazolyl]-thiomethyl)-3-desacetoxymethylcephaosporanic acid,
7-(D-2-amino-2-phenylacetamido)desacetoxycephalosporanic acid,
7-α-methoxy-7-(2-[2-thienyl]acetamido)-3-carbamoyloxymethyl-3-deacetoxymethylcephalosporanic acid,
7-(2-cyanoacetamido)cephalosporanic acid,
7-(D-2-hydroxy-2-phenylacetamido)-3-(5-[1-methyltetrazolyl]-thiomethyl)-3-desacetoxymethylcephalosporanic acid,
7-(2-[4-pyridylthio]acetamido)cephalosporanic acid,
7-(D-2-amino-2-[1,4-cyclohexadienyl]acetamido)cephalosporanic acid,
7-(D-2-amino-2-phenylacetamido)cephalosporanic acid, and the pharmaceutically-acceptable salts thereof.

4,234,580

CARBAMATE THIOSULFENYLCARBAMOYL FLUORIDE COMPOUNDS

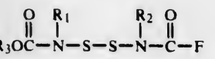
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,996

Int. Cl.[3] **C07C** *124/04, 125/06;* **A01N** *9/12;* **C07C** *125/04*

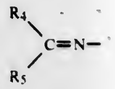
U.S. Cl. 424—246 **32 Claims**

1. A compound of the formula:



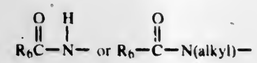
wherein:
R_1 and R_2 are the same or different and are alkyl groups having from one to four carbon atoms;

R_3 is:
(A) alkyl, cycloalkyl, alkenyl or alkyenyl; or
(B) dihydrobenzofuranyl, naphthyl, tetrahydronaphthyl, benzothienyl, indanyl, benzodioxalanyl, benzofuranyl, benzodioxanyl, or methylenedioxyphenyl all of which may be either unsubstituted or substituted with one or more alkyl groups; or
(C) phenyl, either unsubstituted or substituted with one or more halo, cyano, nitro, cycloalkyl, alkyl, alkylthio, alkynyl, alkenyl, alkylsulfinyl, alkylsulfonyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, amino, alkylamino, dialkylamino, alkynylthio, alkenylthio, alkoxycarbonylamino, trihalomethyl , dialkylaminoalkyleneamino, formamidino or alkoxy, or



(D)

or AC=N, wherein:
R_4 is hydrogen, alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl or cyano;
R_5 is alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, alkanoyl, aroyl, alkoxycarbonyl, phenyl, aminocarbonyl, alkylaminocarbonyl or dialkyoaminocarbonyl all of which may be unsubstituted or, except aminocarbonyl, substituted with one or more cyano, nitro, alkylthio, alkylsulfonyl, alkoxy, aminocarbonyl alkylaminocarbonyl,
dialkylaminocarbonyl or R_5 is a



where R_6 is hydrogen, alkyl or alkoxy;
A is a divalent alkylene chain completing a 2-oximino-1,4-dithiane, 2-oximino-1,3-dithiane, 4-oximino-1,3-dithiolane, 2-oximino-1,4-dioxane, 2-oximino-tetrahydro-1,4-thiazine-3-one, 2-oximino-1,3-dithiolane, 3-oximino-thiophane, 2-oximinothiophane, 2-oximino-tetrahydro-1,4-oxazin-3-one, 2-oximino-1,3,5-trithiane, 4-oximino-1,3,5-oxadithiane, 2-oximino-1,4-oxathiane, 4-oximino-1,3-oxathiolane, 2-oximino-thiazolidin-3-one, 2-oximino-1,3-thiazolidin-4-one or 2-oximino-tetrahydro-1,4-thiazin-5-one ring, wherein sulfur may be any of its oxidation states;
with the proviso that R_3, R_4, R_5 and R_6 substituents individually may not include more than eight aliphatic carbon atoms.

4,234,581

THIENO[2,3-D]OXAZINES

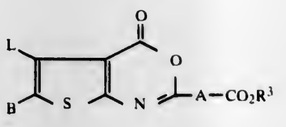
Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 826,591, Sep. 10, 1975, Pat. No. 4,159,377, which is a continuation-in-part of Ser. No. 611,955, Sep. 10, 1975, Pat. No. 4,054,656. This application Mar. 30, 1979, Ser. No. 25,295

Int. Cl.[3] **A61K** *31/38;* **C07D** *498/04*

U.S. Cl. 424—248.51 **26 Claims**

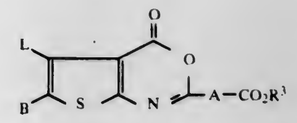
1. The compound having Formula V



Formula V

wherein
R^3 is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation, and
A is a covalent bond or it is —CH=CH—,
L and B are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, lower alkenyl having 3 to 6 carbon atoms, phenyl, and alkanoyl having 2 to 6 carbon atoms, or together they constitute cycloalkene having 5 to 7 carbon atoms, or R-substituted cycloalkene having 5 to 7 carbon atoms wherein R is lower alkyl having 1 to 8 carbon atoms.

22. A method of inhibiting the immediate hypersensitivity reaction in a sensitive mammal which comprises administering to said mammal an effective hypersensitivity reaction inhibiting dose of a compound selected from the group consisting of substances having Formula V



Formula V

wherein
R^3 is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation,
A is a covalent bond or it is —CH=CH—, and
L and B are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, lower alkenyl having 3 to 6 carbon atoms, phenyl, and alkanoyl having 2 to 6 carbon atoms, or together they constitute cycloalkene having 5 to 7 carbon atoms, or R-substituted cycloalkene having 5 to 7 carbon atoms wherein R is lower alkyl having 1 to 8 carbon atoms.

4,234,582

TRIALKYL ISOCYANATES USED AS PESTICIDES

Hironobu Takahashi; Masamitus Honda; Yasushi Murakami, all of Tokyo, and Yoshitaka Iwane, Yokohama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

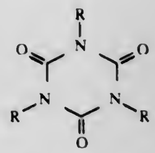
Filed Apr. 20, 1979, Ser. No. 32,091

Claims priority, application Japan, May 10, 1978, 53/54436; Jul. 11, 1978, 53/83522

Int. Cl.[1] **A01N** *43/64*

U.S. Cl. 424—249 **13 Claims**

1. A method for controlling household insect pests, agricultural vermin pests, and noxious insect pests that plague wood or cellulosic materials, comprising:
placing a pesticidally effective amount, at a locus in which the pests will come into contact therewith, of a trialkyl isocyanurate of the formula



wherein R is an alkyl group having 2–4 carbon atoms.

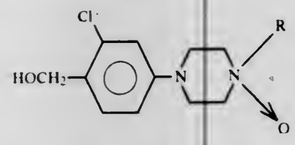
4,234,583

2-CHLORO-4-(4-LOWER ALKYL-1-PIPERAZINYL)BENZENEMETHANOL, N^{ω}-OXIDES AND METHODS FOR THEIR PREPARATION

Ernest Bueding, Baltimore, Md.; Leslie M. Werbel, and Donald F. Worth, both of Ann Arbor, Mich., assignors to Edna McConnell Clark Foundation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,371
Int. Cl.[3] A61K *31/495*; C07D *295/00*
U.S. Cl. 424—250 5 Claims

1. A compound of the formula



and acid addition salts thereof wherein R is methyl, ethyl, propyl, or isopropyl.

5. A method for treating schistosomiasis which comprises administering to a patient afflicted therewith an anti-schistosomiasis effective amount of a compound according to claim 1.

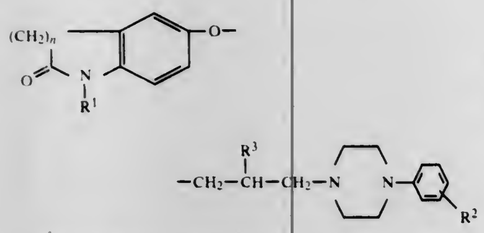
4,234,584

SUBSTITUTED PHENYLPIPERAZINE DERIVATIVES

Rudolf Lattrell, Königstein; Wilhelm Bartmann, Bad Soden am Taunus, and Hermann Gerhards, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 44,948
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1978, 2824677; Dec. 14, 1978, 2853996
Int. Cl.[3] A61K *31/495*; C07D *401/12*
U.S. Cl. 424—250 4 Claims

1. A phenylpiperazine compound of the formula



or a physiologically acceptable salt thereof, wherein

R^1 denotes hydrogen or C_1-C_6alkyl,

R^2 denotes one or several, identical or different, members selected from the group consisting of C_1-C_6-alkyl, C_1-C_6alkoxy, halogen, trifluoromethyl, hydroxy, nitro, amino, and methylene-dioxy,

R^3 denotes hydrogen, hydroxy, C_1-C_6alkanoyloxy, and

n is 1 or 2.

2. A neuroleptic composition comprising a compound as defined in claim 1 and a physiologically acceptable auxiliary agent or carrier therefor.

4,234,585

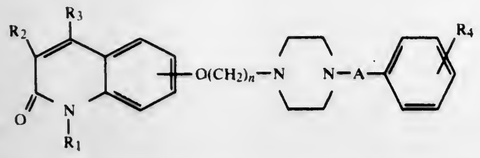
1,2-DIHYDROQUINOLINE-2-ONE DERIVATIVES

Werner Winter, Heppenheim; Walter-Gunar Friebe, Darmstadt; Wolfgang Kampe, Heddesheim; Androniki Roesch, Mannheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 45,472
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827566
Int. Cl.[3] A61K *31/495*; C07D *401/12*
U.S. Cl. 424—250 9 Claims

1. A (4-substituted-piperazin-1-yl)-alkoxy-2-oxo-1,2-dihydroquinoline of the formula:

(I)



in which

R_1, R_2 and R_3 each independently is hydrogen or an alkyl radical with 1 to 6 carbon atoms,

R_4 is hydrogen, halogen, or an alkyl or alkoxy radical with 1 to 6 carbon atoms,

n is 2, 3, 4 or 5 and

A is a valency bond or a methylene radical optionally substituted by phenyl,

or a salt thereof with a pharmacologically acceptable acid.

7. An anti-allergic and anti-hypertensive composition of matter comprising an anti-allergically anti-hypertensive effective amount of a compound or salt according to claim 1 in admixture with a pharmacologically acceptable diluent.

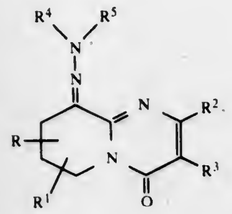
4,234,586

NITROGEN BRIDGEHEAD COMPOUNDS HAVING ANTI-ALLERGIC EFFECT

István Hermecz; Zoltán Mészáros; Tibor Breining; Sándor Virág; Lelle V. Vasvári nee Debreczy; Ágnes Horváth; Gábor Nagy; Attila Mándi; Tamás Szücs; István Bitter, and Gyula Sebestyán, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

Filed Dec. 11, 1978, Ser. No. 967,958
Claims priority, application Hungary, Dec. 29, 1977, CI 1794/77
Int. Cl.[3] A61K *31/505*; C07D *471/04*
U.S. Cl. 424—251 20 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt, hydrate, stereoisomer, optically active isomer, geometric isomer or tautomeric form thereof, wherein:

R is hydrogen or lower alkyl;

R^1 is hydrogen, lower alkyl, styryl or carboxy;

R^2 is hydrogen, lower alkyl or hydroxy;

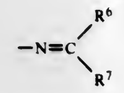
R^3 is hydrogen, lower alkyl, phenyl, naphthyl, formyl, lower alkanoyl, carboxyl, lower alkoxycarbonyl, carbamoyl, —CO—NH—NH_2, cyano, —CH—NH—OH, or a group of the formulae —(CH_2)m—COOH, —(CH_2)m—COO—loweralkyl, —(CH_2)m—$CONH_2$, —(CH_2)m—NH—NH_2, —(CH_2)m—CN or —(CH_2)m—CO—NH—OH, wherein m=1, 2 or 3;

R^4 is hydrogen, lower alkyl, lower alkyl substituted by hydroxy or carboxy, trifluoromethyl, phenyl, naphthyl, phenyl or naphthyl substituted by at least one halogen, lower alkyl, lower alkoxy, lower alkylenedioxy, trifluoromethyl, nitro, aminosulfonyl, carboxyl, sulfo, hydroxy, or amino, phenyl-loweralkyl, 2-, 3-, or 4-pyridyl, benzothiazol-2-yl, methoxycarbonyl or ethoxycarbonyl; and

R^5 is hydrogen, lower alkanoyl, benzoyl or nicotinoyl; or

R^4 and R^5 together with the adjacent nitrogen atom form a piperidino, pyrrolidino, or morpholino ring; or

R^4 and R^5 together with the adjacent nitrogen atom form a group of the formula:



wherein R^6 is hydrogen and R^7 is phenyl or phenyl substituted by N,N-dimethylamino; or

R^4 and R^5 together form a 2-azepinylidene group.

18. An anti-asthma composition comprising as active ingredient a pharmaceutically effective amount of the compound defined in claim 1 or a pharmaceutically acceptable salt thereof in admixture with an inert solid or liquid pharmaceutically acceptable carrier.

20. A method of treating asthma in an animal subject comprising administering to said subject an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

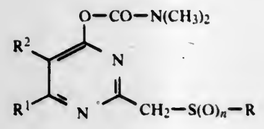
4,234,587

COMBATING PESTS WITH N,N-DIMETHYL-CARBAMIC ACID O-(2-SUBSTITUTED-METHYL-PYRIMIDIN-4-YL)-ESTERS

Fritz Maurer; Rolf Schröder, both of Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, and Paul-Ernst Frohberger, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,795
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838359
Int. Cl.[3] C07D *239/34*, *239/70*, *239/90*
U.S. Cl. 424—251 10 Claims

1. An N,N-dimethyl-carbamic acid O-(2-substituted-methyl-pyrimidin-4-yl) ester of the formula



in which

R is alkyl with 1 to 5 carbon atoms,

R^1 is hydrogen or alkyl with 1 to 6 carbon atoms,

R^2 is hydrogen, alkyl with 1 to 6 carbon atoms or halogen, or

R^1 and R^2 together are alkylenyl with 3 to 5 carbon atoms, and

n is 1 or 2.

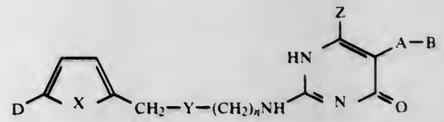
4,234,588

PYRIMIDINE COMPOUNDS

Thomas H. Brown, Welwyn Garden City, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Feb. 7, 1979, Ser. No. 9,990
Claims priority, application United Kingdom, Feb. 13, 1978, 5740/78; May 25, 1978, 22834/78; Nov. 13, 1978, 44259/78
Int. Cl.[3] C07D *401/12*
U.S. Cl. 424—251 40 Claims

1. A compound of the formula:



in which D is hydrogen or $R^1R^2N(CH_2)_m$—, R^1 and R^2 are hydrogen, lower alkyl, phenyl(lower alkyl) or R^1 and R^2 taken together with the nitrogen atom shown can form a pyrrolidino or piperidino group, m is from 1 to 6, X is oxygen or sulphur, Y is sulphur, oxygen or methylene, n is 2 or 3, Z is hydrogen or lower alkyl, A is C_1-C_5 alkylene or —$(CH_2)_p$W$(CH_2)_q$— where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4, and B is a heteroaryl group selected from pyridyl, pyridyl N-oxide and 1,3-dioxolopyridyl optionally substituted by one or more of the groups lower alkyl, lower alkoxy, halo, hydroxy and amino, in the form of the free base or its pharmaceutically acceptable acid addition salts.

29. A pharmaceutical composition having histamine H_2-receptor blocking activity comprising in an effective amount to block said receptors a compound of claim 1 and a pharmaceutically acceptable diluent or carrier.

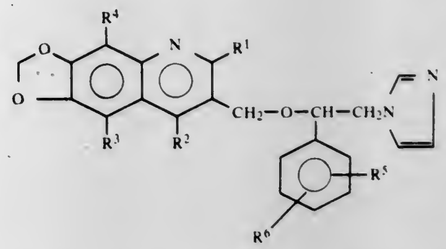
4,234,589

IMIDAZOLYLETHOXYMETHYL DERIVATIVES OF 1,3-DIOXOLO QUINOLINES

Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 24, 1979, Ser. No. 78,344
Int. Cl.[3] C07D *491/056*; A61K *31/47*
U.S. Cl. 424—256 12 Claims

1. A compound of the formula



wherein R^1 to R^6 each is hydrogen, halogen, lower alkyl containing 1 to 7 carbons, on a physiologically acceptable acid addition salt thereof.

12. A method for treating bacterial or fungal infections in mammals which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1.

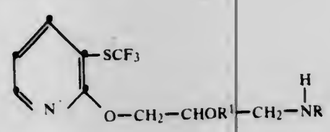
4,234,590

THIOSUBSTITUTED PYRIDINES

John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 5, 1979, Ser. No. 9,008
Int. Cl.³ C07D *213/89*; A61K *31/44*
U.S. Cl. 424—263 **8 Claims**

1. A compound having the formula



and pharmaceutically acceptable salts thereof wherein R is H or C_1-C_6alkyl and R^1 is H or



wherein L is C_1-C_{10}alkyl, phenyl or substituted phenyl having up to two substituents independently selected from C_1-C_4alkoxy, halo and C_1-C_4alkyl.

8. A pharmaceutical composition for treating hypertension containing an effective amount of the compound of claim **1** and a carrier.

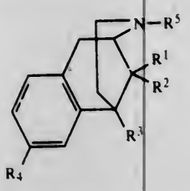
4,234,591

ANALGESIC AND MORPHINE-ANTAGONISTIC 9-PHENYL-6,7-BENZOMORPHANS

Antony M. Akkerman, Amsterdam; Hermanus C. C. K. Van Bakel, Montfoort, and Henriette G. van Breevoort-Uurbanus, Nieuw-Loosdrecht, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Continuation of Ser. No. 804,149, Jun. 6, 1977, abandoned. This application May 4, 1979, Ser. No. 36,089
Claims priority, application United Kingdom, Jun. 21, 1976, 25577/76
Int. Cl.³ A61K *31/445*; C07D *221/26*
U.S. Cl. 424—267 **21 Claims**

1. A benzomorphan compound of the formula



or a pharmaceutically acceptable salt thereof wherein R^1 is unsubstituted phenyl or phenyl substituted by a substituent selected from the group consisting of halogen, lower alkyl, trifluoromethyl, hydroxy, lower alkoxy, di(lower) alkylamino, and piperidino; R^2 is hydrogen, halogen, hydroxy, lower alkoxy, or acetoxy; R^3 is alkyl or alkenyl having up to four carbon atoms; R^4 is hydrogen, hydroxy, lower alkoxy, lower alkanoyloxy, nicotinoyloxy, or phenylloweralkanoyloxy; and R^5 is loweralkyl or, when R^2 is hydrogen and is trans to R^3, R^5 is hydrogen, loweralkyl or loweralkenyl, propargyl, lowercycloalkyl being unsubstituted or substituted by one or two lower alkyl groups, lowercycloalkylloweralkyl wherein the lowercycloalkyl group is unsubstituted or substituted by one or two lower alkyl groups, lowercycloalkenylloweralkyl, cyanoloweralkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, or phe-

acting the physiological effects of an opiate in a warm-blooded animal, which comprises administering to said animal an effective analgesic and/or morphine-antagonistic amount of a compound or salt as in claim **1**.

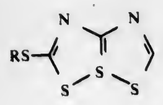
4,234,592

ALKYLTHIODIAZATRITHIAPENTALENE COMPOSITIONS AND METHODS OF USING AS PLANT DISEASE CONTROL AGENTS, INSECTICIDES, AND LARVICIDES

Thomas S. Woods, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1979, Ser. No. 42,944
Int. Cl.³ A01N *43/90*; C07D *513/04*
U.S. Cl. 424—270 **50 Claims**

1. A fungicidal, insecticidal and larvicidal essentially of an effective amount of a compound of the formula

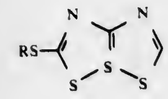


wherein

R is alkyl of C_1-C_{10}, optionally substituted with 1-2 chlorines; alkenyl of C_3-C_8, optionally substituted with 1-2 chlorines; cycloalkyl of C_3-C_{10}; cycloalkylalkyl of C_6-C_9; and $(CH_2)_nR'$, wherein n is 1-3 and R' is phenyl, optionally substituted with CH_3, CH_3O, NO_2, or 1-2 fluorines, chlorines, or bromines

and at least one of (a) a surfactant and (b) a solid or liquid diluent.

26. A method for controlling fungus diseases, and insect and larval pests which comprises applying to locus of infestation a pesticidally effective amount of a compound of the formula



wherein

R is alkyl of C_1-C_{10}, optionally substituted with 1-2 chlorines; alkenyl of C_3-C_8, optionally substituted with 1-2 chlorines; cycloalkyl of C_3-C_{10}; cycloalkylalkyl of C_6-C_9; and $(CH_2)_nR'$, wherein n is 1-3 and R' is phenyl, optionally substituted with CH_3, CH_3O, NO_2, or 1-2 fluorines, chlorines, or bromines.

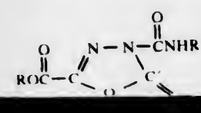
4,234,593

3-(N-ALKYLCARBAMYL)-5-(CARBOALKOXY)-1,3,4-OXADIAZOLE-2-THIONES AND THEIR USE AS ANTI-INFLAMMATORY AGENTS

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Arnold D. Gutman, Berkeley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

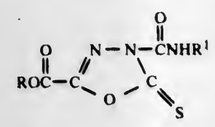
Filed Mar. 20, 1979, Ser. No. 22,129
Int. Cl.² A61K *31/42*; C07D *271/10*
U.S. Cl. 424—272 **3 Claims**

1. A compound having the following structural formula:



wherein R is alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

3. A method of treatment of an inflammatory condition in a mammal comprising administering to said mammal a therapeutically effective amount of a compound having the following structural formula:



wherein R is alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

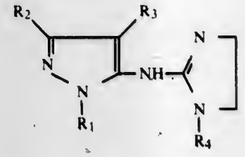
4,234,594

PYRAZOLYL AMINO IMIDAZOLINES AS ANTIHYPERTENSIVE AGENTS

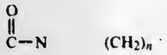
Martin Winn, Deerfield; Carl W. Nordeen, Waukegan, and David L. Arendsen, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 7, 1979, Ser. No. 36,884
Int. Cl.³ A61K *31/40, 31/47, 31/415, 31/435*
U.S. Cl. 424—273 P **9 Claims**

1. A method of treating hypertension in mammalian patients in need of such treatment which comprises administering to said patients a therapeutically effective amount of a compound of the formula



wherein R_1 and R_2 are hydrogen, loweralkyl, lowercycloalkyl, benzyl, phenyl or naphthyl, pyridyl, isoquinolyl or phthalazinyl, or phenyl or naphthyl substituted by one or more hydrogen, halo, loweralkyl, lowercycloalkyl, haloloweralkyl, aminosulfonyl, nitro, hydroxy, alkoxy, carboxy, alkoxycarbonyl, cycloalkoxy carbonyl, aminocarbonyl, diloweralkylaminocarbonyl or



wherein n is 4 or 5

R_3 is hydrogen, halogen, loweralkyl, phenyl or naphthyl, and

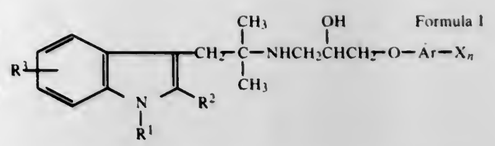
R_4 is hydrogen, acetyl, amino or loweralkyl, or the pharmaceutically acceptable acid addition salts thereof.

4,234,595

3-INDOLYL-TERTIARY BUTYLAMINOPROPANOLS

William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 815,138, Jul. 13, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,535



Formula I

and the acid addition salts thereof wherein one of

R^1 and R^2 is hydrogen and the other is hydrogen or alkyl having 1 to 4 carbon atoms,

R^3 is H, halogen, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms and is located in the 4-, 5-, 6-, or 7- positions of the indole ring,

Ar is selected from the group consisting of phenyl and naphthyl,

X refers to 1 or 2 optional sterically compatible Ar-attached substituents which are independently selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkoxyalkyl, alkanoyl, alkenoyl, alkanoyloxy, alkenoyloxy, alkylsulfonyl, alkylsulfinyl, alkylthio, alkanoylamino, alkenoylamino, alkoxycarbonyl, alkenoxycarbonyl, alkoxycarbonylamino, alkoxycarbonylaminoalkyl, cycloalkyl having 3 to 6 ring members and 1 to 3 optional alkyl substituents, cycloalkenyl having 4 to 6 ring members and up to 3 optional alkyl substituents, cycloalkylalkyl having 3 to 6 ring members and up to 3 optional alkyl substituents, cycloalkenylalkyl having 4 to 6 ring members and up to 3 optional alkyl substituents with the additional proviso that each of the foregoing Ar-attached substituents has up to 8 carbon atoms, trifluoromethyl, nitro, amino, hydroxyl, halogen, aminocarbonyl, cyano, cyanoalkyl having from 2 to 4 carbon atoms, aminocarbonylalkyl having 2 to 4 carbon atoms,

n is the integer 0, 1, or 2 signifying the number of X groups, or

$Ar\text{-}X_n$ as a unit refers to 4-indenyl, 6,7-dihydroxy-5,6,7,8-tetrahydro-1-napthyl, or 5-oxo-5,6,7,8-tetrahydro-1-naphthyl.

98. The method of inhibiting β-adrenergic activity in a mammalian host having a condition in which therapeutic benefit is derived from inhibition of the β-adrenergic receptors which comprises administering to said host a non-toxic effective adrenergic β-receptor inhibiting dose of a compound as claimed in claim **1**.

99. The method of exerting a vasodilating effect in a mammalian host which comprises administering to a mammal having a condition in which therapeutic benefit is derived from vasodilatation, a non-toxic effective vasodilating dose of a compound as claimed in claim **1**.

100. The antihypertensive method which comprises administering to a mammalian host having hypertension a non-toxic antihypertensive effective dose of a compound claimed in claim **1**.

4,234,596

3-(2-AMINOETHYLTHIO)-6-(1-HYDROXYETHYL)-7-OXO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID

Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 833,210, Sep. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,365, Nov. 19, 1976, abandoned, and Ser. No. 792,071, Apr. 28, 1977, abandoned. This application May 8, 1979, Ser. No. 37,080

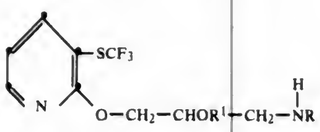
4,234,590

THIOSUBSTITUTED PYRIDINES

John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 5, 1979, Ser. No. 9,008
Int. Cl.[3] C07D *213/89*; A61K *31/44*
U.S. Cl. 424—263 **8 Claims**

1. A compound having the formula



and pharmaceutically acceptable salts thereof wherein R is H or C_1-C_6alkyl and R^1 is H or



wherein L is C_1-C_{10}alkyl, phenyl or substituted phenyl having up to two substituents independently selected from C_1-C_4alkoxy, halo and C_1-C_4alkyl.

8. A pharmaceutical composition for treating hypertension containing an effective amount of the compound of claim 1 and a carrier.

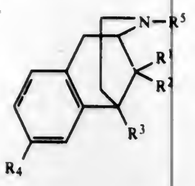
4,234,591

ANALGESIC AND MORPHINE-ANTAGONISTIC 9-PHENYL-6,7-BENZOMORPHANS

Antony M. Akkerman, Amsterdam; Hermanus C. C. K. Van Bakel, Montfoort, and Henriette G. van Breevoort-Uurbanus, Nieuw-Loosdrecht, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Continuation of Ser. No. 804,149, Jun. 6, 1977, abandoned. This application May 4, 1979, Ser. No. 36,089
Claims priority, application United Kingdom, Jun. 21, 1976, 25577/76
Int. Cl.[3] A61K *31/445*; C07D *221/26*
U.S. Cl. 424—267 **21 Claims**

1. A benzomorphan compound of the formula



or a pharmaceutically acceptable salt thereof wherein R^1 is unsubstituted phenyl or phenyl substituted by a substituent selected from the group consisting of halogen, lower alkyl, trifluoromethyl, hydroxy, lower alkoxy, di(lower) alkylamino, and piperidino; R^2 is hydrogen, halogen, hydroxy, lower alkoxy, or acetoxy; R^3 is alkyl or alkenyl having up to four carbon atoms; R^4 is hydrogen, hydroxy, lower alkoxy, lower alkanoyloxy, nicotinoyloxy, or phenylloweralkanoyloxy; and R^5 is loweralkyl or, when R^2 is hydrogen and is trans to R^3, R^5 is hydrogen, loweralkyl or loweralkenyl, propargyl, lowercycloalkyl being unsubstituted or substituted by one or two lower alkyl groups, lowercycloalkylloweralkyl wherein the lowercycloalkyl group is unsubstituted or substituted by one or two lower alkyl groups, lowercycloalkenylloweralkyl, cyanoloweralkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, or phenylloweralkyl wherein the phenyl group is unsubstituted or substituted by lower alkoxy, halogen, or nitro.

20. The method of raising the pain threshold and/or counteracting the physiological effects of an opiate in a warm-blooded animal, which comprises administering to said animal an effective analgesic and/or morphine-antagonistic amount of a compound or salt as in claim 1.

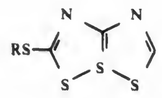
4,234,592

ALKYLTHIODIAZATRITHIAPENTALENE COMPOSITIONS AND METHODS OF USING AS PLANT DISEASE CONTROL AGENTS, INSECTICIDES, AND LARVICIDES

Thomas S. Woods, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1979, Ser. No. 42,944
Int. Cl.[3] A01N *43/90*; C07D *513/04*
U.S. Cl. 424—270 **50 Claims**

1. A fungicidal, insecticidal and larvicidal essentially of an effective amount of a compound of the formula

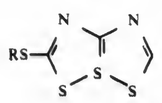


wherein

R is alkyl of C_1-C_{10}, optionally substituted with 1-2 chlorines; alkenyl of C_3-C_8, optionally substituted with 1-2 chlorines; cycloalkyl of C_3-C_{10}; cycloalkylalkyl of C_6-C_9; and $(CH_2)_nR'$, wherein n is 1-3 and R' is phenyl, optionally substituted with CH_3, CH_3O, NO_2, or 1-2 fluorines, chlorines, or bromines

and at least one of (a) a surfactant and (b) a solid or liquid diluent.

26. A method for controlling fungus diseases, and insect and larval pests which comprises applying to locus of infestation a pesticidally effective amount of a compound of the formula



wherein

R is alkyl of C_1-C_{10}, optionally substituted with 1-2 chlorines; alkenyl of C_3-C_8, optionally substituted with 1-2 chlorines; cycloalkyl of C_3-C_{10}; cycloalkylalkyl of C_6-C_9; and $(CH_2)_nR'$, wherein n is 1-3 and R' is phenyl, optionally substituted with CH_3, CH_3O, NO_2, or 1-2 fluorines, chlorines, or bromines.

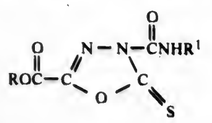
4,234,593

3-(N-ALKYLCARBAMYL)-5-(CARBOALKOXY)-1,3,4-OXADIAZOLE-2-THIONES AND THEIR USE AS ANTI-INFLAMMATORY AGENTS

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Arnold D. Gutman, Berkeley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

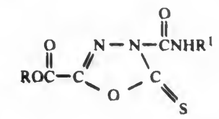
Filed Mar. 20, 1979, Ser. No. 22,129
Int. Cl.[2] A61K *31/42*; C07D *271/10*
U.S. Cl. 424—272 **3 Claims**

1. A compound having the following structural formula:



wherein R is alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

3. A method of treatment of an inflammatory condition in a mammal comprising administering to said mammal a therapeutically effective amount of a compound having the following structural formula:



wherein R is alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

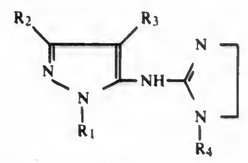
4,234,594

PYRAZOLYL AMINO IMIDAZOLINES AS ANTIHYPERTENSIVE AGENTS

Martin Winn, Deerfield; Carl W. Nordeen, Waukegan, and David L. Arendsen, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 7, 1979, Ser. No. 36,884
Int. Cl.[3] A61K *31/40, 31/47, 31/415, 31/435*
U.S. Cl. 424—273 P **9 Claims**

1. A method of treating hypertension in mammalian patients in need of such treatment which comprises administering to said patients a therapeutically effective amount of a compound of the formula



wherein R_1 and R_2 are hydrogen, loweralkyl, lowercycloalkyl, benzyl, phenyl or naphthyl, pyridyl, isoquinolyl or phthalazinyl, or phenyl or naphthyl substituted by one or more hydrogen, halo, loweralkyl, lowercycloalkyl, haloloweralkyl, aminosulfonyl, nitro, hydroxy, alkoxy, carboxy, alkoxycarbonyl, cycloalkoxy carbonyl, aminocarbonyl, diloweralkylaminocarbonyl or

wherein n is 4 or 5

R_3 is hydrogen, halogen, loweralkyl, phenyl or naphthyl, and

R_4 is hydrogen, acetyl, amino or loweralkyl, or the pharmaceutically acceptable acid addition salts thereof.

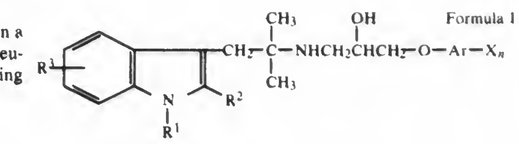
4,234,595

3-INDOLYL-TERTIARY BUTYLAMINOPROPANOLS

William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 815,138, Jul. 13, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,525
Int. Cl.[3] A61K *31/40*; C07D *209/12, 209/14*
U.S. Cl. 424—274 **106 Claims**

1. A compound having the formula



and the acid addition salts thereof wherein one of

R^1 and R^2 is hydrogen and the other is hydrogen or alkyl having 1 to 4 carbon atoms,

R^3 is H, halogen, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms and is located in the 4-, 5-, 6-, or 7- positions of the indole ring,

Ar is selected from the group consisting of phenyl and naphthyl,

X refers to 1 or 2 optional sterically compatible Ar-attached substituents which are independently selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkoxyalkyl, alkanoyl, alkenoyl, alkanoyloxy, alkenoyloxy, alkylsulfonyl, alkylsulfinyl, alkylthio, alkanoylamino, alkenoylamino, alkoxycarbonyl, alkenoxycarbonyl, alkoxycarbonylamino, alkoxycarbonylaminoalkyl, cycloalkyl having 3 to 6 ring members and 1 to 3 optional alkyl substituents, cycloalkenyl having 4 to 6 ring members and up to 3 optional alkyl substituents, cycloalkylalkyl having 3 to 6 ring members and up to 3 optional alkyl substituents, cycloalkenylalkyl having 4 to 6 ring members and up to 3 optional alkyl substituents with the additional proviso that each of the foregoing Ar-attached substituents has up to 8 carbon atoms, trifluoromethyl, nitro, amino, hydroxyl, halogen, aminocarbonyl, cyano, cyanoalkyl having from 2 to 4 carbon atoms, aminocarbonylalkyl having 2 to 4 carbon atoms,

n is the integer 0, 1, or 2 signifying the number of X groups, or

Ar-X_n as a unit refers to 4-indenyl, 6,7-dihydroxy-5,6,7,8-tetrahydro-1-napthyl, or 5-oxo-5,6,7,8-tetrahydro-1-naphthyl.

98. The method of inhibiting β-adrenergic activity in a mammalian host having a condition in which therapeutic benefit is derived from inhibition of the β-adrenergic receptors which comprises administering to said host a non-toxic effective adrenergic β-receptor inhibiting dose of a compound as claimed in claim 1.

99. The method of exerting a vasodilating effect in a mammalian host which comprises administering to a mammal having a condition in which therapeutic benefit is derived from vasodilatation, a non-toxic effective vasodilating dose of a compound as claimed in claim 1.

100. The antihypertensive method which comprises administering to a mammalian host having hypertension a non-toxic antihypertensive effective dose of a compound claimed in claim 1.

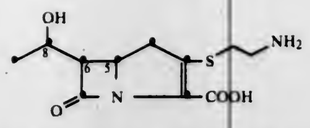
4,234,596

3-(2-AMINOETHYLTHIO)-6-(1-HYDROXYETHYL)-7-OXO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID

Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 833,210, Sep. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,365, Nov. 19, 1976, abandoned, and Ser. No. 792,071, Apr. 28, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,680
Int. Cl.[2] C07D *487/04*; A61K *31/40*
U.S. Cl. 424—274 **12 Claims**

1. A compound having the structural formula:



which has the absolute configuration 5S,6S,8R and the pharmaceutically acceptable salts thereof.

7. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,234,597

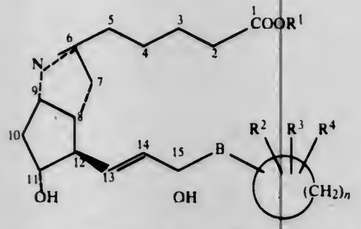
6,9-NITRILO(IMINO)-PROSTAGLANDIN ANALOGUES

Masaki Hayashi, Takatsuki; Shuichi Ohuchida, Kyoto, and Yoshinobu Arai, Toyonaka, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan

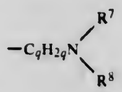
Filed Mar. 14, 1979, Ser. No. 20,339
Claims priority, application Japan, Mar. 18, 1978, 53-030531
Int. Cl.³ A61K *31/40*; C07D *209/52*
U.S. Cl. 424—274 **20 Claims**

1. A prostaglandin I_2 analogue of the formula:

II



wherein R^1 represents a hydrogen atom, a straight- or branched-chain alkyl group of from 1 to 12 carbon atoms, a carbocyclic aralkyl group of from 7 to 12 carbon atoms, a cycloalkyl group of from 4 to 7 carbon atoms unsubstituted or substituted by at least one straight- or branched-chain alkyl group of from 1 to 4 carbon atoms, a phenyl group unsubstituted or substituted by chlorine, trifluoromethyl, straight- or branched-chain alkyl of from 1 to 4 carbon atoms, or phenyl, or represents a group $-C_pH_{2p}COOR^5$, $-C_qH_{2q}OR^6$ or



wherein R^5, R^7 and R^8, which may be the same or different, each represent a straight- or branched-chain alkyl group of from 1 to 4 carbon atoms, R^6 represents a hydrogen atom or a straight- or branched-chain alkyl group of from 1 to 4 carbon atoms, p represent an integer of from 1 to 12, and q represents an integer of from 2 to 12, R^2, R^3 and R^4, which may be the same or different, each represent a hydrogen atom or a straight- or branched-chain alkyl group of from 1 to 8 carbon atoms, B represents a single bond, or a straight- or branched-chain alkylene group of from 1 to 4 carbon atoms, n represents 3, 4, 5 or 6, the symbol == attached to the C_6 carbon atom represents a single or double bond, the double bond between C_{13}–C_{14} is trans, and the hydroxy groups attached to the C_{11} to C_{15} carbon atoms of formula II are in α-configuration, and non-toxic acid addition salts thereof and, when R^1 represents a hydrogen atom, non-toxic salts thereof.

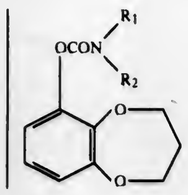
4,234,598

PHENYLCARBAMATES

Madhukar S. Chodnekar, Seltisberg; Peter Loeliger, Münchenstein; Ulrich Schwieter, Reinach; Albert Pfiffner, BUMLu/lach; Milos Suchy, Pfaffhausen, and Rene Zurflüh, Bülach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

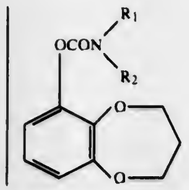
Continuation of Ser. No. 816,826, Jul. 18, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,088
Int. Cl.³ A01N *43/24*; C07D *319/08*
U.S. Cl. 424—278 **18 Claims**

1. A compound represented by the formula



wherein R_1 is lower alkyl, lower alkenyl, lower alkynyl, lower alkylcarbonyl, halogen-lower alkylcarbonyl or trichloromethylsulfenyl and R_2 is hydrogen or lower alkyl.

8. A pesticidal composition which comprises inert carrier material and, as the active ingredient, an amount, which is effective as a pesticide, of a compound of the formula



wherein R_1 is lower alkyl, lower alkenyl, lower alkynyl, lower alkylcarbonyl, halogen-lower alkylcarbonyl or trichloromethylsulfenyl and R_2 is hydrogen or lower alkyl and mixtures of these compounds.

15. A method for the control of pests which comprises applying, to the site to be treated, an amount of the pesticidal composition of claim 8 which is effective in the control of pests.

4,234,599

TREATMENT OF SKIN KERATOSES WITH α-HYDROXY ACIDS AND RELATED COMPOUNDS

Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046, and Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002

Filed Oct. 4, 1978, Ser. No. 948,489
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.³ A61K *31/335, 31/16*
U.S. Cl. 424—279 **25 Claims**

1. A method for alleviating the symptoms of actinic or nonactinic skin keratoses comprising topically applying to involved areas of the body an effective amount of a composition comprising:

a therapeutically effective amount of a member selected from the group consisting of α-hydroxybutyric acid, α-hydroxyisobutyric acid, α-hydroxyisocaproic acid, α-hydroxyisovaleric acid, atrolactic acid, β-hydroxybutyric acid, β-phenyl lactic acid, β-phenylpyruvic acid, citric acid, ethyl pyruvate, galacturonic acid, glucoheptonic acid, glucoheptono 1,4-lactone, gluconic acid, gluconolactone, glucuronic acid, glucuronolactone, glycolic acid, isopropyl pyruvate, mandelic acid, methyl pyruvate, mucic acid, pyruvic acid, saccharic acid, saccharic acid 1,4-lactone, tartaric acid and tartronic acid in a pharmaceutically acceptable vehicle.

2. The method of claim 1 wherein said composition further comprises a base selected from the group consisting of ammonium hydroxide, an organic primary, secondary, tertiary or quaternary alkylamine, alkanolamine, diamine, dialkylamine, dialkanolamine, alkylalkanolamine, trialkylamine, trialkanol amine, dialkyl alkanolamine, or alkyl dialkanolamine wherein the alkyl or alkanol substituent has from 1 to 8 carbon atoms present in an amount effective to establish a pH of said composition of between 3.0 and 7.5.

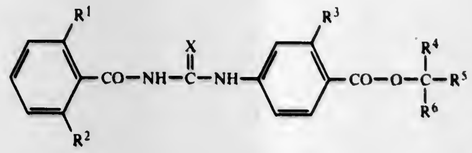
4,234,600

COMBATING ARTHROPODS WITH N-BENZOYL-N'-TERT.-ALKOXYCARBONYLPHENYL-(THIO) UREAS

Wilhelm Sirrenberg, Sprockhoevel; Ingeborg Hammann, Cologne; Wilhelm Stendel, Wuppertal, . ad Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 77,435
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1978, 2843851
Int. Cl.³ A61K *31/245*; C07C *101/42*
U.S. Cl. 424—310 **10 Claims**

1. An N-benzoyl-N'-tert.-alkoxycarbonylphenyl(thio) urea of the formula



in which

R^1 represents halogen or alkyl,

R^2 and R^3 independently of one another represent hydrogen or halogen,

R^4 represents alkyl,

R^5 and R^6 either individually represent alkyl or together represent α,ω-alkanediyl and

X represents oxygen or sulphur.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,234,601

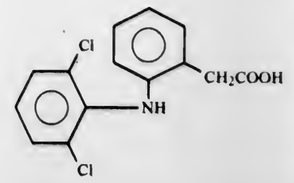
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,513
Int. Cl.² A61K *31/19, 31/165, 31/195*
U.S. Cl. 424—319 **9 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 0.08 to 0.47 mg/kg of body weight of a 2-[(2,6-dichlorophenyl-)amino]benzeneacetic acid compound, said compound selected from (a) 2-[(2,6-dichlorophenyl)amino]benzeneacetic acid having the formula



and (b) the non-toxic therapeutically acceptable salts thereof; and

(2) as potentiating agent, from about 1.8 to 7.5 mg/kg of body weight of acetaminophen.

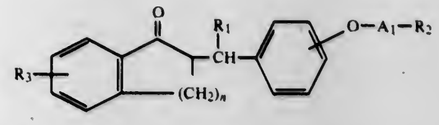
4,234,602

NAPHTHALENONE DERIVATIVES AND ANALOGS

John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 873,644, Jan. 30, 1978, Pat. No. 4,179,558. This application Jul. 16, 1979, Ser. No. 57,914
Int. Cl.³ A61K *31/40, 31/135, 31/205, 31/445*
U.S. Cl. 424—330 **10 Claims**

1. A method of treating inflammation in a mammalian species which comprises administering to a mammal in need thereof an effective amount of a compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, phenyl or phenyl substituted with a halogen, alkyl, alkoxy or trifluoromethyl group; R_2 is alkylamino, dialkylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl, 4-alkyl-1-piperidinyl or 4-(2-hydroxyethyl)-1-piperidinyl; R_3 is hydrogen, halogen, alkyl, alkoxy or trifluoromethyl; A_1 is a straight or a branched chain alkylene group having 2 to 5 carbon atoms; and n is 1, 2 or 3; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

4,234,603

SKIN-TREATING COMPOSITION AND VEHICLE FOR SKIN-TREATING AGENTS

Gunnar P. E. Swanbeck, Vaxholm, Sweden, assignor to Medisan AB, Upsala, Sweden

Continuation of Ser. No. 712,066, Aug. 5, 1976, which is a continuation of Ser. No. 571,746, Apr. 25, 1975, abandoned, which is a continuation of Ser. No. 322,197, Jan. 9, 1973, abandoned. This application Feb. 28, 1978, Ser. No. 882,810
Claims priority, application United Kingdom, Jan. 10, 1972, 1073/72
Int. Cl.² A61K *7/48, 47/00*
U.S. Cl. 424—365 **9 Claims**

1. A composition for softening dry or rough skin which is capable of water retention by the corneous layer of the skin in contact therewith consisting essentially of:

(a) an aqueous solution of urea and a physiologically compatible salt selected from the group consisting of NaCl, $Na_2S_2O_3$, Na_2HPO_4, NaH_2PO_4 and $MgCl_2$, said solution having a pH of 2–8, the concentration of said urea and salt being 10–40% by weight of the aqueous solution, the weight ratio of urea to salt being within the range from 5:1 to 1:5, the rest being water and

(b) a dispersed liquid phase in an amount of from 5 to 50% by weight of the composition, said lipid phase consisting

essentially of an emulsifier selected from the group consisting of monolauric acid monoglyceride and monomyristic acid monoglyceride.

4,234,604

FEED INTAKE LIMITING FAT FOR RUMINANTS

Norman L. Betz, St. Louis, Mo.; Kent J. Lanter, Belleville, Ill., and Danny L. Williams, Manchester, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Dec. 18, 1978, Ser. No. 970,020
Int. Cl.³ A23K *1/00*
U.S. Cl. 426—2 **25 Claims**

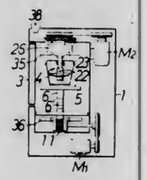
1. A feed intake limiting composition for ruminants to control consumption of a feed supplement when added thereto comprising a material selected from the group consisting of meat meal, diammonium phosphate, ammonium sulfate, and combinations thereof and an intake limiting ingredient comprising a chlorinated fat having a reacted chlorine content of between about 0.2 and 3.7% by weight of said fat.

4,234,605

METHOD OF MAKING BREAD IN AN OVEN USING A COMBINED TROUGH AND BAKING-PAN UNIT

Shigeo Takeuchi, 2-banchi, Kiba-cho, Minato-ku, Nagoya-shi, Aichi-ken, Japan

Filed Aug. 9, 1978, Ser. No. 933,116
Claims priority, application Japan, Aug. 19, 1977, 52-99833
Int. Cl.³ A21C *1/02, 1/04*
U.S. Cl. 426—18 **1 Claim**



1. A method of making bread comprising the sequential steps of:

(a) throwing flour and other bread ingredients into a removably mounted combined trough and baking-pan unit in an oven while feeding water to a water tank in said oven;
(b) heating the water within said water tank to substantially the same temperature as that of the oven interior;
(c) adding the heated water to said flour and other bread ingredients in said combined trough and baking-pan unit;
(d) mechanically agitating and kneading the mixture of said flour, other bread ingredients and water in said combined trough and baking-pan unit to form dough while keeping said combined trough and baking-pan unit within said oven;
(e) primarily fermenting the dough in said combined trough and baking-pan unit;
(f) mechanically degassing the dough in said combined trough and baking-pan unit;
(g) secondarily fermenting the dough in said combined trough and baking-pan unit; and
(h) baking the dough in said combined trough and baking-pan unit in said oven into a loaf of bread;

wherein all of the steps (b) to (h) are carried out in situ continuously and mechanically under atmospheric pressure in one and the same combined trough and baking-pan unit without removing it out of said oven.

4,234,606

FLUID SHORTENING

Ilija Gawrilow, Strongsville, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 747,296, Dec. 3, 1976. This application Aug. 3, 1978, Ser. No. 930,746
Int. Cl.³ A21D *2/16*; A23D *5/02*
U.S. Cl. 426—24 **11 Claims**

1. In a process for making yeast-raised bakery produces containing shortening, the improvement comprising adding to such products a fluid shortening prepared by the process comprising:

heating a mixture of soft or hard mono- and diglycerides, ethoxylated fatty acid ester emulsifier, solid beta-phase crystalline food emulsifier, and liquid vegetable oil to form a liquefied molten mixture, said mixture comprising by weight about 4 to about 10 weight parts of said soft or hard mono- and diglyceride, about 2 to about 8 weight parts of said ethoxylated fatty acid ester emulsifier, about 2 to about 8 weight parts of said solid beta-phase crystalline food emulsifier, and about 0 to about 3 weight parts solid stearine, the remainder being at least about 40 parts of said liquid vegetable oil;

said ethoxylated fatty acid ester emulsifier being an ethoxylated fatty acid ester of glycerol, polyglycerols propylene glycol, hexitol, hexitan and isohexide, or a fatty acid ester of ethoxylated glycerol, hexitol, hexitan and isohexide;

rapidly cooling said molten mixture to a temperature within the range of about 80° to 90° F. to initiate beta-crystal formation and produce a chilled blend having dispersed fat crystals;

working said chilled blend within said temperature range to further develop beta-crystal formation and produce a substantially uniform dispersion containing beta-fat crystals in equilibrium with said liquid vegetable oil; and

fluidizing said uniform dispersion still within said temperature range for a time sufficient to complete the beta-crystal formation and produce a stabilized fluid shortening.

4,234,607

PROCESS FOR PRODUCING CURED MEAT PRODUCTS

Shigenori Ohta, Komae, and Kenji Watanabe, Hino, both of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1979, Ser. No. 53,161
Claims priority, application Japan, Jun. 30, 1978, 53/78698
Int. Cl.³ A23B *4/12*; A23L *1/272*
U.S. Cl. 426—56 **9 Claims**

1. A process for producing cured meat products, which process comprises treating a raw meat with a curing agent containing NO_2, and at least one member selected from ascorbic acid and alkali metal salts thereof in the presence of ascorbinase.

4,234,608

PROCESS OF MANUFACTURING FEED BLOCKS AND PRODUCTS THEREOF

Kevin L. Linehan, East Burwood, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Oct. 16, 1978, Ser. No. 951,954
Claims priority, application Australia, Nov. 1, 1977, 2259/77
Int. Cl.³ A23K *1/16, 1/175, 1/20*
U.S. Cl. 426—72 **25 Claims**

1. A process for the manufacture of a rigid alkaline, animal feed supplement block which process comprises the following steps in sequence:

(1) heating a water bearing medium chosen from the group consisting of water, aqueous whey, aqueous sorbitol, aqueous glucose, aqueous fructose, aqueous sucrose and molasses to a temperature in the range from 20° C. to 90° C.

(2) adding to said water bearing medium an amount of active magnesium oxide in the range from 5% to 30% by weight of the total block ingredients and an amount of dicalcium phosphate in the range from 3 to 50% by weight of the total block ingredients and blending the mixture of the water bearing medium, magnesium oxide and dicalcium phosphate at a temperture not in excess of 90° C. for a sufficient length of time to obtain a substantially uniform reaction mixture;

(3) optionally blending into the mixture additional water or one or more liquid or solid animal medicaments or animal nutrients;

(4) transferring said reaction mixture to a mould; and

(5) reacting said mixture in the mould at a temperature in the range from 45° C. to 110° C. to give a substantially rigid alkaline block.

4,234,609

METHOD OF FORMING FOOD PRODUCT FROM MOLLUSKS AND PRODUCT THEREOF

Philip A. Witte, West Alton, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 840,925, Oct. 11, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,618
Int. Cl.³ A23L *1/333*
U.S. Cl. 426—104 **17 Claims**

11. A method of making an imitation mollusk meat product comprising:

a. parboiling mollusk meat;
b. mixing said parboiled meat with from 5 to 80% by weight isolated soy protein fibers buffered to about neutral pH;
c. forming said mixture; and cooking said formed mixture to an internal temperature of between about 150° F. and 220° F.

4,234,610

METHOD OF REMOVING OFFENSIVE ODOR FROM THE MEAT OF SHARKS

Ichiro Ema, 6-6, Nipponbashi higashi 3-chome, Naniwa-ku, Osaka-shi, Osaka-fu, Japan

Filed Jun. 4, 1979, Ser. No. 45,263
Claims priority, application Japan, May 11, 1979, 54-59461
Int. Cl.³ A23L *3/26*
U.S. Cl. 426—248 **9 Claims**

1. A method of removing offensive odor from the meat of sharks, comprising the steps of cutting the meat of a shark into slices, wrapping each of the slices in a wrapping film, immersing said slices in a saline solution, allowing them to stand at temperatures, low enough to preserve the shark meat from decay, for several hours under exposure to scattered light produced by permitting light from an electric light source to pass through a synthetic resin sheet, discarding said saline solution, further allowing said slices to stand at a low temperature of about 5°–10° C. for at least 8 hours under exposure to said scattered light, removing said wrapping film from said slices, and washing said slices in clear water.

4,234,611

SOFT INTERMEDIATE-MOISTURE FROZEN PUDDINGS AND FILLINGS

Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Division of Ser. No. 917,379, Jun. 20, 1978, which is a division of Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,145,863, which is a division of Ser. No. 763,613, Jan. 28, 1977, Pat. No. 4,146,652. This application Mar. 26, 1979, Ser. No. 24,128
Int. Cl.³ A23L *1/187, 1/04*
U.S. Cl. 426—321 **21 Claims**

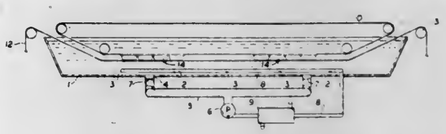
1. A microbiologically stable pudding or filling product comprising about from 25 to 55% water, sugar in a ratio to water of about from 2–0.8:1, about from 3 to 25% fat, and minor but effective amounts of gelling agent, emulsifier, stabilizer and flavoring, provided that the amount of fat is less than the amount of water, the solutes content is adequate to provide the product with a water activity of about from 0.8 to 0.9, and in said sugar the amount of dextrose plus fructose is at least about 50% based on the total sugar content, and wherein the foregoing ingredients are adapted to provide a product which is substantially non-crystalline at about 10° F.

4,234,612

CONTINUOUS FRYING METHOD

Sakuichi Sakakibara, No. 1-8, 2-chome, Uozaki-kita-machi, Higashinada-ku, Kobe-shi, Hyogoken; Ko Sugisawa, No. 8-15, 2-chome, Chiyogaoka, Nara-shi, Nara-ken; Junji Majima, No. 12-21, Kita-Showa-cho, Nishinomiya-shi, Hyogo-ken, and Ryusuke Nakanaga, No. 7-22, Fujinosato-cho, Takatsuki-shi, Osaka-fu, all of Japan

Division of Ser. No. 844,585, Oct. 25, 1977, which is a continuation of Ser. No. 681,437, Apr. 29, 1976, abandoned. This application Nov. 24, 1978, Ser. No. 963,274
Int. Cl.³ A23L *1/16*
U.S. Cl. 426—394 **5 Claims**



1. A method using oil for drying water-bearing food consisting of noodles in strip form comprising the steps of: packing said food in open containers having perforated bottoms, the perforations in the bottoms of said containers being of a size sufficiently small so as to prevent said food from being displaced out of said containers and sufficiently large so as to enable oil to pass therethrough; providing a bath of said oil; sequentially conveying said packed containers through said oil bath in a predetermined path; applying over said containers a removable cover having perforations of about the same size as said container bottoms before conveying said containers through said bath; directing oil against said conveyed containers within said oil bath under a pressure sufficient to cause oil to enter said containers through said perforations and sufficient to urge apart parts of said food in said containers thereby to induce substantially all the surfaces of said food parts to be exposed to said oil; maintaining the temperature of the oil entering said containers at a level at least sufficient to convert water in said food to steam; maintaining contact between said food in said containers and said oil for a period sufficient to at least partly dehydrate said food; and separating the at least partly dehydrated food from said oil.

4,234,613

ROBUSTA COFFEE

Neal A. Lewis, Mason, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 30, 1976, Ser. No. 755,924
Int. Cl.³ A23F *5/16*
U.S. Cl. 426—430 **16 Claims**

1. A process for preparing an improved, substantially non-decaffeinated Robusta coffee comprising:

(1) contacting roast and ground Robusta coffee beans with a low molecular weight alcohol having from 1 to 3 carbon atoms, the weight ratio of beans:alcohol being in the range of from about 2:1 to about 1:5, for from about 1 minute to about 20 minutes; and

(2) removing the alcohol from contact with said coffee.

4,234,614

METHOD OF PROCESSING CORN

Edwin R. Hart, Allen, Tex., assignor to Seven-H Corporation, Richardson, Tex.

Division of Ser. No. 729,376, Oct. 4, 1976, Pat. No. 4,126,707.
This application Nov. 20, 1978, Ser. No. 962,464
The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.
Int. Cl.³ A23L *1/10, 1/20*
U.S. Cl. 426—462 7 Claims



1. A method of processing corn to make masa comprising the steps of:
mixing water with the corn to form a slurry;
pumping the slurry successively through a plurality of pump stages, each stage having a turbine pump and a turbine pump impeller, in each turbine pump, raised to provide sufficient clearance so that the pump will pass the corn as a whole kernel and separate the husks from the kernels without cracking a substantial percentage of the kernels;
removing the water from the slurry;
surface drying the corn;
aspirating the corn to remove the husks from the kernels and;
cooking the aspirated kernels.

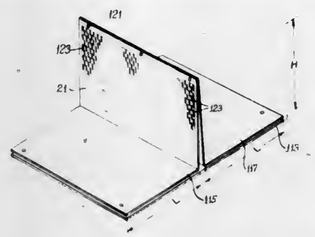
4,234,615

METHOD FOR MAKING LARGE SIZED BLOCKS OF CHEESE

Grant E. Krueger, Green Bay, Wis., assignor to Kraft, Inc., Glenview, Ill.

Continuation of Ser. No. 705,104, Jul. 14, 1976, abandoned, which is a continuation of Ser. No. 388,101, Aug. 13, 1973, Pat. No. 3,969,952. This application Aug. 1, 1978, Ser. No. 930,055
The portion of the term of this patent subsequent to Jul. 20, 1993, has been disclaimed.
Int. Cl.³ A23C *19/02*
U.S. Cl. 426—478 9 Claims

1. In a method for manufacturing a block of cheese of uniform texture and moisture distribution from curd in particulate form comprising the steps of filling the curd into a container, locating a perforated, V-shaped blade wholly in the curd, said V-shaped blade having two side walls diverging from the apex of the blade, opening the curd by means of the two diverging side walls of the blade, applying pressure to the curd while the blade is in the curd, draining the curd through the blade, and removing the blade to permit knitting of the curd to provide a cheese block of uniform texture and moisture, the improvement comprising: locating the apex of a V-shaped blade substantially along an axis of said container; providing at least 3 square inches of perforated area per linear inch of blade length; locating all of the perforated area of said V-shaped blade in the half of said blade closest to the apex thereof for whey drainage; and opening the curd by means of the two side walls of the



blade by a maximum distance of 4 inches and not less than a distance sufficient to accommodate the diverging side walls such that said walls are separated by a space only adequate to allow whey flow between said walls.

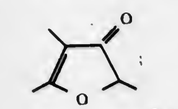
4,234,616

FLAVORING WITH MIXTURES OF 2,5-DIALKYL DIHYDROFURANONES AND 2,4,5-TRIALKYL DIHYDROFURANONES

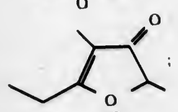
Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 928,606, Jul. 27, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,561
Int. Cl.³ A23L *1/226*
U.S. Cl. 426—536 2 Claims

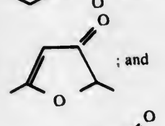
1. A process for augmenting or enhancing the taste or aroma of a caramel, butterscotch, rum, dairy,, vanilla or roasted almond-flavored foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of a mixture of dialkyl and trialkyl dihydrofuranones having the structures:



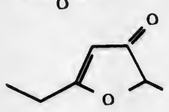
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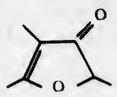
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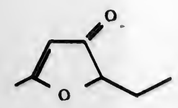
; and



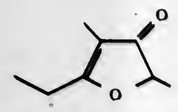
wherein the weight percentage ranges in said dihydrofuranones in said mixture is from about 10% up to about 40% by weight of the compound having the structure:



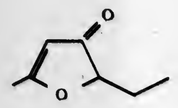
from about 5% up to about 20% of the compound having the structure:



from about 10% up to about 30% of the compound having the structure:



and from about 5% up to about 20% of the compound having the structure:



4,234,617

METHOD FOR PREPARING INSTANT COOKING NOODLES

Sakuichi Sakakibara, Kobe; Ko Sugisawa; Takashi Kimura, both of Nara; Teruo Yasukawa, Sakai, and Tamotsu Kamoda, Kishiwada, all of Japan, assignors to House Food Industrial Company, Limited, Osaka, Japan

Filed Apr. 13, 1979, Ser. No. 29,634
Claims priority, application Japan, May 23, 1977, 52 58719
Int. Cl.³ A23L *1/16*
U.S. Cl. 426—557 9 Claims

1. A method for preparing instant cooking noodles, comprising the steps of
(a) mixing a cereal flour with about 1% to 10%, by weight, based on the weight of the cereal flour, of a hydrolyzate of a starch derived from a root or stalk of a plant having a D.E. of 1 to 10 and water to produce a dough mixture,
(b) kneading the mixture to form a dough,
(c) rolling the dough into a sheet having a thickness of less that 2 millimeters.
(d) cutting the rolled sheet into strips,
(e) steaming the cut strips, and
(f) drying the steamed strips at a temperature of about 80° C. to 130° C.

4,234,618

LIPOIDAL COMPOSITIONS, HARD BUTTER COMPONENTS, AND IMPROVEMENT IN PROCESS FOR MAKING THE LATTER

James J. Jasko, and Richard J. Zielinski, both of Middleburg Heights, Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,639
Int. Cl.³ A23D *5/00*; C11C *3/12*; A23G *1/00*
U.S. Cl. 426—607 7 Claims

1. A composition comprising:
about 15–40 parts cocoa butter;
about 0–25 parts butterfat,
the sum of the parts of said cocoa butter and of said butterfat being not in excess of about 40; and
about 60–85 parts of confectioner's hard butter having the following characteristics;
at least about 96% C_{16-18} triglycerides with about 40–50% by weight of the total combined acids being unsaturated acids in the trans configuration, a substantial proportion of the remaining acids being also unsaturated and in the cis configuration,
an SFI profile of 78–85% at 50° F. and at 70° F., 70–80% at 80° F., 31–45% at 92° F., a maximum of 3% at 100° F., and zero at 110° F.; and
a Mettler Dropping Point between about 36° and about 39° C.

4,234,619

DECHOLESTEROLIZED AND DEFATTED EGG POWDER AND METHOD FOR PRODUCING SAME

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo; Koji Yoshida, and Yutaka Wakiyama, both of Kamikohashi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1978, Ser. No. 957,594
Claims priority, application Japan, Nov. 16, 1977, 52/136678
Int. Cl.³ A23L *1/28, 1/32*
U.S. Cl. 426—614 4 Claims

2. A method for producing decholesterolized and defatted egg powder which comprises removing moisture from whole egg or yolk to obtain a moisture content of up to 25% by weight contacting the resulting whole egg or yolk with liquid dimethyl ether to remove 95% or more of the cholesterol and 95% or more of the neutral fat therefrom and to retain 30% or more of the phospholipids, and removing the dimethyl ether.

4,234,620

WATER-SOLUBLE VEGETABLE PROTEIN AGGREGATES

Paulette A. Howard; Michael F. Campbell, and David T. Zollinger, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Dec. 26, 1978, Ser. No. 973,195
Int. Cl.³ A23J *3/00*
U.S. Cl. 426—656 25 Claims

1. A process for improving the water-solubility of a vegetable protein product, said process comprising the steps of:
(A) supplying an aqueous vegetable seed feedstream to a homogenizer with said feed stream containing on a dry solids basis at least 30% by weight vegetable seed protein and a sufficient amount of base to maintain the feed stream within said homogenizer at a pH between about 6.5 to 9.0;
(B) increasing the water-solubility of the vegetable seed protein by subjecting the aqueous feed stream in the homogenizer to successive pressure and cavitation cycling at a temperature between about 50° C. to about 150° C.; and
(C) recovering the vegetable protein product having an improved water-solubility therefrom.

4,234,621

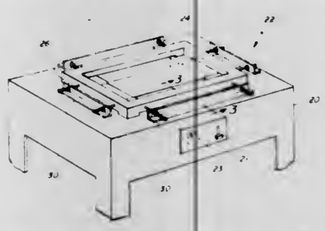
MEANS AND METHOD OF RESTORING DOCUMENTS, PAINTINGS AND THE LIKE

Robert E. Fieux, 263 Cedar St., West Barnstable, Mass. 02668

Division of Ser. No. 856,772, Dec. 2, 1977, Pat. No. 4,156,399.
This application Jan. 8, 1979, Ser. No. 1,481
Int. Cl.³ B05D *1/02*; B32B *35/00*
U.S. Cl. 427—13 8 Claims

1. A method of restoring paintings, documents and the like comprising the steps of;
providing a strainer means,

securing the painting in the strainer means,
heating the painting so as to make the painting more supple,



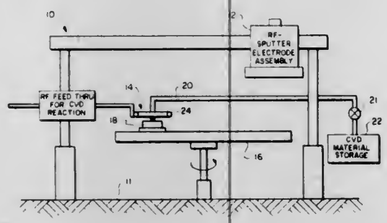
and applying lateral tension by operation of the strainer means in the plane of the painting to correct surface irregularities.

4,234,622

VACUUM DEPOSITION METHOD

Stanley DuBuske, Lincroft; Willis M. Smith, Fair Haven; Edward Daly, Keyport, all of N.J.; Albert F. Newman, Sun City, Ariz.; Louis E. Branovich, Howell, and Adolph G. Hager, Pt. Pleasant, both of N.J., assignors to The United States of American as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 11, 1979, Ser. No. 28,935
Int. Cl.³ B05D 3/06
U.S. Cl. 427—45.1 **18 Claims**



1. Method of vacuum depositing more than one metallic coating onto a substrate using different film deposition methods in a single vacuum deposition chamber without breaking vacuum between depositions, said method including the steps of:

(a) providing a vacuum deposition chamber with an RF sputter electrode, a chemical vapor deposition assembly spaced from said sputter electrode, and a substrate that can be rotated from beneath the RF sputter electrode to beneath the chemical vapor deposition assembly, wherein said chemical vapor deposition assembly includes a delivery tube for delivering material for chemical vapor deposition to the substrate, a source of material for said chemical vapor deposition located externally to said vacuum deposition chamber and connecting with an end of said delivery tube, and an RF coil positioned around the other end of the delivery tube to heat the substrate to the chemical vapor deposition reaction temperature,

(b) cleaning and degassing the substrate under vacuum in the deposition chamber,

(c) positioning the substrate below the RF sputter electrode, backfilling the chamber with argon, and then sputter depositing a primary metal coating onto the substrate, and

(d) rotating the coated substrate to beneath the chemical vapor deposition assembly, vacuum pumping the chamber to 10^{-7} torr, delivering the material to be chemically vapor deposited to the substrate surface, and heating the substrate to the temperature required for the chemical vapor deposition reaction to take place.

4,234,623

METHOD FOR THE PRODUCTION OF MEMBRANE BATTERY SEPARATORS

Rafail V. Moshtev; Hrisanta N. Budevska; Latinka T. Ivanova, and Radka D. Yankova, all of Sofia, Bulgaria, assignors to ZLEHIT pri BAN, Sofia, Bulgaria

Filed Aug. 30, 1978, Ser. No. 937,998
Int. Cl.³ B05D 3/06; H01M 2/16
U.S. Cl. 427—54.1 **9 Claims**

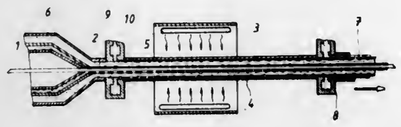
1. In a method for the production of a battery separator film made of a polyolefin film which has been irradiated by ultraviolet rays to which a vinyl monomer has been grafted, the improvement which includes the accomplishment of the grafting in a five-layer sandwich comprising forming a three-layer sandwich made up of the polyolefin film and a cellulose tissue on each side of the polyolefin film, the tissue layers being impregnated with the monomer or its solution, the three-layer sandwich being pressed on each side by a polymer foil which confines the reaction space, said polymer foil being inert, contacting the resulting five-layer sandwich for 10 to 45 minutes against a heater with a pressure of 10 to 30 g/cm², the layers of the five-layer sandwhich being of unlimited length, the five-layer sandwich being transported over the surface of the heater at a speed of from 1-100 m/hour.

4,234,624

METHOD OF APPLYING AN INSULATION OF CROSS-LINKED POLYMER ON A CABLE CONDUCTOR

Gustaf Linderoth, Bromma, and Karl-Gunnar Wiberg, Stockholm, both of Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Mar. 1, 1979, Ser. No. 16,505
Claims priority, application Sweden, Mar. 7, 1978, 7802547
Int. Cl.³ B05D 3/06
U.S. Cl. 427—55 **6 Claims**



1. In a method of applying an insulation of cross-linked polymer onto a cable conductor in which a cross-linkable polymer is extruded around the cable conductor and thereafter cross-linked by the simultaneous application of heat and pressure in a vulcanization tube, the improvements of heating the cross-linkable polymer by use of radiation energy having at least its main portion with wavelengths of between 0.76 and 4 microns, locating the radiation energy generating means outside of the vulcanization tube, and utilizing a vulcanization tube which is pervious to the said radiation energy so as to allow its passage therethrough.

4,234,625

PROCESS FOR PRODUCING MATERIAL SENSITIVE TO ELECTROMAGNETIC AND CORPUSCULAR RADIATION

Vyacheslav V. Petrov, prospekt Vernadskogo, 85, kv. 55, and Andrei A. Krjuchin, ulitsa Studencheskaya, 12/14, kv. 43, both of Kiev, U.S.S.R.

Filed Jan. 19, 1978, Ser. No. 870,835
Int. Cl.² G03C 5/00
U.S. Cl. 427—74 **4 Claims**

1. A process of producing a material sensitive to electromagnetic and corpuscular radiation comprising the following steps: depositing, onto a transparent substrate, a layer of a semiconductive material; depositing, unto said layer of the semiconductive material, a barrier layer inert to the layer of the semiconductive material; depositing, unto said barrier layer, a layer of a metal capable of chemically reacting with said semiconductive layer under the effect of said electromagnetic and corpuscular radiation with formation of reaction products having physical and chemical properties different from those of said metal layer and semiconductive layer; annealing of the resulting laminated structure at a temperature at least equal to



the temperature of diffusion of the material of said barrier layer into the material of at least one of said layers adjacent thereto, said annealing step being conducted for a period of time sufficient for at least partial dissolution of said barrier layer and prior to the exposure of the material to radiation.

4,234,626

PRODUCING PRINTED CIRCUITS BY CONJOINING METAL POWDER IMAGES

Robert W. Peiffer, Jackson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1978, Ser. No. 874,353
Int. Cl.³ H01K 1/00
U.S. Cl. 427—97 **24 Claims**

1. In a process for producing a printed circuit containing an electrically conductive circuit trace from an electrically insulating material having adherent and non-adherent surface areas which comprises applying finely divided ductile metal or alloy particles to the surface areas; removing any excess metal or alloy particles from the non-adherent areas; the improvement comprising applying limited shear or pressure to the adherent ductile metal particles by which the particles are conjoined without damaging the metallized areas to form an electrically conductive circuit.

4,234,627

FABRIC CONDITIONING COMPOSITIONS

Kenneth J. Schilling, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 636,382, Nov. 28, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,510
Int. Cl.² B05D 3/12; D06M 13/16
U.S. Cl. 427—242 **13 Claims**

1. A granular laundry presoaking/washing composition comprising:

(A) from about 3% to 20% by weight of a granular fabric treatment mixture, the granules within said mixture comprising

(i) water-insoluble, friable microcapsules varying in size from about 5 to 500 microns, each microcapsule consisting essentially of

(a) a liquid core containing fabric conditioning agent; and

(b) a solid thin polymeric shell completely surrounding said core; said shell having an average thickness ranging between about 0.1 and 50 microns; and

(ii) a substantially water-insoluble, fabric substantive capsule transfer agent having a melting point between about 40° C. and 150° C.; said capsule transfer agent surrounding each microcapsule;

the weight ratio of microcapsules to capsule transfer agent within each granule of the fabric treatment mixture between about 0.002:1 and 2000:1; and

(B) from about 5% to 90% by weight of a presoaking/washing adjuvant selected from the group consisting of water-soluble detersive surfactants, detergency builders and mixtures of water-soluble detersive surfactants and detergency builders.

10. A process for conditioning fabrics comprising the steps of:

(A) contacting said fabrics in an aqueous bath with an effective amount of a composition comprising:

1. from about 3% to 20% by weight of a granular fabric treatment mixture, the granules within said mixture comprising

(i) water-insoluble; friable microcapsules varying in size from about 5 to 500 microns, each microcapsule consisting essentially of

(a) a liquid core containing fabric conditioning agent; and

(b) a solid thin polymeric shell completely surrounding said core; said shell having an average thickness ranging between about 0.1 and 50 microns; and

(ii) a substantially water-insoluble, fabric substantive capsule transfer agent having a melting point between about 40° C. and 150° C.; said capsule transfer agent surrounding each microcapsule;

the weight ratio of microcapsules to capsule transfer agent within each granule of the fabric treatment mixture ranging between about 0.002:1 and 2000:1; and

2. from about 5% to 90% by weight of a presoaking-/washing adjuvant selected from the group consisting of water-soluble detersive surfactants, detergency builders and mixtures of water-soluble detersive surfactants and detergency builders; and

(B) manipulating said fabrics in an automatic clothes dryer at a temperature of from about 38° C. to about 100° C.

4,234,628

TWO-STEP PREPLATE SYSTEM FOR POLYMERIC SURFACES

Arthur H. DuRose, Pinellas Park, Fla., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 687,261, May 14, 1976. This application Nov. 28, 1978, Ser. No. 964,306
Int. Cl.² B05D 3/04; C23C 3/02
U.S. Cl. 427—305 **8 Claims**

1. A process of preparing a non-metallic surface for the electroless deposition of a metallic layer of copper, nickel or gold comprising the steps of

(a) contacting the surface with a copper compound available from a bath selected from the group consisting of

(1) a solution of a simple cupric compound;

(2) a basic cupric hydrate suspension or colloid prepared by adding an alkali to the solution of (1);

(3) a clear cuprate solution; and

(4) a complex solution of copper containing a suitable complexing agent;

(b) thereafter contacting the surface with an accelerator selected from the group consisting of

(1) a nickel salt; and

(2) a cobalt salt

available as a simple solution, suspension or a complex solution;

(c) rinsing the surface; and

(d) contacting the surface with a reducing agent selected from the group consisting of a borohydride, hydrazine and a borane.

4,234,629

METHOD FOR IMPROVING THE REMOVAL OF OIL FROM SURFACES

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 796,271, May 12, 1977, Pat. No. 4,160,063, which is a division of Ser. No. 614,093, Sep. 17, 1975, Pat. No. 4,039,717, which is a division of Ser. No. 416,712, Nov. 16, 1973, now Re. 28,257. This application Apr. 2, 1979, Ser. No. 26,627

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—388.2 **34 Claims**

1. A method for facilitating the removal of residual oil from contacting surfaces comprising coating the surfaces with a film of polyacrylamide cross-linked in the presence of water with a salt of a polyvalent metal, contacting the surfaces with oil, and removing the oil from the surfaces.

18. A method for facilitating the removal of residual oil from contacting surfaces comprising coating the surfaces with a film of carboxymethylcellulose cross-linked in the presence of water with a salt of a polyvalent metal, contacting the surfaces with oil, and removing the oil from the surfaces.

4,234,630

PROCESS FOR THE PROTECTION OF CARBON BODIES

Josef Dietl, Munich, and Michael Wohlschläger, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,818

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845459

Int. Cl.² A23L *1/28*

U.S. Cl. 427—431 **5 Claims**

1. In a process for protecting carbon bodies against attack by molten silicon comprising the step of:

applying to the surface of the carbon body to be protected a separating protective layer comprising alkaline earth metal fluorides in admixture with 0 to 90 mole % of alkaline earth metal silicates have a melting point lower than that of silicon, said layer being applied in a manner which results in the wetting of the surface of said carbon body.

4,234,631

METHOD FOR IMMERSION DEPOSITION OF TIN AND TIN-LEAD ALLOYS

Thomas F. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 857,069, Dec. 5, 1977, Pat. No. 4,194,913, which is a continuation-in-part of Ser. No. 574,979, May 6, 1975, Pat. No. 4,093,466. This application Jul. 20, 1979, Ser. No. 59,767

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—436 **13 Claims**

1. A method for the immersion deposition of essentially tin and tin-lead alloys onto copper or copper alloy substrates, comprising immersing said copper or copper alloy substrate into an immersion plating bath which comprises:

(a) a soluble plumbous salt in an amount from about 0.5 grams to about 25 grams per liter calculated on the basis of elemental lead including the maximum soluble in said bath;

(b) tin as a soluble stannous salt in an amount of from about 5 to 150 grams per liter;

(c) a thiourea as a sulfur containing complexing agent in an amount of from about 40 grams per liter to about 150 grams per liter; and

(d) sufficient hydrochloric acid or hydrobromic acid to provide a pH for the bath in the range of 0.6 to 1.0;

permitting said immersion plating to proceed at a temperature of about 100° F. to 200° F. for a sufficient time to build upon said substrate a tightly adherent layer of essentially tin or tin-lead alloy; wherein, in said deposition of essentially tin, said plumbous salt is present in sufficient amount to act as a rate of deposition enhancer, and wherein said bath will function to deposit said essentially tin and tin-lead alloys onto said copper or copper alloy substrates by immersion deposition at a rate of at least 85 microinches in 5 minutes at a temperature of 170° F.

4,234,632

SOLID WASTE ENCAPSULATION

Hyman R. Lubowitz, Hawthorne, Calif., assignor to The United States of America as represented by the Administrator U.S. Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 812,535, Jul. 5, 1977, abandoned, which is a continuation of Ser. No. 626,507, Oct. 28, 1975, abandoned. This application May 26, 1978, Ser. No. 909,892

Int. Cl.³ B65D *71/00*

U.S. Cl. 428—2 **8 Claims**

6. A process for isolating soluble solid waste from ecological forces such as water, pressure of overlying materials, and the like, comprising:

(A) mixing solid particulate waste selected from the group consisting of compounds of lead, chromium, cadmium, copper, zinc, calcium, iron, mercury, fluoride, and sulfate-sulfite, with about 1 to 10 percent by weight thermosetting resin in a solvent solution, and permitting the solvent to evaporate thereby forming a free-flowing powder;

(B) placing the free-flowing powder in a mold and curing the powder by application of heat and pressure thereto, thereby forming a hard, filled resin, compacted aggregate;

(C) completely coating said compacted aggregate with a tough, flexible, liquid impervious thermo-plastic resin layer about at least ¼" thick;

(D) whereby the aggregate is encapsulated in a liquid impervious casing.

8. The product produced by the process of either claim 6 or 7.

4,234,633

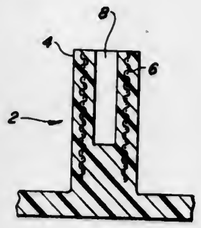
REINFORCED STUD SUPPORTS IN FIBERGLASS PARTS

Michael Gowetski, Muncie, and Robert W. Smith, Marion, both of Ind., assignors to The General Tire & Rubber Co., Akron, Ohio

Continuation of Ser. No. 850,758, Nov. 11, 1977, abandoned, which is a division of Ser. No. 713,757, Aug. 12, 1976, Pat. No. 4,088,525. This application Apr. 23, 1979, Ser. No. 32,048

Int. Cl.³ B32B *3/26, 3/30*

U.S. Cl. 428—36 **1 Claim**



1. In a glass fiber filled plastic vehicle body part, made from sheet molding compound containing from 22% to 35% of glass fibers having a length of from 12 to 50 millimeters, having a plurality of stud supports, the improvement characterized by each of the plurality of stud supports containing:

one non-woven continuous filament glass fiber cylinder embedded in each of the stud supports and completely surrounded by the sheet molding compound whereby each of the stud supports is reinforced to withstand the stress of the insertion of a self-threading stud.

4,234,634

PREFABRICATION SYSTEM FOR BUILDING WALLS

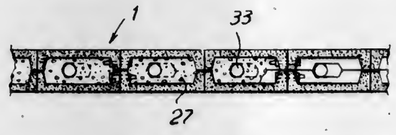
Enrico Longinotti, Via Timoteo Bertelli 2, Florence, Italy

Filed Aug. 23, 1978, Ser. No. 935,951

Claims priority, application Italy, Aug. 23, 1977, 9555 A/77

Int. Cl.² B32B *3/30*

U.S. Cl. 428—58 **13 Claims**



1. A prefabricated construction for building walls, comprising: a pair of substantially flat, rectangular, cement wall elements; a plurality of integral, spaced, transverse, stiffening rib portions extending from one surface of each of said elements; a plurality of integral, spaced, longitudinal stiffening rib portions intersecting said transverse stiffening rib portions and extending from the same surface of each of said elements, at least some of said transverse rib portions on at least one of said wall elements including recesses on edges thereof away from said one surface, at least one of said recesses in one of said transverse rib portions being aligned with one of said recesses in each of a plurality of said transverse rib portions, and the depth of said recesses being less than the height of the respective transverse rear portions, said wall elements facing and spaced from each other with said stiffening rib portions of one wall element facing said stiffening rib portions of the other of said wall elements, and at least some of said stiffening rib portions of one wall element aligned with at least some of said stiffening rib portions of the other of said wall elements; and expanded synthetic material substantially filling the space between the said wall elements with at leaast one conduit passage defined in said expanded synthetic material adjacent at least some of said aligned recess of said transverse rib portions.

4,234,635

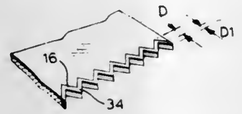
METHOD OF RIGIDIFYING THE TEARING EDGE OF A CARTON

William G. Atkinson, London, Canada, assignor to Somerville Belkin Industries Limited, London, Canada

Filed May 29, 1979, Ser. No. 42,992

Int. Cl.³ B05D *5/00*; B32B *23/02, 9/06, 29/00*

U.S. Cl. 428—80 **5 Claims**



1. A method of forming a rigidified tearing edge at a first edge of a paperboard blank, said blank having a serrated marginal edge portion extending inwardly from said first edge, comprising the steps of,

(a) arranging a plurality of paperboard blanks in a stack with said first edges thereof disposed in a common plane,

(b) applying a clamping force to said stack of blanks to press at least said marginal edge portions towards one another to an extent sufficient to substantially prevent the ingress of hardening fluid therebetween and thereby prevent adhesion between the marginal edges of the sheets,

(c) applying to said first edges of the stack of blanks a coating liquid of a type which is at least semi-rigid when set,

(d) setting said coating to form a rigidifying coating at said first edge and thereby provide a rigidified tearing edge,

(e) releasing the clamping force to permit separation of the blanks from the stack.

5. A carton blank having a reinforced edged formed in accordance with the method of claim 1.

4,234,636

THERMOPLASTIC ELASTOMERIC COMPOSITION, PRODUCT AND METHOD OF MANUFACTURE

Agmund K. Thorsrud, Bath, and Roy W. Siedenstrang, Akron, both of Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1978, Ser. No. 973,978

Int. Cl.³ B32B *7/10, 25/04, 27/04*

U.S. Cl. 428—95 **56 Claims**

1. An unvulcanized, pressure and heat moldable composition comprising:

100 parts by weight of a thermoplastic elastomer;

at least about 10 parts by weight of an extender oil per 100 parts by weight of said thermoplastic elastomer; and

at least about 20 parts by weight of at least one solid, hygroscopic filler, having greater than 1 percent by weight of absorbed water and being capable of retaining a substantial portion of said absorbed water at a temperature above 100° C. and utilized in the preparation of said composition, per 100 parts by weight of said thermoplastic elastomer;

the ratio of said extender oil to said hygroscopic filler being from about 0.3 to about 3.

37. A flexible, molded thermoplastic elastomer article comprising:

100 parts by weight of a thermoplastic elastomer;

at least about 10 parts by weight of an extended oil per 100 parts by weight of said thermoplastic elastomer;

and at least 20 parts by weight of at least one solid, hygroscopic filler, having greater than 1 percent by weight of absorbed water and being capable of retaining a substantial portion of said absorbed water at a temperature above 100° C. and utilized in the preparation of said article prior the molding thereof, per 100 parts by weight of said thermoplastic elastomer;

the ratio of said extender oil to said hygroscopic filler being about 0.3 to about 3.

4,234,637

MICROPOROUS PROTECTIVE COVERINGS

Richard B. H. Sewell, and Derek J. Kidd, both of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 20, 1979, Ser. No. 50,297

Claims priority, application Canada, Jun. 22, 1978, 306049

Int. Cl.³ B32B *3/26*

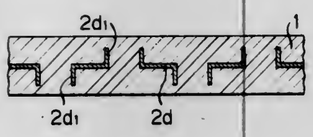
U.S. Cl. 428—131 **2 Claims**

1. A flexible, microporous non-water-soluble, non-skin-toxic film of a material selected from the group consisting of natural and synthetic elastomers and synthetic polymers for use in protective garments, said film having first and second surfaces, a thickness between said surfaces being in the range of about 12.5μ to 12 mm, and between about 100 to 1000 pores per cm^2 of film surface, said pores extending between said surfaces and having a diameter in the range of about 2 to 100μ, wherein the pores are tapered and have an average diameter at the first surface of the film of about 2μ and an average diameter at the second surface of the film in the range of about 30 to 100μ.

4,234,638
COMPOSITE GRAPHITE SHEETS

Hiroshi Yamazoe, and Isao Sugiura, both of Yokohama, Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1977, Ser. No. 817,319
Claims priority, application Japan, Jul. 23, 1976, 51-87853
Int. Cl.³ B32B 3/10, 3/24; B29J 1/00
U.S. Cl. 428—133 17 Claims



1. A composite sheet for gaskets, prepared by the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with an inorganic binder selected from the group consisting of $Al_2O_3.3P_2O_5.6H_2O$, and $Al_2O_3.0.25Cr_2O_3.3P_2O_5.nH_2O$, each in an amount of 0.1 to 30 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at a pressure of 50–200 kg/cm² and a temperature of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

8. A composite sheet for gaskets, prepared by the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with oxidized graphite as a binder in an amount of 3–40 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at a pressure of 50–200 kg/cm² and a temperature of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

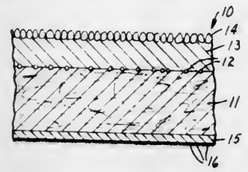
15. A method of making a composite gasket sheet comprising the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with oxidized graphite as a binder in an amount of 3 to 40 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at a pressure of 500–200 kg/cm² and a temperature of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

16. A method of making a composite gasket sheet comprising the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with an inorganic binder selected from the group consisting of $Al_2O_3.3P_2O_5.6H_2O$ and $Al_2O_3.0.25Cr_2O_3.3P_2O_5.nH_2O$, each in an amount of 0.1 to 30 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at pressure of 50–200 kg/cm² and a temperture of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

4,234,639
INTUMESCABLE FIRE-RETARDANT PRODUCTS

Joseph Graham, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 23, 1979, Ser. No. 59,614
Int. Cl.² B32B 11/02, 5/30
U.S. Cl. 428—144 13 Claims



1. Fire-retardant granules comprising (1) core particles that comprise hydrated soluble silicate glass that intumesces in the presence of heat, and (2) a coating on the core particles comprising a mixture of (a) halogenated organic compound that releases halogen when heated to a temperature less than about 250° C.; and (b) an iron-containing compound adapted to react with said released halogen to form iron halide, whereby when said granules are mixed into asphalt and the asphalt exposed to a flame, charring of an exterior layer of the asphalt is catalyzed to limit flaming and flow of the asphalt.

9. Roofing material comprising in parallel layers, a roofing felt; at least one asphalt coating disposed above the felt; a layer of roofing granules partially embedded in the top asphalt coating in the roofing material; and a layer of the catalytic intumescable granules of claim 1 disposed within the roofing material.

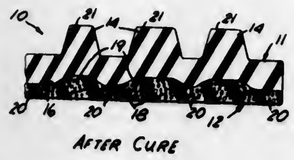
10. Sheet material useful as an expansible fire barrier comprising a binder material that softens in the presence of heat and the granules of claim 1 dispersed in the binder material.

13. Polyurethane-based foam in which granules of claim 1 are dispersed.

4,234,640
CUSHIONED PRINTING LAMINATE

Frederick H. Wittel, P.O. Box 2501, Gainesville, Ga. 30501

Continuation of Ser. No. 664,954, Mar. 8, 1976, abandoned, which is a division of Ser. No. 343,461, Mar. 21, 1973, abandoned. This application Jul. 13, 1978, Ser. No. 924,186
Int. Cl.³ B41N 1/00; B32B 3/30
U.S. Cl. 428—159 12 Claims

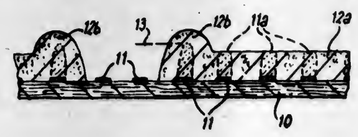


1. A printing laminate comprising:
a vulcanized rubber compound printing layer having a front side and a back side, and including raised printing elements formed on the front side thereof and lowered non-printing areas formed on the front side thereof between said raised printing elements, each of said printing elements defining a printing face thereof; and
a cushion coextensive with and vulcanized to the back side of said printing layer including a foamed cushion layer of vulcanized rubber compound having voids uniformly distributed throughout, said voids constituting at least about one-half of the volume of said foamed cushion layer, said cushion layer including first portions underlying said raised printing elements of said printing layer having a first prescribed thickness to effectively cushion said printing elements during printing and second portions underlying said non-printing areas of said printing layer having a second prescribed thickness less than said first prescribed thickness of said first portions under said raised printing elements of said printing layer, said second prescribed thickness being no greater than about two-thirds said first prescribed thickness to maintain the lateral stability of said printing elements on the printing laminate while said first portions of said cushion layer effectively cushion said printing elements, that side of said cushion opposite said printing generally parallel to said printing faces on said printing elements and said first portions extending up behind said printing elements beyond the plane of the back side of said lowered non-printing areas of said printing layer.

4,234,641
FOAM PLASTICS SHEET MATERIALS

David R. Thompson, Preston, and John P. Tomlinson, Darwen, both of England, assignors to Reed International Limited, England

Filed Jul. 10, 1979, Ser. No. 56,323
Int. Cl.² B32B 5/20
U.S. Cl. 428—159 11 Claims

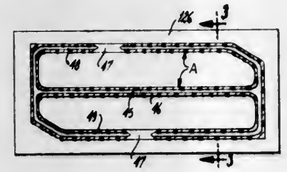


1. Foam plastics sheet material having a decorative finish comprising a substrate web having thereon a base coat and a foam coat in which the base coat comprises an organic pigment and some of the pigment has migrated through the foam coat to the surface of the foam coat so that the overall surface of the material exposes at least two different colourations.

4,234,642
MOLDED PLASTIC STRUCTURAL WEB ARTICLES

Olagoke Olabisi, Plainfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 936,056, Aug. 23, 1978, which is a continuation of Ser. No. 705,101, Jul. 14, 1976, Pat. No. 4,136,220. This application Dec. 8, 1978, Ser. No. 968,027
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.² B32B 3/30; B29H 7/02
U.S. Cl. 428—188 2 Claims

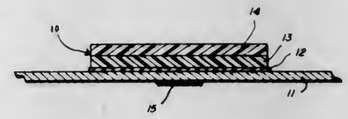


1. In a structural web article of thermoplastic material having a substantially continuous enveloping skin around the exterior of said article, at least one generally continuous, hollow center therein, at least one integral skin-connecting web positioned in said hollow center and at least one entry passage from the exterior to the hollow center(s) of said article through said enveloping skin, the improvement which comprises an article having at least two tubular channels each having hollow center(s) passing therethrough, said center(s) each originating at said entry passage and terminating at said web, the length of said tubular channels being at least ten times its width and depth dimensions.

4,234,643
TENNIS BALL MARKING DECALCOMANIA

Alan C. Grotefend, Glen Ellyn, Ill., and Stephen F. Thon, Jim Falls, Wis., assignors to The Meyercord Co., Carol Stream, Ill.

Filed May 30, 1978, Ser. No. 910,475
Int. Cl.² B44C 1/16; B32B 27/36, 23/04
U.S. Cl. 428—200 5 Claims



1. A heat release type decalcomania for application to a section of textile material formed of felted polyamide-containing textile material which is thereafter adapted for vulcanizing to a rubber surface in a mold comprising;
(a) a paper-like wax-free flexible temporary carrier strip;
(b) a clear film on one surface of said carrier strip formed of a mixture containing a blocked isocyanate stable at room temperature in a mixture containing a polyester, and a silicone modified polyester which when heated to heat release temperature for application of said decalcomania are adapted to react to form a thermoset elastomeric film and effect the release of said clear film from said carrier strip, and said thermoset elastomeric film also having high temperature mold release properties when heated in said mold; and
(c) a pigmented thermoplastic elastomeric design fixedly supported by said clear film formed of a first pigmented layer of thermoplastic elastomer which is comprised of a blend of polyamide resins having a softening point of about 100° F. (38° C.) and a second pigmented layer of thermoplastic elastomer superimposed on said first pigmented layer comprised of a blend of polyamide resins having a softening point of about 230° F. (110° C.), said first and second pigmented layers when heated above said softening points during the heating to effect release of said clear film from said carrier strip and during said vulcanizing having a viscosity which enables said layers penetrating deeply into said felted polyamide-containing textile material, and said second layer being non-tacky and resistant to offsetting when placed in contact with said carrier strip at room temperature.

4,234,644
COMPOSITE LAMINATION FILM FOR ELECTROPHORETICALLY TONED IMAGES

Stephen D. Blake, and Katherine J. Lewis, both of Los Angeles, Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Continuation of Ser. No. 889,647, Mar. 24, 1978, abandoned. This application Jan. 18, 1979, Ser. No. 4,366
Int. Cl.³ B32B 7/14, 9/04; C09J 5/00
U.S. Cl. 428—204 9 Claims

1. A composite lamination film for electrophoretically toned images deposited on a plastic dielectric receptor sheet, comprising, in combination:
an optically transparent, flexible support layer of a material selected from the group consisting of polyethylene terephthalate, polycarbonate, polysulfone, cellulose triacetate or a vinyl chloride/vinylidene chloride copolymer resin, and of a thickness of from 0.1 to 7.0 mils;
an optically transparent, flexible intermediate layer of a heat softenable film of a material selected from the group consisting of low density polyethylene resin, polypropylene resin or copolymer resin of ethylene or propylene with

relatively small amounts of vinyl or acrylic monomers, and of a thickness from about 0.05 to 4.0 mils, and applied to one side of said support layer, said intermediate layer having good adhesion to said support layer; and

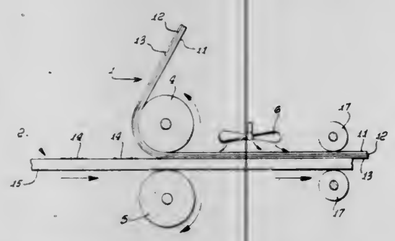
an optically transparent, flexible adhesive layer of a heat softenable film comprising a low molecular weight fatty polyamide or polyacrylic resin, and of a thickness from about 0.05 to 2.5 mils, and applied to the free side of said intermediate layer, said adhesive layer having good adhesion to said intermediate layer and adapted to have good adhesion to said receptor sheet and said toned images deposited on said receptor sheet, said adhesive layer reaching a low melt viscosity at or below 120° C. to insure good penetration of said dried toner deposits.

9. A process for preparing a composite laminate containing electrophoretically toned images which comprise the steps of:

heating a laminating film to a temperature of from about 80° C. to 160° C. to soften intermediate and adhesive layers thereof, said laminating film comprising, in combination:

an optically transparent support layer of flexible, shrink and scratch resistant, mechanically strong film, said support layer having a sufficiently high melting point to remain undistorted in the presence of heat softened adhesives, said support layer selected from the group consisting of polyethylene terephthalate, polycarbonate, polysulfone, cellulose triacetate or a vinyl chloride/vinylidene chloride copolymer resin, and of a thickness of from 0.1 to 7.0 mils,

an optically transparent intermediate layer of a flexible, heat softenable film applied to one side of said support layer,



said intermediate layer having good adhesion to said support layer, said intermediate layer having good chemical compatibility with an adhesive layer, said intermediate layer having a moderately high molecular weight to give high tensile strength to the laminate bond, said intermediate layer softening below the distortion point of said support layer and adhering to said adhesive layer and said support sheet, said intermediate layer selected from the group low density polyethylene resin, polypropylene resin or copolymer resin of ethylene or propylene with relatively small amounts of vinyl or acrylic monomers, and of a thickness from about 0.05 to 4.0 mils, and

an optically transparent adhesive layer of a flexible, heat softenable film applied to the free side of said intermediate layer, said adhesive layer having good adhesion to said intermediate layer and to a receptor sheet and said toned images deposited on said receptor sheet, said adhesive layer softening below the distortion point of said support layer, said adhesive layer reaching a low melt viscosity at or below 120° C. to insure good penetration of said dried toner deposits, said adhesive layer having a relatively low molecular weight, a relatively non-polar character and a proportionately high aliphatic hydrocarbon content to be compatible with said dried toner deposits and said intermediate layer, said adhesive layer showing no blocking or distortion, said adhesive layer comprising a low molecular weight fatty polyamide or polyacrylic resin, and of a thickness from about 0.05 to 2.5 mils;

applying said laminating film to an optically transparent receptor sheet to form a composite laminate, said receptor sheet comprising

an optically transparent sheet of flexible, shrink and scratch resistant, mechanically strong film, said sheet having a sufficiently high melting point to remain undistorted in the presence of heat softened adhesives, said sheet having electrophoretically toned images deposited thereon; and

cooling said composite laminate to a temperature at which the adhesive resin layers resolidify.

4,234,645

PHARMACEUTICAL COMPOSITION

Harald Gunther, and Herbert C. Fleisch, both of Bern, Switzerland, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 782,580, Mar. 29, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,072

Int. Cl.[2] A61K *31/66*

U.S. Cl. 424—204 **6 Claims**

1. A method for treating ankylosing spondylitis in humans and lower animals comprising administering to a human or lower animal in need of such treatment a safe and effective amount of a pharmaceutically-acceptable dichloromethane diphosphonate compound selected from the group consisting of dichloromethane diphosphonic acid, salts of dichloromethane diphosphonic acid, and alkyl and aryl esters of dichloromethane diphosphonic acid.

4,234,646

ENGRAVING BOARD FOR PRINT-PRODUCTION

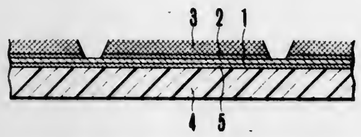
Sadao Fujimori, Tokyo, Japan, assignor to Tokyo Shobundo & Co., Ltd., Japan

Continuation of Ser. No. 842,339, Oct. 14, 1977, abandoned. This application Jun. 19, 1979, Ser. No. 49,979

Claims priority, application Japan, Aug. 23, 1977, 52-112709

Int. Cl.[3] B32B *7/02, 29/02*; B41F *9/02*

U.S. Cl. 428—215 **9 Claims**



1. An engraving board for printing a design with coloring media comprising,

a base paper layer,

a middle paper layer overlaying at least a portion of said base paper layer and secured thereto by an adhesive, and

a water absorbent printing layer comprising a multiplicity of densely packed unwoven short fibers overlaying said middle paper layer and water-resistantly secured thereto, said printing layer can be cut to remove a portion thereof for exposing a portion of said middle paper layer and leaving a remaining portion of said printing layer in the shape of the design to be printed whereby the coloring medium is laid over the engraving board and is absorbed into the exposed portion of said middle paper layer.

4,234,647

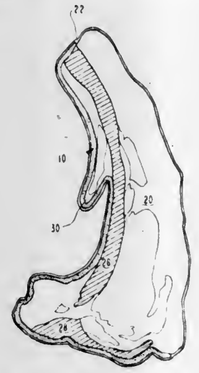
MEAT PACKAGING OF FOAM AND OXYGEN IMPERVIOUS MATERIAL

Robert E. Murphy, Downers Grove, and Harry F. Bernholdt, Lombard, both of Ill., assignors to Swift & Company, Chicago, Ill.

Division of Ser. No. 835,421, Sep. 21, 1977, Pat. No. 4,136,203, which is a continuation-in-part of Ser. No. 703,593, Jul. 8, 1976, abandoned. This application Dec. 29, 1978, Ser. No. 974,565

Int. Cl.[3] B65D *33/02*

U.S. Cl. 428—220 **1 Claim**



1. As an article of manufacture an improved puncture resistant cushion film for use in the packaging of meat items, said cushion film comprising:

an outer film layer of oxygen impermiable material; and

a meat contacting surface comprised of a separate cushion film of an open celled foam of about 1/16-¼ inch thick capable of both absorbing liquids and of closely conforming to the surface shape of the meat, and said meat contacting surface is coated on its meat contacting surface with a non-toxic adhesive.

4,234,648

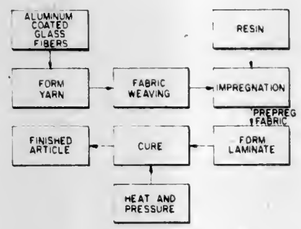
ELECTRICALLY CONDUCTIVE PREPREG MATERIALS

Gary L. Patz, Walnut Creek, and Donald E. Davenport, Palo Alto, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Jan. 29, 1979, Ser. No. 7,096

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—245 **24 Claims**



1. A prepreg material comprising a fabric web woven of a multiplicity of fiber bundles, each bundle including a plurality of fibers of a dielectric material, at least some of said fibers having been coated on their outer surfaces with a layer of an electrically conductive material over the entire length of said coated fibers prior to said fabric being woven, at least some of said coated fibers extending throughout said fabric in the direction in which their corresponding bundles are woven providing a continuous electrical conductor, and an uncured resin carried by the fabric after being woven.

4,234,649

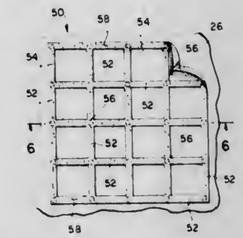
BINDER MATERIAL SEAM

Robert C. Ward, Bay Shore, N.Y., assignor to Commercial Affiliates, Inc., New York, N.Y.

Filed May 24, 1976, Ser. No. 688,943

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—255 **20 Claims**



1. Binder material comprising a grid-like frame construction for stripably binding covering material to rigid holding surface, said binder material comprising a first outer surface and a second outer surface, said first outer surface being next to said holding surface, said binder material comprising a plurality of spaced frame elements intersecting each other to form a grid-like frame construction, said frame elements being coated with pressure sensitive adhesive, said adhesive coating being present only on said frame elements, said adhesive on said frame elements being positioned on said first outer surface which is next to said holding surface and on said second outer surface, and the pressure sensitive adhesive comprises the property of being strippable from both the holding surface and the covering material.

4,234,650

LAMINAR CARBON MEMBER AND A METHOD OF MANUFACTURING IT

Franz Schieber, Pegnitzstrasse 12, D-8505 Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,528

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724131

Int. Cl.[2] B32B *9/00, 33/00*

U.S. Cl. 428—280 **13 Claims**

1. A thin laminar porous carbon member having a gross density of 0.1 to 0.8 gm/cm, a thickness of 0.1 to 5 mm and a ratio of surface area to thickness of at least 10^5 produced by carbonizing a carbon fiber felt impregnated with a heat and pressure hardened carbonaceous binder coating substantially all the carbon fibers of the felt in such a manner that the porosity of the felt is retained.

7. A method of forming a thin carbon member from a hardenable binder and porous carbon felt, said carbon felt being formed of carbon fibers, said method comprising the steps of:

(a) impregnating said porous felt with a carbonaceous, hardenable and cokable binder such that substantially all of said fibers are coated with said binder;

(b) eliminating some of said binder from said porous felt to the extent that said impregnated felt is porous; and

(c) hardening said binder with heat and pressure to produce a rigid, partially impregnated, porous carbon member

(d) carbonizing said member by heating to produce a rigid, high strength, dimensionally stable and porous carbon member having a gross density of 0.1 to 0.8 g/cm, a thickness of 0.1 to 5 mm, and a surface area to thickness ratio of at least 10^5.

13. A method comprising the step of binding a plurality of

thin laminar carbon members produced by the method of claim 7.

4,234,651

PROCESS FOR THE MANUFACTURE OF A NON-WOVEN PRODUCT HAVING HIGH SHEAR STRENGTH AND DIMENSIONAL STABILITY

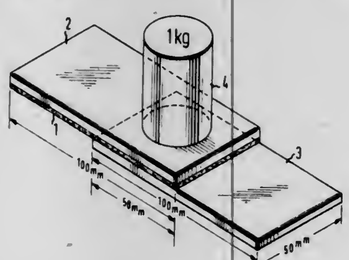
Helmut Kuhn, Königstein, and Kurt Seiler, Abtsteinach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,996

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721989

Int. Cl.³ B32B 27/00

U.S. Cl. 428—290 **4 Claims**



1. A process for the manufacture of a spunlaid product of crimp-free polyester filaments by deposition and bonding of the filaments, wherein the filaments consist of polyethyleneglycol terephthalate, and the bonding is obtained by needling and subsequent impregnation with a binder liquor; the needling being carried out by placing 80 to 300 stitches/cm^2, preferably 80 to 150 stitches/cm^2 at a depth of stitch of 11 to 20 mm, preferably 12 to 17 mm; and the impregnation being carried out with an aqueous dispersion of a copolymer containing
from 47 to 59 weight % of styrene,
from 33 to 45 weight % of butadiene,
from 3 to 4 weight % of acrylic acid and
from 3 to 4 weight % of acrylic acid amide.

4,234,652

MICROFIBROUS STRUCTURES

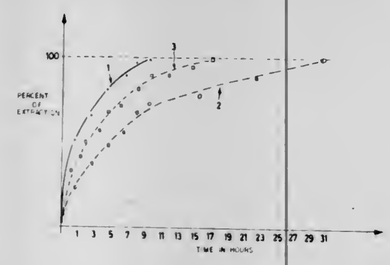
Pier L. Vanoni, San Donato Milanese; Giancarlo Serboli, Soronno, and Franco De Marchi, Milan, all of Italy, assignors to Anic, S.p.A., Palermo, Italy

Continuation of Ser. No. 722,137, Sep. 10, 1976, abandoned. This application Apr. 6, 1979, Ser. No. 27,868

Claims priority, application Italy, Sep. 12, 1975, 27206 A/75; Aug. 13, 1976, 26263 A/76

Int. Cl.³ D04H 1/04

U.S. Cl. 428—296 **3 Claims**



1. A microfiber of irregular cross section having a length ranging from 1 to 10 millimeters with an average diameter of about 1.0 micron consisting of a synthetic, fiber-forming, thermoplastic polymeric material selected from the group consisting of low-density polyethylene, copolymers of ethylene with vinyl acetate and acrylic acid, high density polyethylene, relevant ethylene copolymers, polypropylene, polyvinyl acetate, polyvinyl alcohol, polystyrene, polyamides, polyethylene terephthalate, cellulose acetate, polyvinyl chloride, and having incorporated therewith by adsorption a material selected from the group consisting of medicaments, antiseptics, pesticides, microorganisms preservatives and sequestering agents.

4,234,653

PROTECTIVE COATING

Norman E. Ballard; Frank Cork, both of Derby; Philip H. Andrews, Solihull, and Francis Chappell, Halesowen, all of England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 607,993, Aug. 26, 1975, abandoned. This application May 24, 1977, Ser. No. 800,016

Claims priority, application United Kingdom, Aug. 31, 1974, 38149/74

Int. Cl.³ B32B 5/16, 15/20, 17/06

U.S. Cl. 428—328 **7 Claims**

1. A metal article having thereon a heat-resistant protective coating, said coating consisting essentially of:
(a) a glass matrix which has as its major constituent, a eutectic of PbO-B_2O_3 and contains about 84% by weight of PbO;
(b) from about 50 to about 78% by weight of aluminum particles in the size range of 5 to 10 microns dispersed in said glass matrix; and
(c) a metal chromate selected from the group consisting of zinc chromate, strontium chromate, barium chromate and mixtures thereof, and
(d) an organophilic cation modified clay; the glass matrix and aluminum particles being substantially chemically non-reactive with respect to each other.

4,234,654

HEAT WAVE-REFLECTIVE OR ELECTRICALLY CONDUCTIVE LAMINATED STRUCTURE

Toshiaki Yatabe, Hino; Shigenobu Sobajima, and Ikuto Sugiyama, both of Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 9, 1979, Ser. No. 56,192

Claims priority, application Japan, Jul. 11, 1978, 53-83582

Int. Cl.³ B32B 7/02, 27/36, 15/04

U.S. Cl. 428—333 **12 Claims**

1. A heat wave-reflective or electrically conductive laminated structure composed of
(A) a shaped solid substrate,
(B) a transparent thin layer having a high refractive index in contact with said substrate (A),
(C) a transparent heat wave-reflective layer of an electrically conductive metal in contact with said layer (B), and
(D) optionally, a transparent thin layer having a high refractive index (D') in contact with said layer (C) and a transparent top layer (D'') in contact with said transparent thin layer (D');
characterized in that said layer (C) is a layer composed of Ag and Au in which the amount of Au is 3 to 30% by weight based on the total weight of Ag and Au.

10. The laminated structure of claim 1 wherein the layer (B) has a thickness of 50 to 1,000 A.

4,234,655

HEAT-ADHESIVE COMPOSITE FIBERS

Kohichi Kunimune, Moriyamashi; Teruaki Hane, Shigaken; Seigo Inadomi, Moriyamashi, and Yasuhiko Furukawa, Kusatsushi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 31,989, Apr. 20, 1979, which is a continuation of Ser. No. 842,660, Oct. 11, 1977, abandoned. This application Aug. 1, 1979, Ser. No. 62,814

Claims priority, application Japan, Oct. 20, 1976, 51-125723; Dec. 13, 1976, 51-149597; Apr. 12, 1977, 52-41685

Int. Cl.² D02G 3/00

U.S. Cl. 428—374 **9 Claims**

1. Heat-adhesive composite fibers having a denier within the range of 1-20, and comprising
(a) a first component of crystalline polypropylene, and
(b) a second component selected from the group consisting of
(1) an ethylene-vinyl acetate copolymer,
(2) a saponification product thereof,
(3) a polymer mixture of an ethylene-vinyl acetate copolymer with polyethylene, and
(4) a polymer mixture of a saponification product of an ethylene-vinyl acetate copolymer with polyethylene,
said copolymer containing 0.5-18 mol % of vinyl acetate units based upon the total of vinyl acetate units and ethylene units,
said saponification product containing 0.5-18 mol % of vinyl monomer units consisting of vinyl alcohol units and vinyl acetate units based upon the total of vinyl alcohol units, vinyl acetate units and ethylene units,
said polymer mixtures consisting of 70% by weight or less of said copolymer or said saponification product and 30% by weight or more of said polyethylene,
said polymer mixtures containing 0.5-18 mol % of vinyl monomer units consisting of vinyl alcohol units and/or vinyl acetate units based upon the total of vinyl acetate units, vinyl alcohol units and ethylene units of the said polymer mixtures,
the composite ratio of said first component to said second component being in the range of 40:60 to 70:30,
said first and second components being joined together along an axially extending interface, and
said second component forming at least 50% of the exterior surface of the composite fibers continuously in the longitudinal direction of the fibers so as to give the composite fibers heat-adhesive properties.

4,234,656

REPROCESSABLE THERMOPLASTIC GRAFT COPOLYMER OF PROPYLENE POLYMER AND ETHYLENE COPOLYMER

Amar Amembal, Edison; Robert Bostwick, Somerset, both of N.J., and Richard G. Shaw, Remsen, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,182

Int. Cl.³ C08L 23/08, 23/12

U.S. Cl. 428—379 **14 Claims**

1. A reprocessable graft copolymer comprising (A) ethylene copolymer containing more than 60 weight percent ethylene and at least one comonomer selected from the group consisting of vinyl acetate and alkyl acrylates or methacrylates and (B) propylene polymer grafted to said ethylene copolymer with from about 0.1 to about 0.75 weight percent, based on the weight of (A) and (B), of a peroxide having a half life of one minute at ≥140° C.

4,234,657

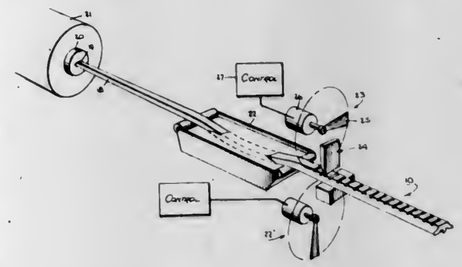
FOAMABLE THERMOPLASTIC STICK AND FOAMED ELEMENT MADE THEREFROM

Harry Bussey, Jr., P.O. Box 115 Serpentine Rd., Navesink, N.J. 07752

Division of Ser. No. 886,075, Mar. 13, 1978. This application Mar. 5, 1979, Ser. No. 17,133

Int. Cl.² B32B 1/00; D02G 3/00

U.S. Cl. 428—400 **10 Claims**



1. A straight stick of foamable thermoplastic material having a substantially uniform cross-sectional shape along a longitudinal axis, and a plurality of grooves in at least one surface thereof extending width-wise of said longitudinal axis.

4,234,658

WOOD COMPOSITES WITH FOLIAGE ADHESIVE

Suezone Chow, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 771,992, Feb. 25, 1977, Pat. No. 4,082,903. This application Mar. 6, 1978, Ser. No. 883,951

Int. Cl.³ B32B 21/02

U.S. Cl. 428—403 **17 Claims**

1. A method of bonding wood or bark to form composite products comprising:
(a) subdividing plant foliage to a fine particle size;
(b) uniformly contacting the wood or bark to be bonded with adhesive which consists essentially of one of,
(i) said subdivided foliage,
(ii) said subdivided foliage with up to 20% formaldehyde by weight of the adhesive, and
(iii) said subdivided foliage having its natural acid pH raised to neutral or alkaline pH, said adhesive being present in sufficient amounts to bond the wood or bark,
(c) subjecting the crude composite to bonding pressure at a selected temperature above the softening temperature of the foliage, the selected temperature being high enough to give the desired bond strength; and
(d) recovering the hot-pressed composite wood or bark product.

4,234,659

COMPOSITE MATERIAL AND METHOD OF PRODUCING SAME

Leonid A. Kostandov, Vorobievskoe shosse, 6, kv. 4; Nikolai S. Enikolopov, Kutuzovsky prospekt, 26, kv. 245; Fridrikh S. Dyachkovsky, Vorobievskoe shosse, 2-b, kv. 9; Ljudmila A. Novokshonova, ulitsa 26 Bakinskikh komissarov, 7, korpus 4, kv. 38; Jury A. Gavrilov, Chistoprudny bulvar, 14, kv. 57, all of, Moscow; Olga I. Kudinova, poselok Kratovo, ulitsa Malakhovskaya, 15, Moskovskaya oblast; Tatyana A. Maklakova, Leningradskoe shosse, 8/2, kv. 200, Moscow; Leonid A. Akopian, Mytischi, ulitsa Tereshkovoi, 11, kv. 21, Moskovskaya oblast; Otar P. Mchedlov-Petrosian, ulitsa Vorobieva, 14, kv. 5, Kharkov; Mikhail I. Boiko, ulitsa Arkhangelskaya, 12, kv. 54, Kharkov; Alexandr A. Staroselsky, ulitsa Stadionnaya, 21, kv. 76, Kharkov, and Vladimir P. Tkachenko, ulitsa akademika Makarova, 13, kv. 24, Moscow, all of U.S.S.R.

Filed Sep. 18, 1978, Ser. No. 943,188

Int. Cl.[3] B32B *5/16, 9/00*

U.S. Cl. 428—403 **10 Claims**

1. A composite material comprising a solid porous carrier having pores filled with a polyolefin polymer having a molecular weight of at least 300,000, said polymer filling at least 4 percent with respect to the total volume of the pores, the ratio of the carrier mass to the mass of the polymer being 50–99.5:-50–0.5.

4,234,660

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS CONTAINING A POLYMETALOXANE AND ARTICLE

Lawrence W. McKenna, Jr., Wilbraham; Ronald S. Finkelstein, Longmeadow, and John K. Haynes, Jr., Springfield, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 863,113, Dec. 22, 1977, Pat. No. 4,185,051. This application Sep. 17, 1979, Ser. No. 76,008

Int. Cl.[3] B32B *27/08, 27/30, 27/32, 27/36*

U.S. Cl. 428—411 **17 Claims**

1. An article coated with a pressure sensitive resin composition comprising:

A. an interpolymer having a weight average molecular weight in the range of about 10,000 to about 500,000 and a glass transition temperature in the range of about −15° C. to about −75° C., the interpolymer comprising:

a. from about 0.5 to about 20 weight percent of at least one monomer containing a hydroxyl or carboxyl group, and

b. at least one acrylic ester containing from six to 20 carbon atoms; and

B. at least one polymetaloxane having the formula $(M_nO_{n-1})(OR)_{2n+2}$ wherein M is titanium or zirconium, n is an integer of from 2 to 20 and R is selected from the group consisting of aliphatic, substituted aliphatic, alicyclic and substituted alicyclic radicals containing from 2 to 10 carbon atoms and wherein the polymetaloxane is present in an amount sufficient to improve the cohesive strength of the dry pressure sensitive resin composition.

4,234,661

POLYCRYSTALLINE DIAMOND BODY/SILICON NITRIDE SUBSTRATE COMPOSITE

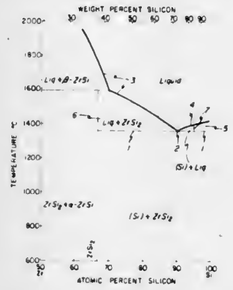
Minyoung Lee, Schenectady; Lawrence E. Szala, Scotia, and Robert C. DeVries, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 844,449, Oct. 21, 9177, abandoned. This application Mar. 12, 1979, Ser. No. 19,366

Int. Cl.[3] B32B *9/04*

U.S. Cl. 428—446 **10 Claims**

1. A composite consisting essentially of a polycrystalline diamond body integrally bonded to a substrate of polycrystalline silicon nitride, said polycrystalline diamond body consisting essentially of a mass of diamond crystals adherently bonded together by a bonding medium consisting essentially of silicon carbide and a carbide and/or silicide of a metal component which forms a silicide with silicon and which forms a eutectiferous alloy with silicon, said metal component of said metal silicide being selected from the group consisting of cobalt, chromium, iron, hafnium, manganese, molybdenum, niobium, nickel, palladium, platinum, rhenium, rhodium, ruthenium, tantalum, thorium, titanium, uranium, vanadium, tungsten, yttrium, zirconium and alloys thereof, said metal component of said metal carbide being selected from the group consisting of chromium, hafnium, titanium, zirconium, tantalum, vanadium, tungsten, molybdenum, and alloys thereof, said diamond crystals ranging in size from about 1 micron to about 1000 microns, the volume of said diamond crystals ranging from at least about 70% by volume up to about but less than 90% by volume of said body, said bonding medium being present in an amount ranging up to about 30% by volume of said body, said bonding medium being distributed substantially uniformly throughout said body, the portion of said bonding medium in contact with the surfaces of said diamond crystals being at least in a major



amount silicon carbide, said diamond body being substantially pore-free, said substrate consisting essentially of a hot-pressed or sintered polycrystalline silicon nitride body ranging in density from about 80% to about 100% of the theoretical density of silicon nitride and containing silicon nitride in an amount of at least 90% by weight of said substrate and being free of constituents which have a significantly deleterious effect on the mechanical properties of said composite, said polycrystalline diamond body forming an interface with said silicon nitride substrate wherein said bonding medium extends from said polycrystalline diamond body into contact with said silicon nitride substrate at least substantially filling pores throughout said interface so that said interface is substantially pore-free, the distribution and thickness of the bonding medium throughout said interface being substantially the same as the distribution and thickness of the bonding medium throughout said polycrystalline diamond body of said composite.

4,234,662

PRESSURE SENSITIVE HOT MELT ADHESIVE CURABLE BY EXPOSURE TO ELECTRON BEAM RADIATION

Stephen D. Pastor, Spring Valley, N.Y., and Stuart H. Ganslaw, Morristown, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 26, 1979, Ser. No. 33,199

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—500 **10 Claims**

1. A method for the production of a hot melt adhesive composition having pressure sensitive properties comprising the steps of

(a) copolymerizing allyl acrylate or methacrylate with at least one copolymerizable acrylic monomer, obtaining thereby a prepolymer solid at ambient temperature;

(b) heating the resultant solid allylic unsaturated prepolymer to a temperature sufficient to render it fluid and flowable;

(c) coating the fluid prepolymer onto a substrate; and

(d) exposing the coated substrate to electron beam radiation of 1–4 megarads sufficient to crosslink the prepolymer, thereby providing a cured pressure sensitive adhesive.

4,234,663

THERMOPLASTIC MULTI-LAYER FOIL STRUCTURE

Raymond Catte, Cuqueron; Robert Laputte, Pau; Jean-Claude Moulies, Dagneux, and Jean-Pierre Lalaün, Pau, all of France, assignors to ATO Chimie, Paris, France

Filed Jan. 29, 1979, Ser. No. 7,514

Claims priority, application France, Jan. 30, 1978, 78 02554

Int. Cl.[3] B32B *27/08, 5/16*

U.S. Cl. 428—517 **18 Claims**

1. A thermoplastic multi-layer foil structure comprising a thermoplastic styrenic polymer layer comprising at least one polymer selected from the group consisting of styrene, methyl styrene, chlorostyrene and mixtures thereof, copolymers containing at least 50% styrene, methyl styrene, chlorostyrene and mixtures thereof and acrylonitrile, methacrylonitrile, a C_1 to C_4 alkyl acrylate, a C_1 to C_4 alkyl methacrylate, butadiene, isoprene, and polymers of styrene, methylstyrene and chlorostyrene, and mixtures thereof modified with polybutadiene or polyisoprene, a thermoplastic olefinic polymer layer comprising at least one polymer selected from the group consisting of polymers of alpha olefins containing 2 to 6 carbon atoms and mixtures thereof, polymers containing at least 50% by weight of alpha olefins containing 2 to 6 carbon atoms with vinyl alkanoates, alkylacrylates, alkylmethacrylates and mixtures thereof, bonded by an intermediary polymer layer comprising at least one layer comprising a bonding agent, wherein at least one layer containing scrap produced from the multi-layer foil structure is included in the multi-layer foil structure intermediate of said styrenic and olefinic polymer layers, said scrap-containing layer comprising a mixture of said scrap with a graft copolymer in a ratio of graft copolymer to scrap of from 0.2:1 to 9:1 wherein the graft copolymer comprises at least one polyolefinic substrate selected from the group consisting of polymers of C_2 to C_6 alpha-olefin monomers and mixtures thereof, polymers of said alpha-olefin monomers and a diene, polymers of said alpha olefin monomers and vinyl monomers having grafted thereon from 10 to 50% by weight of a styrenic monomer selected from the group consisting of styrene, methyl styrene, chlorostyrene, and mixtures thereof, and mixtures of at least one of said monomers with a minor amount of at least one monomer selected from the group consisting of acrylonitrile, methacrylonitrile, alkylacrylates, alkylmethacrylates, butadiene, and isoprene.

4,234,664

ORIENTED POLYOLEFIN FILM

Brian N. Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 762,157, Jan. 24, 1977. This application Mar. 30, 1979, Ser. No. 25,599

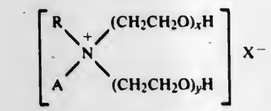
Claims priority, application United Kingdom, Feb. 6, 1976, 4767/76

Int. Cl.[3] B32B *27/32*

U.S. Cl. 428—520 **8 Claims**

1. An oriented polyolefin film comprising a polyolefin substrate having on at least one surface thereof a mixture comprising:

(a) a quaternary ammonium salt of the formula:



wherein X is a univalent anion or an equivalent of a multivalent anion, x and y are positive integers the sum of which is from 2 to 5, A is a lower alkyl group containing from 1 to 6 carbon atoms, and R is a univalent aliphatic radical containing from 1 to 22 carbon atoms, and (b) a monoethoxylated quaternary ammonium salt.

4,234,665

OIL-BORNE CREOSOTE AND PENTACHLOROPHENOL WOOD PRESERVATIVE COMPOSITIONS CONTAINING DIMETHYLAMIDE

Titus M. Johnston, Nesbit, Miss., assignor to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Oct. 17, 1979, Ser. No. 85,567

Int. Cl.[3] B05D *1/18;* B18K *3/40*

U.S. Cl. 428—541 **11 Claims**

1. In a process for the treatment of wood with a wood preservative composition selected from the group consisting of oil-borne creosote and oil-borne pentachlorophenol compositions to inhibit the growth and proliferation of bacteria and fungi in and on the surface of the wood, the improvement which comprises the addition to said wood preservative composition of a N,N-dimethylamide of a carboxylic acid containing 18 carbon atoms and at least 1 carbon to carbon double bond in an amount sufficient to increase the wood penetrative properties of said preservative composition.

4,234,666

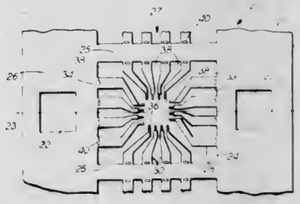
CARRIER TAPES FOR SEMICONDUCTOR DEVICES

Michael T. Gursky, Allentown, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,134

Int. Cl.[2] H02G *13/08;* H05K *5/00, 15/00*

U.S. Cl. 428—573 **9 Claims**



1. A tape which comprises:

a continuous web having at least an electrical conductor strip;

at least one pattern in the continuous web;

at least one cluster of finger-like leads in the pattern which leads have free ends that project toward the center of the cluster and opposite ends fixed to the web; and

at least one stress-relief means at a stress-relief site in each of the leads formed by reducing the cross sectional area of the lead to weaken the cross section and located symmetrically about the longitudinal centerline of each lead for absorbing flexure and tensile stresses by concentrating the stresses to plastically deform the leads at the stress-relief sites to form the finger-like leads into a spaced relationship with the plane of the tape during an inner lead bonding operation.

4,234,667

BATTERY AND METHOD FOR FABRICATING SAME

Douglas N. Bennion, Bellevue, Wash., and Su-Chee S. Wang, Los Angeles, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 2, 1979, Ser. No. 16,929

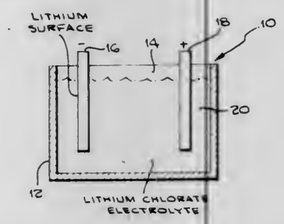
Int. Cl.[3] H01M *6/36*

U.S. Cl. 429—81 **28 Claims**

1. An electrical battery comprising:

a positive electrode;

an electrolyte comprising molten lithium chlorate or lithium perchlorate; and



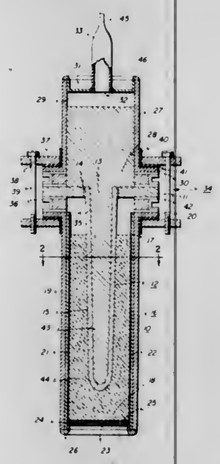
a negative electrode comprising elementary lithium in contact with said electrolyte.

4,234,668

COMPOSITE SULFUR ELECTRODE CONTAINER AND METHOD OF MANUFACTURE

Dong-Sil Park; Manfred W. Breiter, both of Schenectady, and Rendall N. King, Johnstown, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,485
Int. Cl.[3] H01M 2/02
U.S. Cl. 429—163 **3 Claims**



1. A composite sulfur electrode container for use as a portion of a sodium-sulfur cell which comprises an outer metallic casing portion readily corroded by liquid sulfur and polysulfides, the outer casing having opposite open ends, a metallic foil portion substantially corrosion resistant to liquid sulfur and polysulfides bonded to the inner surface of the outer casing portion, a chromium layer portion bonded to the opposite surface of the foil portion, the chromium layer portion containing in excess of 60 weight percent chromium, a metallic end cap adapted to fit and to be sealed within and adjacent one open end of the container, and at least the inner surface of the end cap substantially corrosion resistant to liquid sulfur and polysulfides.

4,234,669

CRT SCREEN STRUCTURE PRODUCED BY PHOTOGRAPHIC METHOD

Samuel Pearlman, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 800,285, May 25, 1977, abandoned. This application Mar. 27, 1979, Ser. No. 24,391
Int. Cl.[3] G03C 5/00
U.S. Cl. 430—25 **10 Claims**

1. A method for producing a screen structure on a surface for a cathode-ray tube including

(a) exposing a film of water-soluble photopolymeric material on said surface to a light image until the solubilities of the irradiated regions of said film are selectively reduced,

(b) flushing said exposed film with an aqueous medium that is free from borate ions to remove only the regions of greater solubilities, thereby producing a stencil on said surface,

(c) rinsing said stencil and support surface with an aqueous solution containing borate ions whereby an encapsulating skin is formed on said stencil for preventing further removal of material from said stencil by subsequently-applied aqueous media,

(d) then overcoating said stencil and the surface not covered by said stencil with pigment material,

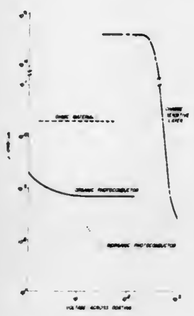
(e) and then removing only said stencil and the overcoating thereon.

4,234,670

REDUCIBLE METAL SALT-DRY ELECTROGRAPHIC VISIBLE IMAGE RECORDING PROCESS

Joseph Y. Kaukeinen, and Duane A. Rockafellow, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 624,815, Oct. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,814, Jul. 29, 1974, abandoned. This application Sep. 27, 1979, Ser. No. 79,642
Int. Cl.[3] G03G 13/22, 13/24, 13/12
U.S. Cl. 430—52 **26 Claims**



1. A dry electrographic recording process for producing a visible image in a charge-sensitive recording element having an ohmic resistivity of at least about 1×10^{10} ohm-cm and containing at least one reducible metal salt, said process comprising the steps of:

(a) applying an electric potential to selected portions of said recording element of a magnitude and for a sufficient period of time to produce in said portions a charge density of from approximately 1 microcoulomb/cm^2 to approximately 1 millicoulomb/cm^2 said charge density forming a developable pattern of latent image sites; and

(b) heating the entire recording element substantially uniformly in the presence of a reducing agent until a sufficient quantity of said metal salt is reduced at said image sites to form a visible image.

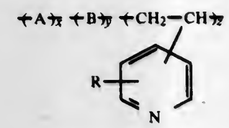
4,234,671

COLOR DIFFUSION TRANSFER DYE MORDANT

Hideaki Iwama, Tachikawa; Mikio Koyama, Tokorosawa; Masao Asano, and Yasuo Tsuda, both of Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,800
Claims priority, application Japan, Mar. 20, 1978, 53/32100
Int. Cl.[2] G03C 1/40
U.S. Cl. 430—213 **3 Claims**

1. A color diffusion transfer photographic material comprising a support, a photosensitive layer containing a silver halide emulsion, at least one layer containing a dye mordant and at least one layer containing a dye image forming substance wherein the dye mordant-containing layer comprises a water-dispersible particulate polymer mordant comprising units represented by the general formula:



wherein A is a polymerized monomer unit containing at least 2 ethylenically unsaturated groups; B is a polymerized copolymerizable α,β-ethylenically unsaturated monomer unit; and R is a hydrogen atom or a methyl or ethyl group; x, y and z individually represent a mole proportion, and x is 1–3 mol %, y is 7–49 mol % and z is 50–90 mol %.

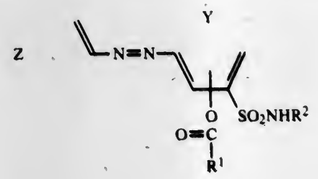
4,234,672

SHIFTED PHOTOGRAPHIC DYES AND COMPOSITIONS, ELEMENTS AND PROCESSES EMPLOYING THEM

John A. Ford, and Gregory J. Lestina, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,463
Int. Cl.[3] G03C 3/02, 1/10
U.S. Cl. 430—222 **28 Claims**

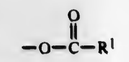
1. A photographic element comprising a support, at least one photosensitive silver halide emulsion layer and, associated with the silver halide emulsion layer, a photographic image dye of the formula:



wherein:

Z represents the atoms to complete an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms;

Y represents the atoms to complete a benzene or naphthalene nucleus;



is ortho to the sulfamoyl group;

R^1 is a tertiary alkyl group of 4 to 20 carbon atoms or a tertiary amino group of the formula $-N(R^3)_2$ where each R^3 is independently alkyl of 1 to 10 carbon atoms or aryl of 6 to 20 carbon atoms; and

R^2 is a primary or secondary alkyl group of 1 to 20 carbon atoms.

4,234,673

MANUFACTURE OF SIGNS USING PHOTOIMAGING AND HEAT TRANSFER

Simon L. Scrutton; John V. Shepherd; John S. Thornley, all of London, England, and Eric M. Sutton, Nairobi, Kenya, assignors to Letraset Corporation, Paramus, N.J.

Filed Dec. 20, 1978, Ser. No. 971,647
Claims priority, application United Kingdom, Dec. 21, 1977, 53243/77
Int. Cl.[3] G03C 11/12, 5/00
U.S. Cl. 430—252 **14 Claims**

1. The method of manufacturing a subsurface sign legend which comprises

forming a composite material by applying to a coating layer a transparent or translucent substrate, said coating layer comprising a photosensitized organic polymeric material whose adhesion to the substrate increases on exposure to light,

imagewise exposing the composite material through the substrate to a sign legend whereby the adhesion of the polymeric material to the substrate in the areas exposed to light is increased, and

developing the imagewise exposed material by application of a water spray to remove the polymeric composition from the unexposed areas to leave a legend formed in sign indicia on said substrate,

bringing a light transmitting plastic surface into contact with the exposed surface of the legend on the substrate to form a laminate, and

applying sufficient heat and pressure to said laminate to form a bond between the light transmitting surface and the indicia which is stronger than the bond between the indicia and the substrate, and

thereafter stripping the substrate away from the indicia.

4,234,674

AMINO-FUNCTIONAL PHOTOPOLYMER COMPOSITIONS AND PHOTO-OXIDATION IMAGING PROCESSES EMPLOYING SAME

James C. Woodbrey, Chesterfield, Mo., and Marlowe V. Moncur, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 866,133, Dec. 30, 1977, Pat. No. 4,188,223. This application Aug. 8, 1979, Ser. No. 64,978
Int. Cl.[3] G03C 11/12, 5/00, 1/68
U.S. Cl. 430—253 **19 Claims**

1. An imaging process comprising selectively exposing to electromagnetic radiation in the presence of ordinary molecular oxygen a film or layer of a photopolymer composition comprising an amino-functional photopolymer having two or more amino-functional groups per polymeric unit, said amino-functional groups comprising one selected from the group consisting of tertiary aliphatic amines, hindered secondary aliphatic amines, dialkyl aryl amines and combinations thereof, and

a photosensitizer capable of generating singlet molecular oxygen upon being subjected to electromagnetic radiation in the presence of ordinary molecular oxygen,

said photopolymer being capable of undergoing a photooxidation reaction when exposed to electromagnetic radiation in the presence of said photosensitizer and ordinary molecular oxygen to form a latent image in the exposed regions of said film or layer.

4,234,675

DRY FILM PHOTOSENSITIVE RESIST

Vladimir N. Kuznetsov, ulitsa Jubileinaya, 6, kv. 73, Istra Moskovskoi oblasti, U.S.S.R.

Continuation of Ser. No. 822,569, Aug. 8, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,068
Claims priority, application U.S.S.R., Aug. 10, 1976, 2382553
Int. Cl.³ G03C 1/68
U.S. Cl. 430—271 40 Claims

1. A dry film photosensitive resist comprising a flexible laminated structure consisting of three layers: a first transparent polymer film transmitting UV radiation and having a thickness of 5-100μ; a second light-sensitive layer having a thickness of 5-1,000μ consisting essentially of:

(a) a carboxyl-containing polymer thickener consisting essentially of a water insoluble copolymer obtained by the polymerization of at least one carboxyl-containing monomer with at least one water insoluble monomer having a water solubility of less than 3 weight % at 20° C. and a pH of 7, the amount of carboxyl-containing monomer in the polymer ranging from 20 to 50 mol%;

(b) a hydroxyl-containing polar oligomer obtained through addition of an organic acid to at least one epoxy resin, said polar oligomer having a chain length of from 300 to 3,000 carbon units, and containing 4 to 8 weight % OH groups and wherein the number of residual epoxy groups in the polar oligomer ranges from zero to 10% of the initial number of epoxy groups;

(c) a monomeric substance having a boiling point above 200° C. at 760 mm Hg containing at least one fully substituted ester of a polyatomic alcohol with carboxylic acids, at least two hydroxyl groups of the polyatomic alcohol being substituted by residues of methacrylic and/or acrylic acid; the weight ratio of said polymer-thickener, polar oligomer, and monomeric substance in the light-sensitive layer being 100:15-100:15-100 respectively; a third layer comprising a polymeric film having a thickness of 5-100μ to form a protective layer for the light-sensitive layer and disposed thereon, all of the three layers being adhesively bonded together.

4,234,676

POLYTHIOL EFFECT CURABLE POLYMERIC COMPOSITION

Paul R. Hein, Marietta; James A. Evans, Atlanta, and Michael W. Yang, Marietta, all of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,931
Int. Cl.² G03F 7/08; C33F 7/10
U.S. Cl. 430—286 6 Claims

1. The method of forming a printing plate which comprises

(A) Applying to a polyester film substrate in a coating thickness of about 2 to about 200 mils, a radiation curable composition comprising

(1) about 60 to about 95% by weight of said composition of C-C unsaturated acrylonitrile resin having a macromolecular structure and being a polyene having a weight average molecular weight of at least about 5,000;

(2) about 5 to about 30% by weight of said acrylonitrile resin of at least one monomer of an addition photopolymerizable polyethylenically unsaturated acrylic or methacrylic acid ester containing one or more acrylate or methacrylate groups per molecule or mixtures thereof having at least one photocrosslinkable C—C unsaturated bond;

(3) about 0.01 to about 10% by weight of said acrylonitrile resin of photoinitiator; and

(4) about 0.5 to about 10% by weight of said acrylonitrile resin of polythiol having the general formula R_8—$(-SH)_n$ where n is at least 2 and R_8 is a polyvalent organic moiety free from reactive carbon to carbon unsaturation, said polythiol being limited to an amount that will not basically change the curing properties of the combination of components (1), (2) and (3) of said radiation curable composition,

(B) Exposing to actinic radiation projected through an image-bearing transparency selected portion of said radiation curable composition for a time sufficient to cure said radiation curable composition in the exposed portions, and

(C) Thereafter removing the unexposed radiation curable composition, forming a resilient printing plate that has a surface having a substantially reduced tack compared to a printing plate formed from the same composition except the polythiol.

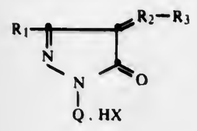
4,234,677

PYRAZOLONE DYESTUFFS AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Stephen R. Postle, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 22, 1979, Ser. No. 5,647
Claims priority, application United Kingdom, Jan. 26, 1978, 3110/78; Feb. 16, 1978, 6089/78
Int. Cl.³ C07D 231/08, 401/06, 403/06
U.S. Cl. 430—518 13 Claims

1. A dyestuff of the formula

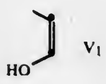


wherein,

R_1 is alkyl of 1 to 5 carbon atoms, amino, amido, hydroxyl or carboxyl, phenyl substituted by halogen, hydroxyl, alkyl or alkoxyl of 1 to 5 carbon atoms,

R_2 is -N= or =CH-$(CH=CH)_n$- where n is 0, 1 or 2 and

R_3 is 5-membered nitrogen-containing heterocyclic ring with 1 or 2 nitrogen atoms, a 6-membered nitrogen-containing heterocyclic ring with 1 nitrogen atom or these rings fused with a benzene ring, phenyl or phenyl substituted by halogen, hydroxyl, alkyl of 1 to 5 carbon atoms, carbalkoxyalkoxy with 1 to 5 carbon atoms in each alkoxy moiety or dialkylamino with 1 to 5 carbon atoms in each alkyl radical, R_3 is further a heterocyclic ring of the formula



wherein,

V_1 represents the atoms to complete a 5- or 6-membered nitrogen-containing heterocyclic ring with 1 or 2 nitrogen atoms or this ring substituted by hydroxyl, alkyl of 1 to 5 carbon atoms or cyano, and

Q is a group of the formula



wherein

W_1 and Y_1 are hydrogen or alkyl of 1 to 5 carbon atoms and X is an anion.

4,234,678

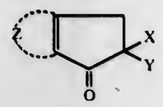
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Shinji Yoshimoto, Hachioji; Mitsuto Fujiwhara, Tokyo; Shoji Kikuchi, Hachioji; Ryosuke Satoh, Koganei; Takaya Endo, and Satoshi Nakagawa, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1978, Ser. No. 962,793
Claims priority, application Japan, Nov. 23, 1977, 52-140927
Int. Cl.³ G03C 1/06
U.S. Cl. 430—564 7 Claims

1. A photographic material comprising a light-sensitive silver halide emulsion layer coated on a support, which material is characterized by containing a compound represented by the following general formula [I]:

General formula [I]



wherein X represents hydrogen or halogen atom, Y represents a group capable of being released, when said compound of the general formula reacts with an oxidation product of a color developing agent, and of forming an arylmercapto compound, a heterocyclic mercapto compound or a triazole compound which has no mercapto group, each having a development inhibiting action, and Z represents a nonmetal atomic group necessary for forming a benzene ring, said benzene ring having been substituted by at least one —S—R group and/or a group having at least one —S—R group in which R represents an alkyl, aryl or heterocyclic group.

4,234,679

DRY IMAGE FORMING MATERIALS

Kageyasu Akashi; Yoshio Hayashi; Tatsumi Arakawa; Takeo Kimura, and Hidehiko Kobayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 950,772
Claims priority, application Japan, Oct. 17, 1977, 52-123575
Int. Cl.² G03C 1/02
U.S. Cl. 430—619 6 Claims

1. A dry image forming material comprising:

(a) an organic silver salt oxidizing agent;

(b) a photosensitive silver halide or a component capable of forming a photosensitive silver halide by the reaction with the organic silver salt oxidizing agent (a);

(c) a reducing agent for silver ion; and

(d) at least one compound selected from the group consisting of α,α,α',α'-o-tetrabromoxylene, α,α,α',α'-m-tetrabromoxylene, α,α,α',α'-p-tetrabromoxylene, 1,2-diiodoethane and tribromoacetic acid.

4,234,680

METHOD FOR TERMINATING A PEROXIDASE CATALYZED REACTION

Richard C. Hevey, Rockport, Me.; Mark K. Malmros, Newton, Pa., and Wayne W. Petko, Bound Brook, N.J., assignors to Calbiochem-Behring Corp., La Jolla, Calif.

Filed Aug. 3, 1979, Ser. No. 63,178
Int. Cl.³ C12Q 1/66, 1/28; C12N 9/99
U.S. Cl. 435—7 7 Claims

1. A method for terminating a peroxidase catalyzed reaction employed in a peroxidase-labeled enzyme immunoassay for detecting and quantitating ligands, said peroxidase catalyzed reaction comprising the oxidation of a substrate selected from the group consisting of o-phenylenediamine, m-phenylenediamine, dianisidine, aniline, p-aminobenzoic acid and m-aminosalicylic acid in the presence of a peroxide selected from the group consisting of hydrogen peroxide, methyl peroxide and ethyl peroxide, which method comprises adding to the enzyme immunoassay subsequent to the peroxidase catalyzed reaction an amount of alkali metal metabisulfite sufficient to terminate said reaction.

4,234,681

IMMOBOLIZED LIGHT EMITTING SYSTEMS

Marlene A. DeLuca-McElroy, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 750,436, Dec. 14, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,642
Int. Cl.³ C12Q 1/66; C12N 11/18, 11/14, 11/10
U.S. Cl. 435—8 7 Claims

1. A product useful for comprising: a non-reactive elongated rod having an insoluble enzyme retaining material attached thereto, said enzyme retaining material being porous glass beads; an oxidoreductase enzyme immobilized on said enzyme retaining material; and luciferase enzyme also immobilized on said enzyme retaining material.

4,234,682

METHOD AND REAGENT FOR DETERMINING BIOLOGICALLY ACTIVE HEPARIN IN PLASMA

Knut Bartl, Tutzing; Helmut Lill, Wielenbach, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,759
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812943
Int. Cl.³ C12Q 1/38, 1/56
U.S. Cl. 435—13 7 Claims

1. Method for the determination of the biological activity of heparin in plasma which method comprises

adding to the heparin sample a proteolytic enzyme selected from thrombin or factor Xa, and a chromogen substrate of said proteolytic enzyme, without addition of exogenous antithrombin III, and measuring the dye released from the chromogen substrate as a measure of the heparin activity initially present.

4,234,683

BETA-LACTAMASE DIAGNOSTIC PRODUCT AND METHOD

William A. McMillan, 2981 Magliocco Dr., Apt. 2, San Jose, Calif. 95128

Filed Nov. 24, 1978, Ser. No. 963,910
Int. Cl.³ C12Q 1/34, 1/36, 1/04
U.S. Cl. 435—18 20 Claims

1. A diagnostic product useful for sensitive, reproducible assays of microorganisms which produce beta-lactamase comprising:

a porous support on which is absorbed a substrate component, a starch component and a water-soluble thiosulfate component, the substrate component having a beta-lactamase ring.

4,234,684

METHOD OF PREPARING MYCOPHENOLIC ACID GLUCOSIDE

Bernard J. Abbott, Greenwood, and John G. Whitney, Noblesville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 11, 1979, Ser. No. 102,504
Int. Cl.³ C12P 19/60
U.S. Cl. 435—75 4 Claims

1. The method of producing mycophenolic acid glucoside which comprises contacting mycophenolic acid with glucose in the presence of a glucosylating enzyme selected from that produced by *Streptomyces candidus* NRRL 5449 and that produced by *Streptomyces aureofaciens* NRRL 2209 in an aqueous

medium until a substantial amount of mycophenolic acid glucoside is produced.

4,234,685

MICROBIOLOGICAL METHYLATION OF AMINOGLYCOSYL-AMINOGLYCOSIDES

Bong K. Lee; Gerald H. Wagman, both of East Brunswick; Dinanath F. Rane, Emerson; Joseph A. Marquez, Montclair, and Peter J. L. Daniels, Cedar Grove, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 25, 1979, Ser. No. 51,790
Int. Cl.[3] C12P *19/48*
U.S. Cl. 435—80 7 Claims

1. A process for methylating certain aminoglycosyl aminocyclitols which comprises subjecting a member of the group consisting of tobramycin, kanamycin A, kanamycin B and dibekacin to *Micromonospora inyoensis* 1550F-1G or to *Micromonospora purpurea* strain 1124 in an aqueous nutrient medium containing an assimilable source of nutrients and an assimilable source of methionine, under aerobic conditions until methylation is substantially complete and recovering the corresponding 3″-N-methyl and the corresponding 3″-N-methyl-4″-C-methylanalogs of said aminoglycosyl aminocyclitols.

4,234,686

STARCH-DEGRADING ENZYMES DERIVED FROM *CLADOSPORIUM RESINAE*

James J. Marshall, Miami, Fla., assignor to Lifeline Products, Inc., Plainfield, N.J.

Continuation-in-part of Ser. No. 892,747, Apr. 3, 1978. This application Jun. 7, 1979, Ser. No. 46,482
Int. Cl.[2] C12P *19/24, 19/20, 19/16, 19/14*
U.S. Cl. 435—94 8 Claims

1. A method of producing dextrose from starch which comprises solubilizing starch to prepare a solution with a pH in the range from about 1.5 to about 8.5, contacting said solubilized starch with the mixture of starch-degrading enzymes selected from the group consisting of a mixture of starch-degrading enzymes prepared by culturing *Cladosporium resinae* (Strain ATCC No. 20 495) and an exo-pullulanase, a maltase, an α-amylase and glucoamylase S produced by *Cladosporium resinae* (Strain ATCC No. 20495) at a temperature in the range from about 30° C. to about 70° C. for a sufficient time so that said starch is substantially completely converted to dextrose, and recovering the dextrose so produced.

7. A method of producing fructose from starch which comprises the method of claim 1 wherein glucose isomerase is additionally present along with the mixture of starch-degrading enzymes.

4,234,687

β-GALACTOSIDASE

Stephen J. Bungard, and David Byrom, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 9, 1977, Ser. No. 831,914
Claims priority, application United Kingdom, Sep. 19, 1976, 38002/76
Int. Cl.[3] C12P *19/14;* C12N *9/38;* C12R *1/01*
U.S. Cl. 435—99 16 Claims

1. A method for producing a composition selected from the group consisting of β-galactosidase enzyme and enzyme preparations containing β-galactosidase, comprising:

culturing a microorganism having the identifying characteristics of the microorganism LT-2 (NCIB No: 11259) capable of producing β-galactosidase, in a medium containing appropriate nutrients, and

recovering the β-galactosidase.

8. A method according to claim 1 wherein the medium contains as a carbon source a carbohydrate selected from the group consisting of lactose and galactose.

4,234,688

POLYSACCHARIDE PRODUCING PROCESS USING PROTEASE AND AZOTOBACTER

Renton C. Righelato, and Trevor R. Jarman, both of Reading, England, assignors to Tate & Lyle Limited, London, England

Filed Mar. 10, 1978, Ser. No. 885,272
Claims priority, application United Kingdom, Mar. 14, 1977, 10695/77
Int. Cl.[2] C12P *19/04;* C13L *3/00;* C12R *1/065*
U.S. Cl. 435—101 9 Claims

1. In a process for producing a polysaccharide by culturing a polysaccharide-producing strain of *Azotobacter vinelandii* in a culture broth containing a nutrient medium for said strain, the improvement which comprises regulating the solution viscosity of the polysaccharide product by incorporating in the culture broth during the culture a viscosity regulating effective amount of a protease having proteolytic activity at the pH of the culture broth.

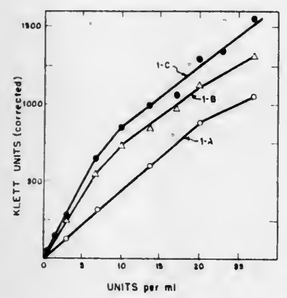
6. In a process for producing a polysaccharide by culturing in a fermenter polysaccharide-producing strain of *Azotobacter vinelandii* in a culture broth containing a nutrient medium for said strain, and subsequently withdrawing the culture broth from the fermenter and storing the broth for a finite period before isolation of the polysaccharide product from the broth, the improvement which comprises conducting said culturing in the presence of a first amount of a protease having proteolytic activity at the pH of the culture broth and by adding to the culture broth, after it is withdrawn from the fermenter but before isolation of the polysaccharide product therefrom, second amount of said protease, said first and second amounts together being a solution viscosity regulating amount whereby the solution viscosity of the polysaccharide product is regulated.

4,234,689

PRODUCTION OF α-EMULSANS

David L. Gutnick, Ramat Aviv; Eugene Rosenberg, Raanana, and Yossef Shabtai, Ramat Hasharon, all of Israel, assignors to Biotechnologie Aktiengesellschaft fiir Emulsan, Basel, Switzerland

Filed Feb. 22, 1979, Ser. No. 12,972
Int. Cl.[2] C12P *19/04*
U.S. Cl. 435—101 21 Claims



1. A process for producing extracellular microbial lipopolysaccharides which comprises (A) inoculating an aqueous fermentation medium containing a growth-sustaining amount of ethanol with a culture of Arthrobacter Sp. ATCC 31012 or its mutants; and (B) aerobically growing the microorganism in such fermentation medium, while adding additional amounts of ethanol to sustain growth, for a period of time sufficient to produce extracellular microbial protein-associated lipopolysaccharides (herein collectively called "α-emulsans") in which the lipopolysaccharide components (herein collectively called "apo-α-emulsans") of such α-emulsans are N- and O-lipoacylated heteropolysaccharides made up of major amounts of D-galactosamine and an aminouronic acid, such apo- -emulsans containing at least 5 percent or above by weight of fatty acid esters in which (1) the fatty acids contain from about 10 to about 18 carbon atoms; and (2) about 50 percent by weight or more of such fatty acids are composed of 2-hydroxydodecanoic acid and 3-hydroxydodecanoic acid.

4,234,690

METHOD FOR PRODUCING ROSARAMICIN (ROSAMICIN)

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 516,338, Oct. 21, 1974, Pat. No. 4,161,523, which is a continuation-in-part of Ser. No. 303,883, Nov. 15, 1972, abandoned, and Ser. No. 4,916, Jan. 22, 1970, abandoned. This application Jul. 16, 1979, Ser. No. 58,044
Int. Cl.[3] C12P *17/18*
U.S. Cl. 435—119 6 Claims

1. A process for the production of rosaramicin which comprises cultivating an rosaramicin producing strain of *Micromonospora rosaria* in an aqueous nutrient medium under submerged aerobic conditions until a composition of matter having substantial antibiotic activity is produced and isolating the composition of matter from said medium.

4,234,691

L-LYSINE α-OXIDASE

Hitoshi Kusakabe, Kyoto; Kenjiro Kodama, Choshi; Yuichiro Midorikawa, Choshi; Akira Kuninaka, Choshi; Haruo Misono, Hirakata, and Kenji Soda, Uji, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba, Japan

Filed Feb. 26, 1979, Ser. No. 15,179
Claims priority, application Japan, Feb. 27, 1978, 53/20993; Jun. 16, 1978, 53/73441
Int. Cl.[2] C12N *9/06*
U.S. Cl. 435—191 6 Claims

1. L-lysine α-oxidase which is an L-amino acid oxidase having an ability to form α-keto-ε-aminocaproic acid, ammonia and hydrogen peroxide from L-lysine by oxidative deamination of L-lysine in the presence of water and oxygen as well as having a very low Km value with respect to L-lysine and the high substrate-specificity with respect to L-lysine.

4,234,692

PREPARATION OF SULPHONIUM POLYMERS

Claude Favie, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Mar. 7, 1979, Ser. No. 18,170
Claims priority, application France, Aug. 3, 1978, 78 06723
Int. Cl.[3] C08F *08/34*
U.S. Cl. 521—33 14 Claims

1. A method of preparing a polymer the chain of which bears lateral branchings terminated by a sulfonium group and the chain of which has a hydroxyl group in the β position with respect to each of the sulfonium groups comprising the successive steps of:

(a) reacting an epoxy group containing polymer with a mercaptan in the presence of a basic substance as an oxirane bridge opening catalyst so as to convert a portion of the epoxy groups into sulfide groups;

(b) eliminating the residual epoxy groups from said sulfide group containing polymer by reaction thereof with a strong acid; and

(c) reacting the resulting sulfide containing polymer with an alkyl halide or alkyl ester in a non-acid medium so as to convert said sulfide groups into sulfonium groups.

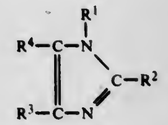
4,234,693

PROCESS FOR MAKING POLYUREA FOAMS UTILIZING IMIDAZOLE CATALYSTS

Alan M. Wooler, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 14, 1976, Ser. No. 695,413
Claims priority, application United Kingdom, Jun. 24, 1975, 26746/75
Int. Cl.[3] C08G *18/14, 18/20, 18/76*
U.S. Cl. 521—107 8 Claims

1. A process for the manufacture of polyurea foams which comprises reacting an organic polyisocyanate with from 1 to 10 times the chemically equivalent amount of water in the presence of from 0.5 to 10% by weight, based on the weight of organic polyisocyanate, of an imidazole compound of the formula:



wherein R^1, R^2, R^3 and R^4 each independently represents hydrogen or lower alkyl.

4,234,694

ADDITION COMPOUNDS WHICH CONTAIN PHOSPHORUS AND THEIR USE AS CATALYSTS FOR THE PRODUCTION OF FOAM RESINS WHICH CONTAIN CARBODIIMIDE GROUPS

Andrea La Spina, Saronno, Italy; Werner Dietrich, and Reinhard Schliebs, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 2,623, Jan. 8, 1979, abandoned, which is a continuation of Ser. No. 857,059, Dec. 5, 1977, abandoned, which is a continuation of Ser. No. 394,427, Sep. 4, 1973, abandoned. This application May 21, 1979, Ser. No. 41,124
Int. Cl.[3] C08G *18/14, 18/16*
U.S. Cl. 521—107 11 Claims

1. In a process for the production of hard foam resins which contain carbodiimide groups from polyisocyanates in the presence of catalysts which form carbodiimide groups and a blowing agent, in the absence of carboxylic acids and imide-forming catalysts, the improvement comprising employing catalysts consisting essentially of addition compounds comprising the reaction products of (a) phospholine oxides, and (b) mono-, di- and/or polyalcohols with a molecular weight of 32 to 250, wherein component (a) and component (b) are mixed in a molar ratio of 1:20 to 20:1 and wherein said catalysts are used in a quantity of 0.5 to 20% by weight, based on the quantity of polyisocyanate.

4,234,695

METHOD OF PRODUCING POLYUREA FOAMS

Toshio Yukuta; Takumi Ishiwaka, both of Yokohama, and Kiyoshi Usui, Kawasaki, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 88,312
Claims priority, application Japan, Oct. 25, 1978, 53-131128; Oct. 25, 1978, 53-131129
Int. Cl.[3] C08J *9/02*
U.S. Cl. 521—107 10 Claims

1. A method of producing polyurea foams, which comprises reacting an organic polyisocyanate with water in the presence of urea.

4,234,696

2-CHLOROETHYL PHOSPHONATE COMPOSITIONS

Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 945,668, Sep. 25, 1978, Pat. No. 4,179,482, which is a continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,581

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—108 3 Claims

1. The process of improving the tack-free and rise times in the production of a rigid polyurethane foam having flame retardant properties comprising incorporating in said polyurethane foam the composition prepared by the step-wise treatment of phosphorus trichloride with ethylene oxide in about stoichiometric proportions and at temperatures of from about −20° C. to 125° C. followed by treatment of the resulting phosphite ester intermediate with about 0.4 to 1.2 moles of acrylic acid per mole of said phosphite ester intermediate at temperatures of from about 20° C. to 150° C. and then heating up to about 185° C. until substantially all the phosphite ester is converted to phosphonate structures.

4,234,697

METHOD OF PREPARING CROSS-LINKED POLYDIORGANOSILOXANE USING ORGANIC ISOCYANATES AND PRODUCTS PREPARED THEREFROM

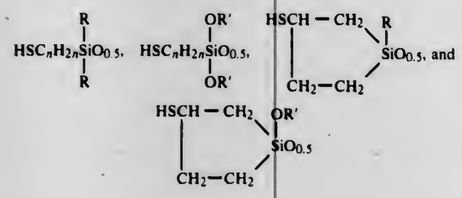
Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 18, 1979, Ser. No. 4,522

Int. Cl.[3] C08J *9/00*

U.S. Cl. 521—128 17 Claims

1. A method of preparing a sponge comprising combining a mercaptofunctional polydiorganosiloxane, an organic diisocyanate, and a catalyst such that a homogeneous mixture is formed, contacting the homogeneous mixture with water in the liquid state promoting foaming and cross-linking, and thereafter recovering a sponge, said mercapto-functional polydiorganosiloxane consisting essentially of a polydiorganosiloxane endblocked with organosiloxy units selected from units represented by unit formulae



wherein the polydiorganosiloxane has organic radicals selected from phenyl radicals and alkyl radicals of one to four inclusive carbon atoms, where at least 50 percent of the organic radicals of the polydiorganosiloxane are alkyl radicals, each R is phenyl radical or an alkyl radical of one to four inclusive carbon atoms, each R' is an alkyl radical of one to three inclusive carbon atoms, n is an integer of from 2 to 4 inclusive, there being more than one mole of isocyanate group from the organic diisocyanate for each mole of mercapto group from the mercapto-functional polydiorganosiloxane, and there being at least one mole of water for each mole of isocyanate in excess of one mole of isocyanate group per mole of mercapto group.

14. A sponge obtained from the method of claim 1.

4,234,698

METHOD OF MAKING CURED AMINOPLAST FOAM

George Inverarity, West Midlands, and Dennis H. Ogden, Wolverhampton, both of England, assignors to British Industrial Plastics Limited, England

Filed Dec. 4, 1978, Ser. No. 966,242

Claims priority, application United Kingdom, Sep. 12, 1977, 51269/77

Int. Cl.[2] C08G *12/12, 12/14*

U.S. Cl. 521—188 5 Claims

1. In a method of making a cured foamed aminoformaldehyde product by

(a) dispersing a curing catalyst and a blowing agent in a liquid aminoformaldehyde precondensate to obtain a liquid foamable composition, and

(b) heating the composition to a temperature such as to cause the flowing agent to form a foam and the aminoformaldehyde precondensate to cure,

the improvement which consists in

(1) employing as the aminoformaldehyde precondensate one that has a water content less than 20% by weight and a viscosity in the range of about 400 to about 1300 poise at 25° C., and is obtained from a reaction mixture which consists essentially of urea, a source of formaldehyde selected from paraformaldehyde and hexamine, and a reaction modifier to maintain the reaction mixture in the liquid phase, said modifier being selected from ethylene urea, a melamine-formaldehyde precondensate, melamine, diethylene glycol, polyvinyl alcohol, a water-soluble carbohydrate, and dicyandiamide, and

(2) formulating the foamable composition so that, at the temperature at which foaming begins, its viscosity is in the range 100–1000 poise.

4,234,699

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

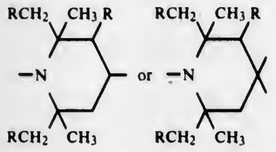
Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,685

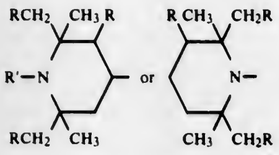
Int. Cl.[3] C08L *63/00*

U.S. Cl. 525—55 14 Claims

1. A polyether, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1–5 C atoms and R' denotes hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–8 C atoms, alkinyl with 3–6 C atoms, aralkyl with 7–12 C atoms, alkanoyl with 1–8 C atoms or alkenoyl with 3–5 atoms.

4,234,700

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

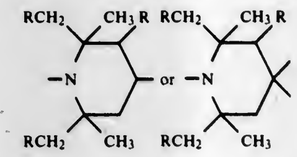
Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,044

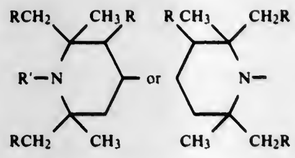
Int. Cl.[3] C08G *63/62*

U.S. Cl. 525—55 13 Claims

1. A polycarbonate, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1–5 C atoms and R' denotes hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–8 C atoms, alkinyl with 3–6 C atoms, aralkyl with 7–12 C atoms, alkanoyl with 1–8 C atoms or alkenoyl with 3–5 C atoms, and a copolymer thereof with polyalkylpiperidine-free components.

4,234,701

COMPOSITIONS COMPRISING COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN UNSATURATED CYCLIC ANHYDRIDE AND IMPACT IMPROVERS

Visvaldis Abolins, Delmar, N.Y.; John C. Goossens, Mount Vernon, Ind.; Fred F. Holub, Schenectady, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 6, 1977, Ser. No. 839,905

Int. Cl.[3] C08L *61/04*

U.S. Cl. 525—68 8 Claims

1. A thermoplastic molding composition which comprises an intimate admixture of:

(a) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride, and

(b) an impact modifier consisting essentially of a graft copolymer comprising a vinyl aromatic compound and a diene rubber, alone, or in combination with an acrylonitrile, and

(c) a polyphenylene ether resin.

4,234,702

SILICONE RUBBER COMPOSITIONS

Akito Nakamura, Ichihara, Japan, assignor to Toray Silicone Company, Ltd, Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,576

Claims priority, application Japan, Apr. 21, 1978, 53/46465

Int. Cl.[3] C08L *9/06, 23/16, 33/06, 83/04*

U.S. Cl. 525—100 4 Claims

1. A composition of matter consisting essentially of

(a) 5–95 parts by weight of an unvulcanized rubber selected from the group consisting of

(i) natural rubber and

(ii) synthetic organic rubber;

(b) 5–95 parts by weight of an unvulcanized organopolysiloxane rubber wherein the silicon atoms in the organopolysiloxane rubber are attached to monovalent hydrocarbon radicals or substituted monovalent hydrocarbon radicals selected from a group consisting of methyl, vinyl, phenyl and 3,3,3-trifluoropropyl radicals and wherein at least 50 mol percent of all the hydrocarbon radicals are methyl;

(c) 1–30 parts by weight based on 100 parts by weight of components (a) and (b) of an organopolysiloxane having the average unit formula

$$R_aR_b'SiO_{\frac{4-a-b}{2}}$$

wherein R is a substituted or unsubstituted monovalent hydrocarbon radical selected from the group consisting of methyl, ethyl, vinyl, phenyl, naphthyl, β-phenylethyl, 2-phenylpropyl, 3-chloropropyl and 3,3,3-trifluoropropyl radicals and R' is a substituted or unsubstituted aliphatic monovalent hydrocarbon radical of 4 to 20 carbon atoms, a has a value of 1 to 2.5 and b has a value of 0.01 to 1.2 and a+b has a value of 1.9 to 3;

(d) 0.1–15 parts by weight based on 100 parts by weight of components (a) and (b) of an organic peroxide.

4,234,703

POLYMER COMPOSITIONS AND A METHOD FOR ENHANCEMENT IN PHASE COMPATIBILITY OF ELASTOMERS WITH RELATIVELY RIGID POLYMERS

Geoffrey A. Lindsay, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 11, 1978, Ser. No. 950,481

Int. Cl.[3] C08L *23/16*

U.S. Cl. 525—211 1 Claim

1. A thermoplastic composition consisting essentially of a relatively rigid chlorinated vinylchloride polymer having enhanced impact resistance at relatively low temperatures, said composition containing (a) from about 20 to about 70 weight percent chlorinated poly(vinylchloride), (b) from about 10 to about 50 weight percent EPM and/or EPDM type elastomer, said EPM and EPDM type elastomer having an ethylene content from about 60 to about 85 weight percent and (c) about 10 to about 60 weight percent chlorinated ethylene, chlorinated interpolymers of ethylene and/or poly(ethylene-co-vinylacetate).

4,234,704

CHLOROPRENE POLYMER COMPOSITION

Yasuhiro Sakanaka, and Mamoru Narui, both of Shin-Nanyo, Japan, assignors to Toyo Soda Manufacturing Company, Limited, Yamaguchi, Japan

Filed Jun. 14, 1979, Ser. No. 48,382

Claims priority, application Japan, Sep. 18, 1978, 53/113671

Int. Cl.[3] C08L *11/00*

U.S. Cl. 525—215 10 Claims

1. In a chloroprene polymer composition consisting essentially of a benzene soluble chloroprene polymer (A) and a gel chloroprene polymer (B) in a ratio ranging from 20:1 to 1:1, the improvement comprising: said benzene soluble chloroprene polymer (A) being obtained by the aqueous emulsion polymerization of chloroprene or a mixture of chloroprene and from 1 to 20 weight %, based on the total monomer content, of an ethylenically unsaturated or conjugated diene comonomer with 0.05 to 5.0 weight % of a molecular weight regulator, said polymerization occurring by polymerizing said chloroprene or chloroprene-monomer mixture in the presence of a quantity of said molecular weight regulator, less than said above indicated amount, sufficient to prevent gel formation during polymeriza-

tion until a conversion level of 40% to 60% is attained, and then adding to the partially polymerized reaction medium an additional quantity of molecular weight regulator in an amount of from 40% to 70% by weight the amount of molecular weight regulator originally mixed with the monomer and continuing said polymerization until a conversion in excess of 80% is attained; and the gel chloroprene polymer (B) being obtained by the aqueous emulsion polymerization of chloroprene or a mixture of chloroprene and from 0.1 to 10% by weight of an ethylenically unsaturated polyfunctional monomer.

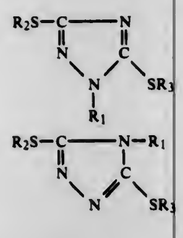
4,234,705

CURABLE COMPOSITION OF HALOGEN-CONTAINING POLYMER AND CROSSLINKING AGENT THEREFOR

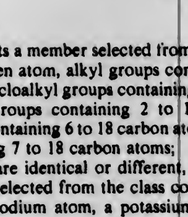
Yasuo Matoba, Toyonaka, Japan, assignor to Osaka Soda Co. Ltd., Osaka, Japan

Filed Sep. 26, 1979, Ser. No. 79,152
Claims priority, application Japan, Sep. 26, 1978, 53-118892
Int. Cl.³ C08J 3/24; C08C 19/32; C08F 8/30; C08G 65/32
U.S. Cl. 525—329 **6 Claims**

1. A curable composition consisting essentially of
(1) 100 parts by weight of a halogen-containing polymer,
(2) 0.1 to 10 parts by weight of a 3,5-dimercapto-1,2,4-triazole compound as a crosslinking agent which is selected from compounds of the following formulae



(I)



(I')

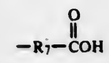
wherein
R_1 represents a member selected from the class consisting of a hydrogen atom, alkyl groups containing 1 to 18 carbon atoms, cycloalkyl groups containing 5 to 18 carbon atoms, alkenyl groups containing 2 to 18 carbon atoms, aryl groups containing 6 to 18 carbon atoms and aralkyl groups containing 7 to 18 carbon atoms;
R_2 and R_3 are identical or different, and each represents a member selected from the class consisting of a hydrogen atom, a sodium atom, a potassium atom, groups of the formula



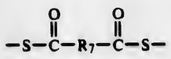
and groups of the formula



in which
R_4 and R_5 are identical or different and each represents a member selected from the class consisting of a hydrogen atom, alkyl groups containing 1 to 12 carbon atoms, cycloalkyl groups containing 5 to 12 carbon atoms, aryl groups containing 6 to 12 carbon atoms and aralkyl groups containing 7 to 18 carbon atoms, or R_4 and R_5 may form a heterocyclic ring in combination with each other, or through another heteroatom, and R_6 represents a member selected from the class consisting of alkyl groups containing 1 to 18 carbon atoms, cycloalkyl groups containing 5 to 18 carbon atoms, alkenyl groups containing 2 to 18 carbon atoms, aryl groups containing 6 to b 18 carbon atoms, aralkyl groups containing 7 to 18 carbon atoms and groups of the formula



in which
R_7 represents a member selected from the class consisting of alkylene groups containing 1 to 8 carbon atoms, alkenylene groups containing 1 to 8 carbon atoms, cycloalkylene groups containing 6 to 12 carbon atoms and arylene groups containing 6 to 12 carbon atoms;
and SR_2 and SR_3 may be bonded within the same molecule or among a plurality of molecules, forming a group of the formula



in which
R_7 is as defined above, and
(3) 0.5 to 50 parts by weight of a compound of a metal of group II or IVa of the periodic table as an acid acceptor.

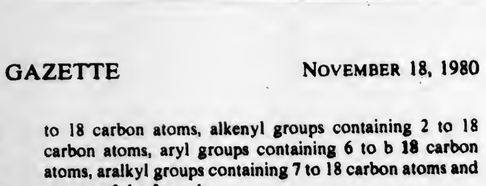
4,234,706

QUINONE-COUPLED POLYPHENYLENE OXIDES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 26, 1977, Ser. No. 800,635
The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.
Int. Cl.³ C08G 65/44, 65/48
U.S. Cl. 525—390 **8 Claims**

1. A quinone-coupled polyphenylene oxide of the formula



(I)

wherein independently each $\{OZO\}$ is a divalent quinone residue, Z is a divalent arene radical, either a or b is at least equal to 1 and the sum of a plus b is at least equal to 10, R′ is hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydrocarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus, R″ being the same as R′ and, in addition, halogen.

4,234,707

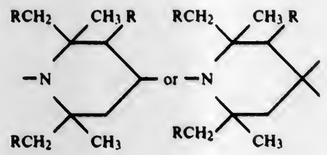
POLYMERIC LIGHT STABILIZERS FOR PLASTICS

Jean Rody, Basel, and Erwin Niklas, Liestal, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

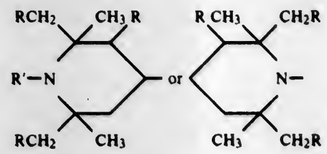
Filed Nov. 1, 1978, Ser. No. 956,715
Claims priority, application Switzerland, Nov. 10, 1977, 13722/77
Int. Cl.³ C08G 63/76
U.S. Cl. 525—437 **8 Claims**

1. A condensation or addition polymer selected from the group consisting of a polyester, polyamide, polyurethane, polyurea, polyether, polyamine or polyaminotriazine which

has blocked end groups and can be used as a light stabiliser and in which the recurring structural unit contains a polyalkylpiperidine residue of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R is hydrogen or alkyl having 1-5 C atoms and R′ is hydrogen, alkyl having 1-12 C atoms, alkenyl having 3-8 C atoms, alkynyl having 3-6 C atoms, aralkyl having 7-11 C atoms, alkanoyl having 1-8 C atoms or alkenoyl having 3-5 C atoms, or a copolymer of such polymers with one another or with a polyalkylpiperidine-free component, the end groups of the said polymer or copolymer having been blocked by the addition of a monofunctional compound during its preparation or by its subsequent reaction with a monofunctional compound.

8. A polymer according to claim 1 which is a polyester.

4,234,708

EXTRUSION GRADE POLYETHYLENE ISO/TEREPHTHALATE COPOLYMER

Robert Edelman, Staten Island, N.Y.; Frank M. Berardinelli, Millington, and Kurt F. Wissbrun, Short Hills, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 894,674, Apr. 10, 1978, Pat. No. 4,161,579. This application Apr. 23, 1979, Ser. No. 32,447
Int. Cl.³ C08G 63/46, 63/76
U.S. Cl. 525—444 **38 Claims**

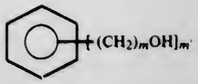
1. A high melt-strength, gel-free, branched polyethylene iso/terephthalate copolymer, capable of being extrusion blow molded to form shaped articles which are transparent throughout, comprising a polyethylene iso/terephthalate copolymer which has been modified by the incorporation of: (a) from about 0.025 to about 1.5 mol percent of chain branching agent selected from one or more members of the group consisting of pentaerythritol; compounds having the formula:

$$R^1(OH)_k$$

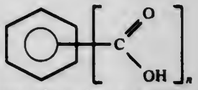
wherein R^1 is a saturated aliphatic hydrocarbon radical containing from 3 to 6 carbon atoms and k is an integer from 3 to 6; compounds having the formula:

$$R^2\text{-}(CH_2OH)_l$$

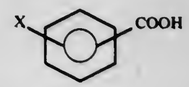
wherein R^2 is a saturated aliphatic hydrocarbon radical containing from 1 to 6 carbon atoms and wherein l is an integer from 3 to 6; compounds having the formula:



where m is an integer from 1 to 6 and m′ is an integer from 3 to 6; and compounds having the formula:



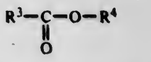
wherein n is an integer from 3 to 4; and (b) from about 0.25 to about 10 equivalents based on the number of moles of (a) of a chain terminating agent, the chain terminating agent having a boiling point of above about 200° C. and being stable at temperatures of up to about 305° C. and selected from one or more members of the group consisting of aromatic monocarboxylic acids having the formula:



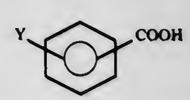
wherein X is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen, and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:

$$(C_6H_5)_pCH_{3-p}COOH$$

where p is an integer from 1 to 3; substituted and unsubstituted, saturated and unsaturated aliphatic monocarboxylic acids having from 6 to 30 carbon atoms; substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; monofunctional esters having the formula:



wherein R^3 is an organic radical derived from a member selected from the group consisting of aromatic monocarboxylic acids having the formula:

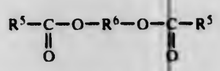


wherein Y is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:

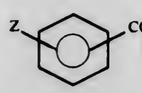
$$(C_6H_5)_qCH_{3-q}COOH$$

where q is an integer from 1 to 3; substituted and unsubstituted aliphatic monocarboxylic acids having from 6 to 30 carbon atoms; and substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; and wherein R^4 is a

member selected from the group consisting of benzyl radicals and aliphatic radicals having from 1 to 18 carbon atoms; and which are the reaction product of an alcohol and a monocarboxylic acid; and difunctional esters having the formula:



wherein R^5 is an organic radical derived from a member selected from the group consisting of aromatic monocarboxylic acids having the formula:



wherein Z is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen, and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:

$$(C_6H_5)_rCH_{3-r}COOH$$

wherein r is an integer from 1 to 3; substituted and unsubstituted, saturated and unsaturated aliphatic monocarboxylic acids having from 1 to 30 carbon atoms; and substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; and wherein R^6 is a member selected from the group consisting of saturated aliphatic radicals having from 2 to 18 carbon atoms and saturated alicyclic radicals having from 5 to 18 carbon atoms; and which are the reaction product of a diol and a monocarboxylic acid; the modified polyethylene iso/terephthalate copolymer having a zero shear rate melt viscosity at a temperature in the range of from about 265° C. to about 300° C. of from about 10^5 to about 10^6 poise and a melt viscosity at a shear rate of about 10^3 seconds^{-1} and at a temperature in the range of from about 265° C. to about 300° C. of from about 10^3 to about 10^4 poise.

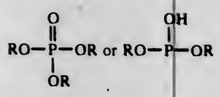
4,234,709

CATALYST COMPOSITION, METHOD FOR PRODUCING SAME AND METHOD FOR POLYMERIZATION OF 1-OLEFINS WITH SAME

Louis J. Rekers, Wyoming, and Stanley J. Katzen, Cincinnati, Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Division of Ser. No. 532,131, Dec. 16, 1974, Pat. No. 3,985,676, which is a continuation-in-part of Ser. No. 436,263, Jan. 24, 1974, abandoned. This application May 7, 1976, Ser. No. 684,042
Int. Cl.³ C08F 4/22, 4/78
U.S. Cl. 526—100 **13 Claims**

1. A process for the polymerization of 1-olefins to produce polymers, copolymers and interpolymers of said 1-olefins comprising contacting said 1-olefins, under polymerization conditions of temperature and pressure, with a catalyst composition comprising a solid inorganic support material having deposited thereon an organophosphoryl chromium product obtained from the reaction of chromium trioxide and an organophosphorus compound having the formula



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen, but at least one R group is other than hydrogen, said catalyst composition having been heated in a dry oxygen containing atmosphere at a temperature about about 400° F. and below the temperature at which the structure of the support is impaired for a period of time sufficient to promote the polymerization activity of said catalyst composition for the polymerization of 1-olefins.

4,234,710

CATALYST AND A POLYMERIZATION PROCESS EMPLOYING THE CATALYST

Charles W. Moberly; Melvin B. Welch, and Lawrence M. Fodor, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 598,965, Jul. 24, 1975, abandoned. This application Jul. 8, 1976, Ser. No. 703,473
Int. Cl.³ C08F 4/02
U.S. Cl. 526—125 **26 Claims**

1. A catalyst which forms on mixing:
a first component resulting from the admixture of a halogenated tetravalent titanium compound, and a compound selected from the group consisting of magnesium and manganese dihalide;
a second component wherein said second component is a compound selected from the group consisting of a trialkylaluminum compound and an organoaluminum compound having two or more aluminum atoms bonded to one another by an oxygen or a nitrogen atom;
a third component wherein said third component is a Lewis base; and
a fourth component wherein said fourth component is an organoaluminum monohalide represented by the general formula AlR_2X wherein the R groups represent alkyl radicals having from 1 to about 12 carbon atoms, said R groups being the same or different, and X represents a halogen atom;
wherein the mole ratio of the second component to the Lewis base of the third component ranges from about 1.5:1 to about 6.0:1, wherein the molar ratio of the aluminum compound of the second component to the titanium compound ranges from about 25:1 to about 1500:1 and wherein the molar ratio of the aluminum compound of the fourth component to the titanium compound ranges from about 2:1 to about 1500:1.

4,234,711

ANAEROBIC ADHESIVE AND/OR SEALING COMPOSITIONS COMPRISING DICYCLOPENTENYLOXYETHYL (METH)ACRYLATES

William D. Emmons, Huntingdon Valley, and Vincent J. Moser, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 9, 1978, Ser. No. 932,256
Int. Cl.³ C08F 4/34; C09D 3/80; C08F 236/00
U.S. Cl. 526—282 **10 Claims**

1. A spreadable fluid adhesive and/or sealing composition hardenable under exclusion of oxygen comprising, as its essential components:
(a) Liquid dicyclopentenyloxyethyl acrylate or methacrylate, or a mixture thereof as the main component,
(b) From 0 to 0.1% by weight of a polymerization inhibitor serving to stabilize the composition while stored in the presence of oxygen,
(c) From about 0.1 to 20% by weight of an organic percompound having 3 to 18 carbon atoms selected from the group consisting of organic peroxides, which are half-decomposed after 10 hours at temperatures above 90° C., and organic hydroperoxides as a polymerization initiator, effective under exclusion of oxygen, and
(d) From about 0.1 to 5% by weight of an accelerator, the aforesaid percentages being based on the total weight of the components (a), (b), (c) and (d).

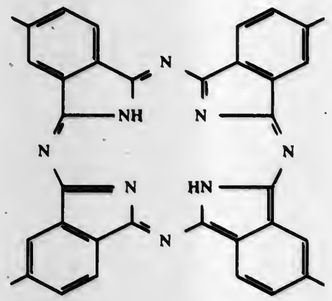
4,234,712

POLYPHTHALOCYANINE RESINS

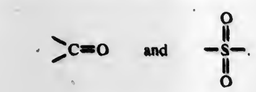
Teddy M. Keller, Alexandria, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1979, Ser. No. 75,631
Int. Cl.³ C08G 73/00
U.S. Cl. 528—9 **6 Claims**

1. A thermosetting resin which comprises a polyphthalocyanine having recurring units of the general formula selected from the class consisting of $(PcO_4R_2Ph_4)$ $(M.PcO_4R_2Ph_4)$ and $(MXPcO_4R_2Ph_4)$ wherein Pc represents the phthalocyanine nucleus having the formula:



Ph represents the phenyl group, M is selected from the class consisting of chromium, molybdenum, vanadium, beryllium, silver, mercury, aluminum, tin, lead, antimony, calcium, barium, manganese, magnesium, zinc, copper, iron, cobalt, nickel, palladium, platinum, and mixtures thereof, MX is selected from cuprous chloride, cuprous bromide, cuprous cyanide, cuprous ferricyanide, zinc chloride, zinc bromide, zinc iodide, zinc cyanide, zinc ferrocyanide, zinc acetate, zinc sulfide, silver chloride, ferrous chloride, ferric chloride, ferrous ferricyanide, ferrous chloroplatinate, ferrous fluoride, ferrous sulfate, cobaltous chloride, cobaltic sulfate, cobaltous cyanide, nickel chloride, nickel cyanide, nickel sulfate, nickel carbonate, stannic chloride, stannous chloride hydrate, a complex of triphanylphosphine oxide and stannous chloride and mixtures thereof, and R is selected from the class consisting of



4,234,713

CURABLE SOLVENTLESS ORGANOPOLYSILOXANE COMPOSITIONS

Gary E. LeGrow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 912,794, Jun. 5, 1978, abandoned. This application May 29, 1979, Ser. No. 42,831
Int. Cl.³ C08G 77/06
U.S. Cl. 528—15 **7 Claims**

1. An improved curable composition consisting essentially of a mixture of
(a) an organopolysiloxane containing from 67 to 85 mol percent $C_6H_5SiO_{3/2}$ units and 33 to 15 mol percent of $CH_2{=}CH(CH_3)_2SiO_1$ units, said organopolysiloxane having an average of at least 8 silicon atoms per molecule;
(b) a silicon hydride containing polysiloxane crosslinker for (a), said (b) being present in an amount sufficient to provide about 0.9 to 1.1 mol of silicon hydride per mol of $CH_2{=}CHSi$ present in (a) and (d);
(c) a platinum catalyst in an amount sufficient to catalyze the reaction of the silicon hydride with the $CH_2{=}CHSi{-}$; the improvement comprising adding a reactive diluent
(d) having the formula

$\{CH_2{=}CH(CH_3)_2SiO\}_2Si(C_6H_5)_2$ in a ratio of 1:4 to 1:1 of component (d) to component (a).

4,234,714

PREPARATION OF SINGLE-PHASE, URETHANE PREPOLYMERS FROM HYDROXY-TERMINATED DIENE POLYMERS

Mason H. Earing, Williamsville; Leonard H. Gielinski, West Seneca, both of N.Y.; Paul F. Martin, Fairfield, Ohio, and Glenn H. Petschke, Tonawanda, N.Y., assignors to Textron Inc., Providence, R.I.

Filed Mar. 29, 1979, Ser. No. 25,046
Int. Cl.³ C08G 18/08; C07C 125/077; C08G 18/62
U.S. Cl. 528—67 **18 Claims**

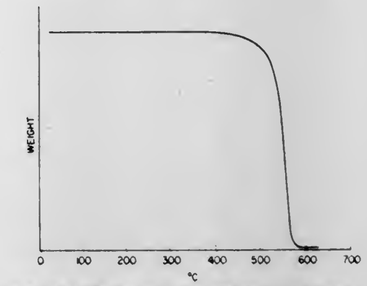
1. A process for preparing urethane prepolymers resistant to the formation of multiple phases or layers upon storage which comprises reacting a viscous, normally liquid hydroxy-terminated polymer of conjugated diene of 4 to 8 carbon atoms and normally liquid, relatively non-volatile, aromatic polyisocyanate at a temperature above about 150° C. to form an isocyanate-terminated urethane prepolymer having an isocyanate group content of at least about 10 weight percent.

4,234,715

PERFLUOROALKYL POLYTRIAZINES CONTAINING PENDENT IODODIFLUOROMETHYL GROUPS

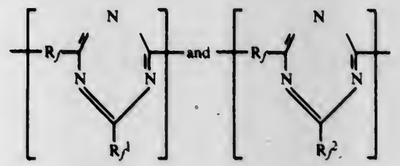
Robert A. Fresch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Robert W. Rosser, San Jose, Calif., and Theodore Psarras, Gainesville, Fla.

Filed May 8, 1979, Ser. No. 37,066
Int. Cl.³ C08G 63/44
U.S. Cl. 528—362 **4 Claims**



THERMOGRAVIMETRIC ANALYSIS OF THE CURED PRODUCT OF EXAMPLE 3. SAMPLE WEIGHT: 17.25 mg; ATMOSPHERE: N_2; HEATING RATE: 10 °C/min.

1. A linear polytriazine curable to a crosslinked elastomer and consisting of randomly distributed repeating units of the formula



wherein:
(a) R_f represents identical bivalent perfluorinated organic

radicals or any combination of bivalent perfluorinated organic radicals, said radicals being selected from the group consisting of $-(CF_2)_p-$ in which p ranges from 2 to 18, and oligomeric or polymeric radicals prepared by the reaction of a perfluorinated dicarboxylic acid halide with a perfluoroepoxide and having the formula

$$-CFY(OCF_2CFY)_mO(CF_2)_pO(CFYCF_2O)_n-$$
$$CFY-$$

wherein Y is a fluorine atom or a trifluoromethyl group, p ranges from 2 to 18, and m+n ranges from 2 to 7;

(b) R_f^1 represents a monovalent perfluoro radical selected from the group consisting of (1) monovalent perfluorinated alkyl radicals containing up to 11 carbon atoms, (2) monovalent perfluorinated alkylether radicals having the formula $R_f^4O(CFYCF_2)_yCFY-$ in which R_f^4 is a perfluorinated alkyl group containing up to 3 carbon atoms, Y is a fluorine atom or a trifluoromethyl group, and y ranges from 0 to 50, and (3) mixtures thereof;

(c) R_f^2 is a monovalent ω-iodoperfluoro radical selected from the ω-iodo substituted homologs of R_f^1; and

(d) the number of iodine-containing randomly distributed triazine repeating units constitutes from about 1 to 100% of all repeating units in the linear polytriazine compound.

4,234,716

PROCESS FOR THE SEPARATION OF POLYOLEFINS MANUFACTURED AT LOW PRESSURE

Herve Cuypers, Cerouxmoousty, and Paul Baekelmans, Genval, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Sep. 12, 1978, Ser. No. 941,671
Claims priority, application France, Sep. 12, 1977, 77 27700
Int. Cl.³ C08F 6/02
U.S. Cl. 528—483 **12 Claims**

1. Process for the separation of a polyolefin, manufactured by low pressure polymerization of at least one alpha-olefin monomer with the aid of a catalyst, from the reaction mixture resulting from the polymerization and containing the polyolefin, the unreacted monomer, and the catalyst, comprising: adding carbon monoxide to the reaction mixture.

4,234,717

ANTIBACTERIAL ANTIBIOTIC BM782

Homer D. Tresner, LaFarge, Wis.; Amedeo A. Fantini, New City; Donald B. Borders, Suffern, both of N.Y., and William J. McGahren, Dumont, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 891,572, Mar. 30, 1978, abandoned. This application Mar. 2, 1979, Ser. No. 17,000
Int. Cl.³ A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R **3 Claims**

1. Antibiotic BM782α1 which

(a) is effective as an antibacterial agent; and in its essentially pure amorphous sulfate form;

(b) has the following elemental analysis (percent): C, 31.79; H, 6.18; N, 12.48; S, 7.40;

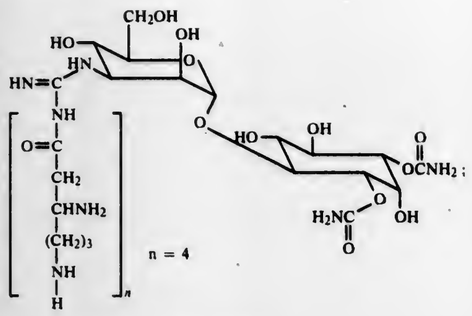
(c) has an optical rotation $[\alpha]_D^{20}=0°$ (C-0.48 in water);

(d) has an infrared absorption spectrum as shown in FIG. 1 of the drawings;

(e) has a characteristic ^{13}C nuclear magnetic resonance spectrum as shown in FIG. 2 of the drawings;

(f) has a characteristic proton magnetic resonance spectrum as shown in FIG. 3 of the drawings; and

(g) has a structure of



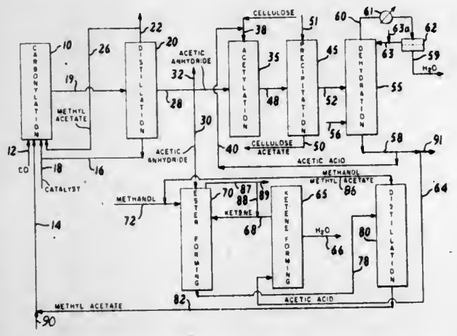
and acid-addition salts thereof.

4,234,718

PROCESS FOR PREPARING CELLULOSE ACETATE

David Brown, Greenwich, Conn., assignor to Halcon Research and Development Corp., New York, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,611
Int. Cl.³ C07B 53/08; C07C 51/15, 51/54; C08B 3/06
U.S. Cl. 536—69 **6 Claims**



1. A cyclic integrated process for the preparation of cellulose acetate from methanol, cellulose and carbon monoxide which comprises the steps of:

(1) carbonylating methyl acetate to produce acetic anhydride in a carbonylation zone;

(2) reacting at least some of the so-produced acetic anhydride with cellulose to convert at least part of said acetic anhydride to cellulose acetate and acetic acid;

(3) converting said acetic acid to ketene;

(4) reacting said ketene with methanol in an ester-forming zone to form methyl acetate for step (1); and

(5) introducing methyl acetate produced in step (4) into said carbonylation zone.

4,234,719

PREPARATION OF CELLULOSE ACETATE

Chee-Gen Wan, North Brunswick, N.J., assignor to Halcon Research and Development Corp., New York, N.Y.

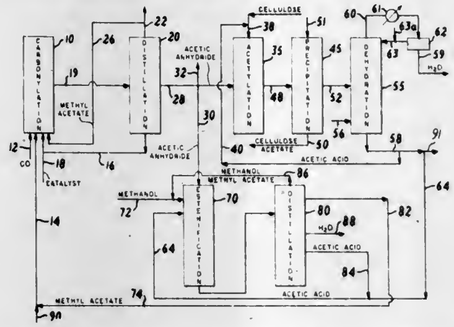
Continuation-in-part of Ser. No. 866,089, Dec. 30, 1977. This application Jun. 29, 1979, Ser. No. 53,612
Int. Cl.³ C07B 53/08; C07C 51/15, 51/54; C08B 3/06
U.S. Cl. 536—69 **5 Claims**

1. A cyclic integrated process for the preparation of cellulose acetate from methanol, cellulose and carbon monoxide which comprises the steps of:

(1) carbonylating methyl acetate to produce acetic anhydride in a carbonylation zone;

(2) reacting at least some of the so-produced acetic anhydride with cellulose to convert at least part of said acetic anhydride to cellulose acetate and acetic acid;

(3) dehydrating said acetic acid by removing at least a portion of the water therefrom;



(4) esterifying said dehydrated acetic acid with methanol in an esterification zone to form methyl acetate for step (1); and

(5) introducing methyl acetate produced in step (4) into said carbonylation zone.

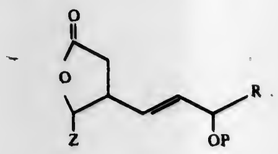
4,234,720

PROSTAGLANDIN DERIVATIVES

Andre G. Pernet, Montreal, Canada; Hiromasa Nakamoto, and Naoyasu Ishizuka, both of Toyama, Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 746,021, Nov. 30, 1976, abandoned, which is a division of Ser. No. 647,822, Jan. 9, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 899,904
Int. Cl.³ C07D 307/20, 407/12
U.S. Cl. 542—413 **7 Claims**

1. A compound of the formula



wherein R is a linear, branched or cyclic alkyl group of 3–7 carbons, P is a protective group that can be removed chemically without affecting the rest of the molecule, and Z is OP, CH_3 or CH_2OP.

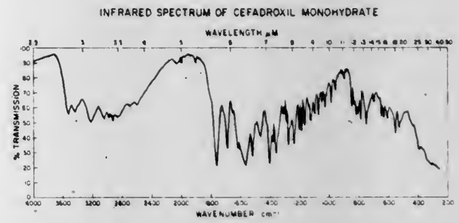
4,234,721

PROCESS FOR THE PREPARATION OF THE CRYSTALLINE MONOHYDRATE OF 7-[D-AMINO-(P-HYDROXYPHENYL]ACETAMIDO)-3-METHYL-3-CEPHEN-4-CARBOXYLIC ACID

Daniel Bouzard, Franconville; Abraham Weber, and Jacques Stemer, both of Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 874,457, Feb. 2, 1978, Pat. No. 4,160,863, which is a division of Ser. No. 785,392, Apr. 7, 1977, abandoned. This application May 21, 1979, Ser. No. 71,951
Claims priority, application United Kingdom, Apr. 27, 1976, 17028/76
Int. Cl.³ C07D 501/02, 501/12, 501/22
U.S. Cl. 544—30 **17 Claims**

1. A process for the preparation of crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid monohydrate exhibiting essentially the following x-ray diffraction properties:



Line	Spacing d(A)	Relative Intensity
1	8.84	100
2	7.88	40
3	7.27	42
4	6.89	15
5	6.08	70
6	5.56	5
7	5.35	63
8	4.98	38
9	4.73	26
10	4.43	18
11	4.10	61
12	3.95	5
13	3.79	70
14	3.66	5
15	3.55	12
16	3.45	74
17	3.30	11
18	3.18	14
19	3.09	16
20	3.03	29
21	2.93	8
22	2.85	26
23	2.76	19
24	2.67	9
25	2.59	28
26	2.51	12
27	2.46	13
28	2.41	2
29	2.35	12
30	2.30	2
31	2.20	15
32	2.17	11
33	2.12	7
34	2.05	4
35	1.99	4
36	1.95	14
37	1.90	10

which process comprises

(a) silylating 7-aminodesacetoxycephalosporanic acid in an inert substantially anhydrous aprotic solvent;

(b) acylating the so-produced silylated 7-aminodesacetoxycephalosporanic acid with D(−)-α-amino-α-(p-hydroxyphenyl)acetyl chloride hydrochloride in an inert substantially anhydrous aprotic solvent in the presence of an acid acceptor;

(c) cleaving any silyl groups of the acylation product by hydrolysis or alcoholysis; and

(d) forming the desired monohydrate product by upwardly adjusting the pH of the solution from step (c) to form 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid and contacting said acid with water or a partially aqueous medium to effect crystallization of the desired monohydrate.

4,234,722

4,5-DICHLORO-IMIDAZOLE-1-CARBOXYLIC ACID ARYL ESTERS

Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

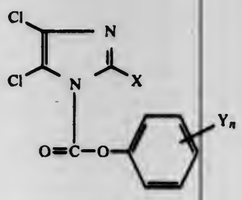
Division of Ser. No. 835,092, Sep. 21, 1977, Pat. No. 4,183,742. This application Apr. 30, 1979, Ser. No. 34,714

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646143

Int. Cl.³ C07D *417/06, 413/06, 403/06*

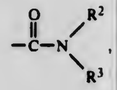
U.S. Cl. 544—58.4 **1 Claim**

1. A 4,5-dichloro-imidazole-1-carboxylic acid aryl ester of the formula



(I)

in which X represents a group



in which

R^2 and R^3 conjointly with the adjoining nitrogen atom form a morpholine, thiamorpholine or piperazine ring,

Y represents halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, nitro, cyano or a



group,

in which

R^4 represents alkyl with 1 to 6 carbon atoms and n represents 0, 1, 2, 3, 4 or 5.

4,234,723

NICKEL STABILIZERS FOR SYNTHETIC POLYMERS

Michael Rasberger, Allschwil; Jean Rody, Basel; Paul Moser, Riehen, and Helmut Müller, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

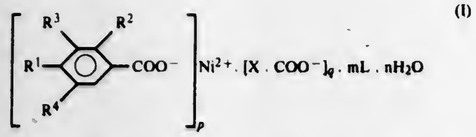
Division of Ser. No. 827,293, Aug. 24, 1977, Pat. No. 4,186,267, which is a division of Ser. No. 663,332, Mar. 3, 1976, Pat. No. 4,046,788, which is a division of Ser. No. 491,978, Jul. 26, 1974, Pat. No. 3,948,852. This application Jul. 30, 1979, Ser. No. 62,448

Claims priority, application Switzerland, Aug. 7, 1973, 11407/73; Jan. 28, 1974, 1103/74

Int. Cl.³ C07F *15/04*

U.S. Cl. 544—64 **5 Claims**

1. A compound of the formula I



(I)

wherein either R^1 is hydroxyl and R^2 is hydrogen or R^1 is hydrogen and R^2 is hydroxyl, R^3 and R^4 are hydrogen or alkyl with 1–5 C atoms, either p is 1 and q is 1 or p is 2 and q is zero, X is optionally hydroxyl-substituted alkyl, cycloalkyl, aryl, alkaryl or aralkyl, m is a value from 1–2 and, n represents a value from 0 to 2 and L denotes a ligand $R^5—N(R^6)—R^7$, in which R^5 and R^6 together with the N atom form a morpholine ring which is substituted by alkyl groups or is unsubstituted and R^7 is H, alkyl or aralkyl.

4,234,724

CEPHALOSPORIN ANALOGUES AND PROCESSES FOR THE PREPARATION THEREOF

Masashi Hashimoto, Takarazuka; Keiji Hemmi, Kyoyo; Matsuhiko Aratani, Osaka; Hidekazu Takeno, Nara, and Daijiro Hagiwara, Moriguchi, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

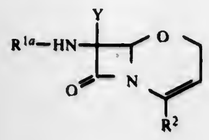
Filed Dec. 22, 1978, Ser. No. 972,382

Claims priority, application United Kingdom, Dec. 23, 1977, 53735/77; Jun. 16, 1978, 27116/78

Int. Cl.³ C07D *498/04*

U.S. Cl. 544—90 **23 Claims**

1. A compound of the formula:



(Ia)

wherein

R^{1a} is a group of the formula:

in which

R^3 is aminothiazolyl, aminothiadiazolyl, aminopyridyl or aminopyrimidinyl, and

A is

lower alkoxyiminomethylene,
lower alkenyloxyiminomethylene,
lower alkynyloxyiminomethylene or
phenyl(lower)alkoxyiminomethylene;

R^2 is carboxy or a protected carboxy; and

Y is hydrogen or lower alkoxy, and pharmaceutically acceptable salts thereof.

4,234,725

4-[6-(2-CHLORO-4-METHOXYPHENOXY)HEXYL]-3,5-DIETHYL-1-[4-(4-MORPHOLINYL)-1-OXOBUTYL]-1H-PYRAZOLE

Guy D. Diana, Stephentown, and Philip M. Carabateas, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 8,412, Feb. 1, 1979, which is a division of Ser. No. 822,246, Aug. 5, 1977, Pat. No. 4,171,365. This application Oct. 24, 1979, Ser. No. 87,879

Int. Cl.³ C07D *413/06*

U.S. Cl. 544—140 **1 Claim**

1. 4-[6-(2-Chloro-4-methoxyphenoxy)hexyl]-3,5-diethyl-1-[4-(4-morpholinyl)-1-oxobutyl]-1H-pyrazole.

4,234,726

HETEROCYCLIC CONTAINING CHROMANS

Derek V. Gardner, Bishop Stortford, England, assignor to Beecham Group Limited, England

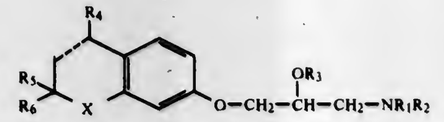
Continuation of Ser. No. 852,744, Nov. 18, 1977, abandoned, which is a division of Ser. No. 691,865, Jun. 1, 1976, Pat. No. 4,093,631. This application May 9, 1979, Ser. No. 37,958

Claims priority, application United Kingdom, Jun. 3, 1975, 24005/75

Int. Cl.³ C07D *413/12, 405/12*

U.S. Cl. 544—151 **23 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof wherein the NR_1R_2 moiety is a 5-, 6-, or 7-membered saturated heterocyclic ring; R_3 is hydrogen, alkyl of 1 to 4 carbon atoms or acyl of 1 to 4 carbon atoms; R_4 is naphthyl or phenyl unsubstituted or substituted by one or two substituents selected from the group consisting of fluorine, chlorine, bromine, methoxyl, benzyloxyl, trifluoromethyl, methyl, cyano, nitro, acetoxyl, amino, methylamino, ethylamino, dimethylamino, diethylamino, acetamido, hydroxyl, methoxycarbonyl, ethoxycarbonyl, carboxamido, sulphonamido, carboxy, trifluoromethylthio, trifluoromethoxyl, methylsulphonyl, trifluoromethylsulphonyl and methylthio; R_5 is hydrogen or alkyl of 1 to 4 carbon atoms; R_6 is hydrogen or alkyl of 1 to 4 carbon atoms; X is oxygen and the dotted line represents a single or double bond.

4,234,727

PREPARATION OF AMINES

Herbert Toussaint, Frankenthal; Wolfgang Schroeder, Bad Durkheim, and Wolfgang Franzischka, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,742

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838184

Int. Cl.³ C07C *85/06, 85/08*; C07D *241/04, 295/02*

U.S. Cl. 544—178 **2 Claims**

1. A process for N-alkylating an amine by reacting it with an alcohol or carbonyl compound in the gas phase over a copper catalyst under hydrogenating conditions, wherein the reaction is carried out over a copper catalyst which has been obtained by thermal decomposition and reduction of a basic copper-aluminum carbonate.

4,234,728

POLYALKYLPIPERIDINE DERIVATIVES OF S-TRIAZINE

Jean Rody, Riehen, and Godwin Berner, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

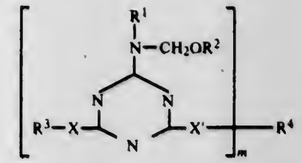
Filed Dec. 21, 1978, Ser. No. 972,146

Claims priority, application Switzerland, Dec. 30, 1977, 16297/77; Aug. 31, 1978, 9199780/78

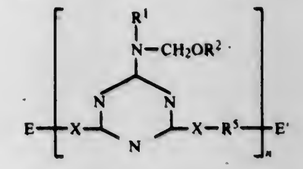
Int. Cl.³ C07D *251/46, 251/52, 251/64, 401/12*

U.S. Cl. 544—198 **9 Claims**

1. A compound of the formula I or II

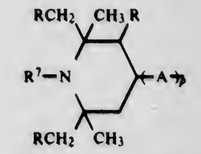


I



II

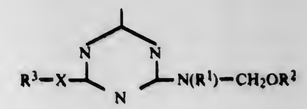
in which m is an integer from 1 to 4 and n is a value from 2 to 50, X and X' are —O—, —S— or —NR^6—, in which R^6 is hydrogen, C_1-C_{18} alkyl, C_3-C_8 alkenyl, C_1-C_4 hydroxyalkyl, C_2-C_{13} alkoxyalkyl, C_5-C_{12} cycloalkyl, C_6-C_{10} aryl, C_7-C_9 phenylalkyl, or a polyalkylpiperidine group of the formula III



III

in which R is hydrogen or methyl, p is 0 or 1, A is C_1-C_4-alkylene, —NR^6—C_2-C_{12}-alkylene- or —$OCH_2CH_2CH_2$— and R^7 is H, O, C_1-C_{12}-alkyl, allyl, benzyl or a —CH_2—CH(R^8)—OH group, in which R^8 is H, CH_3, C_2H_5 or phenyl, and R^1 and R^3 are hydrogen, C_1-C_{18} alkyl, C_3-C_8 alkenyl, C_1-C_4 hydroxyalkyl, C_2-C_{13} alkoxyalkyl, C_5-C_{12} cycloalkyl, C_6-C_{10} aryl, C_7-C_9 phenylalkyl, phenyl or phenylalkyl which is substituted by one or more substituents from the group consisting of C_1-C_8 alkyl, OH, C_1-C_4 alkoxy, and a polyalkylpiperidine group of the formula III, R^2 is hydrogen, C_1-C_{18} alkyl, C_3-C_8 alkenyl, C_2-C_6 hydroxyalkyl or C_3-C_6 alkoxyalkyl, R^4, if m is 1, is hydrogen, C_1-C_{18} alkyl, C_3-C_8 alkenyl, C_2-C_4 hydroxyalkyl, C_3-C_6 alkoxyalkyl, C_6-C_{10} aryl, C_7-C_9 phenylalkyl, phenyl or phenylalkyl which is substituted by one or more substituents from the group consisting of C_1-C_8 alkyl, OH, C_1-C_4 alkoxy, and a polyalkylpiperidine group of the formula III, and, if m is 2, C_2-C_{12} alkylene or oxaalkylene, C_4-C_{12} alkenylene, C_6-C_{10} arylene, a -phenylene-Z-phenylene- radical, in which Z is —O—, —S—, —SO_2—, —CH_2— or —$C(CH_3)_2$—, or a radical of the formula —$(CH_2)_r$—N(Y)—$(CH_2)_r$—N(Y)]$_q$$(CH_2)_r$—, wherein r is 2 or 3 and q is 0 or 1 and Y is a triazinyl group of the formula IV,

IV



and, if m is 3, is a R^8—C(CH_2—)$_3$ radical, in which R^8 is C_1-C_4 alkyl, and, if m is 4, is a C(CH_2—)$_4$ radical, R^5 is C_2-C_{12} alkylene and E is hydrogen, alkyl or HX—R^5— and E' is XH and at least one of the radicals R^1, R^3, R^4, or R^6 is a polyalkylpiperidine of the formula III.

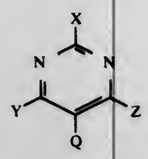
4,234,729

PHOSPHINE OXIDE-SUBSTITUTED PYRIMIDINES

Joseph J. Mrowca, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1979, Ser. No. 49,481
Int. Cl.[3] C07F 9/65; C08K 5/53
U.S. Cl. 544—243 7 Claims

1. Phosphine oxide of the formula



wherein

X is H, alkylthio of 1–4 carbon atoms, or



Y is H, alkyl of 1–4 carbon atoms, Cl, Br, or



Z is H, alkyl of 1–4 carbon atoms, or



at least one of X, Y, and Z is



Q is H or Br; and

each R is selected independently from alkyl of 1–4 carbon atoms, cycloalkyl of 5–6 carbon atoms, benzyl, phenyl, tolyl, and chlorophenyl.

4,234,730

PROCESS OF PREPARING SELECTIVE MIXTURES OF PIPERAZINE AND ETHYLENEDIAMINE

Thomas T. McConnell, and Thomas H. Cour, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,117
Int. Cl.[3] C07D 295/02
U.S. Cl. 544—358 3 Claims

1. In a process of preparing a mixture of piperazine and ethylenediamine by reacting monoethanolamine and ammonia in presence of hydrogen and a nickel-copper-chromium catalyst; the improvement which comprises adjusting the ratio of ethylenediamine to piperazine in said product mixture by varying the hydrogen feed rate such that by increasing said feed rate said ratio is decreased.

4,234,731

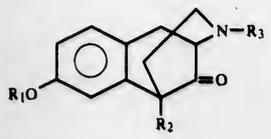
9-OXOBENZOMORPHAN PROCESS

Gerry Kavadias, St-Lambert, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 870,409, Jan. 18, 1979, Pat. No. 4,150,032. This application Jan. 5, 1979, Ser. No. 1,131
Int. Cl.[3] C07D 221/26
U.S. Cl. 46—97 13 Claims

1. A process for preparing 2'-alkoxy-2,5-di-substituted-9-oxo-6,7-benzomorphan compounds of formula I

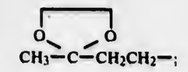
(I)



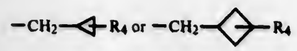
wherein

R_1 is lower alkyl of 1 to 4 carbon atoms inclusive or benzyl;

R_2 is lower alkyl of 1 to 4 carbon atoms inclusive, allyl, benzyl, or



R_3 is lower alkyl of 1 to 4 carbon atoms inclusive,

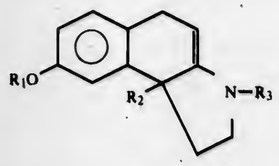


in which R_4 is hydrogen or methyl;

which comprises sequential steps of,

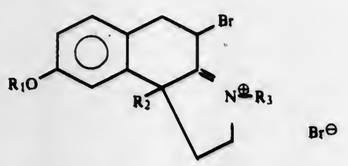
(a) brominating a dihydroben[e]indoline of formula II

(II)



in which R_1, R_2, and R_3 are as recited above wherein said bromination is carried out by combining a methylene chloride solution of the formula II compound and a solution of bromine in methylene chloride at a temperature in the range of −40° to −70° to produce a bromoenaminium bromide compound have formula III

(III)



in which R_1, R_2, and R_3 are as recited above;

(b) treating the formula III compound with a bicarbonate base selected from the group consisting of potassium bicarbonate, sodium bicarbonate, and ammonium bicarbonate for activated aluminum oxide to produce the 9-oxo-6,7-benzomorphan compound of formula I.

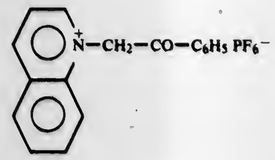
4,234,732

PHOTOINITIATORS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 949,642, Oct. 10, 1978, which is a division of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Dec. 17, 1979, Ser. No. 103,914
Int. Cl.[3] C07D 215/14
U.S. Cl. 546—174 1 Claim

1. The compound



4,234,733

PROCESS FOR PRODUCING ALIPHATIC CARBOXYLIC ACIDS AND ALIPHATIC CARBOXYLIC ACID ESTERS OF PHENOLS

Tomiya Isshiki, Tokyo; Yasuhiko Kijima, and Yuh Miyauchi, both of Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,171
Claims priority, application Japan, Oct. 28, 1977, 52/129438
Int. Cl.[3] C07C 51/09, 51/12, 27/00; C07D 215/32
U.S. Cl. 546—174 4 Claims

1. A process for producing an aliphatic carboxylic acid and an aliphatic carboxylic acid ester of an aromatic hydroxy compound which comprises reacting

(A) an aromatic hydroxy compound selected from the group consisting of phenol, cresol, xylenol, trimethylphenol, tetramethylphenol, pentamethylphenol, ethylphenol, propylphenol, thymol, 2-methyl-5-isopropylphenol, butylphenol, amylphenol, octylphenol, methyldibutylphenol, diethylphenol, catechol, resorcinol, hydroquinone, dihydroxytoluene, hexylresorcinol, pyrogallol, phloroglucinol, chlorophenol, bromophenol, nitrophenol, nitrosophenol, aminophenol, N,N-dimethylaminophenol, N-methyl-N-acetyl-phenol, acetyloxyphenol, formylphenol, cyanophenol, phenolsulfonic acid, hydroxymethylphenol, naphthol, dihydroxynaphthalene, dihydronaphthol, tetrahydronaphthol, phenylphenol, hydroxyquinolin, anthrahydroquinone, methylanthrahydroquinone, ethylanthrahydroquinone, amylanthrahydroquinone, and 1,2-dihydroxyanthraquinone,

(b) (1) an aliphatic carboxylic acid ester formed between an aliphatic carboxylic acid having 1 to 5 carbon atoms and an alcohol having 1 to 4 carbon atoms and selected from the group consisting of methyl formate, propyl formate, methyl acetate, ethyl acetate, butyl acetate, methyl propionate, ethyl propionate, methyl butyrate, propyl butyrate, methyl valerate, dimethyl oxalate, diethyl oxalate, and dimethyl succinate or (2) an aliphatic ether of 2 to 8 carbon atoms selected from the group consisting of dimethyl ether, diethyl ether, methyl ethyl ether, dipropyl ether, and dibutyl ether, and

(C) carbon monoxide at a temperature of from 50°–300° C. and a reaction pressure of 0–1000 kg./cm^2 G in the presence of a catalyst composed of at least one metal of Group VIII of the periodic table and a promotor composed of at least one iodine-containing substance selected from the group consisting of iodine and iodine compounds and separating and recoving the thus produced aliphatic carboxylic acid from the reaction mixture.

4,234,734

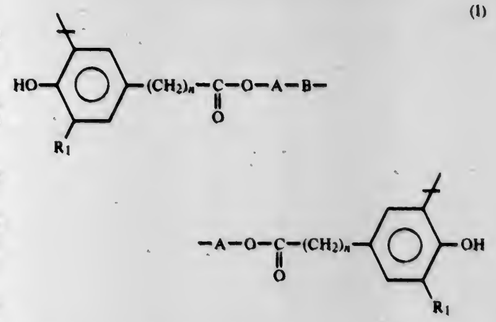
2,2,6,6-TETRAMETHYLPIPERIDINE DERIVATIVES

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 16, 1979, Ser. No. 57,628
Claims priority, application Switzerland, Jul. 21, 1978, 7904/78
Int. Cl.[3] C07D 401/10, 401/06
U.S. Cl. 546—188 4 Claims

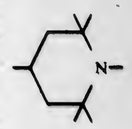
1. A 2,2,6,6-tetramethylpiperidine of the formula I

(I)

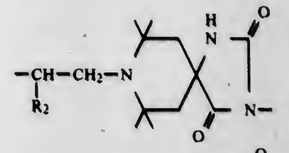


in which A is a radical of the formula II, III or IV, and in formula II B is bonded to the N atom,

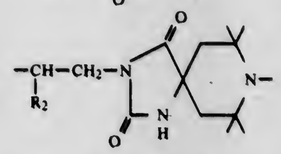
(II),



(III),



(IV)



B is C_2–C_{12} alkylene, C_4–C_{10} alkenylene, C_6 alkynylene, xylylene or bitolylene, R_1 is H or C_1–C_{12}alkyl, R_2 is hydrogen, methyl, ethyl, phenyl or phenoxymethyl and n is 0, 1 or 2.

4. A compound according to claim 1, specifically 1,4-bis-{2,2,6,6-tetramethyl-4-[3-(3,5-di-tert.-butyl-4-hydroxyphenyl)-propionyloxy]-piperidin-1-yl}-but-2-ene.

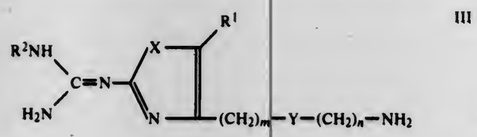
4,234,735

GUANIDINO IMIDAZOLES AND THIAZOLES

Derrick F. Jones, Wilmington, Del., and Tobias O. Yellin, Wallingford, Pa., assignors to Imperial Chemical Industries Limited, London, England and ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 897,910, Apr. 19, 1978, Pat. No. 4,165,377. This application Aug. 13, 1979, Ser. No. 65,801
Claims priority, application United Kingdom, Apr. 20, 1977, 16389/77
Int. Cl.[3] C07D *277/38, 233/88;* A61K *31/425, 31/415*
U.S. Cl. 548—198 10 Claims

1. A guanidine compound of the following formula (III):



III

wherein

X is sulphur or NH;

Y is a direct bond, a methylene radical or a cis- or trans-vinylene radical;

m is 0 to 4;

n is 1 to 4;

R^1 is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms; and

R^2 is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms.

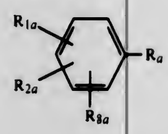
4,234,736

ANTIANDROGENIC AND SCHISTOSOMICIDAL IMIDAZOLIDINE DERIVATIVES

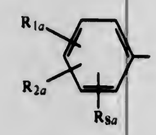
Karl Bernauer, Oberwil; Helmut Link, Basel, and Harro Stohler, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 24, 1978, Ser. No. 954,071
Claims priority, application Luxembourg, Oct. 28, 1977, 78407; Oct. 28, 1977, 78408; Switzerland, May 19, 1978, 5465/78; May 19, 1978, 5466/78; Sep. 7, 1978, 9407/78
Int. Cl.[3] C07D *233/72, 233/88*
U.S. Cl. 548—314 1 Claim

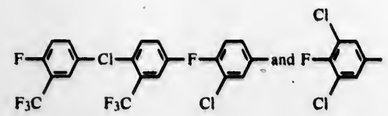
1. A compound of the formula



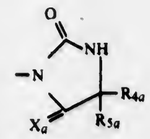
wherein



is selected from the group consisting of



and R_a is



wherein X_a is oxygen or imino, R_{4a} is lower alkyl and R_{5a} is hydrogen or alkyl of from 2 to 4 carbon atoms.

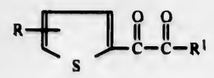
4,234,737

PROCESS FOR PREPARING THIENYLGLYOXYLIC ACIDS AND AMIDES

James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 25, 1979, Ser. No. 42,487
Int. Cl.[3] C07D *333/24;* A61K *31/38*
U.S. Cl. 549—70 9 Claims

1. A process for preparing thienylglyoxyl compounds represented by the structure



wherein R represents hydrogen, a halogen, an alkyl group having from 1 to about 8 carbon atoms, a cycloalkyl group having from 1 to about 8 carbon atoms or any combination thereof, and wherein R^1 represents NH_2 or OH which comprises reacting a thiophene carboxylic acid chloride with aqueous sodium cyanide in an inert, water-immiscible solvent in the presence of a phase transfer catalyst to form a thiophene carboxylic acid cyanide and reacting said thiophene acid cyanide with a strong mineral acid at a temperature and for a time sufficient to form said compound.

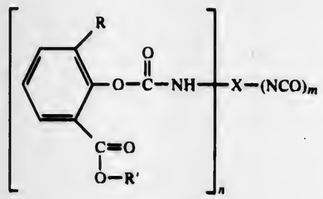
4,234,738

HYDROXY TERMINATED POLYBUTADIENE BASED POLYURETHANE BOUND PROPELLANT GRAINS

William H. Graham, and Inella G. Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 836,925, Sep. 26, 1977, Pat. No. 4,165,421, which is a division of Ser. No. 741,591, Nov. 15, 1976, Pat. No. 4,098,626. This application Nov. 17, 1978, Ser. No. 961,590
Int. Cl.[2] C07C *125/04;* C08G *18/32*
U.S. Cl. 560—32 12 Claims

1. A compound of the formula:



wherein X is an n+m valent organic radical; R is hydrogen or lower alkyl of from 1 to about 10 carbon atoms; R' is lower alkyl of from 1 to about 10 carbon atoms; a carbocyclic aryl of from 6 to about 10 carbon atoms; n is on the average at least 1; m is 0 or 1; and m+n must be at least 2.

4,234,739

METHOD FOR PREPARING GLYOXYLIC ACIDS AND DERIVATIVES THEREOF

James M. Photis, Ridgefield, Conn.; Fred S. Eiseman, Basking Ridge, and Sidney M. Gister, Highland Park, both of N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 5, 1978, Ser. No. 966,673
Int. Cl.[3] C07C *69/66, 59/153*
U.S. Cl. 560—51 16 Claims

1. An improved method for preparing glyoxylic acids and their derivatives which comprises:

(a) reacting an acyl nitrile compound with concentrated sulfuric acid in the presence of halogen anion to form a first reaction product; and

(b) reacting said first reaction product with a compound of the general formula

R OH

wherein R is hydrogen, a straight or branched-chain hydrocarbon or aralalkyl, provided, however, that ROH is not a tertiary alcohol, to form the acid, amide or ester.

4,234,740

PROCESS FOR PREPARING DIESTERS OF DICARBOXYLIC ACIDS

Sumio Umemura; Kanenobu Matsui; Yoshinari Ikeda; Katsuro Masunaga, and Takumi Kadota, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Nov. 28, 1978, Ser. No. 964,363
Claims priority, application Japan, Dec. 9, 1977, 52-147201
Int. Cl.[3] C07C *67/38*
U.S. Cl. 560—81 16 Claims

1. A process for preparing a diester of a dicarboxylic acid having two more carbon atoms than the unsaturated hydrocarbon used as the starting material, which consists essentially of reacting in the liquid phase an unsaturated hydrocarbon, carbon monoxide and an alcohol in the presence of a platinum group metal; a compound selected from the group consisting of nitric acid, a nitrogen oxide, and an ester of nitrous acid used in an amount of from 0.0001 to 10 moles per liter of the reaction medium; and a halogen compound selected from the group consisting of (i) a halide of hydrogen, a platinum group metal, an alkali metal, an alkaline earth metal, cobalt, zinc, copper, iron, chromium, antimony, tin and manganese, and (ii) ammonium chloride, said halogen compound being used in an amount such that the ratio of the halogen atoms to the platinum group metal atoms is not more than 1.

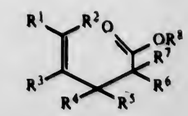
4,234,741

PROCESS FOR THE PREPARATION OF γ, δ-UNSATURATED ESTERS AND ACIDS

Martin Petrzilka, Puplinge, Switzerland, assignor to Firmenich, S.A., Geneva, Switzerland

Filed Aug. 16, 1979, Ser. No. 67,025
Claims priority, application Switzerland, Aug. 30, 1978, 9136/78
Int. Cl.[3] C07C *51/00, 163/00*
U.S. Cl. 560—211 10 Claims

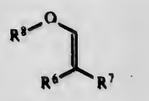
1. A process for the preparation of a compound of formula



(I)

wherein symbols R^1 to R^7 are identical or different and each represents a hydrogen atom or an alkyl radical and R^8 is an alkyl radical, which comprises the following subsequent steps:

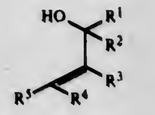
a. reacting an alkyl-vinyl ether of formula



(II)

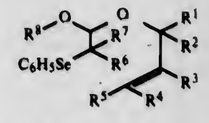
with a benzene-selenenyl halide,

b. adding to the thus obtained reaction mixture an allylic alcohol of formula



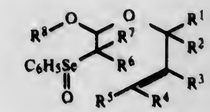
(III)

to give an acetal of formula



(IV)

c. oxidizing said acetal to give the compound of formula



(V)

and,

d. subjecting oxide (V) thus obtained to an intra-molecular thermal rearrangement to give the desired ester of formula (I) wherein R^8 represents an alkyl radical.

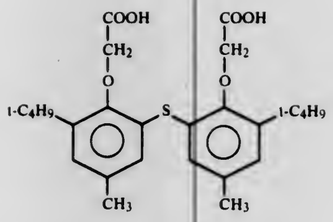
4,234,742

BIS-(ARYLOXYCARBOXYLIC ACID) COMPOUNDS

Jean C. Cognacq, Maule, and Jean Lacrampe, Courbevoie, both of France, assignors to Hexachimie, France

Filed Jun. 5, 1979, Ser. No. 45,665
Claims priority, application France, Jun. 14, 1978, 78 17814
Int. Cl.[3] C07C *149/40;* A61K *31/185*
U.S. Cl. 562—426 2 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof.

4,234,743

ISOMERIC DIAMINOBENZOPHENONEDICARBOXYLIC ACIDS AND METHOD FOR PREPARING SAME

Johann G. Schulz, Pittsburgh; Anatoli Onopchenko, Monroeville, and Edward T. Sabourin, Allison Park, all of Pa., assignors to GR & DC, Pittsburgh, Pa.

Filed May 17, 1979, Ser. No. 39,868
Int. Cl.[3] C07C *101/68*
U.S. Cl. 562—457 **3 Claims**

1. A novel isomeric mixture containing 3,3'-diamino-4,4'-benzophenonedicarboxylic acid, 4,4'-diamino-3,3'-benzophenonedicarboxylic acid and 3,4'-diamono-3',4-benzophenonedicarboxylic acid.

4,234,744

PROCESS FOR THE PRODUCTION OF AMINOACID HYDROCHLORIDES/OR DIAMINOACID DIHYDROCHLORIDES

Franz Effenberger, Stuttgart, and Karlheinz Drauz, Heilbronn, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,064
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854627
Int. Cl.[3] C07C *99/00*
U.S. Cl. 562—562 **14 Claims**

1. A process for the production of an aminoacid hydrochlorides or a diaminoacide dihydrochlorides comprising reacting an ester of a halocarboxylic acid having the formula:

$$R'-CH_2-\underset{\underset{Hal}{|}}{CH}-COOR \text{ or} \quad (I)$$

$$Hal-(CH_2)_n-COOR \text{ or} \quad (II)$$

$$Hal-(CH_2)_m-\underset{\underset{Hal}{|}}{CH}-COOR \quad (III)$$

in which Hal is chlorine or bromine, R is methyl or ethyl, R' is hydrogen or an alkyl group with 1 to 6 carbon atoms, n is one or a whole number between 3 and 5 inclusive and m is a whole number between 2 and 4 inclusive, in an aprotic solvent at a temperature between 80° and 120° C. with an alkali metal cyanate of the formula MeOCN in which Me is lithium, sodium or potassium, and methanol or ethanol and subsequently saponifying the alkoxycarbonylaminocarboxylic acid ester or bis-(alkoxycarbonylamino)-carboxylic acid ester with a mixture of equal parts of concentrated hydrochloric acid, 100 weight percent formic acid and water at reflux temperature.

4,234,745

POLYOLS DERIVED FROM 4,4,4-TRICHLORO-1,2-EPOXYBUTANE AND/OR EPIHALOHYDRIN FOR USE IN THE PRODUCTION OF HEAT SEALABLE FOAMS

Barry A. Phillips, Slovan; Keith G. Spitler, Bethel Park, both of Pa., and Richard E. Keegan, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1979, Ser. No. 8,147
Int. Cl.[3] C07C *43/11*
U.S. Cl. 568—614 **8 Claims**

1. A polyol having a molecular weight of 2,000 to 8,000, comprising the adduct obtained by sequentially reacting:

(a) a polyhydroxyl initiator, with a functionality of 2 to 5 and a weight average molecular weight as determined by gel permeation chromatography of from 62 to 200; with

(b) 10 to 90%, by weight, based on the total oxide present in (b)+(c)+(d), a first alkylene oxide; and subsequently reacting the product with

(c) 10 to 80%, by weight, based on the total oxide present in (b)+(c)+(d), 4,4,4-trichloro-1,2-epoxybutane and/or epihalohydrin; and subsequently reacting the product with

(d) 10 to 60%, by weight, based on the total oxide present in (b)+(c)+(d), a second alkylene oxide, which may be the same or different than the first alkylene oxide of step (b).

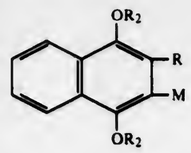
4,234,746

METALLO-SUBSTITUTED NAPHTHALENE

Henry Rapoport, Berkeley, and Clinton D. Snyder, Monte Sereno, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 815,771, Jul. 14, 1977, Pat. No. 4,159,993, which is a division of Ser. No. 565,473, Apr. 7, 1975, Pat. No. 4,089,873, which is a continuation-in-part of Ser. No. 540,450, Jan. 13, 1975, abandoned. This application Mar. 8, 1979, Ser. No. 18,578
Int. Cl.[3] C07C *43/192*
U.S. Cl. 568—633 **3 Claims**

1. Compounds of the formula



wherein R is lower alkyl and R_1 and R_2 are lower alkyl, or aralkyl of 7 to about 12 carbon atoms, and M is MgBr.

4,234,747

PROCESS FOR THE MANUFACTURE OF BUTENEDIOL

Christopher J. McIndoe, Redcar, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 20, 1979, Ser. No. 59,329
Claims priority, application United Kingdom, Aug. 2, 1978, 32013/78
Int. Cl.[3] C07C *31/20*
U.S. Cl. 568—857 **10 Claims**

1. A process for the manufacture of 2-butene-1, 4-diol which comprises reacting butadiene with water and oxygen in the presence of an iron catalyst.

4,234,748

PROCESS FOR THE HYDRATION OF OLEFINS EMPLOYING SLURRIED CATALYST

Orville D. Frampton, Wyoming, and William R. Birchall, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,891
Int. Cl.[3] C07C *29/04*
U.S. Cl. 568—901 **34 Claims**

1. A process for the liquid phase hydration of olefin to the corresponding alkanol in an olefin hydration reactor which comprises hydrating olefin at elevated temperature and superatmospheric pressure in an aqueous reaction medium containing a catalytically effective amount of at least one substantially water-insoluble olefin hydration catalyst in the form of solid particles substantially uniformly distributed throughout the entire reaction medium to provide an aqueous reaction medium containing alkanol, unreacted olefin and suspended catalyst, continuously or intermittently withdrawing a portion of the reaction medium through an expansion valve to simultaneously flash off alkanol and unreacted olefin and cool the residual aqueous catalyst suspension, and cooling the flash-off vapors to condense the alkanol as dilute aqueous alkanol.

18. A process for the liquid phase hydration of olefin to the corresponding alkanol in an olefin hydration reactor which comprises hydrating olefin at elevated temperature and superatmospheric pressure in an aqueous reaction medium containing a catalytically effective amount of at least one substantially water-insoluble olefin hydration catalyst in the form of solid particles substantially uniformly distributed throughout the entire reaction medium to provide an aqueous reaction medium containing alkanol, unreacted olefin and suspended catalyst, continuously or intermittently withdrawing alkanol-containing vapor above the reaction medium through an expansion valve and passing the expanded, cooled vapor through a low pressure water absorber to absorb the alkanol and provide dilute aqueous alkanol.

4,234,749

CATALYTIC OXIDATION/DECARBONYLATION OF POLYNUCLEAR AROMATIC COMPOUNDS

Francis P. Daly, Lawrenceville, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Feb. 1, 1979, Ser. No. 8,305
Int. Cl.[3] C07C *46/00, 4/26*
U.S. Cl. 585—319 **29 Claims**

1. A process of producing benzene from anthracene comprising:

(a) oxidizing the anthracene to anthraquinone by reacting the anthracene with a molecular oxygen-containing gas in the presence of a catalyst selected from the group consisting of ceric ammonium nitrate, ceric nitrate, ceric ammonium sulfate, ceric sulfate, ceric perchlorate or other compounds of Ce^{+4}, and in the presence of a promoter, the reaction being carried out at a temperature of from about 65° to about 205° C. in an essentially water-free environment;

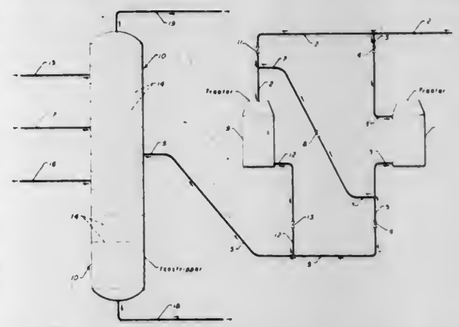
(b) thermally cracking the anthraquinone obtained in (a) at a temperature of from about 425° to about 760° C., and in an inert atmosphere to form benzene.

4,234,750

HF ALKYLATION PROCESS

Michael Z. Mikulicz, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 27, 1979, Ser. No. 69,683
Int. Cl.[3] C07C *2/18, 2/60*
U.S. Cl. 585—332 **12 Claims**



1. In a process for the acid-catalyzed alkylation of an isoparaffin with an olefin alkylating agent wherein the hydrocarbon phase of the alkylation reaction mixture comprising alkylate, unreacted isoparaffin and at least trace amounts of acid, and field paraffins comprising isoparaffins, n-paraffins and olefins, are introduced into a common fractionation column wherein said alkylate, n-paraffins and isoparaffins are separated at conditions conducive to olefin polymerization, the improvement which comprises:

(a) initially treating said field paraffins in contact with a siliceous material effecting the separation of said olefins from said field paraffins; and,

(b) thereafter introducing said field paraffins into said common fractionation column together with said hydrocarbon phase of said alkylation reaction mixture.

4,234,751

SELECTIVE CRACKING OF PHENYLALKANES

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 27, 1979, Ser. No. 61,222
Int. Cl.[3] C07C *4/06*
U.S. Cl. 585—486 **14 Claims**

1. A process for selective cracking of the 2-phenylalkane isomer contained in mixtures comprising said 2-phenylalkane isomer with other positional isomers of said phenylalkane; said process comprising contacting said isomeric mixture with a crystalline zeolite catalyst having a constraint index of about 1 to 12 and a silica to alumina ratio of at least about 12, said contacting being at a temperature of between about 150° C. and about 550° C. and at a pressure of between about 10^4 N/m^2 and about 10^6 N/m^2.

4,234,752

DEHYDRATION OF ALCOHOLS

Yulin Wu, and Stanley J. Marwil, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 28, 1979, Ser. No. 79,744
Int. Cl.[3] C07C *1/27*
U.S. Cl. 585—640 **6 Claims**

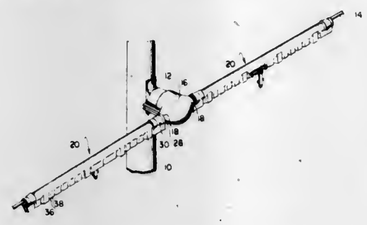
1. A process for the conversion of an alcohol to an olefin which comprises subjecting said alcohol under dehydration reaction conditions of temperature and pressure to the presence of gamma-alumina in the presence of an inert carrier gas.

4,234,753

ELECTRICAL INSULATOR AND CONDUCTOR COVER

Melvin E. Clutter, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed May 18, 1979, Ser. No. 40,129
Int. Cl.³ H01B 17/58
U.S. Cl. 174—5 R **5 Claims**



1. An electrical conductor cover comprising:
an elongated, open-ended member formed of resilient, electrically insulative material,
said member being configured to present an upper tubular, conductor-receiving section, and a pair of elongated, depending, side-by-side, laterally spaced closure legs extending from the tubular section,
said legs normally biased together in abutting contact with each other to present a central line of juncture therebetween, when the cover is in use with a conductor received within said tubular section, for substantially completely surrounding the conductor, said legs being selectively separable for permitting positioning of a conductor within the tubular section,
each of said legs being configured to present a series of inwardly extending, upright, elongated ribs for cooperatively maintaining said conductor in spaced relationship to the outermost margin of the legs remote from the tubular section, in the event that the cover, when in use, is subjected to an impact normally tending to spread said legs and thus expose said conductor, the innermost surfaces presented by the series of ribs on each leg being disposed such that an upright imaginary plane between said legs and coincident with said line of juncture passes uninterruptedly along the length of said cover between the separate series of ribs.

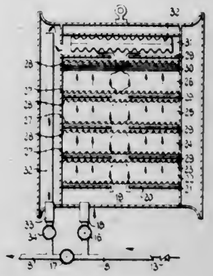
4,234,754

OIL-FILLED ELECTRIC CABLE INSTALLATIONS COMPRISING PRESSURIZING OIL TANKS

Derek R. Edwards, Windsor, and Cyril H. Gosling, Beckenham, both of England, assignors to BICC Limited, London, England

Filed Feb. 23, 1979, Ser. No. 14,727
Claims priority, application United Kingdom, Feb. 28, 1978, 7964/78
Int. Cl.³ H01B 9/06
U.S. Cl. 174—14 R **4 Claims**

1. An oil-filled electric cable installation comprising (i) at least one cable comprising at least one metallic conductor, insulation surrounding the conductor, an enclosing fluid-tight sheath and at least one oil duct extending from end to end of the cable inside the sheath, the cable comprising a plurality of sections defined by stop-joints (ii) oil tanks for maintaining the cable sections filled with oil under pressure and (iii) oil ducts connecting said oil tanks to the stop-joints wherein: at least one said oil duct comprises two passages in parallel; the first passage provides a percolating filter through which oil normally flows when passing from the cable to the tank; and the second passage contains a one-way valve permitting flow of oil from



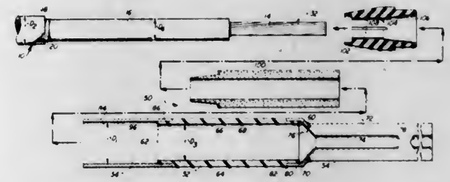
the tank to limit the extent to which the oil pressure in the cable can fall below that in the tank.

4,234,755

ADAPTOR FOR PAPER-INSULATED, LEAD-JACKETED ELECTRICAL CABLES

Craig W. Simons, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,401
Int. Cl.³ H02G 15/23, 1/14
U.S. Cl. 174—19 **18 Claims**



1. An adaptor capable of placement at the terminus of a high voltage electrical cable having diametral dimensions falling within a given range of sizes, the cable being of the oil-filled type including a conductor, a paper insulator and a lead jacket, each having a terminal end adjacent the cable terminus, to seal the terminus and enable installation, in the field, of an electrical connector of the type employing a premolded elastomeric component part for use in an electrical power distribution system, the premolded elastomeric component part having an internal surface, said adaptor comprising:
a sleeve portion of insulating material extending axially between a first end and a second end, the sleeve portion having an axially extending outer surface complementary to the internal surface of the permolded elastomeric component part and an axially extending opening with an inside diameter larger than the diameter of the insulator of the cable of largest diameter in said given range of sizes, said insulating material being essentially impervious to water and to the oil in the cable;
a conductor-sealing portion integral with the first end of the sleeve portion and sealing the opening in the sleeve portion adjacent the first end thereof, the conductor-sealing portion having an axially extending, electrically conductive sheath including an internal passage communicating with the opening in the sleeve portion and corresponding in diameter to the diameter of the conductor of the cable, the internal passage having a closed end remote from the first end of the sleeve;
a jacket-sealing portion integral with the second end of the sleeve portion, the jacket-sealing portion including an axially extending tubular-walled portion capable of being juxtaposed with the lead jacket to seal the juncture between the lead jacket and the adaptor, the tubular-walled

portion having an internal diameter greater than the external diameter of the lead jacket of the cable of largest diameter in said given range of sizes such that the lead jacket will be received within the tubular-walled portion, said tubular-walled portion being capable of permanent deformation toward the lead jacket for the formation of an oil and water seal therewith, in the field;

a dielectric filler for placement between the insulator of the cable and the sleeve portion of insulating material to fill any void therebetween; and

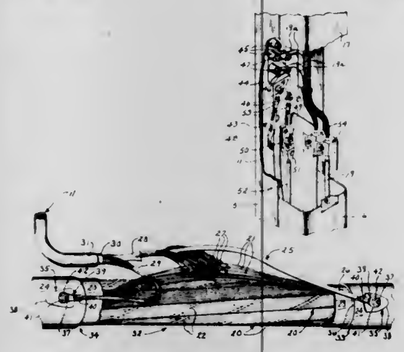
an electrical stress control member for placement in juxtaposition with the terminal end of the lead jacket for controlling electrical stress along the interface between the insulator of the cable and the dielectric filler.

4,234,756

PRETERMINATED BLOCK SYSTEM AND METHOD OF INSTALLING SAME

Michael J. Jackula, and Hans J. Ziegler, both of Milwaukee, Wis., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed Mar. 29, 1979, Ser. No. 25,009
Int. Cl.[3] H02G *9/02*
U.S. Cl. 174—38 **20 Claims**



1. A preterminated block system, comprising:

a distribution cable which includes distribution wires circumferentially surrounded by a cable shield, said distribution cable having a splice opening along a portion of its length to define separate sections of cable shield;

terminal means including a grounded terminal and conductive terminals for providing service connections to the distribution cable;

a first bond conductor connected between one section of cable shield and the grounded terminal of said terminal means;

a second bond conductor connected between the other section of cable shield and the grounded terminal of said terminal means; and

conductor wires bonded at their lower ends to preselected distribution wires and connected at their upper ends to the conductive terminals of said terminal means.

11. An article of manufacturing, comprising:

a terminal block which includes ground terminals and a plurality of conductive terminals; and

a cable stub connected to said terminal block which includes:

(a) a first bond conductor connected at one end to a ground terminal of said terminal block;

(b) a second bond conductor connected at one end to another ground terminal of said terminal block; and

(c) conductor wires connected at their upper ends to the conductive terminals of said terminal block.

15. A method of installing a preterminated block system which includes a distribution cable having distribution wires circumferentially surrounded by a metallic cable shield and a cable jacket circumferentially surrounding the cable shield, comprising the steps of:

forming a splice opening in the distribution cable to expose the distribution wires by removing a portion of the cable jacket and shield at a predetermined interval along the length of the distribution cable;

terminating one end of a first bond wire to the cable shield on one side of the splice opening;

terminating one end of a second bond wire to the cable shield on the other side of the splice opening;

bonding one end of conductor wires to preselected distribution wires; and

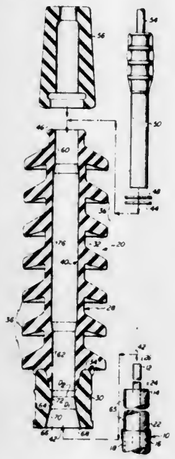
connecting the other ends of the first and second bond wires to commonly grounded terminals of a terminal block and the other ends of the conductor wires to conductive terminals of the terminal block.

4,234,757

ELECTRICAL CABLE ACCESSORIES CONFIGURED FOR LUBRICATED INSTALLATION

Craig W. Simons, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,158
Int. Cl.[3] H02G *15/064*
U.S. Cl. 174—73 R **18 Claims**



1. In a cable accessory to be installed at the terminus of an electrically shielded cable by using a lubricant to ease the installation, the cable having an outside diameter falling within a predetermined range between a smallest diameter and a largest diameter, the cable including a conductor, insulation surrounding the conductor, and a conductive shield surrounding the insulation, the cable having a portion of the shield removed to expose the insulation thereof beyond a terminal region of the shield, and having a portion of the insulation removed to expose the conductor beyond a terminal region of the insulation, the terminal region of the exposed insulation being positioned between a terminal region of the exposed conductor and the terminal region of the exposed shield:

a sleeve-like member of essentially solid elastomeric material having an open end through which the terminus of the cable is to be passed and an axially-extending opening for receiving the cable terminus, the opening including a resiliently dilatable insulation-gripping portion for firmly gripping the insulation and an inlet passage extending between the insulation-gripping portion and the open end of the sleeve-like member;

the inlet passage being flared radially outwardly in the direction from the insulation-gripping portion toward the open end such that the inside diameter of the inlet passage at the open end is substantially larger than the largest diameter of said predetermined range, the inlet passage including a first axially-extending portion tapering downwardly from a maximum diameter at the open end to a first prescribed diameter spaced axially from the open end, and a second axially-extending portion tapering downwardly from the first prescribed diameter to a second prescribed diameter located adjacent the insulation-gripping portion of the opening;

the sleeve-like member having a substantial wall thickness at the second axially-extending portion of the inlet passage, the substantial wall thickness being provided by the solid elastomeric structure of the sleeve-like member;

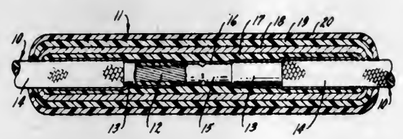
the inside diameter of the inlet passage at the open end being large enough to permit the lubricant on the cable to enter the opening during installation, and the first and second prescribed diameters being such that the relative dimensions of the second axially-extending portion of the inlet passage and a cable having an outside diameter within said predetermined range, together with the substantial wall thickness provided by the solid elastomeric structure of the sleeve-like member at the second axially-extending portion, will assure that the surrounding conductive shield of the cable will be gripped firmly at a location along the second axially-extending portion of the inlet passage, the first prescribed diameter being spaced axially from the second prescribed diameter so as to enable the terminal region of the shield to be located axially anywhere therein between, the second axially-extending portion being adapted, by virtue of said relative dimensions and said substantial wall thickness, to grip radially the terminal region of the shield so as to substantially reduce any voids between the inlet passage and the terminal region of the shield while compensating for a variation in the axial location of the terminal region of the shield relative to the terminal region of the insulation and the terminal region of the conductor.

4,234,758

CABLE SPLICE

Raymond L. Guzy, Morton Grove, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 3, 1978, Ser. No. 957,383
Int. Cl.[3] H02G *15/08*
U.S. Cl. 174—84 R **7 Claims**



1. A cable splice comprising a metallic sleeve member extending over conductor end portions and frictionally engaging the conductor end portions;

a layer of adhesive covering said sleeve member and extending over the exposed cable insulation;

an insulation layer of uncured thermosetting elastomeric polymer tape surrounding the layer of adhesive in a helical wrap;

an overlapped layer of fabric surrounding said insulation layer;

a helically-wrapped layer of heat-shrinkable polymeric material tape surrounding said layer of fabric, and

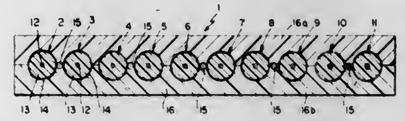
a sleeve of heat shrinkable polymeric material surrounding the layer of heat shrinkable polymeric material tape.

4,234,759

MINIATURE COAXIAL CABLE ASSEMBLY

Norman R. Harlow, Central Valley, N.Y., assignor to Carlisle Corporation, Buchanan, N.Y.

Filed Apr. 11, 1979, Ser. No. 29,119
Int. Cl.[3] H01B *7/08*
U.S. Cl. 174—104 **9 Claims**



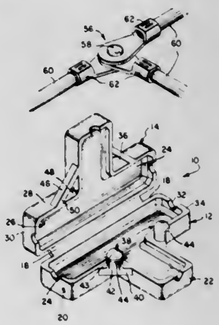
1. A flat coaxial cable assembly comprising: a plurality of parallel and spaced coaxial cables, each said cable comprising a center conductor individually surrounded by a dielectric covering which, in turn, is surrounded by an individual conductive shield in contact with the dielectric covering around its periphery; a plurality of drain wires disposed between alternate adjacent pairs of said cables and parallel thereto, each said wire being in conductive contact with the exterior surfaces of the shields of the pair of cables adjacent thereto, whereby said drain wires are omitted between every other pair of adjacent cables leaving a space therebetween; and a sheath of insulating material encasing said cables and said drain wires, insulating material of said sheath extending from one surface of said assembly to the other surface thereof intermediate pairs of cables not having a drain wire therebetween.

4,234,760

COVERING FOR T-TAP TERMINALS

Gustaf R. Lawson, Willingboro, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1978, Ser. No. 970,508
Int. Cl.[3] H02G *15/113*
U.S. Cl. 174—138 F **1 Claim**



1. A covering for T-tap terminals or the like, comprising:

a. first and second T-shaped halves molded from resilient insulative material and each half being of generally the same structural form with the T-shape being provided by a short section perpendicularly joining a long section intermediate its end, further, each half having a cavity with openings thereto at the ends of the long section, and at the free end of the short section;

b. a hinge attached to both halves with the cavities facing each other; and

c. locking means, located in each of the exterior corners formed by and at the junction of the short and long section, for locking the two halves together, said locking means including posts on one half and bars on the other half, said posts having a downwardly facing shoulder

located below a free end and on an outwardly facing side of the post, said free end cylindrical at least adjacent the downwardly facing shoulder, said bars being spaced from and extending diagonally across the corners with the space therebetween being less than the diameter of the cylindrical portion of the free end of the posts so that as the two halves are brought together and the free ends of the posts are forced into the spaces, the bars and the walls defining the corners stretch so that the free ends may pass therethrough, said bars and walls recovering below the downwardly facing shoulders.

4,234,761

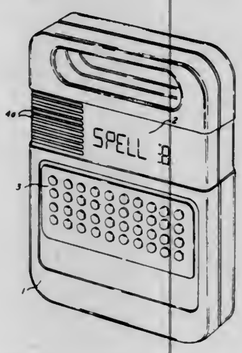
METHOD OF COMMUNICATING DIGITAL SPEECH DATA AND A MEMORY FOR STORING SUCH DATA

Richard H. Wiggins, Jr., Dallas, and George L. Brantingham, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 901,392, Apr. 28, 1978. This application Jun. 19, 1978, Ser. No. 916,989

Int. Cl.[2] G11C *13/00*; G10L *1/08*

U.S. Cl. 179—1 SM **8 Claims**



1. An apparatus for storing digital speech data and for communicating such digital speech data to a speech synthesis circuit, said apparatus comprising:

(a) a memory for storing a plurality frames of digital speech data, said frames including a first frame type representative of voiced speech and a second frame type representative of unvoiced speech, said first frame type having a greater number of bits of data associated therewith than said second frame type;

(b) means for addressing said memory with an address; and

(c) control means responsive to control signals generated by said speech synthesis circuit for communicating the digital data stored in said memory to said speech synthesis circuit.

4,234,762

RING TRIP DETECTOR CIRCUIT

Barry S. Bosik, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

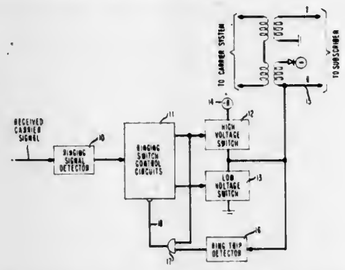
Filed Dec. 29, 1978, Ser. No. 974,387

Int. Cl.[3] H04M *3/04*

U.S. Cl. 179—18 HB **6 Claims**

1. A ring trip detection circuit for subscriber loop carrier systems wherein the ringing signal source provides one half-cycle of the ringing signal which is of a substantially higher voltage than the other half-cycle, said detection circuit characterized by

a voltage detector for detecting an off-hook condition in a telephone subscriber station set, and



means for enabling said voltage detector only during said half-cycle having said substantially higher voltage.

4,234,763

FEEDING BRIDGE WITH D.C.-COMPENSATION FOR BOTH DIRECTIONS OF THE FEED CURRENT

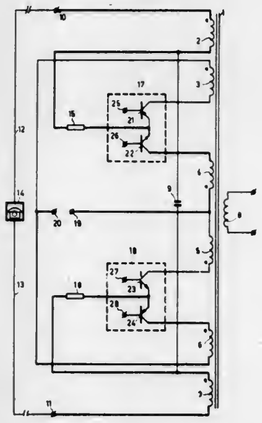
Eise C. Dijkmans; Barend Ijff, both of Eindhoven, and Antonius H. J. Reuvekamp, Blantyre, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,844

Claims priority, application Netherlands, Jul. 19, 1978, 7807706

Int. Cl.[3] H04M *19/08*

U.S. Cl. 179—77 **9 Claims**



5. Apparatus for coupling a pair of input terminals to a pair of output terminals comprising, a transformer having six primary windings each with the same number of turns and a second winding coupled to the output terminals, a capacitor, first and second complementary transistor circuits each having a pair of control terminals, first and second impedance elements, means serially connecting a first primary winding, the capacitor and a sixth primary winding of the transformer across the input terminals with the first and sixth windings polarized in the same sense, first and second supply terminals for connection to a source of voltage, means serially connecting a third primary winding of the transformer, a first part of the first transistor circuit, the first impedance element and said first primary winding of the transformer between said first supply terminal and a first one of said input terminals and with said first and third windings polarized in the opposite sense, means serially connecting a fourth primary winding, a first part of the second transistor circuit, the second impedance element and said sixth primary winding between said first supply terminal and a second one of said input terminals and with said fourth and sixth windings polarized in the opposite sense, means serially connecting a second primary winding of the transformer, a second part of the first transistor circuit, said first impedance element and the first primary winding between the second supply terminal and the first input terminal, means serially connecting a fifth primary winding of the transformer, a second part of the second transistor circuit, the second impedance element and the sixth primary winding between the second supply terminal and the second input terminal, and means for applying control signals to the control terminals of said first and second transistor circuits to control the operation thereof so as to reverse the direction of current flowing from said supply terminals to said input terminals.

4,234,764

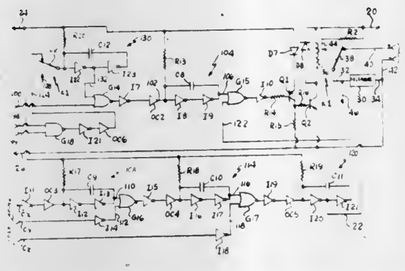
LONG DISTANCE TELEPHONE CALL SECURITY SYSTEM

Ronald Beebe, 1159 Locke Ave., Simi Valley, Calif. 93065

Filed Jan. 22, 1979, Ser. No. 5,674

Int. Cl.[3] H04M *1/66*, *1/36*

U.S. Cl. 179—90 D **20 Claims**



1. A security system for a telephone instrument normally connected to a central office and operable by actuation of certain of a plurality of digits, and wherein a long distance call must be initiated by the initial actuation of at least one predetermined digit from said plurality of digits on the instrument, which comprises:

first means responsive to the initial actuation of said predetermined digit for disconnecting said telephone instrument from said central office for a first-time period; and

second means responsive during said first time period to the actuation of at least one additional digit predetermined from said plurality of digits for reconnecting said telephone instrument to said central office to permit a long distance call to be completed.

4,234,765

KEY TELEPHONE SYSTEM

Kouichi Sekiguchi, Asaka; Hikaru Takematsu, Higashikurume, and Kazutada Katsukura, Tokorozawa, all of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

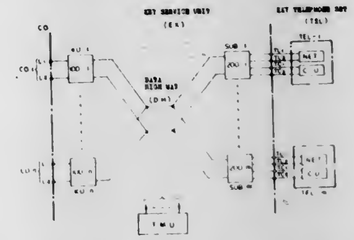
Filed Jun. 21, 1978, Ser. No. 917,578

Claims priority, application Japan, Jun. 25, 1977, 52-74928; Jun. 25, 1977, 52-74929; Jun. 25, 1977, 52-74930; Jun. 25, 1977, 52-74931; Jun. 25, 1977, 52-74932

Int. Cl.[3] H04Q *5/18*

U.S. Cl. 179—99 M **10 Claims**

1. A key telephone system, in which a key service unit comprises a spatially divided temporary storage means for temporarily storing CO line seizure information under control of time slots designated in correspondence to a plurality of CO lines, closing means for forming a DC closed loop in respect of a seized one of the CO lines by an output from the storage means, a plurality of circulating memories provided in correspondence to a plurality of key telephone sets, and first pulse generating means for generating a clock pulse train, in which second pulse generating means is provided in each of the plurality of key telephone sets for deriving output pulses synchronized with pulses of the clock pulse train from the first pulse generating means, control information sending means provided in each of the plurality of key telephone sets for producing control information for the CO line selection by the output from the second pulse generating means and a CO line selecting key, in which write means is provided in the key service



unit for receiving and detecting the control information to write the control information in a selected one of the circulating memories at an address designated by the result of the detection; and in which the output from the circulating memory is applied to the temporary storage means, thereby to seize that one of the plurality of CO lines designated by the actuation of the CO line selecting key in each of the key telephone sets.

4,234,766

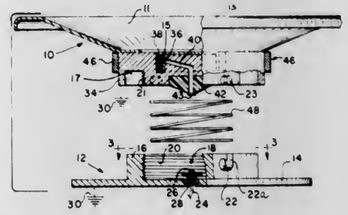
SPEAKER ASSEMBLY

Gibson C. Cacho, 4006 Dorsey Rd.-Lot C, Charleston, S.C. 29405

Filed Feb. 5, 1979, Ser. No. 9,643

Int. Cl.[3] H04R *9/02*, *9/06*; G10K *13/00*

U.S. Cl. 179—115.5 R **5 Claims**



1. A two piece speaker assembly, the improvement comprising:

a cone means including a flexible, lightweight diaphragm;

a base with means interconnecting the cone means with the base;

said cone means including a carrier having a pair of annular recesses extending in opposite directions and including a first recess providing a receptacle to receive a speaker coil;

a second annular recess including a fastening means;

said base including a cavity;

connecting means positioned adjacent said cavity on said base for cooperative engagement with the fastening means of the cone for securely and removably interconnecting the cone unit with the base;

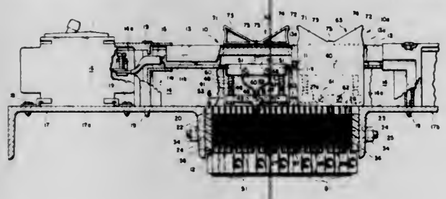
said carrier of the cone unit including a circular magnet attached thereto and providing a magnetic field;

a coil carrier with means extending into the first annular cutout and having means for mounting said speaker coil thereto;

said diaphragm having means attached to the coil carrier and

providing movable means for reciprocating movement in response to movement of the coil carrier;
electrical means for providing an electrical impulse to the speaker coil and moving the coil in said magnetic field to move the attached diaphragm and produce an audible sound.

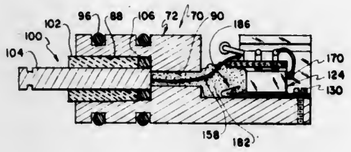
4,234,767
CIRCUIT SELECTOR
Ariel R. Davis, Provo, and Worthington W. Greene, Salt Lake City, both of Utah, assignors to Rual Industries, Inc., Salt Lake City, Utah
Filed Sep. 5, 1978, Ser. No. 939,125
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—1 R **26 Claims**



1. A circuit selector comprising
a support frame;
a plurality of spaced apart buss bars carried by said support frame;
means for connecting each of said buss bars to a source of power;
an electrically conductive guide rail carried by the support frame;
means for electrically connecting said guide rail to stage lights or the like to be operated;
a slider member including a hanger slidable on said guide rail;
a contact bar;
means mounting said contact bar to be carried by said hanger and to be biased away from said hanger towards said buss bars;
a contactor foot carried by said contact bar, said contactor foot being arranged to engage one of said buss bars when said contact bar is fully biased away from said hanger; and
means carried by the support frame for latching said contact bar in a retracted position with the contractor foot out of engagement with said buss bars; and
an electrically conductive flexible shunt cable interconnecting the contact bar and the hanger, whereby an electrical circuit is completed through the contactor foot, the contact bar, the shunt cable and hanger to the guide rail.

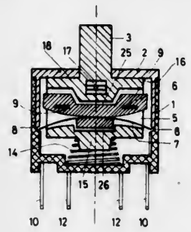
4,234,768
SELECTIVE FIRE PERFORATING GUN SWITCH
Gene T. Boop, Ft. Worth, Tex., assignor to Sie, Inc., Ft. Worth, Tex.
Continuation-in-part of Ser. No. 745,686, Nov. 29, 1976, Pat. No. 4,100,978, which is a division of Ser. No. 535,355, Dec. 23, 1974, Pat. No. 4,007,796. This application Apr. 24, 1978, Ser. No. 899,705
Int. Cl.³ H01H *9/00, 15/00*
U.S. Cl. 200—52 R **19 Claims**

1. A switch comprising:
a plurality of contacts, means mounting the contacts for relative movement, and a member effecting relative movement of the contacts upon application of an impact force thereto; and
means for applying a contact moving impact force to the member including a receptacle having therein a body of flowable material spaced from the member and means for generating an unconfined stream of material from the



receptacle and for directing the same against the member including means for applying pressure to the material.

4,234,769
ELECTRICAL SWITCH HAVING A FLOATING BRIDGE MEMBER
Gert M. Brandt, Bronshoj, and Soren R. Hansen, Ballerup, both of Denmark, assignors to Aktieselskabet MEC Mekanisk Elektrisk Compagni af 1975, Ballerup, Denmark
Filed Feb. 12, 1979, Ser. No. 11,699
Claims priority, application Denmark, Feb. 22, 1978, 785/78
Int. Cl.³ H01H *13/26*
U.S. Cl. 200—67 DB **1 Claim**

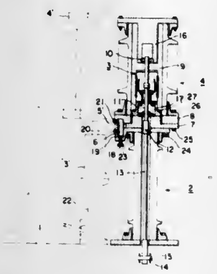


1. An electrical switch including a housing and a button, which button, by means of a manual depression in a single direction, is movable relative to the housing between two positions and during this movement causes a snap spring inserted in the button to slip from a first extreme position to a second one, characterized in
that said snap spring (7) is set up to a bow between two bearings or seats (8) provided in opposite walls of the housing,
that a central part of said snap spring is placed in a bridge member (6) carrying resilient contact fingers (9), and
that said bridge member (6) is arranged with a two-sided clearance (25,26) in a recess provided in the button (3).

4,234,770
SECTIONALIZED PORCELAIN INSULATOR HAVING REMOVABLE CIRCUIT BREAKER
Kosuke Higuchi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tanagawa, Japan
Filed Jun. 12, 1978, Ser. No. 914,774
Claims priority, application Japan, Jun. 21, 1977, 52-72803
Int. Cl.³ H01H *9/08*; B65D *6/00*; H01B *17/04*; H01H *33/66*
U.S. Cl. 200—144 B **2 Claims**

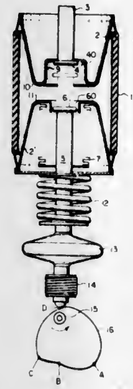
1. In a porcelain insulator type circuit breaker including a lower porcelain tube secured to a supporting frame, an upper porcelain tube mounted on said lower porcelain tube in axial alignment therewith, and an interrupting unit provided in said upper porcelain tube, the improvement which comprises means for interconnecting said upper porcelain tube and said lower porcelain tube in a manner permitting rotation of said upper porcelain tube relative to said lower porcelain tube to displace said upper porcelain tube from axial alignment with said lower porcelain tube, said means comprising a jack bolt

for upwardly forcing said upper porcelain tube from said lower porcelain tube and a hinge for interconnecting said upper and lower porcelain tubes so that said jacked-up upper porcelain



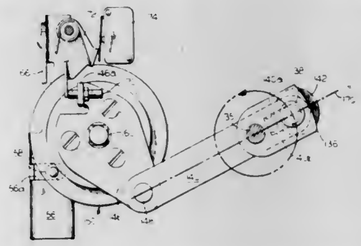
tube can be rotated about said hinge so as to permit removal of said interrupting unit from the lower end of the rotated upper tube.

4,234,771
VACUUM SWITCH
Mikio Ohkawa, Machida, and Nobuo Kawashima, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan
Filed Dec. 5, 1977, Ser. No. 857,458
Claims priority, application Japan, Dec. 9, 1976, 51-147164; Dec. 9, 1976, 51-164123[U]; Feb. 14, 1977, 52-14208
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**



1. In a vacuum switch comprising a vacuum vessel having an insulating cylinder and end plates which are air-tightly sealed to both ends of said insulating cylinder, relatively movable first and second contacts, and a bellows attached to one of said end plates, the improvement which comprises a first metal plate having a first annular edge portion and a relatively long first cylindrical reentrant portion extending from the inner end of said first edge portion in parallel with said insulating cylinder, a second metal plate having a second annular edge portion opposed to said first edge portion and a second cylindrical reentrant portion extending from the inner end of said second edge portion in parallel with said insulating cylinder, said second reentrant portion being coaxial with said first reentrant portion, said first and second edge portions being disposed in parallel with a predetermined spacing therebetween, and means for separating said contacts such that said contacts are firstly separated in said first reentrant portion of said first metal plate at the time of current interruption and that one of said contacts is then moved into the second cylindrical reentrant portion of said second metal plate for increasing the insulating distance after the current interruption.

4,234,772
MOTOR OPERATED CIRCUIT BREAKER INCLUDING A VARIABLE DRIVE COUPLING LINK ASSEMBLY
Eric H. Rask, Newington, Conn., assignor to General Electric Company, New York, N.Y.
Filed Jun. 25, 1979, Ser. No. 51,587
Int. Cl.³ H01H *3/30, 73/12*
U.S. Cl. 200—153 V **7 Claims**



1. In a circuit breaker equipped with a motor operator mechanism functioning to reciprocate a circuit breaker operating member from a home position through a first stroke in one direction and then through a second stroke in the opposite direction back to the home position, the motor operator mechanism including a unidirectionally rotating output shaft to which is affixed a first crank arm, and a second crank arm drivingly coupled with the operator member, a variable drive coupling assembly comprising, in combination:
A. linkage means drivingly interconnecting the first and second crank arms such that, for each revolution of the first crank arm, the second crank arm is propelled through successive, oppositely directed throws effective in motivating the operating member through its first and second strokes;
B. drive coupling means operative to estaolish a constant first effective driving length in said linkage means which is utilized to propel the operating member through its second stroke, upon arrival of the operating member at its home position, said coupling means automatically effectuating a lost motion connection between the first and second crank arms, said lost motion connection providing a coasting zone through which the first crank arm may revolve without disturbing the home position of the operator member;
C. cam means operative at the conclusion of said coasting zone to establish a second effective driving length in said linkage means, the differential between said first and second effective driving lengths defining the limits of said lost motion connection, said second effective driving length being utilized to propel the operating member into its first stroke, said cam means acting on said drive coupling means to progressively change the effective driving length in said linkage means such that said first effective driving length therein is re-established by the conclusion of the first stroke of the operator member, thereby equalizing the lengths of the first and second strokes thereof; and
D. switch means acting in response to the arrival of the operator member at its home position to deactivate the motor operator mechanism.

4,234,773

DISPLAY DEVICE FOR A PUSH BUTTON ASSEMBLY

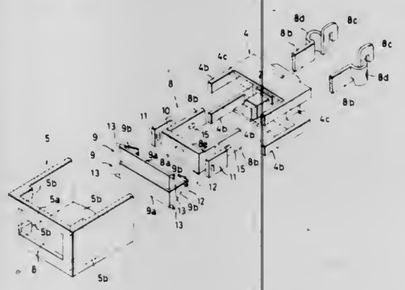
Kiyotaka Nakatani, and Kunikazu Konno, both of Isezaki, Japan, assignors to Hosiden Electronics Co., Ltd., Japan

Filed May 3, 1979, Ser. No. 35,566

Claims priority, application Japan, May 15, 1978, 53-65399[U]; Aug. 3, 1978, 53-107087[U]

Int. Cl.³ H01H 9/00, 9/16

U.S. Cl. 200—308 **9 Claims**



1. A display device for a push button assembly comprising:
a push button having a case-shape button outer body provided in the front surface thereof with a window, a button inner body fitted into the bottom opening of said button outer body, guide grooves formed in the opposite inner lateral sides of said button outer body, and side grooves formed in both lateral sides of said button inner body;
a display plate housed in said push button with the display surface thereof faced to said window;
a support inserted into said push button with a pair of parallel leg members of said support slideably inserted into said side grooves of said button inner body, the end portions of said leg members which are extended to the outside of said push button, being securely fixed to the frame of said push button assembly; and
at least one shutter rotatably connected to the portions of the support which are inserted into said push button, and adapted to be rotated with the pivoted ends of said shutter guided by said guide grooves, between a first position wherein said display surface is screened from said window and a second position wherein said display surface is exposed to said window, responsively to the axial relative movement of said push button with said support.

4,234,774

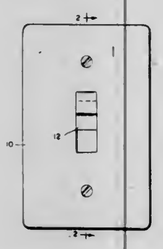
IMITATION WALL SWITCH

James B. Paparella, Andover, Mass., assignor to American Publishing Corporation, Watertown, Mass.

Filed Mar. 19, 1979, Ser. No. 22,214

Int. Cl.² H01H 3/20

U.S. Cl. 200—330 **6 Claims**



1. An imitation wall switch of large size for use in conjunction with a conventional wall switch of the kind wherein there is a wall plate through which projects one end of a toggle lever, comprising an imitation wall plate containing a centrally-located opening, an imitation switch lever, means mounting the imitation switch lever in the opening with one end projecting from the face of the imitation wallplate and the other end projecting from the back of the imitation wallplate, said means comprising accurate bearings on the imitation switch lever, arranged with their convex sides facing the inner side of the imitation wallplate, a bearing plate mounted on the imitation switch lever between the bearings and the imitation wallplate, a means operably connecting the inwardly projecting end of the imitation switch lever to the outwardly projecting end of the toggle lever, comprising a length of elasticly flexible tubing, one end of which is pressed onto one end of the toggle lever, and the other end of which is received in an opening in the end of the imitation switch lever, said elasticly flexible length of tubing operating to hold the bearings rockably pressed against the bearing plate.

4,234,775

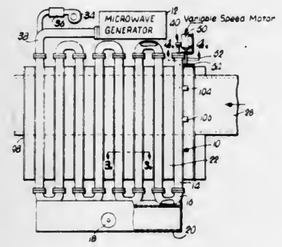
MICROWAVE DRYING FOR CONTINUOUSLY MOVING WEBS

Larry B. Wolfberg, and John Harper, both of Wichita, Kans., assignors to Technical Developments, Inc., Wichita, Kans.

Filed Aug. 17, 1978, Ser. No. 934,417

Int. Cl.³ H05B 6/78

U.S. Cl. 219—10.55 A **12 Claims**



1. A drier for removing moisture associated with a web advancing along a predetermined path of travel, said drier including:
an elongated wave guide adapted for conduction of electrical energy in the microwave region characterized by a series of standing waves,
said wave guide having a plurality of serially interconnected sections extending back and forth across said path of travel,
each of said sections having means permitting the passage of the moving web through the wave guide transversely of said sections;
a source of said electrical energy coupled with the wave guide for producing said standing waves;
a tuning device coupled with said wave guide and adapted for selective adjustment to tune the wave guide and the particular web associated therewith to the frequency of said source of electrical energy; and
continuously moving means separate from said device and associated with said wave guide for continuously disrupting said standing waves at a selectively adjustable rate and causing the peaks thereof to oscillate along the various sections, thereby avoiding stationary alignment of the wave peaks in one section with those in another section to the end that the drying effects of the microwave energy are dispersed throughout the width of the web.

4,234,776

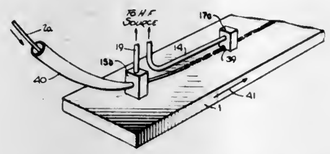
METHOD OF PRODUCING AREAS OF ALLOY METAL ON A METAL PART USING ELECTRIC CURRENTS

Wallace C. Rudd, New Canaan, and Humfrey N. Udall, Darien, both of Conn., assignors to Thermatool Corp., Stamford, Conn.

Filed Jul. 12, 1978, Ser. No. 923,778

Int. Cl.³ B23K 9/04; H05B 6/00; B23K 11/00

U.S. Cl. 219—76.17 **27 Claims**



1. A method for producing in an area on the surface of a metal part, a volume of metal which is the fusion product of the metal of said part and an alloying material which forms an alloy with, and has a composition different from, the metal of said part, said fusion product having a composition different from that of the metal of said part and said volume of metal being structurally continuous, said method comprising:
heating the metal in said area of said surface to at least its melting temperature without heating adjacent metal to its melting temperature thereby to provide a pool of molten metal of said part extending inwardly from said surface and to be mixed with said alloying material, said heating being performed by causing an electric current having a frequency of at least 3000 Hz to flow in said area while causing a current of the same frequency to flow in a conductor overlying said area but which, at any instant, flows oppositely to the direction of the current flow in said area, said conductor being spaced from said area by a distance not greater than three times the width of said conductor, said current being caused to flow in said area by contacting said part with contacts respectively contacting the surface of the metal part at opposite ends of said area and connected to a source of said current, at least one of said contacts being connected to said source in series with said conductor;
depositing said alloying material on said area before, during or after heating of the metal of said area and heating said alloying material unit at least a portion thereof melts and the alloying material mixes with the molten metal of said part and the metal of said area is structurally continuous; and
cooling the metal of said area to form a volume of metal in said area at the surface of said metal part which extends inwardly from said surface, which comprises an alloy of the metal of said part and of said alloying material formed in situ and which is structurally continuous.

4,234,777

PROGRAMMED WELDING MACHINE WITH WELD HEAD SPEED OVERRIDE

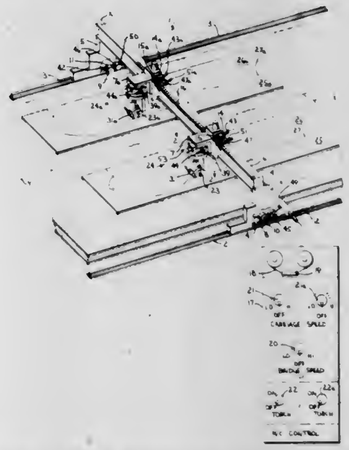
Fredrick J. Balfanz, Waukesha, Wis., assignor to C-R-O, Inc., Menomonee Falls, Wis.

Continuation-in-part of Ser. No. 24,696, Mar. 28, 1979. This application Aug. 15, 1979, Ser. No. 65,175

Int. Cl.³ B23K 9/12

U.S. Cl. 219—125.1 **7 Claims**

1. In a welding machine for joining a plurality of pairs of metal pieces along substantially identical weld grooves disposed between said pieces:
(a) a frame,
(b) a plurality of carriages, each being mounted to said frame for movement relative to a respective first axis,
(c) a rotator suspended beneath each said carriage and with said rotator being rotatable about a C axis disposed generally perpendicularly to said pieces,
(d) a weld head suspended beneath each said carriage for forming a weld in one of said grooves,
(e) a sensor suspended beneath each said carriage for following the contour of the respective groove in advance of the respective weld head,
(f) each said weld head and sensor being rotatable with a respective rotator with respect to a said C axis,
(g) first and second motive means:
(1) to selectively drive each said carriage along its respective first axis, and
(2) to rotate each said rotator about its respective C axis,
(h) each said first and second motive means being actuatable



in response to a programmable input control unit to cause each said sensor and weld head to traverse a programmed path at a given speed, and with said path generally corresponding to that of the respective groove,
(i) program override means connected to each said rotator and responsive to a deviation in the respective groove perpendicular to the respective programmed path and sensed by the respective sensor to cause said rotator and its weld head to move from the programmed path to a corrected path which is in correspondence with the actual path formed by the respective groove,
(j) and second override means connected to the program override means of each said rotator for selectively changing the speed of movement of the respective weld head in a direction parallel to the respective groove.

4,234,778

METHOD OF AND WELDING TORCH FOR ARC WELDING

Gerardus A. M. Willems, and Gerrit W. Tichelaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 896,235

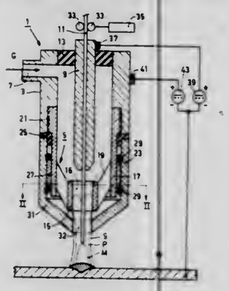
Claims priority, application Netherlands, Apr. 26, 1977, 7704527

Int. Cl.³ B23K 9/16

U.S. Cl. 219—121 P **1 Claim**

1. A method of plasma-MIG welding, which comprises providing a single nozzle non-consumable electrode having a central orifice and a surrounding annular opening; flowing a thermally ionizable gas stream from a common gas source through said single nozzle non-consumable electrode toward a workpiece, said single nozzle splitting said gas stream into a central gas column surrounded by a parallelly flowing annular gas sheath, said annular gas sheath and said central gas column having the same composition as they flow past the outlet of said single nozzle; feeding a consumable electrode through said central gas column toward the workpiece; first establishing a MIG-arc between said consumable electrode and said work-

piece; then spontaneously establishing a plasma arc by means of said MIG-arc between said single nozzle non-consumable electrode and said workpiece to ionize said central gas column and sustain a plasma flow enveloping said MIG-arc, the surrounding annular gas sheath remaining non-ionized and relatively colder than the resulting central plasma gas column; and constricting the annular gas sheath downstream of the single



nozzle non-consumable electrode to drive the relatively colder gas sheath into the central plasma gas column to expand the former by heating whereby the central plasma gas column is also constricted and its flow rate is increased.

4,234,779

METHOD OF AND DEVICE FOR PLASMA-MIG WELDING

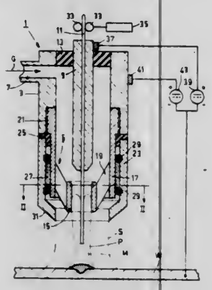
Gerardus A. M. Willems, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,008

Claims priority, application Netherlands, Jan. 31, 1977, 7700971

Int. Cl.³ B23K 9/00

U.S. Cl. 219—121 P **4 Claims**



1. A method of plasma-MIG welding, which comprises providing a single nozzle non-consumable electrode having a central aperture and a surrounding annular aperture; flowing a thermally ionizable gas stream from a common gas source through said single nozzle non-consumable electrode toward a workpiece, said single nozzle splitting said gas stream into a central gas column surrounded by a parallelly flowing annular gas sheath, said annular gas sheath and said central gas column having the same composition as they flow past the outlet of said single nozzle; feeding a consumable electrode through said central gas column toward the workpiece; first establishing a MIG-arc between said consumable electrode and said workpiece; and then spontaneously establishing a plasma arc by means of said MIG-arc between said single nozzle non-consumable electrode and said workpiece to ionize said central gas column and sustain a plasma flow enveloping said MIG-arc, the surrounding annular gas sheath remaining non-ionized.

4,234,780

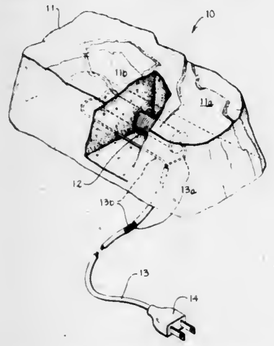
RESTING PLACE FOR REPTILES IN CAPTIVITY

Gregory M. McCarthy, 180 Mayfield Ave., Mountain View, Calif. 94043

Filed May 12, 1978, Ser. No. 905,220

Int. Cl.³ A01K 61/00; H05B 1/00

U.S. Cl. 219—200 **1 Claim**



1. A reptile rest or pad comprising a simulated natural rock formed with uneven surface portions on its sides and top, said top surface forming a resting place for reptiles, said rock being formed as a cast body of conrete, electric heating means embedded within said rock for warming same to attract an elongate reptile to lie upon said top surface, said rock having an exposed, uneven, abrasive, peripheral side wall surface, said periphery having a length serving to permit a reptile to extend substantially around same as said reptile rubs against said side wall surface to aid in shedding its skin.

4,234,781

METHOD AND ARRANGEMENT FOR HEAT-WELDING TOGETHER TWO TUBULAR ELEMENTS

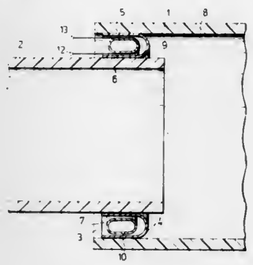
Birger Flink, Porsvägen 4 B, S-752 46 Upsala, Sweden

Filed Nov. 22, 1978, Ser. No. 962,877

Claims priority, application Sweden, Dec. 19, 1977, 7714441

Int. Cl.³ H05B 3/06; F16L 47/02

U.S. Cl. 219—243 **2 Claims**



1. A system of joining together by heat-welding two tubular elements of thermoplastic material and of mutually different diameters, subsequent to inserting one end of one said element into one end of the other to leave an annular gap therebetween, said system comprising:

(a) a ring-shaped welding sleeve which is located in said gap and which is made of a meltable thermoplastic material,

(b) a recoverably deformed pressure-generating ring-shaped body made of a heat-recoverable plastic material inserted within the welding sleeve,

(c) heat-generating means arranged to cooperate with said ring-shaped body in a manner such as to heat the same and

to bring the welding sleeve and said mutually opposing wall surfaces to a fusible state.

4,234,782

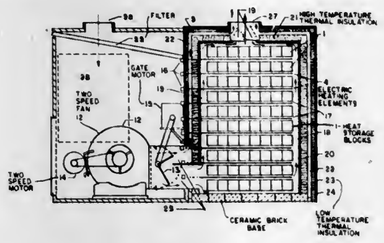
SPACE HEATING USING OFF-PEAK ELECTRIC HEAT STORAGE

Miklos F. Barabas; William B. Cooke; R. H. Stephen Hardy, and Arun Verma, all of Regina, Canada, assignors to Saskatchewan Power Corporation, Regina, Canada

Continuation of Ser. No. 567,104, Apr. 11, 1975, abandoned. This application Jan. 19, 1978, Ser. No. 870,711

Int. Cl.³ H05B 1/02; F24H 7/04

U.S. Cl. 219—365 **11 Claims**



1. An electrical heating unit comprising:

a mass of solid heat storage material for storing heat generated electrically during off-peak electrical power periods;

means associated with the mass of solid heat storage material for electrically generating heat for storage in the heat storage material;

a casing having an outer jacket and an inner jacket with an air space therebetween, the heat storage material being enclosed in the inner jacket;

means associated with the solid mass of heat storage material for withdrawing heat stored in the mass of solid heat storage material, said heat withdrawing means including an air inlet passage communicating with the air space between the inner and outer jackets and with the interior of the inner jacket; and an air outlet passage communicating with the space between said inner and outer jackets with the interior of said inner jacket;

a two-speed fan disposed to draw air into said air inlet passage;

an air flow control gate in one of said air passages, the air flow control gate being movable to select the path of air flowing from said inlet air passage to said outlet air passage, control means for moving said gate to selectively direct the air driven by the fan in one of three manners including (1) only through the air space between the two jackets, (2) only through the interior of the inner jacket thereby causing the air to pick up heat directly from the mass of solid heat storage material and (3) in two parts with one part being directed through the air space between the two jackets the other part being directed through the interior of the inner jacket, the two air parts being subsequently blended together in said air outlet passage for delivery to a space to be heated; and

means for controlling operation of the fan between its two speeds, said fan control means being responsive to the position of said air flow control gate and operating said fan on the lower of its two speeds when the air flow control gate is set to allow air flow only through the air space between the jackets and operating the fan on the higher of its two speeds when the air flow control gate is set to allow air flow other than only through the air space between the jackets.

4,234,783

ELECTRIC RICE COOKERS

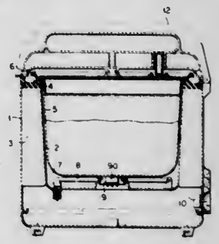
Terutaka Aoshima, Toyohashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 11, 1979, Ser. No. 47,240

Claims priority, application Japan, Jun. 16, 1978, 53-73656; Jun. 16, 1978, 53-73657

Int. Cl.³ F27D 11/02

U.S. Cl. 219—441 **5 Claims**



1. An electric rice cooker comprising a kettle adapted to contain a quantity of rice and water, a removable lid covering the top of said kettle, an electric heater for heating said kettle, a temperature sensitive switch disposed to sense temperature of said kettle and having first and second contacts, said temperature sensitive switch energizing said electric heater through said first contact at the time of starting cooking operation, but transferring to said second contact in response to a cooking completion temperature, frame means for supporting and enclosing said kettle and heater, and a timer energized through said second contact for reenergizing said heater for a definite interval a predetermined time after energization of said timer.

4,234,784

COOKING APPLIANCE CONTROLS

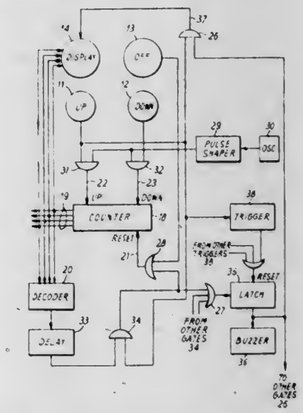
Anthony C. Totterdell, London, England, assignor to Thorn Domestic Appliances (Electrical) Limited, London, England

Filed Jan. 2, 1979, Ser. No. 184

Claims priority, application United Kingdom, Jan. 17, 1978, 1849/78

Int. Cl.³ H05B 1/02; G08C 9/00

U.S. Cl. 219—506 **9 Claims**



1. A cooking appliance having controls comprising an array of touch pads and a display device for displaying a preset temperature value, the touch pads including at least one pad for changing the preset and displayed temperature value for a cooking facility of the appliance, control means responsive to touching of the touch pads to store a signal representing the

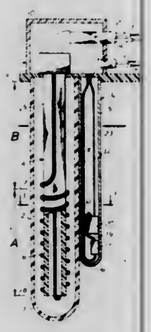
preset temperature value for the facility, and means responsive to the stored signal to control the supply of power to the cooking facility, wherein the control means are arranged to initiate a predetermined delay whenever the preset temperature value reaches at least one of the maximum and minimum presettable values and at the end of the delay to effect at least one of the operations of terminating the supply of power to the facility and providing a warning signal, if a touched pad is still signalling that it is touched at the end of the delay.

4,234,785

LIQUID LEVEL RESPONSIVE CONTROL DEVICE

Fredrick L. Lefebvre, 700 Solano Prado, Coral Gables, Fla. 33156

Filed Jan. 26, 1979, Ser. No. 7,154
Int. Cl.[3] H05B 3/06
U.S. Cl. 219—523 **7 Claims**



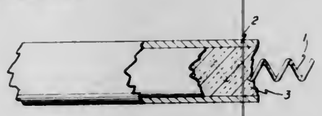
1. Liquid level responsive control means for use in connection with the heating of liquid in tanks, comprising a control unit, main power supply connections therefore, a source of radiant energy to be immersed in the liquid being heated and connected to said unit to be energized for radiation generation, sensing instrumentalities closely adjacent said source, said instrumentalities including a recycling switch connected to said unit, said switch being operable to terminate operation of the said source, when the switch is subjected to direct radiation from the source aforesaid when the liquid reaches a predetermined lower level.

4,234,786

MAGNESIA INSULATED HEATING ELEMENTS AND METHOD OF MAKING THE SAME

Marcus P. Borom, Schenectady, N.Y., and John Schultz, Jr., Louisville, Ky., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,068
Int. Cl.[3] H05B 3/50
U.S. Cl. 219—544 **4 Claims**



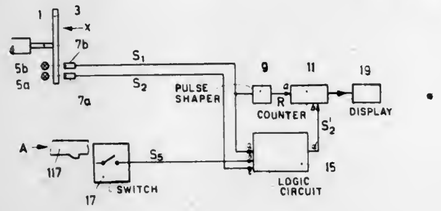
1. In a tubular heating element including a metal sheath and a coaxial coil resistor enclosed in the sheath, the combination of a compacted electrically insulating mass filling the space in the sheath between the resistor and the sheath and comprising fused magnesia and from about 0.1% to about 10% of a glass of softening temperature below about 700° C. having resistivity greater than about 10^7 ohm-cm at 600° C. and being thermodynamically stable in oxygen partial pressure of 10^{-15} atmosphere at temperature in the range of 750° to 1100° C.

4,234,787

APPARATUS FOR MONITORING THE MOTION OF SHUTTLES IN LOOMS OR THE LIKE

Willi Hutter, Roggwil, and Kurt Huber, Arbon, both of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Jul. 6, 1978, Ser. No. 922,574
Claims priority, application Austria, Jul. 15, 1977, 5133/77
Int. Cl.[3] G06M 3/06
U.S. Cl. 235—92 MP **10 Claims**



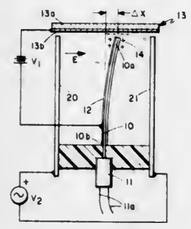
1. Apparatus for monitoring the extent of recurrent movements of a monitored component in relation to the advances of a reference component, comprising first signal generating means for generating first signals whenever said reference component assumes a first position; second signal generating means for generating second signals in response to identical incremental advances of said reference component; third signal generating means for generating a third signal whenever said monitored component assumes a predetermined position in its path of movement, and fourth signal generating means connected to said first, second and third signal generating means and operative for generating fourth signals each of which denotes the number of second signals generated by said second signal generating means during an interval which elapses between the generation of a first signal by said first signal generating means and the generation of the next-following third signal by said third signal generating means.

4,234,788

ELECTROSTATIC FIBER OPTIC SCANNING DEVICE

John P. Palmer, Pomona, and Scott M. Rose, Mountain View, both of Calif., assignors to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Apr. 6, 1979, Ser. No. 27,550
Int. Cl.[3] G02B 5/14
U.S. Cl. 250—227 **8 Claims**



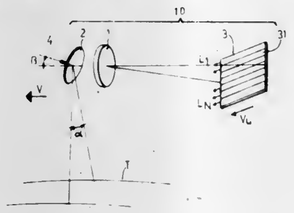
1. A fiber optic scanning device with improved electrostatic positioning comprising:
- an optical fiber of predetermined length having one unsupported end for scanning, and having another end rigidly supported in a cantilevered fashion;
- electrically conductive means rigidly attached to said fiber and extending from said unsupported end to said supported end;
- a transparent conductive plate lying in a plane perpendicular to the length of said fiber and spaced apart from said unsupported end to form a capacitance C with said conductive means;
- a voltage source V coupled between said transparent conductive plate and said electrically conductive means on said fiber to thereby produce an electrostatic charge Q on said conductive means near said movable end where Q=VC; and
- means for generating an electric field E transverse to the length of said fiber to position said movable end with a force F=QE.

4,234,789

OBSERVATION OPTICAL APPARATUS

Maurice Fournet, Meudon, France, assignor to Organisation Europeenne de Recherches Spatiales, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,532
Claims priority, application Belgium, Aug. 2, 1977, 0179836
Int. Cl.[3] H01J 3/14
U.S. Cl. 250—234 **3 Claims**



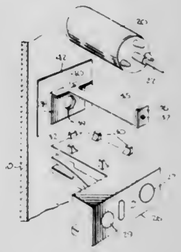
1. An optical observation system for a movable body in space, said system comprising: optical means having a narrow angular field for imaging a viewed scene onto the image plane thereof, said optical means having a plurality of spectral channels and having scanning means such that each image point in said plane is displaced across said image plane in a direction which makes an acute angle with respect to the direction of movement of said movable body;
- planar sensor means located in said image plane for generating electric signals proportional to the irradiance, said sensor means comprising a plate with an array of photodetector elements arranged in a plurality of parallel detection lines, said detection lines extending in a direction which is parallel to the direction of said displacement of the image point in the image plane, n gratings insulated from one another and placed parallel to one another and to said plate, said gratings being coupled to successive groups of respective photodetector elements in each detection line, and said gratings being further connected to be fed with recurrent drive pulses for shifting the electric signal from each photodetector element to succeeding ones of them in each detection line at a rate equal to the rate of said displacement of the image point, with the drive pulses for each grating having a phase shift of 360°/n relative to the pulses for each of the other gratings;
- a second plurality of photodetector elements aligned in a direction perpendicular to the direction lines with each photodetector element in said second plurality of photodetector elements being coupled to the end of a respective one of said detection lines, n second gratings insulated from one another and placed parallel to one another and to said plate, said second gratings being coupled to successive groups of respective photodetector elements in said second plurality of photodetector elements, said second gratings being further connected to be fed with recurrent drive pulses for shifting the electric signal from each of said second photodetector elements to succeeding ones of them, thereby to multiplex the detection signals from the output ends of said detection lines; and
- reading-out means coupled for sensing the electric signals developed at the output end of each of said detection lines.

4,234,790

PHOTODETECTOR HEAT STABILIZER

Charles F. deMey, II, West Redding, and Charles C. Helms, Trumbull, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 1, 1979, Ser. No. 8,373
Int. Cl.[3] H01J 7/24
U.S. Cl. 250—238 **7 Claims**



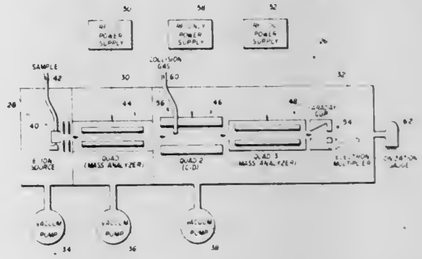
1. A photodetector mounting structure for rapidly heating the photodetector to operating temperature comprising:
- (a) a photodetector having a photocathode,
- (b) a heat conductive casting,
- (c) a block of insulating material on which said photodetector is mounted,
- (d) a metallic strip positioned on said block of insulating material,
- (e) said metallic strip having one end thereof coupled to said photocathode and the other end thereof coupled in heat conducting relationship with said casting, and
- (f) electrical insulating means mounted between said casting and said metallic strip.

4,234,791

TANDEM QUADRUPOLE MASS SPECTROMETER FOR SELECTED ION FRAGMENTATION STUDIES AND LOW ENERGY COLLISION INDUCED DISSOCIATOR THEREFOR

Christie G. Enke; Richard A. Yost, both of East Lansing, Mich., and James D. Morrison, Mooroolbark, Australia, assignors to Research Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,439
Int. Cl.[2] B01D 59/44
U.S. Cl. 250—281 **21 Claims**



1. A selected ion mass spectrometer for the analysis of unknown samples comprising:
- a source capable of ionizing unknown sample molecules of widely varying molecular weights to produce molecular ions, fragment ions, and/or other ions derived from sample components;
- first and second mass analyzers in tandem;
- means for directing ionized unknown sample molecules,

fragments or otherwise derived ions of sample components from said source into said first mass analyzer;

means, interposed between said mass analyzers, for fragmenting and/or reacting, by collision-induced dissociation or reaction, ionized sample molecules, fragments or derivatives selected by said first mass analyzer, the fragmentation and/or reaction being accomplished within a focus device and being induced by unknown sample ions, fragments or components having axial kinetic energies of less than 1 keV colliding with collision gas atoms or molecules; and

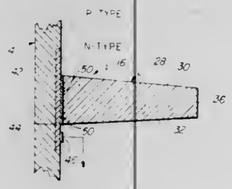
a detector responsive to the output of said second mass analyzer.

4,234,792

SCINTILLATOR CRYSTAL RADIATION DETECTOR

Donald F. DeCou, West Redding, and Terence Roach, Fairfield, both of Conn., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1977, Ser. No. 837,958
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—361 R **5 Claims**



1. An invisible radiation detector comprising a scintillator crystal of material capable of scintillating when subjected to a beam of invisible radiation, and a photodiode mounted on one end surface of said crystal, said crystal also having an opposed end surface, said one end surface of the crystal having means for enhancing the passage of light photons from the crystal to the photodiode, the remaining surfaces of the crystal being provided with means for enhancing the collection of light photons generated within the crystal, said crystal having one selected surface directed toward said radiation and an opposed surface, said selected and opposed surfaces having adjacent ends disposed adjacent said photodiode, and said selected and opposed surfaces being convergently inclined in a direction away from said photodiode.

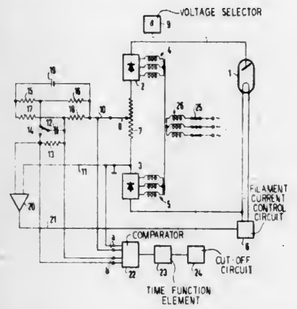
4,234,793

X-RAY DIAGNOSTIC GENERATOR FOR OPERATION WITH FALLING LOAD

Heribert Ammann, Buckenhof, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,617
Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2822811
Int. Cl.[2] H05G *1/42*
U.S. Cl. 250—414 **2 Claims**

1. An x-ray diagnostic generator for operation with falling load with a control means for controlling x-ray tube output, and a function generator which, during an x-ray exposure, generates a rated value signal for the x-ray tube output according to a falling exponential function which effects the adjustment of the x-ray tube output via the control means, characterized by a cut-off element (**24**) actuatable for shutting off x-ray tube operation prior to expiration of the x-ray exposure time, and a comparator (**22**) for comparing the actual and the rated value of the x-ray tube output, and connected to the cut-off element (**24**) for actuating the same to switch off x-ray tube



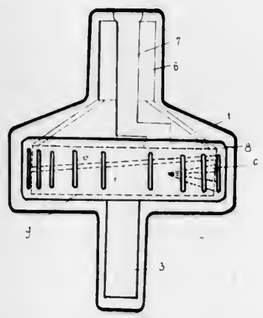
operation when the difference between actual and rated value exceeds a predetermined value.

4,234,794

INSTALLATION OF RADIODIAGNOSIS WITH SWEEP

Vasile Voinea; Vasile Catuneanu; Ioan Birzu; Eugen Teisanu; Maria I. Voinea, and Sorin Patrascu, all of Bucharest, all of Romania, assignors to Statia de Verificare si Intretinere a Aparaturii Medicale, Bucharest, Romania

Filed Nov. 20, 1978, Ser. No. 962,153
Claims priority, application Romania, Dec. 22, 1977, 92587
Int. Cl.[3] H05G *1/70*
U.S. Cl. 250—416 TV **7 Claims**



1. A radiodiagnosis-tomography apparatus comprising:

a radiodiagnosis tube including:

a sealed envelope having a cylindrical axially extending first portion, a cylindrical axially extending second portion, coaxial with said first portion and of a larger diameter than said first portion, and a third portion coaxial with said first and second portions and of a smaller diameter than said second portion,

a rotary anode in said second portion,

a rotatable body forming part of an electric motor in said third portion operatively connected to said anode for rotating same,

a cathode in said second portion extending axially from said first portion and juxtaposed with said anode and cooperating therewith to produce an outwardly directed X-ray beam sweeping around said second portion, and

an annular radio-opaque shield of a metal of high atomic weight and high melting point disposed in said second portion and surrounding said anode, said shield being formed with at least one opening and being provided with means for rotating said shield about a common axis

of said envelope and said anode for sweeping a filiform pencil of X-ray radiation derived from said beam across a patient juxtaposed with said second portion of said envelope:

a transducer responsive to X-ray radiation spaced from said second portion and intercepting the portion of said pencil of X-ray radiation traversing the patient, producing signals adapted to generate a television display; and

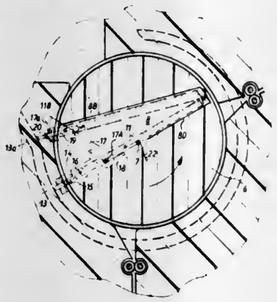
means responsive to said signals and synchronized with the rotation of said shield for displaying a series of points representing a tomographic image of the patient.

4,234,795

APPARATUS FOR LOADING AND UNLOADING CONTAINERS FOR X-RAY FILM

Jürgen Müller, Münich, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Munich, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,120
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758981
Int. Cl.[3] G11B *1/00*
U.S. Cl. 250—468 **10 Claims**



1. Apparatus for inserting photosensitive material into and for withdrawing such material from normally locked and closed containers, particularly for removing exposed sheets of X-ray film from and for introducing unexposed sheets of X-ray film into cassettes, comprising a housing having an internal chamber and an opening for insertion and withdrawal of containers, said opening communicating with said chamber; a rotary carrier sealingly installed in said chamber for rotation from a first to a second and a third angular position and then again to said first angular position and having a compartment with an open end which registers with said opening in said first angular position of said carrier so that a container can be inserted into or withdrawn from said compartment when said carrier assumes said first position; unlocking means for maintaining a container in said compartment in its open position only while said open end is so completely out of register with said opening that outside light reaching the latter is prevented from entering said compartment through said open end thereof; means for receiving photosensitive material from a container in said compartment in said second angular position of said carrier; and means for admitting photosensitive material into a container in said compartment in said third angular position of said carrier.

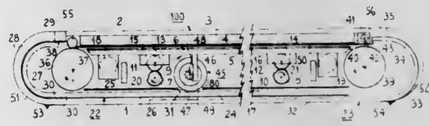
4,234,796

FILM CHANGER FOR X-RAY APPARATUS

Jean Caugant, and Jacques Dale, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jun. 21, 1979, Ser. No. 50,583
Claims priority, application France, Jun. 23, 1978, 78 18837
Int. Cl.[3] G03B *41/16*
U.S. Cl. 250—468 **19 Claims**

1. A film changer for an X-ray apparatus including within a light-tight casing a supply magazine for holding a stack of unexposed film in sheets, means for extracting a single sheet from said stack, an exposure station having two parallel pressure plates respectively covered on their adjacent faces by intensifying screens, one being fixed and the other reciprocably movable toward and away from said fixed one, means for transferring the extracted sheet between said pressure plates



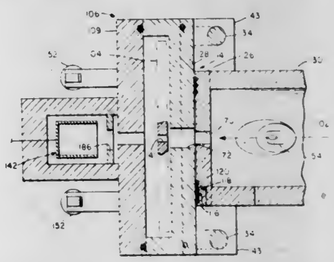
when apart, means for ejecting the film sheets after their exposure from said exposure station, and a receiver magazine for holding the exposed film sheets, wherein the extracting means comprise means for coupling it to the movable pressure plate so that its sole displacement away from said fixed plate actuate the extraction of a film sheet and its presentation to the transferring means.

4,234,797

TREATING WORKPIECES WITH BEAMS

Geoffrey Ryding, Manchester, Mass., assignor to Nova Associates, Inc., Beverly, Mass.

Filed May 23, 1979, Ser. No. 41,806
Int. Cl.[2] A61K *27/02*
U.S. Cl. 250—492.B **16 Claims**



1. In apparatus for treating a workpiece by directing a beam at the workpiece, said apparatus being of the type including a moving support element for carrying said workpiece in a scanning direction, second means for providing relative translation between said support surface and said beam in a control direction generally orthogonal to said scanning direction, measuring means for measuring the intensity of said beam, control means for varying the speed of translation in said control direction, the improvement wherein

said support surface has a slot extending generally along said control direction,

said beam measuring means comprises means positioned behind said support element for measuring the intensity of said beam travelling through said slot, and

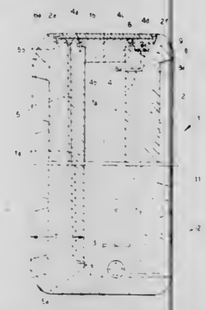
said control means comprises means for varying the speed of translation in said control direction in dependent response to said measured beam intensity travelling through said slot.

4,234,798

TRANSPORT AND STORAGE RECEPTACLE FOR RADIOACTIVE WASTE

Henning Baatz, Essen, and Dieter Rittscher, Helligenhaus, both of Fed. Rep. of Germany, assignors to Steag Kernenergie GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 940,098
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 7727690
Int. Cl.[2] G21F 5/00
U.S. Cl. 250—506 **8 Claims**



1. A shielding transport and storage receptacle for radioactive materials, especially for nuclear-reactor fuel elements, comprising:

an elongated body cast in one piece and formed with a lateral wall surrounding a chamber for said material and a bottom, said body being composed of cast iron or cast steel;

a shielding cover connected to said body and closing said chamber at an upper end thereof with a thickness of radiation absorbing material limiting escape of radiation into the environment,

at least one passage cast in said body and communicating with said chamber at a low point thereof, said passage terminating at an upper end of said body;

means including an additional cover removably affixed to said body for closing said passage at said end of said body; and

a further passage cast in said body and communicating with said chamber at an upper portion thereof, said further passage terminating at said end,

means being provided for closing said further passage,

the means for closing said further passage being said additional cover.

4,234,799

METHOD AND INSTRUMENT FOR PHOTOMETRIC ANALYSIS OF LIQUID USING CENTRIFUGE ROTOR

Akira Okumura, Takarazuka, Japan, assignor to Tetsuo Matsumoto, Hyogo; Eiko Okumura, Takarazuka and Hitachi Koki Company, Limited, Tokyo, all of, Japan

Filed Dec. 12, 1978, Ser. No. 968,722
Claims priority, application Japan, Dec. 16, 1977, 52-152248
Int. Cl.[3] G01K 15/06
U.S. Cl. 250—576 **9 Claims**

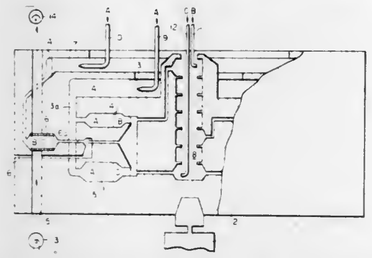
1. A method of photometrically analyzing a liquid mixture of a sample and a reagent, comprising the steps of:

(a) forming in a centrifuge rotor a sample chamber, a reagent chamber and a reservoir chamber each elongated and oriented radially of said rotor in such a fluidic connection that said reservoir chamber communicates with both said sample chamber and said reagent chamber through the radially outermost ends thereof;

(b) forming in said rotor a light-transmissive measurement chamber which is elongated, oriented radially of said rotor and located radially outward from said sample chamber and said reagent chamber and a passageway which connects said measurement chamber to the radially innermost ends of said sample chamber and said reagent chamber;

(c) introducing a high density liquid which is higher in density than either of said sample and said reagent into both said sample chamber and said reagent chamber through said reservoir chamber so as to leave said sample chamber and said reagent chamber each partly vacant;

(d) introducing a liquid sample into said sample chamber through the radially innermost end thereof and introducing a liquid reagent into said reagent chamber through the radially innermost end thereof while said rotor is rotating;



(e) further introducing said high density liquid into both said sample chamber and said reagent chamber through said reservoir chamber, while said rotor is rotating, so as to force said sample and said reagent to flow out of said sample chamber and said reagent chamber, respectively, through the radially innermost ends of the respective chambers, whereby said sample and said reagent enter said measurement chamber through said passageway by the action of centrifugal force; and

(f) projecting a light beam so as to intersect said measurement chamber and receiving and analyzing the light beam transmitted through said measurement chamber, in which is contained a mixture of said sample and said reagent.

4,234,800

OZONE GENERATOR

William L. Kenly, V, Parsippany; William O. Grefe, West Paterson, and Walter H. Lawrence, Hopatcong, all of N.J., assignors to Pollution Control Industries, Inc., West Caldwell, N.J.

Filed Jan. 29, 1979, Ser. No. 7,557
Int. Cl.[3] C01B 13/11
U.S. Cl. 250—540 **10 Claims**

1. In an ozone generator comprising an inner tubular metallic electrode, an outer electrode comprising a tubular dielectric having on its outer surface an outer metal electrode, said dielectric and said inner electrode defining a corona discharge ozone generation zone, and means for contacting the outer surface of said outer electrode with a cooling fluid, and two end members cooperating with said inner and outer electrodes to form a unitary module, the improvement wherein:

(a) The longitudinal dimension of said outer tubular dielectric is greater than the longitudinal dimension of said tubular metallic electrode;

(b) Each of said end members comprises an end plate having:

(1) On the inner surface thereof a first projection for receiving in slidably engaging, fluid-tight contact said tubular dielectric;

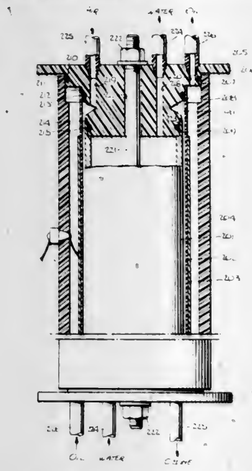
(2) On the inner surface of said first projection, a second projection for receiving in slidably engaging fluid-tight contact said inner electrode;

(3) The side wall of said second projection being provided with a circumferential recess extending therearound, and in fluid communication with the annulus between said inner electrode and said dielectric;

(c) Said end member being further provided with:

(1) A passage extending from said circumferential recess to the outer face of said end member for transmitting oxygen-containing gas between said annulus and the outside of said module; and

(2) A passage extending from the inner face of said projection to the outer face of said end member for transmitting cooling fluid between the core of said inner cylinder and the outside of said module.



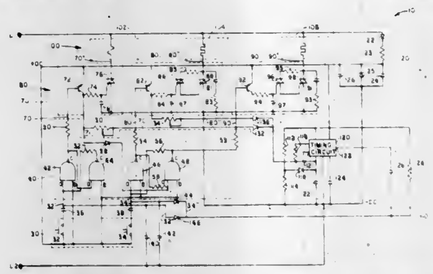
(d) Means for securing end members being secured by applying to said members an axial compressive force, the axial dimensions of said end members, said tubular metallic electrode and said outer tubular dielectric being such that substantially all of said axial compressive force is applied to said tubular metallic electrode and said tubular dielectric is free to slide longitudinally and is not subjected to said axial compressive force.

4,234,801

CONTROL SYSTEM UTILIZING MOMENTARY SWITCHING DEVICES

James E. Small, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 22, 1978, Ser. No. 880,089
Int. Cl.[3] H02J 3/00
U.S. Cl. 307—38 **5 Claims**



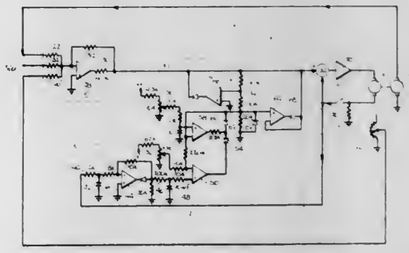
1. In an apparatus having a plurality of machine functions and a control system for controlling activation and deactivation of said machine functions, said control system including programming means having N momentary switching devices for programming desired operational modes of said apparatus and function control means for activating and deactivating said machine functions in accordance with predetermined operational sequences associated with said operational modes, the improvement wherein said control system further comprises: gate circuit means responsive to said N momentary switching devices for latching said control system in at least N+1 operational modes, said gate circuit means including at least two bistable multivibrator circuits and each of said bistable multivibrator circuits includes a plurality of multiple input inverting logic gates each having an output electrically coupled to an input of at least one other of said logic gates, at least N of said inverting logic gates have inuts electrically coupled to said momentary switching devices whereby activating any one of said N momentary switching devices causes at least one of said inverting logic gates to make a logical one (1) to logical zero (0) transition and at least another of said inverting logic gates to make a logical zero (0) to logical one (1) transition thereby latching said control system in at least one of said N+1 operational modes, said function control means responsive to said gate circuit means whereby said machine functions are activated and deactivated in accordance with said predetermined operational sequences, and timing means responsive to said function control means for determining timing cycles for operational sequences of at least N of said N+1 operational modes.

4,234,802

CURRENT LIMITER

Francis X. Bock, New Hyde Park, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Sep. 11, 1978, Ser. No. 941,011
Int. Cl.[3] H04B 15/00
U.S. Cl. 328—171 **5 Claims**



1. A current limiter for independently limiting both the peak current and average current of a transconductance switching servo amplifier by clamping the input voltage of said amplifier, comprising:

(a) peak current limit set means adapted for connection to a fixed voltage source for producing an adjustable peak limit voltage corresponding to a peak current limit;

(b) average current limit set means adapted for connection to a fixed voltage source for producing an adjustable average limit voltage corresponding to an average current limit;

(c) averaging means for producing an average voltage corresponding to the average current of said amplifier; and

(d) clamping means connected to said peak current limit set means, to said average current limit set means and to said averaging means for clamping said amplifier input voltage to said adjustable peak limit voltage when said input voltage tends to exceed said adjustable peak limit voltage or when said average voltage exceeds said adjustable average limit voltage.

4,234,803

INTEGRATED LOGIC CIRCUIT ARRANGEMENT

Terumoto Nonaka, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

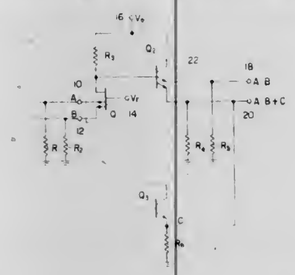
Filed Apr. 24, 1978, Ser. No. 899,588
Claims priority, application Japan, Apr. 30, 1977, 52-50258
Int. Cl.[3] H03K 19/094, 19/20, 19/21
U.S. Cl. 307—218 **11 Claims**

1. An integrated logic circuit arrangement comprising:

an input junction field effect transistor having at least one

source for receiving a digital input signal, a drain to which a load is connected, and a gate held at a fixed DC reference potential, said junction field effect transistor being operative to effect switching operation in accordance with said digital input signal, said load being adapted for connection between said drain and a power source;

an output bipolar type transistor having its base connected to said drain to effect switching operation in accordance with an output signal delivered from said drain;



said output bipolar type transistor having a load connected to the emitter of said output bipolar transistor, whereby said output bipolar transistor behaves as an emitter-follower transistor; and

a second emitter-follower transistor,

the emitter of said output bipolar type transistor serving as the first mentioned emitter-follower transistor being connected to an emitter output terminal of said second emitter-follower transistor to thereby form a wired OR logic circuit.

4,234,804

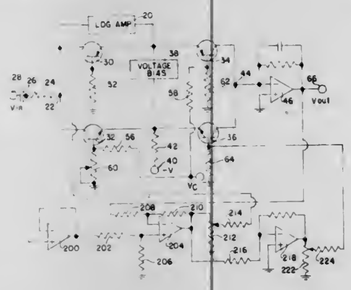
SIGNAL CORRECTION FOR ELECTRICAL GAIN CONTROL SYSTEMS

Gary Bergstrom, Lexington, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Sep. 19, 1978, Ser. No. 943,859

Int. Cl.[3] G06G *7/12, 7/24*

U.S. Cl. 307—229 **16 Claims**



1. In an electrical gain control system including first signal converting means for providing at its output a first output signal logarithmically related to an input signal; means coupled with respect to the output of said first signal converting means for summing a gain control signal with said first output signal; and second signal converting means for providing at its output a second output signal which is an anti-logarithmic function of the sum of said first output signal and said gain control signal, the improvement comprising:

signal generating means for comparing said input signal and said second output signal and for generating, in response to said comparison, an error correction signal as a function of the distortion in said second output signal; and

means coupled with respect to the output of said first signal converting means for summing said error correction signal with said first output signal and said gain control signal so as to reduce said distortion in said second output signal.

4,234,805

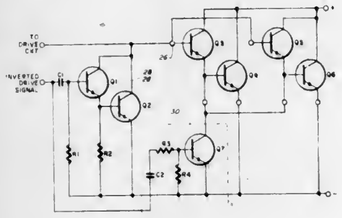
CIRCUIT AND METHOD FOR PARALLELING POWER TRANSISTORS

George D. Carlsen, II, Culver City, Calif., assignor to EVC, Inc., Inglewood, Calif.

Filed Mar. 15, 1978, Ser. No. 886,716

Int. Cl.[3] H03K *17/60, 3/26*

U.S. Cl. 307—254 **11 Claims**



1. A high-current switching transistor circuit comprising:

a first Darlington device;

at least one other Darlington device;

said Darlington devices being connected in a parallel pin-for-pin configuration;

drive source means for driving said Darlington devices said drive source means being directly connected to an input common base connection of all of said Darlington devices;

first pull-down circuit means connected to said common base connection of the Darlington devices to reduce the storage time of power transistor in said Darlington devices;

at least one other pull-down circuit means connected to a base to emitter connection in each Darlington device for synchronizing the turn-off times of said Darlington devices while further reducing the storage time of said power transistors.

4,234,806

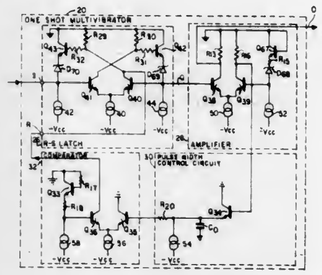
MONOSTABLE MULTIVIBRATOR EMPLOYING NONSATURATING SWITCHING TRANSISTOR

James C. Schmoock, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1978, Ser. No. 922,397

Int. Cl.[3] H03K *3/284*

U.S. Cl. 307—273 **9 Claims**



1. A one shot multivibrator, comprising:

(a) a bistable circuit means adapted to be placed selectively in either a first stable condition in response to a trigger signal or in a second stable condition in response to a reset signal;

(b) a transistor;

(c) means for enabling the transistor to be placed in either a conducting state or a nonconducting state selectively in accordance with the stable condition of the bistable circuit means while preventing forward-biasing of a base-collector junction of such transistor when such transistor is in the conducting state and for enabling a capacitor to discharge when such transistor is in one state and to charge at a predetermined rate when the transistor is in the other state; and

(d) means for producing the reset signal when the capacitor charges to a predetermined level.

4,234,807

LADDER DEVICE WITH WEIGHTING FACTOR ADJUSTING MEANS

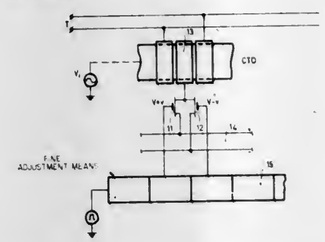
Leonard J. M. Esser, and Ludovicus G. M. Heldens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,765

Claims priority, application Netherlands, Mar. 8, 1977, 7702452

Int. Cl.[3] H03L *1/00*

U.S. Cl. 307—304 **6 Claims**



1. A ladder device comprising at least three ladder sections each having an input and an output, first means for coupling said ladder sections in cascade via said inputs and outputs, second means for coupling a signal input terminal to at least one input of said ladder sections, a signal output terminal coupled to an output of at least one ladder section, weighting-factor adjusting means coupled to an input of at least one ladder section, said weighting-factor adjusting means comprising first and second field-effect transistors each having a main electrode connected to said input of said one ladder section, the channel regions of said first and second transistors having mutually different predetermined length-to-width ratios defining a selected weighting factor coefficient, both of said transistors being integrated in the same semiconductor body, and means for adjusting the gate voltages of said first and second field-effect transistors as a voltage difference so as to provide a further fine adjustment of the weighting factor.

4,234,808

STEPPING MOTOR

Klaus Geppert, Friesenheim; Günter Heine, Seelbach; Karl Hübner, Kippenheim; Günter Ose, Seelbach; Bernd Seeger, Lahr; Claus Schäffer, Friesenheim, and August Spiesberger, Lahr, all of Fed. Rep. of Germany, assignors to Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgerate, Lahr, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,124

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703791

Int. Cl.[3] H02K *37/00*

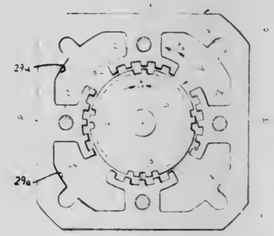
U.S. Cl. 310—49 R **11 Claims**

1. In a stepping motor of the homopolar design and having a housing, a shaft journaled in the housing, a rotor secured to the shaft, and a stator connected with the housing and concentrically surrounding the rotor with a working air gap therebetween, wherein the stator is a layered steel structure with a plurality of radially inwardly extending poles for the respective field windings and each of the stator poles is provided on the end face thereof at the working air gap with a plurality of stator pole teeth at a uniform pitch, insulation means is provided for covering the stator poles so as to isolate the field windings electrically therefrom, the rotor includes an axially magnetized permanent magnet and two magnetically conductive annular steel members sandwiching the magnet therebetween and provided on their circumferential faces at the working air gap with respective identical sets of rotor teeth at a uniform pitch but with the rotor teeth on each annular member offset by a half pitch with respect to the rotor teeth on the other annular member, the shaft is magnetically non-conductive, and the housing includes a pair of magnetically non-conductive bearing bells; the improvement comprising that:

(a) the stator is a single-section hollow structure devoid of an external yoke for the magnetic return in the axial direction and has a generally square transaxial shape with straight sides and slightly rounded or chamfered corners;

(b) each of the two bearing bells has a transaxial shape the same as that of the stator, and means are provided for securing the bearing bells to the stator at the respective opposite faces of the latter and in alignment with the stator and each other to provide the motor with a generally cubic form;

(c) the stator has only four stator poles and four field windings are wound about said stator poles, respectively, and



each of the stator poles extends from the middle region of a respective one of the four straight sides of the stator and has four or five stator pole teeth;

(d) the pitch of the rotor teeth is expressed by the relation $\tau_r = 360°/Z_r$ and the pitch of the stator pole teeth by the relation $\tau_s = 360°/Z_s = 360°/(Z_r - 1 \pm k)$, where Z_r is the number of rotor teeth, Z_s is the theoretical number of stator pole teeth consisting of the sum of the actual number of stator pole teeth plus the number of such teeth omitted between adjacent stator poles and must be divisible by 4, k is an even integer with $0 \leqq k \leqq 6$, and for a given value of either Z_r or Z_s, k is so chosen that the step angle of the motor is about 3.6°;

(e) the permanent magnet of the rotor is a thin ring disc structure of a highly coercive magnetic material with an energy density $(B \times H)_{max} \geqq 10$ MGOe and a ratio of disc diameter to disc thickness ranging from about 4 to about 20;

(f) the two annular members on which the rotor teeth are provided are ring disc structures which are of somewhat greater diameter than the permanent magnet and on their sides facing each other and the magnet are provided with respective axial projections beveled inwardly at an angle of about 30°-60° down to the outer circumference of the magnet; and

(g) the insulation means is a composite annular structure consisting of two unitary annular sections fitted into the stator from opposite sides thereof and covering all parts of the stator poles except the toothed end faces thereof, the

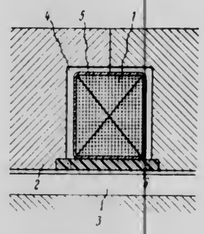
insulation structure being of such configuration as to leave between adjacent stator poles respective wire winding gaps each not less than 2 mm wide.

4,234,809

ELECTROMAGNETIC BRAKE

Nikolai A. Burenkov, ulitsa Molostovykh, 2, korpus 2, kv. 54; Rikhard A. Ioganson, Kutuzovsky prospekt, 4, kv. 6; Mark B. Perchenok, ulitsa Chasovaya, 27/12, kv. 16; Alexandr V. Kuprianov, Chuxin tupik, 5, kv. 73; Evgeny V. Chegodaev, ulitsa Novgorodskaya, 34, kv. 317, and Valentin I. Chulin, ulitsa Novo-Petrovskaya, 18, kv. 49, all of Moscow, U.S.S.R.

Filed Jul. 31, 1978, Ser. No. 929,440
Claims priority, application U.S.S.R., Aug. 31, 1977, 2512802
Int. Cl.³ H02K 49/02
U.S. Cl. 310—105 **1 Claim**



1. In an electromagnetic brake, comprising:
an armature;
a serrated inductor;
a support ring;
an exciting coil disposed in one of said armature and said serrated inductor and attached to said support ring;
a water-proofing means for water-proofing said exciting coil; and
a liquid cooling cavity embracing said exciting coil;
the improvement wherein said support ring and said water-proofing means are non-conducting, whereby the production of current in said support ring and said water-proofing means during operation of said electromagnetic brake is precluded.

4,234,810

CONCENTRATED WINDING SALIENT-POLE SHADED POLE MOTORS HAVING MULTIPLE SHORT CIRCUITED SHADING COILS FOR EACH POLE AND METHODS OF MAKING SAME

Joe T. Donahoo, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 688,251, May 20, 1976, Pat. No. 4,131,814, which is a continuation-in-part of Ser. No. 293,802, Oct. 2, 1972, Pat. No. 3,959,678. This application Jun. 2, 1978, Ser. No. 912,052
Int. Cl.³ H02K 17/10
U.S. Cl. 310—172 **15 Claims**

1. A shaded pole motor comprising a stator assembly, a rotor assembly including a short circuited squirrel cage winding, and means for supporting the rotor assembly in spaced apart air gap defining relation with the stator assembly and for permitting rotation of the rotor assembly relative to the stator assembly during excitation of said winding; said stator assembly including a magnetizeable core having circumferentially spaced apart pole pieces having leading and trailing pole tips and being interconnected by yoke sections and defining with said yoke sections windows for winding conductors; said stator assembly further comprising an excitable winding disposed about one of the pole pieces and having side turn portions disposed in a first winding window between the yoke section and the trailing pole tip of said one of the pole pieces; said first winding window having an area for accommodating a predetermined maximum cumulative cross-sectional area AW of winding conductor; said one of the pole pieces having the leading pole tip thereof configured to establish a relatively high magnetic reluctance therealong, as compared to another region of such pole piece; said one of the pole pieces also having at least two short circuited shading coils disposed along the trailing pole tip thereof at a first large span and a second short span, respectively, and having cross-sectional current carrying areas of A1 and A2, respectively; and said pole pieces being spaced apart magnetically so that the leading pole tip of each pole piece is



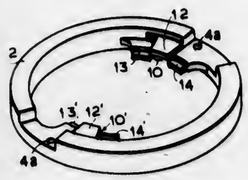
magnetically spaced from the trailing pole tip of the pole piece adjacent thereto; said leading pole tip having a high magnetic reluctance characteristic on a stepped construction basis generally corresponding to the high magnetic reluctance characteristic of a stepped pole piece having a step of a preselected span in a predetermined range, and said first large span comprising a span in the range of from about fifty percent of the preselected span to less than sixty electrical degrees; said area A1 being at least equal to said area A2; and said area A1 being approximately equal to from about ten to fifteen percent of said area AW.

4,234,811

SUPPORTING STRUCTURE FOR A THICKNESS-SHEAR TYPE CRYSTAL OSCILLATOR FOR WATCHES

Hiroshi Hishida, Sayama; Toshihiko Nakayama, Tokorozawa; Isao Koyama, Kodaira, and Hisao Wakabayashi, Higashikurume, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,303
Claims priority, application Japan, Jan. 14, 1977, 52-3462
Int. Cl.³ H01L 41/08
U.S. Cl. 310—348 **1 Claim**



1. A supporting structure for a thickness-shear type crystal oscillator for watches comprising:
(a) a crystal piece having a peripheral notch therein;

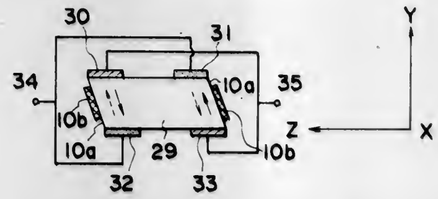
(b) a resilient supporting frame for firmly supporting said crystal piece;
(c) a plurality of tongues spaced apart from each other and arranged side by side along the inner periphery of said resilient supporting frame and including grooves formed therebetween in which circumferential portions of said crystal piece are located; and
(d) an integral projection provided on at least a specific one of said tongues for engaging the notch of said crystal piece whereby said tongues prevent axial movement of said crystal piece and said projection prevents rotational movement of said crystal piece;
wherein
(e) said projection is perpendicular to said specific one of said tongues and extends between and is located between adjacent side by side tongues associated with said specific one of said tongues.

4,234,812

THICKNESS-WIDTH SHEAR QUARTZ CRYSTAL VIBRATOR

Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 929,027
Claims priority, application Japan, Dec. 7, 1977, 52/146735
Int. Cl.³ H01L 41/08, 41/18
U.S. Cl. 310—361 **5 Claims**



1. A thickness-width shear quartz crystal vibrator cut out from the a Y-plate of quartz crystal at the angle of 34 to 36 degrees truned around the X'-axis thereof, wherein respective pairs of spaced electrodes are respectively provided on the main surfaces thereof which are penpendicular to the Y'-axis thereof, said spaced electrodes provided on each main surface having a different polarity and spaced in the width dimensions of the vibrator, and frequency-adjusting elements adhered to the side surfaces on which said electrodes not being provided; and the width-to-thickness ratio Yo/Zo thereof is less than 0.3, where Yo is the thickness of the vibrator and Zo is the width of the vibrator.

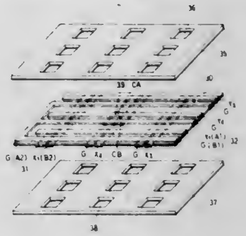
4,234,813

PIEZOELECTRIC OR PYROELECTRIC POLYMER INPUT ELEMENT FOR USE AS A TRANSDUCER IN KEYBOARDS

Heishaburo Iguchi, Kamakura, and Hiroji Ohigashi, Zushi, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,822
Claims priority, application Japan, Apr. 10, 1978, 53/41981
Int. Cl.³ H01L 41/08, 41/18
U.S. Cl. 310—366 **7 Claims**

1. An input element for use as a transducer in keyboard comprising:
a supporting plate,
a plurality of stimulus-receiving portions provided on said supporting plate,
a first signal-detecting electrode (A1) and a front-face earthing electrode (B1) provided mutually independently on the front face of each of said stimulus-receiving portions,
a back-face earthing electrode (A2) and a second signal-detecting electrode (B2) provided mutually independently on the back face of each of said stimulus-receiving portions,
said first signal-detecting electrode (A1) being disposed corresponding to said back-face earthing electrode (A2),
said second signal-detecting electrode (B2) being disposed corresponding to said front-face earthing electrode (B1),
a portion (CA) of each of said stimulus-receiving portions located between said first signal-detecting electrode (A1)



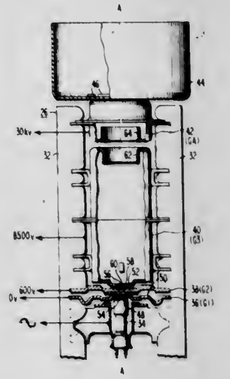
and said back-face earthing electrode (A2) being formed from polymeric material having piezoelectric or pyroelectric property, and
a portion (CB) of each of said stimulus-receiving portions located between said second signal-detecting electrode (B2) and said front-face earthing electrode (B1) being formed from polymeric material having piezoelectric or pyroelectric property.

4,234,814

ELECTRON GUN WITH ASTIGMATIC FLARE-REDUCING BEAM FORMING REGION

Hsing-Yao Chen, Landisville, and Richard H. Hughes, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,600
Int. Cl.³ H01J 29/50, 29/56
U.S. Cl. 313—412 **12 Claims**



1. A cathode ray tube comprising an image screen and an electron gun for projecting an electron beam onto said screen, said gun comprising:
a cathode, a control grid, a screen grid, and electron lens means adapted to focus electrons from said cathode onto said screen,
said screen grid comprising a first plate portion which is transverse to said beam path and which contains a circular electron beam aperture therethrough, and a second plate portion flush with said first plate on the side thereof facing said cathode which may be either attached to or integral

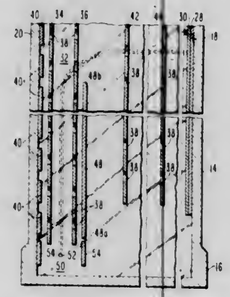
with said first plate portion, and which contains a slot therethrough into which said electron beam aperture opens.

4,234,815

FLAT DISPLAY TUBE HAVING SHIELDING MEMBER BETWEEN BEAM GUIDE AND SCREEN

Thomas L. Credelle, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,555
Int. Cl.³ H01J 29/04, 31/08
U.S. Cl. 313—422 **2 Claims**



1. In a display device having an evacuated envelope with substantially parallel front and back walls,
a cathodoluminescent screen on the front wall,
an electron beam guide in spaced relation to said back wall, said beam guide being disposed substantially parallel to said screen, said beam guide comprising a pair of spaced apart, elongated guide grids having a plurality of apertures therethrough, said apertures being arranged so as to define a plurality of rows across and columns along said guide grids,
means at one end of said beam guide for generating and directing at least one beam of electrons between said guide grids, the improvement comprising:
conductive shielding means in spaced parallel relationship to said beam guide having a proximal end adjacent to said electron generating and directing means, said shielding means being disposed between said screen and said beam guide and extending along said beam guides so as to overlap at least the first row of apertures on the screen side of said beam guide, said shielding means having a distal end which terminates between adjacent rows of apertures.

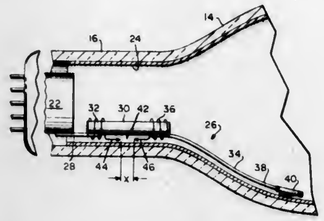
4,234,816

CATHODE RAY TUBE WITH INTERNAL ARC SUPPRESSOR AND PROTECTIVE SPARK GAP

Martin Fischman, Seneca Falls, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,417
Int. Cl.³ H01J 29/88, 29/94, 29/96
U.S. Cl. 313—479 **2 Claims**

1. In a cathode ray tube including a high resistance coating on the interior thereof, an electron gun having a plurality of axially aligned electrodes having varying spaces therebetween and an antenna getter mounted upon the final one of said electrodes, said antenna getter being substantially electrically insulated from said final electrode by a resistor, the improvement comprising: a spark gap across said resistor defining a sparking potential greater than the sparking potential existing between any adjacent pair of electrodes of said electron gun at



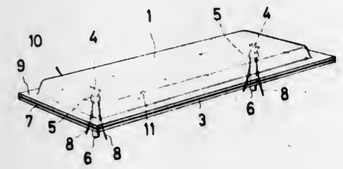
normal operating tube voltages and lower than that inherently existing across said resistor.

4,234,817

FLAT TYPE FLUORESCENT LAMP

Toru Teshima, Yokohama; Kazuo Ariga, Tokyo, and Mitunari Yoshida, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1979, Ser. No. 1,284
Claims priority, application Japan, Jan. 26, 1978, 53-8029
Int. Cl.³ H01J 61/30, 61/42
U.S. Cl. 313—493 **4 Claims**



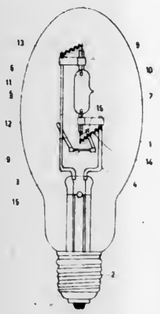
1. A flat type fluorescent lamp comprising:
a molded plate glass member in the shape of an upside-down dished generally rectangular plate and having a peripheral joining edge, said dished glass member having a dished light emitting surface;
a generally rectangular flat plate glass member having a peripheral joining edge overlapping the peripheral joining edge of said dished glass member, said peripheral joining edges of said glass members being sealingly joined together with said flat glass member below said upside-down dished glass member to form a hollow flat type fluorescent lamp body, said flat glass member having a pair of holes extending generally perpendicularly through flat surface portions thereof, said holes being located at opposite ends of said hollow lamp body and spaced inwardly from said peripheral joining edge;
a pair of electrodes mounted to said flat glass member in the vicinity of respective holes in said flat glass member and being spaced from said flat glass member in a direction substantially perpendicular to the surface of said flat glass member, said pair of electrodes being sealed in said fluorescent lamp body; and
a respective pair of electrical conductors connected to and supporting each of said electrodes and passing through respective holes in said flat glass member to extend generally perpendicularly to said flat glass member and to electrically connect said electrodes to the outside of said lamp body.

4,234,818

ELECTRIC MIXED LIGHT LAMP

Willy L. J. Engelen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,746
Claims priority, application Netherlands, Apr. 17, 1978, 7804040
Int. Cl.³ H01J 7/44
U.S. Cl. 315—49 **1 Claim**



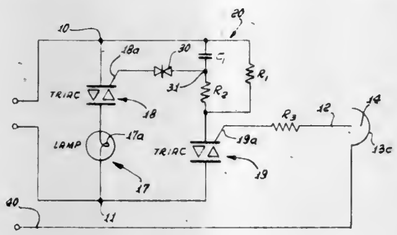
1. An electric mixed light lamp which comprises:
a single vacuum-tight sealed lamp envelope,
at least first and second pole wires extending through the wall of said lamp envelope,
a high pressure discharge tube having first and second electrodes disposed in said lamp envelope,
first and second current supply wires which extend respectively in a vacuum-tight manner through the wall of said discharge tube to said first and second electrodes, and
first and second incandescent filaments disposed in said envelope which are each connected electrically in series mutually and with said discharge lamp, each of said filaments being a coiled-coil filament, said first filament being stretched between said first pole wire and said first current supply conductor, said second filament being stretched between and fixed to said second pole wire and said second current supply conductor.

4,234,819

UNDERWATER LIGHT CIRCUIT AND INSTALLATION

Eugene R. Maxey, Valinda, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Jun. 14, 1979, Ser. No. 48,548
Int. Cl.³ H05B 39/04; F21V 31/00
U.S. Cl. 315—119 **9 Claims**



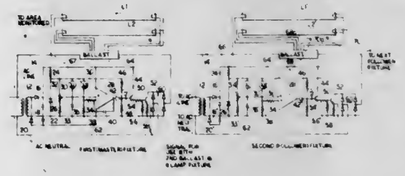
1. In an underwater light circuit, the combination comprising
(a) first and second terminals across which AC power is applicable, and a ground connection,
(b) a pair of electrodes exposed for contact with the water, one electrode electrically connected with the first of said terminals, and the other electrode connection with said ground connection,
(c) a network including resistance and capacitance connected in series between said one electrode and said first terminal,
(d) an electric lamp having a filament, and a first gate controlled switch connected in series with the filament between said first and second terminals,
(e) said network electrically connected with the gate of said first switch to effect turn-on of said first switch in response to predetermined charging of said capacitance to predetermined voltage level,
(f) and a second gate controlled switch connected in series with said network, said one electrode connected with the gate of said second switch to effect turn-on of said second switch when current passes between said electrodes, thereby to effect current flow between said terminals and charging of said capacitance to said voltage level.

4,234,820

LIGHT REGULATION SYSTEM

Don F. Widmayer, Bethesda, Md., assignor to Controlled Environments Systems, Rockville, Md.

Continuation-in-part of Ser. No. 945,842, Sep. 26, 1978. This application Apr. 6, 1979, Ser. No. 27,740
Int. Cl.³ H05B 41/38
U.S. Cl. 315—152 **7 Claims**



1. A light regulation system for controlling the output of at least one lamp in a follower fixture in accordance with the light output of a master fixture containing at least one lamp, said lamps comprising arc discharge lamps and said lamp units each comprising a ballast for the at least one lamp and a control device for controlling the ballast and hence the light output of the at least one lamp, said system comprising optical-electrical transducer means in the control device of said follower fixture for controlling the output of the control device of the follower fixture in accordance with the light input received thereby, and light collecting and coupling means for collecting the light output of the at least one master lamp and for coupling the said output of said at least one master lamp to said optical-electrical transducer means.

4,234,821

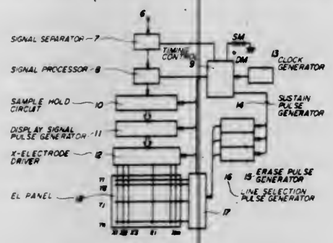
FLAT PANEL TELEVISION RECEIVER IMPLEMENTED WITH A THIN FILM EL PANEL

Noritoshi Kako, Kashihara; Yasukuni Yamane, Tenri, and Chuji Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1978, Ser. No. 941,202
Claims priority, application Japan, Sep. 14, 1977, 52/110898; Sep. 17, 1977, 52/112009; Sep. 19, 1977, 52/113091; Sep. 26, 1977, 52/116206; Sep. 30, 1977, 52/118073; Sep. 30, 1977, 52/118076
Int. Cl.² H04N 5/70; H05B 33/08
U.S. Cl. 315—169.3 **13 Claims**

4. A television receiver comprising:
a television image screen including a thin-film electroluminescent panel having hysteresis properties in the applied voltage vs brightness characteristics; and
means for selectively enabling said thin-film electrolumines-

cent panel to display an image in either a normal moving picture mode or a steady picture mode, said image not



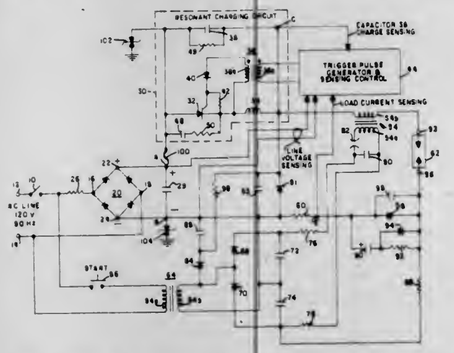
moving when said panel displays said image in said steady picture mode.

4,234,822

CONTROL CIRCUIT PROVIDING CONSTANT POWER SOURCE

Robert L. Garrison, Henniker, N.H., and James C. Morris, Wakefield, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 3, 1978, Ser. No. 902,456
Int. Cl.³ H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **14 Claims**



1. A circuit for controlling the power applied to a load means from a source of alternating current line voltage comprising, in combination:

a full wave rectifying means having input means for connection to said source of alternating current and a pair of direct current output terminals;

a pair of supply terminals for connection to said load means;

a resonant charging circuit including a first unidirectional controlled switch means and having input and output terminals, said intput terminal being connected to a first one of the output terminals of said full wave rectifying means;

an averaging filter means connected between the output terminal of said resonant charging circuit and a first one of said supply terminals;

circuit means connecting a second one of the output terminals of said full wave rectifying means to a second one of said supply terminals;

a first diode means connected between said last-mentioned circuit means and said output terminal of said resonant charging circuit;

trigger pulse generating means coupled to said first unidirectional controlled switch means for intermittently operating the same; and

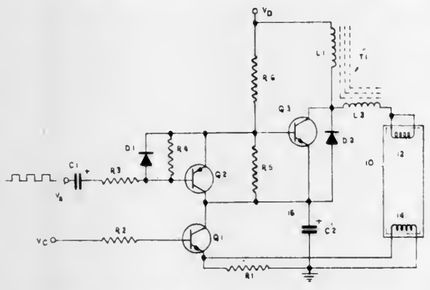
means connected across the first and second output terminals of said full wave rectifying means for sensing changes in said line voltage and adjusting the pulse rate of said trigger generating means in response thereto, whereby said resonant charging circuit maintains a source of constant power to a load connected to said supply terminals regardless of line voltage variations.

4,234,823

BALLAST CIRCUIT FOR LOW PRESSURE GAS DISCHARGE LAMP

Lincoln H. Charlot, Tampa, Fla., assignor to National Computer Sign Company, Tampa, Fla.

Filed Feb. 14, 1979, Ser. No. 12,234
Int. Cl.³ H05B *41/24*
U.S. Cl. 315—224 **8 Claims**



1. A ballast circuit for a low pressure gas discharge lamp having two filament-type electrodes at opposite ends of the lamp, comprising;

first means for providing a high AC voltage for application across opposite electrodes of the lamp;

a solid state controlled current source for providing a controlled current to the first means for enabling the first means to apply said AC voltage across said lamp electrodes to illuminate said lamp, wherein the voltage placed across said electrodes is non-sinusoidal; and

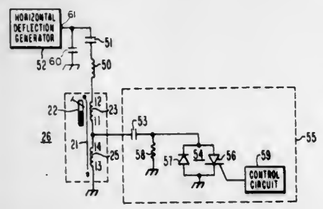
second means coupled to the first means for inhibiting said non-sinusoidal voltage from causing mercury migration in said lamp.

4,234,824

COMBINED LINEARITY AND SIDE PINCUSHION CORRECTION ARRANGEMENT

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,252
Claims priority, application United Kingdom, Jan. 10, 1979, 924/79
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—371 **8 Claims**



5. A deflection circuit including a combined side pincushion and linearity correction magnetic structure, comprising:

a horizontal deflection winding;

a horizontal deflection generator coupled to said horizontal deflection winding for producing scanning current in said horizontal deflection winding;

a side pincushion correction modulator circuit; and

a combined side pincushion and linearity correction magnetic structure comprising:

a magnetic core, including first and second core portions;

a linearity winding wound around said first core portion and coupled to said deflection winding;

magnetic biasing means for generating a first bias magnetic flux in said first core portion and a second bias magnetic flux in said second core portion, said first bias magnetic flux establishing a magnetic bias in said first core portion near saturation for providing a linearity corrected scanning current in said horizontal deflection winding; and

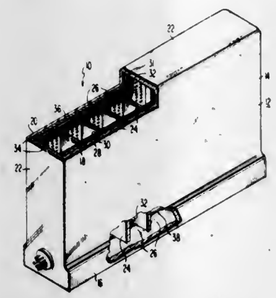
a side pincushion correction winding wound around said second core portion and coupled to said side pincushion correction modulator circuit and to said horizontal deflection winding, the magnetic bias of said second core portion established by said second bias magnetic flux being such as to enable said side pincushion correction winding to exhibit a substantially linear inductance of sufficient magnitude to provide substantial side pincushion correction to said scanning current, the amount of magnetic coupling between said linearity and side pincushion correction windings sufficient to compensate for an undesirable vertical rate modulation of said magnetic bias of said first core portion caused by said side pincushion corrected scanning current without substantially disturbing said side pincushion correction.

4,234,825

SYSTEM FOR CONTROLLING BRIGHTNESS UNIFORMITY IN DISPLAY DEVICES

Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 19, 1979, Ser. No. 31,461
Int. Cl.³ H01J *29/52*
U.S. Cl. 315—383 **9 Claims**



1. A system for controlling the brightness uniformity of a display device having a digitally controlled beam generating means for generating a plurality of electron beams, and a display screen for producing a visual display in response to impact by said electron beams, said system comprising:

sensing means for sensing a voltage from a plurality of beams which impinge on at least one sense electrode in the proximity of said display screen;

converting means for converting the sensed voltage to a control voltage; and

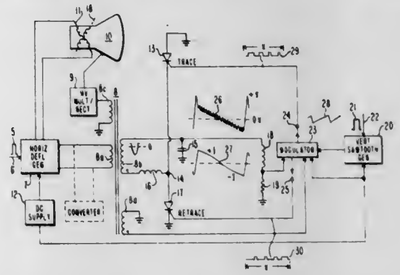
modifying means for modifying the beam generating means in response to said control voltage so as to compensate for non-uniform electron beam currents by varying the period of time during which electrons are generated by the beam generating means.

4,234,826

SYNCHRONOUS SWITCHED VERTICAL DEFLECTION DRIVEN DURING BOTH TRACE AND RETRACE INTERVALS

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,784
Int. Cl.³ H01J *29/72*
U.S. Cl. 315—393 **17 Claims**



1. A deflection system for a cathode-ray tube, said deflection system comprising:

a horizontal deflection circuit for deflecting an electron beam of said tube in horizontal directions during alternate horizontal trace and retrace intervals in response to a recurrent deflection signal;

a vertical deflection winding responsive to a recurrent sawtooth current therethrough for deflecting said beam in a vertical direction; and

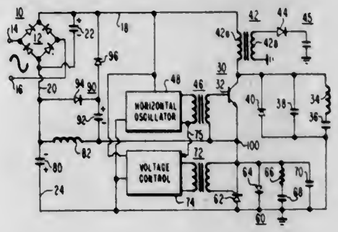
switched vertical deflection means for applying successively smaller portions of the energy of said deflection signal to said vertical deflection winding during a first interval of the recurrent vertical deflection cycle and successively greater portions of said energy of said deflection signal during a second interval of said recurrent vertical deflection cycle for producing said sawtooth current, said first and second intervals both occurring during the trace interval of said vertical deflection cycle, one of said first and second intervals occurring during said horizontal retrace intervals and the other of said first and second intervals occurring during said horizontal trace intervals.

4,234,827

REGULATED DEFLECTION CIRCUIT WITH REGULATOR SWITCH CONTROLLED BY DEFLECTION CURRENT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 926,337, Jul. 20, 1978. This application Jul. 19, 1979, Ser. No. 58,659
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **12 Claims**



1. A deflection circuit with switched regulator adapted for

operation from a source of unregulated direct voltage, comprising:

a deflection winding;

input inductance means serially coupled between a first terminal of said source and a first end of said deflection winding to form a first series circuit;

capacitance means coupled between a second end of said deflection winding and a second terminal of said source, the voltage across said first series circuit being regulated by the difference between said unregulated voltage and the voltage across said capacitance means;

first controllable switch means coupled with said deflection winding and operated at the deflection rate for establishing currents in said deflection winding during periodic trace and retrace intervals;

second controllable switch means serially coupled with said first controllable switch means at a first junction for providing a path for the flow of current in said first switch means;

second inductance means coupled between said first junction and said second terminal of said source for providing a path for the flow of current in said capacitance means; and

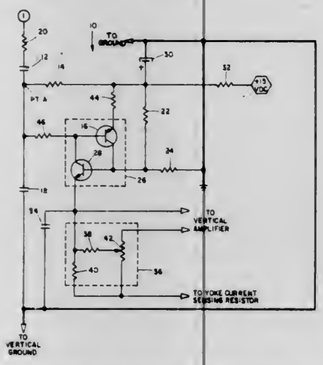
control means for controlling the deflection and for controlling the conduction period of said first and second switches in a manner to control the current flow in said capacitance means through said second inductance means and thereby maintain said regulated voltage substantially constant.

4,234,828

SELF-OSCILLATING SAWTOOTH CURRENT DEFLECTION GENERATOR

Lloyd E. Matthews, Berwyn, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 20, 1979, Ser. No. 77,434
Int. Cl.³ H01J 29/70, 29/76
U.S. Cl. 315—408 **5 Claims**



1. A self-oscillating deflection generator for producing a sawtooth current waveform in a magnetic deflection coil of a cathode ray tube comprising:

pulse differentiation means coupled to a source of input pulses for generating a series of output pulses, each of said output pulses representing the leading edge of each of said input pulses;

first transistor means coupled to said pulse differentiation means for receiving said output pulses;

a DC voltage source coupled to said first transistor means so as to maintain said first transistor means at a first voltage level with said first transistor means rendered conductive upon receipt of said output pulses;

second transistor means coupled to said DC voltage source and to said first transistor means such that the current output of said first transistor means is connected to the input of said second transistor means with the current output of said second transistor means connected to the input of said first transistor means so as to form a regenerative, oscillatory network;

voltage divider means coupling said second transistor means with said DC voltage source so as to maintain said second transistor means at a second voltage level, said second voltage level being less than said first voltage level;

capacitor means coupled to said second transistor means such that said capacitor means is charged by the output of said second transistor means; and

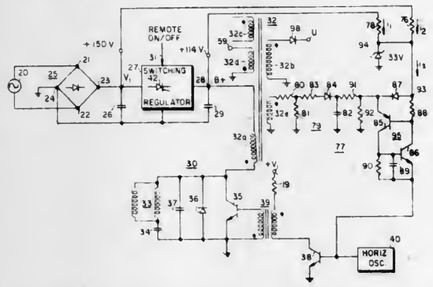
discharge means coupled to said capacitor means for discharging said capacitor means when said capacitor means becomes fully charged and said first and second transistor means stop conducting thereby generating a sawtooth current waveform.

4,234,829

HIGH VOLTAGE DISABLING CIRCUIT FOR A TELEVISION RECEIVER

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,839
Int. Cl.³ H01J 29/70
U.S. Cl. 315—411 **6 Claims**



1. A deflection and high voltage system with a disabling circuit, comprising:

a deflection winding;

a deflection generator coupled to said deflection winding for generating scanning current in said deflection winding;

a transformer coupled to said deflection winding;

high voltage generating means coupled to said transformer for generating a high voltage;

detection means responsive to said high voltage for generating a first signal representative of high voltage;

a disabling latch coupled to said detection means and to said deflection generator for generating a disabling signal for disabling normal deflection generator operation upon energization of said latch by said detection means when said first signal exceeds predetermined values; and

means coupled to said disabling latch for providing a sustaining current to said latch for maintaining said latch in a regeneratively conducting state upon latch energization;

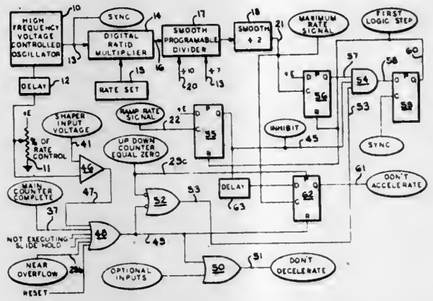
wherein said sustaining current providing means includes a first source of voltage coupled to said disabling latch for providing a first component of said sustaining current to said latch, and a second source of voltage coupled to said disabling latch for providing a second component of said sustaining current to said latch, at least one of said first and second sustaining current components being by itself of insufficient magnitude to maintain said disabling latch in a regeneratively conducting state.

4,234,830

STEPPING MOTOR CONTROL CIRCUIT

Lee E. Cannon, Bozeman, Mont., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 731,867, Oct. 13, 1976, Pat. No. 4,126,821, This application Jan. 25, 1978, Ser. No. 872,276
Int. Cl.³ H23Q 5/10
U.S. Cl. 318—39 **4 Claims**



1. In a numerical controller for controlling the movement of a part of the action of two stepping motors moving in response to pulses, a control circuit comprising:

(a) oscillator means providing pulses at a rate proportional to the rate of desired movement of the part;

(b) drive means controlled by pulses from said oscillator means to drive said stepping motors both simultaneously and individually at a rate proportional to the rate it receives pulses;

(c) means to determine when said stepping motors are to be driven simultaneously;

(d) means for blocking pulses to one of said stepper motors when it is determined that both will not be driven simultaneously; and

(e) means interposed between said oscillator means and said drive means to reduce the rate of control pulses to said stepping motors by a factor of approximately 1.4 when both of said stepping motors are being driven simultaneously as compared to when they are driven individually.

4,234,831

COMPOUND ROTARY AND/OR LINEAR MOTOR

Josef Kemmer, No. 3, Ingolstadter Strasse, 8041 Haimhausen, and Eckhard Kellner, No. 14, Obere Dorfstrasse, 8061 Viehbach, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 684,124, May 7, 1976, abandoned. This application Jul. 18, 1978, Ser. No. 925,678
Int. Cl.³ H02K 7/06
U.S. Cl. 318—115 **5 Claims**

1. A compound rotary and linear motor comprising

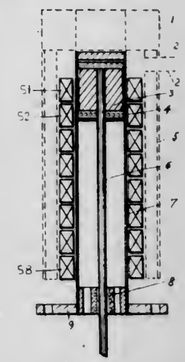
(a) a first stationary magnet system comprising consecutive stator sections arranged along a predetermined axis, each stator section including a plurality of electrically separate consecutive magnets arranged in a ring, the magnetic poles of consecutive stator sections lying side by side in axial alignment;

(b) a second magnet system comprising a rotor including at least one pair of magnet poles;

(c) said first and second magnet systems being interposed;

(d) means mounting said rotor for rotary movement about said axis and for linear movement along said axis; and

(e) an electronic control system responsive to control signals and adapted to sequentially energize said consecutive magnets of each stator section to rotate said rotor and to independently sequentially energize axially consecutive magnets to move said rotor axially;



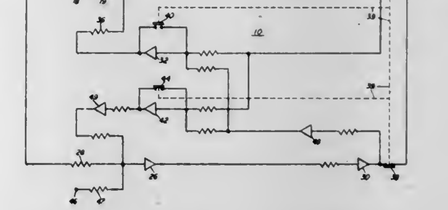
(f) whereby said motor may independently generate rotary, linear and helical motions.

4,234,832

ON-LINE SWITCHING BETWEEN TWO CONTROL PARAMETERS

Louis H. Dreinhoefer, Murrysville, Pa.; David W. Nolen, Evansville, Ind., and Paul C. Donatelli, Trafford, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 2, 1979, Ser. No. 53,846
Int. Cl.³ H02P 5/24
U.S. Cl. 318—146 **1 Claim**



1. A circuit arrangement adapted to provide smooth transition between voltage and speed control of the motor of a motor-generator set, comprising

a first circuit means for comparing a voltage reference signal and a signal representative of the speed of the motor of the set, and providing an output signal that is indicative of any difference existing between the levels of the voltage reference and speed signals,

a second circuit means connected to receive the output signal from the first circuit means and a signal representative of the current in the armature of the motor, and for producing a second output signal that is indicative of any difference existing between the first output signal and the current in the motor armature,

means for directing the output of the second circuit means to a voltage regulator of the generator to maintain excitation of the generator field at a value determined by the voltage and current references,

means for disconnecting the voltage regulator of the generator from the second circuit means,

a third circuit means for developing a voltage control signal for the generator field, and means for applying this signal to the generator field when the field is disconnected from the second circuit means, and

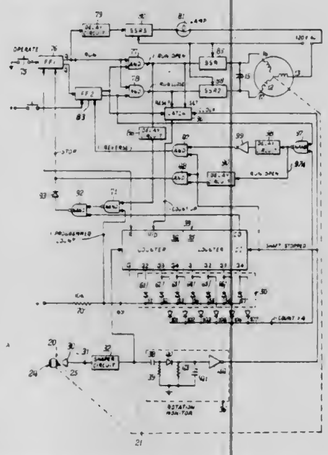
a fourth circuit means for comparing the voltage control signal developed by the third circuit means to the output of the second circuit means, and for causing said output of match that of the voltage signal developed for the voltage regulator.

4,234,833

DOOR OPERATOR SYSTEM USING COUNTER CIRCUIT FOR DETERMINING LIMIT POSITIONS

Jack E. J. Barrett, Waupaca, Wis., assignor to A. E. Moore Company, Inc., Waupaca, Wis.

Filed Jan. 19, 1978, Ser. No. 870,762
Int. Cl.³ G05D 3/20
U.S. Cl. 318—282 **12 Claims**



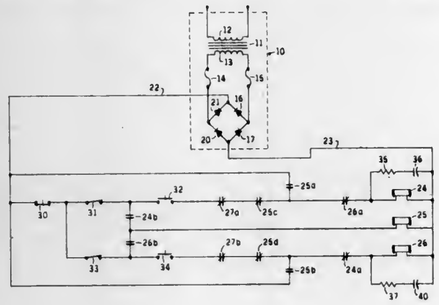
1. Apparatus for opening and closing a door comprising: a reversible electric motor coupled to a drive shaft; transducer means operatively associated with said shaft for generating signals representative of rotations of said shaft; counter circuit means receiving the signals from said transducer means for generating a count signal when the rotations of said shaft reach a predetermined number, actuatable switch means; binary circuit means responsive to actuation of said switch means for generating output signals defining a plurality of states including an open cycle, a close cycle and at least one stop state; first logic circuit means responsive to the output signals of said binary circuit means for selectively operating said motor in a first direction and a second direction when said binary circuit means is in said open and close cycles respectively to thereby drive said shaft to open and close said door, said first logic circuit means being further responsive to the output signals of said binary circuit means for de-energizing said motor when said binary circuit means is in said stop state; second logic circuit means for switching said binary circuit means from said open cycle to a stop state when said binary circuit means is in said open cycle and said counter circuit means generates said count signal to thereby de-energize said motor when said shaft has turned a predetermined number of revolutions; and rotation monitor circuit means responsive to the output signals of said transducer means for generating a signal when the rotation of said shaft stops; said second logic circuit means being responsive to the output signal of said rotation monitor circuit means and an output signal of said binary circuit means representative of the operation of said system in said close cycle to switch said binary circuit means to said open cycle and thereby reverse the direction of said motor when said shaft stops due to an obstruction during a close cycle, said second logic circuit means being further responsive to the output signal of said rotation monitor circuit means and an output signal of said binary circuit means representative of the operation of said system in an open cycle to change the state of said binary circuit means to cause said motor to stop; and detector means responsive to the output of said counter circuit means indicative of said door's being within a predetermined number of counts from a full closed position to modify the operation of said second logic circuit means during a close cycle to permit said binary circuit means to cause said motor to stop during said predetermined count rather than to reverse in direction if an obstruction is encountered as said door approaches the fully closed position.

4,234,834

D.C. MOTOR DIRECTIONAL CONTROL

G. B. Jennings, St. Louis, Mo., assignor to The Pandjiris Weldment Co., St. Louis, Mo.

Filed Jan. 10, 1979, Ser. No. 2,248
Int. Cl.³ H02P 1/22
U.S. Cl. 318—285 **6 Claims**



1. In a directional control for a D.C. motor including a motor armature circuit having an armature winding:
(a) a switching means operatively connected to the armature circuit for controlling the polarity of the direct current applied to the armature winding,
(b) a SCR in the armature circuit to control the current of the armature circuit,
(c) a control means operatively connecting the SCR to the switching means, the control means including a trigger means operatively connected to the SCR for providing a trigger signal to the SCR to turn on the SCR, and the control means operatively controlling the trigger means and the switching means for allowing the switching means to connect the armature winding in the armature circuit before a trigger signal is provided to the SCR,
(d) the switching means including forward and reverse relay means that are selectively activated, and
(e) the control means including a common relay means operatively connected to the forward and reverse relay means, and activated selectively by either the forward or reverse relay means for providing the trigger signal to the SCR after the forward or reverse relay means has been activated.

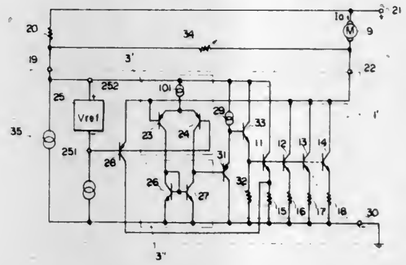
4,234,835

SPEED CONTROL APPARATUS FOR DC MOTOR

Mitsuharu Ota, Takatsuki; Isao Yoshida, Neyagawa, and Hiromitsu Nakano, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 3, 1978, Ser. No. 957,577
Claims priority, application Japan, Nov. 14, 1977, 52-136893
Int. Cl.³ H02P 5/16
U.S. Cl. 318—317 **4 Claims**

1. A speed control apparatus for a DC motor comprising:
a first transistor having a collector connected through a first resistor to a first end of a power source and having an emitter connected through a second resistor to a second end of the power source,
at least one second transistor of the same conductivity type as said first transistor having a base connected to the base of said first transistor, having a collector connected through said DC motor to said first end of the power source and having an emitter connected through a third resistor to said second end of the power source,
a differential amplifier including a pair of transistors of the same conductivity type, said transistors having having emitters connected in common and joined through a constant current circuit to said collector of the first transistor, a first one of said pair of transistors having a base connected to the collector of said second and a second one of said pair of said transistors having a base connected



through a reference voltage source to the collector of said first transistor,
a current mirror circuit including an additional pair of transistors each having a collector, the collectors of said additional transistors being connected to respective collectors of the transistors of the differential amplifier at respective junction points,
a third transistor having a control electrode connected to one of said junction points and an output electrode connected to the bases of said first and second transistors to control their base currents in response to changes of collector current of one of the transistors of said differential amplifier, and
a speed adjusting variable resistor connected between the collector of said first transistor and the collector of said second transistor.

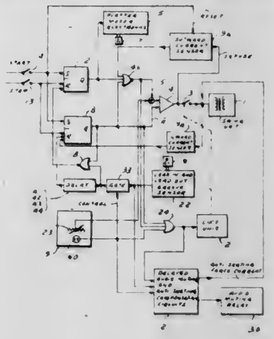
4,234,836

PHONOGRAPH TURNTABLE CONTROL SYSTEM

Harry Gaus, Kronberg; Jeffrey Johnson, Wiesbaden-Hessloch; Udo Milutziki, Walldorf, and Dietwald Schotte, Eschborn, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 835,535, Sep. 22, 1977, Pat. No. 4,132,935. This application Sep. 27, 1978, Ser. No. 946,833
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642726
Int. Cl.³ H02P 5/06
U.S. Cl. 318—480 **6 Claims**

1. An automatic turntable control system for operating an electrical arm lifter that raises and lowers a play arm upwardly and downwardly, for further operating an electric arm rotator that pivots the play are inwardly and outwardly about the fixed point, and for still further operating an electric motor to turn it on and off, whereby such operation can be coordinated in accordance with user instructions entered into the system by depression of electrical pushbutton switches and further in accordance with rotational position of the play arm, comprising: an arm sensor cooperating with the play arm generating an arm position signal which represents rotational position of the play arm; a user-activated pushbutton-type on-off switch for turning the turntable on and off and causing the arm lifter, the arm rotator and the motor to be appropriately operated after the on-off switch is activated; a user-activated pushbutton-type switch, the arm switch cooperating with the arm lifter to raise and lower the arm when the turntable is turned on in accordance with operation of the switch; and an electrical control network cooperating with the arm sensor, the arm lifter, the arm rotator, the motor, the on-off switch and the switch to



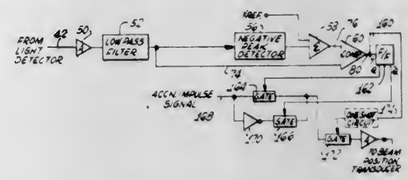
cause the play arm to be appropriately lifted, lowered and rotated and to further cause the motor to be turned on and off in order to cause a record to be played automatically and in order to further cause the play arm to be raised and lowered during record play by activation of the cue switch.

4,234,837

DIGITAL CENTER TRACKING SYSTEM

John S. Winslow, Altadena, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Filed Jan. 12, 1979, Ser. No. 3,020
Int. Cl.³ G05B 19/33
U.S. Cl. 318—577 **17 Claims**



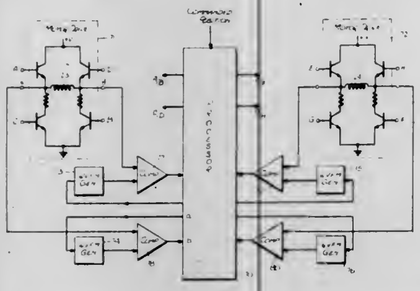
1. A digital servo control system for controlling the position of a detection means with respect to an information track, said system comprising:
first transducer means for moving the detection means transversely with respect to the information track;
second transducer means for deriving an information signal from the detection means;
means for filtering the information signal to obtain an error signal indicative of the position of the detection means with respect to the track centerline;
signal processing means, for processing the error signal to obtain a timing signal indicative of transitions of the detection means through non-central parallel switching lines located at preselected distances from the track centerline; and
control means, responsive to the timing signal, for controlling the polarity and duration of an acceleration signal applied to said first transducer means to accelerate the detection means toward a corrected position, whereby the detection means is accelerated in alternating directions and oscillates about the track centerline.

4,234,838

INCREMENTAL MOTION MOTOR CONTROLLER

Lawrence W. Langley, and H. Keith Kidd, both of Christiansburg, Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jan. 11, 1979, Ser. No. 2,797
Int. Cl.[3] G05B *19/40*
U.S. Cl. 318—696 **37 Claims**



1. An incremental motion motor controller for a linear, variable reluctance stepper motor comprising:

a first cylindrical motor member having a plurality of regular helical teeth with grooves therebetween, said teeth having a pitch P and a width equal to P/2;

a second cylindrical motor member surrounding at least a portion of said first member, said second member comprising two annular poles separated by an annular magnet, each pole having two annular elements separated by an annular winding, each element having a set of regular helical teeth with grooves therebetween, said teeth having a pitch P and a width equal to P/4, the sets of teeth in each pole being offset longitudinally from each other by an amount equal to $(n\pm\frac{1}{4})P$, n being an integer, said poles being offset from each other in the longitudinal direction by an amount equal to $(m\pm\frac{1}{4})P$, m being an integer, said windings characterized by no-motion signals having unperturbed waveforms and by motion-dependent signals having perturbed waveforms;

waveform generator means synthesizing waveforms modeled after said no-motion signals;

comparator means for comparing said synthesized waveforms with said motion-dependent waveforms; and

means for controlling the energization of said windings in response to said comparison.

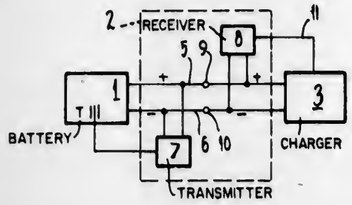
4,234,839

BATTERY CHARGING

Christopher D. King, 12 Parkers Rd., Parkdale, Victoria, and Noel T. Bowman, 11 Mountain Hwy., Frankston, Victoria, both of Australia, assignors to Christopher Duff King; Sally King, both of Parkdale and Noel Trevor Bowman, Frankston, all of, Australia

Filed Nov. 1, 1978, Ser. No. 956,823
Claims priority, application Australia, Nov. 8, 1977, 2344/77
Int. Cl.[3] H02J *7/04*; H01M *10/46*
U.S. Cl. 320—36 **5 Claims**

1. A battery charging system comprising a charging circuit, battery temperature sensing means and charging circuit control means operatively connected with the battery temperature sensing means to stop charging when the temperature sensing means senses that the temperature of a battery being charged is at or above a predetermined temperature unsuitable for charging, and wherein the charging circuit control means includes a signal transmitter and a signal receiver and wherein the transmitter generates and transmits a signal when the temperature of the temperature sensing means is above a predetermined value and the receiver detects such signal and switches off the charging circuit and wherein during charging the signal transmitter and the signal receiver are continuously powered by DC which is on charging leads connected between said charging circuit and said battery, said signal transmitter being connected to the battery terminals and said temperature sensing means being connected to the battery so that when the charging leads are removed the signal transmitter and the temperature sensing means remain connected to the battery terminals as a unitary structure.

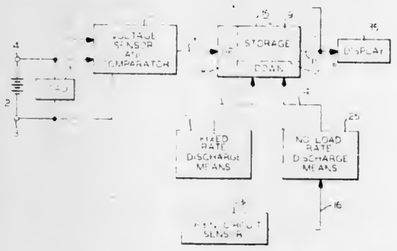


4,234,840

BATTERY STATE-OF-CHARGE INDICATOR

Charles E. Konrad, Roanoke, and Richard K. Davis, Salem, both of Va., assignors to General Electric Company, Salem, Va.

Continuation of Ser. No. 862,796, Dec. 21, 1977, abandoned.
This application Apr. 13, 1979, Ser. No. 29,941
Int. Cl.[3] H02J *7/00*; G08B *21/00*
U.S. Cl. 320—48 **16 Claims**



1. A circuit for monitoring the charge state of a battery supplying discharge current to its normal load circuit under actual load operation during which battery discharge current is subject to magnitude variations and interruptions comprising:

(a) battery terminal voltage sensing means adapted to provide a scaled battery voltage signal representative of actual battery terminal voltage;

(b) storage means for storing a stored signal whose value is indicative of the state-of-charge of said battery, said stored signal having predetermined first and second values representative of battery terminal voltage under no-load conditions, said first and said second values being representative, respectively, of the fully charged and discharged battery;

(c) means for coupling said sensing means and storage means solely to increase the value of said stored signal at a rapid first rate to the scaled value of said battery voltage signal during intervals when the scaled value of said battery voltage signal exceeds the value of said stored signal;

(d) means for continuously decreasing the value of said stored signal at a slow second rate, said second rate being pre-established to provide for variation of said stored signal from said first value to said second value in a time period approximating the average time required for the fully charged battery to become discharged during normal operation of the load circuit; and

(e) means responsive to the value of said stored signal for

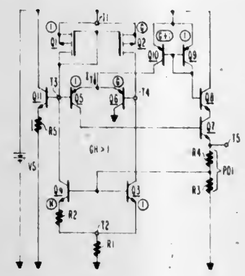
providing an indication of battery state-of-charge, whereby said circuit is operative under conditions of variable battery discharge current and without sensing the magnitude of battery discharge current.

4,234,841

SELF-BALANCING BRIDGE NETWORK

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,350
Int. Cl.[3] G05F *3/08*
U.S. Cl. 323—1 **24 Claims**



1. A current amplifier comprising:

input, output and common terminals;

first and second bipolar transistors of a first conductivity type, having respective collector electrodes respectively connected to said input terminal and to said output terminal, having respective emitter electrodes connected to said common terminal, and having respective base electrodes with an interconnection therebetween through which the combined base currents of said first and second transistors flow;

third and fourth transistors of a second conductivity type complementary to said first conductivity type, having respective input electrodes respectively connected to said input terminal and to said output terminal, having respective output electrodes respectively connected to said common terminal and direct coupled to said interconnection between the base electrodes of said first and second transistors, and having respective common electrodes; and

means for completing the connection of said third and fourth transistors in long-tailed-pair configuration including

means responsive to the combined base currents of said first and second transistors for applying a tail current to an interconnection between the common electrodes of said third and fourth transistors which is in such proportion to those combined base currents as to maintain the potential offset between said input and output terminals substantially zero.

4,234,842

VOLTAGE REGULATOR AND FLICKER COMPENSATOR

Michael B. Brennen, Wilkins Township, Allegheny County, and Laszlo Gyugyi, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

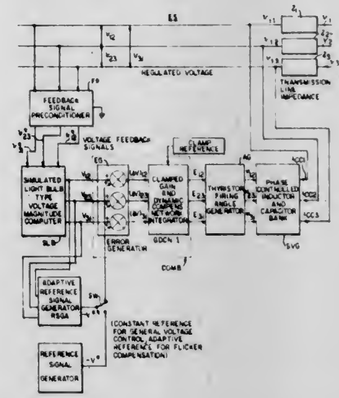
Filed Apr. 3, 1978, Ser. No. 892,556
Int. Cl.[3] H02J *3/18*
U.S. Cl. 323—119 **9 Claims**

1. A voltage regulator for an electrical system, comprising:

determining means interconnected with said electrical system for detecting the voltage in said electrical system and for providing a determining means output signal which is related to the variation in said voltage;

error detector means interconnected with said determining means for comparing the variation in said voltage with a fixed reference signal in a predetermined frequency range to thus provide an output error signal which is proportional to the difference between the reference signal and the variation in said voltage, said reference signal however varying in substantially exact correspondence with said variation in the voltage of said electrical system in a second frequency range which is lower than said predetermined frequency range and thus provide a zero output signal for voltage variation in said second frequency range; and

compensating means interconnected with said electrical system and said error detector means for providing regulation for said electrical system in correspondence with said error signal.

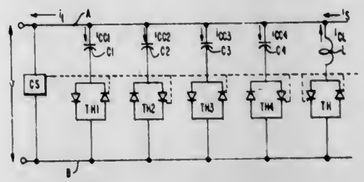


4,234,843

STATIC VAR GENERATOR WITH DISCRETE CAPACITIVE CURRENT LEVELS

Laszlo Gyugyi, Pittsburgh, and Peter Wood, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1978, Ser. No. 942,837
Int. Cl.[3] H02J *3/18*
U.S. Cl. 323—119 **9 Claims**



1. A VAR generator of the type which produces a controlled condution path for reactive current between two conductors in an electrical system, comprising:

(a) control means for determining whether said reactive current should be capacitive or inductive and for determining the magnitude thereof;

(b) discretely variable capacitance means disposed as part of said conduction path and interconnected with said control means for providing one of any number of fixed available discrete levels of capacitive current through said conduction path when said control means determines net capacitive reactive current is to flow therethrough, the discrete level of capacitive current so applied being the next closest largest available capacitive current to said magnitude

of capacitive current as determined by said control means; and

(c) continuously variable inductance means disposed as part of said conduction path and interconnected with said control means for providing any level of inductive current in a predetermined range of inductive current through said conduction path when said control means determines net inductive reactive current is to flow therethrough, the level of said inductive current applied being generally equal to said magnitude of inductive current as determined by said control means, said inductance means additionally being controlled by said control means to combine an increment of inductive current with said capacitive current for cancelling a portion of said capacitive current when said control means determines that net capacitive current is to flow through said conduction path, the amount of said inductive current so ordered to be applied being equal to an amount which will cause said net capacitive current to be generally equal to said determined magnitude of capacitive reactive current.

4,234,844

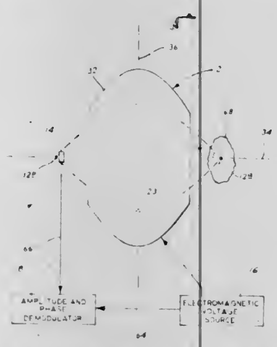
ELECTROMAGNETIC NONCONTACTING MEASURING APPARATUS

Tex N. Yukl, Banks, Oreg., assignor to Near Field Technology Co., Portland, Oreg.

Continuation of Ser. No. 792,528, May 2, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,985

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58.5 A **8 Claims**



1. Noncontacting apparatus for following an electrical characteristic of a substance located at a selected interrogation site, said apparatus comprising

a source for producing electromagnetic energy,

bidirectional, focusing, energy-directing means coupled to said source for bidirectionally directing energy produced thereby toward a pair of spaced foci, one of which is positioned adjacent said interrogation site, and

monitoring means including sensor means located adjacent the other one of said foci for monitoring changes in electrical conditions occurring adjacent said other one of said foci.

4,234,845

AUTOMATIC CONTROL OF ARMING SIGNAL FOR TIME INTERVAL MEASUREMENTS

Mark S. Allen, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 13, 1978, Ser. No. 959,969

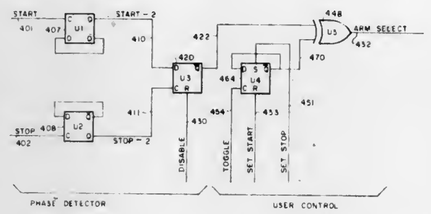
Int. Cl.³ G01R *25/00*

U.S. Cl. 324—83 D **2 Claims**

1. A method for use in the measurement of time intervals between first and second signals, said method comprising:

selecting one of said first and second signals for use in providing an arming signal for said time interval measurement;

detecting preselected changes of said first signal with respect to said second signal; and



selecting the other of said first and second signals for use in providing said arming signal for said time interval measurement in response to the detection of said preselected changes.

4,234,846

METHODS OF ELIMINATING CONVERSION FACTOR DRIFT EFFECTS IN A CLIP-ON HALL-EFFECT AMMETER

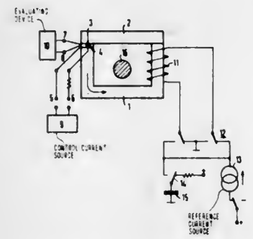
Albert Maringer, Karlsruhe, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,688

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735054

Int. Cl.³ G01R *33/00*

U.S. Cl. 324—117 H **4 Claims**



1. A method of operating a clip-on ammeter which includes a magnetic frame in the form of a clamp for enclosing a conductor in which current is to be measured, an air gap in the frame in which a Hall element is disposed for developing a Hall voltage and a winding of w turns on said frame, comprising:

(a) enclosing a conductor with said frame;

(b) measuring the Hall voltage U_{H1} of the Hall element;

(c) coupling a reference current source establishing a current I_{ref} in said winding to said winding in a direction such as to weaken the magnetic induction caused by the current in said conductor;

(d) measuring the Hall voltage U_{H2} with said reference current source coupled across said winding;

(e) forming the difference of the two measurements; and

(f) calculating a conversion factor K from said difference, said Hall voltage measurements said number of windings and said current I_{ref} using the equation $K=(U_{H1}-U_{H2})/(I_{ref}w)$.

4,234,847

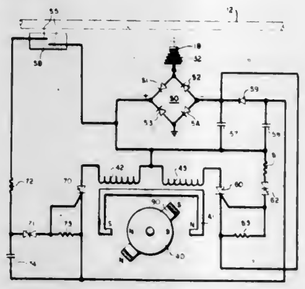
FAULT INDICATOR

Edmund O. Schweitzer, 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Nov. 6, 1978, Ser. No. 958,103

Int. Cl.³ G01R *1/20*

U.S. Cl. 324—146 **15 Claims**



1. A fault indicator for indicating the occurrence of a fault current in an electrical conductor, comprising, in combination:

a housing;

status indicating means having a reset-indicating state and a fault-indicating state;

first circuit means for conditioning said status indicating means to said reset state, said first circuit means being periodically operable from an external excitation source;

second circuit means for conditioning said status indicating means to said fault-indicating state in response to an applied control affect;

fault detecting means responsive to occurence of a fault current in the conductor; and

time delay means responsive to detection of a fault by said fault detecting means for actuating said second circuit means after a predetermined delay period following the fault to preclude simultaneous actuation of said first and second circuit means.

4,234,848

TEST HEAD FOR INDUCTIVE SURFACE TESTING HAVING PLURAL RESONANT COILS HELD IN CONDUCTIVE HOLDER

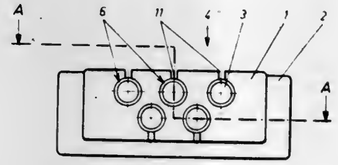
Rudolf Diem, Dittelbrunn, and Hans-Jürgen Hentrich, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,929

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725354

Int. Cl.³ G01R *33/00*

U.S. Cl. 324—262 **7 Claims**



1. A test head for the inductive surface testing of metallic workpieces brought into proximity with said test head for areal scanning of the surface of such workpieces, comprising a holder of an electrically conductive material, a plurality of parallel spaced holes extending through said holder, a plurality of resonant circuits each including a coil having a ferrite core and each of said plurality of resonant circuits being mounted in each of said holes and coaxially therewith so that the axes of said coils extend at right angles to the workpiece surface, whereby the resonant frequencies are increased, thereby increasing sensitivity of said testing, the distance between adjacent said holes in said holder being less than the diameter of each said ferrite core so that the magnetic field built up under the test head loses little in intensity between adjacent holes, thereby maximizing accuracy in indicating longitudinal and transverse flaws of the workpiece surface.

4,234,849

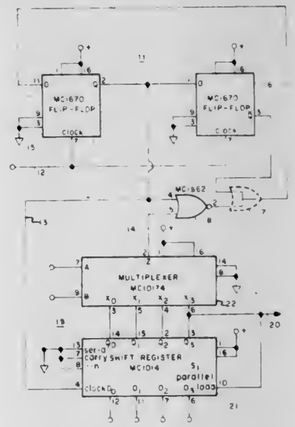
PROGRAMMABLE FREQUENCY DIVIDER AND METHOD

William J. Crilly, Jr., Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 708,467, Jul. 26, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,126

Int. Cl.³ H03K *21/36*

U.S. Cl. 328—46 **11 Claims**



1. An apparatus for dividing the frequency of an applied signal by a programmable integer divisor comprising:

frequency divider means having an input connected to receive an applied signal having a frequency to be divided, having a control input for selecting one of a plurality of partial divisors wherein the sum of positive integer multiples of said partial divisors is equal to a desired programmed divisor, and having an output for generating a signal with a partially divided frequency of the applied signal frequency;

shift register means having a plurality of interconnected cells each capable of storing data, having a clock input connected to receive the output of the frequency divider means for producing a serial shift of the data in said cells, having a parallel load control input, having a data output from each of a plurality of said cells and having a data input to each of a plurality of said cells for loading programming signals applied thereto into said cells;

first means for connecting one of said data outputs, which generates the desired frequency divided signal, to said parallel load control input for loading said cells with a programming signal applied to said data inputs, in response to signal appearing on the clock input of said shift register means;

second means for connecting one of said data outputs to the control input of said frequency divider means; and

said shift register means serially shifting said loaded data within said cells in response to the appearance of signals on the clock input of said shift register means to produce a change in the data in the cell having an output connected to the parallel load control input for causing a parallel

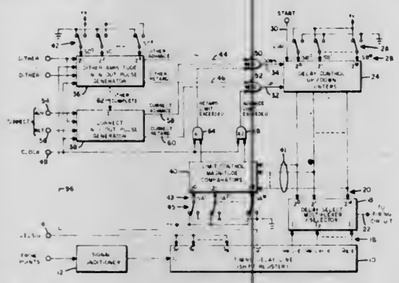
load only after an integer number of serial shifts, where said integer number is equal to the sum of said integers which are multipliers of the partial divisors, and for serially shifting said loaded data to produce a change in the data in the cell having an output connected to the control input of said frequency divider means, where said change is capable of controlling the selection of said partial divisors a number of times equal to the integer multiplier of the selected partial divisor.

4,234,850

FIRING TIME CONTROL CIRCUIT

Thomas W. Collins, State College, Pa., assignor to Optimizer Control Corporation, Burnsville, Minn.

Filed Jan. 8, 1979, Ser. No. 1,869
Int. Cl.³ H03K 5/22, 3/04
U.S. Cl. 328—66 **7 Claims**



1. An adaptive control circuit for producing an output circuit signal at a time subsequent to an initial event as determined by an optimizing control system, comprising:

(a) multi-stage delay line means having a plurality of output taps emanating from predetermined stages thereof and having an input terminal for receiving a pulse indicative of said initial event;

(b) means for propagating said pulse through said delay line at a desired rate;

(c) code responsive means coupled to said plurality of output taps for selecting only one of said taps at a time and delivering the signal thereon to a utilization device;

(d) bi-directional counting means having its output coupled to said code responsive means; and

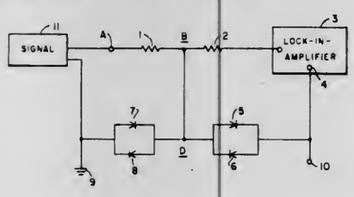
(e) means for incrementing or decrementing said counting means by a predetermined count value as determined by said optimizing control system.

4,234,851

LOGARITHMIC LOCK-IN AMPLIFIER

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1978, Ser. No. 972,179
Int. Cl.³ H03F 3/10; G06G 7/12
U.S. Cl. 328—145 **1 Claim**



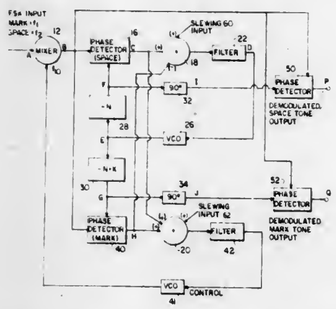
1. An amplifying system comprising a signal having an output connected between a first terminal and ground; a locked-in amplifier having an input and an output; first and second impedance means connecting said first terminal in a series circuit to said input of said amplifier; a first junction between said first and second impedance means; first and second variable impedance means connecting said output of said amplifier in a series circuit to said ground connection; a second junction between said variable impedance means; connecting means connecting said first and second junctions directly to each other; said variable impedance means have an impedance that is directly proportional to the logarithmic value of the impressed voltage across them, whereby the output of said amplifier will be a logarithmic amplification of said signal; and said first and second variable impedance means being diodes.

4,234,852

COHERENT FREQUENCY SHIFT KEY DEMODULATOR

John W. McCorkle, 2009 Evansdale Dr., Adelphi, Md. 20783

Filed Nov. 15, 1978, Ser. No. 960,992
Int. Cl.³ H04L 27/14
U.S. Cl. 329—50 **10 Claims**



1. A frequency shift key detector for demodulating mark and space tone frequency shifts from a carrier frequency comprising:

first phase locked loop means for locking onto and tracking the difference in frequency between said mark and space tones, said first phase locked loop means including:

a first space tone sub-loop comprising:

first phase detector means for receiving space tones and comparing them with a space tone loop signal;

a first summer having multiple inputs, one positive input of which is coupled to the output of said first phase detector;

first filter means coupled to the output of said first summer;

a first voltage controlled oscillator having its control input coupled to the output of said first filter means; and

first divider means coupled to the output of said first voltage controlled oscillator and providing said space tone loop signal coupled to said first phase detector means;

a first mark tone sub-loop sharing in common with said first space tone sub-loop said first summer means, said first filter means, and said first voltage controlled oscillator and in addition to said elements shared in common further including:

second divider means coupled to the output of said first voltage controlled oscillator for generating a mark tone loop signal; and

second phase detector means for receiving mark tones and comparing them with said mark tone loop signal, wherein the output of said second phase detector means is coupled to a negative input of said first summer;

second phase locked loop means for locking onto and tracking the overall frequency drift of said mark and space tones, said second phase locked loop means including:

a second space tone sub-loop sharing said first phase detector means with said first space tone sub-loop and further comprising:

a second summer having multiple inputs, wherein one positive input is coupled to the output of said first phase detector means and another positive input is coupled to the output of said second phase detector means;

a second filter means coupled to the output of said second summer;

a second voltage controlled oscillator having its control input coupled to the output of said second filter means; and

a mixer having a first input for receiving said carrier, mark and space frequencies and a second input for receiving an input mix signal and an output providing frequency translated mark and space tones, wherein said second input of said mixer is coupled to the output of said second voltage controlled oscillator and wherein the output of said mixer is coupled to said first phase detector for supplying said mark and space tones thereto;

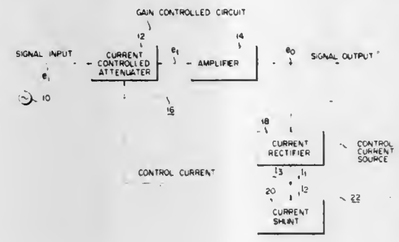
a second mark tone sub-loop, sharing in common with said second space tone sub-loop said mixer, said second summer, said second filter means, and said second voltage controlled oscillator and sharing in common with said first mark tone sub-loop said second phase detector means wherein said second phase detector means is coupled to the output of said mixer.

4,234,853

AUTOMATIC LEVEL CONTROL CIRCUIT

Hiroyasu Yamaguchi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 11, 1978, Ser. No. 923,629
Claims priority, application Japan, Jul. 15, 1977, 52/94354
Int. Cl.² H03G 3/30
U.S. Cl. 330—280 **25 Claims**



1. An automatic level control circuit for controlling the level of an input signal comprising:

a gain controlled circuit having input, output and control ports, said input port for coupling to said input signal to be level controlled and said output port supplying a level controlled output signal, the gain of said gain controlled circuit being controllable responsive to a control current applied to said control port, said gain controlled circuit including at least one variable impedance element, the impedance of which is a function of said control current; and

a control current source for supplying said control current, said control current being a function of the difference between a direct current component corresponding to the level of said input signal and a reference current;

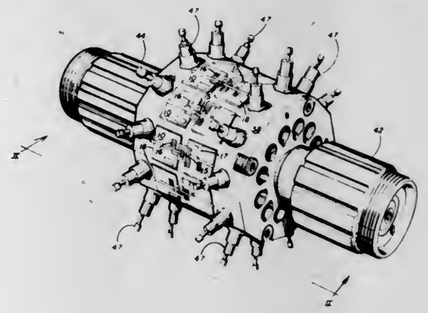
wherein the output impedance of said control current source is high so that said control current is substantially independent from the temperature change of the voltage drop occurring across said variable impedance element.

4,234,854

AMPLIFIER WITH RADIAL LINE DIVIDER/COMBINER

James M. Schellenberg, Severna Park, and Marvin Cohn, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1978, Ser. No. 905,604
Int. Cl.³ H03F 3/60
U.S. Cl. 330—286 **11 Claims**



1. A radial line divider/combiner comprising:

an annular substrate having an inner radius and an outer radius;

a radial line covering selected portions of a major surface of the annular substrate, said radial line having a plurality of sectors symmetrically disposed about the center of the annular substrate;

a plurality of transmission lines radially extending from the perimeter of the radial line to the outer radius of the substrate; and

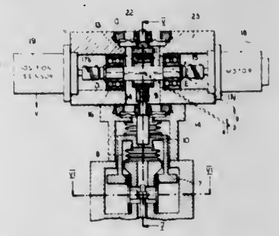
a plurality of isolation resistors connecting laterally adjacent sectors of the radial line.

4,234,855

SYSTEM FOR LINEARLY TUNING A MICROWAVE OSCILLATOR

Guido Bussacca; Pietro Luparello; Lucio Marranca, and Michele Sanfilippo, all of Palermo, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 31, 1979, Ser. No. 8,091
Claims priority, application Italy, Feb. 2, 1978, 19895 A/78
Int. Cl.³ H01P 7/04; H03B 9/10, 23/00
U.S. Cl. 331—90 **6 Claims**



1. In a generator of microwaves of variable frequency provided with a resonant cavity and a tuning element in said cavity, said tuning element being linearly displaceable between

two terminal positions corresponding to respective limiting frequencies f_1 and f_2,

the combination therewith of:

a rotatable crankshaft;

a mechanical linkage coupling said crankshaft with said tuning element, said linkage including a pitman with a first extremity fulcrumed on said crankshaft and a second extremity positively connected with said tuning element via a pivotal joint, said crankshaft having an eccentricity e, said pitman having an effective length p measured between the pivotal axes of said extremities, said second extremity being substantially linearly guided between a first dead-center position farther from the axis of said crankshaft and a second dead-center position closer to said axis respectively coinciding with said terminal positions of said tuning element;

drive means coupled with said crankshaft for rotating same about said axis; and

position-sensing means coupled with said crankshaft for emitting an output signal varying as a sinusoidal function of the angle of rotation of the crankshaft from a predetermined reference position;

the length p being related to the eccentricity e by the expression

$$p = \frac{q - e}{2} + \frac{e^2}{2(q - e)}$$

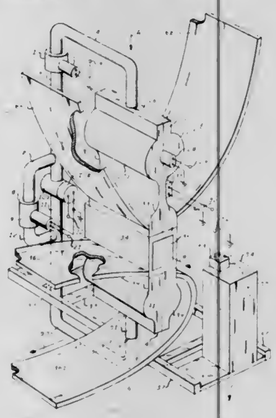
where q is the distance of travel of said second extremity between said first dead-center position and an intermediate position thereof in which said frequency has a mean value of $(f_1+f_2)/2$ whereby said frequency varies as a sinusoidal function of said angle of rotation and is proportional to said output signal.

4,234,856

GASDYNAMIC SOLAR POWERED LASER

Check K. Jung, Brooklyn, and Harold E. Whalen, Dix Hills, both of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,352
Int. Cl.[2] H01S 3/045, 3/091, 3/223
U.S. Cl. 331—94.5 P **11 Claims**



1. Apparatus for operation at a stabilized extraterrestrial geosynchronous satellite station for the conversion of solar radiation into a compact beam of infrared energy directed to perform work at a predetermined second station, comprising:

gas laser means including:

solar energy absorber means,

transverse flow gas laser means, and

thermal radiator means for radiation of degraded thermal energy,

said transverse flow gas laser means being characterized by producing a compact beam of infrared radiation, when said solar energy absorber means is excited by solar energy, along a first path,

solar radiation collector means normally oriented for maximum coupling of solar energy into said solar energy absorber means along a second path at a substantially right angle to said first path,

radiant energy directive means coupled to said thermal radiator means for coupling degraded energy into space generally in at least a part of a plane substantially perpendicular to said second path and spaced from said first path whereby said thermal radiator means is substantially shielded from solar radiation and from said infrared beam,

said solar energy absorber means, said transverse flow gas laser means, and said thermal radiator means forming closed envelope means of a common cavity for enclosure of a lasable gas, and

gas conduit means connecting said common cavity at said thermal radiator means to said common cavity at said solar energy absorber means for forming closed loop gas conduit means,

discharge valve means within said common cavity disposed between said solar energy absorber means and said transverse flow gas laser means, and

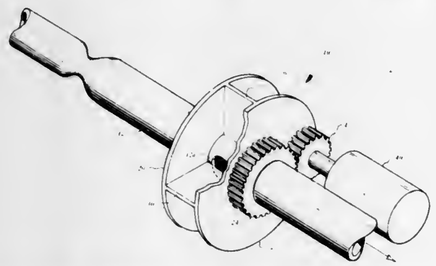
pump means in serial relation in said gas conduit means for raising the pressure of gas within said solar energy absorber means to a predetermined level in cooperation with said solar energy when said discharge valve means is closed.

4,234,857

CENTRIFUGAL GASDYNAMIC WINDOW

Frank J. Stoddard, Huntington Beach, Calif., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Apr. 13, 1979, Ser. No. 30,034
Int. Cl.[3] H01S 3/02
U.S. Cl. 331—94.5 G **3 Claims**



1. In a flowing gas laser having a laser tube with radially extending ports for the passage of a laser beam, the improvement consisting of a centrifugal gasdynamic window assembly for establishing a fluid seal between a laser medium in the laser tube and ambient atmosphere while permitting passage of the laser beam through the radially extending ports and including:

two rotatable discs;

means for maintaining said discs in a spaced relationship and on respective sides of said ports;

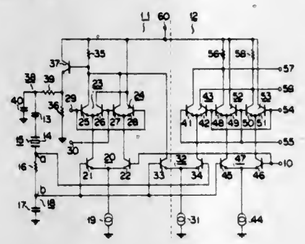
means for causing said discs to rotate as a unit at a predetermined speed about the laser tube whereby a radially extending pressure gradient is established between said discs which prevents flow between the laser medium and atmosphere while permitting passage of the laser beam between said discs.

4,234,858

VOLTAGE CONTROLLED OSCILLATOR WITH PHASE CONTROL CIRCUITS

Hiroshi Gomi, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 773,689, Mar. 2, 1977, Pat. No. 4,128,817. This application Jul. 11, 1978, Ser. No. 923,643
Claims priority, application Japan, Mar. 3, 1976, 51-22270; Mar. 9, 1976, 51-24646; Mar. 9, 1976, 51-24647; Mar. 10, 1976, 51-24998
Int. Cl.[3] H03B 5/36; H04N 9/535
U.S. Cl. 331—177 R **7 Claims**



1. A voltage controlled oscillator comprising:

a resonant circuit;

means for phase-shifting by a predetermined amount a first reference vector signal ($\dot{e}_1$) from one end of said resonant circuit, thereby generating a second reference vector signal ($\dot{e}_2$);

means for generating a third vector signal ($\dot{e}_3$) equal to the difference between said first and said second reference vector signals ($\dot{e}_1$, $\dot{e}_2$);

means for generating a vector signal $\dot{e}_4$ and for feeding back said vector signal and said third vector signal e_3 to said resonant circuit, including means for generating a vector signal 180° out of phase with said vector signal $\dot{e}_4$ and including a first control-addition means for receiving one of said first, second and third vector signals, for controlling the absolute value of said vector signal $\dot{e}_4$ relative to said vector signal 180° out of phase with said vector signal and for combining both vector signals; and

hue control signal generating means including means for generating a fourth vector signal $-\dot{e}_3$ that is 180° out of phase with said third vector signal $\dot{e}_3$, and further including a first vector adding circuit for adding one of said third vector signal e_3 and fourth vector signal $(-\dot{e}_3)$ to a vector signal $(-\dot{e}_2$ or $+\dot{e}_2)$ which differs in phase by +90° from said third or fourth vector signals, and generating a fifth vector signal (e_6) said hue control signal generating means further including a second vector adding circuit for adding one of said third vector signal (e_3) and said fourth vector signal $(-\dot{e}_3)$ to a vector signal $(-\dot{e}_2$ or $+\dot{e}_2)$ which differs in phase by −90° from said third or fourth vector signal, thereby generating a sixth vector signal ($\dot{e}_5$).

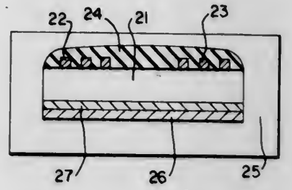
4,234,859

ELASTIC SURFACE WAVE DEVICE AND METHOD FOR MAKING THE SAME

Hiroshi Ikushima, Hirakata; Toyota Noguchi, Kyoto; Tsuneo Danno, Moriguchi, and Tooru Tamura, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 14, 1979, Ser. No. 12,193
Claims priority, application Japan, Feb. 14, 1978, 53-16176
Int. Cl.[3] H03H 9/25, 9/42, 3/08, 9/10
U.S. Cl. 333—151 **2 Claims**

1. An elastic surface wave device comprising a resin having embedded therein a unitary body comprising: a piezoelectric plate; a transmitting interdigital transducer and a receiving interdigital transducer, both transducers being attached to one major surface of the piezoelectric plate, which unitary body is attached to a unitary supporting substrate via double adhesive layers, one of which is composed of one kind of adhesive resin and the other of which is composed of another kind of resin, different from the former in ultrasonic property, each of the transducers comprising a pair of electrodes facing each other, a wave propagation surface for an elastic surface wave being



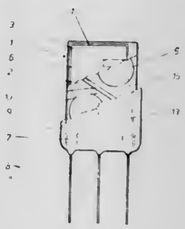
thereby defined on the major surface of the piezoelectric plate between the transducers; and two pairs of electrical leads, one pair of which are respectively connected to the pair of electrodes of the transmitting transducer and the other pair of which are respectively connected to the pair of electrodes of the receiving transducer, all of said electrical leads being out of contact with the wave propagation surface.

4,234,860

PIEZOELECTRIC FILTER AND PROCESS FOR THE MANUFACTURE THEREOF

Heinz Schumacher, and Hermann Zacharias, both of Cologne, Fed. Rep. of Germany, assignors to Draloric Electronic GmbH, Nuremberg, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,333
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2715202
Int. Cl.[2] H03H 9/04, 9/10, 9/14; H01L 41/22
U.S. Cl. 333—187 **18 Claims**



1. A piezoelectric filter, comprising:

a resonator including: a resonator body, having two opposite principal surfaces, at least one electrode on each of said surfaces, and a respective external connector for each of said electrodes, each of said external connectors being in electric contact with its respective electrode;

an ian insulating envelope encasing said resonator; said connectors extending through said envelope; and

a respective spacer between each of said two principal surfaces of said resonator body and said envelope; said spacers each comprising a preformed self-adhesive film and having a first set of regions which register with respective ones of said electrodes and which are maintained out of physical contact with said electrodes, and each of said spacers having a second set of regions that are in contact with said resonator body.

4,234,861

ELECTRICAL WINDINGS

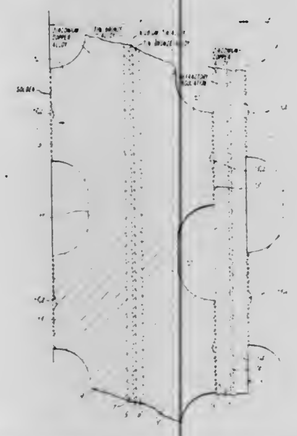
Alan Woolcock, Lichfield; Bryan W. H. Lowe, Sutton Coldfield, and Colin R. Walters, Abingdon, all of England, assignors to Imi Kynoch Limited, Birmingham, England

Filed Mar. 13, 1978, Ser. No. 886,128

Claims priority, application United Kingdom, Mar. 14, 1977, 10734/77

Int. Cl.³ H01F *7/22*; H01B *12/00*

U.S. Cl. 335—216 **13 Claims**



1. An electric winding comprising a plurality of turns of a strip conductor consisting of a layer of a material which can be rendered superconducting sandwiched between two metallic layers of equal thickness adapted to thermally stabilise the layer of material which can be rendered superconducting when it is in the superconducting state, and interposed between each turn of the strip conductor in the winding a composite strip comprising a layer of insulating material sandwiched between two layers of metal so as to occupy the neutral axis of the composite strip.

4,234,862

ROBUST POLYPHASE TRANSFORMER

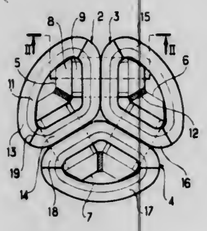
Gérard Prevotat, Nevers, France, assignor to Alsthom-Unelec, Paris, France

Filed Jul. 7, 1978, Ser. No. 922,699

Claims priority, application France, Jul. 22, 1977, 77 22536

Int. Cl.³ H01F *33/00*

U.S. Cl. 336—5 **1 Claim**



1. A polyphase transformer for oil immersion cooling within a tank and having a magnetic core for each phase, said cores being in contact with each other and oriented vertically and having two adjacent rectangular sides each of which is disposed against one of the rectangular sides of an adjacent magnetic core, and each core threading a coil which comprises a high tension winding of trapezoidal right cross-section and a low tension winding of rectangular right cross-section, with said trapezoidal right cross-section high tension winding radially surrounding the low tension winding, each magnetic core being symmetrical about the plane of symmetry of two adjacent coils and being resin impregnated, the improvement wherein: said magnetic cores are sawn into two parts along a plane perpendicular to the plane of symmetry, said two parts being stuck together and being made from magnetic sheets of at least two different widths so as to provide a right cross-section including at least one step and said two adjacent sides forming a core cross-section of pseudo-elliptical shape such that the uppermost coil is horizontally disposed to form cooling channels which are vertically oriented to insure adequate cooling of all coils, and wherein single wedges lie in the plane of symmetry of given cores which thread both of two adjacent coils and are interposed between opposed coplanar sides of opposed trapezoidal right cross-section high tension windings to jam the coils both axially and radially by orthogonal tightening force components perpendicular to the plane of symmetry of the coil and parallel thereto, so as to oppositely mutually wedge adjacent coils.

4,234,863

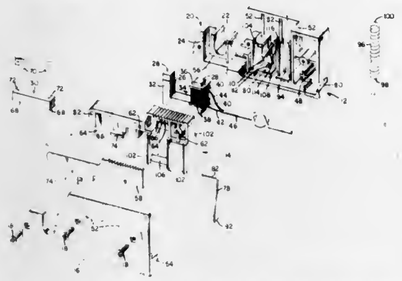
INDUCTIVE PICKUP CLIP

DeWayne J. Shumway, Fruita, and Delbert D. Gennetten, Grand Junction, both of Colo., assignors to Dixson, Inc., Grand Junction, Colo.

Filed Nov. 8, 1978, Ser. No. 958,748

Int. Cl.³ H01F *27/02*, *40/06*

U.S. Cl. 336—90 **14 Claims**



1. An inductive pickup clip for generating an output signal in response to changes in the flow of electric current in an electric conductor about which said clip is adapted to be removably secured, wherein said clip is of the type including:

first and second body portions having first and second core portions secured thereto respectively, wherein said first body portion is held telescopically within said second body portion; and

a pickup coil means positioned about one of said core portions and having terminals adapted to be connected to an electrical circuit;

wherein said body portions, and hence said core portions, are telescopically selectively movable with respect to each other between an open configuration and a closed configuration in which said core portions fit together to define an opening adapted to receive said electric conductor during use, and

wherein the improvement comprises: shock absorbing means located only at the end portions of at least one of said core portions and being secured between said at least one of said core portions and its respective body portion for cushioning said at least one core portion as said core portions are moved into contact with each other in said closed configuration, to prevent chipping or breaking of said core portions and to insure a close fit and correct alignment between said core portions when in said closed configuration.

4,234,864

TRANSFORMER WITH OFFSET SIDE WALL-MOUNTED ON-LOAD TAP CHANGER

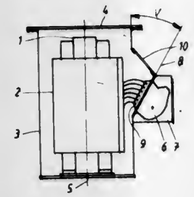
Birger Johansson, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Jun. 11, 1979, Ser. No. 47,644

Claims priority, application Sweden, Jun. 16, 1978, 7806937

Int. Cl.³ H01F *27/04*

U.S. Cl. 336—90 **4 Claims**



1. Transformer apparatus comprising:

a liquid-filled transformer tank;

a transformer core and windings mounted within said transformer tank, and at least one of said windings including tapping points;

a tap-changer tank mounted on the outside of one side wall of said transformer tank;

an on-load tap changer connected to said tapping points and mounted within said tap-changer tank;

said tap changer including a terminal board mounted at the dividing line between said transformer tank and said tap-changer tank; and

said tap-changer tank being mounted to said transformer tank such that said dividing line is directed obliquely outwardly and upwardly from the vertical plane in which the side wall of said transformer tank is substantially located.

4,234,865

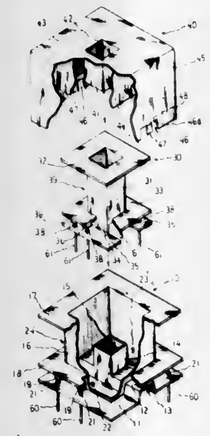
TRANSFORMER FRAMING STRUCTURE

Katsumi Shigehara, 29-15, Higashikashiwagaya 2-chome, Eginashi, Kanagawa-ken, Japan

Filed Jul. 9, 1979, Ser. No. 56,094

Int. Cl.³ H01F *27/02*, *27/30*

U.S. Cl. 336—92 **4 Claims**



1. A transformer framing structure compriaing a frame body including a base plate having provided centrally thereof a trapezoidal raised-up portion forming a channel extending through said base plate, and a prismatic portion provided at the center of said trapezoidal portion, with the hollow of said prismatic portion being in communication with said channel, said prismatic portion being enclosed by a wall erected on said base plate outside of and spaced-apart from said prismatic portion, said enclosing wall being provided with the upper and lower flanges at its both ends; a bobbin assembly comprising a prismatic portion provided with the upper and lower flanges at its upper and lower ends respectively, said prismatic portion having legs extending down from the lower end thereof and joined to the respective support plates, said bobbin assembly being designed to wind thereon the coil to be housed in a coil chamber defined between the prismatic portion of said frame body and the surrounding wall; and a cover for enclosing said frame body and bobbin assembly, said cover comprising a top cover portion provided at an end of a prismatic structure disposed in opposition to the prismatic portion of said frame body and a side cover portion extending down vertically from the outer periphery of said top cover portion.

4,234,866

CENTRALIZED ALARM SYSTEM FOR VEHICLES

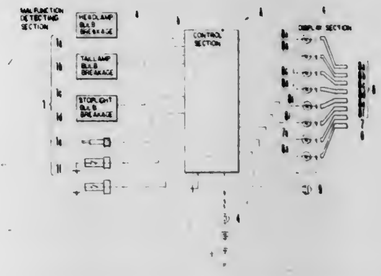
Masahiko Kuroda, Chigasaki, and Eiji Ohsawa, Ebina, both of Japan, assignors to Nissan Shatai Co., Ltd., Japan

Filed Nov. 1, 1978, Ser. No. 956,788

Claims priority, application Japan, Dec. 26, 1977, 52-155635

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **42 Claims**



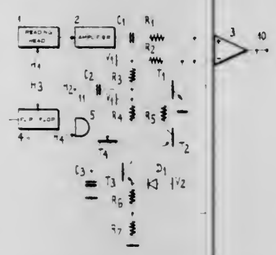
1. A centralized alarm system for vehicles, having sensors provided on various parts of the vehicle for detecting the conditions of said parts, comprising, a control section for controlling signals generated from said sensors, an indicating section for indicating the conditions of said parts according to signals generated from said control section, a main alarm device connected to said control section, local alarm devices corresponding to said parts to be inspected connected to said control section, a check switch, connected to said control section, and a circuit in said control section adapted to give said control section a command for indicating abnormal parts in response to a signal produced when said check switch is closed, said circuit including means so that when one or a plurality of said parts are detected to be abnormal, said main alarm device is first turned on and then the parts found to be abnormal are indicated by the closing of said check switch.

4,234,867

THRESHOLD DEVICE FOR DISTINGUISHING THE WHITE LEVEL FROM THE BLACK LEVEL IN AN INPUT SIGNAL DELIVERED BY A READING HEAD FOR ANALYZING A DOCUMENT

Henri Butin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 10, 1979, Ser. No. 73,855
Claims priority, application France, Sep. 8, 1978, 78 25850
Int. Cl.³ G06K *9/38*; H03K *5/153*
U.S. Cl. 340—146.3 AG **4 Claims**



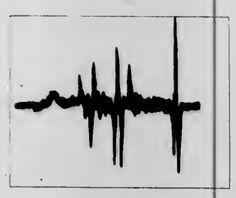
1. A threshold device for distinguishing the white level from the black level in a first signal delivered by the output of a reading head for analyzing a document, and comprising amplification means having one input coupled to the output of the reading head and one output for delivering a second signal, a comparator having a first input coupled to the output of the amplification means, a second input and an output for delivering a signal having a first level when the level of the first signal is a white level and a second level when the level of the first signal is a black level, storage means having one input coupled to the output of the amplification means for storing the value of the level of the second signal, a control input coupled to the output of the comparator for controlling the storage operation under the action of the first level and an output coupled to the second input of the comparator in order to deliver a signal which is representative of a fraction of the value of the level of the second stored signal.

4,234,868

PERSONAL VERIFICATION DEVICE

Peter F. Radice, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 6, 1978, Ser. No. 949,172
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 SY **5 Claims**



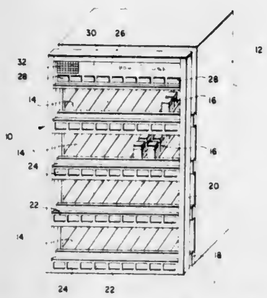
1. In a verification device having a surface adapted to receive hand markings and to transmit a representation of said markings by electrical energy for comparison with a similar representation, the improvement wherein said surface comprises a poled sheet of a piezoelectric-forming resin, said poled sheet holding a sufficient charge to provide an electric response when said sheet is hand marked and being coated on each side with an electroconductive coating for transmission of electric responses generated by said hand markings.

4,234,869

MERCHANDISE DISPLAY AND CATEGORICAL INDICATORS

Robert M. Sandelman, 11 E. 36th Street, New York, N.Y. 10016

Filed Nov. 15, 1978, Ser. No. 960,771
Int. Cl.² G08B *5/00*
U.S. Cl. 340—286 R **8 Claims**



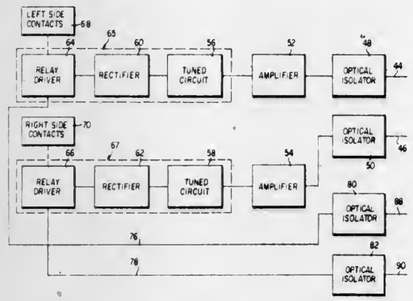
1. A categorical indicator device on an article display rack, said display rack including a plurality of rows for display of articles, said articles, discretely stackable on said shelves in columns, said shelves slanted downward for gravity feed of said articles, said categorical indicator device adapted to optionally indicate at least one subset of a category matrix of articles, said indicator device comprising indicator means including members having a one-to-one physical relationship with individual members of said category matrix at said columns, storage means for storing the identity of said at least one category subset, selection means for selecting a selected subset of said at least one subset, and control means for energizing selected indicator members associated with said selected subset whereby said selected subset is distinguished from other articles.

4,234,870

VITAL ELECTRONIC CODE GENERATOR

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,765
Int. Cl.³ G08G *25/00*; G06F *11/30*; H04L *1/14*
U.S. Cl. 340—348 **15 Claims**



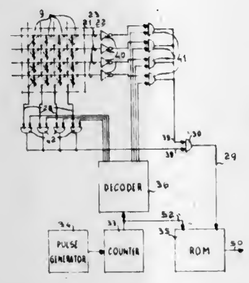
1. A vital electronic code generator comprising:
a programmable central processing unit, said central processing including means for generating a signal at a selected code rate, said signal including pulses formed by a carrier signal of a given frequency,
relay driving means for operating relay contacts, said relay driving means including circuit means tuned to said frequency of said carrier signal for discriminating against signals of other frequencies,
output channel means for coupling said relay driving means to said central processing unit; and,
feedback means coupled between said relay driving means and said central processing unit for comparing the activity of said relay driving means with the output of said central processing unit.

4,234,871

CAPACITIVE KEYBOARD FOR DATA PROCESSING EQUIPMENTS

Nicolo Guglielmi, Turin; Giandomenico Dagna, and Bruno Visentin, both of Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 6, 1978, Ser. No. 913,217
Int. Cl.³ G06F *3/023*; G08C *9/02*
U.S. Cl. 340—365 S **8 Claims**



1. A capacitive keyboard for data processing equipment comprising:
a plurality of keys,
a keyboard encoder,
a plurality of variable capacitors associated with said plurality of keys, said capacitors being arranged according to a matrix by a group of rows and a group of columns, each capacitor comprising a single-piece fixed armature, a single-piece movable armature adapted to be moved upon the depression of the associated key, and a polarized dielectric material interposed between said armatures, each capacitor upon the depression of the associated key generating on the corresponding armatures a pair of signals of opposite polarities,
first connecting means for connecting the fixed armatures according to one of said groups of rows and columns of said matrix,
second connecting means for connecting the movable armatures according to the other of said groups of rows and columns of said matrix,
inverting means for inverting the signals of one of said groups of rows and columns of said matrix, and
means for applying the signals so inverted and the signals of the other one of said groups to the input of said keyboard encoder.

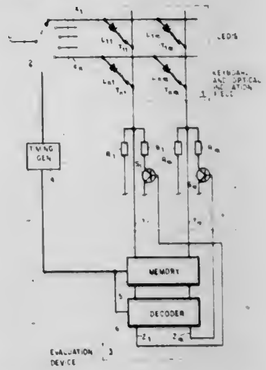
4,234,872

CIRCUIT ARRANGEMENT FOR A KEYBOARD

Mathis Halder, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Feb. 23, 1979, Ser. No. 15,605
Claims priority, application Switzerland, Mar. 8, 1978, 2516/78
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 R **4 Claims**

1. A keyboard circuit arrangement comprising:
a plurality of light-emitting diodes arranged to provide an optical indication field;
a like plurality of switches, each of said switches connected in series with a different one of said diodes to form a matrix with rows and columns;
a multiplexer connected for selectively energizing successive rows of said matrix;
an evaluation device connected to the columns of said matrix, the current flow through a matrix column normally being insufficient to activate the diode in the matrix column;
the outputs of said evaluation device being connected to said matrix columns, said evaluation device,



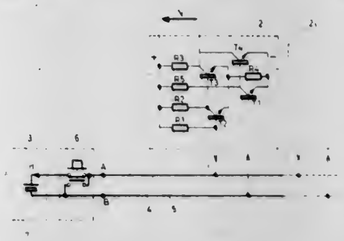
being capable of detecting when a switch has been actuated, and
being operable, subsequent to said switch actuation, to increase current flow through the matrix column corresponding to the actuated switch when the matrix row corresponding to the actuated diode is energized to thereby activate the diode associated with the actuated switch.

4,234,873

ALARM INSTALLATION WITH A NUMBER OF SELF POWERED INDICATING ELEMENTS

Bertrand A. Warnod, Neuilly-sur-Seine, France, assignor to Klaxon S.A., Courbevoie, France

Filed Apr. 17, 1978, Ser. No. 897,085
Claims priority, application France, May 4, 1977, 77 13793
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—509 **6 Claims**



1. In an alarm system comprising a plurality of indicating elements each including a warning device and an independent power supply source, the provision of
(a) a first control circuit for each respective element connected between the source and the warning device to control the operation thereof;
(b) coupling means comprising a pair of wires connected to the first control circuit of each indicating element to form a pair of common connections in parallel therebetween;
(c) a second control circuit between the pair of wires form-

ing said coupling means at a position remote from said first control circuits connected with each said first control circuit via said coupling means to form a common control for each said indicating element capable of maintaining a potential difference between the pair of wires of said coupling means, and

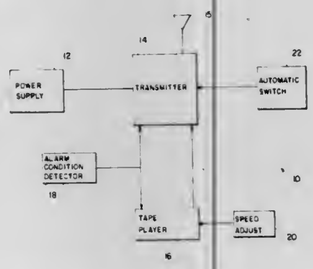
(d) a switch mechanism for actuating said alarm connected between said common second control circuit and each said first control circuit via said coupling means, said mechanism being operable to effect at least one of the conditions of short circuit of said second control circuit, open-circuit between the first control circuit and the second control circuit, and both the aforesaid short circuit and open circuit conditions causing a change in circuit conditions normally dependent on said second control circuit, to effect operation of said alarm when an open circuit or short circuit condition occurs.

4,234,874

ALARM SYSTEM AND METHOD THEREOF

Wayne P. Saya, Cambridge, Mass., assignor to Inventional/-Security Development Corp., Cambridge, Mass.

Filed Nov. 8, 1978, Ser. No. 958,822
Int. Cl.[2] G08B *1/08*
U.S. Cl. 340—539 **2 Claims**



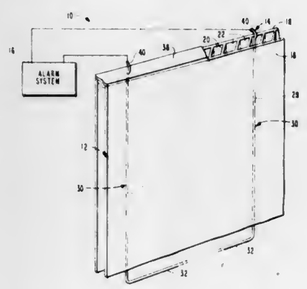
1. An alarm system responsive to an alarm condition detector to communicate a message to a distant radio receiver system operable to receive messages on a plurality of frequencies, featuring fail safe features that prevent disabling the system by cutting wires or jamming transmission, comprising in combination, a battery operated power supply permitting operation when power lines are disabled, a radio transmitter operable from said power supply for transmitting an alarm message on a plurality of different radio broadcast frequency channels receivable by said distant receiver system, alarm message repeater means operable from said power supply having a pre-recorded audio message signal reproducible at audio reproduction rates greatly increased over comprehensible audible speeds and thus incomprehensible to humans and to be transmitted rapidly before jamming analysis can be effective, means responsive to an alarm condition connected for activating said alarm message repeater to modulate said transmitter with said signal at said reproduction rates, and means activating said transmitter to broadcast the recorded signal on each of the different frequency channels including means operable from said power supply selecting a cyclic sequence of said plurality of different frequencies at a repetition rate of a few seconds timed so that the transmitter will repeat the message on each of the plurality of frequencies thereby permitting effective radio transmission of the alarm message to the distant receiver in the presence of jamming of any less than all said plurality of different broadcast frequency channels.

4,234,875

SECURITY STRUCTURE

William H. Williams, Palos Verdes Peninsula, Calif., assignor to Sandstone, Inc., La Mirada, Calif.

Filed Mar. 6, 1978, Ser. No. 883,487
Int. Cl.[2] G08B *13/12*; E05G *1/10*
U.S. Cl. 340—550 **35 Claims**



1. A securing panel arrangement for use with an intrusion alarm system designed to monitor the continuity of a normally continuous signal conductive path and to produce a warning signal when the signal conductive path is broken, said arrangement comprising:

a cellular panel means positionable to cover an area on a surface of a structure to be secured and attachable thereto, including:

two generally co-extensive and substantially continuous parallel outer walls spaced a relatively small distance apart, and

a series of elongated inner walls substantially parallel to each other joining said outer walls to form a series of parallel elongated passages therewith, said elongated passages extending parallel to said outer walls in the space therebetween;

at least one means for conducting a signal, continuous between two ends thereof and extending through at least one of said elongated passages in a configuration preventing passage of a human being through said panel means unless said at least one conducting means is severed; and

means for connecting said at least one conducting means at said two ends thereof to the alarm system in a continuity monitoring relationship therewith;

whereby passage of a human being through the area on the surface and through said panel means breaks the continuity of said at least one conducting means and causes the alarm system to produce the warning signal.

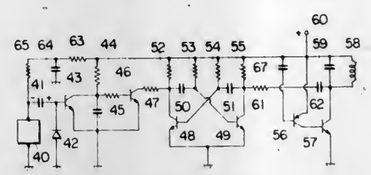
4,234,876

OMNIDIRECTIONAL MOVE-STOP SENSOR

Hiroshi Murai, Tokyo, Japan, assignor to Riken-Denshi Kogyo Kabushiki Kaisha and Morimura Shoji Kabushiki Kaisha, both of Tokyo, Japan

Filed May 20, 1977, Ser. No. 798,939
Claims priority, application Japan, Oct. 19, 1976, 51-125384; Oct. 27, 1976, 51-128244
Int. Cl.[3] G08B *23/00*; A01K *15/00*
U.S. Cl. 340—573 **10 Claims**

1. An omnidirectional move-stop sensor, comprising a movable ball placed within a confined space and voltage-inducing means at least partly defining a wall of said space for generating a voltage varying with impact on collision of said ball with said wall, said wall including a material generating a voltage on



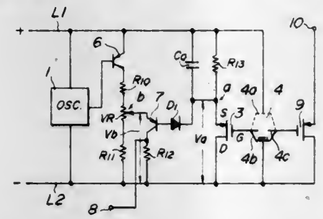
impact, said ball being freely movable along at least two dimensions during operation.

4,234,877

ION TYPE SMOKE SENSOR

Masaki Maruyama, and Kohei Nakamura, both of Machida, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Aug. 23, 1979, Ser. No. 69,080
Claims priority, application Japan, Aug. 26, 1978, 53-116220[U]
Int. Cl.[3] G08B *17/10*; G01T *1/185*
U.S. Cl. 340—629 **10 Claims**



1. An ion type smoke sensor including a smoke sensing means having an internal electrode, an intermediate electrode and an external electrode, and a field effect transistor, having a control input terminal connected to said intermediate electrode, a first output terminal connected to said internal electrode and a second output terminal connected to said external electrode, for producing a sensing output between said first output terminal and said second output terminal, said ion type smoke sensor further comprising:

an oscillator circuit for generating an oscillating output having a predetermined oscillating frequency;

a reference level source for intermittently producing an output signal with a predetermined reference level in response to said oscillating output from said oscillator circuit; and

a comparing circuit for comparing said sensing output of said field effect transistor with said reference level from said reference level source to produce a fire sensing signal in accordance with the result of the comparison.

4,234,878

MONITORING DEVICE FOR THE PROPER OPERATION OF LAMPS PARTICULARLY IN MOTOR VEHICLES

Wolfgang Stark, Kriftel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

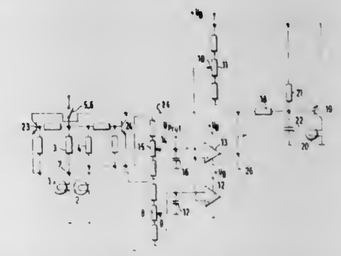
Filed Jun. 23, 1978, Ser. No. 918,516
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728229
Int. Cl.[3] B60Q *9/00*
U.S. Cl. 340—642 **12 Claims**

1. A lamp burnout indicating circuit, particularly for monitoring at least one lamp constituting a first-mentioned lamp in motor vehicles, with a signal circuit, said at least one lamp being energizable from a circuit voltage, comprising

a resistor connected in series with the lamp operatively to said circuit voltage, said resistor having a small resistance in comparison with the resistance of said lamp,

said signal circuit including an indicator lamp,

at least one differential amplifier means for sensing a voltage at a point between said resistor and said first-mentioned lamp and providing an output signal for said indicator



lamp for actuating the latter when a defective condition of said first-mentioned lamp occurs,

a potentiometer means connected in series between said point and said differential amplifier means for adjusting said differential amplifier means according to characteristics of said first-mentioned lamp, and

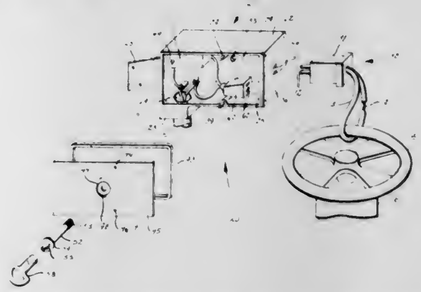
transmission means for operatively applying a voltage drop across said resistor to said signal circuit for signalling a defective condition of said resistor.

4,234,879

PLUG-TYPE SWITCH

Robert K. Baker, Elvins, Mo., assignor to Potter Electric Signal Co., St. Louis, Mo.

Filed Aug. 2, 1979, Ser. No. 62,991
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—686 **10 Claims**



1. A normally closed alarm switch device for use in supervision, by an alarm system, of the tetherable manual actuators of water valves and the like, comprising

a plug assembly including

a male electrical plug of the type having at least two contacts,

a loop of flexible insulated conductor by which such manual actuator is tethered, the conductor connecting two contacts of the male plug, the alarm switch device further comprising

a receptacle assembly including

a female electrical receptacle of the type having at least two contacts, each with an associated hook-up terminal, the receptacle being so formed as to mate for electrical con-

nection with the male plug, whereby the mated receptacle and plug assembly forms a closed switch circuit between the receptacle hook-up terminals, the receptacle assembly further including

an enclosure of such interior dimensions as to contain the female receptacle with freedom for movement of the receptacle, the enclosure having

an access opening to its interior,

a cover for the opening,

means to lock the cover in place at the opening, and

passage means into the enclosure to accept insertion of the male plug contacts therethrough, whereby to mate with the female receptacle contained within the enclosure,

whereby movement of such tethered manual actuator draws the loop and unmates the plug and receptacle, opening the switch circuit, and the plug may thereafter be remated with the receptacle only by unlocking and removing the enclosure cover and manually positioning the receptacle in alignment with the passage means while so inserting the male plug contacts through the passage means.

4,234,880

ADAPTIVE METHOD AND A RADAR RECEIVER FOR SUPPRESSION OF DISTURBING PORTIONS OF THE DOPPLER SPECTRUM

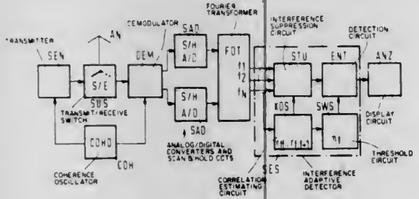
Richard Klemm, La Spezia, Italy, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,359

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752338

Int. Cl.³ G01S *13/02*

U.S. Cl. 343—5 FT **11 Claims**



1. A method for adaptive suppression of disturbing components of the Doppler frequency spectrum in a radar receiver having coherent integration, comprising the steps of:

receiving modulated echo signals in a plurality of frequency bands;

demodulating the echo signals in each frequency band and converting the same to digital signals;

performing a Fourier transformation on the digital echo values;

then comparing the echo value of a band with the echo value of at least one other band to measure the disturbing components and suppressing the disturbing components in the frequency band; and then

performing an approximate decorrelation by forming submatrices symmetrical with the principal diagonal from the power spectrum matrix in a suboptimal detection technique suitable for real-time operation, and detecting a Doppler frequency from a decorrelation value which is above a predetermined threshold.

4,234,881

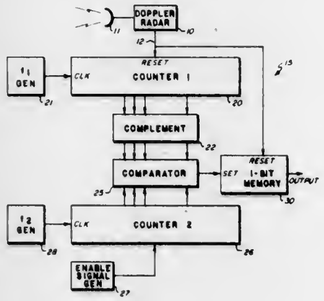
DYNAMIC DIGITAL TIME INTERVAL DISCRIMINATOR AND METHOD

Juris Stauers, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1978, Ser. No. 946,483

Int. Cl.³ G01S *13/58*

U.S. Cl. 343—8 **12 Claims**



5. A dynamic digital time interval discriminator for indicating the occurrence of a predetermined separation time between pairs of pulses in a sequence of pulses, which sequence is decreasing in repetition rate, the discriminator comprising:

(a) first counting means having a clock input terminal, a reset input terminal and a plurality of output terminals;

(b) second counting means having a clock input terminal, an enable signal input terminal and a plurality of output terminals;

(c) Doppler radar means having an output connected to the reset input of said first counting means for providing a sequence of Doppler pulses thereon;

(d) first signal generating means connected to the clock input terminal of said first counting means for providing a first clock signal at a first predetermined frequency relatively high compared to the sequence of Doppler pulses;

(e) second signal generating means connected to the clock input terminal of said second counting means for providing a second clock signal at a second predetermined frequency substantially lower than said first predetermined frequency;

(f) enable signal generating means connected to the enable signal input terminal of said second counting means for supplying an enable signal thereto;

(g) comparator means having a first plurality of input terminals connected to the output terminals of said first counting means, a second plurality of input terminals connected to the output terminals of said second counting means, and an output terminal for comparing signals at the outputs of said first and second counting means and providing an output signal when the signals compare; and

(h) output means having an input terminal connected to the output terminal of said comparator means, a reset terminal coupled to the reset terminal of said first counting means, and an output for providing a signal indicative of the occurrence of the predetermined time.

4,234,882

METHOD AND APPARATUS FOR MEASUREMENT OF THE CONTENTS OF A BUNKER OR SILO

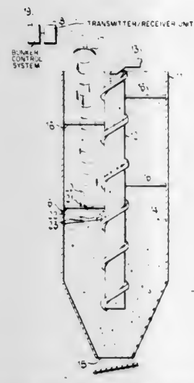
Lionel R. F. Thompson, Hatfield, England, assignor to Hawker Siddeley Dynamics Engr., Inc., Hatfield, England

Filed Feb. 5, 1979, Ser. No. 9,248

Claims priority, application United Kingdom, Feb. 24, 1978, 7436/78

Int. Cl.³ G01S *13/34*

U.S. Cl. 343—14 **7 Claims**



1. Apparatus for measuring the contents of a bunker or silo, comprising

a transmitter mounted over the bunker to beam down on to the surface of the bunker contents a very high frequency signal,

sweep generator means for modulating the transmitted signal to cause the frequency to rise and fall repeatedly with either a constant sweep time and a progressively changing amplitude or a constant amplitude and a progressively changing sweep time,

a mixer responsive to both the transmitted signal and the target signal returns to deliver a beat frequency,

a filter for said beat frequency,

a control unit receiving the filtered beat frequency,

said control unit both controlling the sweep generator means and also computing from the filtered beat frequency the distance of the bunker contents surface below the transmitter as indicated by the particular frequency sweep of the transmitted signal with which each target return from the contents surface is associated,

said control unit including means for discriminating against target signal returns from fixed structure of the bunker which discriminating means comprises a long-term memory store for pre-storing signals corresponding to signal returns from fixed structure of the bunker,

a short-term memory store for receiving the incoming filtered beat frequency signals, and

comparator means for comparing the incoming beat frequency signals in the short-term store with the pre-stored signals in the long-term store and rejecting any of the incoming beat frequency signals that corresponds to a pre-stored signal.

4,234,883

NOISE ADAPTIVE CORRELATOR

Oscar J. Kaelin, Harvard, and Richard H. Mathews, Sudbury, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 26, 1974, Ser. No. 509,708

Int. Cl.³ H04B *7/00*

U.S. Cl. 343—100 CL **7 Claims**

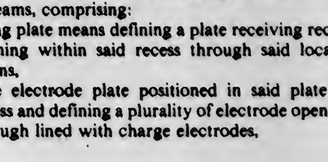
1. Apparatus for measuring the degree of correlation between input signals and correlation measurement pulses in the presence of input noise including

correlation pulse generating means for producing a continuous series of correlation measurement pulses;

correlation gating means for producing a correlation measurement coincidence pulse in response to the coincidence of an input signal and a correlation measurement pulse;

noise measuring means for determining whether or not input noise exceeds a predetermined noise condition during each of a series of noise analysis periods, said noise measuring means being operable to produce a first indication when the input noise does not exceed the predetermined noise condition during a noise analysis period and being operable to produce a second indication when the input noise exceeds the predetermined noise condition during a noise analysis period;

first counting means coupled to said correlation pulse generating means for counting correlation measurement pulses;



first count storage means coupled to said first counting means;

second counting means coupled to said correlation gating means for counting correlation measurement coincidence pulses;

second count storage means coupled to said second counting means;

said first and second count storage means being coupled to said noise measuring means and being operable in response to a first indication therefrom to load the counts present in the first and second counting means into the first and second count storage means, respectively;

said first and second counting means being coupled to said noise measuring means and being operable in response to a second indication therefrom to load the counts present in the first and second count storage means into the first and second counting means, respectively; and

indicator means for indicating the relationship of the counts in the first and second counting means.

4,234,884

INK JET PRINTER ASSEMBLY AND ALIGNMENT OF PRINTER COMPONENTS

James L. Vedder, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 1, 1979, Ser. No. 16,627

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **14 Claims**

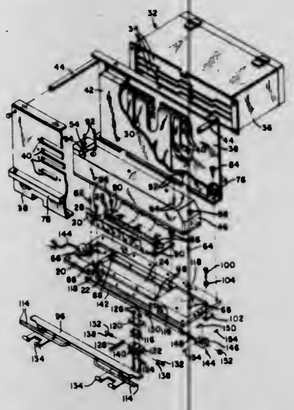
1. An ink jet printer for generating a plurality of fluid jet drop streams, comprising:

locating plate means defining a plate receiving recess and an opening within said recess through said locating plate means,

charge electrode plate positioned in said plate receiving recess and defining a plurality of electrode openings therethrough lined with charge electrodes,

print data conductors, connected electrically to said charge electrodes, for selectively supplying charge control signals thereto,

print head means including a fluid receiving reservoir and an orifice plate communicating therewith, said orifice plate defining a plurality of orifices from which fluid jet drop streams emerge,



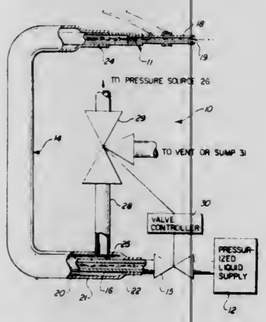
a plurality of locating pin means, mounted on said print head means and received within registration openings in said locating plate means, for positioning said orifice plate with respect to said charge electrode plate such that each of said plurality of orifices is aligned with a respective one of said electrode openings defined by said charge electrode plate, whereby fluid drops in each jet stream are selectively charged in correspondence with said charge control signals.

4,234,885

REMOTE INK VALVE

George W. Arway, River Grove, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Sep. 10, 1979, Ser. No. 73,843
Int. Cl.[3] G01D *15/18*; F16L *55/04*; B65D *37/00*
U.S. Cl. 346—140 R 6 Claims



1. In a liquid flow system having a head which is supplied from a source with pressurized liquid that is expelled by the head, the combination comprising:

a first conduit of elastic material connecting the liquid source with the head for conveying liquid thereto;

first means connected to said first conduit for controlling the flow of liquid conveyed through said first conduit to be expelled from the head;

a second conduit extending between the head and said valve and surrounding said first conduit for providing a pressurizable jacket about said first conduit, and

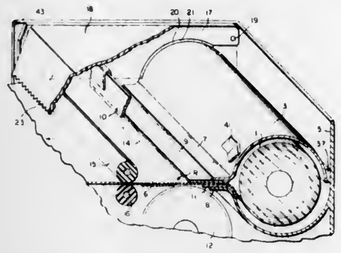
second means connected to said jacket for controlling the pressure applied to said first conduit to prevent the expansion thereof, said flow of liquid from said head being terminated substantially immediately upon operation of said first and second means for terminating the flow of liquid in said first conduit and for relieving the pressure in said jacket.

4,234,886

ELECTRIC GRAPHIC RECORDER

John M. Alden, Needham, and George C. Williams, So. Easton, both of Mass., assignors to Alden Research Foundation, Brockton, Mass.

Filed Jan. 22, 1979, Ser. No. 5,244
Int. Cl.[3] G01D *15/06*, *15/24*, *15/26*
U.S. Cl. 346—165 7 Claims



1. A graphic recorder of electrical signals on a moist recording web drawn on a path from a roll to between a scanning electrode and a linear electrode; said recorder comprising:

a frame and a well disposed upon said frame for holding said moist recording web;

a cover demountably disposed over said well and arranged to form a humidor and retain moisture in the roll;

means for holding the roll of recording web in said well, said means being arranged so that the axis of the roll is aligned parallel to the linear electrode;

a mouth formed between said well and said well cover for the emergence of moist web and means on said mouth for retaining moisture within said well; and

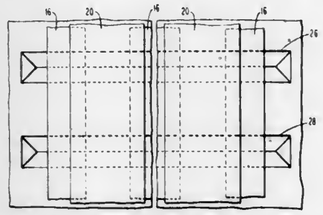
a recorder cover hinged to the frame, and means on the recorder cover positioned to engage the well cover to urge the well cover to a position sealing the humidor well.

4,234,887

V-GROOVE CHARGE-COUPLED DEVICE

Wilbur B. Vanderslice, Jr., Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1979, Ser. No. 41,975
Int. Cl.[3] H01L *29/78*, *29/06*, *29/04*; G11C *19/28*
U.S. Cl. 357—24 7 Claims



1. A charge transfer device comprising:

a semiconductor substrate having at least one longitudinal

recess having a length substantially greater than its width formed in a surface thereof;

a plurality of longitudinal charge transfer electrodes positioned over and substantially perpendicular to said recess for effecting charge transfer of carriers from under an electrode to under an adjacent electrode within and along the length of said recess in response to signals applied to said electrodes; and

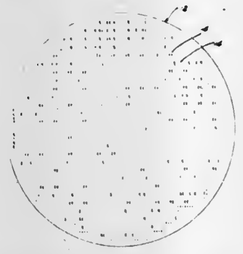
isolation means between said charge transfer electrodes and the portions of said surface of said substrate adjacent to said recess for preventing charge transfer from occurring in said portions of said surface in response to said signals.

4,234,888

MULTI-LEVEL LARGE SCALE COMPLEX INTEGRATED CIRCUIT HAVING FUNCTIONAL INTERCONNECTED CIRCUIT ROUTED TO MASTER PATTERNS

Donald F. Calhoun, Inglewood, and Barry Bennett, Wilmington, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 209,397, Dec. 17, 1973, Pat. No. 3,795,975, which is a continuation of Ser. No. 16,840, Mar. 5, 1970, abandoned. This application Jul. 26, 1973, Ser. No. 382,993
Int. Cl.[3] H01L *27/04*
U.S. Cl. 357—45 21 Claims



1. A multi-level complex integrated circuit of the type which defines a configuration of signal-connect portions, vias and integrated circuits which are the same in location for a plurality of wafers having the same functional circuit type, including:

a wafer having a plurality of cells in a nonstandard yield distribution of usable cells;

a first level of means for defining dielectric insulation formed on said wafer and having means for defining vias formed through said insulation for exposing signal-connects of selected ones of said usable cells;

a first level of metalization formed on said first level dielectric insulation means including electrical conductor means routed between and from said exposed signal connects of said usable cells to signal-connect portions for interconnecting at least one of said selected usable cells into at least one functional circuit, and for defining a routing of said signal-connects of said selected usable cells to locations of circuits corresponding to the configuration of signal-connect portions which is the same for the plurality of the wafers having the same functional circuit type, at least one of said signal-connect portions being positioned substantially directly above at least one of said signal-connects and at least one other of said signal-connect portions being positioned above and substantially laterally spaced from at least a corresponding one of said signal-connects;

a second level of means for defining dielectric insulation formed on said electrical conductor means and having means for defining vias formed through said second level dielectric insulation means corresponding to a configuration of means for defining the vias which is the same for the plurality of the wafers having the same functional circuit type for having exposed said signal-connect portions of said electrical conductor means at the circuit locations; and

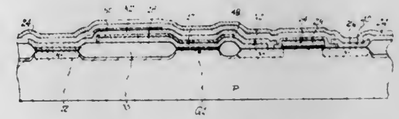
at least a second level of metalization formed on said second level of dielectric insulation means including means for defining electrical interconnects routed between and from said exposed signal-connect portions at the circuit locations and corresponding to the configuration of integrated circuits which is the same for the plurality of the wafers having the same functional circuit type for having interconnected said selected usable cells into the functional circuit type.

4,234,889

METAL-TO-MOAT CONTACTS IN N-CHANNEL SILICON GATE INTEGRATED CIRCUITS USING DISCRETE SECOND-LEVEL POLYCRYSTALLINE SILICON

Joseph H. Raymond, Jr., Katy, and Jih-Chang Lien, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1977, Ser. No. 801,698
Int. Cl.[3] H01L *23/48*, *29/46*, *29/54*
U.S. Cl. 357—71 6 Claims



1. A contact and interconnection arrangement for a semiconductor integrated circuit of the type having circuit elements formed at a face of a semiconductor body, a plurality of levels of contacts and electrode areas and interconnections at said face of the body, the levels including at least one level of polycrystalline silicon and one of metallization on the face as well as elongated regions of monocrystalline semiconductor material in the face, said elongated regions being of opposite conductivity-type and more heavily doped than surrounding material in said face, a first insulating layer on said face between the semiconductor material and said at least one level of polycrystalline silicon and a second insulating layer on said face between said at least one level of polycrystalline silicon and said level of metallization, the improvement wherein: a connection between a contact part of the level of metallization and a contact area on a part of an elongated region of the semiconductor material includes a discrete area of one of the levels of polycrystalline silicon, said discrete area being substantially uniformly doped with impurity between said contact part of the level of metallization and said contact area of said elongated region, said discrete area being solely for the purpose of making electrical connection from said contact part of the level of metallization and said contact area and not being a part of or being connected to said circuit elements except through said contact part of the level of metallization and said contact area on said part of said elongated region of semiconductor material, said discrete area contacting said contact area through a first aperature in said first insulating layer, said first aperature being smaller than said discrete area, said contact part contacting said discrete area through a second aperature in said second insulating layer, said second aperature being smaller than said contact part.

4,234,890

AUTOMATIC SETUP SYSTEM FOR TELEVISION CAMERAS

Brian Astle, Princeton, and Robert A. Dischert, Burlington, both of N.J., assignors to RCA Corporation, New York, N.Y.

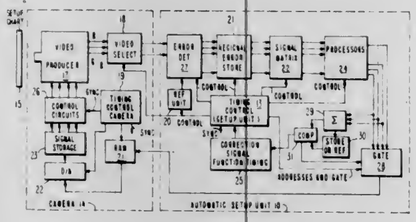
PCT No. PCT/US79/00099, § 371 Date Feb. 22, 1979, § 102(e) Date Feb. 22, 1979, PCT Pub. No. WO 79/00717, PCT Pub. Date Oct. 4, 1979

This PCT application Filed Feb. 22, 1979, Ser. No. 24,737

Claims priority, application United Kingdom, Mar. 6, 1978, 08836/78

Int. Cl.³ H04N *9/62, 9/04, 5/24*

U.S. Cl. 358—10 17 Claims



1. A system for automatic adjustment of a television camera, comprising:

means coupled to said camera and responsive to the video signals therefrom at a plurality of regions of the television raster for providing simultaneously a plurality of signals each representing the detected video signal from different regions of the television raster,

second means coupled to said first means and responsive to the signals simultaneously provided for selectively and separately processing said detected signals without reexamining the video signal for providing a plurality of corresponding camera adjustment signals, and

means coupled to said camera and responsive to said adjustment signals for adjusting said camera.

10. A system for automatic adjustment of a color television camera for correcting for registration errors between two color video signals with said camera viewing a test chart having a plurality of identical test marks equally distributed in rows and columns, comprising:

first means including measuring means coupled to said camera and responsive to said two color video signals for providing simultaneously horizontal and vertical error signals associated with each of the identical marks representing in each mark location the horizontal and vertical positional errors between the two video signals,

second means coupled to said first means and responsive to said horizontal and vertical error signals from each mark location for selectively and separately processing said error signals for horizontal centering, horizontal size, horizontal bow, horizontal tilt and horizontal linearity, vertical centering, vertical size, vertical bow, vertical tilt and vertical linearity, without remeasuring the errors for providing separate camera adjustment signals for horizontal centering, horizontal size, horizontal bow, horizontal tilt and horizontal linearity, vertical centering, vertical size, vertical bow, vertical tilt and vertical linearity, and

third means coupled to said camera and responsive to the adjustment signals for adjusting said camera according to all of said adjustment signals before remeasuring for errors.

4,234,891

OPTICAL ILLUMINATION AND DISTORTION COMPENSATOR

James C. Beck, La Canada, and Harrie W. Nielsen, Pasadena, both of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,446

Int. Cl.³ H04N *7/18*; G09C *9/00*; G02B *17/00, 9/08*

U.S. Cl. 358—104 17 Claims



1. A method of compensating for the distortion developed in an optical display apparatus due to the imposition of a concave spherical mirror for viewing intermediate a viewing position and a curved rear-projection screen and for improving the illumination substantially simultaneously, comprising:

establishing a viewing position,

arranging a concave spherical mirror for viewing from said viewing position by at least one trainee,

positioning a curved rear-projection screen on the side of said concave spherical mirror so that the image on said screen is visible when reflected by said mirror toward said viewing position,

locating a curved folding mirror adjacent said curved rear-projection screen so that an image is reflected from the curved folding mirror onto said screen,

positioning the major axes of said curved folding mirror and said curved rear-projection screen in a predetermined relationship relative to each other, whereby distortion is reduced and illumination increased substantially simultaneously; and

projecting an image for reflection from said curved folding mirror onto said curved rear-projection screen so that said image is viewed at said viewing position substantially undistorted and with substantially maximum illumination.

4,234,892

AGC CIRCUIT RESPONSIVE TO INTERMEDIATE GRAY LEVEL IN VIDEO SIGNAL

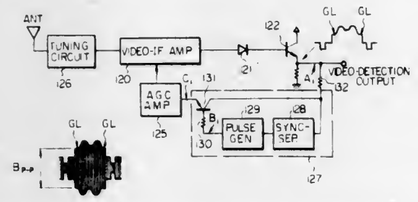
Hidetoshi Mochizuki, Kokubunji, and Masataka Okada, Konosu, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 972,700

Claims priority, application Japan, Dec. 29, 1977, 52-159502

Int. Cl.³ H04N *5/52*

U.S. Cl. 358—174 1 Claim



1. An automatic gain control circuit for an amplitude modulated receiver system for receiving an amplitude modulated video signal of the type having a gray level of a constant amplitude existing intermediately between a black level and a white level for use as a reference level, said circuit comprising:

video intermediate frequency amplifier means for receiving said amplitude modulated video signal,

means connected to the output of said amplifier means for generating a video detection output signal in response to said video signal, and

means connected to the output of said generating means for detecting the gray level from said video detection output signal and for generating an output signal representing the amplitude of the gray level signal during the existing period of said gray level,

whereby said output signal representing the amplitude of said gray level signal is used as an AGC voltage by said amplifier means.

4,234,893

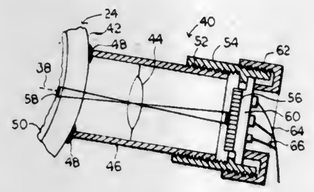
IMAGE DRIFT CORRECTION APPARATUS

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,462

Int. Cl.³ H04N *3/22*

U.S. Cl. 358—180 9 Claims



1. Apparatus for continuously and accurately maintaining the location of the raster produced by an energy beam on a display surface of a visual system, during operation of said visual system for its intended purpose, comprising:

optical sensing means mounted to said display surface outside of the viewing area for continuously monitoring the position of a selected portion of the path of a raster line also outside of the viewing area on said display surface during operation of said visual system for its intended purpose, said optical sensing means for determining the position of said selected portion of a raster line with respect of the location of said optical sensing means and for providing an electrical signal representative thereof;

said optical sensing means having a support structure, a photosensitive device having a multiplicity of linearly arranged photosensitive elements mounted in said support structure, said photosensitive device being oriented such that said linear arrangement is substantially at a right angle with respect to said monitored raster line path;

means mounted to said support structure between said display surface and said photosensitive device for imaging said monitored raster line path onto an area of said multiplicity of photosensitive elements, said area varying according to changes in the location of said monitor raster line path on said display surface;

circuitry for detecting which of said elements said image of said monitored raster line path impinges, and for providing said signals representative of the position of said selected portion of said raster line;

means for receiving said electrical signal, and for comparing said electrical signal with a predetermined stored reference signal representative of said selected portion of the path of a raster line properly located on said display surface, and for generating a control signal representative of the difference between said reference signal and said electrical signal; and

means for combining said control signal with sweep drive signals which are produced during operation of said visual system for its intended purpose for deflecting said energy beam to produce resulting sweep drive signals which maintain said raster scan in a selected location to provide a scene properly positioned on said display surface.

4,234,894

REFLECTING OPTICAL SYSTEM FOR PROJECTION TELEVISION

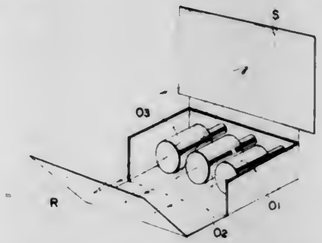
Hisashi Tokumaru, Osaka, and Mitsuo Yasukuni, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1978, Ser. No. 955,097

Claims priority, application Japan, Nov. 2, 1977, 52-131807

Int. Cl.³ H04N *5/72*; G02B *17/00, 9/34*

U.S. Cl. 358—250 9 Claims



1. In a projection television system including a light emitting target capable of providing a video image of a high resolution definition of 1,000 T.V. lines and a screen for realizing the projected video image for example generated by an electron gun exciting the target, an improvement in a reflecting optical system which defines an optical path for projecting the video image on the screen, comprising;

a concave mirror for reflecting the image toward the screen;

a meniscus lens located in the optical path between the concave mirror and the screen;

at least one optical aspherical surface in the optical path, whereby the aspherical surface coefficient, C_2; radius of curvature of the inside surface of the meniscus lens, R, and the focal length, f, of the entire optical system satisfies the following conditions;

$$10^{-2}/f^4 < |C_2| < 10^2/f^4 \quad (1)$$

$$0.6f < |R| < 1.2f \quad (2)$$

these conditions providing a projection television system with a resolution of 1,000 T.V. lines on the screen.

4,234,895

CONVERTING A VIDEO SIGNAL INTO A TWO-LEVEL SIGNAL

Rudiger Sommer, and Hermann Wischer, both of Kiel, Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Jan. 3, 1979, Ser. No. 671

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1978, 2800759

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—282 9 Claims

1. In a method usable in a facsimile scanner for converting a video signal obtained by scanning an original point by point and line by line into a two-level signal, wherein first and second companion signals are generated to derive a threshold signal from said companion signals, which follows the video signal dynamically, and wherein said video signal and said threshold signal are compared to obtain said two-level signal, the method comprising the steps of generating said first and second companion signals:

charging first capacitor means, the voltage of which corre-

sponds to said first companion signal, to the actual level of the video signal under the control of first switching means when said video signal rises until the maximum level of the video signal is reached, whereby the first companion signal substantially follows a rise in said video signal;

interrupting the charge of the first capacitor means by said first switching means under the control of the video signal at the maximum level of the video signal, whereby the first companion signal remains at a constant level in the first instance when said video signal declines;

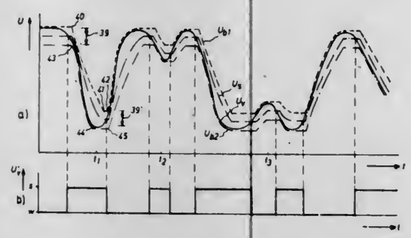
generating a first distance value from said video signal by generator means;

determining continuously actual first difference values between the first companion signal and a first reference signal by first differential means;

discharging the first capacitor means under the control of the first switching means and the first differential means when the actual first difference value is equal to said first distance value, whereby the first companion signal comes close to the decrising video signal;

interrupting the discharge of said first capacitor means under the control of the first switching means and the first differential mean when the actual first difference value is equal to said first distance value again, whereby the first companion signal remains at a constant level in the first instance;

continuing the charge of the first capacitor means under the control of the first switching means when the first companion signal substantially coincides with the rising video signal, whereby the first companion signal follows the rising video signal again;



discharging second capacitor means, the voltage of which corresponds to said second companion signal, to the actual level of the video signal under the control of second switching means when said video signal decrises until the minimum level of the video signal is reached, whereby the second companion signal substantially follows a decrise in said video signal;

interrupting the discharge of said second capacitor means by said second switching means under the control of the video signal at the minimum level of the video signal, whereby the second companion signal remains at a constant level in the first instance when said video signal rises;

generating a second distance value from said video signal by said generator means, whereby said first and second distance values are proportional to the mean brightness values of the background of the original to be scanned;

determining continuously actual second difference values between the second companion signal and a second reference signal by second differential means;

charging the second capacitor means under the control of the second switching means and the second differential means when the actual second difference value is equal to said second distance value, whereby the second companion signal comes close to the rising video signal;

interrupting the charge of said second capacitor means under the control of the second switching means and the second differential means when the actual second difference value is equal to said second distance value again, whereby the second companion signal remains at a constant level in the first instance;

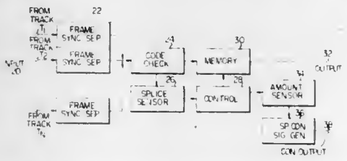
continuing the discharge of the second capacitor means under the control of the second switching means when the second companion signal substantially coincides with the decrising video signal, whereby the second companion signal follows the decrising video signal again.

4,234,896

PCM RECORDING AND REPRODUCING SYSTEM

Ken Onishi, and Kunimaro Tanaka, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,777
Int. Cl.³ G11B *5/00, 5/09, 27/02*; H04W *5/78*
U.S. Cl. 360—32 **7 Claims**



1. An improvement in a PCM recording and reproducing system having a PCM converter means for converting an analog signal into a pulse code modulated signal, a PCM record medium having a plurality of record tracks disposed thereon, a recording means for recording the pulse code modulated signal on the plurality of record tracks of the PCM record medium in a predetermined pattern and a reproducing means for reproducing the pulse code modulated signal recorded on the PCM record medium, said improvement comprising:

a memory means in said reproducing system having a predetermined storage capacity for storing data therein;

a writing means connected to said memory means and having the reproduced pulse code modulated signal applied thereto, for continuously storing the reproduced pulse code modulated signal in said memory means;

a reading means connected to said memory means for continuously reading the data stored in said memory means after a time delay from the time said data was stored in said memory means;

a splice sensing means for sensing errors in the patterns in adjacent positions in a plurality of adjacent tracks in the direction transverse to the tracks and thereupon indicating the presence of a splice in the PCM record medium; and

a writing suspension means connected to said writing means and said splice sensing means for suspending the writing of the pulse code modulated signal in said memory means upon generation of said splice signal.

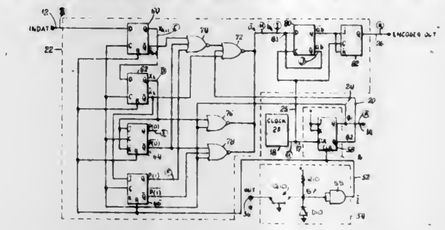
4,234,897

DC FREE ENCODING FOR DATA TRANSMISSION

Jerry W. Miller, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 5, 1978, Ser. No. 948,725
Int. Cl.² G11B *5/09*
U.S. Cl. 360—45 **6 Claims**

1. In a self-clocking transmission system for transmitting binary data bits sequentially in successive clocked bit cells of a transmission channel wherein logical first bit states are normally transmitted as signal transitions relatively early in the respective bit cells and logical second bit states are normally transmitted as signal transitions relatively late in the respective bit cells and any transition relatively early in a bit cell following a transition relatively late in the next preceding bit cell is normally suppressed, apparatus for modifying the transmitted signal to remove any net DC component, said apparatus comprising first indicating means responsive to first bit states for counting the number of first bit states and producing at the onset of a sequence of second bit states following a first bit state a first indicating signal when the number of first bit states is of predetermined parity indicating any such sequence that might introduce a DC component into the transmitted signal with normal transmission, second indicating means responsive



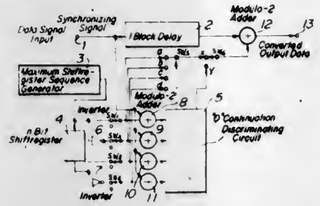
to bit states for producing a second indicating signal indicating whether the number of second bit states occurring in such sequence prior to a current bit is odd or even, and transition modifying means responsive to said first and second indicating signals and to the current bit and the next succeeding bit for modifying the transmission of signal transitions from the onset of such sequence to eliminate any DC component.

4,234,898

DIGITAL MAGNETIC RECORDING AND REPRODUCING APPARATUS

Shozo Nakagawa; Katsuya Yokoyama, both of Machida, and Hironobu Katayama, Sagamihara, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Mar. 12, 1979, Ser. No. 19,592
Claims priority, application Japan, Mar. 15, 1978, 53/28757; Mar. 16, 1978, 53/29221; Aug. 1, 1978, 53/93092
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—41 **9 Claims**



1. A digital magnetic recording and reproducing apparatus, wherein a digital code signal is recorded and reproduced magnetically, comprising:

a first signal generating means for generating a first digital signal provided for preventing the continuation of the same signal levels in said digital code signal;

a first adder for effecting a code conversion by modulo-2-adding together said digital code signal and said first digital signal;

a recording means for recording an output signal derived from said first adder on a magnetic carrier;

a reproducing means for reproducing said output signal from said magnetic carrier;

a threshold level generating means for generating a threshold level comprising a compensator and at least two peak rectifiers which treat an applied input signal derived from said reproduced signal with the same time-constant respectively;

a level comparator for correcting the waveform of said applied input signal by comparing said applied input signal with said threshold level derived from said threshold level generator;

a second signal generating means for generating a second digital signal provided for restoring said code conversion; and,

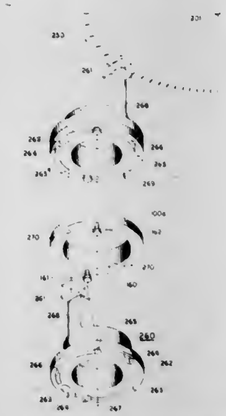
a second adder for modulo-2-adding together a corrected output signal derived from said level comparator and said second digital signal, so as to restore said digital code signal.

4,234,899

KEYED MOUNTING FOR ORIENTING OPTICAL ANGULAR, DISPLACEMENT TRANSDUCER IN RIGID MAGNETIC DISC MEMORY

Michael Feldstein, Sudbury, and Harold L. Thackaberry, Franklin, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 25, 1978, Ser. No. 899,944
Int. Cl.³ G11B *19/28*
U.S. Cl. 360—73 **4 Claims**



1. In memory apparatus supported by a base and intended for use in a digital computer system, said apparatus comprising a spinable and rigid magnetic disc for recording digital information, motor means including a spinable shaft for driving said disc about its spin axis, and a transducer system including a transducer for measuring at least angular displacement of said disc from a reference fixed to said base, said transducer system comprising:

a transducer-related disc having means mounted thereon for communicating with said transducer, said transducer-related disc being mounted on said shaft and spinable therewith;

said transducer having transmitting and receiving devices, and oriented to permit passage of said transducer-related disc between ssid devices to alternately permit and prevent communication between said devices; and

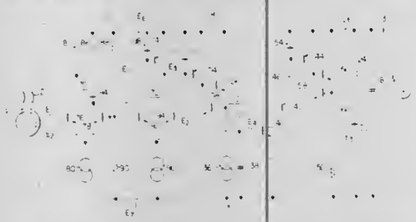
an upright member for supporting said transducer, said upright member including a base lip for connection to said base, said base and said base lip having keying means for constraining the mounting of said transducer system to said base to a predetermined orientation thereby precluding incorrect insertion or removal, whereby said transducer-related disc is constrained to pass between said devices and damage to said transducer system is inherently avoided.

4,234,900

GROUND FAULT DETECTOR

Yukio Miyazaki, and Mitsugu Takeda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1979, Ser. No. 27,018
Claims priority, application Japan, Apr. 11, 1978, 53/42963
Int. Cl.³ H02H 3/26
U.S. Cl. 361—45 **6 Claims**



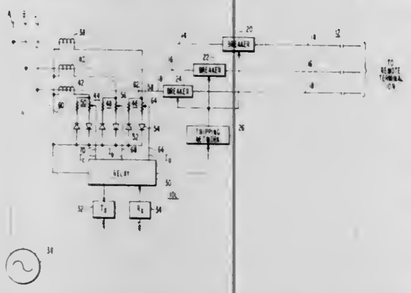
1. A ground fault detector comprising, in combination, a ground fault sensor for sensing a ground fault occurring in an AC line to produce a sensed current, an amplifier connected to said ground fault sensor to amplify a signal representative of said sensed current, a time delay circuit connected to said amplifier to delay said signal amplified by said amplifier, a waveform shaper circuit connected to said time delay circuit to receive the delayed signal to be put in its ON state, and a switching element responsive to an output from said waveform shaper circuit to be conducting, said waveform shaper circuit being formed of a constant current circuit for decreasing operating currents flowing through both said amplifier and said time delay circuit in said ON state of said waveform shaper circuit and supplying at least one portion of said decreased operating current in the form of a constant current to said switching element as a switching current.

4,234,901

PROTECTIVE RELAY APPARATUS

William A. Strickland, Jr., Livingston, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1979, Ser. No. 18,706
Int. Cl.³ H02H 7/26
U.S. Cl. 361—64 **6 Claims**



1. Protective relay apparatus for protecting a three-phase power line section having first, second and third phase currents flowing between first and second line ends of the protected section, comprising:

first means at each line and providing one of first, second and third signals indicative of the largest of the first, second and third phase currents, respectively, flowing at any instant;

second means at each line end for communicating the first, second and third signals to the other line end;

third means at each line end for phase comparing each of the first, second and third signals from its line end with the like numbered signal from the other line end; and

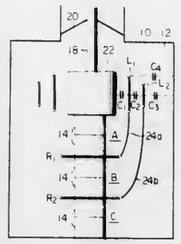
fourth means for isolating the protected section in response to a predetermined phase relationship between any pair of compared signals.

4,234,902

ENCLOSED LIGHTNING ARRESTER

Yukio Fujiwara; Shigeru Yamaji; Yoshikazu Shibuya, and Tohei Nitta, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1978, Ser. No. 946,829
Claims priority, application Japan, Oct. 7, 1977, 52/121121; Oct. 7, 1977, 52/121122
Int. Cl.³ H02H 3/22
U.S. Cl. 361—120 **9 Claims**



1. An enclosed lightning arrester device comprising, in combination, a grounded metal enclosure, a high voltage conductor adapted to be connected to an electric power device to be protected and extending into said grounded metal enclosure, a cylindrical high voltage conductor connected to the end of said high voltage conductor located within said grounded metal enclosure and coaxial with said high voltage conductor, a plurality of nonlinear resistors disposed within said grounded metal enclosure and series connected between said cylindrical high voltage conductor and said grounded metal enclosure, each of said nonlinear resistors having an excellent nonlinear resistance characteristic and having a high electrostatic capacity, said plurality of nonlinear resistors being divided into a plurality of units, a shield disc interposed between each pair of adjacent units of said nonlinear resistors, and a plurality of hollow cylindrical electrical conductors disposed in radially spaced relationship around said cylindrical high voltage conductor and coaxially encircling the latter, each of said hollow cylindrical electrical conductors being electrically connected to a different one of said shield discs.

4,234,903

INDUCTIVE LOAD DRIVER CIRCUIT EFFECTING SLOW HOLD CURRENT DELAY AND FAST TURN OFF CURRENT DECAY

Patrick D. Harper, Seaford, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,326
Int. Cl.² H03K 1/14
U.S. Cl. 361—154 **2 Claims**

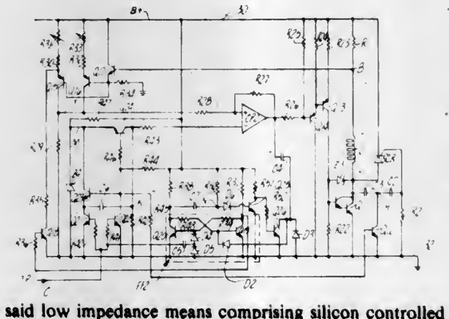
1. A circuit for controlling current from a power supply to the solenoid coil of an electromagnetically activated armature in response to a command pulse having a beginning and an end bounding an actuating portion and a holding portion, the current in said actuating portion increasing to an actuating current level sufficient to overcome a bias causing the armature to move from a first position to a second position and the current in said holding portion decreasing to a range sufficient to maintain the armature in said second position, said circuit comprising:

(a) power switch means coupled to said power supply and adapted to be coupled to a one of first and second sides of said solenoid coil, said power switch means responsive to first and second inputs thereto to alternately complete and interrupt a charging current path between said power supply and said solenoid coil;

(b) reference means for generating a lower and higher reference value representing respectively a lower level and a higher level of said holding current;

(c) comparator means coupled to said reference means, said power switch means, and a one of said first and second sides of said solenoid coil for comparing a representation of the current through the solenoid coil with said lower and higher reference values and generating said first input to said first switch means when said current through said solenoid is less than said lower holding level and generating said second input when said current through the solenoid coil is greater than said higher holding level;

(d) solenoid current decay means comprising low impedance means and high impedance means, said low impedance means coupled across both sides of said solenoid coil and being enabled by the presence of said command pulse to establish a low impedance current path through said solenoid coil when the charging current path is interrupted,



said low impedance means comprising silicon controlled rectifier means, and said high impedance means coupled across both sides of said solenoid coil having an impedance value higher than said low impedance means to establish a high impedance current path through said solenoid coil;

(e) SCR turn off means coupled to said power switch means responsive to the termination of said command pulse to momentarily cause said power switch means to complete said charging current path so as to rapidly turn off said silicon controlled rectifier means by diverting current therefrom; and

(f) said low and high impedance means cooperating with the inductance of said solenoid coil to establish respective slow and fast L/R decay rates for the current through the coil so that said slow L/R decay rate allows said holding current to flow through said solenoid coil prior to the end of said command pulse even though said power switch interrupts said path between said power supply and said solenoid coil and so that said fast L/R decay allows said armature to be rapidly biased back to its first position after the end of said command pulse.

4,234,904

PROCESS AND DEVICE FOR THE PROTECTION OF ELECTRICAL ENERGY SUPPLY SYSTEMS CONTROLLED BY MEANS OF AUDIO-FREQUENCY

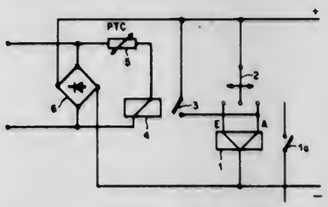
Kjell T. Fahlesson, Tyreso, Sweden, assignor to LGZ Landis & Gyr Zug AG, Switzerland

Filed Jul. 18, 1979, Ser. No. 58,617
Claims priority, application Switzerland, Jul. 19, 1978, 7775/78
Int. Cl.³ H01H 47/26
U.S. Cl. 361—165 **7 Claims**

2. Apparatus for protecting electrical energy supply systems wherein supply to secondary loads is normally controlled by means of audio-frequency signals, said apparatus comprising

a two-state switching relay,

a normal control path coupled to said relay for controlling the state of said switching relay under normal conditions to control the secondary loads, and



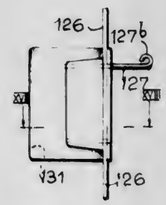
an additional control path coupled to said relay to momentarily energize said relay in a direction which momentarily assures disconnection of the secondary loads, prior to reaching ¼ maximum supply voltage following interruption of the electrical energy supply.

4,234,905

ELECTRICAL CONDENSER

Jacques Benezech, Le Vesinet, France, assignor to NOVI P.B. Societe Anonyme, Pantin, France

Filed Mar. 21, 1978, Ser. No. 888,786
Claims priority, application France, Mar. 22, 1977, 77 08465; Feb. 10, 1978, 78 03751
Int. Cl.³ H01G 1/14
U.S. Cl. 361—307 **8 Claims**



1. In a condenser wherein first and second conductive strips are wound together with insulating strips to form an elongated condenser body having longitudinally opposite first and second ends provided with respective first and second terminals connected to the first and second conductive strips, the improvement wherein:

a mass of material permeates said body and bonds said strips together into a rigid block;

said conductive strips are both substantially narrower than said insulating strips and are longitudinally offset from each other with said first strip terminating short of said second end and said second strip terminating short of said first end;

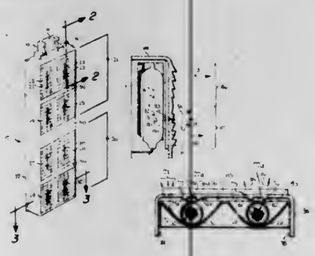
said body is formed at said ends with respective first and second transversely extending socket holes, said first conductive strips being exposed in said first hole and said second conductive strip being exposed in said second hole;

said terminals have respective first and second connection parts respectively tightly received in said first and second holes in good electrical contact with said first and second conductive strips; and

a hard casing of insulating material tightly surrounds said condenser body, said first terminal being a ground lug extending longitudinally along said body, imbedded in said casing, exposed at both ends of said body, and having

a throughgoing hole through which said second terminal extends.

4,234,906
PHOTOFLASH UNIT HAVING LIGHT-REFRACTIVE PRISMS
Donald R. Schindler, Burton, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 800,193, May 25, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,430
Int. Cl.[3] G03B *15/02*
U.S. Cl. 362—16 22 Claims

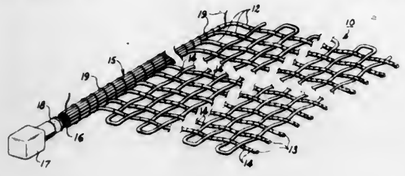


1. A photoflash unit comprising an elongated flash lamp which when flashed emits light over a wider angle than the viewing angle of a normal camera lens, a reflector having reflective areas laterally flanking said lamp, and first two or more elongated prism means symmetrically positioned directly in front of said lamp and parallel to the axis thereof, and a second two or more elongated prism means symmetrically positioned directly in front of said lamp and perpendicular to the axis thereof, each of said first and second prism means being shaped for refracting and coverging light emanating directly from said lamp when flashed in a more frontward direction and into said viewing angle of the camera lens so as to increase the brightness substantially uniformly within said viewing angle. .

8. A photoflash unit comprising an elongated flash lamp which when flashed emits light over a wider angle than the viewing angle of a normal camera lens, a reflector having spectral reflective areas laterally flanking said lamp and shaped to reflect light from said lamp when flashed in a desired pattern, and two or more elongated prism means symmetrically positioned directly in front of said lamp and parallel to the axis thereof, said prism means being shaped for refracting and converging light emanating directly from said lamp when flashed in a more frontward direction and into said viewing angle of the camera lens so as to increase the brightness substantially uniformly within said viewing angle, there being no prism means parallel to said lamp axis directly in front of said reflective areas of the reflector.

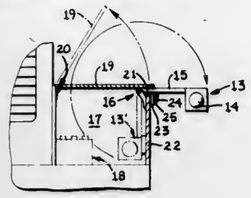
15. A photoflash unit comprising an elongated flash lamp which when flashed emits light over a wider angle than the viewing angle of a normal camera lens, a reflector having nonspectral reflective areas laterally flanking said lamp, and two or more elongated prism means symmetrically positioned directly in front of said lamp and parallel to the axis thereof, said prism means being shaped for refracting and converging light emanating directly from said lamp when flashing in a more frontward direction and into said viewing angle of the camera lens so as to increase the brightness substantially uniformly within said viewing angle.

4,234,907
LIGHT EMITTING FABRIC
Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012
Filed Jan. 29, 1979, Ser. No. 7,592
Int. Cl.[3] F21V *7/04*
U.S. Cl. 362—32 35 Claims



1. A light emitting fabric comprising a woven plurality of optical fibers, each of which fibers is deformed at discrete intervals along the length thereof to allow light to radiate therefrom.

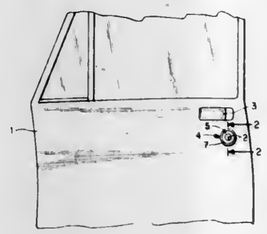
4,234,908
STORABLE LIGHT ASSEMBLY FOR VEHICLES
Mary Ann C. McGee, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jul. 10, 1978, Ser. No. 923,123
Int. Cl.[3] B60Q *1/06*
U.S. Cl. 362—66 11 Claims



1. A vehicle (10) comprising
means for defining a receptacle (17) on a side of said vehicle,
means for defining a window (27) in said receptacle, said window exposed towards one of the forward and rearward ends of said vehicle, and
a light assembly (13) mounted on the side of said vehicle comprising
a light (14), and
mounting means (15) for movably mounting said light on said vehicle for movement between a stored, operating position within said receptacle to align said light with said window and an extended, operating position remote from said stored operating position, and on a lateral side of said vehicle, said light pointing towards said one of the forward and rearward ends of said vehicle in each of its stored and extended positions.

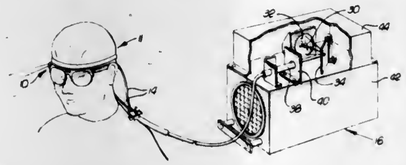
4,234,909
ILLUMINATED DOOR LOCK
Peter R. Cotroneo, 63 Smithtown Polk Blvd., Centereach, N.Y. 11720
Filed Jun. 15, 1978, Ser. No. 915,894
Int. Cl.[3] E05B *17/10*
U.S. Cl. 362—100 2 Claims

1. An illuminated door lock which comprises in combination with a door, a lock which fits into an aperature in said door, a metal plate holding a translucent material, both the plate and translucent material having a central circular aperture the diameter of the aperture plate being smaller than the diameter of aperture of the translucent material, a lock cylinder having a cylindrical body portion and a face portion, said face portion having a larger diameter than the body portion, said aperture in the metal plate will let only said cylindrical body portion through, said face portion being positioned inside said aperature of the translucent material and in contact with said plate, said face portion in contact with said plate holding the metal plate in contact with the door by a "U" shaped tenstion clip placed inside the door, the translucent material being held in place by the metal plate having a metal rim which forms a



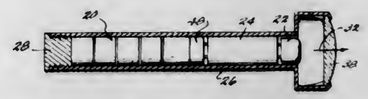
complete frame around the translucent material, at least one recess in the translucent material for accommodating at least one light bulb, both the door and the metal plate have at least one notch which extends outwardly from the aperature in the door and metal plate for accomodate electrical wires connecting a power source to the at least one light bulb and at least one additional notch in the door and the metal plate which accomodates a raised rib on said cylindrical body portion to prevent turning in the aperature.

4,234,910
HEAD-SUPPORTED ILLUMINATION DEVICE
Linda D. Price, 6025 Sea Side Walk, Belmont Shores, Calif. 90803
Filed Mar. 20, 1978, Ser. No. 888,016
Int. Cl.[3] F21L *15/14*; F21V *7/04*
U.S. Cl. 362—105 23 Claims



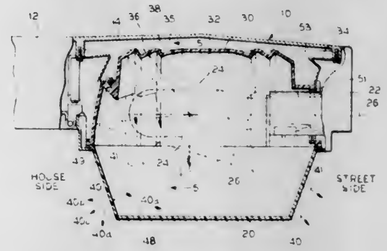
1. A high-intensity, lightweight, head-supported illumination device, comprising:
a light source having a high-intensity lamp and filtering means for removing heat radiation emitted by said lamp, said filtering means including at least one dielectric mirror for separating visible light from infrared radiation;
light collecting means including heat-resistant glass for receiving filtered visible light from said dielectric mirror;
lightweight, plastic fiber-optic light transmitting means adapted for connection to said light collecting means;
head-supported means for securing said light transmitting means to the head; and
means for terminating said light transmitting means at said head-supported means in such a manner as to project light forwardly of said head-supported means.

4,234,911
OPTICAL FIRING ADAPTOR
Donald L. Faith, 1503 Park Rd., S.E., Atlanta, Ga. 30315
Filed Mar. 13, 1979, Ser. No. 20,958
Int. Cl.[3] F41G *1/34*
U.S. Cl. 362—111 12 Claims



1. An apparatus for insertion in a gun barrel to produce pulses of light simultaing firing of the gun comprising:
means for detecting vibrations produced by the hammer impact resulting from pulling the trigger and producing at least one electrical pulse in response thereto;
a source of electrical energy connected to said detecting and producing means; and
a light source connected to said detecting and producing means for producing said pulses in response to said electrical pulse.

4,234,912
LUMINAIRE FOR RESIDENTIAL ROADWAY LIGHTING
Jocelyn T. Barnes; Chester A. Hard, III, both of Charlevoix, Mich.; Billy L. Shelby, Memphis, and Charles H. Loch, Germantown, both of Tenn., assignors to International Telephone and Telegraph Corporation, Del.
Filed Jun. 28, 1978, Ser. No. 919,938
Int. Cl.[2] F21S *1/02*
U.S. Cl. 362—145 15 Claims



1. A luminaire adapted for mounting above a roadway to illuminate the roadway, the luminaire comprising: a high intensity light source, a reflector for developing a plurality of parallel rays of light from the light reflected from said source, said reflector configured to produce a plurality of collimated beams for each opposite direction longitudinally of the roadway above which the luminaire is mounted, and a refractor comprised of repetitive uniform prisms receptive of said collimated beams from said reflector and said source to spread and direct said beams into a pattern of substantially uniform light intensity on the roadway being lighted.

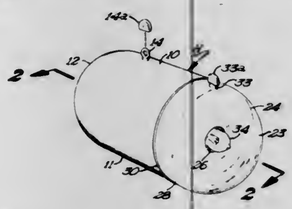
4,234,913
LIGHTED BOBBER FOR A FISHING LINE
Clarence Ramme, 65G, Aurora, Minn. 55705
Filed Feb. 26, 1979, Ser. No. 14,845
Int. Cl.[3] F21L *7/00*
U.S. Cl. 362—158 1 Claim

1. A sealed lighted bobber for a fishing line comprising:
(a) a two piece housing having
(b) a first hollow portion and
(c) a second hollow portion,
(d) means for removably connecting said first housing por-

tion to said second housing portion in sealing engagement to exclude the atmosphere and render the housing water buoyant,

(e) said second housing portion having a translucent section,

(f) means for mounting a light bulb in said second housing portion including a hollow cylindrical member mounted coaxially within and spaced from said second hollow portion,



(g) means for mounting a battery in said first hollow housing portion to maintain said first hollow housing portion substantially downwardly when the bobber is placed in the water,

(h) means for causing said battery to contact the base of said light bulb for actuation thereof when said first and second housing portions are connected together, and

(i) means carried by the housing for connection with a fish line.

4,234,914

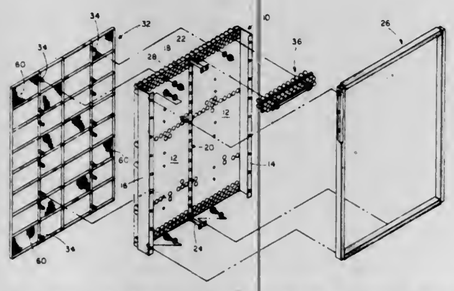
INCANDESCENT DISPLAY SYSTEM

Raymond J. Boesen, Glenview, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 13, 1979, Ser. No. 20,077

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—240 **4 Claims**



1. A lamp tray assembly for an incandescent lamp display system including an enclosure having a front panel with a plurality of openings therethrough for the receipt of incandescent lamps said tray assembly comprising:

(a) a chassis having a pluraity of openings therein,

(b) a plurality of lamp sockets, each secured over one of said chassis openings and adapted to receive an incandescent lamp therein, said sockets being smaller in size than the chassis openings so that air may pass through said openings to cool the incandescent lamps,

(c) means for releasably securing said tray assembly including said chassis and lamp sockets to said front panel from the rear side thereof during operation of said display system and permitting removal of the tray assembly from said front panel to periodically service the incandescent lamps.

4,234,915

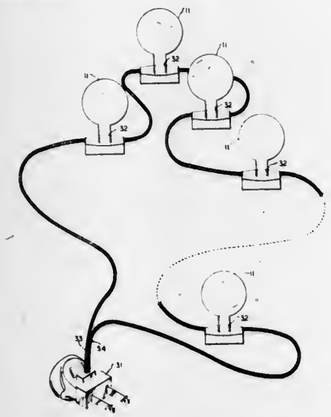
ORNAMENTAL ATTACHMENT FOR DECORATIVE STRING SETS

Richard F. Malinowski, Chesterland, and Thomas F. Harmon, Chagrin Falls, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,057

Int. Cl.³ F21P *1/00*

U.S. Cl. 362—252 **11 Claims**



1. A decorative string set comprising:

a plurality of incandescent lamps permanently attached and secured to a conductor means series connecting said lamps; and

a plurality of decorative means, each secured to and enclosing one of said lamps and a portion of said conductor means and permanently attached and connected thereto, and further securing said lamp to said conductor means.

4,234,916

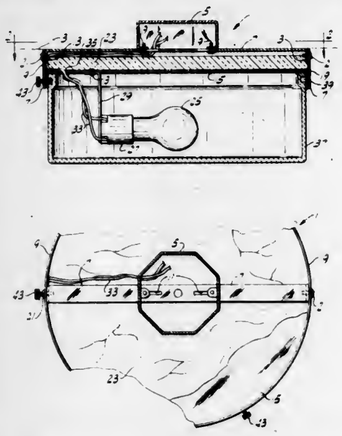
LIGHTING FIXTURE

Charles D. Goralnik, 200 Brynwych Pl., St. Louis County, Mo. 63141

Filed Aug. 17, 1978, Ser. No. 934,461

Int. Cl.³ F21S *1/02*; F21V *15/00, 21/02, 29/00*

U.S. Cl. 362—294 **14 Claims**



1. A lighting fixture adapted to be mounted on a ceiling by attachment to an outlet box in the ceiling, comprising:

a crossbar adapted to be attached to the bottom of the outlet box in position extending horizontally across the bottom of the box, a pan having a relatively thin flat bottom adapted to extend generally horizontally below the crossbar and spaced therefrom, a rim extending upwardly from the bottom of the pan, means for attaching the rim to the crossbar, a lip extending downwardly from the bottom of the pan generally at the periphery thereof, means secured to the bottom of the pan for mounting a light source on the underside of the pan, a diffuser for surrounding said light source, means for fastening the diffuser on the underside of the pan adjacent said lip, the bottom of the pan being substantially continuous and free of any relatively large openings therein, and insulation in the pan above the bottom of the pan and said mounting means for thermally insulating the light source, said mounting means and the pan from the outlet box thereby to reduce the transfer of heat generated by the light source to the outlet box.

4,234,917

COMMUTATION FAILURE DETECTION AND RESTORATION FOR SCR FREQUENCY CONVERTERS

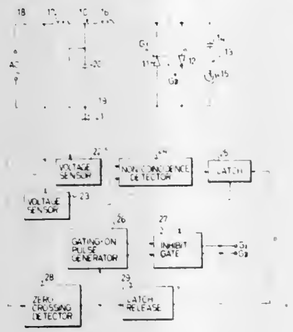
Yoshiaki Suzuki; Junichi Nakakuki; Takumi Mizukawa, and Yoshio Ogino, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 24, 1979, Ser. No. 6,114

Claims priority, application Japan, Jan. 25, 1978, 53-7746

Int. Cl.³ H05B *5/04*

U.S. Cl. 363—160 **7 Claims**



1. A frequency converter comprising:

a silicon controlled rectifier;

a first series resonant circuit operatively connected with said silicon controlled rectifier;

a second series resonant circuit including inductive and capacitive elements operatively connected with said silicon controlled rectifier and tuned to a frequency lower than the resonant frequency of said first resonant circuit and higher than the frequency of a source of energy for generating a reverse voltage across said silicon controlled rectifier upon the occurrence of a commutation failure;

current supplying means having one terminal connected at one end to said silicon controlled rectifier through said inductive element of said second resonant circuit and another terminal connected to said source of energy

control means for providing gating signals to said silicon-controlled rectifier to control the flow of current therethrough; and

means for inhibiting said gating signals upon the occurrence of said reverse voltage to allow said silicon controlled rectifier to restore to its blocking state;

wherein said inhibiting means comprises means for detecting non-coincidence between the polarities of the energy source and the voltage across said capacitive element of said second resonant circuit, and means responsive to said detected non-coincidence to inhibit said gating signals.

4,234,918

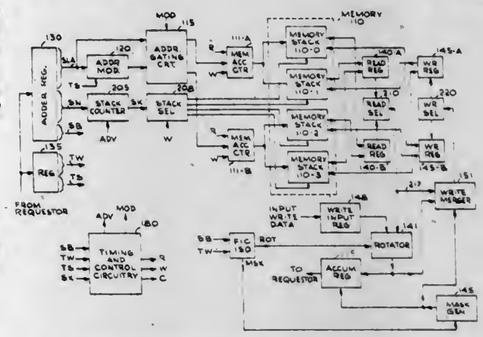
TIME-SHARED, MULTI-PHASE MEMORY SYSTEM WITH ERROR CHECKING AND DATA CORRECTING

Ke-Chiang Chu, San Jose, and Richard S. Sharp, Santa Barbara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 784,352, Apr. 4, 1977, Pat. No. 4,138,720. This application May 31, 1977, Ser. No. 801,869

Int. Cl.³ G0GF *13/00*

U.S. Cl. 364—200 **8 Claims**



1. In a data processing system, the combination comprising:

a memory partitioned into a plurality of individually addressable memory portions, the accessing time of each memory portion requiring at least a plurality of operating cycles of said data processing system;

addressing means coupled to said memory and responsive to an applied address for initiating accessing of selected locations in a plurality of different memory portions over a plurality of consecutively occurring operating cycles in a manner such that the accessing of only a particular selected one of said memory portions is initiated during an operating cycle;

data accumulation means capable of simultaneously storing data read out from a plurality of said memory portions; and

memory output means coupled to said memory and operative during a read operation for receiving data read out from each addressed selected location of a memory portion as it becomes available and operative during each of a plurality of said operating cycles for storing a predetermined portion of the received data from a selected one of said memory portions in a different designated location of said accumulation means until all of the predetermined portions of the received data read out from the addressed selected locations of said memory are simultaneously stored in said accumulation means;

said memory output means including error checking and correcting means for detecting an error in the received data and for correcting at least one predetermined type of error prior to storage of the received data in said accumulation means.

4,234,919

INTERSYSTEM COMMUNICATION LINK

Kenneth E. Bruce, Nashua, N.H.; George J. Barlow, Tewksbury, Mass.; John W. Conway, Waltham, Mass.; Ralph M. Lombardo, Jr., Lowell, Mass.; John J. Bradley, Framingham, Mass., and David B. O'Keefe, Westford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 31, 1978, Ser. No. 956,385

Int. Cl.³ G06F *3/04*

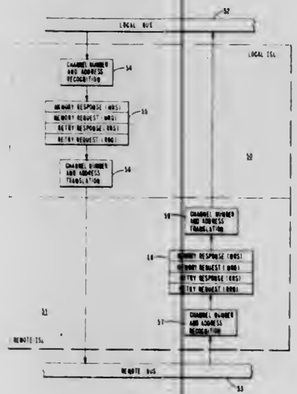
U.S. Cl. 364—200 **10 Claims**

1. An intersystem communication link for use in a data processing system having plural intersystem communication links for accommodating the transfer of information between

plural communication busses each providing a common information path for data processing devices electrically interfacing therewith, which comprises:

(a) asynchronous information acquisition means for capturing at the bus rate binary information presented on a first one of said communication busses wherein each type of bus communication is stored in a separate one of plural dedicated file locations included in said acquisition means thereby accommodating plural bus communications of different types in parallel;

(b) information decoding means in electrical communication with said acquisition means for identifying substantially at said bus rate binary information to be further processed by said intersystem link;



(c) information translation means in electrical communication with said acquisition means for selectively converting substantially at said bus rate address information presented on said first bus to address information pertaining to a second, remote one of said communication busses, and address information pertaining to said second bus to address information pertaining to said first bus; and

(d) logic control means in electrical communication with said decoding means, said translation means, and said acquisition means and responsive to detection of first control signals on said first bus by said acquisition means for effecting a selective reconfiguration of said intersystem link and further responsive to the detection of second control signals on said first bus by said acquisition means for controlling the transfer of information through said intersystem link to said remote second bus.

4,234,920

POWER FAILURE DETECTION AND RESTART SYSTEM

Bradford O. Van Ness, Paradise Valley, and Dan G. Weimer, Scottsdale, both of Ariz., assignors to Engineered Systems, Inc., Tempe, Ariz.

Filed Nov. 24, 1978, Ser. No. 963,315

Int. Cl.³ G06F *11/00*; G11C *7/02*

U.S. Cl. 364—200 **6 Claims**

1. A power failure detection system for use with a computer including in combination:

first means for supplying a voltage to be monitored;

second means for supplying a predetermined reference voltage;

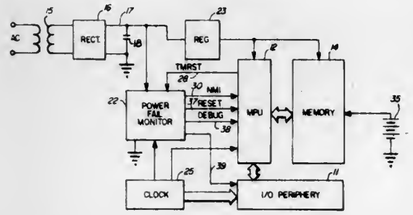
first comparator means having inputs coupled with said first and second means and having an output for supplying a first output signal level when a predetermined normal relationship exists between the voltages supplied by said first and second means and providing a second output signal level when a predetermined abnormal relationship exists between the voltages supplied by said first and second means;

third means for supplying a second predetermined reference voltage;

time delay circuit means;

second comparator means having one input coupled with said third means, having a second input coupled with the output of said first comparator means through said time delay circuit means, and having an output for supplying a first output signal level when the output of said first comparator means is at said first output signal level and for supplying a second output signal level a predetermined time after the signal on the output of said first comparator changes from the first signal level to the second signal level;

computer means connected to the outputs for said first and second comparator means, said computer means interrupting operation in response to the change in the output



signal level from said first comparator means from said first signal level to said second signal level, said computer means including timer circuit means coupled to said second comparator means for driving said second comparator means to produce the second output signal level on the output thereof in response to the output of said timer circuit means irrespective of the state of operation of said first comparator means; and

means coupled with said computer means for receiving signals therefrom indicative of proper operation of said computer means for periodically resetting said timer circuit means to prevent said timer circuit means from driving said second comparator means to the state where it produces said second output signal level, where the second signal level on the output of said second comparator means resets said computer means to a predetermined state of operation.

4,234,921

TESTER FOR ELECTRONIC ENGINE CONTROL SYSTEMS

Tsuneo Kinoshita, Kokubunji; Kazuyuki Sato, Koganei, and Ryusuke Sonooka, Kunitachi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 27, 1978, Ser. No. 919,494

Claims priority, application Japan, Jun. 27, 1977, 52-76381

Int. Cl.² G01M *15/00*

U.S. Cl. 364—424 **26 Claims**

1. An apparatus for testing an electronic engine control unit wherein the electronic engine control unit receives input signals from a variety of sensors representing the physical conditions of an engine system and wherein the electronic engine control unit generates, in response to the received input signals, response signals to control the operation of the engine system, said testing apparatus comprising:

means for generating signals simulating physical conditions of an engine system;

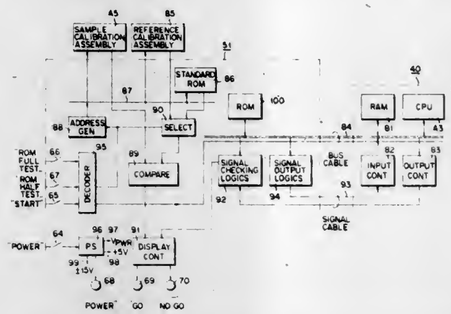
means for selectively supplying said generated signals as said input signals to said electronic engine control unit;

means for receiving said response signals generated by said electronic engine control unit in response to said input signals supplied to said electronic engine control unit;

means for testing whether said received response signals are within predetermined response limits;

means for indicating the results of said testing determination; and

means for controlling said generating means and said supply



means to select the sequence of said simulating signals supplied to said electronic engine control unit and for controlling said receiving means, said testing means and said indicating means to control the indication of the result of the response of said electronic engine control unit to said supplied simulating signals.

4,234,922

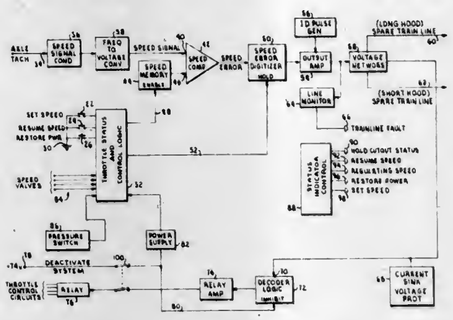
AUTOMATIC LOCOMOTIVE SPEED CONTROL

Calvin D. Wilde, Foster City, and Daniel L. Turner, Belmont, both of Calif., assignors to SAB Harmon Industries, Inc., Grain Valley, Mo.

Filed Mar. 7, 1979, Ser. No. 18,167

Int. Cl.³ G05D *13/62*; G06G *7/66*; B60L *15/32*

U.S. Cl. 364—426 **20 Claims**



1. Apparatus for automatically controlling the speed of a consist of locomotives having a lead engine and a plurality of trailing engines, where each engine has a predetermined, efficient high throttle position and a desired low throttle position, said apparatus comprising:

a plurality of control units including a lead unit for said lead engine and at least a first trail unit and a second trail unit for controlling the throttles of corresponding first and second trailing engines,

an electrical control line extending from said lead unit to said trail units in serial order,

said lead unit having means for sensing the speed of the consist, operator-activated means for selecting a desired operating speed for the consist, and means responsive to activation thereof for generating a cutout control signal and transmitting the same to said trail units along said control line, said control signal having a magnitude that changes in one direction as the actual speed of the consist rises above said desired operating speed, and that changes in the opposite direction as the speed of the consist falls below said desired operating speed,

each of said trail units having a decoder responsive to the magnitude of said control signal for setting the respective engine throttle at either the high position to put the engine on line or the low position to cut it out,

said trail units being provided with means responsive to said control signal for changing the magnitude thereof in said one direction by an amount equal to a predetermined speed increase as said control signal is conducted rearwardly in the consist from each trail unit to the next succeeding trail unit, whereby engines are successively throttled back from the rear of the consist and returned on line from the front to maintain the consist at said desired operating speed.

16. A method for automatically controlling the speed of a consist of locomotives having a lead engine and a plurality of trailing engines, where each engine has a predetermined, efficient high throttle position and a desired low throttle position, and where the trailing engines for control purposes are numerically designated in sequence beginning with the first trailing engine immediately behind the lead engine, said method comprising the steps of:

selecting a desired operating speed for the consist;

generating a cutout control signal in said lead engine and transmitting the control signal to the trailing engines in serial order;

providing said control signal with a characteristic that changes as the actual speed of the consist rises above and falls below said desired operating speed;

modifying said characteristic of the control signal as it is transmitted from the first trailing engine to successive trailing engines, in a manner such that the control signal at each trailing engine in succession represents a predetermined speed increase; and

decoding said control signal at each trailing engine and setting the throttle thereof at either the high position to put the engine on line or the low position to cut it out, whereby engines are successively throttled back from the rear of the consist and returned on line from the front to maintain the consist at said desired operating speed.

4,234,923

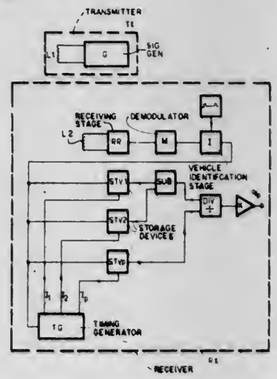
VEHICLE DETECTION SYSTEMS

Kamran Eshraghian, Hectorville, and Robert E. Bogner, College Park, both of Australia, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 902,929

Int. Cl.³ G06G *7/76*

U.S. Cl. 364—436 **4 Claims**



1. A vehicle detection system comprising a transmitter for

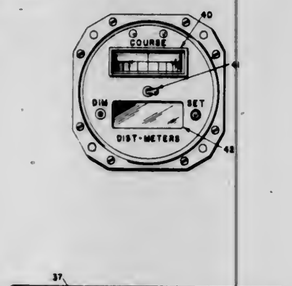
supplying a continuous wave signal, a receiver and sensing means for coupling said continuous wave signal to said receiver so that the approach of a vehicle produces a disturbance having a leading edge with a changing voltage level in the envelope of the signal received by said receiver, said receiver including first means for deriving from said received signal a first signal representative of the envelope voltage at a first instant during the leading edge portion of said disturbance at which the slope of the leading edge first starts to markedly decrease less a voltage corresponding approximately to the envelope voltage prior to said disturbance produced by the approach of a vehicle, second means for deriving from said received signal a second signal representative of the envelope voltage of the received signal at a second instant at which the slope of the leading edge is substantially at its maximum, third means for deriving from said received signal a third signal representative of the envelope voltage of the received signal at a third instant occurring at a fixed time period subsequent to said second instant and prior to said first instant, means for producing from said third and second signals a fourth signal representative of the difference between the envelope voltages at said third and second instants and means for dividing said fourth signal by said first signal to obtain an output signal indicative of the velocity of the vehicle.

4,234,924

METHOD OF INTRODUCING A BASELINE MEASUREMENT INTO ELECTRONIC POSITIONING APPARATUS

Cecil N. La Vance, Paradise Valley, and Allan A. Beale, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 11, 1978, Ser. No. 940,913
Int. Cl.³ G06F *15/50*; G01S *5/14, 13/08*
U.S. Cl. 364—460 **3 Claims**



2. In conjuction with electronic positioning apparatus, including means for substantially continuously measuring the distance of the apparatus from each of two spaced apart reference stations each having a unique identification code and for substantially continuously computing the position of the apparatus relative to the two reference stations with the use of a known baseline between the two stations and further including a control unit having a keyboard and an "enter" switch combination, a multiple position switch and an associated memory for storing information used by the positioning apparatus for computing the position, the keyboard being operatively connected to different portions of the memory by different positions of the switch and the memory being operatively connected to the positioning apparatus in a final position for use of the stored information during computations, a method of setting up an operation comprising the steps of:

(a) moving the multiple position switch to a first position, operating appropriate keys of the keyboard corresponding with a desired amount of offset between adjacent parallel paths and entering the information in the memory by operating the "enter" switch;

(b) moving the multiple position switch to a second position, operating appropriate keys of the keyboard corresponding with the unique identification code of one of the reference stations and entering the information in the memory by operating the "enter" switch;

(c) moving the multiple position switch to a third position, operating appropriate keys of the keyboard corresponding with the unique identification code of the other of the reference stations and entering the information in the memory by operating the "enter" switch;

(d) moving the multiple position switch to a fourth position, operating appropriate keys of the keyboard corresponding with the length of the baseline between the two reference stations and entering the information in the memory by operating the "enter" switch;

(e) moving the multiple position switch to a fifth position for connecting the position computing apparatus to the memory through the "enter" switch, positioning the apparatus over a first point on a first path and operating the "enter" switch to enter the position information in the memory, and moving the apparatus along the first path to a second point on the first path spaced from the first point and operating the "enter" switch to enter the position information in the memory; and

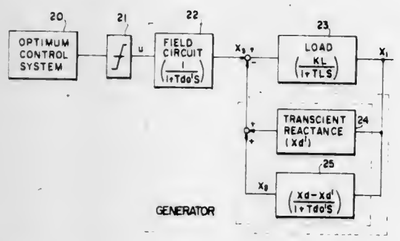
(f) moving the multiple position switch to the final position.

4,234,925

CONTROL SYSTEMS FOR GENERATORS

Yuichi Kitano, Kawagoe, and Kaiichirou Hirayama, Tokorozawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 626,103, Oct. 28, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,419
Claims priority, application Japan, Oct. 29, 1974, 49-123978
Int. Cl.² G21C *7/00*
U.S. Cl. 364—494 **3 Claims**



1. A control system for a generator comprising:

a generator having a field winding,

a digital computer, said digital computer including memory means for storing a predetermined optimum pattern of the field excitation of said generator,

a digital analogue converter for converting the digital signal produced by said digital computer into an analogue signal for controlling the excitation of said field winding,

a load energized by said generator, said load comprising a plasma device including a field coil requiring an excitation current having a rectangular waveform, and

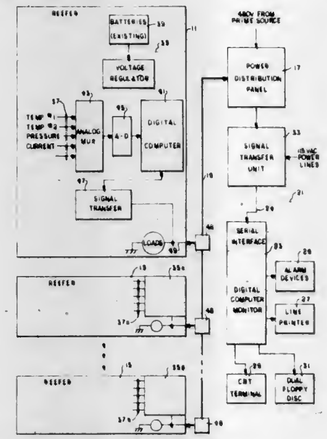
means responsive to said optimum pattern for causing said computer to generate an optimum control signal required by the characteristics of said load, thereby controlling the field excitation of said generator in accordance with said optimum control signal.

4,234,926

SYSTEM & METHOD FOR MONITORING & DIAGNOSING FAULTS IN ENVIRONMENTALLY CONTROLLED CONTAINERS, SUCH SYSTEM AND METHOD BEING ESPECIALLY ADAPTED FOR REMOTE COMPUTER CONTROLLED MONITORING OF NUMEROUS TRANSPORTABLE CONTAINERS OVER EXISTING ON-SITE POWER WIRING

Clifford G. Wallace, Alameda, Calif.; Carl von Isenburg, Westfield; Michael D. Chun, Bud Lake, both of N.J.; Kenneth G. Holmberg, Oakland, and Robert T. Bryant, San Leandro, both of Calif., assignors to Sealand Service Inc., Edison, N.J.

Filed Dec. 5, 1978, Ser. No. 966,785
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—551 **64 Claims**



1. A system for monitoring the condition of a controlled area over existing on-site wiring, said system comprising

sensor means disposed for detecting predetermined parameters representative of the condition of said controlled area,

a data acquisition unit located proximate said controlled area, said data acquisition unit comprising electronic means forming a first digital computer having input/output interface means including serial input/output interface means, and further comprising means for inputting to said first digital computer container parameter data generated by said sensor means, and a first bidirectional data transfer means for transferring serial digital data between said first digital computer and on-site power wiring,

a second digital computer and input/output means therefore, said second digital computer and input/output means being suitably located to provide for the remote monitoring of said controlled area, and

a second bidirectional data transfer means for transferring serial digital data between said second digital computer and said on-site wiring whereby a serial digital data stream can be transmitted in either direction between the monitoring second digital computer and the first digital computer of the data acquisition units.

4,234,927

MICRO PROCESSOR CONTROLLED SENSOR SYSTEM FOR APARTMENT HOUSE

Theodore C. First, R.D. #1, Furnace, Pa. 16865

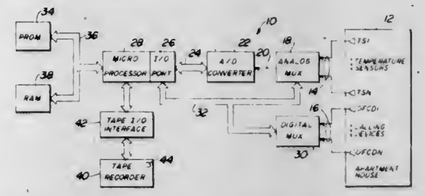
Filed May 8, 1978, Ser. No. 904,173
Int. Cl.² G06F *15/20*; F28F *27/00*
U.S. Cl. 364—557 **5 Claims**

5. A method of collecting energy information for an apartment house having plural apartments, a furnace for heating said apartments and plural calling devices located in said apartments for operating said furnace, comprising:

sensing the temperatures of said apartments and generating a set of apartment temperature signals representative thereof,

sensing the states of said plural calling devices to determine whether said furnace is being operated by said calling devices,

repeating said temperature sensing and state sensing steps at preselected intervals of time,



accumulating for each apartment said apartment temperature signals, and

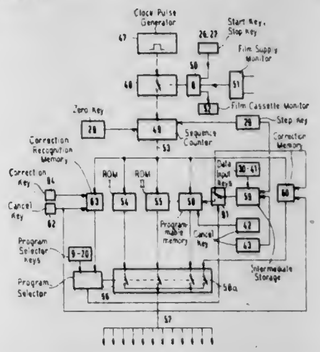
counting for each apartment the number of times that a calling devices located at that apartment operates said furnace.

4,234,928

X-RAY DIAGNOSTIC INSTALLATION FOR X-RAY PHOTOGRAPHS

Rolf Pfeifer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,399
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808288
Int. Cl.³ G11C *11/42*
U.S. Cl. 364—571 **4 Claims**



1. Program control apparatus for the photographic operating sequence of an x-ray photographic installation comprising a series of memory circuits for storing respective photographic program sequences, a resettable pulse counter being connected with the address input of each of said memory circuits for sequentially selecting the program steps of the respective memory circuits, a pulse generator for supplying program signals to the pulse counter for sequentially selecting the program steps of the respective memory circuits, and a program selection circuit connected with the outputs of the memory circuits for transmitting the output signals from a selected one of the memory circuits, wherein the improvement comprises a correction memory (60) for selectively storing respective corrected photographic program steps representing corrections for selected program steps of said memory circuits, said correction memory (60) having an address input connected with said resettable pulse counter (49) for enabling the selection of the corrected

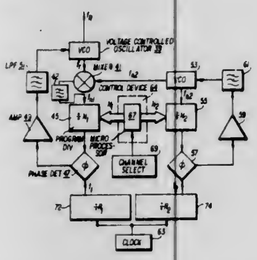
photographic program step corresponding to the count of said pulse counter (49), and having an output connected with said program selection circuit (56) for supplying such corrected photographic program step thereto, a correction recognition memory (63) having an address input connected with said resettable pulse counter (49) and operable for storing correction signals for identifying the counts of said pulse counter (49) for which the respective corrected photographic program steps are stored in said correction memory (60) and having a correction recognition output connected with said program selection circuit (56) for signalling the program selection circuit (56) when a stored correction signal in said correction recognition memory (63) corresponds to the current count of said pulse counter (49), said selection circuit (56) having selection switch means (56a) controlling the selection of said correction memory (60) for control of the photographic operating sequence, and being connected with said correction recognition output and responsive to said signalling therefrom for disabling transmission of the output signals from the selected one of the memory circuits and for effecting in place thereof the transmission of the corresponding corrected photographic program step from said correction memory (60).

4,234,929

CONTROL DEVICE FOR A PHASE LOCK LOOP VERNIER FREQUENCY SYNTHESIZER

William J. Riley, Jr., Rochester, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 24, 1979, Ser. No. 78,210
Int. Cl.[3] G06F 7/68
U.S. Cl. 364—701 **14 Claims**



1. An apparatus for generating an output signal of a selected frequency comprising:

means for generating first and second reference signals of different frequency;

a signal mixer;

a first phase lock loop frequency locked to said first reference signal for providing a first mixing signal to said mixer, said first phase lock loop including a first adjustable frequency changing device for changing the frequency of a signal within said first loop by an adjustable factor of N_1;

a second phase lock loop frequency locked to said second reference signal for providing a second mixing signal to said mixer, said second phase lock loop including a second adjustable frequency changing device for changing the frequency of a signal within said second loop by an adjustable factor of N_2, said first and second phase lock loops controlling said mixer to provide an output signal having a frequency which is determined by said N_1 and N_2 factors;

means for selecting a desired frequency for said output signal; and,

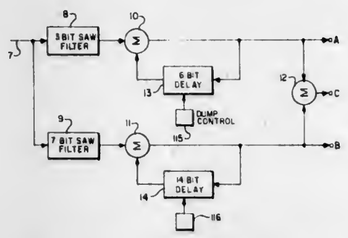
a microprocessor responsive to said desired frequency selection means for determining N_1 and N_2 factors which will produce said desired frequency and for respectively applying determined N_1 and N_2 factors to said first and second frequency changing devices, said microprocessor preventing application of predetermined ones of the N_1 and N_2 factors, which could produce a selected desired frequency, to said first and second frequency changing devices.

4,234,930

INTERLEAVED BINARY CODED SIGNAL TRANSLATION DEVICE

Russell Campbell, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Jul. 28, 1978, Ser. No. 928,972
Claims priority, application Canada, Apr. 25, 1978, 301883
Int. Cl.[3] G06F 15/31; H04B 1/12
U.S. Cl. 364—724 **13 Claims**



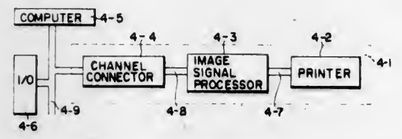
1. Apparatus for translation of an interleaved binary coded signal, said signal comprising a plurality of individual signals, said apparatus comprising a plurality of matched binary code filters adapted to receive the interleaved signal in parallel, each filter being matched to one of the individual signals, and means for summing the output signals of each of the matched filters to produce said translated signal.

4,234,931

INFORMATION OUTPUT APPARATUS FOR PUTTING OUT A CHARACTER DOT PATTERN

Kiyoshi Kanaiwa, Kawasaki, and Kozo Matsumoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1978, Ser. No. 933,048
Claims priority, application Japan, Aug. 11, 1977, 52/96441; Nov. 11, 1977, 52/135482; Nov. 15, 1977, 52/136920; Nov. 17, 1977, 52/138205
Int. Cl.[3] G06F 3/14; H04L 17/16; B41B 15/00
U.S. Cl. 364—900 **20 Claims**



1. An information output apparatus comprising:

dot pattern store means storing a plurality of sets of character dot patterns for displaying characters;

position store means storing position signals representing the stored positions of the respective dot patterns stored in said dot pattern store means;

signal forming means responsive to character code signals designating the character dot patterns to be put out for forming read-out signals for reading out from said position store means the position signals;

read-out means for applying the position signal read out from said position store means by the read-out signal from said signal forming means to said dot pattern store means to read out from said dot pattern store means the character dot pattern stored in the position associated with the applied position signal; and

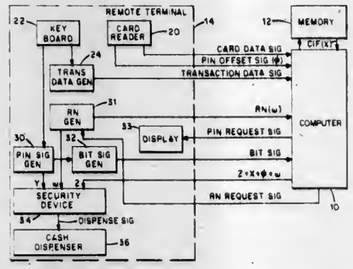
output means for putting out as visible information the character dot pattern read out from said dot pattern store means by said read-out means.

4,234,932

SECURITY SYSTEM FOR REMOTE CASH DISPENSERS

Richard A. Gorgens, Bedford, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 5, 1978, Ser. No. 939,504
Int. Cl.[3] G06F 15/30
U.S. Cl. 364—900 **6 Claims**



1. A security system for a remote transaction terminal of an automated banking system including a central computer with a main memory and a plurality of remote transaction terminals in electrical communication with said central computer, said remote transaction terminal having customer operated data entry means and a cash dispenser, which comprises:

(a) first generator means responsive to an electrical signal received from said data entry means for providing an identification signal representative of a customer personal identification number;

(b) second generator means responsive to a random number request signal received from said central computer for supplying a pseudo random number signal to said central computer; and

(c) comparator means in electrical communication with said first generator means and said second generator means by way of signal paths wholly contained within said remote transaction terminal, and in electrical communication with said central computer for issuing a cash dispense signal to said cash dispenser when a composite signal received from said central computer bears a predetermined relationship with said identification signal received from said first generator means and said random number signal received from said second generator means, said composite signal being formed by said central computer from a customer record signal stored in said main memory, from an offset signal supplied by said data entry means and bearing a predetermined relationship between said identification signal and said customer record signal, and from said random number signal.

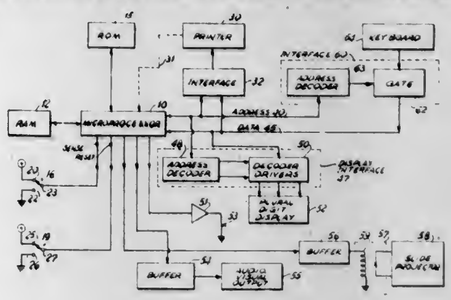
4,234,933

ELECTRICAL GAME, POLLING AND TESTING APPARATUS

Alexander M. Adelson, Peekskill; Stephen C. Gulick, Flushing, both of N.Y., and Arnold L. Grubin, Teaneck, N.J., assignors to Dimensional Communications, Inc., Northvale, N.J.

Filed Sep. 13, 1978, Ser. No. 941,934
Int. Cl.[3] G06F 3/14
U.S. Cl. 364—900 **10 Claims**

1. In combination, a microprocessor; a read only memory, a variable content memory, an address bus, and a data bus connected to said microprocessor; visual image forming means including means for displaying a sequence of images, and display control means for advancing the image then formed by said image forming means; said image forming means comprising a slide projector containing plural projectable slides, and wherein said display control means comprises a projector-controlling switch to advance the slide then being projected by said slide projector; means controlled by said microprocessor for selectively actuating said display control means; data input means, and interface means connected to said address bus and



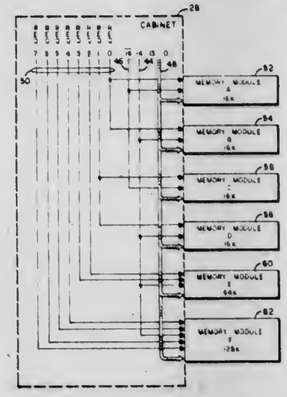
said data bus for selectively connecting said data input means to said data bus; said variable content memory including plural answer data storage means in one-to-one correspondence with at least a subset of said images; and means for loading said answer data storage means employing said data input means.

4,234,934

APPARATUS FOR SCALING MEMORY ADDRESSES

Lee T. Thorsrud, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,994
Int. Cl.[3] G06F 13/00
U.S. Cl. 364—900 **5 Claims**



1. A data processing apparatus comprising:

a memory module wherein said memory module has a storage capacity depending upon a variable number of memory banks contained within said memory module;

a requestor which generates a memory address to be used by said memory module wherein said memory address consists of a plurality of bits;

determining means responsively coupled to said memory module for determining said variable number of memory banks contained within said memory module;

stripping means responsively coupled to said requestor and said determining means for stripping from said memory address a one or more of said plurality of bits thereby producing a modified memory address wherein said modified memory address consists of a minimum number of bits sufficient to address said storage capacity of said memory

module depending upon said variable number of memory banks as determined by said determining means; and

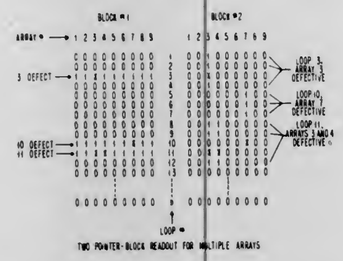
means responsively coupled to said memory module and said stripping means for transferring said modified memory address from said stripping means to said memory module.

4,234,935

MEANS FOR MAINTAINING THE IDENTIFICATION OF DEFECTIVE MINOR LOOPS IN A MAGNETIC BUBBLE MEMORY

Kenneth E. Schreiner, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,298
Int. Cl.³ G11C 19/08
U.S. Cl. 365—15 **9 Claims**



1. A bubble domain memory system having a major/minor loop array suitable for the storage and guided movement of bubble domains, the system comprising:

a plurality of minor loops in said array adapted for the storage of bits of data encoded as the presence or absence of bubble domains, said plurality of minor loops containing defective minor loops, a bit of data from the same position in each of said plurality of minor loops represents a block of data,

a plurality of pointers for said plurality of minor loops that identify said defective loops,

at least one block in said array reserved for the storage of said pointers, said pointer block and said data blocks containing a reserved portion as a notch means wherein the reserved portion includes a marker bit pattern to distinguish said pointer block from said data blocks, and

a read-write memory system associated with said block and adapted to have the data from said block communicaed to said read-write memory system during initialization wherein during the read/write operations of said bubble domain memory said read-write memory system enables the data positions to be skipped that correspond to said defective loops.

4,234,936

POWER SEAT MEMORY

Burton L. Siegal, 7605 N. Tripp St., Skokie, Ill. 60076

Filed May 4, 1979, Ser. No. 36,006
Int. Cl.³ G11C 13/00
U.S. Cl. 365—244 **9 Claims**

1. In an electro-mechanical memory-positioning system comprising:

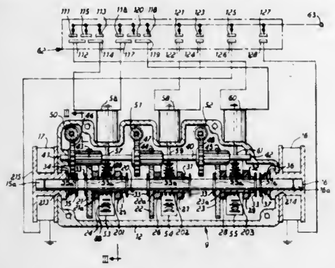
an electrically energizable drive means mechanically connectable to a positionable device to move the device to a pre-determined position when the device is displaced therefrom;

at least one pair of cams connected to said drive means movable in response to movement of the positionable device, said cams mounted on a shaft side by side for rotation about their axes and for selective movement longitudinal of their axes;

at least a pair of cam followers mounted between each said pair of cams;

a pair of switch means mechanically mounted on said cam followers for movement therewith, said switch means including contacts to electrically connect said drive means to a power supply; and

means for moving each said pair of cams longitudinally of their axis such that when moved in a first direction one of said cams engages one of said cam followers to cause said drive means to move said positionable device in a first



direction to a first pre-determined position or said cam engages the other switch actuator to cause said drive means to move said positionable device in a second direction to said first pre-determined position; the improvement of:

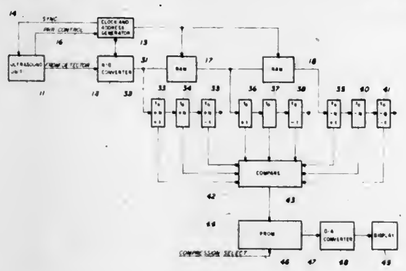
at least one solenoid having a manually operable switch for selective energizing of said solenoid, having an actuator mechanically connected to said switch means to move said switch means upon energizing of said solenoid to open and close said switch means.

4,234,937

PEAK DETECTOR FOR RESOLUTION ENHANCEMENT OF ULTRASONIC VISUALIZATION SYSTEMS

Reginald C. Eggleton, Indianapolis, Ind., and Warren L. Williamson, Mesa, Ariz., assignors to Indianapolis Center For Advanced Research, Indianapolis, Ind.

Continuation-in-part of Ser. No. 878,126, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 711,359, Aug. 3, 1976, Pat. No. 4,074,223. This application Feb. 12, 1979, Ser. No. 11,303
Int. Cl.³ G01S 15/00
U.S. Cl. 367—11 **9 Claims**



1. A peak detector system for ultrasonic visualization arrangements comprising:

(a) first means for dividing received ultrasonic energy into resolution elements;

(b) second means for creating for each resolution element a plural-bit word which encodes the value of the received ultrasonic energy in the resolution element;

(c) third means for storing said plural-bit words;

(d) fourth means connected to said third means for comparing said plural-bit words and producing at its output a signal indicative of peak points determined by said fourth means for comparing;

(e) fifth means for selecting a transfer function from a plurality of transfer functions for performing a value conversion of the output of said fourth means; and

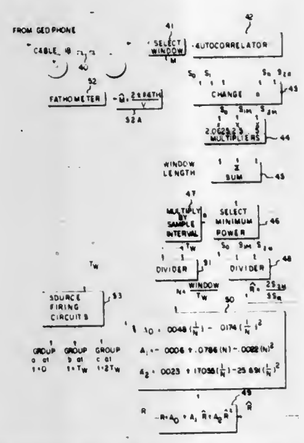
(f) said fifth means including a PROM having a first series of address inputs coupled to said fourth means and a second series of address inputs for receiving a plural-bit word.

4,234,938

DETERMINATION OF REFLECTIVITY AND WATER DEPTH FOR MARINE SEISMIC EXPLORATION

Kenneth P. Allen, Stamford, Conn., and Maynard S. Redeker, Farmers Branch, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 709,484, Jul. 28, 1976. This application Oct. 25, 1977, Ser. No. 844,549
Int. Cl.³ G01V 1/38
U.S. Cl. 367—24 **7 Claims**



1. In marine seismic exploration which includes:

firing at least one source in an array of sources towed by a marine vessel,

recording seismograms representing the reflected seismic pulses,

measuring the water bottom reflectivity and the water depth from the recorded seismograms,

converting the measurements of reflectivity and water depth into a time domain operator representative of the inverse of the reverberaion distortion in the water layer between the water bottom and water surface, and

thereafter firing said array of sources in groups such that the acoustic pulses from each of said sources combine to produce a resultant acoustic pressure wave having said time domain operator characteristic in its travel to and from the subsurface formation,

the improvement wherein said measuring comprises the steps of:

generating the zero lag auto-correlation coefficients of a window of said seismogram,

generating the auto-correlation coefficients of said window with a lag of n time samples,

generating the auto-correlation coefficients of said window with a lag of 2n time samples,

repeating the foregoing for various values of n,

combining the auto-correlation coefficients generated for each value of n, and

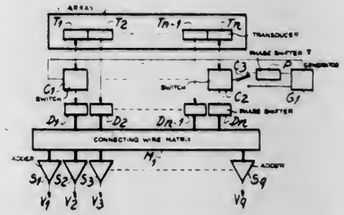
selecting the n producing the minimum in the combined auto-correlation functions as being representative of water depth.

4,234,939

ARRAY SYSTEM WITH A HIGH RESOLVING POWER

Georges Grall, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 12, 1978, Ser. No. 968,815
Claims priority, application France, Dec. 16, 1977, 77 38092
Int. Cl.³ G01S 15/06
U.S. Cl. 367—87 **5 Claims**



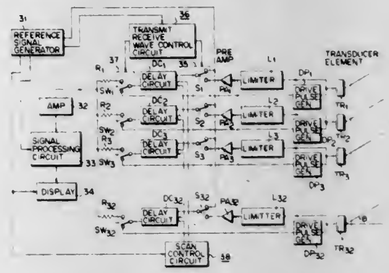
1. An array system for the detection of targets in a wave system, in particular sonar with a high resolving power, comprising: an array of transmitting transducers and an array of receiving transducers, each array having substantially the same length L, said receiving array comprising a plurality of transducers distributed over said length L, phasing means connected to said transducers for pre-forming q channels in q directions, each of said channels having a reception pattern directed at one of said q directions, said transmitting array comprising first and second transmitting transducers connected to a generator said first and second transmitting transducers being placed at the extremities of the transmitting array, the radiation pattern of said transmitting array having a series of maxima and minima and the transmission-reception assembly having an overall pattern with an angular width at 3 dB that is less than 0.64 λ/L, wherein λ is the wavelength in the medium of propagation and the centre of the pre-formed channels corresponds to the directions of the maxima of transmission.

4,234,940

ULTRASOUND TRANSMITTING OR RECEIVING APPARATUS

Kazuhiro Iinuma, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 16, 1978, Ser. No. 887,337
Claims priority, application Japan, Mar. 16, 1977, 52-28016
Int. Cl.² G01S 9/66
U.S. Cl. 367—105 **17 Claims**



1. A beam steering system for an ultrasonic diagnostic apparatus comprising, in combination:

a plurality of ultrasound transducers for generating an ultrasonic beam;

pulse generating means for energizing said transducers to emit a sequence of pulses of ultrasonic energy;

a plurality of variable delay circuits for coupling said pulse

generating means to each of said transducers, each said variable delay circuit including a tapped analog delay line having an input connected to receive the output of said pulse generating means and a plurality of output taps, said circuit further including an analog switch connected to each said tap and to a common output coupled to one of said transducers and a memory storing switch control codes representing states of said analog tap switches, said memory including an output connected to control said switches; and

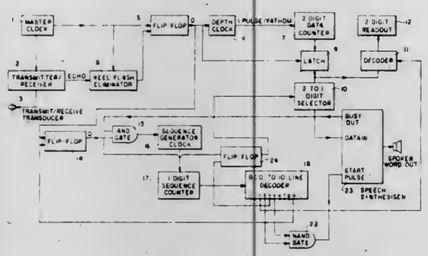
a scan control circuit connected to said memories of said variable delay circuits and constructed and arranged to generate a succession of scan signals each of which represent a particular beam direction, each of said signals operating to access an address of said memories and to apply the switch control code stored at said address to the associated analog tap switches, whereby said transducers are pulsed at predetermined times for generating an ultrasonic beam in a direction controlled by said scan control circuit.

4,234,941

VERBAL READ-OUT DEPTH SOUNDING SYSTEM

Frederick J. Welland, Jr., Namu, and Edward C. Cairns, Richmond, both of Canada, assignors to Coast Radar and Communications Ltd., Namu, Canada

Filed Sep. 25, 1978, Ser. No. 945,381
Claims priority, application Canada, May 25, 1978, 304241
Int. Cl.[3] G01S *15/14*
U.S. Cl. 367—116 **8 Claims**



1. A system for measuring distance to an object comprising means both for transmitting a high frequency sound impulse and for receiving a high frequency echo sound impulse reflected from the object, a depth clock, a multidigit counter connected to receive an output from said depth clock, means to initiate the depth clock at a first time corresponding to the time of transmission of the high frequency sound impulse, means for stopping the depth clock at a second time corresponding to the time of receipt of the echo sound impulse, whereby the content of said multidigit counter is proportional to the distance to the object, time delay means coupled to prevent said means for stopping the depth clock from actuation until expiration of a predetermined delay after said first time, speech synthesizer means having a gating input and a data input, selector means coupled to said multidigit counter and to said data input of said speech synthesizer for selectively supplying data corresponding to a single one of said digits at a time in said multidigit counter, and sequence clock means operable when the depth clock is stopped to drive a sequence generator which provides sequential pulses to different outputs, and includes a plurality of outputs coupled to said gating input of said synthesizer, and an output therebetween coupled to said selector means for sequentially stepping said selector means to couple a different digit in said multidigit counter to said data input of said synthesizer.

4,234,942

APPARATUS FOR MEASURING THE LENGTH OF PIPE AND OTHER HOLLOW MEMBERS

Benjamin G. Prause, Tomball, and John D. Meyers, Plano, both of Tex., assignors to D & W International, Inc., Lafayette, La.

Filed Jul. 24, 1978, Ser. No. 927,463
Int. Cl.[3] G01S *11/00*
U.S. Cl. 367—128 **14 Claims**



1. A distance measuring apparatus comprising:

an electromagnetic wave transmitter including a frequency modulator, for sending a start timing signal in the form of a frequency modulated electromagnetic wave, disposed at a first location;

an electromagnetic energy sensor disposed at a second location, for detecting said frequency modulated start timing signal, where the difference between said first and second locations equals the distance to be measured;

an acoustic transmitter for sending an acoustic stop timing signal over said distance to be measured, located at said first location;

an acoustic receiver for detecting said stop timing signal, located at said second location;

a reference signal generator for initiating both of said start and stop timing signals; and

circuit means for calculating the time delay response between the detection of said start time signal and said stop timing signal.

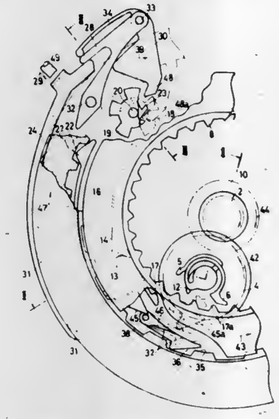
4,234,943

MONTH CORRECTING MECHANISM FOR CALENDAR TIMEPIECES

Kazuo Teramoto, Fuchu; Minoru Watanabe, Tokorozawa, and Tetuo Matumura, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,173
Claims priority, application Japan, Nov. 26, 1977, 52-141883
Int. Cl.[3] G04B *27/08*
U.S. Cl. 368—35 **12 Claims**

1. A month correcting mechanism for calendar timepieces comprising a date dial having a toothing: a month dial having a toothing, a driving member adapted to engage the toothing of said date dial for driving it one step every 24 hours, a month dial driving device for driving said month dial one step during the rotation of said date dial between the date indications "31" and "1", and a month correcting lever assembly provided to engage with said toothing of said month dial and adapted to be manually actuated to drive said month dial independently of said date dial.

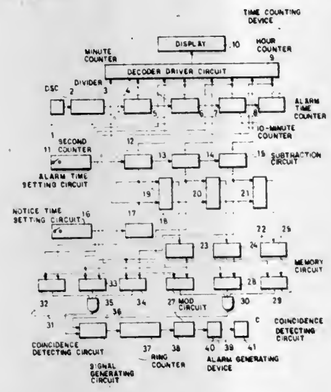


4,234,944

ALARM ELECTRONIC TIMEPIECE

Shojiro Komaki, and Noboru Kaneko, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 966,271
Claims priority, application Japan, Dec. 8, 1977, 52-147519
Int. Cl.[3] G04C *21/00*
U.S. Cl. 368—72 **4 Claims**



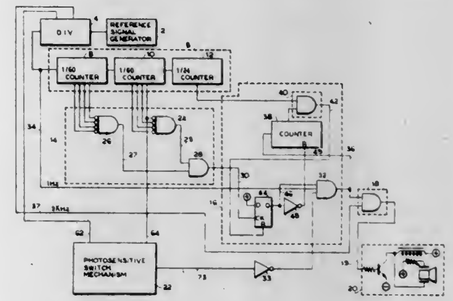
1. In an alarm electronic timepiece comprising an oscillating circuit for generating a high frequency reference signal, a frequency dividing circuit for dividing the reference signal into a low frequency time signal, a display device for displaying the present time in accordance with the time signal, an alarm counter for presetting a desired alarm time, a coincidence detecting circuit for detecting coincidence between a signal representative of the preset alarm time and a signal representative of present time and for generating an output signal when coincidence is detected, and a buzzer for generating an alarm sound in response to the output signal, the improvement comprising: means for generating the alarm sound at a time before the preset alarm time and at a sound volume which varies with the passage of time, said means including a subtraction circuit connected between said alarm counter and said coincidence detecting circuit, a ring counter connected to receive the output signal from said coincidence detecting circuit, and a modulation circuit connected to said ring counter for modulating the signal applied to said buzzer.

4,234,945

ELECTRONIC TIMEPIECE WITH HOURLY STRIKE MECHANISM

Yasushi Nomura; Yuzo Komatsu, both of Tokorozawa, and Shigeru Morokawa, Higashiyamato, all of Japan, assignors to Citizen Watch Co., Ltd. and Rhythm Watch Co., Ltd., both of Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,897
Claims priority, application Japan, Mar. 7, 1977, 52/23883
Int. Cl.[3] G04B *21/00, 21/02;* G08B *3/00*
U.S. Cl. 368—75 **7 Claims**



1. An electronic timepiece comprising:

(a) a timepiece mechanism comprising a time reference signal generator, a frequency divider connected to said generator, a time keep mechanism connected to said divider, and a display device connected to said time keep mechanism;

(b) an acoustic information mechanism comprising an hour information time detection means receiving an output from said time keep mechanism, an acoustic hour information control means, and an alarm mechanism receiving an output of said acoustic hour information control means and emitting an alarm in response thereto; and

(c) a photosensitive switch mechanism controlling said acoustic information mechanism, said photosensitive switch mechanism comprising an intermittent switch means and a memory means each connected to said timepiece mechanism, and a photosensitive element controlled intermittently by said intermittent switch means whereby the amount of light intermittently received by said photosensitive element is memorized by said memory means so that said acoustic information mechanism may be controlled in response to the memorized contents in said memory means.

4,234,946

ELECTRONIC WRISTWATCHES

Kotaro Takahashi, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

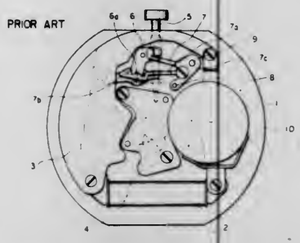
Filed Dec. 19, 1978, Ser. No. 970,905
Claims priority, application Japan, Dec. 22, 1977, 52/171906[U]
Int. Cl.[3] G04B *19/24, 27/00*
U.S. Cl. 368—76 **6 Claims**

1. In a watch movement construction for an electronic wristwatch powered by a battery and having time indicating hands, the improvement comprising:

a base plate having a radial bore, and a recess formed on one side of said base plate to accommodate said battery;

a time adjustment shaft movable in said radial bore of said base plate to predetermined locations for correcting said time indicating hands;

a setting lever pivotally mounted on said one side of said base plate and cooperating with said time adjustment shaft; and



a spring mounted on said one side of said base plate, said spring comprising a resilient arm for urging the setting lever in a given direction and a fixed body part having a peripheral edge portion conforming to a portion of the periphery of said recess.

4,234,947

SOLAR BATTERY POWERED TIMEPIECE

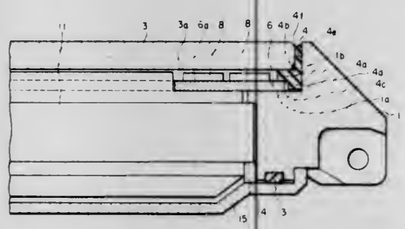
Masataka Matsumoto, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1978, Ser. No. 968,688

Claims priority, application Japan, Dec. 22, 1977, 52/171788[U]; Jan. 12, 1978, 53/2429[U]

Int. Cl.³ G04B 37/00

U.S. Cl. 368—287 **9 Claims**



1. An electronic timepiece having an electro-optical display cell, comprising:

a watch case including an recess in one side thereof, said recess having a radially extending bottom surface formed at a lower portion of said recess and a radially facing peripheral wall;

a base plate mounted on the bottom surface of said recess, said base plate supporting at least one solar battery and having a recess at a central portion thereof to accommodate therein said display cell and having a peripheral side wall;

a watch glass positioned in said recess above said base plate and having a bottom wall and a peripheral wall; and

resilient packing means including an axially outwardly extending annular wall portion compressed between the peripheral wall of said watch glass and the radially facing peripheral wall of said watch case, a radially inwardly extending annular wall portion compressed between the bottom wall of said watch glass and said base plate to resiliently retain said base plate to alleviate external shocks being applied to said base plate in an axial direction, and an axially inwardly extending annular wall portion compressed between the peripheral wall of said base plate and the peripheral of said watch case to resiliently retain said base plate to alleviate the external shocks being applied to said base plate in its radial direction.

4,234,948

WATCHGLASS FIXING STRUCTURE

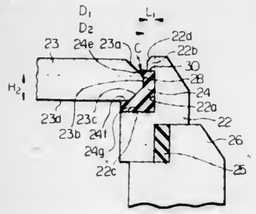
Yasuo Maekawa; Tsunetoshi Sekiguchi, both of Tokyo; Masahiko Waki, Tokorozawa; Hiroshi Koide, Tokyo; Kisuke Watanabe, Tokyo; Osamu Matsumura, Chofu, and Hisao Yamagata, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,686

Claims priority, application Japan, Apr. 6, 1977, 52-39353; Jul. 9, 1977, 52-82265; Nov. 4, 1977, 52-131475; Nov. 4, 1977, 52-131476; Nov. 5, 1977, 52-132825; Nov. 7, 1977, 52-133280; Nov. 17, 1977, 52-138131; Dec. 23, 1977, 52-155136; Dec. 27, 1977, 52-156440

Int. Cl.³ G04B 37/08, 39/02

U.S. Cl. 368—291 **9 Claims**



1. A structure for fixing a watchglass of a watch case, comprising:

a watchglass fixing member having an annular recess, a flange formed at an upper portion of said recess and having an inner diameter, and a watchglass seating surface formed at a lower portion of said recess;

a watchglass having an outer diametric surface formed with a vertical portion having a height less than the height of an inner surface at the upper portion of said annular recess while the outer diameter of the watchglass is slightly less than the inner diameter of said flange, an inclined guiding surface at a portion below said outer diameteric surface and a recess provided in said diametric surface; and

a synthetic resin ring sandwiched between said annular recess and said watchglass and having a protrusion formed when said watchglass is press fitted into said synthetic resin ring, said protrusion engaging the recess of said watchglass to retain the same in a fixed position.

4,234,949

MULTIPLEXER AND TIME DURATION MEASURING CIRCUIT

James Gray, Jr., Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 10, 1979, Ser. No. 28,741

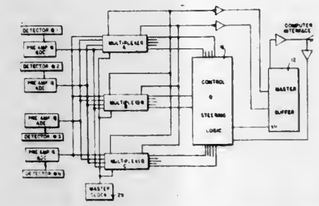
Int. Cl.³ H04L 5/00

U.S. Cl. 370—41 **8 Claims**

1. A device for multiplexing data to a master storage from a plurality of pulse sources which randomly develop pulses, comprising:

a first multiplexer unit including a plurality of input circuits equal in number to the sources, each of said input circuits being coupled to a separate one of said sources and having first and second stable states indicated by different outputs therefrom and having a disabled state wherein said input circuits are prevented from switching from said one stable state to the other stable state, with all of said input circuits at said first stable state, one of said input circuits being responsive to the leading edge of a pulse of particular time duration from the source coupled thereto to assume said second stable state, disabling means coupled to said input circuits and responsive to the change in output of one of said input circuits assuming said second stable state to drive all of said input circuits to assume said disabled state,

with all of said input circuits at said disabled state said input circuit at said second stable state being responsive to the trailing edge of said pulse to assume said first stable state said particular time duration after assuming said second stable state, and register means coupled to said



input circuits and responsive to the output thereof to develop an output data signal indicating which of said input circuits assumes said second stable state and indicating said particular time duration, the master storage being coupled to said register means and being responsive to said output data signal to store said output signal.

4,234,950

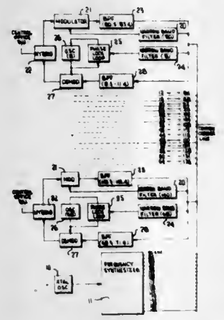
TELEPHONE STATION CARRIER SYSTEM

Sidney Browne, 6307 Crosswoods Clr., Falls Church, Va. 22044

Filed Apr. 25, 1979, Ser. No. 33,248

Int. Cl.³ H04J 1/06

U.S. Cl. 370—71 **22 Claims**



1. In a frequency-multiplexed carrier system of the type employing a common transmission line to service a plurality of remote subscriber circuits from a respective plurality of local circuits at a central location, each remote subscriber circuit being paired with a respective local circuit with which it alone communicates, a method comprising the steps of:

generating at said central location a frequency-stable first carrier signal for each local circuit, the first carrier signal for each local circuit having a different frequency, the frequencies of all of said first carrier signal residing in a first band of frequencies;

modulating said first carrier signal at each local circuit with externally-derived intelligence signals to derive a single sideband of said first carrier signal, the frequency bandwidth of said intelligence signals being less than the spacing between adjacent first carrier signal frequencies;

transmitting, from said central location to said remote circuits via said common transmission line, all of said first carrier signals and all of said single sidebands of said first carrier signals;

at each remote circuit, receiving from said common transmission line the first carrier signal and single sideband thereof for the local circuit with which that remote circuit is paired;

at each remote circuit, demodulating the received single sideband with the received first carrier signal to recover the externally-derived intelligence signals;

for all of said remote circuits, generating a translating signal having the same frequency at each remote circuit;

at each remote circuit, frequency-mixing said translating signal and the received first carrier signal to derive a second carrier signal, the second carrier signals at each remote circuit having different frequencies which reside in a second band of frequencies which does not overlap said first band of frequencies, the frequency difference between the received first carrier signal and the derived second carrier signal being equal to the frequency of said translating signal at all of said remote circuits;

modulating said second carrier signal at each remote circuit with externally derived further intelligence signals to derive a single sideband of said second carrier signal, the frequency bandwidth of said further intelligence signals being less than the spacing between adjacent second carrier signal frequencies;

transmitting from each remote circuit to said central location via said common transmission line, said derived single sideband of said second carrier signal;

at each local circuit, receiving from said common transmission line the single sideband of said second carrier signal transmitted from the remote circuit with which that local circuit is paired;

providing at each local station a second carrier signal to demodulate the received single sideband; and

at each local circuit, demodulating the received single sideband with the received second carrier signal to recover said further intelligence signal.

4,234,951

Patent Not Issued For This Number

4,234,952
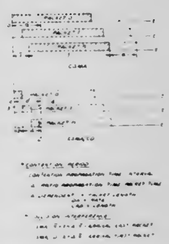
CONFLICT RESOLUTION BY RETRANSMISSION DELAY ON SHARED COMMUNICATION MEDIUM

Melvin G. Gable, Ypsilanti, and Richard H. Sherman, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 7, 1979, Ser. No. 46,577

Int. Cl.³ H04J 6/00

U.S. Cl. 370—94 **10 Claims**



1. A data communication modem adapted for use in conjunction with a plurality of other modems over a shared communication medium, said modem comprising:

a transmitting and receiving means for transmitting and receiving data over the communication medium;

a first sense means coupled to said modem for detecting carrier transmission from any of the modems on the communication medium (busy) and for detecting no transmission (idle) on the communication medium;

a second sense means for detecting simultaneous transmission (interference) of more than one modem;

a computation means for determining a first duration of time between the time of transition from an idle channel to a busy channel and the time of transmission interference, and a second duration of time between the time of transmission interference and the time of transition from a busy channel to an idle channel; and

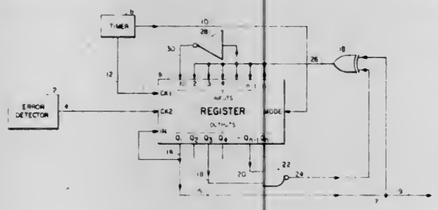
a control means responsive to outputs from said first sense means, said second sense means and said computation means for governing transmission of said modem so that said modem will not transmit until said first sense means is not detecting carrier transmission and will interrupt transmission if interference is detected by said second sense means.

4,234,953

ERROR DENSITY DETECTOR

Ralph L. Kline, Los Altos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 7, 1978, Ser. No. 967,192
Int. Cl.³ H04B *17/00*; G06F *11/00*
U.S. Cl. 371—5 **5 Claims**



1. In a digital transmission system in which the presence or absence of errors in a periodic framing pattern is used to determine if the system is properly synchronized, an error density detector comprising:

an error detector which provides an error output pulse at an output whenever an error is detected in the framing pattern;

a timer which provides at a first output a sample pulse at the beginning of each sample interval, said sample interval including a plurality of frames and said sample pulse occurring intermediate of said framing pattern; and at a second output a sample clock pulse which occurs within the time slot of the sample pulse; and

logic means comprising:

a programmable register having n programmable input terminals 1 to n, having a mode and a first clock input connected, respectively to the first and second outputs of said timer, said programmable input terminals being enabled during the occurrence of the sample pulse so that programmed information may be read into said input terminals 1 to n in parallel, having a second clock input connected to receive the error output pulses so as to cause the register to shift one bit for each error pulse, having n output terminals Q1 to Qn, and having a serial input terminal connected to the first output terminal Q1, whereby the state programmed into the first input terminal will be propagated by said error pulse and;

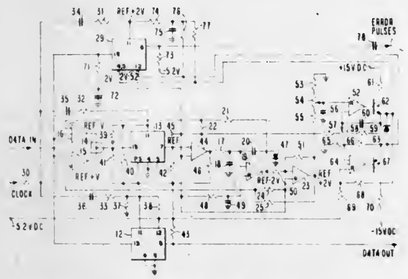
gating means for providing the program information and for providing an alarm indication, having a first input connected to Q1, having second and third inputs connected to appropriate output terminals of said register so that an alarm indication will occur only when at least a first predetermined number of errors have occurred during a sample interval and so that the alarm lead state will subsequently change if less than a second predetermined number of errors have occurred during a subsequent sample interval.

4,234,954

ON-LINE BIT ERROR RATE ESTIMATOR

Julius Lange, Sunnyvale, and Gary L. Wagner, Menlo Park, both of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Jan. 24, 1979, Ser. No. 6,054
Int. Cl.³ H03K *13/32*; G06F *11/00*
U.S. Cl. 371—6 **16 Claims**



1. Apparatus for detecting the rate of error in an input binary coded data stream not including code characters of the parity check type, said apparatus comprising:

means for generating a relative test voltage equal to approximately twice the average relative signal voltage of the data stream; and

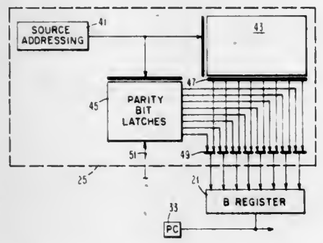
means connected to said generating means for producing an error pulse only whenever, at any one of many preselected sampling points clocked onto said producing means by clocking means connected thereto, the magnitude of the relative voltage of the data stream, including any noise superimposed thereon, exceeds the magnitude of said relative test voltage.

4,234,955

PARITY FOR COMPUTER SYSTEM HAVING AN ARRAY OF EXTERNAL REGISTERS

Thomas L. Jeremiah, Round Rock, Tex., and Karl F. Pezdirtz, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,712
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **15 Claims**



1. In a data processing system including an information processing unit utilizing an odd parity check for detecting machine malfunctions, and a plurality of external byte wide registers electrically connected into an M×N array, said array having a number of unusable registers whereby the number of usable registers is less than M times N, thereby leaving unimplemented bytes in the array of registers, means for implementing a parity bit for each of said unimplemented bytes in the array of registers, said means comprising:

a plurality of parity bit generating devices mapped to the configuration of said array of external registers, each bit generating device upon activation providing a parity bit for its respective external register location; and

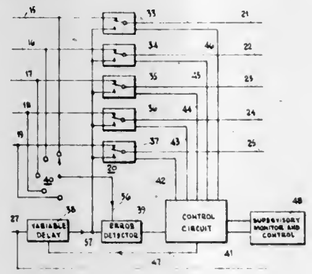
means for selectively activating said plurality of parity bit generating devices to activate those, and only those, devices corresponding to the unimplemented bytes in said array of external registers.

4,234,956

DIGITAL RELAY SYSTEMS

John A. Adderley, Holm Rook, and Dennis R. Bester, Coventry, both of England, assignors to The General Electric Company Limited, London, England

Filed Oct. 11, 1978, Ser. No. 950,514
Int. Cl.³ H04K *1/00*
U.S. Cl. 375—38 **6 Claims**



1. A digital signal transmission system comprising:

(a) transmitting apparatus at a first station and

(b) receiving apparatus at a second station

(c) for providing a plurality of normal transmission channels and a standby channel between said first and second stations,

(d) means for applying digital information signals to the transmitting apparatus for transmission over the normal channels,

(e) switching means for selecting digital information signals in respect of any one of the normal channels for transmission over said standby channel,

(f) means providing a predetermined delay in each normal transmission channel,

(g) means providing a variable delay in said standby channel,

(h) comparator means

(i) for comparing digital information signals received over said standby channel and said selected normal channel and

(ii) for adjusting said variable delay means until said received signals are substantially in synchronism, and

(i) switching means responsive to an output signal from the comparator indicating that said received signals are in synchronism to effect the replacement of the selected normal transmission channel by the standby channel.

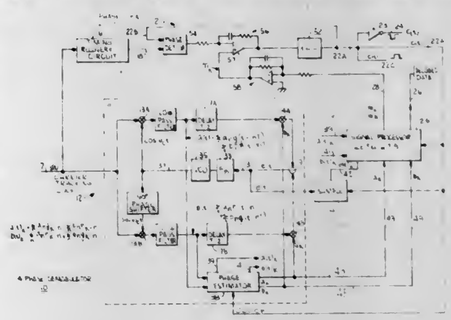
4,234,957

METHOD AND APPARATUS FOR GENERATING TIMING PHASE ERROR SIGNALS IN PSK DEMODULATORS

Robert J. Tracey, Downers Grove, Ill.; Stevan D. Bradley, Palo Alto, and William F. Hartley, Belmont, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1978, Ser. No. 966,228
Int. Cl.² H03D *3/18*; H04L *27/22, 25/40*
U.S. Cl. 375—86 **52 Claims**

21. In synchronous PSK data transmission system transmitting data pulses coded during sample intervals into the phase of a carrier frequency signal and including receiver circuitry responsive to a received data signal and a locally generated clock timing signal for producing a signal phase error signal and a differential phase signal indicating the difference $\Delta\theta_k$ between the phases θ_k of allowable phasors, of an ideal set of symbol phasors, that are associated with receive phasors in adjacent signal intervals, the improved method of producing a timing phase error signal comprising the step of combining the signal phase error signal and the differential phase signal indicating the phase difference $\Delta\theta_k$ at sample times in a manner so as to produce a timing phase error signal in sample intervals which is a measure of the difference between the phase of the local clock timing signal and that of timing in the received data signal for use in the receiver circuitry for adjusting the phase of the local timing signal there to be more nearly equal to the phase of timing in the received data signal.

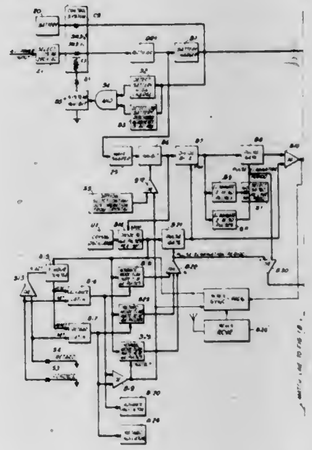


4,234,958

RADIO SYNCHRONIZED TIME-KEEPING APPARATUS AND METHOD

William F. Pipes, Smyrna; Roy V. Millsap, Roswell; Richard W. McClure, and Harrison G. Hooper, both of Atlanta, all of Ga., assignors to Lathem Time Recorder Co., Inc., Atlanta, Ga.

Filed Jun. 16, 1977, Ser. No. 807,011
Int. Cl.³ H03K *1/17*
U.S. Cl. 375—107 **24 Claims**



1. In a time controller system of the type which supplies electrical timing pulses of a predetermined pulse rate derived from a frequency source to one or a plurality of clocks for driving the respective clock mechanisms included therein in response to the number of timing pulses received and wherein said system includes means for increasing or decreasing the timing pulse rate relative to said predetermined pulse rate for

advancing or retarding the time indication of said clocks, the improvement comprising:

synchronizer circuit means coupled to said system for automatically controlling said means for increasing or decreasing the timing pulse rate following at least one timing pulse measurement period, which period is derived from signals received from a predetermined standard signal source;

radio receiver means coupled to said synchronizer circuit means and being operatively responsive to a WWV signal broadcast by the National Bureau of Standards, said receiver means providing a tone output signal at one minute intervals and wherein said synchronizer circuit means is responsive to said tone output signal and includes circuit means for generating digital signals for defining said pulse measurement period in response to said tone output signals;

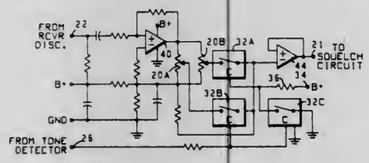
said synchronizer circuit means additionally includes means for inhibiting operation of said one or a plurality of clocks until the occurrence of the first said WWV signal following power being applied to the system.

4,234,959

DUAL THRESHOLD REPEATER SQUELCH CIRCUIT

Ralph W. Andrea, III, Sunrise; Leonard W. Bennett, Plantation, and William W. O'Connor, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 12, 1979, Ser. No. 57,047
Int. Cl.³ H04B *1/10*
U.S. Cl. 455—35 **7 Claims**



1. A dual threshold squelch control circuit for use with received signals which may contain a coded tone in addition to the intelligence signals for controlling a receiver squelch circuit, the control circuit comprising in combination:

first detector means responsive to the reception of a usable carrier signal;

second detector means responsive to the reception of a predetermined coded tone on said received signal;

low frequency amplifying means;

first circuit means for coupling an output signal of the first detector means to a signal input of the amplifier means;

switching means for controlling the amplitude of the output signal of the amplifying means;

second circuit means for coupling an output signal of the second detector means to the switching means for enabling said switching means when the coded tone is detected; and

third circuit means for coupling the controlled output of the amplifying means to the squelch circuit for enabling said squelch circuit.

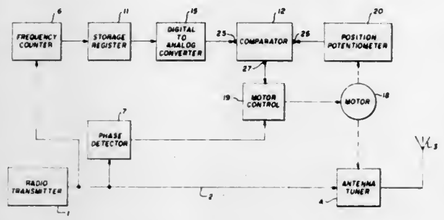
4,234,960

ANTENNA AUTOMATIC TUNING APPARATUS

Ronald W. Spilsbury, Coquitlam, Canada, and Ashton J. Spilsbury, 6691 Madrona Crescent, West Vancouver, British Columbia, Canada (V7W 2J9), assignors to Ashton James Spilsbury, West Vancouver, Canada

Filed Jul. 3, 1978, Ser. No. 921,273
Int. Cl.³ H04B *1/04*
U.S. Cl. 455—123 **3 Claims**

1. Apparatus for automatically tuning an antenna circuit for an antenna to any transmitter signal of a radio transmitter coupled to said circuit, comprising a tuner for the antenna, a motor for operating the tuner, a controller for the motor, apparatus coupled to the tuner to produce an antenna tuner position signal in accordance with the impedance of the antenna circuit, a frequency counter coupled to the circuit and adapted to produce a frequency counter signal representative of the frequency of each transmitter signal and comparing apparatus coupled to the frequency counter and to the tuner



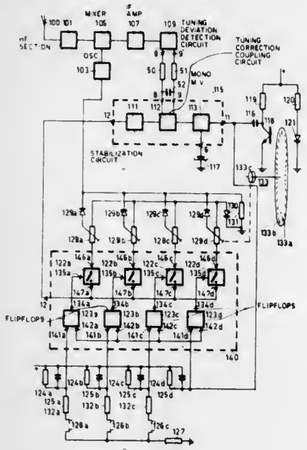
position signal apparatus and to the motor controller for comparing the frequency counter signal and the antenna tuner position signal, said comparing apparatus being adapted, when there is a significant difference between the signals being compared, to apply a coarse position control signal to the motor controller to tune the antenna circuit until there is no significant difference between the compared signals.

4,234,961

RECEIVER COMPRISING A TUNING MEMBER AND AN AUTOMATIC TUNING CORRECTION SUPPRESSION CIRCUIT

Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,789
Claims priority, application Netherlands, May 2, 1977, 7704772
Int. Cl.³ H04B *1/26*; H03J *7/02*
U.S. Cl. 455—160 **1 Claim**



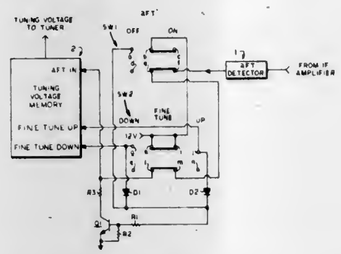
1. A receiver having a tuning member, an automatic tuning correction circuit and an automatic tuning correction suppression circuit for disabling said automatic tuning correction circuit when said tuning member is operated, said receiver further comprising a light-emitting element, a light-sensitive semiconductor arranged in a fixed position relative to said light-emitting element for the illumination thereby, a light-interrupting element operatively coupled to said tuning member and arranged in a movable manner, relative to said light-sensitive semiconductor and said light-emitting element, for selectively blocking, depending upon the position thereof, the light passing from said light-emitting element to said light-sensitive semiconductor, a differentiating network coupled to said light-sensitive semiconductor for differentiating the output thereof, said suppression circuit being coupled to an output of said differentiating circuit at least one preselection-adjusting element, and a switch-over circuit coupled to said preselection-adjusting element for switching over the receiver tuning from said preselection-adjusting element to manual tuning by said tuning member, wherein said switch-over circuit includes a control input coupled to said differentiating network whereby movement of said tuning member will result in a differentiated signal from said light-sensitive semiconductor for activating said switch-over circuit and for providing said automatic tuning correction suppression.

4,234,962

AUTOMATIC AFT DEFEAT CIRCUIT

Jon L. Hoeft, Rochester, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 17, 1979, Ser. No. 76,016
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—173 **12 Claims**



1. An automatic AFT defeat circuit for a tuning voltage memory system having both AFT and FINE TUNING inputs, the defeat circuit comprising:

a source of fine tuning voltage,

a manual FINE TUNE switch having first and second sections, each with respective first, second and third terminals wherein the switch is so arranged and constructed that the first and second terminal of each section are connected when the FINE TUNE switch is activated and the second and third terminals are connected when the FINE TUNE switch is de-activated, and wherein:

(1) the first terminal of the first section is connected to the FINE TUNING input,

(2) the second and third terminals of the first section are connected to the source of FINE TUNING voltage,

(3) the second terminal of the second section is connected to the AFT input, and

(4) the third terminal of the second section is coupled to the output of an AFT detector.

4,234,963

SYNCHRONOUS DETECTOR PARTICULARLY ADAPTED FOR A VIDEO IF SIGNAL

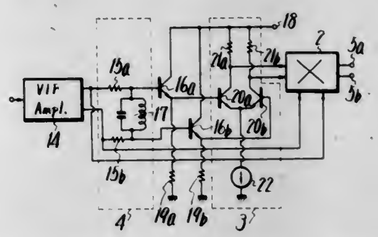
Masayuki Hongu, Kawasaki; Hiromi Kawakami, Yokohama, and Masaharu Tokuhara, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,406
Claims priority, application Japan, May 19, 1977, 52-64105[U]
Int. Cl.³ H04B *1/30*, *1/66*
U.S. Cl. 455—204 **7 Claims**

1. A synchronous detector adapted to detect an information signal modulated onto a carrier, such as a video IF signal, comprising:

means for supplying said modulated information signal in the form of a vestigial sideband signal having a broad bandwidth sideband on a first side of said carrier and a vestigial sideband on a second side of said carrier;

filter means coupled to said means for supplying, said filter means including a tuned circuit having a center frequency substantially equal to the frequency of the carrier on which said information signal is modulated and having a passband which passes said vestigial sideband and which also passes only a portion of said broad bandwidth sideband having a band of frequencies substantially equal to the band of frequencies of said vestigial sideband for limiting the spectrum of the signal passed thereby to a double sideband signal having a bandwidth substantially equal to twice said vestigial sideband;



a differential amplifier having first and second inputs for differentially receiving the double sideband signal passed by said filter means, said differential amplifier being effective to limit said double sideband signal and to thereby derive a switching carrier therefrom, the frequency of said switching carrier being equal to the frequency of the carrier on which said information signal is modulated;

emitter-follower means connected between said filter means and said limiter means for coupling said double sideband signal from said filter means to said limiter means; and

multiplier means having first and second input terminals coupled to said limiter means and to said means for supplying, respectively, for multiplying said modulated information signal with said switching carrier to obtain said information signal.

4,234,964

RADIO RECEIVER MONITORING AND TESTING APPARATUS

Richard F. Cieslak, Algonquin; John V. Balding, Palatine, and Joseph Lafreaz, Schaumburg, all of Ill., assignors to Industrial Electronics Service Company, Schaumburg, Ill.

Division of Ser. No. 795,778, May 11, 1977, Pat. No. 4,143,323.
This application Oct. 2, 1978, Ser. No. 948,054
Int. Cl.³ H04B *17/00*
U.S. Cl. 455—226 **7 Claims**

1. Monitoring and testing circuitry for attachment to a radio receiver to monitor and test a detected intermediate frequency (IF) signal from a demodulator portion of said radio receiver to determine if a radio signal received from radio transmitting equipment is within permissible modulation limits and circuitry comprising:

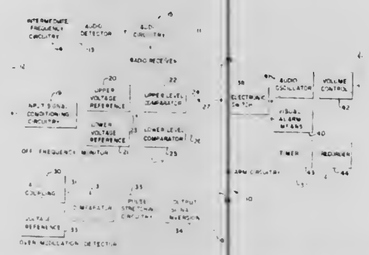
AC coupling means for receiving the detected IF signal and for blocking the DC component thereof while passing the audio frequencies;

a modulation voltage reference related in magnitude to the maximum permissible modulation level of the radio signal;

comparator means for comparing the audio signal from the AC coupling means to the modulation voltage reference, said comparator changing an output state whenever the audio signal exceeds said modulation voltage reference;

pulse stretching means between said comparator means and

an alarm means for providing a changed output state of a predetermined interval whenever a changed output state from the comparator means is received by the pulse stretching means such that intermittent as well as continu-



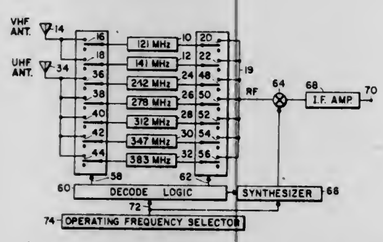
ous over modulation conditions of the radio signal are sensed, said pulse stretching means having an output; and said alarm means being responsive to the output of said pulse stretching means for indicating when either intermittent or continuous over modulation of the radio signal exists.

4,234,965

COMMUNICATION TUNING SYSTEM UTILIZING LOCAL OSCILLATOR FREQUENCY SELECTION FOR MAXIMUM RF FILTER BANDWIDTH AND METHOD THEREOF

Robert H. Bickley; Ronald C. Briggs, and Ronald C. Jost, all of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1978, Ser. No. 920,049
Int. Cl.³ H04B *1/04, 1/06*
U.S. Cl. 455—285 **6 Claims**



2. A transmitter radio frequency (RF) section for transmitting a RF signal having a frequency within a band of frequencies comprising:

(a) a plurality of bandpass filters each having a predetermined bandpass range of frequencies;

(b) logic means for selecting one of said plurality of bandpass filters for passing an RF signal within the bandpass of said bandpass filter; and

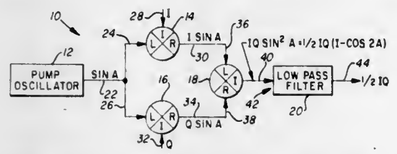
(c) a local oscillator having a frequency determined by said logic means such that said frequency of said local oscillator is placed outside of said predetermined bandpass range of said selected bandpass filter.

4,234,966

DOUBLE BALANCED DIODE MIXER WITH D.C. RESPONSE

William H. Mosley, Jr., St. Petersburg, and Carl F. Andren, Indialantic, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Feb. 26, 1979, Ser. No. 15,231
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—326 **13 Claims**



1. A direct current responsive mixing circuit for receiving two input signals and a pump signal and producing an output signal having a signal component corresponding to the product of the input signals comprising:

first, second and third mixers, each of said mixers having a first D.C. responsive port, and second and third A.C. responsive ports, each of said mixers generating a signal at one of said ports corresponding to the product of signals received at the other two of said ports thereof;

said first port on said first and second mixers for respectively receiving the two input signals;

said second port on said first and said second of said mixers connected to receive the pump signal;

said third port on said first mixer connected to one of the A.C. responsive ports of said third mixer and said third port of said second mixer connected to the remaining one of said A.C. responsive ports of said third mixer; and

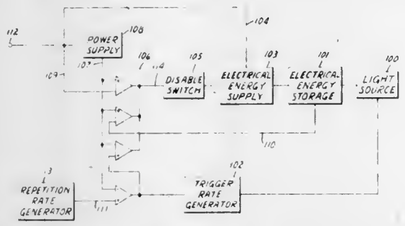
said first port on said third mixer for producing an output signal corresponding to one-half the product of the two input signals and including a signal component having a frequency which is twice the frequency of the pump signal.

4,234,967

OPTICAL SIGNAL TRANSMITTER

John P. Henschel, White Bear, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 20, 1978, Ser. No. 952,959
Int. Cl.³ H04B *9/00, 1/04;* H02J *9/02;* H01M *10/44*
U.S. Cl. 455—603 **8 Claims**



1. An optical signal transmitter having,

a light source for converting stored electrical energy into light energy in response to a trigger signal,

trigger means for providing a trigger repetition rate signal having a controlled repetition rate,

electrical energy storage means, and

electrical energy supply means for supplying electrical energy to said electrical energy storage means; wherein the improvement comprises

means for disabling said electrical energy supply means in response to a disable signal,

means for generating a reference signal,

means for generating an input signal indicative of a measured operating condition, and

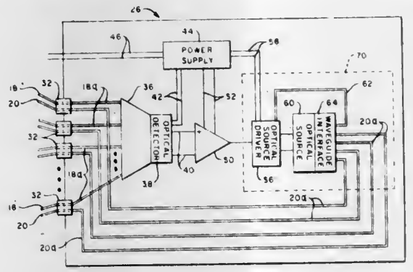
means for comparing said reference signal with said input signal to generate said disable signal for controlling said electrical energy supply means such that said light source is operable only under predetermined operating conditions.

4,234,968

OPTICAL COUPLER MODULE IN A DISTRIBUTED PROCESSING SYSTEM

Amar J. Singh, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 5, 1978, Ser. No. 939,726
Int. Cl.³ H04B *9/00;* G02B *5/172*
U.S. Cl. 455—607 **2 Claims**



1. An optical coupler for a distributed data processing system having a plurality of stations, a first transmission line from an optical source in each of said stations, and a second transmission line to an optical detector in each of said stations, the coupler comprising:

optical waveguide means for receiving optical signals from any said first transmission line and directing the optical signals to a single optical path;

means for amplifying the optical signals on the single optical path, including optical detector means for converting the optical signals on the single optical path to electrical signals, electrical amplifying means for amplifying the electrical signals from said optical detector means, and optical source means for converting the amplified electrical signals to optical signals, said optical source means including an optical source driver; and

means for distributing the amplified optical signals to each said second transmission line, including a waveguide interface for receiving the optical signals from said optical source means at one end face and having an opposite end face cooperating with a plurality of waveguide segments to provide the optical signals received at the one end face to each of the waveguide segments, one of the waveguide segments providing a feedback signal to said optical source driver, and each of the other waveguide segments providing the optical signals from the waveguide interface to an associated second transmission line.

4,234,969

BIDIRECTIONAL OPTICAL COUPLER FOR A DATA PROCESSING SYSTEM

Amar J. Singh, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 5, 1978, Ser. No. 939,727
Int. Cl.³ H04B *9/00;* G02B *5/172*
U.S. Cl. 455—607 **8 Claims**

1. In a data processing system having a plurality of stations and optical transmission means interconnecting the stations, the improvement wherein the optical transmission means comprises:

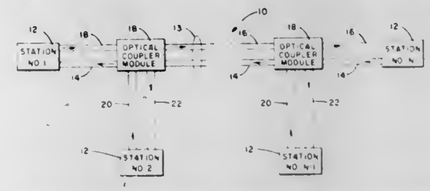
a data bus, including first transmission line means for carrying an optical signal in one direction and second transmission line means for carrying an optical signal in a second opposite direction simultaneously so that two of the stations may communicate with each other simultaneously over said first and said second transmission line means;

third transmission line means associated with each one of the stations for receiving an optical signal from an optical source in the station;

fourth transmission line means associated with each one of the stations for carrying an optical signal to an optical detector in the station; and

an optical coupler module for coupling each of the stations to said data bus, comprising:

optical beam splitting means associated with each of said first, said second, and said third transmission line means for splitting portions of the optical signals on said first and said second transmission line means for said fourth transmission line means and for splitting portions of the optical signal on said third transmission line means from the opti-



cal source for each of said first and said second transmission line means; and

optical waveguide means associated with each of said first, said second and said fourth transmission line means, said waveguide means associated with said fourth transmission line means being connected for receiving portions of the optical signals from said first and said second transmission line means and directing the portions of the optical signals from said first and said second transmission line means into a single optical path for said fourth transmission line means to said optical detector, said waveguide means associated with said first transmission line means and associated with said second transmission line means each being connected for receiving portions of the optical signal from said third transmission line means and directing the portion of the optical signal from said third transmission line means into a single optical path for said first transmission line means and a single optical path for said second transmission line means.

4,234,970

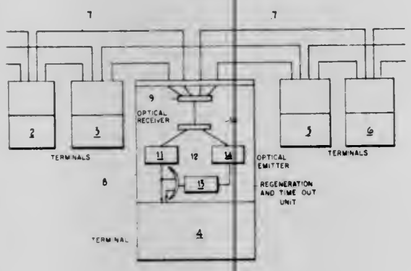
FIBER OPTIC COMMUNICATION SYSTEM

Robin D. Beasley, Chatham; Trevor J. Hall, Rochester, and Trevor A. Morgon, Rainham, all of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Oct. 27, 1978, Ser. No. 955,460
Claims priority, application United Kingdom, Nov. 3, 1977, 45764/77
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—607 **10 Claims**

1. A multi-access fibre optic communication system comprising at least a first terminal, a second terminal and a third terminal, said first terminal being connected to transmit optical signals directly to at least said second terminal and said third terminal, and said second terminal being connected to transmit optical signals directly to at least said third terminal, wherein

said second terminal includes regenerating means whereby an optical signal received by that terminal is re-transmitted to all



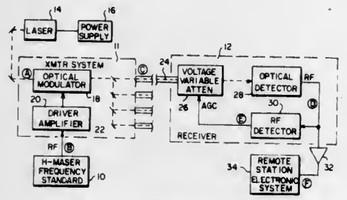
the terminals to which that terminal is connected to transmit signals directly.

4,234,971

PRECISE RF TIMING SIGNAL DISTRIBUTION TO REMOTE STATIONS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Georg F. Lutes, Jr., Glendale, Calif.

Filed Sep. 24, 1979, Ser. No. 78,521
Int. Cl.³ H04B 9/00
U.S. Cl. 455—619 **6 Claims**



1. A method of distributing a precise RF frequeny signal from a source to a plurality of remotely located stations for use at said stations in processing of data comprising,

generating a light beam,

modulating the amplitude of said light beam with said RF timing signal from said source,

dividing said modulated beam into a plurality of split beams,

transmitting each split beam to a different station over an optical fiber, and at each station

detecting the amplitude modulation of the split beam with an optical detector to produce an RF electrical signal that conforms in frequency with said RF reference signal from said source for use at the station,

detecting the average amplitude of said RF electrical signal to produce an automatic gain control signal, and

controlling an optical attenuator at the input of said optical detector for automatic gain control of said RF electrical signal without introducing any appreciable phase shift.

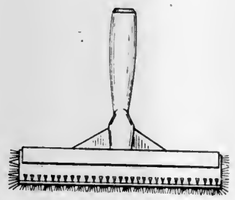
DESIGN PATENTS

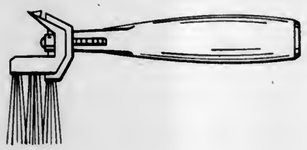
GRANTED NOV. 18, 1980

ERRATA

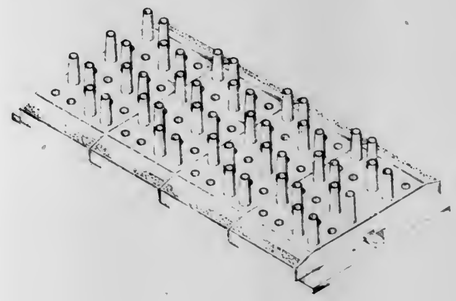
For CLASS	See PATENT NO.
D23-019	257,543
D23-019	257,544
D21-213	257,545

257,521
COMBINED BRUSH AND SCRAPER
Niccolai Piero, Pistola, Italy, assignor to Action Industries, Inc., Cheswick, Pa.
Filed May 30, 1978, Ser. No. 910,599
Term of patent 14 years
Int. Cl. D4—*01;* D7—*05*
U.S. Cl. D4—06





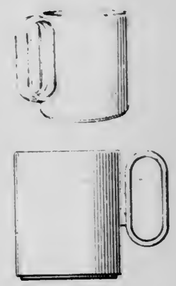
257,523
SKI POLE STORAGE RACK
James D. Allsop, 2144 Dellesta Dr., Bellingham, Wash. 98225
Filed Mar. 17, 1978, Ser. No. 887,990
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—157



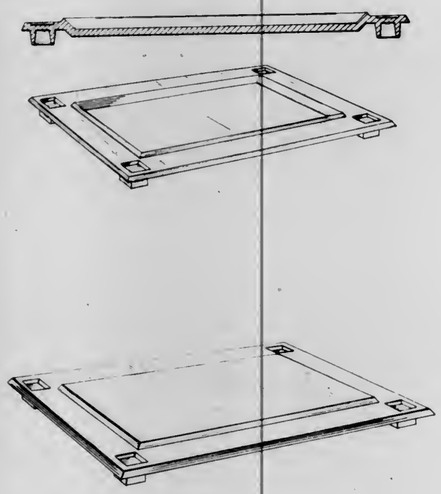
257,522
MULTIPLE SEATING UNIT
Roger K. Leib, 1064 S. Crescent Heights Blvd., LosAngeles, Calif. 90035
Filed Oct. 16, 1978, Ser. No. 951,343
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



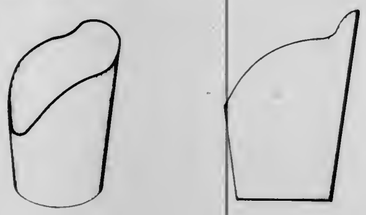
257,524
DRINKING MUG
William Heinrich, McHenry, Ill., assignor to Volna Promotions, Inc.
Filed Mar. 12, 1979, Ser. No. 19,844
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9



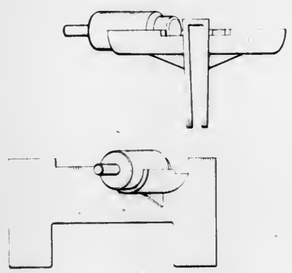
257,525
SERVING TRAY
Alwin J. Stahel, II, New Brighton, Minn., assignor to Princeton Industries Corporation, Princeton, Ind.
Filed Aug. 2, 1978, Ser. No. 930,542
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—37



257,526
COMBINED SCOOP AND SERVING CUP
David H. Herbst, Reistertown, and Patrick T. Boyle, Baltimore, both of Md., assignors to Maryland Cup Corporation, Owings Mills, Md.
Filed Oct. 20, 1978, Ser. No. 953,104
Term of patent 14 years
Int. Cl. D07—*01, 99*
U.S. Cl. D7—104



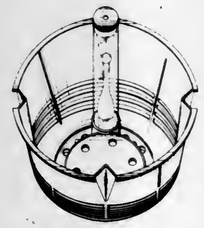
257,527
SAW CHAIN SHARPENING ASSEMBLY
Frank J. Aksamit, West Hartford, Conn., assignor to Pro Sharp Corporation
Filed Jan. 6, 1978, Ser. No. 867,627
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—71



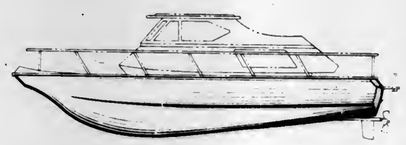
257,528
CONTAINER BIN
Richard S. Cherry, Don Mills, Canada, assignor to Phillips-Parkway Corporation, Toronto, Canada
Filed Sep. 6, 1978, Ser. No. 940,111
Claims priority, application Canada, Jul. 20, 1978, 2007784
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—431



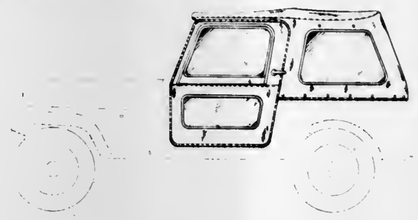
257,529
COMBINED PLANT POT LINER AND WATER LEVEL GAUGE
Joachim E. Raap, Dallas, Tex., assignor to Casa Flora, Inc., Dallas, Tex.
Filed Mar. 20, 1978, Ser. No. 888,685
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164



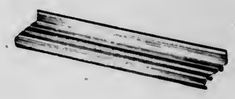
257,530
BOAT HULL
Richard D. Moyer, 45 Ardmore Ave., Hermosa Beach, Calif. 90254
Filed Jan. 23, 1978, Ser. No. 871,559
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—70



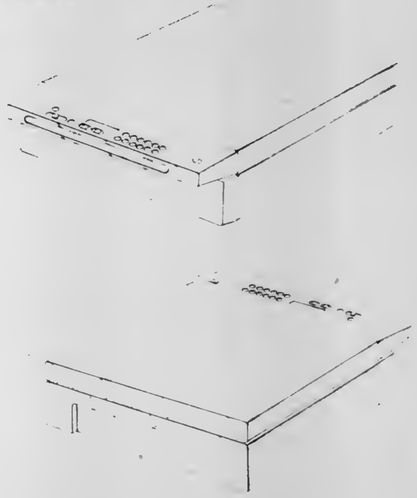
257,531
VEHICLE TOP
Kim M. Hickman, and Ralph C. Young, both of Colorado Springs, Colo., assignors to White Automotive Corporation, Colorado Springs, Colo.
Continuation-in-part of Ser. No. 695,163, Jun. 11, 1976, Pat. No. Des. 250,330. This application Jun. 14, 1978, Ser. No. 915,404
The portion of the term of this patent subsequent to Nov. 21, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



257,532
RUNNING BOARD
Merlyn C. Okland, 204 W. Broad St., Story City, Iowa 50248
Filed Dec. 14, 1978, Ser. No. 969,370
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



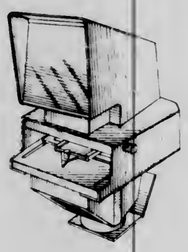
257,533
VIDEO DISK PLAYER
Ernest M. Bevilacqua, Wilton; Gordon P. Bruce, New Milford; David C. Danielson, Rowayton, all of Conn.; Daniel J. Formosa, Fort Lee, N.J.; Allen D. Hawthorne, New Canaan, Conn.; Kurt Roehrs, Clintondale, N.Y.; Paul F. Siegel, Norwalk, Conn.; Eliot F. Noyes, deceased, late of New Canaan, Conn. (by Mary D. Noyes, executrix), and by New England Merchants National Bank, executor, Milton, Mass., assignors to Discovision Associates, Costa Mesa, Calif.
Filed May 22, 1978, Ser. No. 908,594
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3



257,534
TONE-ARM
Makoto Ikeda, Machida, Japan, assignor to R & D Office Makoto Ltd., Machida, Japan
Filed Jun. 23, 1978, Ser. No. 918,557
Claims priority, application Japan, Dec. 26, 1977, 52-51814
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—27



257,535
MICROFILM READER
John R. Zellner, Menomonee, and Eino M. Lehto, Juneau, both of Wis., assignors to Bell & Howell Company, Chicago, Ill.
Filed Jun. 5, 1978, Ser. No. 912,827
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—11



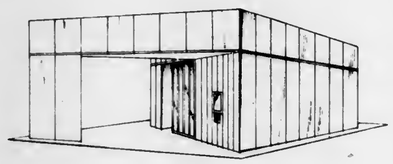
257,536
SKATEBOARD
John R. Lukes, 17914 Gard Ave., Artesia, Calif. 90701
Filed Jun. 8, 1978, Ser. No. 915,199
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227



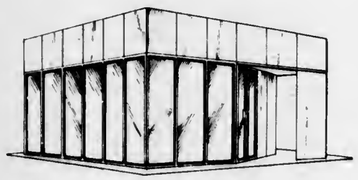
257,537
SPRAY WAND
Ho Chow, River Edge, N.J., and David Muramatsu, Long Beach, Calif., assignors to Beatrice Foods Co., Chicago, Ill.
Filed Oct. 10, 1978, Ser. No. 949,744
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



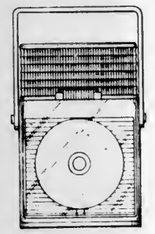
257,538
DRIVE-UP BANKING BUILDING
James S. Berman, New York, N.Y., assignor to Citibank, N.A., New York, N.Y.
Filed Sep. 22, 1978, Ser. No. 944,874
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33



257,539
WALK-UP BANKING BUILDING
James S. Berman, New York, N.Y., assignor to Citibank, N.A., New York, N.Y.
Filed Sep. 22, 1978, Ser. No. 944,875
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33



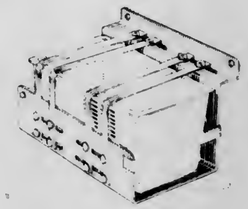
257,540
LANTERN
Wan K. Yip, Kowloon, Hong Kong, assignor to Chung Ah Manufacturing Co., Ltd., Kowloon, Hong Kong
Filed Oct. 30, 1978, Ser. No. 956,598
Claims priority, application United Kingdom, Aug. 17, 1978, 985980/78
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—41



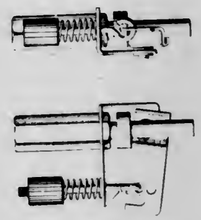
257,541
NAIL BUFFER
James H. Fox, New York; Gerald Yablans, Sands Point, and Stephan A. Tuchman, Rockville Centre, all of N.Y., assignors to Andrea Raab Corporation, Brooklyn, N.Y.
Continuation-in-part of Ser. No. 773,257, Mar. 1, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,198
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—59



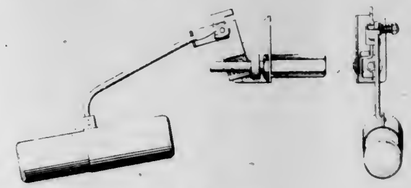
257,542
FOAL FEEDER
Andrew Gorretta, 339 Bentleyville Rd., Moreland Hills, Ohio 44022
Filed Mar. 13, 1978, Ser. No. 885,698
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



257,543
POULTRY WATERING VALVE
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed May 11, 1979, Ser. No. 38,102
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



257,544
POULTRY WATERING VALVE
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed May 11, 1979, Ser. No. 38,103
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



257,545
BALL PADDLE FOR TABLE GAME
Bertrand Castelli, c/o Myron Salisian, 251 S. Lake Ave., Ste. 701, Pasadena, Calif. 91101
Filed Sep. 25, 1978, Ser. No. 945,182
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF NOVEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
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A. B. Dick Company: *See*—
Arway, George W., 4,234,885, Cl. 346-140.00R.

A. E. Moore Company, Inc.: *See*—
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A. E. Staley Manufacturing Company: *See*—
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A/S Hoyer-Ellefsen: *See*—
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AB Dentatus: *See*—
Edwardson, Svante R., 4,233,850, Cl. 74-44.000.

AB Siwertell: *See*—
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Abbott, Bernard J.; and Whitney, John G., to Eli Lilly and Company. Method of preparing mycophenolic acid glucoside. 4,234,684, Cl. 435-75.000.

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Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,234,720, Cl. 542-413.000.
Winn, Martin; Nordeen, Carl W.; and Arendsen, David L., 4,234,594, Cl. 424-273.00P.

Abele, Alan C. Rainwater gauge. 4,233,841, Cl. 73-171.000.

Abell, Ralph N. Sandblasting apparatus. 4,233,785, Cl. 51-427.000.

Aberg, Ulf L.: *See*—
Soderqvist, Gunnar M. T.; and Aberg, Ulf L., 4,234,329, Cl. 65-2.000.

Abo, Toshimi, to Nissan Motor Company, Limited. Exhaust gas recirculation system having a solenoid duty compensation circuit for an internal combustion engine. 4,233,947, Cl. 123-571.000.

Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., to General Electric Company. Compositions comprising copolymers of a vinyl aromatic compound and an unsaturated cyclic anhydride and impact improvers. 4,234,701, Cl. 525-68.000.

ACF Chemiefarma N.V.: *See*—
Akkerman, Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., 4,234,591, Cl. 424-267.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,234,160, Cl. 251-144.000.
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Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,159, Cl. 251-144.000.

Acquarulo, Frank, Jr.: *See*—
Apuzzo, Louis J., Jr.; and Acquarulo, Frank, Jr., 4,234,104, Cl. 222-94.000.

Acree, Claude: *See*—
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Acrow-Richmond Limited: *See*—
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Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with automatic trill performance function. 4,233,875, Cl. 84-1.240.

Adams, Michael B.; Angold, John A.; Morrison, Robert B.; and Zimmerman, Robert E., to Itel Corporation. Railway car assembly composed of a series of articulately interconnected cars. 4,233,909, Cl. 105-4.00R.

Adderley, John A.; and Bester, Dennis R., to General Electric Company Limited, The. Digital relay systems. 4,234,956, Cl. 375-38.000.

Adelson, Alexander M.; Gulick, Stephen C.; and Grubin, Arnold L., to Dimensional Communications, Inc. Electrical game, polling and testing apparatus. 4,234,933, Cl. 364-900.000.

Adidas Fabrique de Chaussures de Sport: *See*—
Anderie, Wolf, 4,234,208, Cl. 280-614.000.

Adidas Sportschuhfabriken Adi Dassler KG: *See*—
Bente, Alfred; Dassler, Adolph, deceased; and Henkel, Albert, legal representative, 4,233,759, Cl. 36-59.00R.

Advanced Mineral Research AB: *See*—
Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, 4,234,380, Cl. 162-152.000.

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AFA Corporation, The: *See*—
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Agar Ginosar Electronics and Metal Products: *See*—
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Agence National de Valorisation de la Recherche (ANVAR): *See*—
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Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
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Aihara, Takayuki: *See*—
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Aisan Industry Co., Ltd.: *See*—
Arai, Hisaharu, 4,234,524, Cl. 261-41.00D.
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Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming materials. 4,234,679, Cl. 430-619.000.

Akins, Robert J., to CarboMedics, Inc. Prosthetic device couplings. 4,233,690, Cl. 3-1.500.

Akkerman, Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., to ACF Chemiefarma N.V. Analgesic and morphine-antagoniatic 9-phenyl-6,7-benzomorphans. 4,234,591, Cl. 424-267.000.

Akopian, Leonid A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

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Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Crystallized silica-alumina cogel and catalyst employing the same. 4,234,457, Cl. 252-438.000.

Alcuri, Louis F.: *See*—
Aliotta, Joseph; and Alcuri, Louis F., 4,234,339, Cl. 75-255.000.

Alden, John M.; and Williams, George C., to Alden Research Foundation. Electric graphic recorder. 4,234,886, Cl. 346-165.000.

Alden Research Foundation: *See*—
Alden, John M.; and Williams, George C., 4,234,886, Cl. 346-165.000.

Alessi, Anthony A. Notching tool. 4,233,871, Cl. 83-607.000.

Alfa Romeo S.p.A.: *See*—
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Hodgeman, Herbert H.; and Ali, Syed S., 4,234,157, Cl. 251-56.000.

Aliotta, Joseph; and Alcuri, Louis F., to Engelhard Minerals & Chemicals Corporation. Corrosion-resistant dental alloy. 4,234,339, Cl. 75-255.000.

Allen, Kenneth P.; and Redeker, Maynard S., to Mobil Oil Corporation. Determination of reflectivity and water depth for marine seismic exploration. 4,234,938, Cl. 367-24.000.

Allen, Mark S., to Hewlett-Packard Company. Automatic control of arming signal for time interval measurements. 4,234,845, Cl. 324-83.00D.

Allied Chemical Corporation: *See*—
Linares, Robert C., 4,234,376, Cl. 156-617.0SP.

Allis-Chalmers Corporation: *See*—
Quick, David C., 4,233,857, Cl. 74-665.0GA.

Allwood, Inc.: *See*—
Olson, Alvin E., 4,233,753, Cl. 34-16.500.

Almen, Rune, to Senkotherm AB. Radiator. 4,234,039, Cl. 165-67.000.

Alpha Therapeutic Corporation: *See*—
Safianoff, Albert, 4,234,095, Cl. 215-232.000.

Alsip, Bruce F. Strategy and perception game. 4,234,185, Cl. 273-243.000.

Alsthom-Unelec: *See—*
Prevotat, Gerard, 4,234,862, Cl. 336-5.000.
Aluminum Company of America: *See—*
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Amancharla, Amareswar, to Baker International Corporation. Conduit sealing system. 4,234,197, Cl. 277-124.000.
Amari, Masaharu: *See—*
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Amato, Michael G. Portable security wall. 4,233,699, Cl. 5-426.000.
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Amazonen-Werke H. Dreyer GmbH & Co. KG: *See—*
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Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., to Union Carbide Corporation. Reprocessable thermoplastic graft copolymer of propylene polymer and ethylene copolymer. 4,234,656, Cl. 428-379.000.
Amer-O-Matic Corporation: *See—*
Long, William J.; Roberts, Larry W.; and Williams, H. Ross, 4,233,800, Cl. 53-381.00R.
Amerace Corporation: *See—*
Simons, Craig W., 4,234,755, Cl. 174-19.000.
Simons, Craig W., 4,234,757, Cl. 174-73.00R.
American Can Company: *See—*
Blakeslee, Harry N., 4,233,932, Cl. 118-306.000.
American Color & Chemical Corporation: *See—*
Botros, Raouf; and Riggle, Ivan E., 4,234,483, Cl. 260-207.100.
American Cyanamid Company: *See—*
Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., 4,234,717, Cl. 536-17.00R.
American Hospital Supply Corporation: *See—*
Rippe, Delfin F., 4,234,563, Cl. 424-8.000.
American Medical Systems, Inc.: *See—*
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., 4,233,991, Cl. 128-733.000.
American Publishing Corporation: *See—*
Paparella, James B., 4,234,774, Cl. 200-330.000.
American Screen Printing Equipment Company: *See—*
Lala, Louis A., 4,233,897, Cl. 101-123.000.
American Thermometer Co., Inc.: *See—*
Hutten, James E., 4,234,084, Cl. 206-306.000.
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Davis, Thomas F., 4,234,631, Cl. 427-436.000.
Lawson, Gustaf R., 4,234,760, Cl. 174-138.00F.
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Amsted Industries Incorporated: *See—*
Ramon, Thomas; and Peck, Richard O., 4,233,745, Cl. 33-174.00L.
Rhodes, Cecil C.; and Kozar, Robert S., 4,234,429, Cl. 423-109.000.
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Amundsen, Alan R.: *See—*
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Anderie, Wolf, to Adidas Fabrique de Chaussures de Sport. Binding for securing a boot or shoe on a touring or cross-country ski. 4,234,208, Cl. 280-614.000.
Anderson, Richard D. Evaporative carburetor for combustion engines. 4,234,527, Cl. 261-102.000.
Anderson, Robert N.; and Parlee, Norman A. D., to Parlee-Anderson Corporation. Actinide nitride-fueled reactor and continuous method of operating the same. 4,234,383, Cl. 176-37.000.
Andersson, Clarence A., to United States of America, Energy. Structural silicon nitride materials containing rare earth oxides. 4,234,343, Cl. 106-73.200.
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., to Motorola, Inc. Dual threshold repeater squelch circuit. 4,234,959, Cl. 455-35.000.
Andren, Carl F.: *See—*
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Angioletti, Attilio, to Industrie Pirelli, S.p.A. Floating breakwater. 4,234,266, Cl. 405-26.000.
Angold, John A.: *See—*
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Anic, S.p.A.: *See—*
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Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,234,458, Cl. 252-441.000.
Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,234,459, Cl. 252-441.000.
Aoshima, Terutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cookers. 4,234,783, Cl. 219-441.000.
Apuzzo, Louis J., Jr.; and Acquarulo, Frank, Jr. Toothpaste dispenser having a slip clutch drive mechanism. 4,234,104, Cl. 222-94.000.
Arachi, John M.: *See—*
Reavill, Joseph A.; and Arachi, John M., 4,234,373, Cl. 156-382.000.
Arai, Hisaharu, to Aisan Industry Co., Ltd. Idle adjusting screw in carburetor. 4,234,524, Cl. 261-41.00D.
Arai, Yoshinobu: *See—*
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, 4,234,597, Cl. 424-274.000.
Arakawa, Jun: *See—*
Tada, Sugihiko; Yanagihara, Kazuhiko; and Arakawa, Jun, 4,234,392, Cl. 203-91.000.
Arakawa, Tatsumi: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.
Aratani, Matsuhiko: *See—*
Hashimoto, Masashi; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,234,724, Cl. 544-90.000.
Arbman Development AB: *See—*
Friberg, Stig E.; and Roberts, Kelvin, 4,234,437, Cl. 252-62.510.
Archer, Richard L. Real estate sign support. 4,233,769, Cl. 40-607.000.
Arendsen, David L.: *See—*
Winn, Martin; Nordeen, Carl W.; and Arendsen, David L., 4,234,594, Cl. 424-273.00P.
Arendt, Ronald H.; and Rosolowski, Joseph H., to General Electric Company. Molten salt synthesis of modified alkali niobate powders. 4,234,436, Cl. 252-62.900.
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Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., to Borg-Warner Corporation. Two fluid heat exchanger. 4,234,040, Cl. 165-164.000.
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Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, 4,234,817, Cl. 313-493.000.
Arnold, Jonathan H. Safety harness for infants. 4,234,229, Cl. 297-467.000.
Arrow, Arthur: *See—*
Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., 4,234,142, Cl. 244-3.210.
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Hryhorczuk, Dmytro, 4,233,767, Cl. 40-453.000.
Arvin Industries, Inc.: *See—*
Williams, Ronald S., 4,233,726, Cl. 29-507.000.
Arway, George W., to A. B. Dick Company. Remote ink valve. 4,234,885, Cl. 346-140.00R.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, 4,234,431, Cl. 210-500.00M.
Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Wakiyama, Yutaka, 4,234,619, Cl. 426-614.000.
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Koenuma, Masao; and Gibu, Yoshitaka, 4,233,751, Cl. 33-434.000.
Asai, Akira: *See—*
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.
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Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.
ASEA Aktiebolag: *See—*
Johansson, Birger, 4,234,864, Cl. 336-90.000.
Linderoth, Gustaf; and Wiberg, Karl-Gunnar, 4,234,624, Cl. 427-55.000.
Ashley-Butler, Inc.: *See—*
Watt, William E. R., 4,233,801, Cl. 53-453.000.
Astle, Brian; and Dischert, Robert A., to RCA Corporation. Automatic setup system for television cameras. 4,234,890, Cl. 358-10.000.
Astra Chemical Products AB: *See—*
Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., 4,234,565, Cl. 424-33.000.
Atherton, John H.; and Hodgkinson, Ian, to Imperial Chemical Industries Limited. Process and apparatus for the diazotization of amines. 4,234,478, Cl. 260-141.000.
Atkinson, William G., to Somerville Belkin Industries Limited. Method of rigidifying the tearing edge of a carton. 4,234,635, Cl. 428-80.000.
Atlantic Research Institute Limited: *See—*
Koller, Horst; Hartl, Alfons E.; and Kirchner, Gerhard, 4,234,516, Cl. 568-341.000.

Atlantic Richfield Company: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.
Wulfers, Thomas F., 4,234,434, Cl. 252-50.000.
ATO Chimie: *See—*
Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, 4,234,663, Cl. 428-517.000.
Deleens, Gerard; Guerin, Bernard; and Kern, Rene, 4,234,184, Cl. 273-235.00R.
Auberry, Horace, to Ro-Search, Inc. Footwear. 4,233,758, Cl. 36-3.00A.
Auergesellschaft GmbH: *See—*
Gronau, Manfred; Mascher, Werner; and Pampuch, Klaus, 4,233,971, Cl. 128-202.260.
Austin, Lowell W.: *See—*
Bird, Richard A.; and Austin, Lowell W., 4,234,406, Cl. 204-292.000.
Auston, David H.; Golovchenko, Jene A.; and Venkatesan, Thirumalai N. C., to Bell Telephone Laboratories, Incorporated. Dual wavelength optical annealing of materials. 4,234,356, Cl. 148-1.500.
Automated Production Systems Corporation: *See—*
Twyman, Noel H.; and Jenkins, Robert F., 4,234,283, Cl. 414-171.000.
Automation Designs, Inc.: *See—*
O'Neil, James P., 4,234,223, Cl. 294-88.000.
Autometric Incorporated: *See—*
Bunn, Robert F.; and Greve, Clifford W. (said Clifford W. Greve assors. to), 4,233,740, Cl. 33-1.00A.
Automobiles Peugeot: *See—*
Thiesce, Pierre, 4,234,205, Cl. 280-723.000.
Autovox: *See—*
Porchia, Eliseo, 4,234,139, Cl. 242-191.000.
Axel, Edwin. Container. 4,234,092, Cl. 206-523.000.
Azegami, Hitoshi: *See—*
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,234,438, Cl. 252-62.540.
B. F. Goodrich Company, The: *See—*
Dickens, Elmer D., Jr., 4,234,472, Cl. 260-45.75M.
Kroenke, William J., 4,234,473, Cl. 260-45.75R.
Kroenke, William J., 4,234,474, Cl. 260-45.75R.
Lindsay, Geoffrey A., 4,234,703, Cl. 525-211.000.
Baatz, Henning; and Rittscher, Dieter, to Steag Kernenergie GmbH. Transport and storage receptacle for radioactive waste. 4,234,798, Cl. 250-506.000.
Babbs, Frederick W., to Cox of Watford Limited. Trim lock. 4,234,035, Cl. 160-392.000.
Bachmann, Willi: *See—*
Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, 4,234,029, Cl. 152-354.0RB.
Bachner, Ernst, to Voest-Alpine Aktiengesellschaft. Arrangement at a continuous casting plant. 4,234,036, Cl. 164-420.000.
Bacsanyi, Thomas J.: *See—*
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., 4,234,200, Cl. 279-2.00A.
Bade, Heribert: *See—*
Brunn, Horst; Bade, Heribert; and Hund, Franz, 4,234,348, Cl. 106-304.000.
Baekelmans, Paul: *See—*
Cuypers, Herve; and Baekelmans, Paul, 4,234,716, Cl. 528-483.000.
Bahl, Om P., to Research Corporation. Antigen for early pregnancy test and contraceptive vaccine. 4,234,561, Cl. 424-1.000.
Bailey, Alan; and Maggs, Frederick A. P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Filter assemblies with layers of activated carbon fibrous cloth. 4,234,326, Cl. 55-278.000.
Bake, Earl A.; and Schoeneweis, E. Frederick, to Rockwell International Corporation. Plug valve construction. 4,234,011, Cl. 137-312.000.
Baker, Douglas W., to Leisure Lawn, Inc. Motorized dry fertilizer spreader. 4,234,131, Cl. 239-685.000.
Baker International Corporation: *See—*
Amancharla, Amareswar, 4,234,197, Cl. 277-124.000.
Roberts, William M., 4,234,043, Cl. 166-336.000.
Baker, John D. Clip storage. 4,234,085, Cl. 206-337.000.
Baker Perkins Holdings, Ltd.: *See—*
Mallinson, Leonard B., 4,233,901, Cl. 101-416.00A.
Baker, Robert K., to Potter Electric Signal Co. Plug-type switch. 4,234,879, Cl. 340-686.000.
Baldi, Michael O. Multi-directional marking device of the type to be used on pavement surfaces. 4,234,264, Cl. 404-11.000.
Balding, John V.: *See—*
Cieslak, Richard F.; Balding, John V.; and Lafrenz, Joseph, 4,234,964, Cl. 455-226.000.
Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Thiosubstituted pyridines. 4,234,590, Cl. 424-263.000.
Balfanz, Fredrick J., to C-R-O, Inc. Programmed welding machine with weld head speed override. 4,234,777, Cl. 219-125.100.
Balinski, Henry A., to United States Gypsum Company. Method for stretching sheet metal and structural members formed therefrom. 4,233,833, Cl. 72-180.000.
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, to Rolls-Royce Limited. Protective coating. 4,234,653, Cl. 428-328.000.
Balzano, Lucien D.; and Lepretre, Marc V. A., to Bertin & Cie. Sealing device for hydraulic piston mechanism. 4,233,886, Cl. 92-86.500.
Bamsey, Robert G.: *See—*
Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., 4,234,040, Cl. 165-164.000.
Bandag, Incorporated: *See—*
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.
Bankes, Robert B.; and Grubb, John W., to Western Electric Company, Inc. Apparatus for simultaneous soldering of a plurality of devices. 4,234,118, Cl. 228-49.00R.
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, to Saskatchewan Power Corporation. Space heating using off-peak electric heat storage. 4,234,782, Cl. 219-365.000.
Barber-Colmar Company: *See—*
Patel, Dhiru B., 4,233,716, Cl. 28-187.000.
Barbieri, Joseph C.; and Wirth, Gary J., to W. H. Brady Co. Marker sleeve assembly. 4,234,090, Cl. 206-459.000.
Barlow, George J.: *See—*
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.
Barnard, Ralph G.; and Taylor, Judson D., Jr., to Fieldcrest Mills, Inc. Napped bedding blanket. 4,233,701, Cl. 5-482.000.
Barner, Richard; and Schmid, Max, to Hoffmann-La Roche Inc. Intermediates in the synthesis of vitamin E. 4,234,490, Cl. 260-340.90R.
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., to International Telephone and Telegraph Corporation. Luminaire for residential roadway lighting. 4,234,912, Cl. 362-145.000.
Baron, Steve H. Protective headgear. 4,233,689, Cl. 2-413.000.
Barrett, Jack E. J., to A. E. Moore Company, Inc. Door operator system using counter circuit for determining limit positions. 4,234,833, Cl. 318-282.000.
Barrus, Gordon B.; and Matula, Jerry, to Printronix, Inc. Print hammer mechanism having dual pole pieces. 4,233,894, Cl. 101-93.040.
Barsted, Roger, to Coal Industry (Patents) Limited. Brake equipment. 4,234,060, Cl. 188-44.000.
Barth, Wayne E., to Pfizer Inc. Penicillanic acid 1,1-dioxides as β-lactamase inhibitors. 4,234,579, Cl. 424-246.000.
Bartl, Knut; Lill, Helmut; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Method and reagent for determining biologically active heparin in plasma. 4,234,682, Cl. 435-13.000.
Bartmann, Wilhelm: *See—*
Lattrell, Rudolf; Bartmann, Wilhelm; and Gerhards, Hermann, 4,234,584, Cl. 424-250.000.
Barton, Derek H. R.; and Hesse, Robert H., to Research Institute for Medicine & Chemistry Inc. Preparation of N,N-difluoroamines. 4,234,515, Cl. 564-114.000.
BASF Aktiengesellschaft: *See—*
Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, 4,234,560, Cl. 423-659.000.
Toussaint, Herbert; Schroeder, Wolfgang; and Franzischka, Wolfgang, 4,234,727, Cl. 544-178.000.
BASF Wyandotte Corporation: *See—*
Hirozawa, Stanley T.; O'Brien, Edward F.; and Wilson, Joe C., 4,234,440, Cl. 252-76.000.
Bash, C. Malcolm, to Prince Manufacturing Co., Inc. Propulsion device for tennis balls and like spherical objects having an improved programmed discharge of the oscillatory type. 4,233,953, Cl. 124-56.000.
Bauer, Siegfried; and Boebel, Manfred, to Richard Wolf GmbH. Trocar sleeves having a ball valve. 4,233,982, Cl. 128-347.000.
Baxter Travenol Laboratories, Inc.: *See—*
Bayham, Edward L., 4,234,026, Cl. 150-8.000.
Desecki, Vince; and Filipowicz, Carl, 4,233,974, Cl. 128-215.000.
Schnell, William J., 4,234,428, Cl. 210-321.00B.
Strobl, Frederick P., Jr.; Winchell, David A.; and DeVroom, William A., 4,234,103, Cl. 222-83.500.
Bayer Aktiengesellschaft: *See—*
Brunn, Horst; Bade, Heribert; and Hund, Franz, 4,234,348, Cl. 106-304.000.
De Meyer, Herman; Doclo, Roland; and Seynaeve, Jan, 4,234,322, Cl. 55-18.000.
Fiedler, Franz, 4,234,477, Cl. 260-112.50R.
Harnisch, Horst; and Brack, Alfred, 4,234,488, Cl. 260-326.270.
Kramer, Erich, 4,234,480, Cl. 260-157.000.
La Spina, Andrea; Dietrich, Werner; and Schliebs, Reinhard, 4,234,694, Cl. 521-107.000.
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, 4,234,479, Cl. 260-145.00B.
Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, 4,234,572, Cl. 424-180.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.
Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Seal for flexible container. 4,234,026, Cl. 150-8.000.
Bayles, John J.: *See—*
Hollan, Mark E.; and Bayles, John J., 4,234,044, Cl. 169-14.000.
Bays, Marvin J. Protective device for automobiles. 4,234,222, Cl. 293-124.000.
Beale, Allan A.: *See—*
La Vance, Cecil N.; and Beale, Allan A., 4,234,924, Cl. 364-460.000.

Beasley, Robin D.; Hall, Trevor I.; and Morgon, Trevor A., to Elliott Brothers (London) Limited. Fiber optic communication system. 4,234,970, Cl. 455-607.000.
Beck, Christian A., to Pitney Bowes Inc. Hot roll fuser. 4,234,248, Cl. 355-3.0FU.
Beck, Gunther: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.
Beck, James C.; and Nielsen, Harrie W., to Singer Company, The. Optical illumination and distortion compensator. 4,234,891, Cl. 358-104.000.
Beckert, Alexander; and Dudziak, Ernst, to Reinhard Mohn GmbH. Process and apparatus for the production of book blocks. 4,234,178, Cl. 270-45.000.
Beebe, Ronald. Long distance telephone call security system. 4,234,764, Cl. 179-90.00D.
Beecham Group Limited: *See—*
Gardner, Derek V., 4,234,726, Cl. 544-151.000.
Beeche, Gregory L. Mobile suspension scaffold system. 4,234,055, Cl. 182-63.000.
Beeghly, Richard M.: *See—*
Van Nieuwal, John G.; Montgomery, Edward L.; and Beeghly, Richard M., 4,234,030, Cl. 152-354.00R.
Beeson, Justin L., to United States of America, Energy. Process for changing caking coals to noncaking coals. 4,234,319, Cl. 44-1.00R.
Beeson, Justin L.: *See—*
Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 208-8.00R.
Beggs, Donald: *See—*
Scarlett, John C.; and Beggs, Donald, 4,234,169, Cl. 266-156.000.
Behle, Gunter R., to ACF Industries, Incorporated. Operating handle for bottom operated tank car valve having movable connection portion. 4,234,160, Cl. 251-144.000.
Behle, Gunter R.: *See—*
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,158, Cl. 251-144.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,159, Cl. 251-144.000.
Beitz, Elden W. Carburetion in an internal combustion engine. 4,233,945, Cl. 123-585.000.
Belinko, Keith: *See—*
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.
Bell Telephone Laboratories, Incorporated: *See—*
Auston, David H.; Golovchenko, Jene A.; and Venkatesan, Thirumalai N. C., 4,234,356, Cl. 148-1.500.
Bosik, Barry S., 4,234,762, Cl. 179-18.0HB.
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.
Bellaplast GmbH: *See—*
Heni, Wolfgang; and Wolf, Peter, 4,233,868, Cl. 83-126.000.
Bellus, Daniel: *See—*
Greuter, Hans; Martin, Pierre; and Bellus, Daniel, 4,234,517, Cl. 568-381.000.
Bender, Jeffrey R.: *See—*
Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., 4,234,306, Cl. 433-55.000.
Bendix Autolite Corporation: *See—*
Romine, Donald J., 4,234,542, Cl. 422-98.000.
Bendix Corporation, The: *See—*
Harper, Patrick D., 4,234,903, Cl. 361-154.000.
Benezech, Jacques, to NOVI P.B. Societe Anonyme. Electrical condenser. 4,234,905, Cl. 361-307.000.
Benkwitt, Frances C.; and Sherif, Fawzy G., to Stauffer Chemical Company. Method and composition for inhibiting plaque. 4,234,568, Cl. 424-54.000.
Bennett, Barry: *See—*
Calhoun, Donald F.; and Bennett, Barry, 4,234,888, Cl. 357-45.000.
Bennett, Leonard W.: *See—*
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., 4,234,959, Cl. 455-35.000.
Bennion, Douglas N.; and Wang, Su-Chee S., to University of California, The Regents of the. Battery and method for fabricating same. 4,234,667, Cl. 429-81.000.
Benno, Edward L.: *See—*
Platt, John R.; and Benno, Edward L., 4,234,082, Cl. 206-150.000.
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., to Boeing Company, The. Motor quick-change chuck system for tool having cylindrically shaped adapter portion. 4,234,277, Cl. 408-226.000.
Bente, Alfred; Dassler, Adolph, deceased; and by Henkel, Albert, legal representative, to Adidas Sportschuhfabriken Adi Dassler KG. Outsoles for sports shoes, particularly for use on artificial grass. 4,233,759, Cl. 36-59.00R.
Berardinelli, Frank M.: *See—*
Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,234,708, Cl. 525-444.000.
Berdan, Betty L.; and King, William M., to Gould Inc. Metal composites and laminates formed therefrom. 4,234,395, Cl. 204-12.000.
Berg, Josef, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injection pump, especially for internal combustion engines. 4,234,292, Cl. 417-214.000.
Berg, Odd. Lockable buckle for belts, straps and the like. 4,233,713, Cl. 24-191.000.
Berg, Ramon A.: *See—*
Bjorklund, Lowell L.; Berg, Ramon A.; and Friedland, George A., 4,233,880, Cl. 85-41.000.
Berge, Richard W. Golf bag club cover. 4,234,025, Cl. 150-1.50R.
Berger, Leo; and Scott, John W., to Hoffmann-La Roche Inc. Process of making a carbazole acetic acid. 4,234,487, Cl. 260-315.000.
Bergstrom, Gary, to DBX, Inc. Signal correction for electrical gain control systems. 4,234,804, Cl. 307-229.000.
Berkowitz, Irving M. Fabric hanger. 4,234,088, Cl. 206-408.000.
Bernauer, Karl; Link, Helmut; and Stohler, Harro, to Hoffmann-La Roche Inc. Antiandrogenic and schistosomicidal imidazolidine derivatives. 4,234,736, Cl. 548-314.000.
Berner, Godwin: *See—*
Rody, Jean; and Berner, Godwin, 4,234,728, Cl. 544-198.000.
Bernhard, Rudolf; and Bonjour, Hans, to Glasmatec AG. Apparatus for automatically sealing insulation glass panels. 4,234,372, Cl. 156-356.000.
Bernholdt, Harry F.: *See—*
Murphy, Robert E.; and Bernholdt, Harry F., 4,234,647, Cl. 428-220.000.
Berthold, Heinz; and Zimmer, Karl E., to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft. Equipment for removing bulk material from a dump. 4,234,077, Cl. 198-712.000.
Berti, Marisa: *See—*
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Bertin & Cie: *See—*
Balzano, Lucien D.; and Lepretre, Marc V. A., 4,233,886, Cl. 92-86.500.
Bester, Dennis R.: *See—*
Adderley, John A.; and Bester, Dennis R., 4,234,956, Cl. 375-38.000.
Bethlehem Steel Corporation: *See—*
Lynn, James B.; Homberg, Otto A.; and Burcaw, Kenneth R., Jr., 4,234,389, Cl. 201-30.000.
MacRae, Donald R.; and Gold, Richard G., 4,234,334, Cl. 75-10.00R.
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., to Ralston Purina Company. Feed intake limiting fat for ruminants. 4,234,604, Cl. 426-2.000.
BFG Glassgroup: *See—*
Taupin, Pierre; Glineur, Michel; and Florean, Jean, 4,234,330, Cl. 65-21.000.
BICC Limited: *See—*
Edwards, Derek R.; and Gosling, Cyril H., 4,234,754, Cl. 174-14.00R.
Bichler, Josef: *See—*
Falbesaner, Egon; Bichler, Josef; and Wimmer, Eberhard, 4,234,422, Cl. 210-713.000.
Bickel, Hans: *See—*
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., to Motorola, Inc. Communication tuning system utilizing local oscillator frequency selection for maximum RF filter bandwidth and method thereof. 4,234,965, Cl. 455-285.000.
Bies, Sylvester W., to Stanley Works, The. Retractable blade knife. 4,233,734, Cl. 30-162.000.
Billenstein, Siegfried; Kukla, Bruno; and Stuhler, Herbert, to Hoechst Aktiengesellschaft. Process for the manufacture of fatty acid nitriles and glycerol from glycerides, especially from natural fats and oils. 4,234,509, Cl. 260-465.200.
Billet, Rene, to Societe Anonyme Francaise du Ferodo. Clutch release bearing. 4,234,067, Cl. 192-98.000.
Binks Manufacturing Company: *See—*
Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., 4,234,290, Cl. 415-145.000.
Biotechnologie Aktiengesellschaft fur Emulsan: *See—*
Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, 4,234,689, Cl. 435-101.000.
Birchall, William R.: *See—*
Frampton, Orville D.; and Birchall, William R., 4,234,748, Cl. 568-901.000.
Bird, Richard A.; and Austin, Lowell W., to National Steel Corporation. Nonplating cathode and method for producing same. 4,234,406, Cl. 204-292.000.
Birth, Arden: *See—*
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.
Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. 2-Chloroethyl phosphonate compositions. 4,234,696, Cl. 521-108.000.
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Bishop, Richard N.: *See—*
Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., 4,233,933, Cl. 118-314.000.
Bisping, Hans-Jurgen. Implantable electrode. 4,233,992, Cl. 128-785.000.
Bisset, Claude O., to Hausler Scientific Instruments (Proprietary) Limited. Map reading device. 4,233,741, Cl. 33-1.00N.
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Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.
Bjorklund, Lowell L.; Berg, Ramon A.; and Friedland, George A., to Illinois Tool Works Inc. Stainless steel drill screw. 4,233,880, Cl. 85-41.000.

Blake, Donald F., to Coal Industry (Patents) Limited. Brake equipment. 4,234,063, Cl. 188-181.00T.
Blake, Stephen D.; and Lewis, Katherine J., to Xonics, Inc. Composite lamination film for electrophoretically toned images. 4,234,644, Cl. 428-204.000.
Blakeslee, Harry N., to American Can Company. Controlled dispersions of coatings. 4,233,932, Cl. 118-306.000.
Blazewicz, Andrzej: *See—*
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.
Bock, Francis X., to Kollmorgen Technologies Corporation. Current limiter. 4,234,802, Cl. 328-171.000.
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Snyder, Richard C.; and Bodinger, Donald C., 4,233,795, Cl. 52-514.000.
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Boehme, Detlef R., to Varian Associates, Inc. Pulse damper. 4,234,427, Cl. 210-198.00C.
Boehringer Mannheim GmbH: *See—*
Bartl, Knut; Lill, Helmut; and Ziegenhorn, Joachim, 4,234,682, Cl. 435-13.000.
Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.
Boeing Company, The: *See—*
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,234,277, Cl. 408-226.000.
Deminet, Czeslaw; and Oettel, Richard E., 4,234,351, Cl. 136-89.0EP.
Frank, Ed, 4,234,374, Cl. 156-459.000.
Boersma, Michael A. M.; and Sie, Swan T., to Shell Oil Company. Process for upgrading of Fischer-Tropsch products. 4,234,412, Cl. 208-80.000.
Boesen, Raymond J., to Stewart-Warner Corporation. Incandescent display system. 4,234,914, Cl. 362-240.000.
Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. 1-Trimethylsilylphenyl-3-mono- and -di-halobenzoyl-ureas, insecticidal compositions containing them and their use in controlling insect pests. 4,234,573, Cl. 424-184.000.
Bogner, Robert E.: *See—*
Eshraghian, Kamran; and Bogner, Robert E., 4,234,923, Cl. 364-436.000.
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Bohn, Gerhard: *See—*
Gottzein, Eveline; Roche, Christian; and Bohn, Gerhard, 4,233,905, Cl. 104-281.000.
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Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.
Boissicat, Claude M., to Contrel Corporation. Dip-handling apparatus. 4,234,418, Cl. 209-542.000.
Bolt Associates, Inc.: *See—*
Chelminski, Stephen V., 4,234,052, Cl. 181-120.000.
Bonar, Thomas G. Self-closing hinge apparatus. 4,233,708, Cl. 16-152.000.
Bondar, Petr G.; and Zavadskaya, Anna S. Process for activating a catalyst. 4,234,462, Cl. 252-463.000.
Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., to Singer Company, The. Vehicle simulator optical pick-up head. 4,233,755, Cl. 35-11.00R.
Bonjour, Hans: *See—*
Bernhard, Rudolf; and Bonjour, Hans, 4,234,372, Cl. 156-356.000.
Boop, Gene T., to Sie, Inc. Selective fire perforating gun switch. 4,234,768, Cl. 200-52.00R.
Booth, John L.; and Rittmaster, Peter A., to International Honeycomb Corporation, by said John L. Booth. Packaging machine. 4,233,802, Cl. 53-475.000.
Borchard, Heinz, to Teldec Telefunken-Decca Schallplatten GmbH. Method for producing an information carrier disc. 4,234,394, Cl. 204-5.000.
Borders, Donald B.: *See—*
Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., 4,234,717, Cl. 536-17.00R.
Borg-Warner Corporation: *See—*
Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., 4,234,040, Cl. 165-164.000.
Guzy, Raymond L., 4,234,758, Cl. 174-84.00R.
Borom, Marcus P.; and Schultz, John, Jr., to General Electric Company. Magnesia insulated heating elements and method of making the same. 4,234,786, Cl. 219-544.000.
Bosik, Barry S., to Bell Telephone Laboratories, Incorporated. Ring trip detector circuit. 4,234,762, Cl. 179-18.0HB.
Bostwick, Robert: *See—*
Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., 4,234,656, Cl. 428-379.000.
Botros, Raouf; and Riggle, Ivan E., to American Color & Chemical Corporation. N-(3-Chloro-4-[2,6-dichloro-4-nitrophenyl]azo}-2-methyl phenyl)-β-alanine, methyl ester. 4,234,483, Cl. 260-207.100.
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, to Carl Zeiss-Stiftung. Apparatus for the simultaneous photometric determination of a plurality of elements in a liquid sample. 4,234,252, Cl. 356-73.000.
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, to Bristol-Myers Company. Process for the preparation of the crystalline monohydrate of 7-[D-amino-(p-hydroxyphenyl]acetamido)-3-methyl-3-cephen-4-carboxylic acid. 4,234,721, Cl. 544-30.000.
Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., to AMP Incorporated. Method of accurately positioning fiber cables within ferrules. 4,233,724, Cl. 29-428.000.
Bowman, Noel T.: *See—*
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.
Bowman, Noel Trevor: *See—*
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.
Brack, Alfred: *See—*
Harnisch, Horst; and Brack, Alfred, 4,234,488, Cl. 260-326.270.
Brackmann, Warren A.; and DiIanni, Daniel, to Rothmans of Pall Mall Canada Limited. Cutting leaf tobacco. 4,233,996, Cl. 131-140.00R.
Brad Ragan, Incorporated: *See—*
Christman, Harold E., 4,234,371, Cl. 156-96.000.
Bradley, John J.: *See—*
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.
Bradley, Robert C.: *See—*
Peer, George J.; and Bradley, Robert C., 4,234,430, Cl. 210-489.000.
Bradley, Stevan D.: *See—*
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., 4,234,957, Cl. 375-86.000.
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., to American Medical Systems, Inc. Urethral catheter puller. 4,233,991, Cl. 128-733.000.
Brandenberger, Albert: *See—*
Gehring, Rudolf; and Brandenberger, Albert, 4,234,138, Cl. 242-131.100.
Brandenstein, Manfred: *See—*
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.
Brandoli, Luigi. Structure for a motor vehicle seat. 4,234,173, Cl. 267-103.000.
Brandt, Gert M.; and Hansen, Soren R., to Aktieselskabet MEC Mekanisk Elektrisk Compagni af 1975. Electrical switch having a floating bridge member. 4,234,769, Cl. 200-67.0DB.
Brannan, James R., to Diamond Shamrock Corporation. Method for recovery and use of zinc from a leach solution. 4,234,401, Cl. 204-149.000.
Branovich, Louis E.: *See—*
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.
Brantingham, George L.: *See—*
Wiggins, Richard H., Jr.; and Brantingham, George L., 4,234,761, Cl. 179-1.0SM.
Braun Aktiengesellschaft: *See—*
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.
Bredeweg, Roger L.; and Sitek, George J., to Leco Corporation. Combustion chamber cleaning apparatus. 4,234,541, Cl. 422-78.000.
Breining, Tibor: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.
Breiter, Manfred W.: *See—*
Park, Dong-Sil; Breiter, Manfred W.; and King, Rendall N., 4,234,668, Cl. 429-163.000.
Bremer, Noel J.: *See—*
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,234,461, Cl. 252-462.000.
Brennen, Michael B.; and Gyugyi, Laszlo, to Westinghouse Electric Corp. Voltage regulator and flicker compensator. 4,234,842, Cl. 323-119.000.
Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Round-about game apparatus. 4,234,181, Cl. 273-1.00R.
Brewer, Douglas M.; Mawson, Alan; and Carter, William S., to Nairn Floors Limited. Wall and floor coverings comprising a substrate formed from comminuted, recycled, fiber-reinforced foam-containing sheets. 4,234,366, Cl. 156-79.000.
Bridgestone Tire Co., Ltd.: *See—*
Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, 4,234,695, Cl. 521-107.000.
Briggs, Ronald C.: *See—*
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., 4,234,965, Cl. 455-285.000.
Brinkley, Robert G., to Polaroid Corporation. Process for preparing metal phthalocyanine compounds. 4,234,486, Cl. 260-314.500.
Brissey, David C.: *See—*
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., 4,234,007, Cl. 137-101.190.
Bristol-Myers Company: *See—*
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,234,721, Cl. 544-30.000.
Kavadias, Gerry, 4,234,731, Cl. 46-97.000.

British Industrial Plastics Limited: *See—*
Inverarity, George; and Ogden, Dennis H., 4,234,698, Cl. 521-188.000.

British Petroleum Company Limited, The: *See—*
Clinton, John S., 4,233,924, Cl. 114-259.000.

Brittain, John E.: *See—*
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, 4,234,537, Cl. 422-26.000.

Bromberg, Howard M. Slide calculator. 4,233,768, Cl. 40-489.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.

Brouard, Claude M. H. E.; and Stiot, Jean-Pierre H., to Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle. Substituted 3-carbalkoxy 4-alkylamino-azobenzene compound as disperse dyestuffs for synthetic fibers. 4,234,482, Cl. 260-187.000.

Brown, David, to Halcon Research and Development Corp. Process for preparing cellulose acetate. 4,234,718, Cl. 536-69.000.

Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., to Roberts Corporation. Mold conveyor drive assembly. 4,233,907, Cl. 104-172.00B.

Brown, Michael J., to GAF Corporation. Phenoxybenzylphosphonium salt pesticides. 4,234,576, Cl. 424-211.000.

Brown, Thomas H.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Pyrimidine compounds. 4,234,588, Cl. 424-251.000.

Browne, Sidney. Telephone station carrier system. 4,234,950, Cl. 370-71.000.

Browse, Edward, to Inventec Licensing BV. Seats for children. 4,234,152, Cl. 248-415.000.

Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., to Honeywell Information Systems Inc. Intersystem communication link. 4,234,919, Cl. 364-200.000.

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Schuierer, Manfred, 4,234,311, Cl. 8-138.000.

Brunn, Horst; Bade, Heribert; and Hund, Franz, to Bayer Aktiengesellschaft. Process for the production of iron oxide red pigments. 4,234,348, Cl. 106-304.000.

Bruns, James A., to Uniroyal, Inc. Mechanical power transmission system. 4,233,852, Cl. 474-153.000.

Bryant, Robert T.: *See—*
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.

Buchman, Russell, to Diamond Shamrock Corporation. Method of preparing ketoxime carbamates. 4,234,514, Cl. 564-255.000.

Buckman, John D., to Buckman Laboratories, Inc. Dialkylamino-N,N-bis(phosphonoalkylene)alkylamines and use in aqueous systems as precipitation and corrosion inhibitors. 4,234,511, Cl. 260-502.500.

Buckman Laboratories, Inc.: *See—*
Buckman, John D., 4,234,511, Cl. 260-502.500.
Johnston, Titus M., 4,234,665, Cl. 428-541.000.

Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., to Research Corporation. Application of protein-protein interaction as an assay for the detection of cancer. 4,234,476, Cl. 260-112.00R.

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Moshtev, Rafail V.; Budevska, Hrisanta N.; Ivanova, Latinka T.; and Yankova, Radka D., 4,234,623, Cl. 427-54.100.

Bueding, Ernest; Werbel, Leslie M.; and Worth, Donald F., to Edna McConnell Clark Foundation. 2-Chloro-4-(4-lower alkyl-1-piperazinyl)benzenemethanol, N^{ω}-oxides and methods for their preparation. 4,234,583, Cl. 424-250.000.

Bugarcic, Helmut, to Waggon Union GmbH. Asymmetrical subway vehicle. 4,233,904, Cl. 104-138.00R.

Bungard, Stephen J.; and Byrom, David, to Imperial Chemical Industries Limited. β-Galactosidase. 4,234,687, Cl. 435-99.000.

Bunn, Robert F.; and Greve, Clifford W., to Autometric Incorporated, by said Clifford W. Greve. Photogrammetric plotter and constraint free drive system therefore. 4,233,740, Cl. 33-1.00A.

Burcaw, Kenneth R., Jr.: *See—*
Lynn, James B.; Homberg, Otto A.; and Burcaw, Kenneth R., Jr., 4,234,389, Cl. 201-30.000.

Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I. Electromagnetic brake. 4,234,809, Cl. 310-105.000.

Burger, Norman D., to Mardesich, Nicholas A., a part interest. Method and apparatus for inserting a flexible inner container within a rigid outer container. 4,233,725, Cl. 29-451.000.

Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., to Atlantic Richfield Company. High pressure oxygen aqueous phase catalyst demetallization. 4,234,452, Cl. 252-419.000.

Burley, Joseph W.: *See—*
Groenenboom, Cornelis J.; Huysmans, Willem G. B.; Burley, Joseph W.; Hutton, Ronald E.; and Jolley, Michael R. J., 4,234,501, Cl. 260-429.700.

Burnell, Laurence K.; Hyde, James D.; Kolak, Nicholas P.; and Gibbs, Richard E., to Nox Research Corp. Control of nitrogen oxides from stationary source effluents. 4,234,548, Cl. 423-235.000.

Burroughs Corporation: *See—*
Chu, Ke-Chiang; and Sharp, Richard S., 4,234,918, Cl. 364-200.000.

Burroughs Wellcome Co.: *See—*
Faulkner, Douglas E., 4,234,313, Cl. 23-230.00B.

Busacca, Guido; Luparello, Pietro; Marranca, Lucio; and Sanfilippo, Michele, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for linearly tuning a microwave oscillator. 4,234,855, Cl. 331-90.000.

Bussey, Harry, Jr. Foamable thermoplastic stick and foamed element made therefrom. 4,234,657, Cl. 428-400.000.

Butin, Henri, to Thomson-CSF. Threshold device for distinguishing the white level from the black level in an input signal delivered by a reading head for analyzing a document. 4,234,867, Cl. 340-146.3AG.

Byrom, David: *See—*
Bungard, Stephen J.; and Byrom, David, 4,234,687, Cl. 435-99.000.

C. A. Weidmuller KG: *See—*
Wilmes, Manfred; Obst, Rudiger; and Kretzschmar, Wolfgang, 4,234,239, Cl. 339-198.0GA.

C-R-O, Inc.: *See—*
Balfanz, Fredrick J., 4,234,777, Cl. 219-125.100.

Cacho, Gibson C. Speaker assembly. 4,234,766, Cl. 179-115.50R.

Caille, Gilles, to Societe Anonyme Expandet. Distributing machine for placing stored objects on grill stands. 4,233,799, Cl. 53-154.000.

Cairns, Edward C.: *See—*
Welland, Frederick J., Jr.; and Cairns, Edward C., 4,234,941, Cl. 367-116.000.

Cal Pak Industries, Inc.: *See—*
Pastore, Ronald, 4,234,101, Cl. 221-241.000.

Calbiochem-Behring Corp.: *See—*
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., 4,234,680, Cl. 435-7.000.

Calhoun, Donald F.; and Bennett, Barry, to Hughes Aircraft Company. Multi-level large scale complex integrated circuit having functional interconnected circuit routed to master patterns. 4,234,888, Cl. 357-45.000.

Calspan Corporation: *See—*
Stoddard, Frank J., 4,234,857, Cl. 331-94.50G.

Camilleri, Thomas M. Liner for deck chute. 4,234,182, Cl. 273-42.00R.

Campbell, Michael F.: *See—*
Howard, Paulette A.; Campbell, Michael F.; and Zollinger, David T., 4,234,620, Cl. 426-656.000.

Campbell, Russell, to Canada, Her Majesty the Queen in right of. Interleaved binary coded signal translation device. 4,234,930, Cl. 364-724.000.

Canada, Her Majesty the Queen in right of: *See—*
Campbell, Russell, 4,234,930, Cl. 364-724.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Royce, John H.; Rowarth, John E.; and Walker, John, 4,233,780, Cl. 49-485.000.
Sewell, Richard B. H.; and Kidd, Derek J., 4,234,637, Cl. 428-131.000.

Canadian Patents and Development Limited: *See—*
Chow, Suezone, 4,234,658, Cl. 428-403.000.

Canale, Albert S.: *See—*
Canale, Ralph D.; and Canale, Albert S., 4,234,443, Cl. 252-135.000.

Canale, Michael A.: *See—*
Canale, Ralph D.; and Canale, Albert S., 4,234,443, Cl. 252-135.000.

Canale, Ralph D.; and Canale, Albert S., to Canale, Michael A. Composition and a method useful for making a fountain solution for lithographic printing operations. 4,234,443, Cl. 252-135.000.

Canfield, Sheldon A., to Owens-Corning Fiberglas Corporation. Apparatus for measuring tension in a linear material. 4,233,837, Cl. 73-144.000.

Cannon, Lee E., to Dana Corporation Stepping motor control circuit. 4,234,830, Cl. 318-39.000.

Canon Kabushiki Kaisha: *See—*
Kanaiwa, Kiyoshi; and Matsumoto, Kozo, 4,234,931, Cl. 364-900.000.
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.
Sato, Hiroshi; and Yamamoto, Hironori, 4,234,175, Cl. 269-73.000.

Canyon Corporation: *See—*
Tada, Tetsuya; and Amari, Masaharu, 4,234,127, Cl. 239-333.000.

Carabateas, Philip M.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,234,725, Cl. 544-140.000.

CarboMedics, Inc.: *See—*
Akins, Robert J., 4,233,690, Cl. 3-1.500.

Cardono, Angelo. Apparatus for aiding the cutting of a rubber mold. 4,234,174, Cl. 269-37.000.

Cardrei Corporation: *See—*
Dreisinger, Thomas E.; and Carson, William L., 4,233,844, Cl. 73-379.000.

Carl Zeiss-Stiftung: *See—*
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.

Carlisle Corporation: *See—*
Harlow, Norman R., 4,234,759, Cl. 174-104.000.

Carlsen, George D., II, to EVC, Inc. Circuit and method for paralleling power transistors. 4,234,805, Cl. 307-254.000.

Carlson, Denny L.: *See—*
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., 4,234,007, Cl. 137-101.190.

Carnaby, Garth A., to Wool Research Organization of New Zealand (Inc.). Needle stitching. 4,233,917, Cl. 112-222.000.

Carrier, Vernon J. Wall fastener structure. 4,233,881, Cl. 85-81.000.

Carson, William L.: *See—*
Dreisinger, Thomas E.; and Carson, William L., 4,233,844, Cl. 73-379.000.

Carter, Harold V.; and Durfee, Frederick G., to Process Analyzers, Inc. Flame photometric detector adapted for use in hydrocarbon streams. 4,234,257, Cl. 356-417.000.

Carter, William S.: *See—*
Brewer, Douglas M.; Mawson, Alan; and Carter, William S., 4,234,366, Cl. 156-79.000.

CAS Products, Inc.: *See—*
Fairbanks, Everitt E., 4,233,965, Cl. 128-1.500.

Casad, Edward F.; and Casad, Thomas R., to Ajax Machine & Welding Co. Safety release for water skiing tow line. 4,233,923, Cl. 114-253.000.

Casad, Thomas R.: *See—*
Casad, Edward F.; and Casad, Thomas R., 4,233,923, Cl. 114-253.000.

Caterpillar Tractor Co.: *See—*
Martin, Gary G.; and Smith, James C., 4,234,198, Cl. 277-145.000.
McGee, Mary Ann C., 4,234,908, Cl. 362-66.000.

Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, to ATO Chimie. Thermoplastic multi-layer foil structure. 4,234,663, Cl. 428-517.000.

Catuneanu, Vasile: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Caugant, Jean; and Dale, Jacques, to Compagnie Generale de Radiologie. Film changer for X-ray apparatus. 4,234,796, Cl. 250-468.000.

Cederblad, Claes A., to Spanset Inter AG. Clutched winch. 4,234,166, Cl. 24-68.0CD.

Celanese Corporation: *See—*
Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,234,708, Cl. 525-444.000.
Miano, Ralph R.; and Keith, Charles H., 4,233,993, Cl. 131-2.000.

Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Patterned epitaxial regrowth using overlapping pulsed irradiation. 4,234,358, Cl. 148-1.500.

Centerline Steering Safety Axle Corporation, The: *See—*
Inbody, Melvin R., 4,234,236, Cl. 301-6.00W.

Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych Komag: *See—*
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.

Chabot, Jean-Marie, to Les Industries Procinciales Ltee. Container lid having venting means. 4,234,100, Cl. 220-306.000.

Champion International Corporation: *See—*
Gingerich, David L.; and Cohn, Robert, 4,233,931, Cl. 118-239.000.
Lillibridge, Harold R., 4,234,122, Cl. 229-77.000.

Champlin, Charles L., to Packaging Corporation of America. Carrier for a plurality of articles. 4,234,081, Cl. 206-147.000.

Chang, Mike F.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.

Chapin, John S. Multi-duct muffler. 4,234,054, Cl. 181-252.000.

Chappell, Francis: *See—*
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.

Charette, Ray O.; and Yates, Elmer J., to United States of America, Air Force. Base vent assembly for entry space vehicles. 4,234,144, Cl. 244-160.000.

Charlot, Lincoln H., to National Computer Sign Company. Ballast circuit for low pressure gas discharge lamp. 4,234,823, Cl. 315-224.000.

Chegodaev, Evgeny V.: *See—*
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.

Chelminski, Stephen V., to Bolt Associates, Inc. Method and apparatus for generating seismic impulses using high pressure water pump as the energizing source. 4,234,052, Cl. 181-120.000.

Chem-Crete Corporation: *See—*
Latta, Laurence, Jr.; and Leonard, John B., Jr., 4,234,346, Cl. 106-281.00R.

Chen, Hsing-Yao; and Hughes, Richard H., to RCA Corporation. Electron gun with astigmatic flare-reducing beam forming region. 4,234,814, Cl. 313-412.000.

Cheng, Sheng-Hsiung. Adjustable surface temperature detector. 4,233,750, Cl. 337-374.000.

Chevron Research Company: *See—*
Donaghey, Lee F., 4,234,353, Cl. 136-258.000.
Lilburn, Jennifer E., 4,234,321, Cl. 44-72.000.

Chia, Enrique C.; and Schoerner, Roger J., to Southwire Company. Method for manufacturing an aluminum alloy electrical conductor. 4,234,359, Cl. 148-2.000.

Chihara, Takeshi; and Kono, Masanori, to Delta Kogyo Co., Ltd.; and Toyo Kogyo Co., Ltd. Device for mounting a mirror on an automobile panel. 4,234,153, Cl. 248-475.00B.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Chisso Corporation: *See—*
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,234,655, Cl. 428-374.000.

Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, to Hoffmann-La Roche Inc. Phenylcarbamates. 4,234,598, Cl. 424-278.000.

Chow, Suezone, to Canadian Patents and Development Limited. Wood composites with foliage adhesive. 4,234,658, Cl. 428-403.000.

Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., to Merck & Co., Inc. 3-(2-Aminoethylthio)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid. 4,234,596, Cl. 424-274.000.

Christensen, Inc.: *See—*
Rowley, David S., 4,234,048, Cl. 175-329.000.

Christman, Harold E., to Brad Ragan, Incorporated. Method and apparatus for applying a circumferential tread to a tire carcass. 4,234,371, Cl. 156-96.000.

Christman, William J., to UOP Inc. Liquid-liquid extraction apparatus. 4,234,544, Cl. 422-256.000.

Chu, Ke-Chiang; and Sharp, Richard S., to Burroughs Corporation. Time-shared, multi-phase memory system with error checking and data correcting. 4,234,918, Cl. 364-200.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,234,582, Cl. 424-249.000.

Chulin, Valentin I.: *See—*
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.

Chun, Michael D.: *See—*
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.

Chunn, Robert E. Educational playing cards. 4,234,189, Cl 273-299.000.

Ciavaglia, Lynn A.: *See—*
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.

Ciba-Geigy AG: *See—*
Postle, Stephen R., 4,234,677, Cl. 430-518.000.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; and Drabek, Jozef, 4,234,573, Cl. 424-184.000.
Greuter, Hans; Martin, Pierre; and Bellus, Daniel, 4,234,517, Cl. 568-381.000.
Hicstand, Armin; and Rohringer, Peter, 4,234,341, Cl. 106-18.220.
Karrer, Friedrich, 4,234,734, Cl. 546-188.000.
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.
Rody, Jean; and Rasberger, Michael, 4,234,699, Cl. 525-55.000.
Rody, Jean; and Rasberger, Michael, 4,234,700, Cl. 525-55.000.
Rody, Jean; and Nikles, Erwin, 4,234,707, Cl. 525-437.000.
Rody, Jean; and Berner, Godwin, 4,234,728, Cl. 544-198.000.

Ciccarello, Richard. Cutter-vacuum-plunger applicator. 4,234,375, Cl. 156-530.000.

Cieslak, Richard F.; Balding, John V.; and Lafrenz, Joseph, to Industrial Electronics Service Company. Radio receiver monitoring and testing apparatus. 4,234,964, Cl. 455-226.000.

Citizen Watch Co., Ltd.: *See—*
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.
Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, 4,234,260, Cl. 400-219.300.
Mackawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, 4,234,948, Cl. 368-291.000.
Matsumoto, Masataka, 4,234,947, Cl. 368-287.000.
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, 4,234,945, Cl. 368-75.000.
Takahashi, Kotaro, 4,234,946, Cl. 368-76.000.
Teramoto, Kazuo; Watanabe, Minoru; and Matumura, Tetuo, 4,234,943, Cl. 368-35.000.

Clabburn, Robin J. T.; and Penneck, Richard J., to Raychem Limited. Resilient connector. 4,233,731, Cl. 29-859.000.

Clarion Co., Ltd.: *See—*
Mochizuki, Hidetoshi; and Okada, Masataka, 4,234,892, Cl. 358-174.000.

Cleaveland, Charles M.; and Kowalik, Peter M., to Cleaveland/Price Enterprises, Inc. Shaft-clamping device. 4,234,147, Cl. 248-74.00R.

Cleaveland/Price Enterprises, Inc.: *See—*
Cleaveland, Charles M.; and Kowalik, Peter M., 4,234,147, Cl. 248-74.00R.

Clement, Michael H. Method and apparatus for mounting an engine block boring machine. 4,234,275, Cl. 408-19.000.

Clifft, Dale L., to LCG, Inc. Tool for blowing insulation into an existing wall structure having a brick exterior. 4,233,788, Cl. 52-127.000.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.

Clinton, John S., to British Petroleum Company Limited, The. Underwater craft launch tube. 4,233,924, Cl. 114-259.000.

Clokie, Andrew K., to Greenbat Limited. Circular looms. 4,234,021, Cl. 139-371.000.

Clutter, Melvin E., to A. B. Chance Company. Electrical insulator and conductor cover. 4,234,753, Cl. 174-5.00R.

Clyne, John C.; Steel, William G.; and Nicholls, Ronald T. Cleaning device. 4,233,703, Cl. 15-53.00B.
Coal Industry (Patents) Limited: *See—*
Barsted, Roger, 4,234,060, Cl. 188-44.000.
Blake, Donald F., 4,234,063, Cl. 188-181.00T.
Kormendy, Miltiades, 4,234,163, Cl. 254-108.000.
Coast Radar and Communications Ltd.: *See—*
Welland, Frederick J., Jr.; and Cairns, Edward C., 4,234,941, Cl. 367-116.000.
Coates, George R., to Schlumberger Technology Corporation. Apparatus and method for determining characteristics of subsurface formations. 4,233,839, Cl. 73-152.000.
Cognacq, Jean C.; and Lacrampe, Jean, to Hexachimie. Bis-(aryloxycarboxylic acid) compounds. 4,234,742, Cl. 562-426.000.
Cohen, Milton J. Mixing and filtering vial. 4,234,083, Cl. 206-221.000.
Cohn, Marvin: *See—*
Schellenberg, James M.; and Cohn, Marvin, 4,234,854, Cl. 330-286.000.
Cohn, Robert: *See—*
Gingerich, David L.; and Cohn, Robert, 4,233,931, Cl. 118-239.000.
Coillet, Dudley W. Process for the removal of inorganic salts from a water stream. 4,234,419, Cl. 210-664.000.
Colby, Donald B., to Scott Paper Company. Adjustable and collapsible seating piece. 4,234,226, Cl. 297-21.000.
Collins, Thomas W., to Optimizer Control Corporation. Firing time control circuit. 4,234,850, Cl. 328-66.000.
Colonial Spring Company, The: *See—*
Small, Stuart R., 4,233,764, Cl. 40-152.100.
Colwell, Gary D.: *See—*
Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., 4,234,290, Cl. 415-145.000.
Combustion Engineering, Inc.: *See—*
Maliszewski, Theodore V., 4,234,132, Cl. 241-53.000.
Comer, William T.: *See—*
Kreighbaum, William E.; and Comer, William T., 4,234,595, Cl. 424-274.000.
Cominco Ltd.: *See—*
Higgins, John T.; and Hildred, Gordon C., 4,234,318, Cl. 23-293.00S.
Commercial Affiliates, Inc.: *See—*
Ward, Robert C., 4,234,649, Cl. 428-255.000.
Compagnie de Signaux et d'Enterprises Electriques: *See—*
Le-Hong, Son, 4,234,071, Cl. 194-100.00A.
Compagnie Generale de Radiologie: *See—*
Caugant, Jean; and Dale, Jacques, 4,234,796, Cl. 250-468.000.
Compagnie Generale des Etablissements Michelin: *See—*
Pommier, Jean, 4,234,031, Cl. 152-356.00R.
Condec Corporation: *See—*
Phipps, Arthur L., 4,234,529, Cl. 264-51.000.
Condon, Richard W., to Roper Corporation. Snow bob with detachable fuel tank. 4,234,050, Cl. 180-190.000.
Conner, William R., Jr., to Kellwood Company. Web inspection apparatus. 4,234,135, Cl. 242-56.00R.
Consortium fur Elektrochemische Industrie GmbH: *See—*
Dietl, Josef; and Wohlschlager, Michael, 4,234,630, Cl. 427-431.000.
Constance, Robin Justice: *See—*
Hawkins, David J. D., 4,233,892, Cl. 99-421.00M.
Construzioni Meccaniche Lonati S.p.A.: *See—*
Lonati, Francesco, 4,233,826, Cl. 66-140.00R.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, 4,234,029, Cl. 152-354.0RB.
Wenzel, Hubert; and Mossinger, Reinhard, 4,234,136, Cl. 242-68.400.
Contrel Corporation: *See—*
Boissicat, Claude M., 4,234,418, Cl. 209-542.000.
Controlled Environments Systems: *See—*
Widmayer, Don F., 4,234,820, Cl. 315-152.000.
Conway, Bernard W.; Fegley, Nelson L.; and Moran, James, to Dexter Corporation, The. Process for producing a uniform fiber dispersion and machine made light weight glass fiber web material. 4,234,379, Cl. 162-145.000.
Conway, Charles S. Fluid transfer system for tanker vessels. 4,233,922, Cl. 114-74.00R.
Conway, John W.: *See—*
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.
Cooke, William B.: *See—*
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.
Cookson, Alan H., to Westinghouse Electric Corp. Method of forming an opening in the outer enclosure of a gas-insulated electrical apparatus. 4,234,006, Cl. 137-15.000.
Cooper, Gary F.; and Van Horn, Albert R., to Syntex (U.S.A.) Inc. Steroid synthesis process using mixed anhydride. 4,234,491, Cl. 260-340.9AS.
Cooper, William C.; and Garcia, Alberto A., to O'Brien, Linda F. Foil applicator tool. 4,233,863, Cl. 81-3.00R.
Copco, Inc.: *See—*
Jorgensen, Carsten, 4,234,094, Cl. 211-88.000.
Cork, Frank: *See—*
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.
Cornelissens, Emery G. P., to Akzo N.V. Feed unit of a detergent composition based on alkali carbonate. 4,234,442, Cl. 252-90.000.
Corning Glass Works: *See—*
Dorman, William H., 4,234,247, Cl. 350-320.000.
Kenny, Neal S., 4,233,957, Cl. 126-443.000.
Cornwall, Kenneth R. Protective flange cover and method of use. 4,233,697, Cl. 4-293.000.
Cory, Halsey W., to Force Control Industries, Inc. Centrifuge drive system. 4,234,123, Cl. 233-23.00R.
Costruzioni Meccaniche Lonati S.p.A.: *See—*
Lonati, Francesco, 4,233,822, Cl. 66-14.000.
Lonati, Francesco, 4,233,823, Cl. 66-14.000.
Cotroneo, Peter R. Illuminated door lock. 4,234,909, Cl. 362-100.000.
Coulter Electronics, Inc.: *See—*
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,538, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,539, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,540, Cl. 422-64.000.
Coulter, Howard W.; and Triggs, Dennis R. Apparatus for measuring and marking preselected measurements. 4,233,749, Cl. 33-189.000.
Cour, Thomas H.: *See—*
McConnell, Thomas T.; and Cour, Thomas H., 4,234,730, Cl. 544-358.000.
Courtaulds Limited: *See—*
Stanley, Grahame L., 4,234,552, Cl. 423-268.000.
Cox of Watford Limited: *See—*
Babbs, Frederick W., 4,234,035, Cl. 160-392.000.
Credelle, Thomas L., to RCA Corporation. Flat display tube having shielding member between beam guide and screen. 4,234,815, Cl. 313-422.000.
Cricchio, Renato; and Berti, Marisa, to Gruppo Lepetit S.p.A. Process for preparing 4-desoxy-thiazolo[5,4-c]rifamycin derivatives. 4,234,485, Cl. 260-239.30P.
Crilly, William J., Jr., to Hewlett-Packard Company. Programmable frequency divider and method. 4,234,849, Cl. 328-46.000.
Crivello, James V., to General Electric Company. Photoinitiators. 4,234,732, Cl. 546-174.000.
Crompton & Knowles Corporation: *See—*
Steiner, Russell I., 4,234,481, Cl. 260-163.000.
Cronfel, Ramsey L. Fluid choke. 4,234,008, Cl. 137-182.000.
Crumrine, David F., to Neal, Gaines L., a part interest. Pollution control device for automobile carburetion. 4,233,948, Cl. 123-590.000.
CTS, Inc.: *See—*
Farrell, Richard R., 4,234,056, Cl. 184-105.00B.
Curnow, John M.: *See—*
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,233,829, Cl. 72-38.000.
Custom Packaging Systems: *See—*
LaFleur, Arthur E., 4,233,888, Cl. 493-132.000.
Cuypers, Herve; and Baekelmans, Paul, to Solvay & Cie. Process for the separation of polyolefins manufactured at low pressure. 4,234,716, Cl. 528-483.000.
Cyrulo, Jacek: *See—*
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.
D & W International, Inc.: *See—*
Prause, Benjamin G.; and Meyers, John D., 4,234,942, Cl. 367-128.000.
Daenen, Robert H. C. M., to Dart Industries Inc. Serving plate set or the like. 4,234,097, Cl. 220-4.00D.
DAF Indal Ltd.: *See—*
Pesando, Mario A., 4,234,143, Cl. 244-116.000.
Dagna, Giandomenico: *See—*
Guglielmi, Nicolo; Dagna, Giandomenico; and Visentin, Bruno, 4,234,871, Cl. 340-365.00S.
Dahlgren, Harold P., to Dahlgren Manufacturing Company. Reversible newspaper press. 4,233,898, Cl. 101-138.000.
Dahlgren Manufacturing Company: *See—*
Dahlgren, Harold P., 4,233,898, Cl. 101-138.000.
Dahn, C. James, to Safety Consulting Engineers Inc. Electrostatic discharge tester. 4,233,835, Cl. 73-35.000.
Daimler-Benz Aktiengesellschaft: *See—*
Gaus, Hermann; and Pickard, Jurgen, 4,233,861, Cl. 74-763.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Nishida, Fumihiko; and Ijiri, Hiroshi, 4,234,251, Cl. 355-74.000.
Dale, Jacques: *See—*
Caugant, Jean; and Dale, Jacques, 4,234,796, Cl. 250-468.000.
Dalibor, Horst, to Hoechst Aktiengesellschaft. Copolymer solution consisting of acrylic resin, process for its manufacture and the use thereof in reactive lacquers. 4,234,468, Cl. 260-31.20R.
Daly, Edward: *See—*
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.
Daly, Francis P., to Hydrocarbon Research, Inc. Catalytic oxidation/-decarbonylation of polynuclear aromatic compounds. 4,234,749, Cl. 585-319.000.
Damon Corporation: *See—*
Maddestra, Robert; and Munn, David E., 4,234,148, Cl. 248-174.000.
Dana Corporation: *See—*
Cannon, Lee E., 4,234,830, Cl. 318-39.000.
Daniel, Maurice. Light emitting fabric. 4,234,907, Cl. 362-32.000.

Daniel Valve Company: *See—*
Hodgeman, Herbert H.; and Ali, Syed S., 4,234,157, Cl. 251-56.000.
Daniell, Roy B., Jr. Custom-fitted knee guard and brace. 4,233,967, Cl. 128-80.00C.
Daniels, Peter J. L.: *See—*
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000
Danno, Tsuneo: *See—*
Ikushima, Hiroshi; Noguchi, Toyota; Danno, Tsuneo; and Tamura, Tooru, 4,234,859, Cl. 333-151.000.
Darlington, Raymond: *See—*
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, 4,234,537, Cl. 422-26.000.
Darnell, Alfred J., to Rockwell International Corporation. Europium carboxide and method of preparing the same. 4,234,551, Cl. 423-263.000.
Dart Industries Inc.: *See—*
Daenen, Robert H. C. M., 4,234,097, Cl. 220-4.00D.
Dassler, Adolph, deceased: *See—*
Bente, Alfred; Dassler, Adolph, deceased; and Henkel, Albert, legal representative, 4,233,759, Cl. 36-59.00R.
Data General Corporation: *See—*
Feldstein, Michael; and Thackaberry, Harold L., 4,234,899, Cl. 360-73.000.
Dauenbaugh, Robert L., to Keystone Consolidated Industries, Inc. Changeable combination, axial pin tumbler lock with single interface. 4,233,828, Cl. 70-363.000.
Davenport, Donald E.: *See—*
Patz, Gary L.; and Davenport, Donald E., 4,234,648, Cl. 428-245.000.
Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd.: *See—*
Suzor, Norland L. C., 4,234,349, Cl. 127-12.000.
Suzor, Norland L. C., 4,234,350, Cl. 127-48.000.
Davis, Ariel R.; and Greene, Worthington W., to Rual Industries, Inc. Circuit selector. 4,234,767, Cl. 200-1.00R.
Davis, Kirk E.: *See—*
Meinhardt, Norman A.; and Davis, Kirk E., 4,234,435, Cl. 252-51.50A.
Davis, Richard K.: *See—*
Konrad, Charles E.; and Davis, Richard K., 4,234,840, Cl. 320-48.000.
Davis, Thomas F., to AMP Incorporated. Method for immersion deposition of tin and tin-lead alloys. 4,234,631, Cl. 427-436.000.
Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., to Deere & Company. Adjustable conditioning plate for an impeller mower-conditioner. 4,233,803, Cl. 56-14.900.
DBX, Inc.: *See—*
Bergstrom, Gary, 4,234,804, Cl. 307-229.000.
De Angelis, Giancarlo: *See—*
Rogora, Edoardo; and De Angelis, Giancarlo, 4,233,943, Cl. 123-425.000.
DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., to Stauffer Chemical Company. 3-(N-Alkylcarbamyl)-5-(carboalkoxy)-1,3,4-oxadiazole-2-thiones and their use as anti-inflammatory agents. 4,234,593, Cl. 424-272.000.
DEC International, Inc.: *See—*
Hamilton, Miles J., 4,234,286, Cl. 414-512.000.
DeCou, Donald F.; and Roach, Terence, to Raytheon Company. Scintillator crystal radiation detector. 4,234,792, Cl. 250-361.00R.
Dedrick, Ted R. Glide pad for portable power saw. 4,233,738, Cl. 30-374.000.
Deere & Company: *See—*
Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., 4,233,803, Cl. 56-14.900.
Schupback, Jesse L., 4,234,012, Cl. 137-899.100.
Trott, Clarence R.; and Willer, David A., 4,234,130, Cl. 239-679.000.
Defebvre, Andre; and Pouliquen, Jean, to Agence National de Valorisation de la Recherche (ANVAR). Method for measuring the fatigue of a test-piece subjected to mechanical stress. 4,233,849, Cl. 73-812.000.
de Filippis, Gerald; and Henry, Jean M. Laser aiming device for weapons. 4,233,770, Cl. 42-1.00A.
DeHollander, William R., to General Electric Company. Method for treating a particulate nuclear fuel material. 4,234,550, Cl. 423-261.000.
Delecns, Gerard; Guerin, Bernard; and Kern, Rene, to ATO Chimie. Thermoplastic polymer cover for golf balls and golf balls comprising such a cover. 4,234,184, Cl. 273-235.00R.
Delta Kogyo Co., Ltd.: *See—*
Chihara, Takeshi; and Kono, Masanori, 4,234,153, Cl. 248-475.00B.
DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., to Wisconsin Alumni Research Foundation. Process for preparing 1α-hydroxyvitamin D compounds from 1α-hydroxy-3,5-cyclovitamin D compounds. 4,234,495, Cl. 260-397.200.
DeLuca-McElroy, Marlene A., to University of California, The Regents of the. Immobolized light emitting systems. 4,234,681, Cl. 435-8.000.
del Valle, Clara J., to Dow Chemical Company, The. Method of producing calcium bromide. 4,234,556, Cl. 423-497.000.
De Marchi, Franco: *See—*
Vanoni, Pier L.; Serboli, Giancarlo; and De Marchi, Franco, 4,234,652, Cl. 428-296.000.
deMey, Charles F., II; and Helms, Charles C., to Perkin-Elmer Corporation, The. Photodetector heat stabilizer. 4,234,790, Cl. 250-238.000.
De Meyer, Herman; Doclo, Roland; and Seynaeve, Jan, to Bayer Aktiengesellschaft. Pressure swing adsorption process. 4,234,322, Cl. 55-18.000.
Deminet, Czeslaw; and Oettel, Richard E., to Boeing Company, The. Process for fabricating glass-encapsulated solar cell arrays and the product produced thereby. 4,234,351, Cl. 136-89.0EP.
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Driver, W B. Flexible drill pipe. 4,233,820, Cl. 64-2.00P.
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Hoeschele, James D.; and Amundsen, Alan R., 4,234,499, Cl. 260-429.00R.
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Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,233,870, Cl. 83-563.000.
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Faith, Donald L. Optical firing adaptor. 4,234,911, Cl. 362-111.000.
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Farrell, Richard R., to CTS, Inc. Lubrication fitting. 4,234,056, Cl. 184-105.00B.
Fassle, Fritz, to Guilini Chemie GmbH. Method for producing hard plaster of paris. 4,234,345, Cl. 106-110.000.
Faulkner, Douglas E., to Burroughs Wellcome Co. Device and method for quantitative uric acid testing. 4,234,313, Cl. 23-230.00B.
Faust, John A. Collapsible chair. 4,234,227, Cl. 297-443.000.
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Figueroa, Ruben. File support structure for drawer. 4,234,238, Cl. 312-184.000.
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Fischman, Martin, to GTE Products Corporation. Cathode ray tube with internal arc suppressor and protective spark gap. 4,234,816, Cl. 313-479.000.
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Flamm, Jonathan A. Modular articulating seating system for the handicapped. 4,234,228, Cl. 297-464.000.
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Flanner, Lloyd T. Wasp and hornet spray composition. 4,234,567, Cl. 424-45.000.
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Flink, Birger. Method and arrangement for heat-welding together two tubular elements. 4,234,781, Cl. 219-243.000.
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Fodor, Lawrence M.: *See—*
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Ford, John A.; and Lestina, Gregory J., to Eastman Kodak Company. Shifted photographic dyes and compositions, elements and processes employing them. 4,234,672, Cl. 430-222.000.
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Gray, Dorian R.; Guerra, Salvatore; and Meyer, John H., 4,234,331, Cl. 65-60.00R.
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Rhodes, Eugene E., 4,233,719, Cl. 29-157.30A.
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Forrest, Stanley G.; and Spashett, Michael C., to Guy Colins Co. Limited. Board game. 4,234,186, Cl. 273-243.000.
Foulke, Richard F. Vibration-free tailless wire bonder. 4,234,117, Cl. 228-4.500.
Fournet, Maurice, to Organisation Europeenne de Recherches Spatiales. Observation optical apparatus. 4,234,789, Cl. 250-234.000.
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Duggins, Richard W.; and Rodgers, James W., 4,233,736, Cl. 30-293.000.
Frampton, Orville D.; and Birchall, William R., to National Distillers and Chemical Corp. Process for the hydration of olefins employing slurried catalyst. 4,234,748, Cl. 568-901.000.
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Tofe, Andrew J.; and Francis, Marion D., 4,234,562, Cl. 424-1.000.
Frank, Ed, to Boeing Company, The. Bi-directional step-over tape applicator head. 4,234,374, Cl. 156-459.000.
Franks, John A., Jr., to Vulcan Materials Company. Electrolytic process for the production of stannous chloride products. 4,234,403, Cl. 204-180.00P.
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Schumacher, Friedrich, 4,233,910, Cl. 105-182.00R.
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Fritz, Rolf; and Kissel, Karl-Friedrich, to Hochtemperatur-Reaktorbau GmbH. Support structure for the core of a high capacity gas cooled high temperature reactor. 4,234,384, Cl. 176-58.0PB.
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Gable, Melvin G.; and Sherman, Richard H., to Ford Motor Company. Conflict resolution by retransmission delay on shared communication medium. 4,234,952, Cl. 370-94.000.
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Brown, Michael J., 4,234,576, Cl. 424-211.000.
Morshauser, Fred S., 4,234,464, Cl. 252-544.000.
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., to Sunbeam Corporation. Electric shaver. 4,233,733, Cl. 30-43.920.
Gallant, Guy G. Water ski rack. 4,234,112, Cl. 224-42.430.
Gange, Robert A., to RCA Corporation. System for controlling brightness uniformity in display devices. 4,234,825, Cl. 315-383.000.
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Cooper, William C.; and Garcia, Alberto A., 4,233,863, Cl. 81-3.00R.
Gardner, Derek V., to Beecham Group Limited. Heterocyclic containing chromans. 4,234,726, Cl. 544-151.000.
Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,234,601, Cl. 424-319.000.
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Rowlett, Beb H., 4,233,858, Cl. 74-675.000.
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Gauld, W. Thomas; and Thomsen, Eigild S., to Gauld Equipment Manufacturing Co. Fibrous stock screen. 4,234,417, Cl. 209-306.000.
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, to Braun Aktiengesellschaft. Phonograph turntable control system. 4,234,836, Cl. 318-480.000.
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Thompson, John H.; Gannon, George F., Jr.; and Geil, Fred G., 4,233,843, Cl. 73-339.00A.
Gellert, Jobst U. Collapsible container. 4,234,080, Cl. 206-0.820.
General Dynamics Corporation, Pomona Division: *See*—
Palmer, John P.; and Rose, Scott M., 4,234,788, Cl. 250-227.000.
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Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,558, Cl. 423-593.000.

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DeHollander, William R., 4,234,550, Cl. 423-261.000.
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Kindelspire, Thomas J., 4,233,732, Cl. 29-881.000.
Koenig, Fredrick, 4,233,729, Cl. 29-596.000.
Konrad, Charles E.; and Davis, Richard K., 4,234,840, Cl. 320-48.000.
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Murray, Omer E.; and Thompson, Richard L., 4,234,165, Cl. 248-404.000.
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Pieper, Louis W., 4,233,728, Cl. 29-596.000.
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Schindler, Donald R., 4,234,906, Cl. 362-16.000.
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Stottmann, Richard L., 4,233,819, Cl. 62-349.000.
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Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, to Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgerate. Stepping motor. 4,234,808, Cl. 310-49.00R.
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Gernlein, Hermann, to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft. Tube filling machine having an adjustable stroke, cam operated piston. 4,234,107, Cl. 222-309.000.
Ghandehari, Mohammad H.; and Schussler, Mortimer, to Fansteel, Inc. Process for recovering metal carbide powder from cemented carbides. 4,234,333, Cl. 75-0.5BA.
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Gibbs, Richard E.: *See*—
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Gingerich, David L.; and Cohn, Robert, to Champion International Corporation. Envelope feed apparatus. 4,233,931, Cl. 118-239.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., to Coulter Electronics, Inc. Apparatus for monitoring chemical reactions and employing moving photometer means. 4,234,538, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., to Coulter Electronics, Inc. Apparatus for monitoring chemical reactions and employing moving photometer means. 4,234,539, Cl. 422-64.000.
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Gjerde, Trygve; Vigander, Kjell; Jenssen, Dag N.; and Hjertas, Bjorn, to A/S Hoyer-Ellefsen. Marine structure. 4,234,270, Cl. 405-202.000.
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Goss, Michael J.; and Redford, David A., to Texaco Canada Inc. Method for evaluation of the response of different cores to a recovery process and apparatus therefor. 4,233,840, Cl. 73-153.000.
Gotti, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwickoungs-Gesellschaft mbH. Shearing machine for severing parallel longitudinal members of grids or gratings. 4,233,870, Cl. 83-563.000.
Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrukkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See*—
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Graham, Joseph, to Minnesota Mining and Manufacturing Company. Intumescable fire-retardant products. 4,234,639, Cl. 428-144.000.
Graham, Roy R., to PPG Industries, Inc. Size composition for glass fibers. 4,233,809, Cl. 57-250.000.
Graham, William H.; and Shepard, Inella G., to Thiokol Corporation. Hydroxy terminated polybutadiene based polyurethane bound propellant grains. 4,234,738, Cl. 560-32.000.
Grall, Georges, to Thomson-CSF. Array system with a high resolving power. 4,234,939, Cl. 367-87.000.

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Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., to Ford Motor Company. Spray coating machine. 4,233,933, Cl. 118-314.000.

Gray, Dorian R.; Guerra, Salvatore; and Meyer, John H., to Ford Motor Company. Coating method. 4,234,331, Cl. 65-60.00R.

Gray, James, Jr., to United States of America, Energy. Multiplexer and time duration measuring circuit. 4,234,949, Cl. 370-41.000.

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Greene, Worthington W.: *See—*
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Grefe, William O.: *See—*
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Greuel, Walter J., Jr., to Raychem Corporation. Heat recoverable closure assembly and method. 4,234,020, Cl. 138-166.000.

Greuter, Hans; Martin, Pierre; and Bellus, Daniel, to Ciba-Geigy Corporation. 2-(2',2'-Dihalovinyl)-cyclobutanones and 2-(2',2',2'-trihaloethyl)-cyclobutanones. 4,234,517, Cl. 568-381.000.

Greve, Clifford W.: *See—*
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Griffith, James L.: *See—*
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Griffith, James R.: *See—*
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Griffith, Jerry. Automatic environment stabilizer and protection device for plants. 4,233,779, Cl. 47-26.000.

Groenenboom, Cornelis J.; Huysmans, Willem G. B.; Burley, Joseph W.; Hutton, Ronald E.; and Jolley, Michael R. J., to Akzo N.V. Process for the preparation of organotin compounds. 4,234,501, Cl. 260-429.700.

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Grosshauser, Anton: *See—*
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Grotefend, Alan C.; and Thon, Stephen F., to Meyercord Co., The. Tennis ball marking decalcomania. 4,234,643, Cl. 428-200.000.

Grubb, John W.: *See—*
Bankes, Robert B.; and Grubb, John W., 4,234,118, Cl. 228-49.00R.

Grubin, Arnold L.: *See—*
Adelson, Alexander M.; Gulick, Stephen C.; and Grubin, Arnold L., 4,234,933, Cl. 364-900.000.

Gruppo Lepetit S.p.A.: *See—*
Cricchio, Renato; and Berti, Marisa, 4,234,485, Cl. 260-239.30P.

GTE Automatic Electric Laboratories Incorporated: *See—*
Kline, Ralph L., 4,234,953, Cl. 371-5.000.
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., 4,234,957, Cl. 375-86.000.

GTE Products Corporation: *See—*
Fischman, Martin, 4,234,816, Cl. 313-479.000.
Garrison, Robert L.; and Morris, James C., 4,234,822, Cl. 315-209.00R.
Hoeft, Jon L., 4,234,962, Cl. 455-173.000.

GTE Sylvania Incorporated: *See—*
Kaelin, Oscar J.; and Mathews, Richard H., 4,234,883, Cl. 343-100.0CL.

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Deleens, Gerard; Guerin, Bernard; and Kern, Rene, 4,234,184, Cl. 273-235.00R.

Guerra, Salvatore: *See—*
Gray, Dorian R.; Guerra, Salvatore; and Meyer, John H., 4,234,331, Cl. 65-60.00R.

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Fassle, Fritz, 4,234,345, Cl. 106-110.000.

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Gutierrez, Abel, Jr. Upper main bearing removal tool. 4,233,864, Cl. 81-3.00R.

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DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., 4,234,593, Cl. 424-272.000.

Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, to Biotechnologie Aktiengesellschaft fur Emulsan. Production of α-emulsans. 4,234,689, Cl. 435-101.000.

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Forrest, Stanley G.; and Spashett, Michael C., 4,234,186, Cl. 273-243.000.

Guzy, Raymond L., to Borg-Warner Corporation. Cable splice. 4,234,758, Cl. 174-84.00R.

Gwynn, Eric C.: *See—*
Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., 4,233,755, Cl. 35-11.00R.

Gyugyi, Laszlo; and Wood, Peter, to Westinghouse Electric Corp. Static VAR generator with discrete capacitive current levels. 4,234,843, Cl. 323-119.000.

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Brennen, Michael B.; and Gyugyi, Laszlo, 4,234,842, Cl. 323-119.000.

H. K. Webster Company, Inc.: *See—*
Webster, Ralph K., 4,233,941, Cl. 119-52.00R.

Haga, Tamio: *See—*
Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, 4,234,460, Cl. 252-447.000.

Hagen, Edward L., to Uniroyal, Inc. Polyurethane spray composition containing lactone viscosity modifier. 4,234,445, Cl. 252-182.000.

Hager, Adolph G.: *See—*
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.

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Hahn, Paul R. T.: *See—*
O'Mullan, Norman P.; and Hahn, Paul R. T., 4,233,765, Cl. 40-156.000.

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Brown, David, 4,234,718, Cl. 536-69.000.
Wan, Chee-Gen, 4,234,719, Cl. 536-69.000.
Yeoman, Neil; and Stern, Sidney S., 4,234,519, Cl. 568-492.000.

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Yoshida, Takao; and Hall, John B., 4,234,518, Cl. 568-377.000.

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Hallgren, John E.; and Smith, William E., to General Electric Company. Carbonylation process. 4,234,504, Cl. 260-463.000.

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Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., to HBTI. Method and apparatus for sensing jaw position and movements and utilizing sensed data. 4,234,306, Cl. 433-55.000.

Hamar, Douglas A. Animated illustration for books and the like. 4,233,772, Cl. 46-35.000.

Hamer, David E.: *See—*
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Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., to Rockwell International Corporation. Apparatus for superplastic forming. 4,233,829, Cl. 72-38.000.

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Hamilton, Miles J., to DEC International, Inc. Vehicle body. 4,234,286, Cl. 414-512.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,233,896, Cl. 101-110.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Handleman, Avrom R.; and Alack, Charles S. Fluidizable material handling apparatus. 4,234,273, Cl. 406-90.000.

Hane, Teruaki: *See—*
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,234,655, Cl. 428-374.000.

Hans Giesbert Kommanditgesellschaft: *See—*
Sauer, Walter; and Gerhart, Berthold, 4,233,939, Cl. 119-18.000.

Hansen, Soren R.: *See—*
Brandt, Gert M.; and Hansen, Soren R., 4,234,769, Cl. 200-67.0DB.

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Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.

Hara, Keiichi; and Fujisawa, Tomoji, to Nippon Kokan Kabushiki Kaisha. Inner burr cutting, inner face cleaning and inner face painting apparatus for long pipes of small and medium diameters. 4,233,928, Cl. 118-35.000.

Harasaki, Hayatsugu; and Teramoto, Isao, to Toyo Kogyo Co., Ltd. Rear reinforcement structure for automobile bodies. 4,234,225, Cl. 296-185.000.

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Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,234,912, Cl. 362-145.000.

Hardy, R. H. Stephen: *See—*
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.

Harlow, Norman R., to Carlisle Corporation. Miniature coaxial cable assembly. 4,234,759, Cl. 174-104.000.

Harmon, Thomas F.: *See—*
Malinowski, Richard F.; and Harmon, Thomas F., 4,234,915, Cl. 362-252.000.

Harnisch, Horst; and Brack, Alfred, to Bayer Aktiengesellschaft. Benz-[c,d]-indolyl compounds. 4,234,488, Cl. 260-326.270.

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Harper, Patrick D., to Bendix Corporation, The. Inductive load driver circuit effecting slow hold current delay and fast turn off current decay. 4,234,903, Cl. 361-154.000.

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Riley, William J., Jr., 4,234,929, Cl. 364-701.000.

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DuRose, Arthur H., 4,234,628, Cl. 427-305.000.

Harshman, Ray E.; and Landry, Archie C., to Electro-Pneumatic International GmbH. Locking devices for cargo and the like. 4,234,278, Cl. 410-69.000.

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Hart, Edwin R., to Seven-H Corporation. Method of processing corn. 4,234,614, Cl. 426-462.000.

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Hartl, Alfons E.: *See—*
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Hartley, William F.: *See—*
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., 4,234,957, Cl. 375-86.000.

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Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.

Hartman, John: *See—*
Weikel, Donald J., Jr.; and Hartman, John, 4,234,249, Cl. 355-3.0CH.

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Schulze, Eckehart, 4,233,872, Cl. 83-617.000.

Hartman, Richard L., to United States of America, Army. Logarithmic lock-in amplifier. 4,234,851, Cl. 328-145.000.

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Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., 4,233,724, Cl. 29-428.000.

Hashimoto, Masashi; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, to Fujisawa Pharmaceutical Company, Limited. Cephalosporin analogues and processes for the preparation thereof. 4,234,724, Cl. 544-90.000.

Hassander, Mats S. O.: *See—*
Ryrfors, Lars-Olof; and Hassander, Mats S. O., 4,234,467, Cl. 260-29.70H.

Hassler, Hedvig E. B.: *See—*
Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, 4,234,380, Cl. 162-152.000.

Hauff, Joe. Utility platform. 4,234,284, Cl. 414-462.000.

Hauff, Wolfgang; and Tidland, John W. Portable air filtering and breathing assist device. 4,233,972, Cl. 128-205.120.

Hausler Scientific Instruments (Proprietary) Limited: *See—*
Bisset, Claude O., 4,233,741, Cl. 33-1.00N.

Hawker Siddeley Dynamics Engr., Inc.: *See—*
Thompson, Lionel R. F., 4,234,882, Cl. 343-14.000.

Hawkins, David J. D., to Constance, Robin Justice. Spit roasting apparatus and the spit roasting of roastable foodstuffs. 4,233,892, Cl. 99-421.00M.

Hay, Robert A., II; and St. Louis, Harold E., to Dow Chemical Company, The. Mixing method and container therefor. 4,234,447, Cl. 252-301.10W.

Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, to Ono Pharmaceutical Co. Ltd. 6,9-Nitrilo(imino)-prostaglandin analogues. 4,234,597, Cl. 424-274.000.

Hayashi, Yoshio: *See—*
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Hayes, Fay A.; and Hayes, Leonard L. Gasket feeding apparatus for an inplace gasket belling machine. 4,234,301, Cl. 425-392.000.

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Hayes, Fay A.; and Hayes, Leonard L., 4,234,301, Cl. 425-392.000.

Haynes, Freddie J. Fireplace system. 4,233,956, Cl. 126-121.000.

Haynes, Harvey H. Pressure differential seafloor corer-carrier. 4,234,046, Cl. 175-6.000.

Haynes, John K., Jr.: *See—*
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., 4,234,660, Cl. 428-411.000.

Haynes, Joseph E. Shoe with reflecting means. 4,233,760, Cl. 36-137.000.

HBTI: *See—*
Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., 4,234,306, Cl. 433-55.000.

Health & Education Services Corporation: *See—*
Flick, Francis S., 4,233,743, Cl. 33-143.00C.

Heden, Carl-Goran. Climate-controlled building construction. 4,233,958, Cl. 126-424.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Phosphate beneficiation process. 4,234,414, Cl. 209-166.000.

Hegemann, Karl-Rudolf: *See—*
Weissert, Helmut; Niess, Theodor; and Hegemann, Karl-Rudolf, 4,234,335, Cl. 75-41.000.

Hehr International, Inc.: *See—*
Roe, Norman E., 4,233,781, Cl. 49-504.000.

Heiman, Frederic P., to Mars, Inc. Vending control apparatus. 4,234,070, Cl. 194-1.00N.

Hein, Paul R.; Evans, James A.; and Yang, Michael W., to W. R. Grace & Co. Polythiol effect curable polymeric composition. 4,234,676, Cl. 430-286.000.

Heine, Gunter: *See—*
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.

Heldens, Ludovicus G. M.: *See—*
Esser, Leonard J. M.; and Heldens, Ludovicus G. M., 4,234,807, Cl. 307-304.000.

Helding, James R. Box closing machine. 4,233,798, Cl. 53-76.000.

Helena Laboratories Corporation: *See—*
Rhine, Samuel, 4,234,134, Cl. 242-55.200.

Helms, Charles C.: *See—*
deMey, Charles F., II; and Helms, Charles C., 4,234,790, Cl. 250-238.000.

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Hendrischk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, to Mannesmann Aktiengesellschaft. Printer. 4,234,261, Cl. 400-621.000.

Hendy, Brian N., to Imperial Chemical Industries Limited. Oriented polyolefin film. 4,234,664, Cl. 428-520.000.

Heni, Wolfgang; and Wolf, Peter, to Bellaplast GmbH. Apparatus for moving lightweight articles. 4,233,868, Cl. 83-126.000.

Henkel, Albert, legal representative: *See—*
Bente, Alfred; Dassler, Adolph, deceased; and Henkel, Albert, legal representative, 4,233,759, Cl. 36-59.00R.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Wegener, Ingo; Glasl, Johann; and Werdehausen, Achim, 4,234,444, Cl. 252-174.220.

Hennenfent, Rex E. Livestock farrowing apparatus. 4,233,940, Cl. 119-20.000.

Henry, Dale V.: *See—*
Longsderff, Richard W.; and Henry, Dale V., 4,233,936, Cl. 118-726.000.

Henry, Jean M.: *See—*
de Filippis, Gerald; and Henry, Jean M., 4,233,770, Cl. 42-1.00A.

Henschel, John P., to Minnesota Mining and Manufacturing Company. Optical signal transmitter. 4,234,967, Cl. 455-603.000.

Hensley, Steve L., to Pennwalt Corporation. Cryogenic fluid transfer line. 4,233,816, Cl. 62-55.000.

Hentrich, Hans-Jurgen: *See—*
Diem, Rudolf; and Hentrich, Hans-Jurgen, 4,234,848, Cl. 324-262.000.

Hepworth, Malcolm T.; and Laferty, John M., to Amax Inc. Membrane process for separating contaminant anions from aqueous solutions of valuable metal anions. 4,234,393, Cl. 204-1.500.

Hercules Incorporated: *See—*
Robinson, Anderson E., Jr., 4,234,364, Cl. 149-19.400.

Hergaux, Claude. Cover for waste container. 4,234,096, Cl. 220-1.00T.

Hermann Berstorff Maschinenbau GmbH: *See—*
Spielhoff, Horst, 4,234,298, Cl. 425-186.000.

Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Nitrogen bridgehead compounds having anti-allergic effect. 4,234,586, Cl. 424-251.000.

Herrero, Ricardo M.: *See—*
Torroja, Jaime M.; Rivacoba, Jose U.; and Herrero, Ricardo M., 4,233,921, Cl. 114-74.00R.

Herring, James A.: *See—*
Martin, William F., 4,234,074, Cl. 198-558.000.

Herrington, F. John, Jr., to Mobil Oil Corporation. Flow distribution valve system for control of extrusion from multiple die orifices. 4,234,018, Cl. 138-45.000.

Herrmann, John C. Safe door. 4,233,913, Cl. 109-59.00T.

Herron, Lester W.; Master, Raj N.; and Tummala, Rao R., to International Business Machines Corporation. Method of making multilayered glass-ceramic structures having an internal distribution of copper-based conductors. 4,234,367, Cl. 156-89.000.

Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, to Societe d'Assistance Technique pour Produits Nestle S.A. Sterilization of particulate solid materials. 4,234,537, Cl. 422-26.000.

Hesketh, Bernard; and Pumphrey, Nicholas W. J., to Imperial Chemical Industries Limited. Electrode for electrochemical processes. 4,234,405, Cl. 204-290.00F.

Hesse, Robert H.: *See—*
Barton, Derek H. R.; and Hesse, Robert H., 4,234,515, Cl. 564-114.000.

Hevey, Richard C., to FMC Corporation. Device for delivering measured quantities of reagents into assay medium. 4,234,316, Cl. 23-230.00R.

Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., to Calbiochem-Behring Corp. Method for terminating a peroxidase catalyzed reaction. 4,234,680, Cl. 435-7.000.

Hewlett-Packard Company: *See—*
Allen, Mark S., 4,234,845, Cl. 324-83.00D.

Crilly, William J., Jr., 4,234,849, Cl. 325-46.000.
Jessen, Kenneth C., 4,233,873, Cl. 83-652.000.
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Cognacq, Jean C.; and Lacrampe, Jean, 4,234,742, Cl. 562-426.000
Hexcel Corporation: *See—*
Patz, Gary L.; and Davenport, Donald E., 4,234,648, Cl 428-245.000.
Heytmeijer, Herman R., to Westinghouse Electric Corp. Circuit board having conductor runs resistant to formation of non-conductive localized areas and method. 4,234,304, Cl. 431-359.000.
Hickey, Glen A. External female catheter. 4,233,978, Cl. 128-295.000.
Hiestand, Armin; and Rohringer, Peter, to Ciba-Geigy Corporation. s-Triazine, process for producing it and its use for fireproofing polyester fiber materials. 4,234,341, Cl. 106-18.220.
Higginbotham, John W.; and Dowden, Dennis L., to McDonnell Douglas Corporation. Attenuation measuring system. 4,234,253, Cl 356-73.100.
Higgins, John T.; and Hildred, Gordon C., to Cominco Ltd. Process for granulation of sulfur. 4,234,318, Cl. 23-293.00S.
Higuchi, Kosuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Sectionalized porcelain insulator having removable circuit breaker 4,234,770, Cl. 200-144.00B.
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Higgins, John T.; and Hildred, Gordon C., 4,234,318, Cl. 23-293.00S.
Hildreth, Allan B. Roof tile edge cover. 4,233,786, Cl. 52-94.000.
Hill, Horace E.: *See—*
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Hinrichs, Leslie W. Chainsaw accessory. 4,233,739, Cl. 30-383.000.
Hirai, Takahiro: *See—*
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, 4,234,469, Cl. 260-42.460.
Hirano, Mikio; and Horiuchi, Susumu, to Hitachi, Ltd. Method and apparatus for treating radioactive waste. 4,234,448, Cl. 252-301.10W.
Hirayama, Kaiichirou: *See—*
Kitano, Yuichi; and Hirayama, Kaiichirou, 4,234,925, Cl. 364-494.000.
Hirayama, Masami, Nakata, Tadataka; and Kagayama, Michiko, to Rohto Pharmaceutical Co. Ltd. Preparation of non-fluidizable composition. 4,234,450, Cl. 252-314.000.
Hirozawa, Stanley T.; O'Brien, Edward F.; and Wilson, Joe C., to BASF Wyandotte Corporation. Hydroxybenzoic acid as pH buffer and corrosion inhibitor for antifreeze containing organosilicone-silicate polymers. 4,234,440, Cl. 252-76.000.
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Ferdinand, Irwin J., 4,233,912, Cl. 108-109.000.
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Hitachi Koki Company, Limited: *See—*
Okumura, Akira, 4,234,799, Cl. 250-576.000.
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Hirano, Mikio; and Horiuchi, Susumu, 4,234,448, Cl. 252-301.10W.
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Masaoka, Isao; and Imai, Katsuyuki, 4,234,119, Cl. 228-125.000.
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, 4,234,296, Cl. 418-201.000.
Onuki, Kenichi; Nakagawa, Tohru; and Kenma, Shigeyuki, 4,234,523, Cl. 261-41.00D.
Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, 4,233,848, Cl. 73-727.000.
Takahashi, Tadashi; and Morinaga, Shigeki, 4,233,919, Cl. 112-277.000.
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Gjerde, Trygve; Vigander, Kjell, Jenssen, Dag N.; and Hjertas, Bjorn, 4,234,270, Cl. 405-202.000.
Hochiki Corporation: *See—*
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Hochtemperatur-Reaktorbau GmbH. *See—*
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Hodgeman, Herbert H.; and Ali, Syed S. to Daniel Valve Company Lift-turn valve and actuator assembly. 4,234,157, Cl. 251-56.000.
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Dalibor, Horst, 4,234,468, Cl 260-31.20R.
Kuhn, Helmut; and Seiler, Kurt, 4,234,651, Cl. 428-290.000.
Lattrell, Rudolf; Bartmann, Wilhelm; and Gerhards, Hermann, 4,234,584, Cl. 424-250.000.
Mitzlaff, Michael; and Warning, Klaus, 4,234,484, Cl. 260-239.0BE.
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Hoeft, Jon L., to GTE Products Corporation. Automatic AFT defeat circuit. 4,234,962, Cl. 455-173.000.
Hoehn, Hans, to E. R. Squibb & Sons, Inc. Imidazolylethoxymethyl derivatives of 1,3-dioxolo quinolines. 4,234,589, Cl. 424-256.000.
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Putz, Hermann, 4,234,337, Cl. 75-208.00R.
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Barner, Richard; and Schmid, Max, 4,234,490, Cl. 260-340.90R.
Berger, Leo; and Scott, John W., 4,234,487, Cl. 260-315.000.
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,234,736, Cl. 548-314.000.
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.
Holka, Thomas C.: *See—*
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Hollan, Mark E.; and Bayles, John J., to United States of America, Navy. Chemical agent injection system for fire fighting equipment. 4,234,044, Cl. 169-14.000.
Hollingsworth, John D. Metallic card clothing. 4,233,711, Cl. 19-114.000.
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Wagner, Richard C., 4,233,710, Cl. 17-32.000.
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Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.
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Homeyer, Bernhard: *See—*
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Gorgens, Richard A., 4,234,932, Cl. 364-900.000.
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Honig, Milton L., to Standard Lubricants, Inc. Iso-palmitate polyol ester lubricants. 4,234,497, Cl. 260-410.600.
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Hooper, Harrison G.: *See—*
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desired sealing pressure between refractory plates of sliding nozzle. 4,233,718, Cl. 29-157.00C.
Horino, Kunio, to Tokico Ltd. Accumulator. 4,234,016, Cl. 138-30.000.
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Hoshall, Tom C. Filter device for fibrous materials. 4,234,274, Cl. 406-93.000.
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Howard, Dennis D.: *See—*
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Howard, Paulette A.; Campbell, Michael F.; and Zollinger, David T., to A. E. Staley Manufacturing Company. Water-soluble vegetable protein aggregates. 4,234,620, Cl. 426-656.000.
Howmedica, Inc.: *See—*
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Huber, Kurt: *See—*
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Hurst, George P.; and Svensson, Assar N., to Skega Aktiebolag. Wear lining. 4,234,291, Cl. 415-174.000.
Hurst, Robert G.; and Pinner, Alan L., to Protim International Limited. Apparatus for the treatment of timber. 4,233,929, Cl. 118-50.000.
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Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., 4,233,803, Cl. 56-14.900.
Hutten, James E., to American Thermometer Co., Inc. Combined display package and article storage case. 4,234,084, Cl. 206-306.000.
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Hutton, Ronald E.: *See—*
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Iida, Yoshimi, to Nippon Oil Seal Industry Co., Ltd. Roll neck sealing device. 4,234,196, Cl. 277-12.000.
Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasound transmitting or receiving apparatus. 4,234,940, Cl. 367-105.000.
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Illinois Tool Works Inc.: *See—*
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IMI Norgren Limited: *See—*
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International Flavors & Fragrances Inc.: *See—*
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Iwasaki, Susumu; Nagasawa, Osamu; Takano, Tatsuo; and Matsumoto, Seiji, to Sakai Chemical Industry Co., Ltd. Magnet paper sheet and a method for manufacturing the same. 4,234,378, Cl. 162-138.000.

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Jasko, James J.; and Zielinski, Richard J., to SCM Corporation. Lipoidal compositions, hard butter components, and improvement in process for making the latter. 4,234,618, Cl. 426-607.000.

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Jenkins, Robert E.; and Acree, Claude, to Georgia-Pacific Corporation. Self-cleaning dump valve for chemical reactor tank. 4,234,010, Cl. 137-242.000.

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Jensen, James B. Deep well hydraulic pump system using high pressure accumulator. 4,234,294, Cl. 417-377.000.

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Jeremiah, Thomas L.; and Pezdirtz, Karl F., to International Business Machines Corporation. Parity for computer system having an array of external registers. 4,234,955, Cl. 371-51.000.

Jessen, Kenneth C., to Hewlett-Packard Company. Permanent magnetic hold down for steel rule dies. 4,233,873, Cl. 83-652.000.

Jirard, Lillian R. Bedpan guard. 4,233,691, Cl. 4-450.000.

Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, to Metallgesellschaft Aktiengesellschaft. Process of producing a reducing gas. 4,234,451, Cl. 252-373.000.

Jocteur, Robert, to Societe Industrielle de Liaisons Electriques-Silec. Method for extruding a cross-linked material. 4,234,531, Cl. 264-174.000.

Johansson, Birger, to ASEA Aktiebolag. Transformer with offset side wall-mounted on-load tap changer. 4,234,864, Cl. 336-90.000.

John, Alfryn I.; and Moxham, Jack H. Self-locking adjustable support devices. 4,234,151, Cl. 248-354.00S.

Johns Hopkins University, The: *See—*
Marsh, David G., 4,234,569, Cl. 424-91.000.

Johnson, Alvin P. Berry pickers wagon. 4,234,203, Cl. 280-32.500.

Johnson, Jeffrey: *See—*
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.

Johnson, Roy B.: *See—*
Ristvedt, Victor G.; and Johnson, Roy B., 4,234,003, Cl. 133-3.00A.

Johnson, Russell W.: *See—*
Homeier, Edwin H.; and Johnson, Russell W., 4,234,455, Cl. 252-430.000.

Johnson, Steven A. Heat storage apparatus and method. 4,233,960, Cl. 126-430.000.

Johnson, William R.: *See—*
Morgan, Chester S.; and Johnson, William R., 4,234,338, Cl. 75-235.000.

Johnston, David B. R.: *See—*
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,234,596, Cl. 424-274.000.

Johnston, Titus M., to Buckman Laboratories, Inc. Oil-borne creosote and pentachlorophenol wood preservative compositions containing dimethylamide. 4,234,665, Cl. 428-541.000.

Jolley, Michael R. J.: *See—*
Groenenboom, Cornelis J.; Huysmans, Willem G. B.; Burley, Joseph W.; Hutton, Ronald E.; and Jolley, Michael R. J., 4,234,501, Cl. 260-429.700.

Jones, Derrick F.; and Yellin, Tobias O., to Imperial Chemical Industries Limited; and ICI Americas Inc. Guanidino imidazoles and thiazoles. 4,234,735, Cl. 548-198.000.

Jones, Evan A., to UOP Inc. Guard-bed vapor bypass to overcome pressure drop in mixed-phase reactions. 4,234,314, Cl. 23-230.00A.

Jones, Gordon H.: *See—*
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,234,571, Cl. 424-177.000.

Jones, Robert S. Attachments in model airplanes. 4,233,773, Cl. 46-76.00R.

Jorgensen, Carsten, to Copco, Inc. Gridworks storage system. 4,234,094, Cl. 211-88.000.

Jost, Ronald C.: *See—*
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., 4,234,965, Cl. 455-285.000.

Jung, Check K.; and Whalen, Harold E., to Sperry Corporation. Gasdynamic solar powered laser. 4,234,856, Cl. 331-94.50P.

Junkers, John K. Hydraulic wrench. 4,233,865, Cl. 81-57.440.

Kabushiki Kaisha Daini Seikosha: *See—*
Kawashima, Hirofumi, 4,234,812, Cl. 310-361.000.
Komaki, Shojiro; and Kaneko, Noboru, 4,234,944, Cl. 368-72.000.

Kabushiki Kaisha Kyoritsu Seisakujo: *See—*
Take, Hisao, 4,233,951, Cl. 123-625.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,233,900, Cl. 101-288.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Nakane, Masao; and Nishii, Masahiko, 4,234,057, Cl. 187-9.00E.

Kadelbach, Volker; Will, Gerhard; and Sauer, Joseph, to Robert Bosch GmbH. Control system for automotive automatic transmission with emergency operation feature. 4,233,860, Cl. 74-752.00A.

Kadota, Takumi: *See—*
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; Masunaga, Katsuro; and Kadota, Takumi, 4,234,740, Cl. 560-81.000.

Kaelin, Oscar J.; and Mathews, Richard H., to GTE Sylvania Incorporated. Noise adaptive correlator. 4,234,883, Cl. 343-100.0CL.

Kaga, Hideharu: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,234,534, Cl. 264-328.800.

Kagayama, Michiko: *See—*
Hirayama, Masami; Nakata, Tadataka; and Kagayama, Michiko, 4,234,450, Cl. 252-314.000.

Kahn, Marvin L.; and Eapen, Kuttikandathil E., to Rich Products Corporation. Soft intermediate-moisture frozen puddings and fillings. 4,234,611, Cl. 426-321.000.

Kaji, Hidehiko: *See—*
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, 4,234,469, Cl. 260-42.460.

Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, to Kawasaki Steel Corporation. Apparatus for producing low-oxygen iron-base metallic powder. 4,234,168, Cl. 266-128.000.

Kakenyaku Kako Kabushiki Kaisha: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Kako, Noritoshi; Yamane, Yasukuni; and Suzuki, Chuji, to Sharp Kabushiki Kaisha. Flat panel television receiver implemented with a thin film EL panel. 4,234,821, Cl. 315-169.300.

Kalina, Alexander I. Method and apparatus for loading and unloading pipeline capsules. 4,234,271, Cl. 406-1.000.

Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, to Hitachi, Ltd.; and Nippon Engelhard Ltd. Iodine adsorbent. 4,234,456, Cl. 252-438.000.

Kamoda, Tamotsu: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, 4,234,617, Cl. 426-557.000.

Kamp, Heinz, to W. Schlafhorst & Co. Device for automatically removing a coil from a spindle of a ring spinning frame or a ring twister. 4,233,810, Cl. 57-270.000.

Kampe, Wolfgang: *See—*
Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.

Kanaiwa, Kiyoshi; and Matsumoto, Kozo, to Canon Kabushiki Kaisha. Information output apparatus for putting out a character dot pattern. 4,234,931, Cl. 364-900.000.

Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, to Kakenyaku Kako Kabushiki Kaisha. Proteinic active substances. 4,234,570, Cl. 424-177.000.

Kaneko, Noboru: *See—*
Komaki, Shojiro; and Kaneko, Noboru, 4,234,944, Cl. 368-72.000.

Kaplan, Donald A.; and Wilcox, Gary L., to University of California, The Regents of the. Horizontal slab gel electrophoresis. 4,234,400, Cl. 204-180.00G.

Kappler, Fritz-Robert; and Seiler, Claus-Dietrich, to Dynamit Nobel Aktiengesellschaft. Method of preparing aminoalkylsilanes. 4,234,502, Cl. 556-413.000.

Kappler, Fritz-Robert; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing gamma aminopropyl alkoxy silanes. 4,234,503, Cl. 556-413.000.

Karch, John A.: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. 2,2,6,6-Tetramethylpiperidine derivatives. 4,234,734, Cl. 546-188.000.

Kartchner, Mark M.: *See—*
McRae, Lorin P.; and Kartchner, Mark M., 4,233,980, Cl. 128-325.000.

Kataoka, Hiroyoshi: *See—*
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, 4,234,466, Cl. 260-17.00A.

Katayama, Hironobu: *See—*
Nakagawa, Shozo; Yokoyama, Katsuya; and Katayama, Hironobu, 4,234,898, Cl. 360-41.000.

Kato, Hajime; and Ogata, Yasuhiro, to Fuji Photo Film Co., Ltd. Recording sheet. 4,234,212, Cl. 282-27.500.

Katsukura, Kazutada: *See—*
Sekiguchi, Kouichi; Takematsu, Hikaru; and Katsukura, Kazutada, 4,234,765, Cl. 179-99.00M.

Katzen, Stanley J.: *See—*
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,234,453, Cl. 252-428.000.
Rekers, Louis J.; and Katzen, Stanley J., 4,234,709, Cl. 526-100.000.

Kauffeldt, Horst. Apparatus for cleaning of large scale textile coverings, especially carpets and wall to wall carpeting. 4,233,706, Cl. 15-300.00A.

Kaukeinen, Joseph Y.; and Rockafellow, Duane A., to Eastman Kodak Company. Reducible metal salt-dry electrographic visible image recording process. 4,234,670, Cl. 430-52.000.

Kautetzky, Anton; and Muller, Otto, to Kraftwerk Union Aktiengesellschaft. Attachment for screw-tightening devices, preferably for reactor pressure vessels. 4,233,727, Cl. 29-560.000.

Kavadias, Gerry, to Bristol-Myers Company. 9-Oxobenzomorphan process. 4,234,731, Cl. 46-97.000.

Kawaguchi, Hideo: *See—*
Yamagisi, Kikuo; Okuyama, Hiroshi; and Kawaguchi, Hideo, 4,234,300, Cl. 425-363.000.

Kawai, Hisasi: *See—*
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Kawakami, Hiromi: *See—*
Hongu, Masayuki; Kawakami, Hiromi; and Tokuhara, Masaharu, 4,234,963, Cl. 455-204.000.

Kawakami, Kanji: *See—*
Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, 4,233,848, Cl. 73-727.000.

Kawamoto, Tamio: *See—*
Toyota, Hiroshi; Kawamoto, Tamio; and Takehiro, Etsusou, 4,234,066, Cl. 192-0.092.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Uozumi, Yukio; and Yagi, Masaharu, 4,234,065, Cl. 191-29.00R.

Kawasaki Steel Corporation: *See—*
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,234,168, Cl. 266-128.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Thickness-width shear quartz crystal vibrator. 4,234,812, Cl. 310-361.000.

Kawashima, Nobuo: *See—*
Ohkawa, Mikio; and Kawashima, Nobuo, 4,234,771, Cl. 200-144.00B.

Kawashima, Yutaka: *See—*
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Kawazoe, Michio. Tilting adjusting mechanism for a camera tripod. 4,234,149, Cl. 248-184.000.

Kay, Francis X. Valves for the control of pressure fluid. 4,234,162, Cl. 251-175.000.

Keegan, Richard E.: *See—*
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., 4,234,745, Cl. 568-614.000.

Keegan, Robert R. Modular chess set. 4,234,188, Cl. 273-290.000.

Kehr, Dieter; and Goebell, Juergen, to Minnesota Mining and Manufacturing Company. Dielectric material for influencing electric fields, and stress control devices made therefrom. 4,234,439, Cl. 252-63.200.

Keith, Charles H.: *See—*
Miano, Ralph R.; and Keith, Charles H., 4,233,993, Cl. 131-2.000.

Kelderman, Hendrik C.: *See—*
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,234,512, Cl. 568-420.000.

Keller, Douglas V., Jr.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,234,232, Cl. 299-5.000.

Keller, Teddy M.; and Griffith, James R., to United States of America, Navy. Polyphthalocyanine resins. 4,234,712, Cl. 528-9.000.

Kelley, Carl S., to Phillips Petroleum Company. Temperature control of exothermic reactions. 4,234,410, Cl. 208-57.000.

Kellner, Eckhard: *See—*
Kemmer, Josef; and Kellner, Eckhard, 4,234,831, Cl. 318-115.000.

Kellwood Company: *See—*
Conner, William R., Jr., 4,234,135, Cl. 242-56.00R.

Kelly, Donald A. Suspended, hot-box solar collectors. 4,233,961, Cl. 126-436.000.

Kelly, Robert C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-9-deoxy-6,9α-epoxymethano-5,6-didehydro-PGF$_1$ compounds. 4,234,492, Cl. 260-345.200.

Kelly, Robert C., to Upjohn Company, The. 9-Deoxy-6,9α-epoxymethano-5,6-didehydro-PGF$_1$, amide. 4,234,493, Cl. 260-345.200.

Kelsey-Hayes Company: *See—*
Rozmus, Walter J., 4,233,720, Cl. 29-407.000.

Kemmer, Josef; and Kellner, Eckhard. Compound rotary and/or linear motor. 4,234,831, Cl. 318-115.000.

Kemper, Yves J., to Vadetec Corporation. Infinitely variable transmission unit and method. 4,233,851, Cl. 74-191.000.

Kemper, Yves J., to Vadetec Corporation. Infinitely variable transmission unit and system incorporating same. 4,233,859, Cl. 74-690.000.

Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., to Pollution Control Industries, Inc. Ozone generator. 4,234,800, Cl. 250-540.000.

Kenma, Shigeyuki: *See—*
Onuki, Keiichi; Nakagawa, Tohru; and Kenma, Shigeyuki, 4,234,523, Cl. 261-41.00D.

Kenny, Neal S., to Corning Glass Works. Solar energy collector. 4,233,957, Cl. 126-443.000.

Kern, Rene: *See—*
Deleens, Gerard; Guerin, Bernard; and Kern, Rene, 4,234,184, Cl. 273-235.00R.

Kerscher, Albert; and Furtner, Walter, to Knorr-Bremse GmbH. Mechanical release mechanism for a spring-loaded brake cylinder. 4,234,062, Cl. 188-170.000.

Keystone Consolidated Industries, Inc.: *See—*
Dauenbaugh, Robert L., 4,233,828, Cl. 70-363.000.

Kidd, Derek J.: *See—*
Sewell, Richard B. H.; and Kidd, Derek J., 4,234,637, Cl. 428-131.000.

Kidd, H. Keith: *See—*
Langley, Lawrence W.; and Kidd, H. Keith, 4,234,838, Cl. 318-696.000.

Kiddie Products, Inc.: *See—*
Panicci, Richard L., 4,233,714, Cl. 24-201.00R.

Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, to Advanced Mineral Research AB. Polymeric silicate material and a method of manufacturing the same. 4,234,380, Cl. 162-152.000.

Kijima, Yasuhiko: *See—*
Isshiki, Tomiya; Kijima, Yasuhiko; and Miyauchi, Yuh, 4,234,733, Cl. 546-174.000.

Kikuchi, Shoji: *See—*
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Kilbourn, Edward E.: *See—*
Weir, W. David; and Kilbourn, Edward E., 4,234,575, Cl. 424-204.000.

Killam, H. Scott, to Rohm and Haas Company. Fibrous material made with polymers stabilized by polymerizable vinyl benzyltrialkyl ammonium salt surfactant. 4,234,381, Cl. 162-158.000.

Kimata, Ikukazu: *See—*
Motegi, Masahiko; Kimata, Ikukazu; and Fujita, Saburo, 4,234,532, Cl. 264-235.800.

Kimerling, Lionel C.: *See—*
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.

Kimura, Takashi: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, 4,234,617, Cl. 426-557.000.

Kimura, Takeo: *See—*
Akashi, Kageyasu, Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.

Kindelspire, Thomas J., to General Electric Company. Method of assembling a relay device. 4,233,732, Cl. 29-881.000.

King, Christopher D.; and Bowman, Noel T., to King, Christopher Duff; King, Sally; and Bowman, Noel Trevor. Battery charging. 4,234,839, Cl. 320-36.000.

King, Christopher Duff: *See—*
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.

King, Rendall N.: *See—*
Park, Dong-Sil; Breiter, Manfred W.; and King, Rendall N., 4,234,668, Cl. 429-163.000.

King, Sally: *See—*
King, Christopher D., and Bowman, Noel T., 4,234,839, Cl. 320-36.000.

King, William M.: *See—*
Berdan, Betty L.; and King, William M., 4,234,395, Cl. 204-12.000.

Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Tester for electronic engine control systems. 4,234,921, Cl. 364-424.000.

Kinner, Edwin K. Valve. 4,234,015, Cl. 137-625.180.

Kirchner, Gerhard: *See—*
Koller, Horst; Hartl, Alfons E.; and Kirchner, Gerhard, 4,234,516, Cl. 568-341.000.

Kiriazaros, Kiriazis, to Maschinenfabrik Andritz Aktiengesellschaft. Bearing for heavy steel drums, in particular decorticating drums. 4,234,237, Cl. 308-26.000.

Kirilishin, Vsevolod P. Binder for chemically resistant concrete and process for producing this binder. 4,234,347, Cl. 106-286.700.

Kirkbride, Chalmer G. Sulfur removal from crude petroleum. 4,234,402, Cl. 204-162.00R.

Kirkpatrick, John W., and Mower, Lawrence N., to Standard Oil Company (Indiana). Direct combustion stimulation of a producing well. 4,234,042, Cl. 166-261.000.

Kishi, Hitotoshi: *See—*
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.

Kissel, Karl-Friedrich: *See—*
Fritz, Rolf; and Kissel, Karl-Friedrich, 4,234,384, Cl. 176-58.0PB.

Kitamura, Masao: *See—*
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.

Kitano, Yuichi; and Hirayama, Kaiichirou, to Tokyo Shibaura Denki Kabushiki Kaisha. Control systems for generators. 4,234,925, Cl. 364-494.000.

Kiwala, Jacob: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.

Klatt, William M.: *See—*
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., 4,233,991, Cl. 128-733.000.

Klauke, Erich: *See—*
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Klaxon S.A.: *See—*
Warnod, Bertrand A., 4,234,873, Cl. 340-509.000.

Klein, Jeshayahu. Portable microfilm viewer. 4,234,244, Cl. 350-241.000.

Kleinguenther, Robert A. Apparatus and process for treating wood and fibrous materials. 4,233,752, Cl. 34-9.500.

Klemm, Richard, to Siemens Aktiengesellschaft. Adaptive method and a radar receiver for suppression of disturbing portions of the Doppler spectrum. 4,234,880, Cl. 343-5.0FT.

Kline, Ralph L., to GTE Automatic Electric Laboratories Incorporated. Error density detector. 4,234,953, Cl. 371-5.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Berg, Josef, 4,234,292, Cl. 417-214.000.
Schleiermacher, Herbert, 4,233,854, Cl. 74-325.000.

Kluss, Karl K.: *See—*
Hornor, Harold G.; and Kluss, Karl K., 4,234,019, Cl. 138-109.000.

Knight, Roger E., to IMI Norgren Limited. Bowl for compressed air or gas filter or lubricator. 4,234,014, Cl. 137-557.000.

Knorr-Bremse GmbH: *See—*
Kerscher, Albert; and Furtner, Walter, 4,234,062, Cl. 188-170.000.

Kobayashi, Hidehiko: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.

Koch, Roderic M., to George Koch Sons, Inc. Nested container and base connection. 4,234,091, Cl. 206-499.000.

Kodama, Kenjiro: *See—*
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.

Koenders, Peter: *See—*
van der Zeeuw, Abraham J.; Koenders, Peter; and Kok, Riekert, 4,234,546, Cl. 423-139.000.

Koenig, Fredrick, to General Electric Company. Apparatus and methods for making and using slot closure wedges at a coil injection station. 4,233,729, Cl. 29-596.000.

Koenuma, Masao; and Gibu, Yoshitaka, to Asahi Seimitsu Kabushiki Kaisha. Universal parallel ruler for three-dimensional drawing. 4,233,751, Cl. 33-434.000.

Koide, Hiroshi: *See—*
Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, 4,234,948, Cl. 368-291.000.

Koike, Masahiko: *See—*
Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, 4,233,875, Cl. 84-1.240.

Koike, Masaru, to Meinan Machinery Works, Inc. Veneer lathe. 4,234,024, Cl. 144-213.000.

Kok, Riekert: *See—*
van der Zeeuw, Abraham J.; Koenders, Peter; and Kok, Riekert, 4,234,546, Cl. 423-139.000.

Kolak, Nicholas P.: *See—*
Burnell, Laurence K., Hyde, James D.; Kolak, Nicholas P.; and Gibbs, Richard E., 4,234,548, Cl. 423-235.000.

Koller, Horst; Hartl, Alfons E.; and Kirchner, Gerhard, to Atlantic Research Institute Limited. Method of isomerizing humulone to isohumulone by catalytic acceleration with metal salts. 4,234,516, Cl 568-341.000.

Kollmorgen Technologies Corporation: *See—*
Bock, Francis X., 4,234,802, Cl. 328-171.000.
Langley, Lawrence W.; and Kidd, H. Keith, 4,234,838, Cl. 318-696.000.

Komaki, Shojiro; and Kaneko, Noboru, to Kabushiki Kaisha Daini Seikosha. Alarm electronic timepiece. 4,234,944, Cl. 368-72.000.

Komatsu, Yuzo: *See—*
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, 4,234,945, Cl. 368-75.000.

Komlos, Peter G.: *See—*
Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., 4,234,565, Cl. 424-33.000.

Konigsberg, Robert L.: *See—*
Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., 4,234,142, Cl. 244-3.210.

Konishiroku Photo Industry Co., Ltd.: *See—*
Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Konno, Kunikazu: *See—*
Nakatani, Kiyotaka; and Konno, Kunikazu, 4,234,773, Cl. 200-308.000.

Kono, Masanori: *See—*
Chihara, Takeshi; and Kono, Masanori, 4,234,153, Cl. 248-475.00B.

Konrad, Charles E.; and Davis, Richard K., to General Electric Company. Battery state-of-charge indicator. 4,234,840, Cl. 320-48.000.

Kontz, Robert F., to Owens-Illinois, Inc. Apparatus for blow molding. 4,234,297, Cl. 425-174.400.

Korbanka, Helmut: *See—*
Wieser, Hartmut; Korbanka, Helmut; and Pfahler, Gerhard, 4,234,471, Cl. 260-45.80N.

Kordon, Moonish J. Apparatus for cultivating soil. 4,233,915, Cl. 111-6.000.

Kormendy, Miltiades, to Coal Industry (Patents) Limited. Engagement devices. 4,234,163, Cl. 254-108.000.

Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P. Composite material and method of producing same. 4,234,659, Cl. 428-403.000.

Kotuby, Paul M.; and Reed, Joseph F., to Risdon Corporation. Cigarette/cigar treatment device. 4,233,995, Cl. 131-133.00R.

Kovalsics, Otto: *See—*
Rywak, Donald E.; Griffith, James L.; Rhodes, Frederick D.; and Kovalsics, Otto, 4,234,106, Cl. 222-239.000.

Kowalik, Peter M.: *See—*
Cleaveland, Charles M.; and Kowalik, Peter M., 4,234,147, Cl. 248-74.00R.

Koyahata, Hirosi; and Suzuki, Nobuo. Stylus lead-in mechanism of record player. 4,234,194, Cl. 274-10.00R.

Koyama, Isao: *See—*
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.

Koyama, Mikio: *See—*
Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.

Kozar, Robert S.: *See—*
Rhodes, Cecil C.; and Kozar, Robert S., 4,234,429, Cl. 423-109.000.

Kraft, Inc.: *See—*
Krueger, Grant E., 4,234,615, Cl. 426-478.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Kautetzky, Anton; and Muller, Otto, 4,233,727, Cl. 29-560.000.

Kramer, Erich, to Bayer Aktiengesellschaft. Water-soluble azo dyestuffs. 4,234,480, Cl. 260-157.000.

Kranz, Max L., to Robertshaw Controls Company. Emergency escape breathing apparatus. 4,233,970, Cl. 128-201.280.

Krapcho, John; and Schwartz, Joseph, to E. R. Squibb & Sons, Inc. Naphthalenone derivatives and analogs. 4,234,602, Cl. 424-330.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Seiler, Karl H., 4,233,906, Cl. 104-294.000.

Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. 3-Indolyl-tertiary butylaminopropanols. 4,234,595, Cl. 424-274.000.

Kreiselman, Robert L.: *See—*
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,538, Cl. 422-64.000.
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Krekeler, Jerome H.: *See—*
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,234,453, Cl. 252-428.000.

Kretzschmar, Wolfgang: *See—*
Wilmes, Manfred; Obst, Rudiger; and Kretzschmar, Wolfgang, 4,234,239, Cl. 339-198.0GA.

Krieger, David, to Emb-Tex Corporation. Process and apparatus for producing continuous embroidered fabrics. 4,233,916, Cl. 112-90.000.

Krjuchin, Andrei A.: *See—*
Petrov, Vyacheslav V.; and Krjuchin, Andrei A., 4,234,625, Cl. 427-74.000.

Kroenke, William J., to B. F. Goodrich Company, The. Dodecyl-1,12-diammonium dimolybdate and composition containing same. 4,234,473, Cl. 260-45.75R.

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Krolski, Kenneth L.; and MacLeod, John N., to Tecumseh Products Company. Safety interlock for an engine ignition system. 4,233,950, Cl. 123-630.000.

Krueger, Grant E., to Kraft, Inc. Method for making large sized blocks of cheese. 4,234,615, Cl. 426-478.000.

Krumm, Hagen: *See—*
Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, 4,234,451, Cl. 252-373.000.

Krutki, Marian: *See—*
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.

Kubo, Tsutomu: *See—*
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.

Kudinova, Olga I.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Kuenzig, Ernest O.; and Pennino, Frank L., to Forest Mechanical Products Corp. Blow pin construction in a plastic bottle blow molding machine. 4,234,299, Cl. 425-292.000.

Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, to BASF Aktiengesellschaft. Process for treating a liquid with a gas and for preventing the phase separation of unreacted gas and liquid, in a circulatory reactor. 4,234,560, Cl. 423-659.000.

Kuhl, LeRoy L.; and Thompson, Lester L. Vapor impermeable insulation facing construction. 4,233,791, Cl. 52-309.100.

Kuhn, Helmut; and Seiler, Kurt, to Hoechst Aktiengesellschaft. Process for the manufacture of a non-woven product having high shear strength and dimensional stability. 4,234,651, Cl. 428-290.000.

Kukla, Bruno: *See—*
Billenstein, Siegfried; Kukla, Bruno; and Stuhler, Herbert, 4,234,509, Cl. 260-465.200.

Kumagai, Shigeto. Drain trap. 4,234,267, Cl. 405-42.000.

Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, to Chisso Corporation. Heat-adhesive composite fibers. 4,234,655, Cl. 428-374.000.

Kuninaka, Akira: *See—*
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.

Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, to Citizen Watch Co., Ltd. Device for feeding ink ribbon. 4,234,260, Cl. 400-219.300.

Kunkel, Heinrich: *See—*
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.

Kuprianov, Alexandr V.: *See—*
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.

Kurata, Noboru: *See—*
Noda, Kenichi; Murakami, Hiroshi; and Kurata, Noboru, 4,233,717, Cl. 29-156.4WL.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, 4,234,460, Cl. 252-447.000.

Kurihara, Toshio: *See—*
Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, 4,234,260, Cl. 400-219.300.

Kuroda, Masahiko; and Ohsawa, Eiji, to Nissan Shatai Co., Ltd. Centralized alarm system for vehicles. 4,234,866, Cl. 340-52.00F.

Kurokawa, Shigeki: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Kurosaki Refractories Co. Ltd.: *See—*
Horiguchi, Hiroshi; and Matsuo, Terumoto, 4,233,718, Cl. 29-157.00C.

Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, to Yamasa Shoyu Kabushiki Kaisha. L-Lysine α-oxidase. 4,234,691, Cl. 435-191.000.

Kuyava, Charles C.: *See—*
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., 4,233,991, Cl. 128-733.000.

Kuzma, John J., Jr.: *See—*
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.

Kuznetsov, Vladimir N. Dry film photosensitive resist. 4,234,675, Cl. 430-271.000.

Kuzuya, Susumu: *See—*
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Ohta, Shigenori; and Watanabe, Kenji, 4,234,607, Cl. 426-56.000.

Lacrampe, Jean: *See—*
Cognacq, Jean C.; and Lacrampe, Jean, 4,234,742, Cl. 562-426.000.

Laferty, John M.: *See—*
Hepworth, Malcolm T.; and Laferty, John M., 4,234,393, Cl. 204-1.500.

LaFleur, Arthur E., to Custom Packaging Systems. Method of making a collapsible drum-type container. 4,233,888, Cl. 493-132.000.

Lafrenz, Joseph: *See—*
Cieslak, Richard F.; Balding, John V.; and Lafrenz, Joseph, 4,234,964, Cl. 455-226.000.

Lage, Frederick A. Shotgun shell. 4,233,903, Cl. 102-42.00R.

Lala, Louis A., to American Screen Printing Equipment Company. Long stroke attachment for a screen printing machine. 4,233,897, Cl. 101-123.000.

Lalaun, Jean-Pierre: *See—*
Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, 4,234,663, Cl. 428-517.000.

Lancellotti, William E. Sports helmet with face mask. 4,233,687, Cl. 2-9.000.

Landry, Archie C.: *See—*
Harshman, Ray E.; and Landry, Archie C., 4,234,278, Cl. 410-69.000.

Lane, William C., to Otis Engineering Corporation. Automatic inhaul winch system. 4,234,167, Cl. 254-291.000.

Lange, Julius; and Wagner, Gary L., to Ford Aerospace & Communications Corp. On-line bit error rate estimator. 4,234,954, Cl. 371-6.000.

Langlands, James W., to Langlands, Mary Frances Theresa. Method of bonding spaced sheets by molding resin therebetween. 4,234,533, Cl. 264-261.000.

Langlands, Mary Frances Theresa: *See—*
Langlands, James W., 4,234,533, Cl. 264-261.000.

Langley, Lawrence W.; and Kidd, H. Keith, to Kollmorgen Technologies Corporation. Incremental motion motor controller. 4,234,838, Cl. 318-696.000.

Lanham Machinery Company, Inc.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,234,281, Cl. 414-37.000.

Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., to Lanham Machinery Company, Inc. Automatic bread pan control system. 4,234,281, Cl. 414-37.000.

Lanham, William E., Jr.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,234,281, Cl. 414-37.000.

Lanter, Kent J.: *See—*
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,234,604, Cl. 426-2.000.

Laputte, Robert: *See—*
Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, 4,234,663, Cl. 428-317.000.

Larach, Simon; and Vilkomerson, David H. R., to RCA Corporation. Echocardiographic apparatus for myocardial disease diagnosis by A-wave quantification. 4,233,989, Cl. 128-661.000.

Larsen, Steven T.: *See—*
Guckel, Henry; and Larsen, Steven T., 4,234,361, Cl. 148-186.000.

Las, Roger. Device for marking an element of information. 4,234,187, Cl. 273-248.000.

Laseter, Douglas E. Material conveyor. 4,234,272, Cl. 406-64.000.

La Spina, Andrea; Dietrich, Werner; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Addition compounds which contain phosphorus and their use as catalysts for the production of foam resins which contain carbodiimide groups. 4,234,694, Cl. 521-107.000.

Lassig, Harry; and Grosshauser, Anton, to Fordertechnische Forschungsgesellschaft mbH. Load handling railroad vehicle. 4,234,287, Cl. 414-542.000.

Lastinger, William R. Heat exchange interface apparatus. 4,233,818, Cl. 62-224.000.

Lathem Time Recorder Co., Inc.: *See—*
Pipes, William F.; Millsap, Roy V.; McClure, Richard W.; and Hooper, Harrison G., 4,234,958, Cl. 375-107.000.

Latta, Laurence, Jr.; and Leonard, John B., Jr., to Chem-Crete Corporation. High strength modified asphalt paving composition. 4,234,346, Cl. 106-281.00R.

Lattrell, Rudolf; Bartmann, Wilhelm; and Gerhards, Hermann, to Hoechst Aktiengesellschaft. Substituted phenylpiperazine derivatives. 4,234,584, Cl. 424-250.000.

Laurel Bank Machine Co., Ltd.: *See—*
Uchida, Isamu; and Watanabe, Kenkichi, 4,234,002, Cl. 133-1.00A.

La Vance, Cecil N.; and Beale, Allan A., to Motorola, Inc. Method of introducing a baseline measurement into electronic positioning apparatus. 4,234,924, Cl. 364-460.000.

Lawrence, Frederick R., to Du Pont de Nemours, E. I., and Company. Catalytic nitration of aromatic compounds. 4,234,470, Cl. 568-939.000.

Lawrence, Walter H.: *See—*
Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., 4,234,800, Cl. 250-540.000.

Laws, William R.; and Reed, Geoffrey R., to Encomech Engineering Services Ltd. Storage of thermal energy. 4,233,959, Cl. 126-426.000.

Lawson, Gustaf R., to AMP Incorporated. Covering for T-tap terminals. 4,234,760, Cl. 174-138.00F.

LCG, Inc.: *See—*
Cliffi, Dale L., 4,233,788, Cl. 52-127.000.

Leahy, Thomas; and Fenoli, John. Method for preventing freeze-up of musical instrument valves and other movable elements. 4,233,876, Cl. 84-388.000.

Leamy, Harry J.: *See—*
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.

Leblanc, Gilles. Footwear cleaning apparatus. 4,233,707, Cl. 15-311.000.

Lebost, Barry A. Fluid turbine. 4,234,289, Cl. 415-2.00R.

Le Brise, Raymond, to Societe Anonyme Francaise du Ferodo. Torsion damping assembly especially for a friction clutch plate assembly. 4,234,068, Cl. 192-106.200.

Leco Corporation: *See—*
Bredeweg, Roger L.; and Sitek, George J., 4,234,541, Cl. 422-78.000.

Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., to Schering Corporation. Microbiological methylation of aminoglycosyl-aminoglycosides. 4,234,685, Cl. 435-80.000.

Lee, Chi-Long: *See—*
Homan, Gary R.; and Lee, Chi-Long, 4,234,697, Cl. 521-128.000.

Lee, Gim F., Jr.: *See—*
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,234,701, Cl. 525-68.000.

Lee, Minyoung; Szala, Lawrence E.; and DeVries, Robert C., to General Electric Company. Polycrystalline diamond body/silicon nitride substrate composite. 4,234,661, Cl. 428-446.000.

Lee, Peter D., to Governor & Company of the Bank of England. Document carrying a legible code, and method and apparatus for producing same. 4,234,214, Cl. 283-57.000.

Lefebvre, Fredrick L. Liquid level responsive control device. 4,234,785, Cl. 219-523.000.

Leftault, Charles J., Jr. Traction assembly for vehicle wheels. 4,234,028, Cl. 152-233.000.

LeGrow, Gary E., to Dow Corning Corporation. Curable solventless organopolysiloxane compositions. 4,234,713, Cl. 528-15.000.

Le-Hong, Son, to Compagnie de Signaux et d'Enterprises Electriques. Device for checking metal pieces, particularly coins. 4,234,071, Cl. 194-100.00A.

Leiboff, Teague N., to Northrop Corporation. Radiant energy quadrant detection device. 4,234,145, Cl. 244-3.160.

Leichtfried, Friedrich: *See—*
Hofbauer, Rupert; Leichtfried, Friedrich; and Svoboda, Josef, 4,234,206, Cl. 280-605.000.

Leistritz, Hans K. Gas discharge apparatus. 4,233,812, Cl. 60-320.000.

Leisure Lawn, Inc.: *See—*
Baker, Douglas W., 4,234,131, Cl. 239-685.000.

Leitch, George J., to MacGregor International S.A. Container and cover arrangement. 4,234,034, Cl. 160-193.000.

Leivenzon, Simon; and Leivenzon, Steven, to Firmaframe Nominees Proprietary Limited. Roller door and frame combination. 4,234,033, Cl. 160-133.000.

Leivenzon, Steven: *See—*
Leivenzon, Simon; and Leivenzon, Steven, 4,234,033, Cl. 160-133.000.

Lemelson, Jerome H. Modular toy. 4,233,778, Cl. 46-240.000.

Leo, John N. Fluoridation system. 4,234,425, Cl. 210-88.000.

Leonard, Henri, to Micro-Mega S.A. Device for locking a tool in a dental handpiece. 4,234,308, Cl. 433-127.000.

Leonard, John B., Jr.: *See—*
Latta, Laurence, Jr.; and Leonard, John B., Jr., 4,234,346, Cl. 106-281.00R.

Lepage, Jeanne L.: *See—*
Lepage, Michel; and Lepage, Jeanne L., 4,233,705, Cl. 15-257.060.

Lepage, Michel; and Lepage, Jeanne L. Paint metering tray for roller applications. 4,233,705, Cl. 15-257.060.

Lepretre, Marc V. A.: *See—*
Balzano, Lucien D.; and Lepretre, Marc V. A., 4,233,886, Cl. 92-86.500.

Les Industries Procinciales Ltee: *See—*
Chabot, Jean-Marie, 4,234,100, Cl. 220-306.000.

Lestina, Gregory J.: *See—*
Ford, John A.; and Lestina, Gregory J., 4,234,672, Cl. 430-222.000.

Letraset Corporation: *See—*
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.

Leuthard, Paul E. Porous ceramic dental filling insert. 4,234,310, Cl. 433-228.000.

Lever Brothers Company: *See—*
Lok, Cornelis M., 4,234,498, Cl. 260-410.700.

Lewallyn, Michael A. Carpet sample stacker. 4,234,282, Cl. 414-45.000.

Lewis, Katherine J.: *See—*
Blake, Stephen D.; and Lewis, Katherine J., 4,234,644, Cl. 428-204.000.

Lewis, Neal A., to Procter & Gamble Company, The. Robusta coffee. 4,234,613, Cl. 426-430.000.

LGZ Landis & Gyr Zug AG: *See—*
Fahlesson, Kjell T., 4,234,904, Cl. 361-165.000.
Halder, Mathis, 4,234,872, Cl. 340-365.00R.

Lichtenveldt: *See—*
Van Egmond, Jacobus H.; and Lichtenveldt, 4,234,390, Cl. 202-262.000.

Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S. Solar power unit. 4,234,354, Cl. 136-246.000.

Lieding, Calvin A., to Irrigation Specialties Company. Pop-up sprinkler. 4,234,125, Cl. 239-111.000.

Lien, Jih-Chang: *See—*
Raymond, Joseph H., Jr.; and Lien, Jih-Chang, 4,234,889, Cl. 357-71.000.

Life Instruments Corporation: *See—*
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,233,988, Cl. 128-660.000.

Lifeline Products, Inc.: *See—*
Marshall, James J., 4,234,686, Cl. 435-94.000.

Lightle, John R., to Dresser Industries, Inc. Axial balancing system for motor driven pumps. 4,234,293, Cl. 417-365.000.

Lilburn, Jennifer E., to Chevron Research Company. Fuel compositions containing deposit control additives. 4,234,321, Cl. 44-72.000.

Lill, Helmut: *See—*
Bartl, Knut; Lill, Helmut; and Ziegenhorn, Joachim, 4,234,682, Cl. 435-13.000.

Lillibridge, Harold R., to Champion International Corporation. Reclosable envelope. 4,234,122, Cl. 229-77.000.

Linares, Robert C., to Allied Chemical Corporation. Growth of single crystal beryllium oxide. 4,234,376, Cl. 156-617.0SP.

Linderoth, Gustaf; and Wiberg, Karl-Gunnar, to ASEA Aktiebolag. Method of applying an insulation of cross-linked polymer on a cable conductor. 4,234,624, Cl. 427-55.000.

Lindsay, Geoffrey A., to B. F. Goodrich Company, The. Polymer compositions and a method for enhancement in phase compatibility of elastomers with relatively rigid polymers. 4,234,703, Cl. 525-211.000.

Linehan, Kevin L., to ICI Australia Limited. Process of manufacturing feed blocks and products thereof. 4,234,608, Cl. 426-72.000.

Link, Helmut: *See—*
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,234,736, Cl. 548-314.000.

Lion Fat & Oil Co., Ltd., The: *See—*
Magari, Teruo; Sato, Toyoyuki; and Nakamura, Masayoshi, 4,234,465, Cl. 252-547.000.

Lithibar Company, The: *See—*
Donnelly, Bernard P.; and Van Slooten, Roland W., 4,234,280, Cl. 414-35.000.

Litsenko, Tatyana A.: *See—*
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,234,354, Cl. 136-246.000.

Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., to Binks Manufacturing Company. Turbine pump. 4,234,290, Cl. 415-145.000.

Loch, Charles H.: *See—*
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,234,912, Cl. 362-145.000.

Lock, Peter M.; and Webb, David R. Wound dressing materials. 4,233,969, Cl. 128-156.000.

Loeliger, Peter: *See—*
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.

Loffelholz, Eberhard. Ski pole. 4,234,202, Cl. 280-820.000.

Lok, Cornelis M., to Lever Brothers Company. Preparation of glyceride esters. 4,234,498, Cl. 260-410.700.

Lombardo, Ralph M., Jr.: *See—*
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.

Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Knitting method and machine. 4,233,822, Cl. 66-14.000.

Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Double-cylinder circular knitting machine. 4,233,823, Cl. 66-14.000.

Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Control device for striper units in circular knitting machines. 4,233,826, Cl. 66-140.00R.

Long, William J.; Roberts, Larry W.; and Williams, H. Ross, to Amer-O-Matic Corporation. Envelope opener. 4,233,800, Cl. 53-381.00R.

Longinotti, Enrico. Prefabrication system for building walls. 4,234,634, Cl. 428-58.000.

Longsderff, Richard W.; and Henry, Dale V., to RCA Corporation. Alkali metal dispenser. 4,233,936, Cl. 118-726.000.

Looney, John H., to Xerox Corporation. Recirculating document handler configuration. 4,234,180, Cl. 271-3.100.

Lord Corporation: *See—*
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,234,399, Cl. 204-159.150.

Loreto, Wilfredo P., to AIT Industries, Inc. Lens edging apparatus. 4,233,784, Cl. 51-105.0LG.

Lotti, Nevio, to Sorma S.n.c. di Pieri-Lotti & C. Automatic apparatus for discharging loose products in bins. 4,234,279, Cl. 414-33.000.

Lowe, Bryan W. H.: *See—*
Woolcock, Alan; Lowe, Bryan W. H.; and Walters, Colin R., 4,234,861, Cl. 335-216.000.

Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., to Rotex, Inc. Feed stream splitter for multiple deck screening machine. 4,234,416, Cl. 209-247.000.

Lube, Robert R.: *See—*
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., 4,233,733, Cl. 30-43.920.

Luborsky, Fred E.: *See—*
Frischmann, Peter G.; Luborsky, Fred E.; and Tompkins, Russell E., 4,234,360, Cl. 148-121.000.

Lubowitz, Hyman R., to United States of America, Administrator U.S. Environmental Protection Agency. Solid waste encapsulation. 4,234,632, Cl. 428-2.000.

Lubrizol Corporation, The: *See—*
Meinhardt, Norman A.; and Davis, Kirk E., 4,234,435, Cl. 252-51.50A.

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Lucas Industries Limited: *See—*
Thomas, Roland M., 4,233,866, Cl. 82-1.00C.

Luparello, Pietro: *See—*
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Lutes, Georg F., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; and Lutes, Georg F., Jr., 4,234,971, Cl. 455-619.000.

Lux, Gregory. Ski sail apparatus. 4,234,211, Cl. 280-810.000.

Lynn, James B.; Homberg, Otto A.; and Burcaw, Kenneth R., Jr., to Bethlehem Steel Corporation. Cooling naphthalene-bearing waters and gas streams. 4,234,389, Cl. 201-30.000.

M.A.N.-Roland Druckmaschinenfabrik Faber & Schleicher AG: *See—*
Rebel, Herbert, 4,233,899, Cl. 101-142.000.

MacGregor, Donald C.: *See—*
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MacGregor International S.A.: *See—*
Leitch, George J., 4,234,034, Cl. 160-193.000.

Mackay, Frederick G.; and Mackay, Spencer L., to McGraw-Edison Company. Evaporative cooler. 4,234,526, Cl. 261-106.000.

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Mackay, Frederick G.; and Mackay, Spencer L., 4,234,526, Cl. 261-106.000.

MacLeod, John N.: *See—*
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MacRae, Donald R.; and Gold, Richard G., to Bethlehem Steel Corporation. Arc control in plasma arc reactors. 4,234,334, Cl. 75-10.00R.

Maddestra, Robert; and Munn, David E., to Damon Corporation. Display stand. 4,234,148, Cl. 248-174.000.

Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, to Citizen Watch Co., Ltd. Watchglass fixing structure. 4,234,948, Cl. 368-291.000.

Magari, Teruo; Sato, Toyoyuki; and Nakamura, Masayoshi, to Lion Fat & Oil Co., Ltd., The. Detergent composition. 4,234,465, Cl. 252-547.000.

Magga, Frederick A. P.: *See—*
Bailey, Alan; and Magga, Frederick A. P., 4,234,326, Cl. 55-278.000.

Maher, John F., to United Technologies Corporation. Collector for water separator. 4,234,323, Cl. 55-97.000.

Mailloux, Louis D.; and Reilich, William M., to Xerox Corporation. Electrophotographic printing system. 4,234,250, Cl. 355-4.000.

Majima, Junji: *See—*
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Maklakova, Tatyana A.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Malavasi, Alberto. Process for the laying of a floor, and for a tile clothing, and elements for the realization thereof. 4,233,792, Cl. 52-387.000.

Malinowski, Richard F.; and Harmon, Thomas F., to General Electric Company. Ornamental attachment for decorative string sets. 4,234,915, Cl. 362-252.000.

Maliszewski, Theodore V., to Combustion Engineering, Inc. Bowl mill with air deflector means. 4,234,132, Cl. 241-53.000.

Mallan, George M.; and Preston, George T., to Occidental Petroleum Corporation. Removal of chlorine from pyrolytic oils. 4,234,388, Cl. 201-25.000.

Mallinson, Leonard B., to Baker Perkins Holdings, Ltd. Drying printed web material. 4,233,901, Cl. 101-416.00A.

Malmros, Mark K.: *See—*
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., 4,234,680, Cl. 435-7.000.

Mammel, A. Dean: *See—*
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Manchem Limited: *See—*
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Mandi, Attila: *See—*
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Mandrin, Charles, to Sulzer Brothers Limited. Process and apparatus for the preparation of ammonia and heavy water. 4,234,553, Cl. 423-359.000.

Manneamann Aktiengesellschaft: *See—*
Hendriachk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, 4,234,261, Cl. 400-621.000.

Mantani, Rokurota, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency conversion system of tone signal produced by electrically picking up mechanical vibration of musical instrument. 4,233,874, Cl. 84-1.230.

Marathon Oil Company: *See—*
Rhudy, John S.; and Gibb, Connie L., 4,234,433, Cl. 252-8.55D.

Mardesich, Nicholas A.: *See—*
Burger, Norman D., 4,233,725, Cl. 29-451.000.

Margetts, Hugh G.; and Rouse, Keith M., to Girling Limited. Disc brakes for vehicles. 4,234,061, Cl. 188-71.300.

Margolis, Jack S.: *See—*
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Maringer, Albert, to Siemens Aktiengesellschaft. Methods of eliminating conversion factor drift effects in a clip-on hall-effect ammeter. 4,234,846, Cl. 324-117.00H.

Marquez, Joseph A.: *See—*
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,234,690, Cl. 435-119.000.

Marranca, Lucio: *See—*
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Mars, Inc.: *See—*
Heiman, Frederic P., 4,234,070, Cl. 194-1.00N.

Marsh, David G., to Johns Hopkins University, The. Production of aldehyde-treated allergen-containing substances. 4,234,569, Cl. 424-91.000.

Marshall, James J., to Lifeline Products, Inc. Starch-degrading enzymes derived from *cladosporium resinae*. 4,234,686, Cl. 435-94.000.

Martin, Gary G.; and Smith, James C., to Caterpillar Tractor Co. Water seal assembly for engines. 4,234,198, Cl. 277-145.000.

Martin, Paul F.: *See—*
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Martin, Pierre: *See—*
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Martin, Raymond B., to Water Control Products/N.A., Inc. Pressure flush tank for toilets. 4,233,698, Cl. 4-354.000.
Martin, William F., to Herring, James A., a part interest. Apparatus for separating metal cuttings from liquid coolants. 4,234,074, Cl. 198-558.000.
Martinez, Evidio. Roof top carrier. 4,234,285, Cl. 414-462.000.
Maruyama, Masaki; and Nakamura, Kohei, to Hochiki Corporation. Ion type smoke sensor. 4,234,877, Cl. 340-629.000.
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Marwil, Stanley J.: *See—*
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Masaki, Kenji. Exhaust gas reaction control system. 4,233,811, Cl. 60-274.000.
Masaoka, Isao; and Imai, Katsuyuki, to Hitachi, Ltd. Method of making a structure immune against stress corrosion cracking. 4,234,119, Cl. 228-125.000.
Mascher, Werner: *See—*
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Maschinenfabrik Beninger AG: *See—*
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Maso Therm Corporation: *See—*
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Massachusetts Institute of Technology: *See—*
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Master, Raj N.: *See—*
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Masunaga, Katsuro: *See—*
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Matinlassi, Ulf A., to Sandvik Special Metal Corporation. Method and apparatus for producing zircaloy tubes and zircaloy tubes thus produced. 4,233,834, Cl. 72-208.000.
Matoba, Yasuo, to Osaka Soda Co. Ltd. Curable composition of halogen-containing polymer and crosslinking agent therefor. 4,234,705, Cl. 525-329.000.
Matovich, Edwin, to Thagard Technology Company. Fluid-wall reactor for high temperature chemical reaction processes. 4,234,543, Cl. 422-109.000.
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, to Hitachi, Ltd. Screw compressor. 4,234,296, Cl. 418-201.000.
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Matsumoto, Seiji: *See—*
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Matsumura, Osamu: *See—*
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Matsuo, Terumoto: *See—*
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Matthews, Lloyd E., to Zenith Radio Corporation. Self-oscillating sawtooth current deflection generator. 4,234,828, Cl. 315-408.000.
Mattson, Larry J., to Howmedica, Inc. Closure means for collection appliances. 4,233,977, Cl. 128-283.000.
Matula, Jerry: *See—*
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Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Combating pests with N,N-dimethyl-carbamic acid O-(2-substituted-methyl-pyrimidin-4-yl)-esters. 4,234,587, Cl. 424-251.000.
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Maxey, Eugene R., to Purex Corporation. Underwater light circuit and installation. 4,234,819, Cl. 315-119.000.
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Mazzoni, Renato J.; and Shoop, Vernon A., to PPG Industries, Inc. Desiccated spandrel panels. 4,233,796, Cl. 52-789.000.
MCA Discovision, Inc.: *See—*
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McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Hepatitis B core antigen composition. 4,234,564, Cl. 424-12.000.
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McCallum, Gerald; and McCallum, Dale A. Fireplace and room heater. 4,233,955, Cl. 126-61.000.
McCarthy, Gregory M. Resting place for reptiles in captivity. 4,234,780, Cl. 219-200.000.
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McCord Corporation: *See—*
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McCorkle, John W. Coherent frequency shift key demodulator. 4,234,852, Cl. 329-50.000.
McDermott, Clifton E. Fastening means for flexible material. 4,233,715, Cl. 24-217.00R.
McDonald, Ray S.: *See—*
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McDonnell Douglas Corporation: *See—*
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Steube, Kenneth E., 4,233,937, Cl. 118-727.000.
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., to Bandag, Incorporated. Method for recapping tires. 4,234,370, Cl. 156-95.000.
McDougal, Thomas F. Differential screw device for workholders and the like. 4,234,177, Cl. 269-241.000.
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., to Lord Corporation. Radiation curable compositions containing acyloin urethane compounds. 4,234,399, Cl. 204-159.150.
McGahren, William J.: *See—*
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McGauran, Hugh K.; and Saunders, Leonard, to Aerpat A.G. Barb and method of making same. 4,233,878, Cl. 85-7.000.
McGee, Mary Ann C., to Caterpillar Tractor Co. Storable light assembly for vehicles. 4,234,908, Cl. 362-66.000.
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McIndoe, Christopher J., to Imperial Chemical Industries Limited. Process for the manufacture of butenediol. 4,234,747, Cl. 568-857.000.
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., to Monsanto Company. Pressure sensitive adhesive compositions containing a polymetaloxane and article. 4,234,660, Cl. 428-411.000.
McMillan, William A. Beta-lactamase diagnostic product and method. 4,234,683, Cl. 435-18.000.
McMullen, Alan R., to NESCO Products, Inc. Steam iron with low temperature soleplate. 4,233,763, Cl. 38-77.830.
McNally, Thomas E.; Holka, Thomas C.; and Moreau, Harold T., to Ford Motor Company. Passive restraint actuator mechanism system. 4,234,210, Cl. 280-804.000.
McNary, James F.: *See—*
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McRae, Lorin P.; and Kartchner, Mark M., to Narco Scientific Industries, Inc. Hemostatic compressive device. 4,233,980, Cl. 128-325.000.
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Temple, Davis L., Jr., 4,234,581, Cl. 424-248.510.
Meadows, David F., to DoNel Corporation. Extrusions and building structures. 4,233,790, Cl. 52-222.000.
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Mee, Francis H. A.; and Taylor, Henry J., to Spar Aerospace Limited. Mechanical arm assembly. 4,234,150, Cl. 248-281.100.
Meier, George D., Jr., to Electrode Dressers Incorporated. Dresser for offset electrode. 4,234,276, Cl. 408-104.000.
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Melchior, Jean F., to Etat Francais. Methods of supercharging a diesel engine, in supercharged diesel engines, and in supercharging units for diesel engines. 4,233,815, Cl. 60-606.000.
Melnyk, William, to McCord Corporation. Radiator tank headsheet and method. 4,234,041, Cl. 165-173.000.
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, to Bayer Aktiengesellschaft. Chromium mixed complex dyestuffs of phenyl-azo-pyrazole components. 4,234,479, Cl. 260-145.00B.
Mercier, Jacques H., to Normand Trust. Accumulator device or the like. 4,234,017, Cl. 138-30.000.
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Mikulicz, Michael Z., to UOP Inc. HF Alkylation process. 4,234,750, Cl. 585-332.000.
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Miller, Jerry W., to Ampex Corporation. DC Free encoding for data transmission. 4,234,897, Cl. 360-45.000.
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Minnesota Mining and Manufacturing Company: *See—*
Dunshee, Wayne K., 4,233,976, Cl. 128-260.000.
Graham, Joseph, 4,234,639, Cl. 428-144.000.
Henschel, John P., 4,234,967, Cl. 455-603.000.
Kehr, Dieter; and Goebell, Juergen, 4,234,439, Cl. 252-63.200.
Minolta Camera Kabushiki Kaisha: *See—*
Tokumaru, Hisashi; and Yasukuni, Mitsuo, 4,234,894, Cl. 358-250.000.
Minoshima, Tsugio: *See—*
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.
Minoura, Mikio: *See—*
Yorioka, Keigo; and Minoura, Mikio, 4,233,946, Cl. 123-568.000.
Mishanec, Stephen P.: *See—*
Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., 4,233,907, Cl. 104-172.00B.
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Membrane filtration type hollow fibers and method for the preparation of same. 4,234,431, Cl. 210-500.00M.
Misono, Haruo: *See—*
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.
Mitchell, Stephen C.: *See—*
Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., 4,234,416, Cl. 209-247.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, 4,234,902, Cl. 361-120.000.
Miyazaki, Yukio; and Taketa, Mitsugu, 4,234,900, Cl. 361-45.000.
Onishi, Ken; and Tanaka, Kunimaro, 4,234,896, Cl. 360-32.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Isshiki, Tomiya; Kijima, Yasuhiko; and Miyauchi, Yuh, 4,234,733, Cl. 546-174.000.
Mitzlaff, Michael; and Warning, Klaus, to Hoechst Aktiengesellschaft. Process for the preparation of cyclic enamides. 4,234,484, Cl. 260-239.0BE.
Miyagawa, Mitsuhiko: *See—*
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, 4,234,296, Cl. 418-201.000.
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, to Canon Kabushiki Kaisha. Transfer sheet guiding device. 4,234,305, Cl. 432-59.000.
Miyauchi, Yuh: *See—*
Isshiki, Tomiya; Kijima, Yasuhiko; and Miyauchi, Yuh, 4,234,733, Cl. 546-174.000.
Miyazaki, Yukio; and Taketa, Mitsugu, to Mitsubishi Denki Kabushiki Kaisha. Ground fault detector. 4,234,900, Cl. 361-45.000.
Mizukawa, Takumi: *See—*
Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.
Mizutani, Nagao: *See—*
Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, 4,234,260, Cl. 400-219.300.
Mobay Chemical Corporation: *See—*
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., 4,234,745, Cl. 568-614.000.
Moberly, Charles W.; Welch, Melvin B.; and Fodor, Lawrence M., to Phillips Petroleum Company. Catalyst and a polymerization process employing the catalyst. 4,234,710, Cl. 526-125.000.
Mobil Oil Corporation: *See—*
Allen, Kenneth P.; and Redeker, Maynard S., 4,234,938, Cl. 367-24.000.
Herrington, F. John, Jr., 4,234,018, Cl. 138-45.000.
Yan, Tsoung-Yuan, 4,234,231, Cl. 299-4.000.
Young, Lewis B., 4,234,751, Cl. 585-486.000.

Mochizuki, Hidetoshi; and Okada, Masataka, to Clarion Co., Ltd. AGC Circuit responsive to intermediate gray level in video signal. 4,234,892, Cl. 358-174.000.

Moga, Nicholas: *See*—
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.

Moller, Friedrich W.: *See*—
Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, 4,234,451, Cl. 252-373.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,233,896, Cl. 101-110.000.

Moncaster, Michael B.; and Rummer, James D., to Vickers Limited. Sealing arrangements. 4,234,199, Cl. 277-237.00R.

Moncur, Marlowe V.: *See*—
Woodbrey, James C.; and Moncur, Marlowe V., 4,234,674, Cl. 430-253.000.

Monsanto Company: *See*—
Birum, Gail H.; and Jansen, Richard F., 4,234,696, Cl. 521-108.000.
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., 4,234,660, Cl. 428-411.000.
Woodbrey, James C.; and Moncur, Marlowe V., 4,234,674, Cl. 430-253.000.

Montell, Joseph J., to Rug Crafters. Method of making a rug. 4,233,918, Cl. 112-266.200.

Montgomery, Edward L.: *See*—
Van Nieuwal, John G.; Montgomery, Edward L.; and Beeghly, Richard M., 4,234,030, Cl. 152-354.00R.

Mookherjee, Braja D.: *See*—
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,234,616, Cl. 426-536.000.

Moore, Albert S.; and Verhoff, Francis H., to United States of America, Energy. Energy recovery system. 4,234,423, Cl. 210-758.000.

Moore, William T.; and Sweeney, Michael T., to Rank Organization Limited, The. Optical scanning system with unwanted reflections controlled. 4,234,240, Cl. 350-6.100.

Moran, James: *See*—
Conway, Bernard W.; Fegley, Nelson L.; and Moran, James, 4,234,379, Cl. 162-145.000.

Moreau, Harold T.: *See*—
McNally, Thomas E.; Holka, Thomas C.; and Moreau, Harold T., 4,234,210, Cl. 280-804.000.

Morefield, Joe. Hair treatment device. 4,234,001, Cl. 132-40.000.

Morgan, Chester S.; and Johnson, William R., to United States of America, Energy. Thermal shock resistance ceramic insulator. 4,234,338, Cl. 75-235.000.

Morgan, Norman D., to Rain Bird Sprinkler Mfg. Corp. Balanced, reaction impact sprinkler. 4,234,126, Cl. 239-230.000.

Morgon, Trevor A.: *See*—
Beasley, Robin D.; Hall, Trevor I.; and Morgon, Trevor A., 4,234,970, Cl. 455-607.000.

Morimura Shoji Kabushiki Kaisha: *See*—
Murai, Hiroshi, 4,234,876, Cl. 340-573.000.

Morinaga, Shigeki: *See*—
Takahashi, Tadashi; and Morinaga, Shigeki, 4,233,919, Cl. 112-277.000.

Morokawa, Shigeru: *See*—
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, 4,234,945, Cl. 368-75.000.

Morris, James C.: *See*—
Garrison, Robert L.; and Morris, James C., 4,234,822, Cl. 315-209.00R.

Morris, Royden B. Microfiche tray. 4,234,089, Cl. 206-456.000.

Morris, Solon S., Jr. Driver alertness device. 4,234,051, Cl. 180-272.000.

Morrison, James D.: *See*—
Enke, Christie G.; Yost, Richard A.; and Morrison, James D., 4,234,791, Cl. 250-281.000.

Morrison, John C.: *See*—
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,234,476, Cl. 260-112.00R.

Morrison, Robert B.: *See*—
Adams, Michael B.; Angold, John A.; Morrison, Robert B.; and Zimmerman, Robert E., 4,233,909, Cl. 105-4.00R.

Morrison, William C.: *See*—
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,234,476, Cl. 260-112.00R.

Morshauser, Fred S., to GAF Corporation. Detergent bar composition and binder therefor. 4,234,464, Cl. 252-544.000.

Moser, Paul: *See*—
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.

Moser, Vincent J.: *See*—
Emmons, William D.; and Moser, Vincent J., 4,234,711, Cl. 526-282.000.

Moshtev, Rafail V.; Budevska, Hrisanta N.; Ivanova, Latinka T.; and Yankova, Radka D., to ZLEHIT pri BAN. Method for the production of membrane battery separators. 4,234,623, Cl. 427-54.100.

Mosley, William H.; and Andren, Carl F., to E-Systems, Inc. Double balanced diode mixer with d.c. response. 4,234,966, Cl. 455-326.000.

Mossinger, Reinhard: *See*—
Wenzel, Hubert; and Mossinger, Reinhard, 4,234,136, Cl. 242-68.400.

Motegi, Masahiko; Kimata, Ikukazu; and Fujita, Saburo, to Toray Industries, Inc. Method of manufacturing polyester films. 4,234,532, Cl. 264-235.800.

Motorola, Inc.: *See*—
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., 4,234,959, Cl. 455-35.000.
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., 4,234,965, Cl. 455-285.000.
La Vance, Cecil N.; and Beale, Allan A., 4,234,924, Cl. 364-460.000.
Stauers, Juris, 4,234,881, Cl. 343-8.000.

Mott, George E., to Texaco Inc. Disconnectable riser for deep water operation. 4,234,047, Cl. 175-5.000.

Moulies, Jean-Claude: *See*—
Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, 4,234,663, Cl. 428-517.000.

Mower, Lawrence N.: *See*—
Kirkpatrick, John W.; and Mower, Lawrence N., 4,234,042, Cl. 166-261.000.

Moxham, Jack H.: *See*—
John, Alfryn I.; and Moxham, Jack H., 4,234,151, Cl. 248-354.00S.

Mrowca, Joseph J., to Du Pont de Nemours, E. I., and Company. Phosphine oxide-substituted pyrimidines. 4,234,729, Cl. 544-243.000.

Muller, Adolf: *See*—
Quester, Karl W.; Gontgen, Josef; and Muller, Adolf, 4,233,997, Cl. 131-147.00R.

Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, to Ciba-Geigy Corporation. Aminoethyl-methoxy-cephalosporin compounds. 4,234,578, Cl. 424-246.000.

Muller, Dieter: *See*—
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.

Muller, Gertraude: *See*—
Rabenau, Albrecht; von Alpen, Ulrich; Schonherr, Erich; and Muller, Gertraude, 4,234,554, Cl. 423-409.000.

Muller, Helmut: *See*—
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.

Muller, Jurgen, to Agfa-Gevaert AG. Apparatus for loading and unloading containers for X-ray film. 4,234,795, Cl. 250-468.000.

Muller, Otto: *See*—
Kautetzky, Anton; and Muller, Otto, 4,233,727, Cl. 29-560.000.

Multi-Metal Wire Cloth Inc.: *See*—
Peer, George J.; and Bradley, Robert C., 4,234,430, Cl. 210-489.000.

Munn, David E.: *See*—
Maddestra, Robert; and Munn, David E., 4,234,148, Cl. 248-174.000.

Murai, Hiroshi, to Riken-Denshi Kogyo Kabushiki Kaisha; and Morimura Shoji Kabushiki Kaisha. Omnidirectional move-stop sensor. 4,234,876, Cl. 340-573.000.

Murakami, Hiroshi: *See*—
Noda, Kenichi; Murakami, Hiroshi; and Kurata, Noboru, 4,233,717, Cl. 29-156.4WL.

Murakami, Yasushi: *See*—
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,234,582, Cl. 424-249.000.

Murphy, Robert E.; and Bernholdt, Harry F., to Swift & Company. Meat packaging of foam and oxygen impervious material. 4,234,647, Cl. 428-220.000.

Murray, Omer E.; and Thompson, Richard L., to General Electric Company. Luminaire lowering device. 4,234,165, Cl. 248-404.000.

Myers, Daniel J. Adjustable carrier. 4,234,116, Cl. 224-250.000.

Nagasawa, Osamu: *See*—
Iwasaki, Susumu; Nagasawa, Osamu; Takano, Tatsuo; and Matsumoto, Seiji, 4,234,378, Cl. 162-138.000.

Nagel, Otto: *See*—
Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, 4,234,560, Cl. 423-659.000.

Nagy, Gabor: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Nairn Floors Limited: *See*—
Brewer, Douglas M.; Mawson, Alan; and Carter, William S., 4,234,366, Cl. 156-79.000.

Nakagawa, Akira: *See*—
Watanabe, Koji; and Nakagawa, Akira, 4,234,137, Cl. 242-71.800.

Nakagawa, Satoshi: *See*—
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Nakagawa, Shozo; Yokoyama, Katsuya; and Katayama, Hironobu, to Nippon Hoso Kyokai. Digital magnetic recording and reproducing apparatus. 4,234,898, Cl. 360-41.000.

Nakagawa, Tohru: *See*—
Onuki, Keiichi; Nakagawa, Tohru; and Kenma, Shigeyuki, 4,234,523, Cl. 261-41.00D.

Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, to Brother Kogyo Kabushiki Kaisha. Single element print head. 4,234,262, Cl. 400-175.000.

Nakakuki, Junichi: *See*—
Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.

Nakamoto, Hiromasa: *See*—
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,234,720, Cl. 542-413.000.

Nakamura, Akito, to Toray Silicone Company, Ltd. Silicone rubber compositions. 4,234,702, Cl. 525-100.000.

Nakamura, Kazuo: *See*—
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.

Nakamura, Kohei: *See*—
Maruyama, Masaki; and Nakamura, Kohei, 4,234,877, Cl. 340-629.000.

Nakamura, Masayoshi: *See*—
Magari, Teruo; Sato, Toyoyuki; and Nakamura, Masayoshi, 4,234,465, Cl. 252-547.000.

Nakamura, Soichi, to Nippon Kogaku K.K. Gauss type photographic lens. 4,234,242, Cl. 350-218.000.

Nakamura, Tsutomu: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Nakanaga, Ryusuke: *See*—
Sakakibara, Sakuichi; Sugisawa, Ko; Majima, Junji; and Nakanaga, Ryusuke, 4,234,612, Cl. 426-394.000.

Nakane, Masao; and Nishii, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Lift truck having a load lifting assembly. 4,234,057, Cl. 187-9.00E.

Nakano, Hiromitsu: *See*—
Ota, Mitsuharu; Yoshida, Isao; and Nakano, Hiromitsu, 4,234,835, Cl. 318-317.000.

Nakata, Tadataka: *See*—
Hirayama, Masami; Nakata, Tadataka; and Kagayama, Michiko, 4,234,450, Cl. 252-314.000.

Nakatani, Kiyotaka; and Konno, Kunikazu, to Hosiden Electronics Co., Ltd. Display device for a push button assembly. 4,234,773, Cl. 200-308.000.

Nakayama, Toshihiko: *See*—
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.

Nakazato, Takuzo: *See*—
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.

Nalvarian, Francois J. Manual ski carrier. 4,234,113, Cl. 224-45.00S.

Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Coking poor coking coals and hydrocracked tar sand bitumen binder. 4,234,387, Cl. 201-23.000.

Narcise, Jacqualine. Mathematics device. 4,233,757, Cl. 35-73.000.

Narco Scientific Industries, Inc.: *See*—
McRae, Lorin P.; and Kartchner, Mark M., 4,233,980, Cl. 128-325.000.

Narui, Mamoru: *See*—
Sakanaka, Yasuhiro; and Narui, Mamoru, 4,234,704, Cl. 525-215.000.

Naser, Georg, to Siemens Aktiengesellschaft. Method of screwing an adapter into the human cranium. 4,233,979, Cl. 128-303.00R.

National Computer Sign Company: *See*—
Charlot, Lincoln H., 4,234,823, Cl. 315-224.000.

National Distillers and Chemical Corp.: *See*—
Frampton, Orville D.; and Birchall, William R., 4,234,748, Cl. 568-901.000.

National Petro Chemicals Corporation: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,234,453, Cl. 252-428.000.
Rekers, Louis J.; and Katzen, Stanley J., 4,234,709, Cl. 526-100.000.

National Starch and Chemical Corporation: *See*—
Pastor, Stephen D.; and Ganslaw, Stuart H., 4,234,662, Cl. 428-500.000.

National Steel Corporation: *See*—
Bird, Richard A.; and Austin, Lowell W., 4,234,406, Cl. 204-292.000.
Suitlas, John R., 4,234,170, Cl. 266-158.000.

NCR Corporation: *See*—
Singh, Amar J., 4,234,968, Cl. 455-607.000.
Singh, Amar J., 4,234,969, Cl. 455-607.000.

Neal, Gaines L.: *See*—
Crumrine, David F., 4,233,948, Cl. 123-590.000.

Near Field Technology Co.: *See*—
Yukl, Tex N., 4,234,844, Cl. 324-58.50A.

Nederman, Bill P. P. Track forming a gas-throughflow duct and provided with a movable gas passage unit. 4,233,889, Cl. 98-115.0VM.

Nelson, Stephen J., to Upjohn Company, The. Phosphorus derivatives of aminothiocarbamoyl halides. 4,234,521, Cl. 260-937.000.

Neny, Michel, to Societe d'Investissement pour le Developpement des Appareils Menagers. Panels for collecting solar energy. 4,233,962, Cl. 126-450.000.

NESCO Products, Inc.: *See*—
McMullen, Alan R., 4,233,763, Cl. 38-77.830.

Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., to Syntex (U.S.A.) Inc. Nonapeptide and decapeptide derivatives of luteinizing hormone releasing hormone. 4,234,571, Cl. 424-177.000.

Neufeld, Anthony C., to Newfeld Limited. Soft toys. 4,233,775, Cl. 46-151.000.

Neugart, Fernando M. Combustion apparatus. 4,234,303, Cl. 431-293.000.

Newfeld Limited: *See*—
Neufeld, Anthony C., 4,233,775, Cl. 46-151.000.

Newman, Albert F.: *See*—
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.

Newquist, John: *See*—
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.

Nicholls, Ronald T.: *See*—
Clyne, John C.; Steel, William G.; and Nicholls, Ronald T., 4,233,703, Cl. 15-53.00B.

Nichols, John A.: *See*—
Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., 4,233,803, Cl. 56-14.900.

Nielsen, Harrie W.: *See*—
Beck, James C.; and Nielsen, Harrie W., 4,234,891, Cl. 358-104.000.

Niess, Theodor: *See*—
Weissert, Helmut; Niess, Theodor; and Hegemann, Karl-Rudolf, 4,234,335, Cl. 75-41.000.

Nifco Inc.: *See*—
Watanabe, Koji; and Nakagawa, Akira, 4,234,137, Cl. 242-71.800.

Nikles, Erwin: *See*—
Rody, Jean; and Nikles, Erwin, 4,234,707, Cl. 525-437.000.

Ninomiya, Masakazu: *See*—
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Nippon Carbon Co., Ltd.: *See*—
Yamazoe, Hiroshi; and Sugiura, Isao, 4,234,638, Cl. 428-133.000.

Nippon Engelhard Ltd.: *See*—
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, 4,233,875, Cl. 84-1.240.
Mantani, Rokurota, 4,233,874, Cl. 84-1.230.
Nonaka, Terumoto, 4,234,803, Cl. 307-218.000.

Nippon Hoso Kyokai: *See*—
Nakagawa, Shozo; Yokoyama, Katsuya; and Katayama, Hironobu, 4,234,898, Cl. 360-41.000.

Nippon Kogaku K.K.: *See*—
Nakamura, Soichi, 4,234,242, Cl. 350-218.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Hara, Keiichi; and Fujisawa, Tomoji, 4,233,928, Cl. 118-35.000.

Nippon Oil Seal Industry Co., Ltd.: *See*—
Iida, Yoshimi, 4,234,196, Cl. 277-12.000.

Nippon Paint Co., Ltd.: *See*—
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, 4,234,466, Cl. 260-17.00A.

Nippon Soken, Inc.: *See*—
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Nippon Steel Corporation: *See*—
Horiguchi, Hiroshi; and Matsuo, Terumoto, 4,233,718, Cl. 29-157.00C.

Nippondenso Co., Ltd.: *See*—
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Nishida, Fumihiko; and Ijiri, Hiroshi, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic picture masking device. 4,234,251, Cl. 355-74.000.

Nishihara, Motohisa: *See*—
Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, 4,233,848, Cl. 73-727.000.

Nishii, Masahiko: *See*—
Nakane, Masao; and Nishii, Masahiko, 4,234,057, Cl. 187-9.00E.

Nishikawa, Tokio: *See*—
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, 4,234,431, Cl. 210-500.00M.

Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Adsorbent for ethylene and process for preparation thereof. 4,234,460, Cl. 252-447.000.

Nissan Motor Company, Limited: *See*—
Abo, Toshimi, 4,233,947, Cl. 123-571.000.
Oikawa, Akio; and Sasai, Koji, 4,233,927, Cl. 116-287.000.
Yoneda, Kenji; and Takagi, Yasuo, 4,233,836, Cl. 73-35.000.

Nissan Shatai Co., Ltd.: *See*—
Kuroda, Masahiko; and Ohsawa, Eiji, 4,234,866, Cl. 340-52.00F.

Nitta, Minoru: *See*—
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,234,168, Cl. 266-128.000.

Nitta, Tohei: *See*—
Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, 4,234,902, Cl. 361-120.000.

Nitto Boseki Co., Ltd.: *See*—
Wakasa, Isao; Yamazaki, Shuichi; and Taguchi, Hideo, 4,234,342, Cl. 106-50.000.

Noda, Kenichi; Murakami, Hiroshi; and Kurata, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Method of bevelling port openings in cylinders for two-cycle engines. 4,233,717, Cl. 29-156.4WL.

Nogimori, Katsumi: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Noguchi, Toyota: *See—*
Ikushima, Hiroshi; Noguchi, Toyota; Danno, Tsuneo; and Tamura, Tooru, 4,234,859, Cl. 333-151.000.
Nokes, Richard H.: *See—*
Robinson, Ward T.; and Nokes, Richard H., 4,234,263, Cl. 403-405.000.
Nolen, David W.: *See—*
Dreinhoefer, Louis H.; Nolen, David W.; and Donatelli, Paul C., 4,234,832, Cl. 318-146.000.
Nolte, Gerhard: *See—*
Hendrischk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, 4,234,261, Cl. 400-621.000.
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, to Citizen Watch Co., Ltd.; and Rhythm Watch Co., Ltd. Electronic timepiece with hourly strike mechanism. 4,234,945, Cl. 368-75.000.
Nonaka, Terumoto, to Nippon Gakki Seizo Kabushiki Kaisha. Integrated logic circuit arrangement. 4,234,803, Cl. 307-218.000.
Nordeen, Carl W.: *See—*
Winn, Martin; Nordeen, Carl W.; and Arendsen, David L., 4,234,594, Cl. 424-273.00P.
Normand Trust: *See—*
Mercier, Jacques H., 4,234,017, Cl. 138-30.000.
Northrop Corporation: *See—*
Leiboff, Teague N., 4,234,145, Cl. 244-3.160.
Nott, Frank J. Conveyor belt drive apparatus. 4,234,078, Cl. 198-833.000.
Nova Associates, Inc.: *See—*
Ryding, Geoffrey, 4,234,797, Cl. 250-492.00B.
NOVI P.B. Societe Anonyme: *See—*
Benezech, Jacques, 4,234,905, Cl. 361-307.000.
Novokshonova, Ljudmila A.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.
Nox Research Corp.: *See—*
Burnell, Laurence K.; Hyde, James D.; Kolak, Nicholas P.; and Gibbs, Richard E., 4,234,548, Cl. 423-235.000.
Nozawa, Shigekazu: *See—*
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, 4,234,296, Cl. 418-201.000.
NSK-Warner K.K.: *See—*
Ikesue, Haruyuki, 4,234,209, Cl. 280-803.000.
Nugarus, Anthony R.: *See—*
Schindler, James; and Nugarus, Anthony R., 4,233,891, Cl. 99-348.000.
Nussbaumer, Dietmar; and Perl, Horst, to Sartorius GmbH. Asymmetrical ultrafiltration membrane based on cellulose hydrate. 4,234,528, Cl. 264-41.000.
Oberle, R. Donald: *See—*
Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 209-8.00R.
Oberrecht, David A.: *See—*
Wilder, Paul R.; and Oberrecht, David A., 4,234,161, Cl. 251-149.900.
O'Brien, Edward F.: *See—*
Hirozawa, Stanley T.; O'Brien, Edward F.; and Wilson, Joe C., 4,234,440, Cl. 252-76.000.
O'Brien, Linda F.: *See—*
Cooper, William C.; and Garcia, Alberto A., 4,233,863, Cl. 81-3.00R.
Obst, Rudiger: *See—*
Wilmes, Manfred; Obst, Rudiger; and Kretzschmar, Wolfgang, 4,234,239, Cl. 339-198.0GA.
Occidental Petroleum Corporation: *See—*
Mallan, George M.; and Preston, George T., 4,234,388, Cl. 201-25.000.
Ochi, Yoshiharu: *See—*
Ozaki, Satoru; Ochi, Yoshiharu; and Matsumura, Kazuo, 4,234,385, Cl. 176-68.000.
O'Connor, William W.: *See—*
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., 4,234,959, Cl. 455-35.000.
Odeen, Kai: *See—*
Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, 4,234,380, Cl. 162-152.000.
Oehler Whylen Lagertechnik AG: *See—*
Schaad, Willi, 4,234,059, Cl. 188-43.000.
Oettel, Richard E.: *See—*
Deminet, Czeslaw; and Oettel, Richard E., 4,234,351, Cl. 136-89.0EP.
Ogata, Yasuhiro: *See—*
Kato, Hajime; and Ogata, Yasuhiro, 4,234,212, Cl. 282-27.500.
Ogawa, Hiroshi: *See—*
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.
Ogden, Dennis H.: *See—*
Inverarity, George; and Ogden, Dennis H., 4,234,698, Cl. 521-188.000.
Ogino, Yoshio: *See—*
Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.
Oguchi, Toshihiko: *See—*
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.
Ohashi, Shigeyasu: *See—*
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, 4,234,431, Cl. 210-500.00M.
Ohigashi, Hiroji: *See—*
Iguchi, Heishaburo; and Ohigashi, Hiroji, 4,234,813, Cl. 310-366.000.
Ohkawa, Mikio; and Kawashima, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Vacuum switch. 4,234,771, Cl. 200-144.00B.
Ohsawa, Eiji: *See—*
Kuroda, Masahiko; and Ohsawa, Eiji, 4,234,866, Cl. 340-52.00F.
Ohta, Shigenori; and Watanabe, Kenji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for producing cured meat products. 4,234,607, Cl. 426-56.000.
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, to Idemitsu Kosan Company Limited. Flame retarding polyolefin resin blend composition. 4,234,469, Cl. 260-42.460.
Ohuchida, Shuichi: *See—*
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, 4,234,597, Cl. 424-274.000.
Oikawa, Akio; and Sasai, Koji, to Nissan Motor Company, Limited. Instrument assembly with illuminated meter mounting panel. 4,233,927, Cl. 116-287.000.
Okada, Masataka: *See—*
Mochizuki, Hidetoshi; and Okada, Masataka, 4,234,892, Cl. 358-174.000.
Okami, Alvin S. Wind shield. 4,233,877, Cl. 84-453.000.
Okamoto, Miyoshi; Yoshida, Syusuke; and Inada, Shigeru, to Toray Industries, Inc. Woven fabric. 4,234,022, Cl. 139-420.00R.
Okamoto, Taira: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
O'Keefe, David B.: *See—*
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.
Okita, Koichi, to Sumitomo Electric Industries, Ltd. Process for producing porous polytetrafluoroethylene tubings. 4,234,535, Cl. 264-519.000.
Okumura, Akira, to Matsumoto, Tetsuo; Okumura, Eiko; and Hitachi Koki Company, Limited. Method and instrument for photometric analysis of liquid using centrifuge rotor. 4,234,799, Cl. 250-576.000.
Okumura, Eiko: *See—*
Okumura, Akira, 4,234,799, Cl. 250-576.000.
Okuyama, Hiroshi: *See—*
Yamagisi, Kikuo; Okuyama, Hiroshi; and Kawaguchi, Hideo, 4,234,300, Cl. 425-363.000.
Olabisi, Olagoke, to Union Carbide Corporation. Molded plastic structural web articles. 4,234,642, Cl. 428-188.000.
Olin Corporation: *See—*
Scott, Robert N.; Gavin, David F.; and Milnes, Frank J., 4,234,441, Cl. 252-78.300.
Oliver, George A. Mass measuring apparatus. 4,234,049, Cl. 177-105.000.
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Mechanism for the axial shifting of an anti-friction bearing. 4,233,855, Cl. 74-396.000.
Olson, Alvin E., to Allwood, Inc. Method for preventing the splitting of logs during drying. 4,233,753, Cl. 34-16.500.
Olympus Optical Co., Ltd.: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.
Takase, Hiroshi, 4,234,243, Cl. 350-226.000.
Omar, Alejandro G. Construction of reactor-driven articulated trains with elevated tracks. 4,233,908, Cl. 105-3.000.
Omholt, Ray E. Resiliently cushioned adhesive-applied wood flooring system and method of making the same. 4,233,793, Cl. 52-390.000.
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, to Nippondenso Co., Ltd.; and Nippon Soken, Inc., part interest to each. Method for controlling ignition timing of internal combustion engine. 4,233,944, Cl. 123-416.000.
Omori, Yukio: *See—*
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, 4,234,466, Cl. 260-17.00A.
O'Mullan, Norman P.; and Hahn, Paul R. T. Frame for securing flexible sheets of material. 4,233,765, Cl. 40-156.000.
Ondetti, Miguel A.; Gordon, Eric M.; and Ryono, Denis E., to E. R. Squibb & Sons, Inc. Pyroglutamic acid derivatives and analogs. 4,234,489, Cl. 260-326.420.
O'Neil, James P., to Automation Designs, Inc. Drive mechaniam for a pick-and-place unit. 4,234,223, Cl. 294-88.000.
Onishi, Ken; and Tanaka, Kunimaro, to Mitsubishi Denki Kabushiki Kaisha. PCM Recording and reproducing system. 4,234,896, Cl. 360-32.000.
Ono Pharmaceutical Co. Ltd.: *See—*
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, 4,234,597, Cl. 424-274.000.
Onoda, Hiroshi: *See—*
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.

Onopchenko, Anatoli: *See—*
Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,234,743, Cl. 562-457.000.
Onuki, Keiichi; Nakagawa, Tohru; and Kenma, Shigeyuki, to Hitachi, Ltd. Adjustment prevention mechanism for carburetor. 4,234,523, Cl. 261-41.00D.
Optimizer Control Corporation: *See—*
Collins, Thomas W., 4,234,850, Cl. 328-66.000.
Orem, Donald E.; Holmes, Vernon P.; and Bacsanvi, Thomas J., to Ransburg Corporation. Dynamic imbalance determining system. 4,234,200, Cl. 279-2.00A.
Organisation Europeenne de Recherches Spatiales: *See—*
Fournet, Maurice, 4,234,789, Cl. 250-234.000.
Osaka Soda Co. Ltd.: *See—*
Matoba, Yasuo, 4,234,705, Cl. 525-329.000.
Osaka, Susumu: *See—*
Toda, Minoru; and Osaka, Susumu, 4,234,245, Cl. 350-269.000.
Ose, Gunter: *See—*
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.
Ota, Hiroshi: *See—*
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,234,438, Cl. 252-62.540.
Ota, Mitsuharu; Yoshida, Isao; and Nakano, Hiromitsu, to Matsushita Electric Industrial Co., Ltd. Speed control apparatus for DC motor. 4,234,835, Cl. 318-317.000.
Otake, Michiko, to Takara Co., Ltd. Packaging for toy articles and the like. 4,234,079, Cl. 206-45.340.
Otis Engineering Corporation: *See—*
Lane, William C., 4,234,167, Cl. 254-291.000.
Otis, George A. Light transmitting roadway marker. 4,234,265, Cl. 404-16.000.
Outteridge, David A. J.: *See—*
Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., 4,234,290, Cl. 415-145.000.
Owens-Corning Fiberglas Corporation: *See—*
Canfield, Sheldon A., 4,233,837, Cl. 73-144.000.
Owens-Illinois, Inc.: *See—*
Kontz, Robert F., 4,234,297, Cl. 425-174.400.
Ozaki, Satoru; Ochi, Yoshiharu; and Matsumura, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Nuclear fuel element. 4,234,385, Cl. 176-68.000.
Ozen Corporation: *See—*
Shiseki, Yutaka, 4,234,193, Cl. 274-1.00A.
Paar, Mark W.: *See—*
Smith, David W.; and Paar, Mark W., 4,233,709, Cl. 17-1.00F.
Paaren, Herbert E.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., 4,234,495, Cl. 260-397.200.
Pacer Systems, Inc.: *See—*
Horwitz, Joshua, 4,233,756, Cl. 35-12.00F.
Packaging Corporation of America: *See—*
Champlin, Charles L., 4,234,081, Cl. 206-147.000.
Packman, Elias W.; and Jeffkin, Ruth. Antihistamine and methods for use thereof. 4,234,566, Cl. 424-47.000.
Page Engineering Company: *See—*
Ryerson, Robert W., 4,233,761, Cl. 37-142.00R.
Pallos, Ferenc M.: *See—*
DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., 4,234,593, Cl. 424-272.000.
Palmer, David A.: *See—*
Schroeder, Hobe; and Palmer, David A., 4,234,494, Cl. 260-346.700.
Palmer, John P.; and Rose, Scott M., to General Dynamics Corporation, Pomona Division. Electrostatic fiber optic scanning device. 4,234,788, Cl. 250-227.000.
Pampuch, Klaus: *See—*
Gronau, Manfred; Mascher, Werner; and Pampuch, Klaus, 4,233,971, Cl. 128-202.260.
Pandak, Zoltan I. Combination toothbrush carrier and holder. 4,234,087, Cl. 206-362.200.
Pandjiris Weldment Co., The: *See—*
Jennings, G. B., 4,234,834, Cl. 318-285.000.
Panicci, Richard L., to Kiddie Products, Inc. End closure. 4,233,714, Cl. 24-201.00R.
Paoletti, Ugo; and Volterra, Alessandro, to Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process and device for the continuous spinning of viscose rayon. 4,234,312, Cl. 8-151.200.
Paparella, James B., to American Publishing Corporation. Imitation wall switch. 4,234,774, Cl. 200-330.000.
Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of monoaryl thioureas. 4,234,513, Cl. 564-26.000.
Park, Dong-Sil; Breiter, Manfred W.; and King, Rendall N., to General Electric Company. Composite sulfur electrode container and method of manufacture. 4,234,668, Cl. 429-163.000.
Park Energy Company: *See—*
Werner, Frank D., 4,233,963, Cl. 126-450.000.
Parkin, Claude E.: *See—*
Rogers, Philip W.; and Parkin, Claude E., 4,233,926, Cl. 116-208.000.
Parlee-Anderson Corporation: *See—*
Anderson, Robert N.; and Parlee, Norman A. D., 4,234,383, Cl. 176-37.000.
Parlee, Norman A. D.: *See—*
Anderson, Robert N.; and Parlee, Norman A. D., 4,234,383, Cl. 176-37.000.
Pascarella, Vincent J.: *See—*
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,234,399, Cl. 204-159.150.
Pashalis, Cryssis: *See—*
Swanson, Harold N.; and Pashalis, Cryssis, 4,234,216, Cl. 285-93.000.
Pastor, Stephen D.; and Ganslaw, Stuart H., to National Starch and Chemical Corporation. Pressure sensitive hot melt adhesive curable by exposure to electron beam radiation. 4,234,662, Cl. 428-500.000.
Pastore, Ronald, to Cal Pak Industries, Inc. Cup dispenser employing universal adjustment apparatus. 4,234,101, Cl. 221-241.000.
Patel, Dhiru B., to Barber-Colmar Company. Photoelectric heddle detection device. 4,233,716, Cl. 28-187.000.
Paton, Neil E.: *See—*
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,233,829, Cl. 72-38.000.
Patrascu, Sorin: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.
Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, to Voest-Alpine Aktiengesellschaft. Mixing arrangement. 4,234,171, Cl. 266-248.000.
Patz, Gary L.; and Davenport, Donald E., to Hexcel Corporation. Electrically conductive prepreg materials. 4,234,648, Cl. 428-245.000.
Paul Revere Corporation: *See—*
Fischer, Thomas R.; and Stelzer, Robert A., 4,233,804, Cl. 56-104.000.
Pearlman, Samuel, to RCA Corporation. CRT Screen structure produced by photographic method. 4,234,669, Cl. 430-25.000.
Peck, Richard O.: *See—*
Ramon, Thomas; and Peck, Richard O., 4,233,745, Cl. 33-174.00L.
Peer, George J.; and Bradley, Robert C., to Multi-Metal Wire Cloth Inc. Filtering septum. 4,234,430, Cl. 210-489.000.
Peiffer, Robert W., to Du Pont de Nemours, E. I., and Company. Producing printed circuits by conjoining metal powder images. 4,234,626, Cl. 427-97.000.
Pellico, Michael A. Antifouling marine coating composition containing agar, a plasticizer and a strengthening agent. 4,234,340, Cl. 106-15.050.
Penneck, Richard J.: *See—*
Clabburn, Robin J. T.; and Penneck, Richard J., 4,233,731, Cl. 29-859.000.
Pennino, Frank L.: *See—*
Kuenzig, Ernest O.; and Pennino, Frank L., 4,234,299, Cl. 425-292.000.
Pennwalt Corporation: *See—*
Hensley, Steve L., 4,233,816, Cl. 62-55.000.
Radice, Peter F., 4,234,868, Cl. 340-146.3SY.
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba. Chromium plating. 4,234,396, Cl. 204-51.000.
Perchenok, Mark B.: *See—*
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.
Perkin-Elmer Corporation, The: *See—*
deMey, Charles F., II; and Helms, Charles C., 4,234,790, Cl. 250-238.000.
Perkins, John A., to Perky & Me Co. Hand catapult device. 4,233,952, Cl. 124-5.000.
Perky & Me Co.: *See—*
Perkins, John A., 4,233,952, Cl. 124-5.000.
Perl, Horst: *See—*
Nussbaumer, Dietmar; and Perl, Horst, 4,234,528, Cl. 264-41.000.
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, to Abbott Laboratories. Prostaglandin derivatives. 4,234,720, Cl. 542-413.000.
Perrault, Ronald. Work cabinet for podiatrists, dentist and the like. 4,233,782, Cl. 51-5.00R.
Person, Abraham; Wetmore, Sherman B.; and McNary, James F., to Global Marine, Inc. Deployment, release and recovery of ocean riser pipes. 4,234,269, Cl. 405-195.000.
Pesando, Mario A., to DAF Indal Ltd. Traversing and housing system for helicopters. 4,234,143, Cl. 244-116.000.
Peter, Heinrich: *See—*
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.
Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,234,029, Cl. 152-354.0RB.
Peters, David L., to Singer Company, The. Image drift correction apparatus. 4,234,893, Cl. 358-180.000.
Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, to Bayer Aktiengesellschaft. 1-N-4,6-di-O-(Aminoglycosyl)-1,3-diamino-cyclitol derivatives, processes for their preparation and their use. 4,234,572, Cl. 424-180.000.
Petko, Wayne W.: *See—*
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., 4,234,680, Cl. 435-7.000.
Petrov, Vyacheslav V.; and Krjuchin, Andrei A. Process for producing material sensitive to electromagnetic and corpuscular radiation. 4,234,625, Cl. 427-74.000.

Petrzilka, Martin, to Firmenich, S.A. Process for the preparation of γ, δ-unsaturated esters and acids. 4,234,741, Cl. 560-211.000.
Petschke, Glenn H.: *See*—
Earing, Mason H.; Gielinski, Leonard H.; Martin, Paul F.; and Petschke, Glenn H., 4,234,714, Cl. 528-67.000.
Pezdirtz, Karl F.: *See*—
Jeremiah, Thomas L.; and Pezdirtz, Karl F., 4,234,955, Cl. 371-51.000.
Pezzoli, Paul A., to Dow Chemical Company, The. Asbestos treatment. 4,234,377, Cl. 162-3.000.
Pfahler, Gerhard: *See*—
Wiezer, Hartmut; Korbanka, Helmut; and Pfahler, Gerhard, 4,234,471, Cl. 260-45.80N.
Pfeifer, Rolf, to Siemens Aktiengesellschaft. X-ray diagnostic installation for x-ray photographs. 4,234,928, Cl. 364-571.000.
Pfiffner, Albert: *See*—
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.
Pfizer Inc.: *See*—
Barth, Wayne E., 4,234,579, Cl. 424-246.000.
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., to Mobay Chemical Corporation. Polyols derived from 4,4,4-trichloro-1,2-epoxybutane and/or epihalohydrin for use in the production of heat sealable foams. 4,234,745, Cl. 568-614.000.
Phillips Petroleum Company: *See*—
Kelley, Carl S., 4,234,410, Cl. 208-57.000.
Moberly, Charles W.; Welch, Melvin B.; and Fodor, Lawrence M., 4,234,710, Cl. 526-125.000.
Scott, Richard L., 4,234,315, Cl. 23-230.0PC.
Strope, Daniel J., 4,234,454, Cl. 252-429.00R.
Thorsrud, Agmund K.; and Siedenstrang, Roy W., 4,234,636, Cl. 428-95.000.
Wu, Yulin; and Marwil, Stanley J., 4,234,752, Cl. 585-640.000.
Phipps, Arthur L., to Condec Corporation. Method and apparatus for shaping plastic foams. 4,234,529, Cl. 264-51.000.
Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,505, Cl. 260-465.00D.
Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,506, Cl. 260-465.00D.
Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,507, Cl. 260-465.00D.
Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,508, Cl. 260-465.00D.
Photis, James M., to Stauffer Chemical Company. Process for preparing thienylglyoxylic acids and amides. 4,234,737, Cl. 549-70.000.
Photis, James M.; Eiseman, Fred S.; and Gister, Sidney M., to Stauffer Chemical Company. Method for preparing glyoxylic acids and derivatives thereof. 4,234,739, Cl. 560-51.000.
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Pickard, Jurgen: *See*—
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Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F. Apparatus for spraying fluid and paste-like materials. 4,234,525, Cl. 261-89.000.
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Beck, Christian A., 4,234,248, Cl. 355-3.0FU.
Pizzino, Carmine P. Compound hair roller. 4,234,000, Cl. 132-39.000.
Place, Kenneth T.: *See*—
Ramras, Daniel, 4,234,446, Cl. 252-187.00R.
Platt, John R.; and Benno, Edward L., to Illinois Tool Works Inc. Two-way container package. 4,234,082, Cl. 206-150.000.
Poate, John M.: *See*—
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Poehlmann, Paul W. Knife with removable blade. 4,233,737, Cl. 30-335.000.
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Berthold, Heinz; and Zimmer, Karl E., 4,234,077, Cl. 198-712.000.
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Polaroid Corporation: *See*—
Brinkley, Robert G., 4,234,486, Cl. 260-314.500.
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Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,233,920, Cl. 114-56.000.
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Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., 4,234,800, Cl. 250-340.000.
Pommier, Jean, to Compagnie Generale des Etablissements Michelin. Radial tire with high angle, low elongation plies and low angle, high elongation plies in belt. 4,234,031, Cl. 152-356.00R.
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Baldwin, John J.; and Ponticello, Gerald S., 4,234,590, Cl. 424-263.000.
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Mazzoni, Renato J.; and Shoop, Vernon A., 4,233,796, Cl. 52-789.000.
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El-Chahawi, Moustafa; and Prange, Uwe, 4,234,545, Cl. 423-138.000.
Pratt, George W., Jr., to Massachusetts Institute of Technology. Method of assessing performance potential of a quadruped. 4,233,845, Cl. 73-432.00R.
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Precitronic Gesellschaft fur Feinmechanik und Electronic mbH: *See*—
Eichweber, Kurt, 4,233,882, Cl. 89-1.00L.
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Mallan, George M.; and Preston, George T., 4,234,388, Cl. 201-25.000.
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Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., 4,234,306, Cl. 433-55.000.
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Bash, C. Malcolm, 4,233,953, Cl. 124-56.000.
Pringle, William L., to Friedman, Leonard. Bonding apparatus for brake linings. 4,233,893, Cl. 100-93.0PB.
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Process Analyzers, Inc.: *See*—
Carter, Harold V.; and Durfee, Frederick G., 4,234,257, Cl. 356-417.000.
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Gunther, Harald; and Fleisch, Herbert C., 4,234,645, Cl. 424-204.000.
Lewis, Neal A., 4,234,613, Cl. 426-430.000.
Schilling, Kenneth J., 4,234,627, Cl. 427-242.000.
Tofe, Andrew J.; and Francis, Marion D., 4,234,562, Cl. 424-1.000.
Proctor, Douglas B. I. Paddles for boats. 4,233,925, Cl. 440-101.000.
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Brouard, Claude M. H. E.; and Stiot, Jean-Pierre H., 4,234,482, Cl. 260-187.000.
Protim International Limited: *See*—
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Prumm, Georg J. Electronic coin tester with controlled mechanical testing device. 4,234,072, Cl. 194-100.00A.
Przybylinski, Thomas L.; and Tylisz, Eugene R., to Pullman Incorporated. Trough hatch locking device. 4,234,221, Cl. 292-256.500.
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Snyder, Richard C.; and Bodinger, Donald C., 4,233,795, Cl. 52-514.000.
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Purex Corporation: *See*—
Maxey, Eugene R., 4,234,819, Cl. 315-119.000.
Putz, Hermann, to Hoerbiger & Co. Method of producing sintered friction laminae. 4,234,337, Cl. 75-208.00R.
Pyle, Jeffrey A.: *See*—
Ford, Daniel E.; and Pyle, Jeffrey A., 4,233,748, Cl. 33-180.00R.
Quester, Karl W.; Gontgen, Josef; and Muller, Adolf, to Firm Wilh. Quester. Rib roller for processing tobacco ribs. 4,233,997, Cl. 131-147.00R.
Quick, David C., to Allis-Chalmers Corporation. Multiple speed transmission with auxiliary transfer drive. 4,233,857, Cl. 74-665.0GA.
Quinn, David R.; and Weaner, Walter H., to AFA Corporation, The. Nozzle assembly. 4,234,128, Cl. 239-478.000.
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Radice, Peter F., to Pennwalt Corporation. Personal verification device. 4,234,868, Cl. 340-146.3SY.
Raemer, Daniel B.; Gehmlich, Dietrich K.; and Westenskow, Dwayne R., to University of Utah. Apparatus for measurement of expiration fluids. 4,233,842, Cl. 73-861.040.
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Morgan, Norman D., 4,234,126, Cl. 239-230.000.
Ralston Purina Company: *See*—
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,234,604, Cl. 426-2.000.
Witte, Philip A., 4,234,609, Cl. 426-104.000.
Ramme, Clarence. Lighted bobber for a fishing line. 4,234,913, Cl. 362-158.000.
Ramon, Thomas; and Peck, Richard O., to Amsted Industries Incorporated. Warpage gage. 4,233,745, Cl. 33-174.00L.
Ramras, Daniel, to Place, Kenneth T. Method and apparatus for producing chlorine dioxide. 4,234,446, Cl. 252-187.00R.
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Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., 4,234,565, Cl. 424-33.000.
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Rank Organization Limited, The: *See*—
Moore, William T.; and Sweeney, Michael T., 4,234,240, Cl. 350-6.100.
Ransburg Corporation: *See*—
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., 4,234,200, Cl. 279-2.00A.
Rapoport, Henry; and Snyder, Clinton D., to University of California, The Regents of the. Metallo-substituted naphthalene. 4,234,746, Cl. 568-633.000.
Rary, James K.: *See*—
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, to Ciba-Geigy Corporation. Nickel stabilizers for synthetic polymers. 4,234,723, Cl. 544-64.000.
Rasberger, Michael: *See*—
Rody, Jean; and Rasberger, Michael, 4,234,699, Cl. 525-55.000.
Rody, Jean; and Rasberger, Michael, 4,234,700, Cl. 525-55.000.
Rask, Eric H., to General Electric Company. Motor operated circuit breaker including a variable drive coupling link assembly. 4,234,772, Cl. 200-153.00V.
Raychem Corporation: *See*—
Greuel, Walter J., Jr., 4,234,020, Cl. 138-166.000.
Raychem Limited: *See*—
Clabburn, Robin J. T.; and Penneck, Richard J., 4,233,731, Cl. 29-859.000.
Rogers, Albert G., 4,234,218, Cl. 285-162.000.
Raymond, Joseph H., Jr.; and Lien, Jih-Chang, to Texas Instruments Incorporated. Metal-to-moat contacts in N-channel silicon gate integrated circuits using discrete second-level polycrystalline silicon. 4,234,889, Cl. 357-71.000.
Raytheon Company: *See*—
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Schmoock, James C., 4,234,806, Cl. 307-273.000.
RCA Corporation: *See*—
Astle, Brian; and Dischert, Robert A., 4,234,890, Cl. 358-10.000.
Chen, Hsing-Yao; and Hughes, Richard H., 4,234,814, Cl. 313-412.000.
Credelle, Thomas L., 4,234,815, Cl. 313-422.000.
den Hollander, Willem, 4,234,824, Cl. 315-371.000.
Dietz, Wolfgang F. W., 4,234,826, Cl. 315-393.000.
Gange, Robert A., 4,234,825, Cl. 315-383.000.
Larach, Simon; and Vilkomerson, David H. R., 4,233,989, Cl. 128-661.000.
Longaderff, Richard W.; and Henry, Dale V., 4,233,936, Cl. 118-726.000.
Pearlman, Samuel, 4,234,669, Cl. 430-25.000.
Schade, Otto H., Jr., 4,234,841, Cl. 323-1.000.
Toda, Minoru; and Osaka, Susumu, 4,234,245, Cl. 350-269.000.
Willis, Donald H., 4,234,827, Cl. 315-408.000.
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Rea, Wayne E., to Dresser Industries, Inc. Silencer-separator with internal trap for liquid seal blowers or the like. 4,234,325, Cl. 55-185.000.
Reavill, Joseph A.; and Arachi, John M., to General Dynamics Corporation, Pomona Division. Method and apparatus for vacuum lamination of flex circuits. 4,234,373, Cl. 156-382.000.
Rebel, Herbert, to M.A.N.-Roland Druckmaschinenfabrik Faber & Schleicher AG. Prevention of impact in impression cylinder of sheet-fed lithographic press. 4,233,899, Cl. 101-142.000.
Rechin, Francis J.; and Vargo, Edward J., to TRW Inc. Method of charging a crucible. 4,234,336, Cl. 75-65.00R.
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Thompson, David R.; and Tomlinson, John P., 4,234,641, Cl. 428-159.000.
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Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 4,234,453, Cl. 252-428.000.
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Jackula, Michael J.; and Ziegler, Hans J., 4,234,756, Cl. 174-38.000.
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Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, 4,234,451, Cl. 252-373.000.
Research Corporation: *See*—
Bahl, Om P., 4,234,561, Cl. 424-1.000.
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,234,476, Cl. 260-112.00R.
Enke, Christie G.; Yost, Richard A.; and Morrison, James D., 4,234,791, Cl. 250-281.000.
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Restaurant Technology, Inc.: *See*—
Schindler, James; and Nugarus, Anthony R., 4,233,891, Cl. 99-348.000.
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Rhine, Samuel, to Helena Laboratories Corporation. Paper tensioning device. 4,234,134, Cl. 242-55.200.
Rhodes, Cecil C.; and Kozar, Robert S., to Amsted Industries Incorporated. System for separating particulate matter into soluble and insoluble portions. 4,234,429, Cl. 423-109.000.
Rhodes, Eugene E., to Ford Motor Company. Method for manufacturing a heat transfer assembly. 4,233,719, Cl. 29-157.30A.
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Rhudy, John S.; and Gibb, Connie L., to Marathon Oil Company. Recovery of petroleum with chemically treated high molecular weight polymers. 4,234,433, Cl. 252-8.55D.
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Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,234,611, Cl. 426-321.000.
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Bauer, Siegfried; and Boebel, Manfred, 4,233,982, Cl. 128-347.000.
Richardson, Charles M. Self-bagging device for powered lawn tools. 4,233,806, Cl. 56-202.000.
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Rieder, Georg: *See*—
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Murai, Hiroshi, 4,234,876, Cl. 340-573.000.

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Rippe, Delfin F., to American Hospital Supply Corporation. Insolubilized deoxyribonucleic acid (DNA). 4,234,563, Cl. 424-8.000.

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Kotuby, Paul M.; and Reed, Joseph F., 4,233,995, Cl. 131-133.00R.

Riseman, Jacob, to International Business Machines Corporation. Method for forming an insulator between layers of conductive material. 4,234,362, Cl. 148-187.000.

Ristvedt, Victor G.; and Johnson, Roy B. Coin handling machine. 4,234,003, Cl. 133-3.00A.

Ritscher, James S.: *See*—
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Robbins Company, The: *See*—
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Roberts, William M., to Baker International Corporation. Removable subsea test valve system for deep water. 4,234,043, Cl. 166-336.000.

Robertshaw Controls Company: *See*—
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Robinson, Anderson E., Jr., to Hercules Incorporated. Crosslinked double base propellant binders. 4,234,364, Cl. 149-19.400.

Robinson, John G. S. Bait holder. 4,233,771, Cl. 43-41.000.

Robinson, Ward T.; and Nokes, Richard H. Joint unit providing multiple joints. 4,234,263, Cl. 403-405.000.

Rocco, Francesco. Catheter provided with a safety-fixing member, remotely adjustable and expandible by introducing fluids. 4,233,983, Cl. 128-349.00B.

Roche, Christian: *See*—
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Rockwell International Corporation: *See*—
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Darnell, Alfred J., 4,234,551, Cl. 423-263.000.
Eshghy, Siavash, 4,233,721, Cl. 29-407.000.
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Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,233,829, Cl. 72-38.000.
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Rodgers, James W.: *See*—
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Roe, Norman E., to Hehr International, Inc. Window assembly for socket window. 4,233,781, Cl. 49-504.000.

Roesch, Androniki: *See*—
Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.

Rogers, Albert G., to Raychem Limited. Feedthrough device. 4,234,218, Cl. 285-162.000.

Rogers, Philip W.; and Parkin, Claude E., to Mammel, A. Dean. Flange valve having improved sealing characteristics and wear indicator. 4,233,926, Cl. 116-208.000.

Rogers, Walter E.; and Midgett, Preston C. Underground heating and cooling system. 4,234,037, Cl. 165-3.000.

Rogora, Edoardo; and De Angelis, Giancarlo, to Alfa Romeo S.p.A. Device for detecting premature ignition in an internal-combustion engine. 4,233,943, Cl. 123-425.000.

Rohm and Haas Company: *See*—
Emmons, William D.; and Moser, Vincent J., 4,234,711, Cl. 526-282.000.
Killam, H. Scott, 4,234,381, Cl. 162-158.000.
Weir, W. David; and Kilbourn, Edward E., 4,234,575, Cl. 424-204.000.

Rohringer, Peter. *See*—
Hiestand, Armin; and Rohringer, Peter, 4,234,341, Cl. 106-18.220.

Rohto Pharmaceutical Co. Ltd.: *See*—
Hirayama, Masami; Nakata, Tadataka; and Kagayama, Michiko, 4,234,450, Cl. 252-314.000.

RoJohn, D. Scott: *See*—
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,233,988, Cl. 128-660.000.

Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., to ACF Industries, Incorporated. Combination tank car valve skid and valve seat wherein the skid is welded to the valve seat. 4,234,158, Cl. 251-144.000.

Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., to ACF Industries, Incorporated. Combination tank car valve skid and valve seat in which end portions on the skid are attached to the tank with fasteners which do not require stress relieving of the tank. 4,234,159, Cl. 251-144.000.

Rolls-Royce Limited: *See*—
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.

Romine, Donald J., to Bendix Autolite Corporation. Thin coat temperature compensated resistance oxide gas sensor. 4,234,542, Cl. 422-98.000.

Roper Corporation: *See*—
Condon, Richard W., 4,234,050, Cl. 180-190.000.

Rose, Scott M.: *See*—
Palmer, John P.; and Rose, Scott M., 4,234,788, Cl. 250-227.000.

Rosenberg, Eugene: *See*—
Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, 4,234,689, Cl. 435-101.000.

Rosenvold, Leo. Truck box cover device. 4,234,224, Cl. 296-98.000.

Rosolowski, Joseph H.: *See*—
Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,436, Cl. 252-62.900.
Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,557, Cl. 423-593.000.
Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,558, Cl. 423-593.000.

Rosser, Robert W.: *See*—
United States of America, National Aeronautics and Space Administration; Rosser, Robert W.; and Psarras, Theodore, 4,234,715, Cl. 528-362.000.

Rotex, Inc.: *See*—
Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., 4,234,416, Cl. 209-247.000.

Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Dilanni, Daniel, 4,233,996, Cl. 131-140.00R.

Rouse, Keith M.: *See*—
Margetts, Hugh G.; and Rouse, Keith M., 4,234,061, Cl. 188-71.300.

Rowarth, John E.: *See*—
Royce, John H.; Rowarth, John E.; and Walker, John, 4,233,780, Cl. 49-485.000.

Rowell, Douglas W. Method and apparatus for rolling metal wire or rod into wide, flat strips. 4,233,832, Cl. 72-91.000.

Rowlett, Beb H., to Garrett Corporation, The. Flywheel drive system having a split electromechanical tranamission. 4,233,858, Cl. 74-675.000.

Rowley, David S., to Christensen, Inc. Drill bits embodying impregnated segments. 4,234,048, Cl. 175-329.000.

Rowney, Michael H. Swimming pool cover with rain water drainage and filter means. 4,233,695, Cl. 4-498.000.

Royce, John H.; Rowarth, John E.; and Walker, John, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Door seal. 4,233,780, Cl. 49-485.000.

Rozgonyi, George A.: *See*—
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.

Rozmus, Walter J., to Kelsey-Hayes Company. Method of forming and ultrasonic testing articles of near net shape from powder metal. 4,233,720, Cl. 29-407.000.

Rual Industries, Inc.: *See*—
Davis, Ariel R.; and Greene, Worthington W., 4,234,767, Cl. 200-1.00R.

Ruark, Joseph S. Line hauler for crab pots and the like. 4,234,164, Cl. 254-371.000.

Rubinstein, Liuba: *See*—
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba, 4,234,396, Cl. 204-51.000.

Rudd, Wallace C.; and Udall, Humfrey N., to Thermatool Corp. Method of producing areas of alloy metal on a metal part using electric currents. 4,234,776, Cl. 219-76.170.

Ruetenik, Roger R. Folding wing assembly. 4,233,938, Cl. 119-15.50A.

Rug Crafters: *See*—
Montell, Joseph J., 4,233,918, Cl. 112-266.200.

Rummer, James D.: *See*—
Moncaster, Michael B.; and Rummer, James D., 4,234,199, Cl. 277-237.00R.

Ryabikov, Stanislav V.: *See*—
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,234,354, Cl. 136-246.000.

Rybalchenko, Gleb F.: *See*—
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F., 4,234,525, Cl. 261-89.000.

Ryding, Geoffrey, to Nova Associates, Inc. Treating workpieces with beams. 4,234,797, Cl. 250-492.00B.

Ryerson, Robert W., to Page Engineering Company. Earth digging bucket tooth construction having a nose with increased section modulus. 4,233,761, Cl. 37-142.00R.

Ryono, Denis E.: *See*—
Ondetti, Miguel A.; Gordon, Eric M.; and Ryono, Denis E., 4,234,489, Cl. 260-326.420.

Ryrfors, Lars-Olof; and Hassander, Mats S. O., to Hoechst-Perstorp AB. Binder for pressure sensitive adhesive. 4,234,467, Cl. 260-29.70H.

Rywak, Donald E.; Griffith, James L.; Rhodes, Frederick D.; and Kovalsics, Otto, to Pullman Incorporated. Fuel delivery system for a furnace or kiln. 4,234,106, Cl. 222-239.000.

SAB Harmon Industries, Inc.: *See*—
Wilde, Calvin D.; and Turner, Daniel L., 4,234,922, Cl. 364-426.000.

Sabourin, Edward T.: *See*—
Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,234,743, Cl. 562-457.000.

Safety Consulting Engineers Inc.: *See*—
Dahn, C. James, 4,233,835, Cl. 73-35.000.

Safianoff, Albert, to Alpha Therapeutic Corporation. Collection container for sterile liquids. 4,234,095, Cl. 215-232.000.

Sagara, Seiji: *See*—
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.

Sahar, Raphael. Spinning top. 4,233,774, Cl. 46-82.000.

St. Louis, Harold E.: *See*—
Hay, Robert A., II; and St. Louis, Harold E., 4,234,447, Cl. 252-301.10W.

Saipem, S.p.A: *See*—
Scodino, Ambrogio, 4,234,268, Cl. 405-158.000.

Saitoh, Osamu: *See*—
Ishida, Kozo; Amimoto, Hiroyuki; and Saitoh, Osamu, 4,234,255, Cl. 350-274.000.

Sakai Chemical Industry Co., Ltd.: *See*—
Iwasaki, Susumu; Nagasawa, Osamu; Takano, Tatsuo; and Matsumoto, Seiji, 4,234,378, Cl. 162-138.000.

Sakakibara, Sakuichi; Sugisawa, Ko; Majima, Junji; and Nakanaga, Ryusuke. Continuous frying method. 4,234,612, Cl. 426-394.000.

Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, to House Food Industrial Company, Limited. Method for preparing instant cooking noodles. 4,234,617, Cl. 426-557.000.

Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Pipe joint construction. 4,234,217, Cl. 285-150.000.

Sakanaka, Yasuhiro; and Narui, Mamoru, to Toyo Soda Manufacturing Company, Limited. Chloroprene polymer composition. 4,234,704, Cl. 523-215.000.

Sakurada, Ichio: *See*—
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,234,168, Cl. 266-128.000.

Salamone, Joseph L. Bi-delta vane. 4,234,192, Cl. 273-423.000.

Salomon, Erna: *See*—
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba, 4,234,396, Cl. 204-51.000.

Sandelman, Robert M. Merchandise display and categorical indicators. 4,234,869, Cl. 340-286.00R.

Sandstone, Inc.: *See*—
Williams, William H., 4,234,875, Cl. 340-550.000.

Sandvik Special Metal Corporation: *See*—
Matinlassi, Ulf A., 4,233,834, Cl. 72-208.000.

Sanfilippo, Michele: *See*—
Busacca, Guido; Luparello, Pietro; Marranca, Lucio; and Sanfilippo, Michele, 4,234,855, Cl. 331-90.000.

Sartorio, Lucio A. Oil dipstick cleaning device. 4,233,704, Cl. 15-210.00B.

Sartorius GmbH: *See*—
Nussbaumer, Dietmar; and Perl, Horst, 4,234,528, Cl. 264-41.000.

Sasai, Koji: *See*—
Oikawa, Akio; and Sasai, Koji, 4,233,927, Cl. 116-287.000.

Sasaki, Toshihiko. Container for liquid. 4,234,121, Cl. 229-1.50B.

Saskatchewan Power Corporation: *See*—
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.

Sass, Bernard J., to Service d'Exploitation Industrielle des Tabacs. Wrapping process for cigars with natural tobacco. 4,233,994, Cl. 131-58.000.

Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole-1-carboxylic acid aryl esters. 4,234,722, Cl. 544-58.400.

Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, to Hitachi, Ltd. Strain gauge pressure transducer apparatus having an improved impedance bridge. 4,233,848, Cl. 73-727.000.

Sato, Hiroshi; and Yamamoto, Hironori, to Canon Kabushiki Kaisha. High precision positioning device. 4,234,175, Cl. 269-73.000.

Sato, Kazuyuki: *See*—
Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, 4,234,921, Cl. 364-424.000.

Sato, Toyoyuki: *See*—
Magari, Teruo; Sato, Toyoyuki; and Nakamura, Masayoshi, 4,234,465, Cl. 252-547.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Label strip charging mechanism for hand labeler. 4,233,900, Cl. 101-288.000.

Satoh, Paul S., to Upjohn Company, The. Horizontal electrophoresis or isoelectric focusing apparatus. 4,234,404, Cl. 204-299.00R.

Satoh, Ryosuke: *See*—
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Satterwhite, Charles R. Aerial conveyor system. 4,234,073, Cl. 198-304.000.

Sauer, Joseph: *See*—
Kadelbach, Volker; Will, Gerhard; and Sauer, Joseph, 4,233,860, Cl. 74-752.00A.

Sauer, Walter; and Gerhart, Berthold, to Hans Giesbert Kommanditgesellschaft. Poultry cage feeding system. 4,233,939, Cl. 119-18.000.

Saunders, Leonard: *See*—
McGauran, Hugh K.; and Saunders, Leonard, 4,233,878, Cl. 85-7.000.

Sawyer, Bobby G.: *See*—
Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., 4,233,803, Cl. 56-14.900.

Saya, Wayne P., to Inventional/Security Development Corp. Alarm system and method thereof. 4,234,874, Cl. 340-539.000.

Scarlett, John C.; and Beggs, Donald, to Midrex Corporation. Apparatus for the direct reduction of iron and production of fuel gas using gas from coal. 4,234,169, Cl. 266-156.000.

Schaad, Willi, to Oehler Whylen Lagertechnik AG. Braking system for freight module on overhead guide rail. 4,234,059, Cl. 188-43.000.

Schade, Otto H., Jr., to RCA Corporation. Self-balancing bridge network. 4,234,841, Cl. 323-1.000.

Schaffer, Claus: *See*—
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.

Schelkmann, Wilhelm, to Vakuum Vulk Holdings Limited. Method for repairing and retreading vehicle tires. 4,234,369, Cl. 156-95.000.

Schellenberg, James M.; and Cohn, Marvin, to Westinghouse Electric Corp. Amplifier with radial line divider/combiner. 4,234,854, Cl. 330-286.000.

Scheppele, James E., to TRW Inc. Process for manufacturing emitters by diffusion from polysilicon. 4,234,357, Cl. 148-1.500.

Schering Corporation: *See*—
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,234,690, Cl. 435-119.000.

Schieber, Franz. Laminar carbon member and a method of manufacturing it. 4,234,650, Cl. 428-280.000.

Schiel, Christian, to J. M. Voith GmbH. Former for a paper machine. 4,234,382, Cl. 162-263.000.

Schieman, Richard D.; and Steffens, John H., to Standard Oil Company. Process for the production of lubricating blend stocks. 4,234,409, Cl. 208-28.000.

Schilling, Kenneth J., to Procter & Gamble Company, The. Fabric conditioning compositions. 4,234,627, Cl. 427-242.000.

Schindler, Donald R., to General Electric Company. Photoflash unit having light-refractive prisms. 4,234,906, Cl. 362-16.000.

Schindler, James; and Nugarus, Anthony R., to Restaurant Technology, Inc. Apparatus for making scrambled eggs. 4,233,891, Cl. 99-348.000.

Schleiermacher, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Mounting arrangement for mounting a piston compressor attached as an auxiliary machine to an internal combustion engine. 4,233,854, Cl. 74-325.000.

Schliebs, Reinhard: *See*—
La Spina, Andrea; Dietrich, Werner; and Schliebs, Reinhard, 4,234,694, Cl. 521-107.000.

Schlumberger Technology Corporation: *See*—
Coates, George R., 4,233,839, Cl. 73-152.000.

Schmekel, Karl-W.: *See*—
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.

Schmid, Hanns-Martin: *See*—
Wiedmann, Werner; and Schmid, Hanns-Martin, 4,234,259, Cl. 366-81.000.

Schmid, Max: *See*—
Barner, Richard; and Schmid, Max, 4,234,490, Cl. 260-340.90R.

Schmidt, Erich, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Stereo line scanner. 4,234,241, Cl. 350-6.900.

Schmidt, Manfred: *See*—
Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, 4,234,171, Cl. 266-248.000.

Schmidt, Robert R.: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.

Schmitt, Frederick L.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.

Schmitt, Susan M.: *See*—
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,234,596, Cl. 424-274.000.

Schmoock, James C., to Raytheon Company. Monostable multivibrator employing nonsaturating switching transistor. 4,234,806, Cl. 307-273.000.

Schneider, Manfred, to Veb Textima Wirkmaschinenbau Karl Marx Stadt. Warp knitting of double jacquard-patterned pile fabric. 4,233,824, Cl. 66-87.000.

Schneider, Peter: *See*—
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.

Schnell, William J., to Baxter Travenol Laboratories, Inc. Dual membrane mass transfer device. 4,234,428, Cl. 210-321.00B.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., 4,234,495, Cl. 260-397.200.

Schoeneweis, E. Frederick: *See*—
Bake, Earl A.; and Schoeneweis, E. Frederick, 4,234,011, Cl. 137-312.000.

Schoerner, Roger J.: *See*—
Chia, Enrique C.; and Schoerner, Roger J., 4,234,359, Cl. 148-2.000.

Scholl, Walter: *See*—
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, 4,234,479, Cl. 260-145.00B.

Schomacher, Paul H. Device for closing severed body vessels. 4,233,981, Cl. 128-334.00R.

Schonherr, Erich: *See*—
Rabenau, Albrecht; von Alpen, Ulrich; Schonherr, Erich; and Muller, Gertraude, 4,234,554, Cl. 423-409.000.

Schonmeier, Herbert: *See*—
Meyer, Rolf; and Schonmeier, Herbert, 4,233,869, Cl. 83-500.000.

Schotte, Dietwald: *See*—
Claus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.

Schrader, Gerhard: *See*—
Hendrischk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, 4,234,261, Cl. 400-621.000.

Schreiner, Kenneth E., to International Business Machines Corporation. Means for maintaining the identification of defective minor loops in a magnetic bubble memory. 4,234,935, Cl. 365-15.000.

Schroder, Rolf: *See*—
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.

Schroeder, Hobe; and Palmer, David A., to Standard Oil Company (Indiana). Formation, purification and recovery of phthalic anhydride. 4,234,494, Cl. 260-346.700.

Schroeder, Wolfgang: *See*—
Toussaint, Herbert; Schroeder, Wolfgang; and Franzischka, Wolfgang, 4,234,727, Cl. 544-178.000.

Schuette, Henry W.; and Wellons, Charles L., to Wellons, Inc. Pressurized waste wood furnace system. 4,233,914, Cl. 110-233.000.

Schuierer, Manfred, to Bruckner Apparatebau GmbH. Processes for removing impurities from textile materials. 4,234,311, Cl. 8-138.000.

Schultz, John, Jr.: *See*—
Borom, Marcus P.; and Schultz, John, Jr., 4,234,786, Cl. 219-544.000.

Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., to GR & DC. Isomeric diaminobenzophenonedicarboxylic acids and method for preparing same. 4,234,743, Cl. 562-457.000.

Schulze, Eckehart, to Hartman & Lammle GmbH & Co. KG, Firma. Hydraulic shock absorption in punch or cutting presses. 4,233,872, Cl. 83-617.000.

Schumacher, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Railway car hydraulically dampened traction rods. 4,233,910, Cl. 105-182.00R.

Schumacher, Heinz; and Zacharias, Hermann, to Draloric Electronic GmbH. Piezoelectric filter and process for the manufacture thereof. 4,234,860, Cl. 333-187.000.

Schundehutte, Karl-Heinz: *See*—
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, 4,234,479, Cl. 260-145.00B.

Schupback, Jesse L., to Deere & Company. Hose support bracket for backhoe swing frame. 4,234,012, Cl. 137-899.100.

Schussler, Mortimer: *See*—
Ghandehari, Mohammad H.; and Schussler, Mortimer, 4,234,333, Cl. 75-0.5BA.

Schwartz, Joseph: *See*—
Krapcho, John; and Schwartz, Joseph, 4,234,602, Cl. 424-330.000.

Schwarz, Karl E. Automatic bagging machine. 4,233,797, Cl. 53-66.000.

Schwarz, Walter. Method of making a pipe coupling. 4,234,368, Cl. 156-91.000.

Schweitzer, Edmund O. Fault indicator. 4,234,847, Cl. 324-146.000.

Schwieter, Ulrich: *See*—
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.

Scientific Applications Incorporated: *See*—
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., 4,234,007, Cl. 137-101.190.

SCM Corporation: *See*—
Gawrilow, Ilija, 4,234,606, Cl. 426-24.000.
Jasko, James J.; and Zielinski, Richard J., 4,234,618, Cl. 426-607.000.

Scodino, Ambrogio, to Saipem, S.p.A. Apparatus for recovering, by means of a pipelaying craft, pipes laid on deep sea beds. 4,234,268, Cl. 405-158.000.

Scott, John W.: *See*—
Berger, Leo; and Scott, John W., 4,234,487, Cl. 260-315.000.

Scott Paper Company: *See*—
Colby, Donald B., 4,234,226, Cl. 297-21.000.

Scott, Richard L., to Phillips Petroleum Company. Gas chromatographic analysis method and apparatus. 4,234,315, Cl. 23-230.0PC.

Scott, Robert N.; Gavin, David F.; and Milnes, Frank J., to Olin Corporation. Silicone oil compositions containing silicate cluster compounds. 4,234,441, Cl. 252-78.300.

Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., to Letraset Corporation. Manufacture of signs using photoimaging and heat transfer. 4,234,673, Cl. 430-252.000.

Seader, Junior D., to University of Utah. Continuous distillation apparatus and method. 4,234,391, Cl. 203-26.000.

Sealand Service Inc.: *See*—
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.

Sebestyen, Gyula: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Secim: *See*—
Houdion, Pierre, 4,233,830, Cl. 72-38.000.

Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych Komag. Driving device for a mining machine. 4,234,234, Cl. 299-43.000.

Seeger, Bernd: *See*—
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.

Seeholzer, Josef: *See*—
Michaud, Horst; Rieder, Georg; and Seeholzer, Josef, 4,234,332, Cl. 71-30.000.

Seiler, Claus-Dietrich: *See*—
Kappler, Fritz-Robert; and Seiler, Claus-Dietrich, 4,234,502, Cl. 556-413.000.
Kappler, Fritz-Robert; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,234,503, Cl. 556-413.000.

Seiler, Karl H., to Krauss-Maffei Aktiengesellschaft. Linear induction motor with improved rail assembly. 4,233,906, Cl. 104-294.000.

Seiler, Kurt: *See*—
Kuhn, Helmut; and Seiler, Kurt, 4,234,651, Cl. 428-290.000.

Seiz, Carl G.: *See*—
Seiz, Frederick G.; and Seiz, Carl G., 4,234,069, Cl. 193-35.00A.

Seiz, Frederick G.; and Seiz, Carl G., to Variable Control Systems, Inc. Vehicle speed control apparatus. 4,234,069, Cl. 193-35.00A.

Sekiguchi, Kouichi; Takematsu, Hikaru; and Katsukura, Kazutada, to Iwasaki Tsushinki Kabushiki Kaisha. Key telephone system. 4,234,765, Cl. 179-99.00M.

Sekiguchi, Tsunetoshi: *See*—
Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, 4,234,948, Cl. 368-291.000.

Sellers, Wm. Ralph. Dental twist lock pin and wrench. 4,234,309, Cl. 433-225.000.

Seltzer, Steven F.: *See*—
Pulley, Howard; and Seltzer, Steven F., 4,234,555, Cl. 423-484.000.

Sener Ingenieria y Sistemas, S.A.: *See*—
Torroja, Jaime M.; Rivacoba, Jose U.; and Herrero, Ricardo M., 4,233,921, Cl. 114-74.00R.

Sensotherm AB: *See*—
Almen, Rune, 4,234,039, Cl. 165-67.000.

Serboli, Giancarlo: *See*—
Vanoni, Pier L.; Serboli, Giancarlo; and De Marchi, Franco, 4,234,652, Cl. 428-296.000.

Service d'Exploitation Industrielle des Tabacs: *See*—
Sass, Bernard J., 4,233,994, Cl. 131-58.000.

Sesamat Anstalt: *See*—
Riedel, Tilo, 4,234,027, Cl. 152-213.00R.

Seven-H Corporation: *See*—
Hart, Edwin R., 4,234,614, Cl. 426-462.000.

Sewell, Richard B. H.; and Kidd, Derek J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Microporous protective coverings. 4,234,637, Cl. 428-131.000.

Seynaeve, Jan: *See*—
De Meyer, Herman; Doclo, Roland; and Seynaeve, Jan, 4,234,322, Cl. 55-18.000.

Shabtai, Yossef: *See*—
Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, 4,234,689, Cl. 435-101.000.

Shargorodsky, Valentina: *See*—
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba, 4,234,396, Cl. 204-51.000.

Sharon Manufacturing Company: *See*—
Hudson, Sharon J., Jr., 4,234,328, Cl. 55-447.000.

Sharp Kabushiki Kaisha: *See*—
Kako, Noritoshi; Yamane, Yasukuni; and Suzuki, Chuji, 4,234,821, Cl. 315-169.300.

Sharp, Richard S.: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,234,918, Cl. 364-200.000.

Shaw, Richard G.: *See*—
Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., 4,234,656, Cl. 428-379.000.

Shaw, Seth T., Jr. IUD Arrangement. 4,233,968, Cl. 128-130.000.

Shearon, Lawrence W.: *See*—
Hartlaub, Jerome T.; McDonald, Ray S.; and Shearon, Lawrence W., 4,233,985, Cl. 128-419.0PG.

Shelby, Billy L.: *See*—
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,234,912, Cl. 362-145.000.

Shell Oil Company: *See*—
Boersma, Michael A. M.; and Sie, Swan T., 4,234,412, Cl. 208-80.000.
Titus, Paul E., 4,234,629, Cl. 427-388.200.
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,234,512, Cl. 568-420.000.
van der Zeeuw, Abraham J.; Koenders, Peter; and Kok, Riekert, 4,234,546, Cl. 423-139.000.
Verschuur, Eke, 4,234,320, Cl. 44-23.000.
Viramontes, Jose A., 4,234,105, Cl. 222-233.000.

Shepard, Inella G.: *See*—
Graham, William H.; and Shepard, Inella G., 4,234,738, Cl. 560-32.000.

Shepherd, John V.: *See*—
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.

Sherif, Fawzy G.: *See*—
Benkwitt, Frances C.; and Sherif, Fawzy G., 4,234,568, Cl. 424-54.000.

Sherman, Richard H.: *See*—
Gable, Melvin G.; and Sherman, Richard H., 4,234,952, Cl. 370-94.000.

Shibata, Norio, to Victor Company of Japan Ltd. Apparatuses for reproducing signals from rotary recording mediums. 4,234,195, Cl. 274-39.00R.

Shibuya, Yoshikazu: *See*—
Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, 4,234,902, Cl. 361-120.000.

Shigehara, Katsumi. Transformer framing structure. 4,234,865, Cl. 336-92.000.

Shima, Eiji; Shimizu, Masao; and Den, Hiroshi, to FEBS International, Ltd.; and Fujikura Cable Works, The. Flat type cable suspension structure. 4,234,146, Cl. 248-63.000.

Shimizu, Masao: *See*—
Shima, Eiji; Shimizu, Masao; and Den, Hiroshi, 4,234,146, Cl. 248-63.000.

Shimizu, Shigehisa; Fukuhara, Sanshiro; Shinmura, Noboru; and Tanigawa, Hisahiro, to Fuji Photo Film Co., Ltd. Web butt-joining system. 4,234,365, Cl. 156-64.000.

Shinmura, Noboru: *See*—
Shimizu, Shigehisa; Fukuhara, Sanshiro; Shinmura, Noboru; and Tanigawa, Hisahiro, 4,234,365, Cl. 156-64.000.

Shinohara, Toshio: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.

Shiseki, Yutaka, to Ozen Corporation. Simplified phonograph capable of selecting desired grooves on a record disc. 4,234,193, Cl. 274-1.00A.

Shoop, Vernon A.: *See*—
Mazzoni, Renato J.; and Shoop, Vernon A., 4,233,796, Cl. 52-789.000.

Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with mixtures of 2,5-dialkyl dihydrofuranones and 2,4,5-trialkyl dihydrofuranones. 4,234,616, Cl. 426-536.000.

Shukla, Vishnu S. Apparatus for administering intravenous drugs. 4,233,973, Cl. 128-214.00R.

Shumate, Michael S.: *See*—
United States of America, National Aeronautics and Space Administration; Margolis, Jack S.; and Shumate, Michael S., 4,234,258, Cl. 356-437.000.

Shumway, DeWayne J.; and Gennetten, Delbert D., to Dixson, Inc. Inductive pickup clip. 4,234,863, Cl. 336-90.000.

Sibley, Henry C., to General Signal Corporation. Vital electronic code generator. 4,234,870, Cl. 340-348.000.

Sie, Inc.: *See*—
Boop, Gene T., 4,234,768, Cl. 200-52.00R.

Sie, Swan T.: *See*—
Boersma, Michael A. M.; and Sie, Swan T., 4,234,412, Cl. 208-80.000.

Sieben, Joannus H. F. C.: *See*—
Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., 4,234,140, Cl. 242-199.000.

Siedenstrang, Roy W.: *See*—
Thorsrud, Agmund K.; and Siedenstrang, Roy W., 4,234,636, Cl. 428-95.000.

Siegal, Burton L. Power seat memory. 4,234,936, Cl. 365-244.000.

Siemens Aktiengesellschaft: *See*—
Amtmann, Heribert, 4,234,793, Cl. 250-414.000.
Dreisbach, Bodo; and Eidling, Karl, 4,234,254, Cl. 356-244.000.
Klemm, Richard, 4,234,880, Cl. 343-5.0FT.
Maringer, Albert, 4,234,846, Cl. 324-117.00H.
Naser, Georg, 4,233,979, Cl. 128-303.00R.
Pfeifer, Rolf, 4,234,928, Cl. 364-571.000.

Sigmund, Jerry A., to SPS Technologies, Inc. Grooved fastener. 4,233,879, Cl. 85-7.000.

Simmons, Walter J., to University of Delaware. Ocean thermal engine. 4,233,813, Cl. 60-496.000.

Simons, Craig W., to Amerace Corporation. Adaptor for paper-insulated, lead-jacketed electrical cables. 4,234,755, Cl. 174-19.000.

Simons, Craig W., to Amerace Corporation. Electrical cable accessories configured for lubricated installation. 4,234,757, Cl. 174-73.00R.

Simpson, Jeremy F.: *See*—
Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., 4,234,416, Cl. 209-247.000.

Singer Company, The: *See*—
Beck, James C.; and Nielsen, Harrie W., 4,234,891, Cl. 358-104.000.
Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., 4,233,755, Cl. 35-11.00R.
Peters, David L., 4,234,893, Cl. 358-180.000.

Singh, Amar J., to NCR Corporation. Optical coupler module in a distributed processing system. 4,234,968, Cl. 455-607.000.

Singh, Amar J., to NCR Corporation. Bidirectional optical coupler for a data processing system. 4,234,969, Cl. 455-607.000.

Sinsley, John D. Rest rooms. 4,233,692, Cl. 4-662.000.

Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, to Bayer Aktiengesellschaft. Combating arthropods with N-benzoyl-N'-tert.-alkoxycarbonylphenyl-(thio) ureas. 4,234,600, Cl. 424-310.000.

Sitek, George J.: *See*—
Bredeweg, Roger L.; and Sitek, George J., 4,234,541, Cl. 422-78.000.

Sitton, Robert L.: *See*—
Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.

Skees, Hugh B., to Standard Register Company, The. Carbonless record system. 4,234,213, Cl. 282-27.500.

Skega Aktiebolag: *See*—
Hurst, George P.; and Svensson, Assar N., 4,234,291, Cl. 415-174.000.

SKF Kugellagerfabriken GmbH: *See*—
Diem, Rudolf; and Hentrich, Hans-Jurgen, 4,234,848, Cl. 324-262.000.
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.

SKW Trostberg Aktiengesellschaft: *See*—
Michaud, Horst; Rieder, Georg; and Seeholzer, Josef, 4,234,332, Cl. 71-30.000.

Skyline Industries, Inc.: *See*—
Airhart, Tom P., 4,234,190, Cl. 273-420.000.

Slobodchikov, Vladimir B.: *See*—
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F., 4,234,525, Cl. 261-89.000.

Slocum, Keith: *See*—
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.

Small, James E., to Emhart Industries, Inc. Control system utilizing momentary switching devices. 4,234,801, Cl. 307-38.000.

Small, Stuart R., to Colonial Spring Company, The. Device for hanging a picture frame. 4,233,764, Cl. 40-152.100.

Smernoff, Ronald B.: *See*—
Lucas, Flordeliza F.; and Smernoff, Ronald B., 4,234,317, Cl. 23-230.00B.

Smith, Clay D.; and Keller, Douglas V., Jr., to Standard Oil Company. Methods of and apparatus for mining and processing tar sands and the like. 4,234,232, Cl. 299-5.000.

Smith, David W.; and Paar, Mark W., to Townsend Engineering Company. Link cutter. 4,233,709, Cl. 17-1.00F.

Smith, James C.: *See*—
Martin, Gary G.; and Smith, James C., 4,234,198, Cl. 277-145.000.

Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; and Ife, Robert J., 4,234,588, Cl. 424-251.000.

Smith, Robert W.: *See*—
Gowetski, Michael; and Smith, Robert W., 4,234,633, Cl. 428-36.000.

Smith, William E.: *See*—
Hallgren, John E.; and Smith, William E., 4,234,504, Cl. 260-463.000.

Smith, Willis M.: *See*—
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.

Snyder, Clinton D.: *See*—
Rapoport, Henry; and Snyder, Clinton D., 4,234,746, Cl. 568-633.000.

Snyder, Richard C.; and Bodinger, Donald C., to Pullman Incorporated. Field repair roof panel for a railway car. 4,233,795, Cl. 52-514.000.

Sobajima, Shigenobu: *See*—
Yatabe, Toshiaki; Sobajima, Shigenobu; and Sugiyama, Ikuto, 4,234,654, Cl. 428-333.000.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Busacca, Guido; Luparello, Pietro; Marranca, Lucio; and Sanfilippo, Michele, 4,234,855, Cl. 331-90.000.

Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Paoletti, Ugo; and Volterra, Alessandro, 4,234,312, Cl. 8-151.200.

Societe Anonyme Automobiles Citroen: *See*—
Thiesce, Pierre, 4,234,205, Cl. 280-723.000.

Societe Anonyme Expandet: *See*—
Caille, Gilles, 4,233,799, Cl. 53-154.000.

Societe Anonyme Francaise du Ferodo: *See*—
Billet, Rene, 4,234,067, Cl. 192-98.000.
Le Brise, Raymond, 4,234,068, Cl. 192-106.200.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, 4,234,537, Cl. 422-26.000.

Societe d'Investissement pour le Developpement des Appareils Menagers: *See*—
Neny, Michel, 4,233,962, Cl. 126-450.000.

Societe Industrielle de Liaisons Electriques-Silec: *See*—
Jocteur, Robert, 4,234,531, Cl. 264-174.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Favie, Claude, 4,234,692, Cl. 521-33.000.

Societe pour l'Equipement de Vehicules: *See*—
Poirier d'Ange d'Orsay, Emmanuel J., 4,233,949, Cl. 123-634.000.

Soda, Kenji: *See*—
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.

Soderberg, Mark S.: *See*—
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,234,277, Cl. 408-226.000.

Soderqvist, Gunnar M. T.; and Aberg, Ulf L., to Rockwool Aktiebolaget. Method for the production of mineral fibers with unitary fiber length characteristics. 4,234,329, Cl. 65-2.000.

Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Co., Ltd. Liquid feeder for automatic culture apparatus. 4,234,023, Cl. 141-99.000.

Sokol, Phillip E., to Gillette Company, The. Reacting protein with organic acid. 4,234,475, Cl. 260-112.00R.

Solvay & Cie.: *See*—
Cuypers, Herve; and Baekelmans, Paul, 4,234,716, Cl. 528-483.000.

Somerville Belkin Industries Limited: *See*—
Atkinson, William G., 4,234,635, Cl. 428-80.000.

Sommer, Rudiger; and Wischer, Hermann, to Dr. Ing. Rudolf Hell GmbH. Converting a video signal into a two-level signal. 4,234,895, Cl. 358-282.000.

Soneoka, Ryusuke: *See*—
Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, 4,234,921, Cl. 364-424.000.

Sony Corporation: *See*—
Hongu, Masayuki; Kawakami, Hiromi; and Tokuhara, Masaharu, 4,234,963, Cl. 455-204.000.

Sorensen, Irvin. Chuck for miniature rotary tool. 4,234,201, Cl. 279-77.000.

Sorma S.n.c. di Pieri-Lotti & C.: *See*—
Lotti, Nevio, 4,234,279, Cl. 414-33.000.

Southwire Company: *See*—
Chia, Enrique C.; and Schoerner, Roger J., 4,234,359, Cl. 148-2.000.

Spann, Donald C. Ventilated body positioner. 4,233,700, Cl. 5-431.000.

Spanset Inter AG: *See*—
Cederblad, Claes A., 4,234,166, Cl. 24-68.0CD.

Spar Aerospace Limited: *See*—
Mee, Francis H. A.; and Taylor, Henry J., 4,234,150, Cl. 248-281.100.

Spashett, Michael C.: *See*—
Forrest, Stanley G.; and Spashett, Michael C., 4,234,186, Cl. 273-243.000.

Spencer, Barry A.: *See*—
Robbins, Richard J.; and Spencer, Barry A., 4,234,235, Cl. 299-56.000.

Sperry Corporation: *See*—
Jung, Check K.; and Whalen, Harold E., 4,234,856, Cl. 331-94.50P.
Vansteelant, Marc G., 4,234,219, Cl. 289-2.000.

Sperry Rand Corporation: *See*—
Thorsrud, Lee T., 4,234,934, Cl. 364-900.000.

Spielhoff, Horst, to Hermann Berstorff Maschinenbau GmbH. Apparatus for removing a cylinder from a screw extruder. 4,234,298, Cl. 425-186.000.

Spiesberger, August: *See*—
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.

Spilsbury, Ashton J.: *See*—
Spilsbury, Ronald W.; and Spilsbury, Ashton J., 4,234,960, Cl. 455-123.000.

Spilsbury, Ashton James: *See*—
Spilsbury, Ronald W.; and Spilsbury, Ashton J., 4,234,960, Cl. 455-123.000.

Spilsbury, Ronald W.; and Spilsbury, Ashton J., to Spilsbury, Ashton James. Antenna automatic tuning apparatus. 4,234,960, Cl. 455-123.000.

Spitler, Keith G.: *See*—
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., 4,234,745, Cl. 568-614.000.

Spodig, Heinrich. Magnetic roller conveyor. 4,234,076, Cl. 198-690.000.

Spohr, Albert R.: *See*—
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., 4,233,733, Cl. 30-43.920.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Cyclohexene methanol derivatives in perfume. 4,234,463, Cl. 252-522.00R.

SPS Technologies, Inc.: *See*—
Sigmund, Jerry A., 4,233,879, Cl. 85-7.000.

Spurgeon, Peter J. C., to AMF Incorporated. Apparatus for measuring and dispensing constant weight portions of material. 4,234,102, Cl. 222-55.000.

Stadler, Peter: *See*—
Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, 4,234,572, Cl. 424-180.000.

Stamires, Dennis: *See*—
Alafandi, Hamid; and Stamires, Dennis, 4,234,457, Cl. 252-438.000.

Standard Lubricants, Inc.: *See*—
Honig, Milton L., 4,234,497, Cl. 260-410.600.

Standard Oil Company: *See*—
Schieman, Richard D.; and Steffens, John H., 4,234,409, Cl. 208-28.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,234,232, Cl. 299-5.000.
Wu, Hsin C., 4,234,510, Cl. 260-465.300.

Standard Oil Company (Indiana): *See*—
Kirkpatrick, John W.; and Mower, Lawrence N., 4,234,042, Cl. 166-261.000.
Schroeder, Hobe; and Palmer, David A., 4,234,494, Cl. 260-346.700.

Standard Oil Company (Ohio): *See*—
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,234,461, Cl. 252-462.000.

Standard Register Company, The: *See*—
Skees, Hugh B., 4,234,213, Cl. 282-27.500.

Stanford University: *See*—
Swanson, Richard M., 4,234,352, Cl. 136-253.000.

Stanley Electric Co., Ltd.: *See*—
Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, 4,234,817, Cl. 313-493.000.

Stanley, Grahame L., to Courtaulds Limited. Stabilization of sulphur. 4,234,552, Cl. 423-268.000.

Stanley, Priscilla B.; and Ritscher, James S., to Union Carbide Corporation. Novel combustion process for an organic substrate. 4,234,549, Cl. 423-245.000.

Stanley Works, The: *See*—
Bies, Sylvester W., 4,233,734, Cl. 30-162.000.

Stark, Gerd, to Dyna Plastik-Werke GmbH. Roller blind box. 4,234,032, Cl. 160-261.000.

Stark, Hanoch, to Stark, Hanoch. Device particularly useful for cutting or grinding round girdles of gems. 4,233,783, Cl. 51-73.00R.

Stark, Wolfgang, to VDO Adolf Schindling AG. Monitoring device for the proper operation of lamps particularly in motor vehicles. 4,234,878, Cl. 340-642.000.

Starkey, George W.: *See*—
Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.

Staroselsky, Alexandr A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Statia de Verificare si Intretinere a Aparaturii Medicale: *See*—
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Stauers, Juris, to Motorola, Inc. Dynamic digital time interval discriminator and method. 4,234,881, Cl. 343-8.000.

Stauffer Chemical Company: *See*—
Benkwitt, Frances C.; and Sherif, Fawzy G., 4,234,568, Cl. 424-54.000.
DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., 4,234,593, Cl. 424-272.000.
Photis, James M., 4,234,505, Cl. 260-465.00D.
Photis, James M., 4,234,506, Cl. 260-465.00D.
Photis, James M., 4,234,507, Cl. 260-465.00D.
Photis, James M., 4,234,508, Cl. 260-465.00D.
Photis, James M., 4,234,737, Cl. 549-70.000.
Photis, James M.; Eiseman, Fred S.; and Gister, Sidney M., 4,234,739, Cl. 560-51.000.

Steag Kernenergie GmbH: *See*—
Baatz, Henning; and Rittscher, Dieter, 4,234,798, Cl. 250-506.000.

Steel, William G.: *See*—
Clyne, John C.; Steel, William G.; and Nicholls, Ronald T., 4,233,703, Cl. 15-53.00B.

Steffens, John H.: *See*—
Schieman, Richard D.; and Steffens, John H., 4,234,409, Cl. 208-28.000.

Steiner, Russell I., to Crompton & Knowles Corporation. Yellow pyrazolone ester dyes for heat transfer printing. 4,234,481, Cl. 260-163.000.

Stelzer, Robert A.: *See*—
Fischer, Thomas R.; and Stelzer, Robert A., 4,233,804, Cl. 56-104.000.

Stemer, Jacques: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,234,721, Cl. 544-30.000.

Stendel, Wilhelm: *See*—
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Stephens, Donald J. Game device. 4,234,183, Cl. 273-318.000.

Stephens, James B.: *See*—
Miller, Charles G.; and Stephens, James B., 4,234,098, Cl. 220-86.00R.

Sterling Drug Inc.: *See*—
Diana, Guy D.; and Carabateas, Philip M., 4,234,725, Cl. 544-140.000.
Wilhelmi, Allan R.; and Troy, Daniel C., 4,234,426, Cl. 210-149.000.

Stern, Sidney S.: *See*—
Yeoman, Neil; and Stern, Sidney S., 4,234,519, Cl. 568-492.000.

Steube, Kenneth E., to McDonnell Douglas Corporation. Vapor deposition coating machine. 4,233,937, Cl. 118-727.000.

Stewart-Warner Corporation: *See*—
Boesen, Raymond J., 4,234,914, Cl. 362-240.000.

Stiebel, Ariel, to Uniroyal, Inc. Load control for tire test machine. 4,233,838, Cl. 73-146.000.

Stiot, Jean-Pierre H.: *See*—
Brouard, Claude M. H. E.; and Stiot, Jean-Pierre H., 4,234,482, Cl. 260-187.000.

Stirling, Harold T. Continuous coke making. 4,234,386, Cl. 201-6.000.

Stocklow, Peter. Height-adjustable wash-basin. 4,233,693, Cl. 4-644.000.

Stoddard, Frank J., to Calspan Corporation. Centrifugal gasdynamic window. 4,234,857, Cl. 331-94.50G.

Stohler, Harro: *See*—
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,234,736, Cl. 548-314.000.

Stokes, Vijay K., to General Electric Company. Unsymmetrical basket for an orbital clothes washer. 4,233,827, Cl. 68-172.000.

Stoll, Kurt. Piston-cylinder unit. 4,233,887, Cl. 92-169.000.

Stottmann, Richard L., to General Electric Company. Automatic icemaker with simplified ice piece ejection. 4,233,819, Cl. 62-349.000.

Strebkov, Dmitry S.: *See*—
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,234,354, Cl. 136-246.000.

Strickland, William A., Jr., to Westinghouse Electric Corp. Protective relay apparatus. 4,234,901, Cl. 361-64.000.

Strobl, Frederick P., Jr.; Winchell, David A.; and DeVroom, William A., to Baxter Travenol Laboratories, Inc. Diagnostic reagent dispensing bottle. 4,234,103, Cl. 222-83.500.

Strope, Daniel J., to Phillips Petroleum Company. Diolefin dimerization catalyst and method for producing nitrosyl halides of iron triad metals. 4,234,434, Cl. 252-429.00R.

Stuhler, Herbert: *See*—
Billenstein, Siegfried; Kukla, Bruno; and Stuhler, Herbert, 4,234,509, Cl. 260-465.200.

Suchy, Milos: *See*—
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.

Sugi, Norio: *See*—
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, 4,234,469, Cl. 260-42.460.

Sugisawa, Ko: *See*—
Sakakibara, Sakuichi; Sugisawa, Ko; Majima, Junji; and Nakanaga, Ryusuke, 4,234,612, Cl. 426-394.000.
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, 4,234,617, Cl. 426-557.000.

Sugiura, Isao: *See*—
Yamazoe, Hiroshi; and Sugiura, Isao, 4,234,638, Cl. 428-133.000.

Sugiyama, Ikuto: *See*—
Yatabe, Toshiaki; Sobajima, Shigenobu; and Sugiyama, Ikuto, 4,234,654, Cl. 428-333.000.

Suitlas, John R., to National Steel Corporation. Movable charging emissions control hood for BOF. 4,234,170, Cl. 266-158.000.

Sukhov, Stanislav A.: *See*—
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F., 4,234,525, Cl. 261-89.000.

Sulzer Brothers Limited: *See*—
Mandrin, Charles, 4,234,553, Cl. 423-359.000.

Sumita, Tadayuki: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,234,534, Cl. 264-328.800.

Sumitomo Electric Industries, Ltd.: *See*—
Okita, Koichi, 4,234,535, Cl. 264-519.000.
Yamamoto, Masachika, 4,234,058, Cl. 188-1.00A.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See*—
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.

Summers, Don D. Method and apparatus for self-cleaning drilling mud separation system. 4,234,413, Cl. 209-17.000.

Sun, Jui-Yuan: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.

Sunbeam Corporation: *See*—
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., 4,233,733, Cl. 30-43.920.

Superior Oil Company, The: *See*—
Weichman, Bernard E., 4,234,230, Cl. 299-2.000.

Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., to Standard Oil Company (Ohio). Oxidation catalysts. 4,234,461, Cl. 252-462.000.

Sutton, Eric M.: *See*—
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.

Suzor, Norland L. C., to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd. Apparatus for the purification of evaporated sugar solutions. 4,234,349, Cl. 127-12.000.

Suzor, Norland L. C., to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd. Process for the purification of evaporated sugar solutions. 4,234,350, Cl. 127-48.000.

Suzuki, Chuji: *See*—
Kako, Noritoshi; Yamane, Yasukuni; and Suzuki, Chuji, 4,234,821, Cl. 315-169.300.

Suzuki, Kenichi, to Suzusei Co., Ltd. Artificial eye structure for use in a doll. 4,233,776, Cl. 46-165.000.

Suzuki, Nobuo: *See*—
Koyahata, Hirosi; and Suzuki, Nobuo, 4,234,194, Cl. 274-10.00R.

Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, to Matsushita Electric Industrial Co., Ltd. Commutation failure detection and restoration for SCR frequency converters. 4,234,917, Cl. 363-160.000.

Suzuki, Yukio: *See*—
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.

Suzusei Co., Ltd.: *See*—
Suzuki, Kenichi, 4,233,776, Cl. 46-165.000.

Svensson, Assar N.: *See*—
Hurst, George P.; and Svensson, Assar N., 4,234,291, Cl. 415-174.000.

Svoboda, Josef: *See*—
Hofbauer, Rupert; Leichtfried, Friedrich; and Svoboda, Josef, 4,234,206, Cl. 280-605.000.

Swanbeck, Gunnar P. E., to Medisan AB. Skin-treating composition and vehicle for skin-treating agents. 4,234,603, Cl. 424-365.000.

Swanson, Harold N.; and Pashalis, Cryssis, to FMC Corporation. Pipe swivel joint for submerged service. 4,234,216, Cl. 285-93.000.

Swanson, Richard M., to Electric Power Research Institute, Inc.; and Stanford University. Thermophotovoltaic converter and cell for use therein. 4,234,352, Cl. 136-253.000.

Sweeney, Michael T.: *See*—
Moore, William T.; and Sweeney, Michael T., 4,234,240, Cl. 350-6.100.

Swift & Company: *See*—
Murphy, Robert E.; and Bernholdt, Harry F., 4,234,647, Cl. 428-220.000.

Swiss Aluminium Ltd.: *See*—
Tschamper, Otto, 4,234,559, Cl. 423-629.000.

Syntex (U.S.A.) Inc.: *See*—
Cooper, Gary F.; and Van Horn, Albert R., 4,234,491, Cl. 260-340.9AS.
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,234,571, Cl. 424-177.000.

Szala, Lawrence E.: *See*—
Lee, Minyoung; Szala, Lawrence E.; and DeVries, Robert C., 4,234,661, Cl. 428-446.000.

Szayer, Geza J.: *See*—
Finch, Harry E.; and Szayer, Geza J., 4,234,220, Cl. 292-148.000.

Szucs, Tamas: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Tada, Sugihiko; Yanagihara, Kazuhiko; and Arakawa, Jun, to Fuji Photo Film Co., Ltd. Oil soluble photographic coupler reclamation process. 4,234,392, Cl. 203-91.000.

Tada, Tetsuya; and Amari, Masaharu, to Canyon Corporation. Manually operated sprayer. 4,234,127, Cl. 239-333.000.
Taguchi, Hideo: *See—*
Wakasa, Isao; Yamazaki, Shuichi; and Taguchi, Hideo, 4,234,342, Cl. 106-50.000.
Taisei Corporation: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,234,534, Cl. 264-328.800.
Takagi, Yasuo: *See—*
Yoneda, Kenji; and Takagi, Yasuo, 4,233,836, Cl. 73-35.000.
Takahashi, George K. Appliance for use in acupressure therapy. 4,233,966, Cl. 128-67.000.
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, to Chugai Seiyaku Kabushiki Kaisha. Trialkyl isocyanates used as pesticides. 4,234,582, Cl. 424-249.000.
Takahashi, Isamu: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
Takahashi, Kotaro, to Citizen Watch Co., Ltd. Electronic wristwatches. 4,234,946, Cl. 368-76.000.
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, to Nippon Paint Co., Ltd. Process for preparation of solid pigment resin dispersion. 4,234,466, Cl. 260-17.00A.
Takahashi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic shock absorber and spring combination. 4,234,172, Cl. 267-8.00R.
Takahashi, Tadashi; and Morinaga, Shigeki, to Hitachi, Ltd. Sewing machine protection apparatus. 4,233,919, Cl. 112-277.000.
Takahashi, Toshiyuki: *See—*
Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, 4,233,875, Cl. 84-1.240.
Takano, Tatsuo: *See—*
Iwasaki, Susumu; Nagasawa, Osamu; Takano, Tatsuo; and Matsumoto, Seiji, 4,234,378, Cl. 162-138.000.
Takara Co., Ltd.: *See—*
Inoue, Tsutomu, 4,233,777, Cl. 46-238.000.
Otake, Michiko, 4,234,079, Cl. 206-45.340.
Takase, Hiroshi, to Olympus Optical Co., Ltd. Reducing lens system. 4,234,243, Cl. 350-226.000.
Take, Hisao, to Kabushiki Kaisha Kyoritsu Seisakujo. Ignition circuit for internal combustion engines. 4,233,951, Cl. 123-625.000.
Takehiro, Etsusou: *See—*
Toyota, Hiroshi; Kawamoto, Tamio; and Takehiro, Etsusou, 4,234,066, Cl. 192-0.092.
Takematsu, Hikaru: *See—*
Sekiguchi, Kouichi; Takematsu, Hikaru; and Katsukura, Kazutada, 4,234,765, Cl. 179-99.00M.
Takeno, Hidekazu: *See—*
Hashimoto, Masashi; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,234,724, Cl. 544-90.000.
Takeshima, Masaki: *See—*
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.
Taketa, Mitsugu: *See—*
Miyazaki, Yukio; and Taketa, Mitsugu, 4,234,900, Cl. 361-45.000.
Takeuchi, Shigeo. Method of making bread in an oven using a combined trough and baking-pan unit. 4,234,605, Cl. 426-18.000.
Tamura, Tooru: *See—*
Ikushima, Hiroshi; Noguchi, Toyota; Danno, Tsuneo; and Tamura, Tooru, 4,234,859, Cl. 333-151.000.
Tanaka, Kunimaro: *See—*
Onishi, Ken; and Tanaka, Kunimaro, 4,234,896, Cl. 360-32.000.
Tanaka, Tohachiro: *See—*
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.
Tanigawa, Hisahiro: *See—*
Shimizu, Shigehisa; Fukuhara, Sanshiro; Shinmura, Noboru; and Tanigawa, Hisahiro, 4,234,365, Cl. 156-64.000.
Tannenbaum, Joseph, to Agar Ginosar Electronics and Metal Products. Apparatus and method for controlling pain by transcutaneous electrical stimulation (TES). 4,233,986, Cl. 128-421.000.
Tarpley, William B., Jr., to Energy and Minerals Research Co. Powder dissemination composition. 4,234,432, Cl. 252-8.000.
Tarro, Richard E. Container with attached pull tab opening. 4,234,099, Cl. 220-269.000.
Tate & Lyle Limited: *See—*
Righelato, Renton C.; and Jarman, Trevor R., 4,234,688, Cl. 435-101.000.
Taupin, Pierre; Glineur, Michel; and Florean, Jean, to BFG Glassgroup. Process of making cellulated glass beads. 4,234,330, Cl. 65-21.000.
Tausch, Walter: *See—*
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.
Tawara, Ikuo: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.
Taylor, Edward L., III. Combination pack frame, cot, and tent. 4,234,005, Cl. 135-1.00R.
Taylor, Henry J.: *See—*
Mee, Francis H. A.; and Taylor, Henry J., 4,234,150, Cl. 248-281.100.
Taylor, Judson D., Jr.: *See—*
Barnard, Ralph G.; and Taylor, Judson D., Jr., 4,233,701, Cl. 5-482.000.
Taylor, Wilson G. Method and apparatus for measuring the imbalance of a bowling ball. 4,233,846, Cl. 73-460.000.
TDK Electronics Company Limited: *See—*
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,234,438, Cl. 252-62.540.
Technical Developments, Inc.: *See—*
Wolfberg, Larry B.; and Harper, John, 4,234,775, Cl. 219-10.55A.
Tecumseh Products Company: *See—*
Krolski, Kenneth L.; and MacLeod, John N., 4,233,950, Cl. 123-630.000.
Teijin Limited: *See—*
Yatabe, Toshiaki; Sobajima, Shigenobu; and Sugiyama, Ikuto, 4,234,654, Cl. 428-333.000.
Teisanu, Eugen: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.
Teldec Telefunken-Decca Schallplatten GmbH: *See—*
Borchard, Heinz, 4,234,394, Cl. 204-5.000.
Temple, Davis L., Jr., to Mead Johnson & Company. Thieno[2,3-d]oxazines. 4,234,581, Cl. 424-248.510.
Teramoto, Isao: *See—*
Harasaki, Hayatsugu; and Teramoto, Isao, 4,234,225, Cl. 296-185.000.
Teramoto, Kazuo; Watanabe, Minoru; and Matumura, Tetuo, to Citizen Watch Co., Ltd. Month correcting mechanism for calendar timepieces. 4,234,943, Cl. 368-35.000.
Terashima, Akio: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, to Stanley Electric Co., Ltd. Flat type fluorescent lamp. 4,234,817, Cl. 313-493.000.
Texaco Canada Inc.: *See—*
Goss, Michael J.; and Redford, David A., 4,233,840, Cl. 73-153.000.
Texaco Development Corp.: *See—*
McConnell, Thomas T.; and Cour, Thomas H., 4,234,730, Cl. 544-358.000.
Texaco Inc.: *See—*
Mott, George E., 4,234,047, Cl. 175-5.000.
Texas Instruments Incorporated: *See—*
Raymond, Joseph H., Jr.; and Lien, Jih-Chang, 4,234,889, Cl. 357-71.000.
Wiggins, Richard H., Jr.; and Brantingham, George L., 4,234,761, Cl. 179-1.0SM.
Textron Inc.: *See—*
Earing, Mason H.; Gielinski, Leonard H.; Martin, Paul F.; and Petschke, Glenn H., 4,234,714, Cl. 528-67.000.
Th. Kieserling & Albrecht: *See—*
Hartkopf, Heinz, 4,234,288, Cl. 414-745.000.
Thackaberry, Harold L.: *See—*
Feldstein, Michael; and Thackaberry, Harold L., 4,234,899, Cl. 360-73.000.
Thagard Technology Company: *See—*
Matovich, Edwin, 4,234,543, Cl. 422-109.000.
Theiler, Robert. Ironing machine. 4,233,762, Cl. 38-8.000.
Thermatool Corp.: *See—*
Rudd, Wallace C.; and Udall, Humfrey N., 4,234,776, Cl. 219-76.170.
Thiel, Alfons W.; and Geppert, Barbara. Method for the manufacture of thin-walled shaped articles of crystalline thermoplastic material. 4,234,530, Cl. 264-151.000.
Thiel, Alfons W.; and Geppert, Barbara. Method for the manufacture of thin-walled shaped articles of crystalline thermoplastic material. 4,234,536, Cl. 264-522.000.
Thiesce, Pierre, to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Suspension for independent vehicle wheels. 4,234,205, Cl. 280-723.000.
Thiokol Corporation: *See—*
Graham, William H.; and Shepard, Inella G., 4,234,738, Cl. 560-32.000.
Thomas, Louis N. Automatic curling iron. 4,233,999, Cl. 132-34.00R.
Thomas, Roland M., to Lucas Industries Limited. Tool for, and a method of, effecting a rotary turning operation. 4,233,866, Cl. 82-1.00C.
Thompson, David R.; and Tomlinson, John P., to Reed International Limited. Foam plastics sheet materials. 4,234,641, Cl. 428-159.000.
Thompson, Gregory J., to UOP Inc. Fluid catalytic cracking process. 4,234,411, Cl. 208-74.000.
Thompson, John H.; Gannon, George F., Jr.; and Geil, Fred G., to Electric Power Research Institute, Inc. Method and means for measuring temperature using acoustical resonators. 4,233,843, Cl. 73-339.00A.
Thompson, Lester L.: *See—*
Kuhl, LeRoy L.; and Thompson, Lester L., 4,233,791, Cl. 52-309.100.
Thompson, Lionel R. F., to Hawker Siddeley Dynamics Engr., Inc. Method and apparatus for measurement of the contents of a bunker or silo. 4,234,882, Cl. 343-14.000.
Thompson, Louis I.: *See—*
Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., 4,233,907, Cl. 104-172.00B.

Thompson, Richard L.: *See—*
Murray, Omer E.; and Thompson, Richard L., 4,234,165, Cl. 248-404.000.
Thomsen, Eigild S.: *See—*
Gauld, W. Thomas; and Thomsen, Eigild S., 4,234,417, Cl. 209-306.000.
Thomson-CSF: *See—*
Butin, Henri, 4,234,867, Cl. 340-146.3AG.
Grall, Georges, 4,234,939, Cl. 367-87.000.
Thon, Stephen F.: *See—*
Grotefend, Alan C.; and Thon, Stephen F., 4,234,643, Cl. 428-200.000.
Thore, Bernard. Supercharged internal combustion engines. 4,233,814, Cl. 60-601.000.
Thorn Domestic Appliances (Electrical) Limited: *See—*
Totterdell, Anthony C., 4,234,784, Cl. 219-506.000.
Thornley, John S.: *See—*
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.
Thorsrud, Agmund K.; and Siedenstrang, Roy W., to Phillips Petroleum Company. Thermoplastic elastomeric composition, product and method of manufacture. 4,234,636, Cl. 428-95.000.
Thorsrud, Lee T., to Sperry Rand Corporation. Apparatus for scaling memory addresses. 4,234,934, Cl. 364-900.000.
Tibbals, Kerry W. Skateboard. 4,234,204, Cl. 280-87.04A.
Tichelaar, Gerrit W.: *See—*
Willems, Gerardus A. M.; and Tichelaar, Gerrit W., 4,234,778, Cl. 219-121.00P.
Tidland, John W.: *See—*
Hauff, Wolfgang; and Tidland, John W., 4,233,972, Cl. 128-205.120.
Timmons, William K.: *See—*
Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., 4,233,933, Cl. 118-314.000.
Tingskog, Karl A. L., to AB Siwertell. Apparatus for sealing a connection between two mutually shiftable components. 4,234,075, Cl. 199-594.000.
Tinsley, John M.; and Watters, Larry T., to Halliburton Company. Lightweight cement and method of cementing therewith. 4,234,344, Cl. 106-88.000.
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., to Scientific Applications Incorporated. Automatic liquid flow control device. 4,234,007, Cl. 137-101.190.
Titus, Paul E., to Shell Oil Company. Method for improving the removal of oil from surfaces. 4,234,629, Cl. 427-388.200.
Tkachenko, Vladimir P.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.
TMC Corporation: *See—*
Hofbauer, Rupert; Leichtfried, Friedrich; and Svoboda, Josef, 4,234,206, Cl. 280-605.000.
Toda, Minoru; and Osaka, Susumu, to RCA Corporation. Light control device using a bimorph element. 4,234,245, Cl. 350-269.000.
Tofe, Andrew J.; and Francis, Marion D., to Procter & Gamble Company, The. Radiographic scanning. 4,234,562, Cl. 424-1.000.
Tokico Ltd.: *See—*
Horino, Kunio, 4,234,016, Cl. 138-30.000.
Tokuhara, Masaharu: *See—*
Hongu, Masayuki; Kawakami, Hiromi; and Tokuhara, Masaharu, 4,234,963, Cl. 455-204.000.
Tokumaru, Hisashi; and Yasukuni, Mitsuo, to Minolta Camera Kabushiki Kaisha. Reflecting optical system for projection television. 4,234,894, Cl. 358-250.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Aoshima, Terutaka, 4,234,783, Cl. 219-441.000.
Higuchi, Kosuke, 4,234,770, Cl. 200-144.00B.
Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, 4,234,921, Cl. 364-424.000.
Kitano, Yuichi; and Hirayama, Kaiichirou, 4,234,925, Cl. 364-494.000.
Ohkawa, Mikio; and Kawashima, Nobuo, 4,234,771, Cl. 200-144.00B.
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.
Yamaguchi, Hiroyasu, 4,234,853, Cl. 330-280.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Gomi, Hiroshi, 4,234,858, Cl. 331-177.00R.
Iinuma, Kazuhiro, 4,234,940, Cl. 367-105.000.
Ozaki, Satoru; Ochi, Yoshiharu; and Matsumura, Kazuo, 4,234,385, Cl. 176-68.000.
Tokyo Shobundo & Co., Ltd.: *See—*
Fujimori, Sadao, 4,234,646, Cl. 428-215.000.
Tomioka, Chikanori: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
Tomlinson, John P.: *See—*
Thompson, David R.; and Tomlinson, John P., 4,234,641, Cl. 428-159.000.
Tompkins, Russell E.: *See—*
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Toray Industries, Inc.: *See—*
Iguchi, Heishaburo; and Ohigashi, Hiroji, 4,234,813, Cl. 310-366.000.
Motegi, Masahiko; Kimata, Ikukazu; and Fujita, Saburo, 4,234,532, Cl. 264-235.800.
Okamoto, Miyoshi; Yoshida, Syusuke; and Inada, Shigeru, 4,234,022, Cl. 139-420.00R.
Yamamoto, Ryuichi, 4,234,398, Cl. 204-130.000.
Toray Silicone Company, Ltd: *See—*
Nakamura, Akito, 4,234,702, Cl. 525-100.000.
Toro Company, The: *See—*
Tsuchiya, William S., 4,233,735, Cl. 30-276.000.
Torrey, Charles T., to United Technologies Corporation. Nondestructive metallographic examination of gas turbine components. 4,234,397, Cl. 204-129.350.
Torroja, Jaime M.; Rivacoba, Jose U.; and Herrero, Ricardo M., to Sener Ingenieria y Sistemas, S.A. Transport vessels having liquid gas storage tanks. 4,233,921, Cl. 114-74.00R.
Toth, Steven J., to Miles Laboratories, Inc. Refrigeration apparatus. 4,233,817, Cl. 62-175.000.
Totterdell, Anthony C., to Thorn Domestic Appliances (Electrical) Limited. Cooking appliance controls. 4,234,784, Cl. 219-506.000.
Toussaint, Herbert; Schroeder, Wolfgang; and Franzischka, Wolfgang, to BASF Aktiengesellschaft. Preparation of amines. 4,234,727, Cl. 544-178.000.
Townsend Engineering Company: *See—*
Smith, David W.; and Paar, Mark W., 4,233,709, Cl. 17-1.00F.
Toyo Kogyo Co., Ltd.: *See—*
Chihara, Takeshi; and Kono, Masanori, 4,234,153, Cl. 248-475.00B.
Harasaki, Hayatsugu; and Teramoto, Isao, 4,234,225, Cl. 296-185.000.
Toyo Soda Manufacturing Company, Limited: *See—*
Sakanaka, Yasuhiro; and Narui, Mamoru, 4,234,704, Cl. 525-215.000.
Toyota, Hiroshi; Kawamoto, Tamio; and Takehiro, Etsusou. Dual stage fluid clutch motor with electric controls including time delay. 4,234,066, Cl. 192-0.092.
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., to GTE Automatic Electric Laboratories Incorporated. Method and apparatus for generating timing phase error signals in PSK demodulators. 4,234,957, Cl. 375-86.000.
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Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., to American Cyanamid Company. Antibacterial antibiotic BM782. 4,234,717, Cl. 536-17.00R.
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Trott, Clarence R.; and Willer, David A., to Deere & Company. Hydraulic cylinder assembly for two-stage discharge on manure spreader. 4,234,130, Cl. 239-679.000.
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Wilhelmi, Allan R.; and Troy, Daniel C., 4,234,426, Cl. 210-149.000.
TRW Inc.: *See—*
Rechin, Francis J.; and Vargo, Edward J., 4,234,336, Cl. 75-65.00R.
Scheppele, James E., 4,234,357, Cl. 148-1.500.
Tschamper, Otto, to Swiss Aluminium Ltd. Process for the manufacture of coarse aluminum hydroxide. 4,234,559, Cl. 423-629.000.
Tsuchiya, William S., to Toro Company, The. Flexible line cutting apparatus. 4,233,735, Cl. 30-276.000.
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Przybylinski, Thomas L.; and Tylisz, Eugene R., 4,234,221, Cl. 292-256.500.
Tyson, Raymond K. Pill dispenser with safety features. 4,234,093, Cl. 206-536.000.
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Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; Masunaga, Katsuro; and Kadota, Takumi, 4,234,740, Cl. 560-81.000.
Uchida, Isamu; and Watanabe, Kenkichi, to Laurel Bank Machine Co., Ltd. Adjusting means for money handling machines. 4,234,002, Cl. 133-1.00A.
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Rudd, Wallace C.; and Udall, Humfrey N., 4,234,776, Cl. 219-76.170.

Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic brush apparatus for electrostatic printing system. 4,233,935, Cl. 118-657.000.

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Ui, Michio: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

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Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., 4,234,656, Cl. 428-379.000.
D'Silva, Themistocles D. J., 4,234,580, Cl. 424-246.000.
Olabisi, Olagoke, 4,234,642, Cl. 428-188.000.
Stanley, Priscilla B.; and Ritscher, James S., 4,234,549, Cl. 423-245.000.

Union Oil Company of California: *See*—
Erich, Otis G., Jr., 4,234,053, Cl. 181-121.000.

Uniroyal, Inc.: *See*—
Bruns, James A., 4,233,852, Cl. 474-153.000.
Hagen, Edward L., 4,234,445, Cl. 252-182.000.
Stiebel, Ariel, 4,233,838, Cl. 73-146.000.

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Desalve, Dennis W., 4,233,821, Cl. 64-32.00R.

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Bailey, Alan; and Maggs, Frederick A. P., 4,234,326, Cl. 55-278.000.

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Balinski, Henry A., 4,233,833, Cl. 72-180.000.

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Administrator U.S. Environmental Protection Agency: *See*—
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Charette, Ray O.; and Yates, Elmer J., 4,234,144, Cl. 244-160.000.
Army: *See*—
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.
Hartman, Richard L., 4,234,851, Cl. 328-145.000.
Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.
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Andersson, Clarence A., 4,234,343, Cl. 106-73.200.
Beeson, Justin L., 4,234,319, Cl. 44-1.00R.
Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 208-8.00R.
Duncan, Dennis A., 4,234,408, Cl. 208-8.00R.
Gray, James, Jr., 4,234,949, Cl. 370-41.000.
Moore, Albert S.; and Verhoff, Francis H., 4,234,423, Cl. 210-758.000.
Morgan, Chester S.; and Johnson, William R., 4,234,338, Cl. 75-235.000.
Pulley, Howard; and Seltzer, Steven F., 4,234,555, Cl. 423-484.000.
Wolson, Raymond D.; and McPheeters, Charles C., 4,234,449, Cl. 252-301.10W.
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Lutes, Georg F., Jr. Precise RF timing signal distribution to remote stations. 4,234,971, Cl. 455-619.000.
Margolis, Jack S.; and Shumate, Michael S. Stark cell optoacoustic detection of constituent gases in sample. 4,234,258, Cl. 356-437.000.
Rosser, Robert W.; and Psarras, Theodore. Perfluoroalkyl polytriazines containing pendent iododifluoromethyl groups. 4,234,715, Cl. 528-362.000.
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Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.
Hollan, Mark E.; and Bayles, John J., 4,234,044, Cl. 169-14.000.
Keller, Teddy M.; and Griffith, James R., 4,234,712, Cl. 528-9.000.
Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., 4,234,142, Cl. 244-3.210.

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Dijkmans, Eise C.; Ijff, Barend; and Reuvekamp, Antonius H. J., 4,234,763, Cl. 179-77.000.
Engelen, Willy L. J., 4,234,818, Cl. 315-49.000.
Eshraghian, Kamran; and Bogner, Robert E., 4,234,923, Cl. 364-436.000.
Esser, Leonard J. M.; and Heldens, Ludovicus G. M., 4,234,807, Cl. 307-304.000.
Garskamp, Arnoldus, 4,234,961, Cl. 455-160.000.
Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., 4,234,140, Cl. 242-199.000.
Wehler, Herbert, 4,233,895, Cl. 101-93.050.
Willems, Gerardus A. M.; and Tichelaar, Gerrit W., 4,234,778, Cl. 219-121.00P.
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Pringle, William L., 4,234,120, Cl. 228-173.00C.

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Maher, John F., 4,234,323, Cl. 55-97.000.
Torrey, Charles T., 4,234,397, Cl. 204-129.350.

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Bennion, Douglas N.; and Wang, Su-Chee S., 4,234,667, Cl. 429-81.000.
DeLuca-McElroy, Marlene A., 4,234,681, Cl. 435-8.000.
Kaplan, Donald A.; and Wilcox, Gary L., 4,234,400, Cl. 204-180.00G.
Rapoport, Henry; and Snyder, Clinton D., 4,234,746, Cl. 568-633.000.

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Simmons, Walter J., 4,233,813, Cl. 60-496.000.

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Raemer, Daniel B.; Gehmlich, Dietrich K.; and Westenskow, Dwayne R., 4,233,842, Cl. 73-861.040.
Seader, Junior D., 4,234,391, Cl. 203-26.000.

UOP Inc.: *See*—
Antos, George J., 4,234,458, Cl. 252-441.000.
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Christman, William J., 4,234,544, Cl. 422-256.000.
Homeier, Edwin H.; and Johnson, Russell W., 4,234,455, Cl. 252-430.000.
Jones, Evan A., 4,234,314, Cl. 23-230.00A.
Mikulicz, Michael Z., 4,234,750, Cl. 585-332.000.
Priegnitz, James W., 4,234,520, Cl. 568-937.000.
Thompson, Gregory J., 4,234,411, Cl. 208-74.000.
Urban, Peter, 4,234,547, Cl. 423-242.000.

Uozumi, Yukio; and Yagi, Masaharu, to Kawasaki Jukogyo Kabushiki Kaisha. Means for feeding electric power to track guided vehicles. 4,234,065, Cl. 191-29.00R.

Upjohn Company, The: *See*—
Kelly, Robert C., 4,234,492, Cl. 260-345.200.
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Nelson, Stephen J., 4,234,521, Cl. 260-937.000.
Satoh, Paul S., 4,234,404, Cl. 204-299.00R.

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Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, 4,234,695, Cl. 521-107.000.

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Kemper, Yves J., 4,233,851, Cl. 74-191.000.
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Kappler, Fritz-Robert; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,234,503, Cl. 556-413.000.

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Schelkmann, Wilhelm, 4,234,369, Cl. 156-95.000.

Valyi, Emery I. Apparatus for the preparation of hollow plastic articles. 4,234,302, Cl. 425-526.000.

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Van Berkel, Johannes; and Kelderman, Hendrik C., to Shell Oil Company. Cyclopropane derivatives. 4,234,512, Cl. 568-420.000.

van Breevoort-Uurbanus, Henriette G.: *See*—
Akkerman, Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., 4,234,591, Cl. 424-267.000.

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Vanderslice, Wilbur B., Jr., to International Business Machines Corporation. V-Groove charge-coupled device. 4,234,887, Cl. 357-24.000.

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Van Egmond, Jacobus H.; and Lichtenveldt, to Hoogovens IJmuiden, B. V. System for control of a coking plant. 4,234,390, Cl. 202-262.000.

Van Horn, Albert R.: *See*—
Cooper, Gary F.; and Van Horn, Albert R., 4,234,491, Cl. 260-340.9AS.

Van Ness, Bradford O.; and Weimer, Dan G., to Engineered Systems, Inc. Power failure detection and restart system. 4,234,920, Cl. 364-200.000.

Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., to U.S. Philips Corporation. Magnetic tape cassette drive system. 4,234,140, Cl. 242-199.000.

Van Nieuwal, John G.; Montgomery, Edward L.; and Beeghly, Richard M., to Goodyear Tire & Rubber Company, The. Tire carcass structure. 4,234,030, Cl. 152-354.00R.

Vanoni, Pier L.; Serboli, Giancarlo; and De Marchi, Franco, to Anic, S.p.A. Microfibrous structures. 4,234,652, Cl. 428-296.000.

Van Scott, Eugene J.; and Yu, Ruey J. Treatment of skin keratoses with α-hydroxy acids and related compounds. 4,234,599, Cl. 424-279.000.

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Donnelly, Bernard P.; and Van Slooten, Roland W., 4,234,280, Cl. 414-35.000.

Vansteelant, Marc G., to Sperry Corporation. Knotter with improved billhook and actuation mechanism. 4,234,219, Cl. 289-2.000.

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Seiz, Frederick G.; and Seiz, Carl G., 4,234,069, Cl. 193-35.00A.

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Boehme, Detlef R., 4,234,427, Cl. 210-198.00C.

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Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

VDO Adolf Schindling AG: *See*—
Stark, Wolfgang, 4,234,878, Cl. 340-642.000.

Veb Textima Wirkmaschinenbau Karl Marx Stadt: *See*—
Schneider, Manfred, 4,233,824, Cl. 66-87.000.

Vedder, James L., to Mead Corporation, The. Ink jet printer assembly and alignment of printer components. 4,234,884, Cl. 346-75.000.

Venable, Edward R., to Western Electric Company Inc. Apparatus for forming twisted conductor units. 4,233,807, Cl. 57-58.520.

Venkatesan, Thirumalai N. C.: *See*—
Auston, David H.; Golovchenko, Jene A.; and Venkatesan, Thirumalai N. C., 4,234,356, Cl. 148-1.500.

Verhoff, Francis H.: *See*—
Moore, Albert S.; and Verhoff, Francis H., 4,234,423, Cl. 210-758.000.

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Verschuur, Eke, to Shell Oil Company. Process for the agglomeration of solids. 4,234,320, Cl. 44-23.000.

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Zaehringer, Andre, 4,234,110, Cl. 223-57.000.

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Moncaster, Michael B.; and Rummer, James D., 4,234,199, Cl. 277-237.00R.

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Shibata, Norio, 4,234,195, Cl. 274-39.00R.

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Gjerde, Trygve; Vigander, Kjell; Jenssen, Dag N.; and Hjertas, Bjorn, 4,234,270, Cl. 405-202.000.

Vignale, Grace M. Shower shelf. 4,233,911, Cl. 108-30.000.

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Larach, Simon; and Vilkomerson, David H. R., 4,233,989, Cl. 128-661.000.

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Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.

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Visser, Frederick J., to Von Rohr Equipment Corp., a part interest. Concrete pile cutting device. 4,233,954, Cl. 125-14.000.

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Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.

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Bachner, Ernst, 4,234,036, Cl. 164-420.000.
Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, 4,234,171, Cl. 266-248.000.

Voinea, Maria I.: *See*—
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Volterra, Alessandro: *See*—
Paoletti, Ugo; and Volterra, Alessandro, 4,234,312, Cl. 8-151.200.

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Franks, John A., Jr., 4,234,403, Cl. 204-180.00P.

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Barbieri, Joseph C.; and Wirth, Gary J., 4,234,090, Cl. 206-459.000.

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Hein, Paul R.; Evans, James A.; and Yang, Michael W., 4,234,676, Cl. 430-286.000.

W. Schlafhorst & Co.: *See*—
Kamp, Heinz, 4,233,810, Cl. 57-270.000.

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Falbesaner, Egon; Bichler, Josef; and Wimmer, Eberhard, 4,234,422, Cl. 210-713.000.

Waggon Union GmbH: *See*—
Bugarcic, Helmut, 4,233,904, Cl. 104-138.00R.

Wagman, Gerald H.: *See*—
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,234,690, Cl. 435-119.000.

Wagner, Gary L.: *See*—
Lange, Julius; and Wagner, Gary L., 4,234,954, Cl. 371-6.000.

Wagner, Richard C., to Hollymatic Corporation. Molding apparatus. 4,233,710, Cl. 17-32.000.

Wakabayashi, Hisao: *See*—
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.

Wakasa, Isao; Yamazaki, Shuichi; and Taguchi, Hideo, to Nitto Boseki Co., Ltd. Glass composition. 4,234,342, Cl. 106-50.000.

Waki, Masahiko: *See*—
Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, 4,234,948, Cl. 368-291.000.

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Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Wakiyama, Yutaka, 4,234,619, Cl. 426-614.000.

Walker, Clifford G. Passive laser accelerometer. 4,233,847, Cl. 73-517.00R.

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Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., to Sealand Service Inc. System & method for monitoring & diagnosing faults in environmentally controlled containers, such system and method being especially adapted for remote computer controlled monitoring of numerous transportable containers over existing on-site power wiring. 4,234,926, Cl. 364-551.000.

Walling, Peter T. Respiratory ventilating device. 4,233,984, Cl. 128-207.140.

Walter, Lothar: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.

Walters, Colin R.: *See*—
Woolcock, Alan; Lowe, Bryan W. H.; and Walters, Colin R., 4,234,861, Cl. 335-216.000.

Walters, Edward A.; and Walters, James J. Tackle box rod holder. 4,234,154, Cl. 248-539.000.

Walters, James J.: *See*—
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Wan, Chee-Gen, to Halcon Research and Development Corp. Preparation of cellulose acetate. 4,234,719, Cl. 536-69.000.

Wang, Su-Chee S.: *See*—
Bennion, Douglas N.; and Wang, Su-Chee S., 4,234,667, Cl. 429-81.000.

Ward, Robert C., to Commercial Affiliates, Inc. Binder material seam. 4,234,649, Cl. 428-255.000.

Warning, Klaus: *See*—
Mitzlaff, Michael; and Warning, Klaus, 4,234,484, Cl. 260-239.0BE.

Warnod, Bertrand A., to Klaxon S.A. Alarm installation with a number of self powered indicating elements. 4,234,873, Cl. 340-509.000.

Wasmuth, Edward H.: *See*—
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., 4,234,564, Cl. 424-12.000.

Watanabe, Kenji: *See*—
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Webster, Ralph K., to H. K. Webster Company, Inc. Disposable wild bird feeder. 4,233,941, Cl. 119-52.00R.
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Hamilton, C. Howard; and Weisert, Edward D., 4,233,831, Cl. 72-60.000.
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Werner, Frank D., to Park Energy Company. Solar heat collector system having means to accommodate thermal expansion. 4,233,963, Cl. 126-450.000.
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Ford, Daniel E.; and Pyle, Jeffrey A., 4,233,748, Cl. 33-180.00R.
Gyugyi, Laszlo; and Wood, Peter, 4,234,843, Cl. 323-119.000.
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Widmayer, Don F., to Controlled Environments Systems. Light regulation system. 4,234,820, Cl. 315-152.000.
Wiedmann, Werner; and Schmid, Hanns-Martin, to Werner & Pfleiderer. Mixing apparatus for kneading of plastic substances. 4,234,259, Cl. 366-81.000.
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Wilde, Calvin D.; and Turner, Daniel L., to SAB Harmon Industries, Inc. Automatic locomotive speed control. 4,234,922, Cl. 364-426.000.
Wilder, Paul R.; and Oberrecht, David A., to Dover Corporation. Linkage assembly for a coupler. 4,234,161, Cl. 251-149.900.
Wilhelmi, Allan R.; and Troy, Daniel C., to Sterling Drug Inc. Wet combustion system incorporating autoregulation. 4,234,426, Cl. 210-149.000.
Wilhelms, Otto-Henning: *See*—
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Willems, Gerardus A. M.; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Method of and welding torch for arc welding. 4,234,778, Cl. 219-121.00P.
Willems, Gerardus A. M., to U.S. Philips Corporation. Method of and device for plasma-MIG welding. 4,234,779, Cl. 219-121.00P.
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Williams, Bill D. Watch band assembly. 4,234,115, Cl. 224-168.000.
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Williams, William H., to Sandstone, Inc. Security structure. 4,234,875, Cl. 340-550.000.
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Willis, Donald H., to RCA Corporation. Regulated deflection circuit with regulator switch controlled by deflection current. 4,234,827, Cl. 315-408.000.
Willis, Donald H., to RCA Corporation. High voltage disabling circuit for a television receiver. 4,234,829, Cl. 315-411.000.
Wills, Bill R. Compressed air system having an air dryer. 4,234,327, Cl. 55-310.000.
Wilmes, Manfred; Obst, Rudiger; and Kretzschmar, Wolfgang, to C. A. Weidmuller KG. Earthing terminal. 4,234,239, Cl. 339-198.0GA.
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Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, to Boehringer Mannheim GmbH. 1,2-Dihydroquinoline-2-one derivatives. 4,234,585, Cl. 424-250.000.
Wirth, Gary J.: *See*—
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Wittel, Frederick H. Cushioned printing laminate. 4,234,640, Cl. 428-159.000.
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Woodbrey, James C.; and Moncur, Marlowe V., to Monsanto Company. Amino-functional photopolymer compositions and photo-oxidation imaging processes employing same. 4,234,674, Cl. 430-253.000.
Woods, Thomas S., to Du Pont de Nemours, E. I., and Company. Alkylthiodiazatrithiapentalene compositions and methods of using as plant disease control agents, insecticides, and larvicides. 4,234,592, Cl. 424-270.000.
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Carnaby, Garth A., 4,233,917, Cl. 112-222.000.
Woolcock, Alan; Lowe, Bryan W. H.; and Walters, Colin R., to Imi Kynoch Limited. Electrical windings. 4,234,861, Cl. 335-216.000.
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Wu, Yulin; and Marwil, Stanley J., to Phillips Petroleum Company. Dehydration of alcohols. 4,234,752, Cl. 585-640.000.
Wulfers, Thomas F., to Atlantic Richfield Company. Stabilization of hydrocracked oils with certain nitrogen-containing aromatic components. 4,234,434, Cl. 252-50.000.
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Yamagisi, Kikuo; Okuyama, Hiroshi; and Kawaguchi, Hideo, to Fuji Photo Film Co., Ltd. Edge embossing device. 4,234,300, Cl. 425-363.000.
Yamaguchi, Hiroyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic level control circuit. 4,234,853, Cl. 330-280.000.
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Yoshida, Takao; and Hall, John B., to International Flavors & Fragrances Inc. Ketones and organoleptic uses thereof. 4,234,518, Cl. 568-377.000.
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Bondar, Petr G.; and Zavadskaya, Anna S., 4,234,462, Cl. 252-463.000.
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Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, 4,234,560, Cl. 423-659.000.
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Ziegenhorn, Joachim: *See*—
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Zilliken, Fritz W., to Z-L Limited Partnership. Ergostadientriols, compositions containing same, and methods of preparing and using same. 4,234,577, Cl. 424-238.000.
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Zweifel, Michael R. Fish tank rock cleaner. 4,233,702, Cl. 15-1.700.

LIST OF REISSUE PATENTEES

TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Casey, Robert, to Caterpillar Tractor Co. Rim construction and tool apparatus for safe tire inflation. Re. 30,436, Cl. 152-310.000.
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Casey, Robert, Re. 30,436, Cl. 152-310.000.
Dew, Robert C., to S & T Industries, Inc. Corner assembly for fireplace enclosure. Re. 30,437, Cl. 126-139.000.
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Dew, Robert C., Re. 30,437, Cl. 126-139.000.

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Aksamit, Frank J., to Pro Sharp Corporation. Saw chain sharpening assembly. 257,527, 11-18-80, Cl. D8-71.000.
Allsop, James D. Ski pole storage rack. 257,523, 11-18-80, Cl. D6-157.000.
Andrea Raab Corporation: *See*—
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Beatrice Foods Co.: *See*—
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Bell & Howell Company: *See*—
Zellner, John R.; and Lehto, Eino M., 257,535, Cl. D16-11.000.
Berman, James S., to Citibank, N.A. Drive-up banking building. 257,538, 11-18-80, Cl. D25-33.000.
Berman, James S., to Citibank, N.A. Walk-up banking building. 257,539, 11-18-80, Cl. D25-33.000.
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased (by Noyes, Mary D., executrix); and New England Merchants National Bank, by, executor, to Discovision Associates. Video disk player. 257,533, 11-18-80, Cl. D14-3.000.
Boyle, Patrick T.: *See*—
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Bruce, Gordon P.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
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Chung Ah Manufacturing Co., Ltd.: *See*—
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Berman, James S., 257,539, Cl. D25-33.000.
Danielson, David C.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Discovision Associates: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Formosa, Daniel J.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
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Hawthorne, Allen D.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Heinrich, William, to Volna Promotions, Inc. Drinking mug. 257,524, 11-18-80, Cl. D7-9.000.
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Hickman, Kim M.; and Young, Ralph C., to White Automotive Corporation. Vehicle top. 257,531, 11-18-80, Cl. D12-156.000.
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Johnson, William H., to Shenandoah Manufacturing Co., Inc. Poultry watering valve. 257,544, 11-18-80, Cl. D23-19.000.
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Leib, Roger K. Multiple seating unit. 257,522, 11-18-80, Cl. D6-59.000.
Lukes, John R. Skateboard. 257,536, 11-18-80, Cl. D21-227.000.
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Muramatsu, David: *See*—
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New England Merchants National Bank, by, executor: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Noyes, Eliot F., deceased: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Noyes, Mary D., executrix: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Okland, Merlyn C. Running board. 257,532, 11-18-80, Cl. D12-203.000.
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Cherry, Richard S., 257,528, Cl. D9-431.000.
Piero, Niccolai, to Action Industries, Inc. Combined brush and scraper. 257,521, 11-18-80, Cl. D4-06.000.
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Pro Sharp Corporation: *See*—
Aksamit, Frank J., 257,527, Cl. D8-71.000.
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Raap, Joachim E., to Casa Flora, Inc. Combined plant pot liner and water level gauge. 257,529, 11-18-80, Cl. D11-164.000.
Roehrs, Kurt: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Shenandoah Manufacturing Co., Inc.: *See*—
Johnson, William H., 257,543, Cl. D23-19.000.
Johnson, William H., 257,544, Cl. D23-19.000.
Siegel, Paul F.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.
Stahel, Alwin J., II, to Princeton Industries Corporation. Serving tray. 257,525, 11-18-80, Cl. D7-37.000.
Tuchman, Stephan A.: *See*—
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Volna Promotions, Inc.: *See*—
Heinrich, William, 257,524, Cl. D7-9.000.
White Automotive Corporation: *See*—
Hickman, Kim M.; and Young, Ralph C., 257,531, Cl. D12-156.000.
Yablans, Gerald: *See*—
Fox, James H.; Yablans, Gerald; and Tuchman, Stephan A., 257,541, Cl. D28-59.000.
Yip, Wan K., to Chung Ah Manufacturing Co., Ltd. Lantern. 257,540, 11-18-80, Cl. D26-41.000.
Young, Ralph C.: *See*—
Hickman, Kim M.; and Young, Ralph C., 257,531, Cl. D12-156.000.
Zellner, John R.; and Lehto, Eino M., to Bell & Howell Company. Microfilm reader. 257,535, 11-18-80, Cl. D16-11.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 18, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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330 4,234,774

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

June 17, 1980.

United States Court of Claims Vacancy

The United States Court of Claims, in anticipation of a vacancy in the position of patent Trial Judge on or about January 1, 1981, announces that it will receive applications from interested persons to fill the vacancy.

The applicant should possess qualifications primarily in the field of patent law although the docket of the Trial Judge will include cases in tax, contract, land taking, back pay, and all other fields of law within the court's jurisdiction.

Experience in litigation is desirable since the position requires application of the Federal Rules of Evidence, Federal Rules of Civil Procedure, and the Rules of the United States Court of Claims. A sound background in substantive patent law is also essential.

Applications should be submitted in letter form, accompanied by a comprehensive resume, addressed to Chief Judge Daniel M. Friedman, United States Court of Claims, 717 Madison Place, NW., Washington, D.C. 20005.

National Inventor's Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 7, 1981, from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 8, 1981 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, Feb. 8, 1981 during which time a number of inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 6, 1981 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property for the early closing.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Oct. 29, 1980.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,264,877, Re. S.N. 174,217, Filed Jul. 31, 1980, Cl. 073/421, SOIL SAMPLING DEVICE, Phillip E. Boxrud, Owner of Record: *Outboard Marine Corporation, Waukegan, Ill.*, Attorney or Agent: Paul R. Puerner, Ex. Gp.: 244

3,616,356, Re. S.N. 172,961, Filed Jul. 28, 1980, Cl. 204/152, ELECTROLYSIS IN A PARTICULATE CARBON PACKING, Clarence H. Roy, Owner of Record: *Inventor,* Attorney or Agent: Anthony P. DeLio, et al., Ex. Gp.: 114

3,737,003, Re. S.N. 183,677, Filed Sep. 2, 1980, Cl. 180/78, ADJUSTABLE CONTROL CONSOLE FOR VEHICLES, Duane E. Beals, et al., Owner of Record: *Caterpillar Tractor Company, Peoria, Ill.*, Attorney or Agent: John W. Grant, Ex. Gp.: 316

3,922,558, Re. S.N. 165,855, Filed Jul. 7, 1980, Cl. 290/38 A, STARTER MOTORS, John David Hollyoak, Owner of Record: *The Lucas Electrical Company Limited, Birmingham, England,* Attorney or Agent: Elwin A. Andrus, et al., Ex. Gp.: 217

4,009,741, Re. S.N. 172,647, Filed Jul. 28, 1980, Cl. 144/41, WOODWORKING MACHINE, Edwin H. Zimmerman, Owner of Record: *E. Z. Manufacturing Co., New Holland, Pa.*, Attorney or Agent: C. Hercus Just, Ex. Gp.: 324

4,014,633, Re. S.N. 183,327, Filed Sep. 2, 1980, Cl. 264/33, METHOD FOR SLIP FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION, Roy R. Goughnour, Owner of Record: *A. C. Aukerman Co., Jackson, Mich.*, Attorney or Agent: Beaman and Beaman, Ex. Gp.: 147

4,025,130, Re. S.N. 184,433, Filed Sep. 4, 1980, Cl. 308/9, FLEXIBLE DAMPED BEARING ASSEMBLY, Keith L. Streifert, Owner of Record: *Mechanical Technology Incorporated, Latham, N.Y.*, Attorney or Agent: J. Raymond Curtin, Ex. Gp.: 212

4,027,651, Re. S.N. 166,336, Filed Jul. 7, 1980, Cl. 126/425, SOLAR-ENERGY-POWERED SUN TRACKER, ROLAND W. ROBBINS, Owner of Record: *Inventor,* Attorney or Agent: Gerald F. Baker, Ex. Gp.: 345

4,056,256, Re. S.N. 083,729, Filed Oct. 10, 1979, Cl. 254/106, JACKING ASSEMBLY, Jack B. Caisley, Owner of Record: *Inventor,* Attorney or Agent: Lester Harwitz, Ex. Gp.: 311

4,089,733, Re. S.N. 177,326, Filed Aug. 12, 1980, Cl. 156/630, METHOD OF FORMING COMPLEX SHAPED METAL-PLASTIC COMPOSITE LEAD FRAMES FOR IC PACKAGING, Richard H. Zimmerman, Owner of Record: *Inventor,* Attorney or Agent: Jay L. Seitchik, et al., Ex. Gp.: 161

4,099,403, Re. S.N. 179,024, Filed Aug. 24, 1980, Cl. 72/288, IN-LINE WIRE DRAWING MACHINE, Richard A. Alcock, Owner of Record: *Rockford Manufacturing Group, Inc., Rockford, Ill.*, Attorney or Agent: C. Frederick Leydig, Ex. Gp.: 321

4,101,715, Re. S.N. 166,126, Filed Jul. 7, 1980, Cl. 428/652, HIGH INTEGRITY CoCrAl(Y) COATED NICKEL-BASE SUPERALLOYS, John Ruel Rairden, III, Owner of Record: *General Electric Company, Schenectady, N.Y.*, Attorney or Agent: Wesley Turner, et al., Ex. Gp.: 111

4,105,174, Re. S.N. 173,501, Filed Jul. 29, 1980, Cl. 244/3.16, DEVICE FOR RECEIVING OR TRANSMITTING RADIATION, Ake Hugo Petrus Blomqvist, et al., Owner of Record: *AB Bofors, Bofors, Sweden,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 221

4,111,668, Re. S.N. 183,496, Filed Sep. 2, 1980, Cl. 51/309 A, FUSED ALUMINUM OXIDE ABRASIVE GRAIN CONTAINING REDUCED TITANIUM OXIDE, Thomas B. Walker, et al., Owner of Record: *The Carborundum Company, Niagara Falls, N.Y.*, Attorney or Agent: David E. Dougherty, et al., Ex. Gp.: 323

4,112,015, Re. S.N. 183,760, Filed Sep. 3, 1980, Cl. 261/92, HUMIDIFIER DRIVE SYSTEM, Theodore E. Tinsler, Owner of Record: *White-Westinghouse Corporation, Pittsburgh, Pa.*, Attorney or Agent: James E. Nolan, et al., Ex. Gp.: 177

4,114,153, Re. S.N. 183,396, Filed Sep. 2, 1980, Cl. 343/9, ECHO LOCATION SYSTEMS, Norman S. Neidell, Owner of Record: *Inventor,* Attorney or Agent: James B. Gambrell, et al., Ex. Gp.: 222

4,114,979, Re. S.N. 188,403, Filed Sep. 18, 1980, Cl. 350/96.21, FIBER OPTIC CONNECTOR, Earl R. Heldt, Owner of Record: *Hewlett-Packard Company, Palo Alto, Calif.*, Attorney or Agent: Edward Y. Wong, Ex. Gp.: 257

4,124,985, Re. S.N. 188,424, Filed Sep. 18, 1980, Cl. 405/150, COLLAPSIBLE TUNNEL LINER SECTION AND METHOD OF LINING A TUNNEL, Lembit Maimets, Owner of Record: *Inventor,* Attorney or Agent: David M. Rogers, et al., Ex. Gp.: 354

4,152,922, Re. S.N. 177,448, Filed Aug. 11, 1980, Cl. 73/3, APPARATUS AND METHOD FOR DETERMINING THE CHARACTERISTIC OF A FLOWMETER, Edward E. Francisco, Jr., Owner of Record: *Flow Technology Inc., Phoenix, Ariz.*, Attorney or Agent: Russell Hale, et al., Ex. Gp.: 244

4,155,093, Re. S.N. 177,297, Filed Aug. 11, 1980, Cl. 346/159, METHOD AND APPARATUS FOR GENERATING CHARGED PARTICLES, Richard A. Fotland, et al., Owner of Record: *Dennison Manufacturing Company, Framingham, Mass.*, Attorney or Agent: George E. Kersey, Ex. Gp.: 211

4,157,898, Re. S.N. 183,495, Filed Sep. 2, 1980, Cl. 51/309, FUSED ALUMINUM OXIDE ABRASIVE GRAIN CONTAINING REDUCED TITANIUM OXIDE, Thomas B. Walker, et al., Owner of Record: *Inventors,* Attorney or Agent: David E. Dougherty, et al., Ex. Gp.: 323

4,167,785, Re. S.N. 185,437, Filed Sep. 9, 1980, Cl. 364/437, TRAFFIC COORDINATOR FOR ARTERIAL TRAFFIC SYSTEM, Marshall B. McReynolds, et al., Owner of Record: *Trac Incorporated, Alexandria, Va.*, Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 236

4,167,952, Re. S.N. 176,546, Filed Aug. 8, 1980, Cl. 137/493, CONTROL DEVICE FOR PROSTHETIC URINARY SPHINCTER CUFF, Robert H. Reinicke, Owner of Record: *Parker-Hannifin Corporation, Cleveland, Ohio,* Attorney or Agent: James A. Baker, et al., Ex. Gp.: 341

4,167,965, Re. S.N. 184,432, Filed Sep. 4, 1980, Cl. 165/1, INTEGRAL WATER-REFRIGERANT-AIR HEAT EXCHANGE SYSTEM, Richard D. Rogers, Owner of Record: *Inventor,* Attorney or Agent: J. Raymond Curtin, Ex. Gp.: 345

4,187,908, Re. S.N. 183,139, Filed Sep. 2, 1980, Cl. 166/254, METHOD FOR ASCERTAINING OPTIMUM LOCATION FOR WELL STIMULATION AND/OR PERFORATION, Walter Hans Fertl, et al., Owner of Record: *Dresser Industries Incorporated, Dallas, Tex.*, Attorney or Agent: John N. Hazelwood, et al., Ex. Gp.: 354, Pub. Nov. 25, 1980

PATENT NOTICES

Certificates of Correction for the Week of Nov. 25, 1980

4,013,695	4,205,708	4,216,036	4,220,143
4,027,215	4,205,842	4,216,189	4,220,247
4,071,582	4,205,849	4,216,235	4,220,284
4,074,844	4,206,055	4,216,273	4,220,309
4,085,167	4,206,800	4,216,296	4,220,459
4,085,587	4,207,290	4,216,555	4,220,522
4,104,501	4,207,403	4,216,664	4,220,544
4,129,618	4,208,318	4,216,693	4,220,590
4,131,337	4,208,373	4,216,742	4,220,635
4,131,424	4,208,402	4,216,969	4,220,657
4,131,480	4,209,318	4,217,021	4,220,697
4,131,491	4,210,444	4,217,103	4,220,737
4,145,260	4,210,529	4,217,388	4,220,767
4,168,161	4,211,082	4,217,470	4,220,820
4,169,606	4,211,841	4,217,509	4,220,948
4,169,679	4,212,078	4,217,551	4,221,066
4,172,839	4,212,873	4,217,801	4,221,090
4,176,106	4,213,734	4,217,859	4,221,162
4,176,216	4,213,764	4,217,884	4,221,285
4,189,168	4,213,787	4,217,913	4,221,345
4,190,325	4,213,847	4,218,147	4,221,516
4,190,335	4,214,044	4,218,247	4,221,558
4,190,810	4,214,125	4,218,278	4,221,570
4,191,685	4,214,531	4,218,325	4,221,840
4,194,238	4,214,541	4,218,489	4,221,917
4,196,280	4,214,793	4,218,926	4,222,008
4,198,189	4,214,815	4,219,011	4,222,042
4,198,419	4,214,906	4,219,097	4,222,070
4,198,466	4,214,945	4,219,225	4,222,411
4,199,931	4,215,020	4,219,407	4,222,436
4,200,489	4,215,170	4,219,530	4,222,882
4,200,646	4,215,463	4,219,553	4,222,903
4,201,036	4,215,490	4,219,583	4,223,031
4,201,999	4,215,538	4,219,589	4,223,162
4,202,097	4,215,660	4,219,663	4,223,210
4,204,206	4,215,710	4,219,701	4,223,887
4,204,918	4,215,736	4,219,782	4,223,918
4,205,064	4,215,752	4,220,076	4,224,005
4,205,344	4,215,912	4,220,096	4,224,439
		4,220,120	4,233,057

Disclaimers

3,789,299.—*Edward E. Aslan*, Plainview, N.Y. PROBE FOR RADIATION DETECTOR. Patent dated Jan. 29, 1974. Disclaimer filed June 30, 1980, by the assignee, *Narda Microwave Corporation*.

The term of this patent subsequent to Feb. 8, 1989 has been disclaimed.

4,071,206.—*Gilbert W. Magill*, Odessa, Tex. PORTABLE HELICOPTER. Patent dated Jan. 31, 1978. Disclaimer filed Sept. 23, 1980, by the assignee, *Aerospace General Company*.

Hereby enters this disclaimer to the entire term of said patent.

4,131,286.—*Dean R. Bainard*, Bethel Township, York County, S.C. SEAL AND METHOD FOR ATTACHING SEAL. Patent dated Dec. 26, 1978. Disclaimer filed June 17, 1980, by the assignee, *Garlock Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

Dedication

4,131,808.—*Joseph A. Dombrowski*, Manchester; Clement T. *Baxter*, Beverly, Mass.; *Frederick B. Howard*, Cape Elizabeth and *George H. Simpson*, Westbrook, Maine. INCANDESCENT LAMP SOCKET HAVING OVER-TEMPERATURE PROTECTOR. Patent dated Dec. 26, 1978. Dedication filed June 23, 1980, by the assignee, *GTE Products Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers and Dedications

3,867,643.—*Richard H. Baker*, Bedford and *Lawrence H. Bannister*, Dedham, Mass. ELECTRIC POWER CONVERTER. Patent dated Feb. 18, 1975. Disclaimer and Dedication filed July 29, 1980, by the assignee, *Massachusetts Institute of Technology*.

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,980,628.—*Wayne R. Sorenson*, Ridgefield; *Peter A. Schucab*, Bethel; *Robert S. Allen*, Danbury, Conn.; *George Tillson* and *David J. Lorine*, Oklahoma City, Okla. LARGE CAPACITY EXTERNAL COOLED VINYL HALIDE POLYMERIZATION REACTOR. Patent dated Sept. 14, 1976. Disclaimer and Dedication filed Sept. 2, 1980, by the assignee, *Conoco Inc.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82d Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents ..... Numbers 2,277 to 2,286, inclusive

REISSUES

NOVEMBER 25, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,438

INFLATABLE BARRIER FOR SUBSTANCES FLOATING ON WATER

Paul Preus, Box 1002, Court House Sq., Toms River, N.J. 08753

Original No. 3,849,989, dated Nov. 26, 1974, Ser. No. 363,954, May 25, 1973. Application for reissue Jun. 7, 1979, Ser. No. 46,491

Int. Cl.[3] **E02B** *15/04*

U.S. Cl. 405—68 **4 Claims**



1. A floating barrier for substances floating on water comprising:

a floatation means including plurality of inflatable chambers hingedly connected in end to end relationship, [each of said chambers being divided into plural independent subchambers by flexible wall means disposed therein] *a flexible diaphragm dividing each of the inflatable chambers into plural independent subchambers, separate inflation and deflation valve means communicating with the interiors of each of the independent subchambers,* and liquid impervious skirt means depending from said floation means to provide a liquid barrier below the water line thereof.

Re. 30,439

TREATMENT OF GENITAL TRACT DISEASES OF DOMESTIC ANIMALS WITH PROSTAGLANDINS

James H. Sokolowski, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Original No. 4,051,238, dated Sep. 27, 1977, Ser. No. 692,440, Jun. 3, 1976. Application for reissue Mar. 12, 1979, Ser. No. 19,524

Int. Cl.[2] **A61K** *31/20, 31/43, 31/71, 31/215*

U.S. Cl. 424—181 **9 Claims**

21. A method for treating a female domestic dog or cat suffering from a purulent genital tract disease which comprises:

administering to said dog or cat an amount of a domestic animal luteolytic-uterine smooth muscle stimulating prostaglandin (DALUSMUS-PG) effective to cure said disease.

PATENTS

GRANTED NOV. 25, 1980

ERRATA

For CLASS	See PATENT NO.
015-302	4,234,980
368-218	4,235,072
474-082	4,235,118
474-205	4,235,119
474-254	4,235,120
474-089	4,235,121
493-334	4,235,158
493-309	4,235,159
493-063	4,235,160
493-376	4,235,161
440-034	4,235,182
440-071	4,235,183
081-438	4,235,269
226-076	4,235,360
226-181	4,235,361
236-011	4,235,372
072-148	4,235,384
191-012 R	4,235,419
273-127 D	4,235,438
415-122 R	4,235,569
403-013	4,235,573
556-443	4,235,797
564-072	4,235,816
564-163	4,235,817
564-199	4,235,818
564-427	4,235,820
564-491	4,235,821
568-330	4,235,822
568-402	4,235,823
568-486	4,235,824
570-210	4,235,825
174-050.61	4,236,045
174-728	4,236,046
174-077 R	4,236,047
343-008	4,236,140

PATENTS

GRANTED NOVEMBER 25, 1980

GENERAL AND MECHANICAL

4,234,972

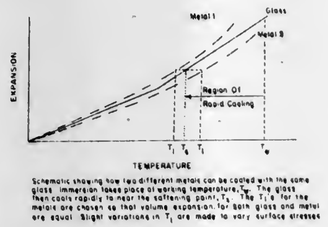
BIOGLASS COATED METAL SUBSTRATE

Larry L. Hench, and Paul J. Buscemi, both of Gainesville, Fla., assignors to Board of Regents, State of Florida, Tallahasse, Fla.

Division of Ser. No. 798,671, May 19, 1977, Pat. No. 4,159,358. This application Jun. 21, 1978, Ser. No. 917,646

Int. Cl.³ A61F *1/24*

U.S. Cl. 3—1.9 **3 Claims**



Schematic showing how two different metals can be coated with the same glass. Immersion takes place at working temperature, T_w. The glass then cools rapidly to near the softening point, T_s. The T_g's for the metals are chosen so that volume expansion for both glass and metal are equal. Slight variations in T_g are made to vary surface stresses

1. A prosthesis or surgical implant suitable for cement-free bonding to bone consisting essentially of a metal substrate of sufficient strength for the intended use coated at least on the portions thereof to be bonded to the bone of the recipient with a coating of about 0.2 mm to about 2 mm thickness of a biologically active glass or glass-ceramic of uniform composition and thermal coefficient of expansion and substantially free of flaws resulting from the release of thermo-mechanical stresses, the surface of said substrate at its interface with said glass coating being roughened, to a degree sufficient to substantially increase the surface area of said substrate without permitting substantial mechanical interlocking between said metal surface and said glass coating, and oxidized, and said glass coating being bonded to said surface of said metal substrate by ion diffusion at said interface, wherein the thermal coefficients of expansion of said metal substrate and said glass or glass-ceramic coating are substantially different.

4,234,973

TUB COVER

Craig W. Vetter, Manitou Springs, Colo., and William F. Dexter, Los Osos, Calif., assignors to Vetter Design Works, Inc., San Luis Obispo, Calif.

Filed Apr. 30, 1979, Ser. No. 34,851

Int. Cl.³ E04H *3/19*; E06B *9/08*; B65D *43/02*

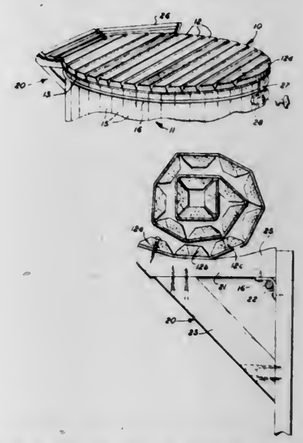
U.S. Cl. 4—500 **9 Claims**

1. A cover for a tub which is defined by a peripheral wall having a top surface, comprising:

a sheet of flexible resilient material;

a plurality of parallel generally straight ribs secured to said sheet, said ribs being spaced apart on said sheet a distance less than the thickness of the ribs;

means fixing the sheet and ribs with respect to the rub wall along a line parallel with said ribs to roll between a rolled retracted position adjacent the tub wall and an extended position covering the tub and resting on the top surface of said peripheral tub wall with said sheet of flexible material interposed between the ribs and said top surface, forming a seal with the top surface, and with said ribs extending from one side of the tub to the other, adjacent ribs having a complementary cross sectional contour whereby said cover may be rolled into a compact form; and



a rack adjacent the tub for holding the retracted rolled cover, said rack having a depression in which the rolled cover rests.

4,234,974

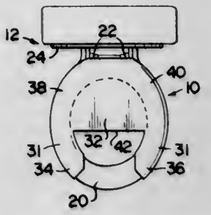
PILLOW FOR COLOSTOMY

J. Bradford MacDonald, 511 Skyview Ave., Clearwater, Fla. 33516

Filed Sep. 27, 1978, Ser. No. 946,113

Int. Cl.³ A47K *13/06*

U.S. Cl. 4—235 **2 Claims**



1. A device for use with a water closet to aid a patient in recovering from a rectum operation, the water closet comprising a bowl having a conventional water closet seat, comprising in combination:

seat means being positionable upon the conventional water closet seat for providing a substantially horizontal seating surface;

said seat means having a continuous substantially semi-circular supporting position;

the periphery of the curved area of the semi-circular supporting portion established for resting on the rear portion of the water closet seat enabling the straight portion to extend across the substantial center of the water closet bowl;

said seat means including plural projections extending from said substantially straight portion for at least partially covering the front portion of the water closet seat; and

said seat means having a resilient interior covered by a protective covering for providing a resilient support sur-

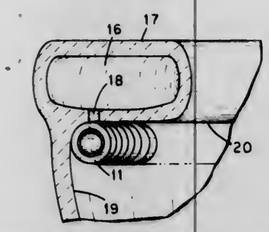
face to completely cover substantially the rear half of the water closet bowl for completely supporting the area of incision of the patient.

4,234,975

WATER DISTRIBUTOR FOR TOILET BOWLS

Jewel W. Revels, Rte. 2, Box 446, Rockwood, Tenn. 37854

Filed Apr. 23, 1979, Ser. No. 32,788
Int. Cl.[1] E03D *3/00, 9/02, 11/00*; B05B *1/26*
U.S. Cl. 4—300 **3 Claims**



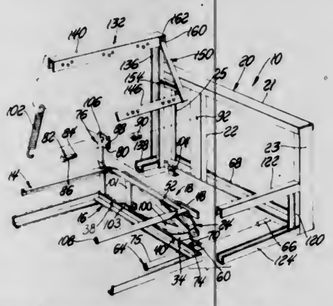
1. In a combination with a toilet bowl a water distributor for toilet bowls to be inserted immediately beneath the rim thereof in contact with the inner bowl surface and the lower surface of the toilet bowl rim for redistributing water entering under the rim to achieve non-swirling motion of the water vertically downward across all of the bowl surface, which comprises:
a flexible elongated core having an uninterrupted length substantially equal to the perimeter of the bowl under the rim, and a uniform cross section throughout the length;
a plurality of equally spaced ridges on the surface of the elongated core, the ridges extending a uniform distance outward from and around the elongated core thereby forming channels for redistributing the water vertically downward over all of the bowl surface; and
wherein the elongated core and the ridges are integrally and unitarily formed of a material inert to fluids present in the bowl, wherein the outward extending distance of the ridges is about 10 to 20 mm, the ridges are about 2 to 5 mm wide and 1.5 to 5 mm high, and the spacing between the ridges is about 1 to 5 mm.

4,234,976

FOLDABLE FURNITURE ASSEMBLY

Stanley Litkewycz, Brighton, Mich., assignor to Lear Siegler, Inc., Detroit, Mich.

Filed Nov. 22, 1978, Ser. No. 963,078
Int. Cl.[3] A47C *13/00, 17/14*
U.S. Cl. 5—18 R **19 Claims**



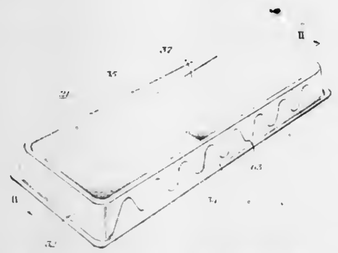
1. A foldable furniture assembly comprising:
first frame means,
second frame means,
side frame means,
front frame means adapted for connection to said side frame means,
linkage means for operatively interconnecting said first frame means to said second frame means and for operatively interconnecting said first and second frame means to said side frame means so that each of said first and second frame means are all able to move relative to each other and relative to said side frame means between a folded position and an open position, said linkage means including a plurality of pivotally connecting links pivotally connected to said side frame means and capable of movement between said folded and open positions, and
back frame means adapted for connection to said side frame means, said back frame means including back wall means and backing means operatively connected to said back wall means for movement relative thereto between a retracted storage position and an extended use position, said backing means including a plurality of interconnected back frame members pivotally connected to said back wall means and capable of movement between said storage and use positions, said backing means providing at least a partial support for a back cushion in said use position.

4,234,977

COT

Bill D. Snow, 3817 Rutledge, Fort Worth, Tex. 76107

Continuation of Ser. No. 934,392, Aug. 17, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,729
Int. Cl.[3] A47C *17/14*; A47F *1/00*; A47K *3/22*
U.S. Cl. 5—110 **15 Claims**



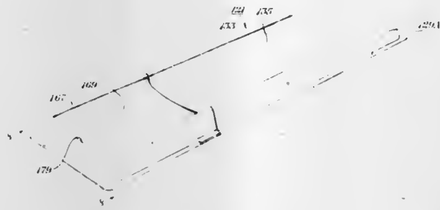
1. A one piece molded cot or the comprising:
a generally rectangular shaped top wall means having two straight sides and two straight ends, said two straight sides being straight over substantially the entire distance between said two straight ends, said two straight ends being straight over substantially the entire distance between said said two straight sides,
a straight supporting side wall extending downward from each side and from each end of said top wall means,
said supporting sides walls having bottom edges spaced from said top wall means and which flange outward in a plane for engaging the floor of a house or building for supporting said top wall means above and spaced from the floor,
said top wall means comprises:
a ridge surrounding a rectangular shaped upward facing surface for supporting a person and which surface is located at a level between the upper edge of said ridge and said bottom edges of said supporting side walls,
four inner side wall portions extending upward from said upward facing surface,
said ridge being defined by ridge wall portions connecting the upper edges of said inner side wall portions with the upper edges of said supporting side walls respectively.

4,234,978

COT

Bill D. Snow, 3817 Rutledge, Fort Worth, Tex. 76107

Continuation-in-part of Ser. No. 934,392, Aug. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,024, Jan. 9, 1978, abandoned, which is a continuation of Ser. No. 718,407, Aug. 30, 1976, abandoned. This application Jun. 26, 1979, Ser. No. 52,428
Int. Cl.[3] A47C *17/14*; A47F *1/00*; A47K *3/22*
U.S. Cl. 5—111 **6 Claims**



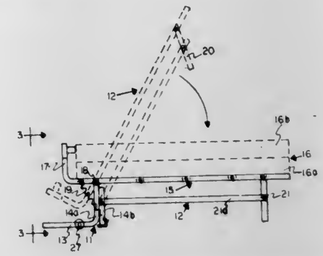
1. A two piece cot or the like, comprising:
first and second members,
said first member comprising:
top wall means having four supporting side walls extending downward from said top wall means for engaging the floor of a house or building for supporting said top wall means above and spaced from the floor,
said top wall means comprising:
an upward facing surface having a ridge extending around three sides thereof, whereby the fourth side has a ridge free edge,
said upward facing surface being located at a level between the upper edge of said ridge and the bottom edges of said side walls,
three inner side wall portions extending upward from said three sides of said upward facing surface,
said ridge being defined by ridge wall portions connecting the upper edges of said three inner side wall portions with the upper edges of said supporting side walls of said three sides respectively,
said second member comprising:
top wall means having three supporting side walls extending downward from said top wall means of said second member for engaging the floor of a house or building for supporting said top wall means of said second member above and spaced from the floor,
said top wall means of said second member comprising:
an upward facing surface having a ridge extending around three sides thereof such that the fourth side has a ridge free edge with no supporting sidewall,
said upward facing surface of said second member being located at a level between the upper edge of said ridge of said second member and the bottom edges of said side walls of said second member,
three inner side wall portions extending upward from said three sides of said upward facing surface of said second member,
said ridge of said second member being defined by ridge wall portions connecting the upper edges of said three inner side wall portions of said second member with the upper edges of said supporting side walls of said three sides respectively,
the ridge free edge of the fourth side of said second member being supportable by the ridge free edge of the fourth side of said first member.

4,234,979

FOLDING BED-FRAME MEMBER AND BED ASSEMBLY

Wilson L. Bergerud, 30 Herring St., Harrington Park, N.J. 07640

Filed Jan. 4, 1979, Ser. No. 801
Int. Cl.[2] A47K *19/06*
U.S. Cl. 5—133 **9 Claims**



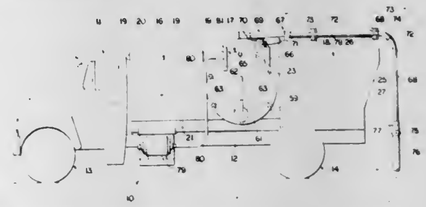
1. A frame member for a spring-balanced wall-type bed which is adapted to be pivotable between a vertical position adjacent a wall and a horizontal position upon a floor, said frame member comprising:
(a) a base which is adapted to be fixed to the floor; and
(b) a support section pivotally mounted on the base and also attached at one portion thereof to said base by spring means, said support section being adapted to support a portion of a mattress assembly and having a width that is substantially less than the width of the mattress assembly such that a plurality of the frame members are needed to support the mattress assembly.

4,234,980

APPARATUS FOR SEWER CLEANING AND THE LIKE

Angelo DiVito, South Euclid, and Benjamin P. Fisco, Jr., Shaker Heights, both of Ohio, assignors to Aquatech, Inc., Cleveland, Ohio

Filed May 16, 1979, Ser. No. 39,735
Int. Cl.[3] B08B *3/02*
U.S. Cl. 15—302 **9 Claims**



8. Apparatus for cleaning a chamber which comprises:
a truck having a forward cab and a rear frame supported by a front wheel axle and a single rear wheel axle;
a water reservoir tank mounted near the front of the vehicle frame, the water reservoir tank adapted to carry a supply of water and having a capacity of at least 500 gallons;
a hose reel assembly mounted at the rear of the vehice frame, said reel assembly having a reel with a hose connected to said water reservoir tank, said hose adapted to be inserted into the chamber to discharge water thereinto;
water pump means connected between said water tank and said hose reel assembly to supply water to said hose at high pressures;
a debris holding vacuum tank mounted on said frame between said water reservoir tank and said hose reel assembly, said vacuum tank adapted to receive and hold debris and having a capacity of at least 500 gallons, said vacuum

tank having means on one side adapted to be opened to discharge debris therefrom;

a boom mounted on top of said vacuum tank and adapted to extend rearwardly over said hose reel assembly, said boom having a conduit connected to said vacuum tank and adapted to be lowered into the chamber to be cleaned;

a discharge hose connected to said vacuum tank and adapted to permit debris in said vacuum tank to be discharged therefrom; and

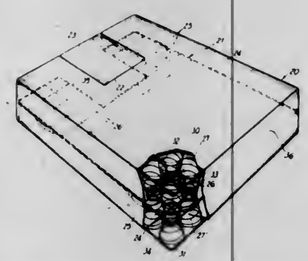
vacuum pump means for creating suction in said vacuum tank to suck debris from the chamber into said vacuum tank through said conduit, and for creating positive pressure in said vacuum tank to discharge material from said tank through said discharge hose.

4,234,981

MATTRESS FOR ARTICULATED BEDS

Paul B. Hanson, 2761 Eastwood Dr., Decatur, Ga. 31907

Filed Oct. 26, 1978, Ser. No. 954,902
Int. Cl.[2] A47C *3/32*
U.S. Cl. 5—411 22 Claims



1. A bed mattress comprising a body portion of substantially uniform thickness, a median plane wire reinforcing grid for the mattress spanning substantially the entire area of the mattress and having a marginal frame and a multiplicity of crossing straight grid wires attached to said frame, and cushioning means included in said body portion above and below the median plane reinforcing grid and spanning substantially the entire area of the mattress, said cushioning means having marginal portions substantially above and below the marginal frame of said grid.

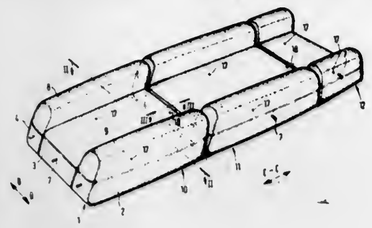
4,234,982

VACUUM MATTRESS, ESPECIALLY FOR RESCUE VEHICLES

Ulrich Bez, Gerlingen, and Wolfgang Bühren, Weissach, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 10,996
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805327
Int. Cl.[3] A47C *27/10*; A61G *1/00, 7/00*
U.S. Cl. 5—455 10 Claims

1. A vacuum mattress comprising a casing means loosely filled with a multitude of synthetic resin components so as to enable the mattress to adapt in shape to the body contour of a person thereon, and means placed on said casing means for evacuating the mattress so as to retain said mattress in said body contour adapted shape, wherein said casing means is subdivided into a plurality of mattress element forming casings arranged in a longitudinal series and each of which includes a middle element bordered by two lateral elements, and wherein said means for evacuating comprises a plurality of external valves and passage means for forming an interconnection between each of said elements, said passage means being comprised at least in part by one-way valves oriented for enabling evacuation of the entire mattress via a first of said external valves and varying degrees of evacuation in at least one selected mattress element via use of at least a second of said external valves.

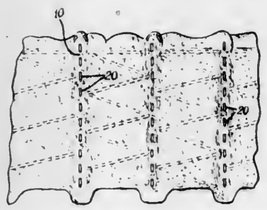


4,234,983

THERMALLY WELDED SPRING POCKETS

Walter Stumpf, Munster, Ind., assignor to Simmons Company, Atlanta, Ga.

Continuation of Ser. No. 790,462, Apr. 25, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,545
Int. Cl.[2] A47C *27/04*
U.S. Cl. 5—477 5 Claims



1. In a series of pocketed springs for use in the manufacture of mattresses or cushions or the like comprising a strip of integrally-connected closed fabric pockets each containing a helically coiled wire compression spring having its axis disposed transversely of the strip, and wherein said pockets are defined between two overlapped plies of fabric strip by spaced transverse lines of discrete attachments of the plies to one another and by connection of said plies together along spaced longitudinal lines, the improvement wherein said fabric is thermally weldable to itself and said discrete attachments are spaced individual welds.

4,234,984

POCKETED SPRING ASSEMBLY

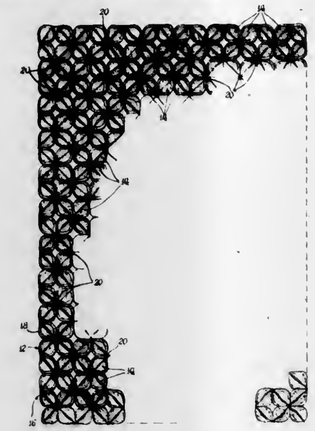
Walter Stumpf, Dunwoody, Ga., assignor to Simmons Company, Atlanta, Ga.

Filed Mar. 19, 1979, Ser. No. 22,067
Int. Cl.[2] A47C *27/04*
U.S. Cl. 5—477 9 Claims

1. An improved assembly of pocketed wire coil springs for mattresses, cushions, or the like, of the type comprising a plurality of touching strips of integrally-connected springs confined in pockets defined between layers of elongated sheet material, the springs of said assembly being disposed in rectangular array in which any given pocketed spring is positioned in two rows at right angles to each other and in touching contact with the adjacent pocketed springs of said two rows, and each said given spring is one of such a strip of springs constituting one of said two rows of springs,

the improvement comprising the connection of adjacent strips of springs together by joining the pocket material of said adjacent strips together between adjacent springs of each of said adjacent strips,

said connections being made at intervals of at least two springs along each said strip, and



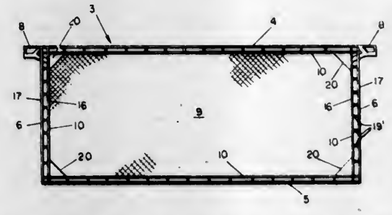
said interstrip connections between successive adjacent strips being staggered from strip to strip.

4,234,985

PLASTIC BEE FRAME WITH REINFORCED SUPPORTING EARS AND NOTCHED FRAME BARS

Paul W. Pierce, 1630 W. 9th St., Upland, Calif. 91786

Filed Aug. 31, 1978, Ser. No. 938,500
Int. Cl.[3] A01K *47/02*
U.S. Cl. 6—10 8 Claims



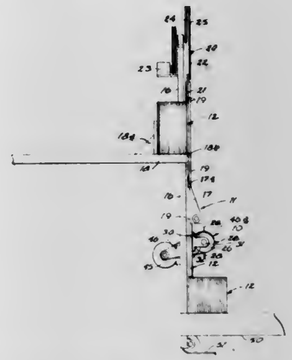
1. A plastic bee frame for vertical positioning in a beehive super, said frame having opposing end walls comprising top, bottom, and end frame bars joined end to end in an open generally rectangular configuration and defining a central generally rectangular opening in said frame, a plastic honeycomb foundation arranged within said central opening and integrally joined about its perimeter to said frame bars, generally rectangular plastic ears integrally joined to and projecting from the upper ends only of said end frame bars longitudinally of said top frame bar, said ears having flat top, bottom, and end walls, and being open at the sides, said flat bottom walls spanning and joined to said end frame bars, and brace means of substantially the same thickness as said bottom walls extending upwardly and inwardly at an angle between and joining said bottom and top walls whereby said ears are reinforced and strengthened and prevented from becoming dislodged therefrom and disturbing said frames as the latter are supported in the super.

4,234,986

BEE BOARD CLEANING DEVICE

Donald R. Cox, Box 44, and Theodore C. Barber, P.O. Box 5, both of Orovada, Nev. 89425

Filed Jan. 19, 1979, Ser. No. 4,676
Int. Cl.[3] A01K *51/00*
U.S. Cl. 6—12 R 18 Claims



1. A bee board cleaning device for cleaning parallel elongated grooves that are spaced across planar surfaces of bee boards, comprising:

a frame;

guide means on the frame for receiving and guiding bee boards in a selected path parallel to the elongated grooves therein;

a drum including axially oriented bristle mounting shafts;

means mounting the drum adjacent to the guide means for rotation about a drum axis that is transverse to the path and to the bee board grooves;

bristle means including a plurality of bristles mounted to the bristle mounting shafts on the drum for rotation with the drum and for pivotal movement thereon about axes parallel to the drum axis;

means for rotating the drum and bristle means about the drum axis to cause the bristles to project outwardly by centrifugal force and engage along the grooves of bee boards held within the guide means; and

spacers on the bristle shafts, dividing the bristles into sets spaced apart by distances equal to corresponding distances between grooves on the bee boards.

4,234,987

ADJUSTABLE WRENCH ADAPTED FOR USE AS A HAMMER

Joseph R. Charette, 229 College St., Sudbury, Ontario, Canada (P3C 4V3)

Filed Apr. 16, 1979, Ser. No. 30,293
Int. Cl.[3] B25F *1/00*; B25B *13/14*
U.S. Cl. 7—139 1 Claim

1. In an adjustable wrench having an elongated wrench handle and an adjustable wrench head at one end of the wrench handle, and the wrench head and wrench handle extending in opposite longitudinal directions in a first plane, and the wrench head having a fixed jaw and a movable jaw, and the wrench head including a crown portion on an outer edge of the fixed jaw and a movable jaw adjustment screw passage extending through the wrench head in a direction which is substantially transverse with respect to said longitudinal direction and opening at one end outwardly through the crown portion, the improvement comprising;

a hammer head fixed on the crown portion and projecting transversely outwardly therefrom in said first plane, said hammer head having a hammer face disposed to lie across said one end of said adjustment screw passage and to

occupy a second plane which is normal to the first plane and which is in non-intersecting relationship with said wrench handle such that the hammer head and wrench handle may be employed as a hammer, said hammer head having opposed side faces extending inwardly from the



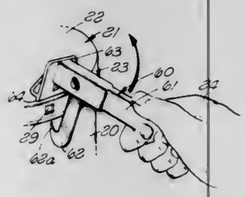
hammer face and joining the crown portion, and the hammer head having a second passage extending through at least one side face thereof and communicating with said one end of said adjustment passage, whereby debris accumulated at said one end of said adjustment passage may be flushed therefrom through said second passage.

4,234,988

PAIL OPENING DEVICE

Charles Y. Ross, and Deltha M. Ross, both of P.O. Box 1390, Burney, Calif. 96013

Filed Jan. 5, 1979, Ser. No. 1,362
Int. Cl.³ B25F *1/00*
U.S. Cl. 7—151 **2 Claims**



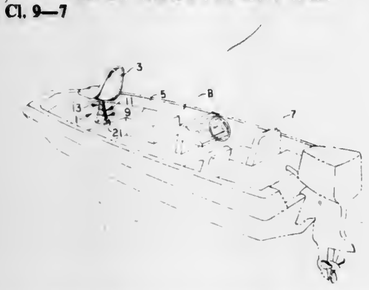
1. An apparatus for cutting plastic lids upon pails and prying the same off of the pail comprising in combination: an elongated handle means suitable to be gripped by a human hand and having a pair of recessed portions on its sides; an enlarged end depending from said handle and including therein a slot suitable to accommodate a knife means; an axle mounted through said enlarged portion of said handle and extending transversely through said slot; knife means mounted at one end in a pivotal manner upon said axle; spring means mounted within said slot and connected to said knife means to hold the same in a fixed position in such manner that the knife blade is always urged forward and upward; knife blade means attached to said knife means mounted in said slot comprising a hook-like sharpened blade; pivot leverage means depending from said enlarged portion of said handle means suitable to rest against the top of a plastic lid in place upon a pail; lip means connected to said pivot leverage point in such manner as to provide a prying member depending forwardly from said handle means; and means adjacent the end of said handle means opposite from said pivot leverage point for hanging said device when not in use.

4,234,989

ADJUSTABLE PEDESTAL FOR A BOAT SEAT

Frank Pearcy, 4212 Beethoven, St. Louis, Mo. 63116

Filed Feb. 10, 1978, Ser. No. 876,575
Int. Cl.³ B63B *29/00*; A47C *1/031*
U.S. Cl. 9—7 **1 Claim**



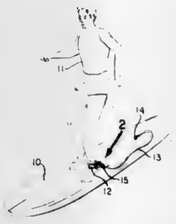
1. In a boat having a deck, a pneumatically adjustable pedestal mounted on the deck, and a boat seat mounted on the pedestal, said pedestal comprising an assembly of telescoping sections; said assembly comprising a base section, first and second intermediate sections and an upper end section; said base section comprising a cup-shaped body having a cylindrical wall and a bottom, with an annular external mounting flange extending radially outwardly from said cylindrical wall at a level above the bottom of the base section and an annular internal flange extending radially inwardly from said cylindrical wall at the upper end of the base section; said base section being mounted in an opening in the deck of the boat with said external flange bearing on the deck around the opening, said flange being adapted to receive fasteners for securing the base section to the deck; each intermediate section comprising a tubular cylindrical section having an annular flange extending radially outwardly at its lower end and an annular flange extending radially inwardly at its upper end; the upper end section comprising a cylindrical section having an annular flange extending radially outwardly at its lower end, means at the upper end of said upper end section for mounting the boat set thereon; each successive section from the base section up being of such diameter as to have a sliding fit in the upper end flange of the next section below; all of said sections being generally of the same height; each successive section from the top down being retractable into the next section below whereby the sections other than the base section are retractable one into another and into the base section for lowering the seat mounted on the upper end of the upper end section to a level closely adjacent the upper end of the base section; the first intermediate section being retractable into the base section to the point where its lower end engages the bottom of the base section, the first intermediate section having inwardly extending stop means adjacent its lower end and the second intermediate section being retractable into the first intermediate section to the point where the lower end of the second intermediate section engages said stop means, and the upper end section being retractable into the second intermediate section, said seat mounting means extending laterally outwardly beyond the upper end section for engagement thereof with the upper end of the second intermediate section when it is retracted into the second intermediate section, the upper end section being retractable into the second intermediate section to the point where said seat mounting means engages the upper end of the second intermediate section, the flange at the lower end of the upper end section lying within said stop means and the lower end of the upper end section lying below the lower end of the second intermediate section when the upper end section is retracted; said base section having a port for admission of air under pressure to extend the intermediate and upper end sections for raising the seat and for exhaust of air for enabling the sections above the base section to telescope one into another and into the base section for lowering the seat, with the sections above the base section extensible to an upper limit determined by engagement of the said lower end flanges with the said upper end flanges; and means for supplying air under pressure to the pedestal through said port to extend the intermediate and upper end sections for raising the seat and for the exhaust of air from the pedestal for lowering the seat; said external mounting flange on said base section being located relative to the height of the base section for mounting the base section with its upper end substantially below normal seating levels and relatively closely adjacent the deck whereby, by fully retracting the intermediate and upper sections into the base section, the seat may be lowered to a fully retracted position closely adjacent the deck.

4,234,990

SURFBOARD ANKLE LEASH QUICK RELEASE

Constantine W. Colburn, 533 Venezia Ave., Venice, Calif. 90291

Filed Jul. 21, 1978, Ser. No. 926,655
Int. Cl.³ A63C *15/06*
U.S. Cl. 9—310 A **6 Claims**



1. A surfboard ankle leash quick release including, in combination:
(a) an ankle cuff for securement about a surfer's ankle said ankle cuff having a connecting eye;
(b) a tether line having one end for connection to said surfboard;
(c) a yoke member connected to the other end of said tether line and straddling said eye in said ankle cuff; and
(d) a pin passing in said yoke through said eye so that a surfer will not lose the surfboard should he become separated from the board under normal conditions but can, at his option, quickly disconnect the tether line from the ankle cuff by manually removing said pin to free himself from the board and tether line in an abnormal emergency situation.

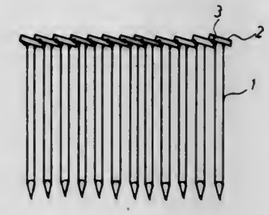
4,234,991

STRIP OF FASTENING ELEMENTS SUCH AS NAILS

Wilfried Lange, Altenhagen, Fed. Rep. of Germany, assignor to Fa. Dieter Haubold Industrielle Nagelgeräte, Hemmingen-Westerfeld, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,453
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748862
Int. Cl.³ F16B *15/02, 15/08*
U.S. Cl. 10—28 **8 Claims**

1. A nail comprising a shank and a deformable head at one end of the shank, the nail head lying in a plane inclined to the plane perpendicular to the longitudinal axis of the nail shank, for attachment to adjacent like nails to form a nail strip, the angle of inclination of said head of said nail being so chosen that upon subsequent driving impacts said head is straightened such that it lies substantially in a plane perpendicular to the



shank of the nail, and attachment means on the underside of said head at the higher end thereof.

4,234,992

CLEANING APPARATUS

William P. Billington, Flitwick, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 786,624, Apr. 11, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 947,174
Int. Cl.³ A23N *15/00*
U.S. Cl. 15—3.11 **29 Claims**



15. Apparatus for cleaning objects comprising:
a first member;
a second member, said first and second members defining a discharge aperture for the discharge of dirt removed from the objects, said discharge aperture being smaller in size than the objects being cleaned;
first and second surfaces defined by the first and second members respectively for cleaning objects by relative movement between the surfaces and the objects to be cleaned;
a frame for mounting said first and second members with the first and second surfaces converging towards each other over at least a part of the extent of each surface; and
driving means for driving the first member in a reciprocatory movement such that, in the vicinity of the convergence of the surfaces, said first surface moves in a reciprocatory movement towards and away from said region of convergence along a path lying substantially in said first surface itself and for driving the second member in a motion such as to effect at least an average movement of said second surface towards the region of convergence of the surfaces.

4,234,993

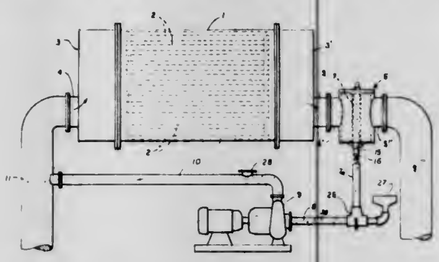
CONDENSER CLEANING SYSTEM USING SPONGE BALLS

Edwin K. Kintner, R.D. 4 A231, Johnstown, Pa. 15905

Continuation-in-part of Ser. No. 873,006, Jan. 27, 1978, abandoned. This application May 30, 1979, Ser. No. 43,617
Int. Cl.³ B08B *9/04*
U.S. Cl. 15—104.06 A **6 Claims**

1. In a cleaning system for the tubes of a condenser or other heat exchanger device including a pump for circulating sponge balls through said tubes, the improvement comprising a screen assembly connected to the discharge end of said tubes, said

screen assembly including a vertical discharge tube for receiving said balls, four rectangular screens rotatable about said discharge tube and radiating from a central pivotal axis in a substantially cylindrical body having an inlet and an outlet, two of said screens confronting the inlet of said body and



discharge end of said tubes for guiding said balls into said vertical discharge tube and into the suction said of said circulating pump, and shaft means for turning said screen assembly about said pivot, whereby turning thereof through 180° will expose debris accumulated on said two of said screens to the outlet end of said substantially cylindrical body.

4,234,994

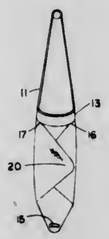
BACK AND BODY WASHER

Frederick F. Schwab, 9705 215th St., Forest Lake, Minn. 55025

Filed Jan. 22, 1979, Ser. No. 3,387

Int. Cl.³ A47K 7/02

U.S. Cl. 15—222 **7 Claims**



1. A back and body cloth comprising:

a cloth material having a surface for rubbing over a user's back and body;

said cloth material of generally a square shape with a first portion, a second portion, a third portion and a fourth portion defining the corners of said cloth material, said cloth material having a first handle of predetermined length attached to said first portion of said cloth material, said first handle having an area for a user's hand to grasp, said second portion of said cloth material located diagonally opposite from said first portion of said cloth, said second portion of said cloth material defining a second handle so that said cloth is operable for hanging in a folded position in response to suspension of said back and body cloth from said first handle;

said second handle having an area for a user's fingers to grasp said second handle, said second handle characterized by being substantially shorter than said first handle whereby said surface for rubbing over a user's back is proximate said second handle, said second handle operable for engagement with a user's fingers or thumb so that when a user grasps said first handle and said second handle the user can rub said cloth on the user's back with an up and down motion.

4,234,995

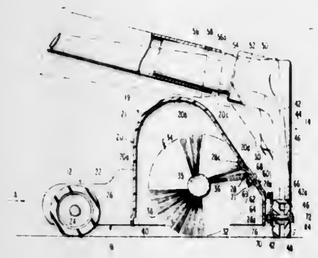
POWER SCRUBBER WITH PIVOTABLY MOUNTED RECOVERY HEAD

Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Sparks, Nev.

Filed Jul. 9, 1979, Ser. No. 55,669

Int. Cl.³ A47L 7/00

U.S. Cl. 15—322 **2 Claims**



1. A power brush housing assembly for a hot water vacuum extraction cleaning machine, said assembly comprising a wheeled chassis, a housing overlying said chassis and being fixed thereto, an elongated scrubbing brush roller mounted transversely to the bottom of the chassis and within said housing for rotation about a horizontal axis with its periphery contacting an underlying surface, a motor carried by the chassis and operatively coupled to the brush roller for positively driving said brush roller about its axis to impart a scrubbing action to said surface, a nozzle mounted to said chassis to one side of said brush roller for spraying a hot liquid cleaning solution onto said surface, an elongated, hollow vacuum recovery head mounted to said chassis and extending parallel to said roller and to one side thereof and having one edge bearing a suction opening defining a mouth facing said surface such that the application of vacuum pressure to said head causes water and dirt scrubbed from said surface to be sucked through said mouth into said vacuum head, the improvement comprising: said housing including a wall extending parallel to the axis of said elongated scrubbing brush roller, said wall being inclined to the vertical, means for hinge mounting said vacuum recovery head to said housing, said hinge mounting means comprising a first elongated hinge plate mounted to said inclined housing wall and extending transversely from one end of said housing to the other, a second hinge plate mounted to the side of said vacuum recovery head adjacent the edge opening towards said surface and extending parallel to said edge; whereby, said head can be tilted to deflect the vacuum recovery head from a first position in general vertical orientation to a second position inclined to the vertical towards said inclined housing wall to permit variation in suction pressure and to permit said head to ride over minor obstructions encountered by said assembly during movement across said surface being cleaned.

4,234,996

AUTOMATIC DOOR CLOSER CONSTRUCTED FOR RELEASABLY HOLDING A DOOR IN A PREDETERMINED PARTLY OPEN POSITION

Dietrich Jentsch, Ennepetal, Fed. Rep. of Germany, assignor to Dorma-Baubeschlag GmbH & Co. KG., Ennepetal, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,558

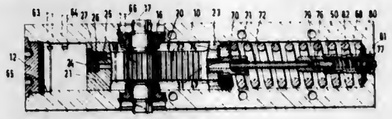
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813592

Int. Cl.² E05F 3/10, 3/22

U.S. Cl. 16—52 **8 Claims**

1. In an automatic door closer, a combination comprising, an elongated housing provided with an axial cylindrical bore closed at opposite ends; a closer shaft adapted to be connected

to a door and mounted in said housing intermediate the ends of the latter turnable about an axis extending transverse to the axis of said bore; piston means guided in said bore and dividing the bore into two compartments for a damping fluid, said piston means being operatively connected to said closer shaft and reciprocatable in said bore between a first end position in which a door connected to the closer shaft is fully closed, a predetermined intermediate position in which the door is partly opened, and a second end position in which the door is fully opened; biasing means cooperating with the piston means for urging the same to said first end position, said biasing means comprising a coil compression spring in one of said compartments abutting with opposite ends against said piston means and one of said closed ends of said housing; a first and a second passage extending through said piston means; a one-way valve in said first passage biased to permit flow of fluid in one direction from said one compartment into the other of said compart-



ments during movement of said piston means from said first towards said second end position and concomitant reduction of the volume of said one compartment while preventing flow of fluid in the opposite direction; and means for closing said second passage when said piston means reaches said predetermined intermediate position to thereby hold said piston means against the force of said biasing means in said intermediate position, said means for closing said second passage comprising a valve member and a compression spring abutting with opposite ends respectively against said valve member and said one closed end of said housing and normally holding said valve member in closed position, the force of said compression spring may be overcome by applying an outer force to the door connected to said closer shaft to turn the latter in a direction to move said piston means from said predetermined intermediate position to said first end position, said means for closing said second passage including said valve member being located within said coil compression spring.

4,234,997

METHOD AND APPARATUS FOR SPLITTING A BODY OF A BUTCHERED ANIMAL INTO TWO HALVES ALONG THE SPINE

Nobuo Koyama, 238-8, Jone, Chobeishinden, Toride-shi, Ibaragi-ken, Japan

Filed Jul. 11, 1978, Ser. No. 923,532

Claims priority, application Japan, Jul. 19, 1977, 52-85657; Jun. 26, 1978, 53-76973

Int. Cl.³ A22B 5/20, 7/00

U.S. Cl. 17—52 **8 Claims**



1. A method for splitting a body of a butchered animal into two halves along the spine, comprising the steps of:

hanging the body of the butchered animal at its hind legs from suspension conveying means and conveying the body to a station for splitting the body into two halves along the spine;

stopping the body and a conveying table in a splitting position interposed between body supporting means and pusher means and turning the body through 90 degrees to cause the back of the body to face the body supporting means while bringing the conveying table into index with the pusher means;

actuating the pusher means and the body supporting means so as to clamp the body tightly to the body supporting means which is operative to support the body, said pusher means including a plurality at push rods which come into contact with the ribs of the animal in a manner to surround adjacent vertebrae and hold the spine therebetween; and

actuating driving box means mounting therein a saw and located behind the body supporting means to cause the driving box means to move from its uppermost position to its lowermost position along a guide frame installed on a floor so that the saw may rotate and split the body into two halves along the spine.

4,234,998

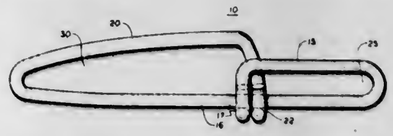
WIRE SNAP

Robert L. McMickle, Spirit Lake, Iowa, assignor to Berkley & Company, Spirit Lake, Iowa

Continuation of Ser. No. 853,039, Nov. 21, 1977, This application Oct. 20, 1978, Ser. No. 953,262

Int. Cl.³ A44B 21/00

U.S. Cl. 24—73 C **2 Claims**



1. A wire snap comprising: a single length of tensile steel wire with the ends bent back toward one another defining a central body portion therebetween, one end being bent back toward the central body portion and defining a first loop therewith and with the extremity of said end having a transverse hook tip adapted to fit around and secure said end to the central body portion and the other end being bent toward the central body portion defining a second loop therewith and having a transverse hook tip adapted to fit around and secure the other end to the central body portion, each of said transverse hook tips of said one and said other ends of said wire being bent toward one another and extending respectively beyond the transverse hook tip of the opposite end of said wire and fitting around the central body portion in an opposite direction with its hook tip being disposed adjacent that of the other and having the same radius of curvature, the bent end of the wire forming the first loop with the central portion being substantially parallel with the central body portion except for the hook tip and the bent end of the wire forming the second loop with the central body portion extending at an acute angle away from the central body portion along substantially a straight line to a point adjacent its hook tip, said first loop having a length dimension relative to the second loop each in the radio of 1:2 with said bent ends of said wire being positioned in the same plane as the central body portion except for the hook tips.

4,234,999

CLAMP ASSEMBLY AND FABRICATION THEREOF

John S. Winter, Walnut Creek, and Robert L. Moore, El Cerrito, both of Calif., assignors to Systron-Donner Corp., Concord, Calif.

Filed Sep. 18, 1978, Ser. No. 943,437

Int. Cl.³ A44B 21/00

U.S. Cl. 24—81 G **1 Claim**

1. A clamp assembly for fixedly supporting segments of two tubes, comprising:

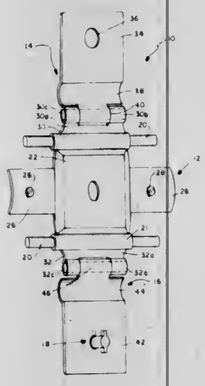
(a) a main body member adapted for connection to a given support surface and including a through hole having a cross sectional configuration which is longer than it is

wide and first and second tube receiving section on opposite sides of said through hole;

(b) a first secondary body member including a through hole and a tube receiving section to one side of said last-mentioned hole, said first secondary body member being pivotally connected with said main body member for movement between a first closed position such that its tube receiving section cooperates with the first of said tube receiving sections of said main body member for clamping a segment of one of said tubes in place, and a second opened position for freeing said tube segment;

(c) a locking member for maintaining said secondary body member locked in said closed position, said locking member including a shaft extending through said secondary through

hole for rotation therein, an integrally formed enlarged head at one end of said shaft and a cross bar integrally formed with and extending normal to the other end of said shaft, said enlarged head being adapted for engagement by a separate tool for rotating said shaft and cross bar and said cross bar being shaped for insertion into said primary



through hole and for locking in place therein upon rotation thereof;

(d) said secondary body member including a slot extending out from said secondary through hole sufficient to allow passage of either said cross bar or enlarged head through said hole, and a tab bendable between a slot opening first position outside said slot and a slot closing position within said slot; and

(e) a second secondary body including a through hole sufficiently large in cross section to allow passage of said cross bar therethrough and a tube receiving section to one side of the latter hole, said second secondary body member being pivotally connected with said main body member for movement between a first closed position such that its tube receiving section and the tube receiving section of said main body cooperate with one another for clamping a segment of a second one of said tubes in place, and a second opened position for freeing said second tube segment, said shaft of said locking member extending through said hole in said second secondary member when the latter is in its closed position for locking said second secondary member in place.

4,235,000

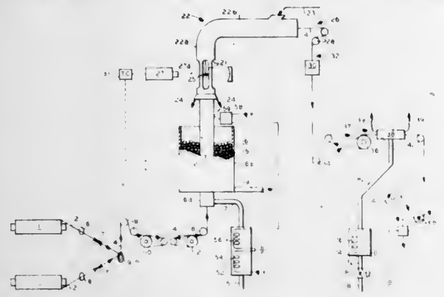
METHOD FOR STRAIGHTENING TEXTURED YARN

Ronnie D. Nikkel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 822,177, Aug. 5, 1977, Pat. No. 4,135,511, which is a continuation of Ser. No. 692,713, Jun. 4, 1976, abandoned. This application Oct. 26, 1978, Ser. No. 955,047

Int. Cl.[2] D02J *1/12, 1/22;* D02G *1/20*

U.S. Cl. 28—290 **4 Claims**



1. A method comprising:

passing a textured yarn to a yarn heating zone suitable to straighten the yarn by subjecting the yarn to heat and tension:

thereafter passing the yarn to a yarn winding zone;

winding and tensioning the yarn by constant tension winding;

monitoring the yarn to determine if the yarn is being wound; and

only if yarn is being wound then passing a fluid to a fluid heating zone, heating the fluid to a temperature suitable to straighten said yarn when said yarn is also subjected to tension, passing the heated fluid to the yarn heating zone and heating the yarn therein.

4,235,001

GAS DISPLAY PANEL FABRICATION METHOD

Haruhiro Matino, 9-32-205, 5-chome, Kugenmakaigan, Fujisawa-Kanagawa, Japan

Continuation of Ser. No. 716,399, Aug. 23, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,446

Claims priority, application Japan, Sep. 17, 1975, 50-111717

Int. Cl.[3] H01J *9/02*

U.S. Cl. 29—25.14 **13 Claims**

1. A method of fabrication a flat display panel which includes first and second parallel conductor arrays disposed substantially orthogonal to each other to define display cells at intersections of said first and second parallel conductor arrays and further includes a voltage responsive gaseous display medium between said first and second conductor arrays at least at the intersections thereof, the method including the sequential steps of:

preparing an insulating substrate with said first parallel conductors formed thereon,

forming a first dielectric coating over said first parallel conductors,

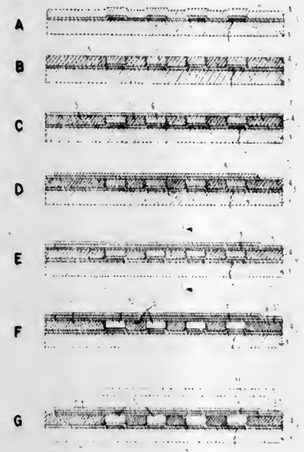
forming over said first dielectric coating a spacer layer which includes first areas of a material removable by a predetermined treatment and second areas of a material unremovable by said treatment,

said first areas including at least regions where the display cells are to be defined and said second areas including at least regions between said display cell regions in a direction parallel to said first parallel conductors,

forming over said spacer layer a second dielectric layer,

forming over said second dielectric layer said second parallel conductor array orthogonal to said first array and to said first areas exposed therebetween,

removing said first areas of said spacer layer by subjecting said exposed portions to selective etching to thereby define said display cells between said first and second parallel conductors, and



attaching a cover plate to maintain said gaseous display medium in the display cell regions.

4,235,002

ROTARY UNIT FOR USE IN CALENDARS OR THE LIKE

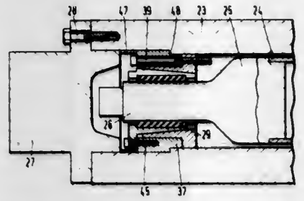
Josef Pav; Michael Jäkel, and Dieter Junk, all of Krefeld, Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,651

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2814244

Int. Cl.[3] F28F *5/02*

U.S. Cl. 29—110 **33 Claims**



1. In a rotary unit, such as a cylinder for use in calenders, the combination of a first component which constitutes a hollow roller including an elongated sleeve having first and second end portions, and first and second trunnions at the respective end portions; an elongated displacing component coaxially mounted in said roller and defining with said sleeve a clearance for the flow of a fluid heat exchange medium, at least one of said trunnions having channel means for admission of said medium into and for evacuation of said medium from said clearance, at least a portion of said displacing component being movable with respect to said first component in at least one of two directions including a first direction axially and a second direction radially of said sleeve; and compensating means including at least one prestressed elastic cushion interposed between said first component and said portion of said displacing component, said first component having a surface coaxial with said sleeve and in permanent contact with said cushion and said cushion being deformable in response to movement of said portion of said displacing component in said one direction.

4,235,003

METHOD OF MANUFACTURE OF A BALL VALVE

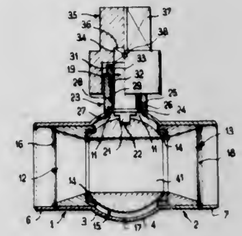
Jean Gachot, 26 bis avenue de Paris, 95230 Soisy-Sous-Montmorency, France

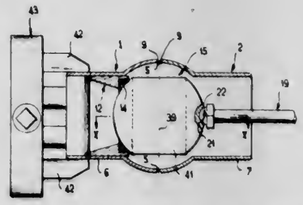
Filed Feb. 22, 1979, Ser. No. 14,212

Claims priority, application France, Mar. 9, 1978, 78 06786

Int. Cl.[3] B23P *15/00;* B23K *31/00*

U.S. Cl. 29—157.1 R **4 Claims**





1. A method for manufacturing a ball valve comprising a hollow body provided with two hubs for connecting the valve to a piping system, said valve body being adapted to contain a spherical plug or ball pierced by a diametrical passageway and rotatably mounted within said body, said ball being connected to an operating rod which traverses the valve body through a stuffing-box, comprising performing the following successive operations:

(a) cutting each of two sections of tube of the nominal diameter of the valve to be manufactured to a length which is substantially one-half the intended length of the valve;

(b) imparting to one end of each section a flared-out shape approximately in a spherical zone in order to constitute two shells, the edge of the flared-out portion being located substantially on a great circle of the sphere to which the zone belongs, the internal diameter of said hollow sphere being larger than that of the ball;

(c) fitting a sliding sleeve at one end with a ring forming a valve-seat for the ball and inserting said sleeve into one of the shells designated as the first shell and welding said sleeve in position within said shell in its precise and definitive location;

(d) positioning the ball between the two shells;

(e) bringing together the edges of the flared-out portions of the two shells so as to enclose the ball and then welding said edges to each other;

(f) fitting a sliding sleeve with a ring forming a valve-seat and inserting the latter sleeve in the second shell and applying the latter valve seat against the ball, and then welding the latter sleeve in position within said second shell;

the two shells being welded together by means of the following operations:

(g) orienting the ball in such a manner as to ensure that the axis of the passageway which extends through said ball is alocated substantially in the plane of the welded joint which is to be made in order to assemble the two shells together;

(h) subjecting, by means of the operating rod, the ball and all

the shells to be joined together to a relative movement of rotation with respect to each other in such a manner as to ensure that the passageway of the ball comes successively opposite to all the points of the weld fillet to be formed;

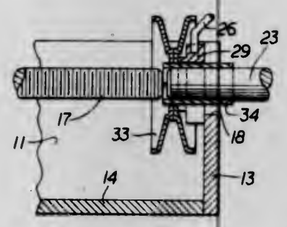
(i) and synchronizing the progression of the welding operation and the rotation of the ball in such a manner as to ensure that the end of the weld fillet during the welding operation is located continuously opposite to one of the passageways of said ball.

4,235,004

PULLER FOR REMOVING PULLEYS AND THE LIKE FROM SHAFTS

William G. Floyd, 504 Woodland Village, Birmingham, Ala. 35216

Filed Feb. 22, 1979, Ser. No. 14,057
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—256 **1 Claim**



1. In a puller for removing pulleys from engine crank shafts,

(a) a rectangular box-like frame of heavy plates having four side walls and one end wall,

(b) a jack screw threadedly passing through one side wall adjacent the longitudinal center thereof, the longitudinal axis of the screw being substantially normal to the side wall opposite the wall through which the screw passes,

(c) a cut-out in the side wall opposite the screw-equipped wall of a size to slip over the shaft from which the pulley is to be removed,

(d) means in the form of a U-shaped spacer having an enlarged portion and a reduced shoulder portion on opposite sides interposed between a central or hub portion of the pulley and said side of the frame opposite that through which the screw passes and said reduced shoulder portion being effective to transmit the thrust from the jack screw to said central or hub portion of the pulley, and

(e) the inner open dimensions of the box-like frame being such as to receive the shaft mounted pulley with the free end of the shaft axially aligned with the end of the screw inside the frame and with a portion of the pulley opposite the free end of the shaft operatively contacting the inner surface of said opposite side wall, whereby running in on said jack screw forces the shaft axially relative to the pulley.

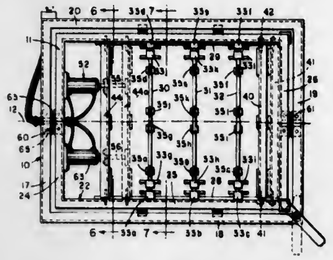
4,235,005

APPARATUS FOR ASSEMBLING PALLETS

Raymond E. James, Chicago, Ill., assignor to Palletron Incorporated, Schiller Park, Ill.

Filed Feb. 12, 1979, Ser. No. 11,204
Int. Cl.³ B27M *3/00*
U.S. Cl. 29—281.1 **7 Claims**

1. Apparatus for assembling pallets comprising: a base; a cradle mounted to said base for rotary motion about a horizontal axis between a start and a discharge position; longitudinal guide means mounted to said cradle and extending between opposite sides thereof; stringer guide means carried by said longitudinal guide means and opening upwardly to receive a plurality of stringers in spaced, parallel relation when said cradle is in said start position; actuatable clamp means for clamping said stringers in said stringer guide means, whereby a first set of deck boards may be fastened to said stringers while said cradle is in said start position and said stringers are held by said clamp means, and a second set of deck boards may be



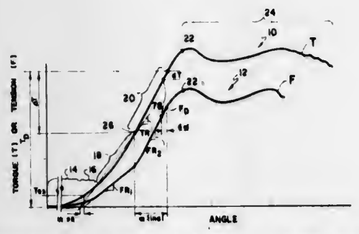
fastened to the other side of said stringers when said cradle is rotated to said discharge position and a completed pallet may be discharged under gravity when said clamp means is released.

4,235,006

TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,687
Int. Cl.³ B23P *19/06*
U.S. Cl. 29—407 **2 Claims**



1. Apparatus for tightening a fastener to a stress value below the yield point thereof, comprising

a tightening tool for applying torque and imparting rotation to the fastener;

means for developing a signal representative of the torque being applied to the fastener and for developing a signal representative of rotation of the fastener;

means for determining, from the torque and rotation signals, an average torque rate over an angle increment of at least 10% of the angular distance between the origin of stress in the fastener and the proof load of the fastener in a region where the torque-angle curve is substantially linear;

means for generating a signal epresentative of a theoretical line parallel to the average torque rate; and

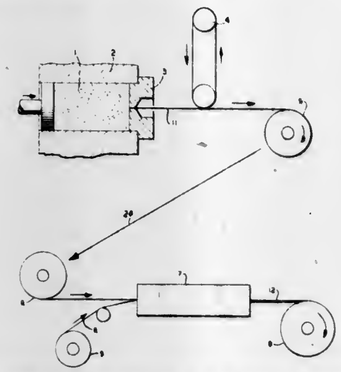
means for terminating tightening in response to non-linear strain prior to the onset of yield of the fastener when a comparison of the torque and angle signals with the theoretical curve signal indicates that the instantaneous torque-angle gradient is decreasing.

4,235,007

METHOD OF PRODUCTION OF A WIRE-SHAPED COMPOSITE ADDITION MATERIAL

Kenkichi Yamaji; Oelhschlägel Dietrich; Hajime Abe, and Koichi Tamura, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Japan

Continuation-in-part of Ser. No. 652,665, Jan. 27, 1976, Pat. No. 4,134,196. This application Sep. 19, 1978, Ser. No. 943,619
Claims priority, application Japan, Jul. 25, 1975, 50-90975
The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.
Int. Cl.³ B22F *13/24*
U.S. Cl. 291—420 **18 Claims**



1. A method of production of a continuous length of composite wire for introduction as a linear additive into the interior of a melt of iron or steel comprising the steps of:

(a) extruding an addition material comprising at least one addition agent selected from the group consisting of calcium, magnesium and aluminum in particulate form to produce a compact wire of a predetermined size,

(b) coiling said extruded wire,

(c) transferring said extruded wire in the form of a coil to a covering applying device and, therein,

(d) enveloping and sealing said wire within a continuous metal covering by folding a tape of iron or steel tightly around said wire so that the tape is aligned parallel to the axis of the wire and that one widthwise marginal portion of the tape is tightly folded over the other widthwise marginal portion thereof in overlapping relation to produce a composite wire, said tape having a width, which is greater than the length of the circumference of said wire.

4,235,008

METHOD OF GUTTER CONSTRUCTION FOR SWIMMING POOLS

David L. Meredith, 5911 Founders Dr., Greensboro, N.C. 27410

Division of Ser. No. 887,538, Mar. 17, 1978, abandoned. This application May 17, 1979, Ser. No. 39,853
Int. Cl.³ B23P *19/00*; B32B *31/00*
U.S. Cl. 29—428 **2 Claims**

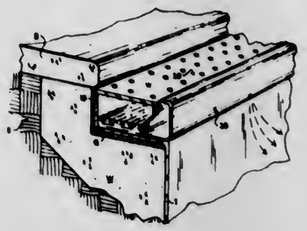
1. The method of forming a gutter construction for swimming pools comprising the steps of:

(a) forming the deck and concrete side walls of the swimming pool leaving an L-shaped rectangular ledge connecting the upper edge of the side wall of the pool and the deck edge;

(b) heating and molding an L-shaped plastic main gutter member from a longitudinally slit piece of cylindrical tubular stock to form a main gutter member having a substantially vertical rear wall and horizontal bottom wall;

(c) mounting said main gutter member in said L-shaped ledge at the top of the side wall of the pool;

(d) forming a polygonal, tubular rim member by heating and molding a length of cylindrical tubular plastic stock material;



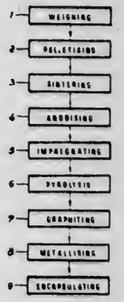
(e) bonding the bottom wall of said rim along the upper surface of the free front portion of said main gutter member to form a dual channel gutter therein with one passageway isolated from the other.

4,235,009

ENCAPSULATING SOLID TANTALUM CAPACITORS

Balint Escher, Ableiges, and Rene' Romanet, Meulan, both of France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Apr. 6, 1978, Ser. No. 893,999
Claims priority, application France, Apr. 15, 1977, 77 11393
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—570 **3 Claims**



1. Process for encapsulating solid-electrolyte tantalum capacitors with thermosettable powdered plastic material which consists in:

heating said capacitors to a temperature between about 150° and 250° C.,

coating said capacitors while they are so heated with said plastic material to completely encapsulate them,

simultaneously with said heating and coating direct biasing said capacitors at 0.2 to 1 times the rated voltage of said capacitors,

maintaining both said bias voltage and heating for a few minutes sufficient to thermoset said plastic material, and

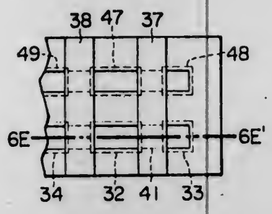
completing the process of manufacture of said capacitors by cutting off said bias voltage and said heating.

4,235,010

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE COMPOSED OF INSULATED GATE FIELD-EFFECT TRANSISTOR

Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 634,772, Nov. 24, 1975. This application Mar. 31, 1978, Ser. No. 892,178
Claims priority, application Japan, Sep. 4, 1975, 50-107350
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—571 **7 Claims**



1. A method of manufacturing a semiconductor integrated circuit device having a matrix of insulated field effect transistors of both enhancement type and depletion type along the rows and columns of the matrix, comprising the steps of:

(a) forming a first insulating layer on the surface of a semiconductor substrate of a first conductivity type, said first insulating layer having a plurality of substantially parallel slots forming relatively thin insulating portions, and relatively thick portions between adjacent slots;

(b) selectively introducing impurities of a second conductivity type, opposite said first conductivity type, into prescribed surface portions of said substrate beneath selected areas of said relatively thin portions in said slots of said first insulating layer;

(c) selectively forming a plurality of strips on at least spaced apart areas of the relatively thin portions in said slots of said first insulating layer, said strips being substantially perpendicular to said slots, some of which strips overlie said prescribed surface portions of said substrate; and

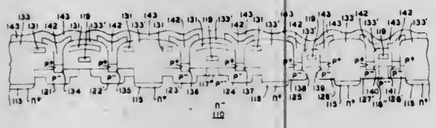
(d) introducing further impurities of said second conductivity type into selected regions of the surface of said substrate between adjacent ones of said strips by using said strips as a mask to form a plurality of regions of said second conductivity type in the surface of said substrate to form depletion type insulated field effect transistors having those strips which overlap the prescribed surface portions of the substrate as gate electrodes, and to form enhancement type insulated field effect transistors having those strips which do not overlap the prescribed surface portions of the substrate as gate electrodes.

4,235,011

SEMICONDUCTOR APPARATUS

Douglas B. Butler, Maple Grove; Thomas E. Hendrickson, Wazata, and Ronald G. Koelsch, Plymouth, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 28, 1979, Ser. No. 24,839
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—571 **9 Claims**



1. A method for constructing a field-effect transistor device at an outer major surface of a first semiconductor material body of a first conductivity type, said method comprising:

providing a first feature selection layer closely proximate at least a first major surface portion of said outer major surface but limited to avoid extending over a field surface portion in said outer major surface contiguous with and surrounding said first major surfaces portion, said first feature selection layer also having at least two openings therethrough which, when projected onto said outer major surface, enclose corresponding portions of said outer major surface which are spaced apart but contained entirely within said first major surface portion;

providing a field insulating means at said field surface portion of said outer major surface;

providing at least two lesser conductivity terminating region portions of a second conductivity type in said semiconductor material body intersecting said first major surface portion at locations so each includes one of said projection portions of said outer major surface, said lesser conductivity terminating region portions being spaced apart in said outer major surface;

removing said first feature selection layer;

providing a first electrical insulating layer of a first thickness on said outer major surface, at least at said first major surface portion, said first insulating layer having a first insulating layer major surface on a side thereof opposite from that insulating layer surface in contact with said first major surface portions;

providing a first gate region on at least a portion of said first insulating layer major surface across said first insulating layer from that space occurring between said two lesser conductivity terminating region portions;

providing at least two extended lesser conductivity terminating region portions of a second conductivity type in said semiconductor material body intersecting said first major surface portion and spaced apart in said first major surface portion to thereby form at least two spaced apart intersection surfaces in said outer major surface with each of said two intersection surfaces containing one of said projected surface portions, there being pn junctions resulting about each of said lesser conductivity terminating region portions and its associated extended lesser conductivity terminating region portion to thereby separate these regions from remaining portions of said first semiconductor material body with these said pn junctions intersecting said first major surface portion to form a boundary about each of said intersection surfaces in said first major surface portion, said first gate region being directly across said first insulating layer from that space in said first major surface portion separating said two intersection surfaces;

providing a second electrical insulating layer of a second thickness on said first gate region and extending beyond said first gate region to be across from substantially all of each adjacent said extended lesser conductivity terminating region portion, said second insulating layer having a second insulating layer major surface on a side thereof opposite that side thereof which is in contact with said first gate region;

providing a first shield region on at least a portion of said second insulating layer major surface across from said first gate region and across from each adjacent said extended lesser conductivity terminating region portion, but across from less than all of each adjacent said extended lesser conductivity terminating region portion at least by virtue of plurality of openings each provided through said first shield region and across from a contact surface located entirely within each said intersection surface; and

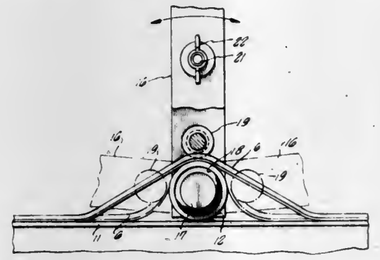
providing higher conductivity terminating region portions of said second conductivity type in said semiconductor material body intersecting said first major surface portion at each of said contract surfaces across from each corresponding said opening in said first shield region, said higher conductivity terminating region portions having a conductivity occurring therein exceeding that occurring in those said extended lesser conductivity terminating region portions remaining after said providing of said higher conductivity terminating region portions, said lesser conductivity terminating region portions being contiguous with said higher conductivity terminating region portions everywhere except on that surface of said higher conductivity terminating region portions formed by intersecting with said first major surface portion.

4,235,012

METHOD OF FORMING A STRIP HEATER EXPANSION JOINT

David W. Liedholm, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 31, 1978, Ser. No. 938,592
Int. Cl.³ H01C *1/016*
U.S. Cl. 29—611 **2 Claims**



1. A method of forming an expansion joint in a heater apparatus of the type utilizing two slotted metallic foil strips encasing, in laminar style, a resistive heating element comprising:

(a) placing a bottom forming plate with a rigid forming support affixed thereto under said metallic foil strips at the center of said slot with said rigid forming support disposed perpendicular to said slot;

(b) pressing said metallic foil strips down around said rigid forming support to form a bend;

(c) removing said bottom forming plate;

(d) affixing a support means to the object to be heated to support said bend; and

(e) affixing said bend in said metallic foil strips, formed in step (b) above, to the object to be heated directly over said support means.

4,235,013

TUBE GUIDE-EXPANDER

Regis R. Vollmer, Penn Township, Berks County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1978, Ser. No. 955,688
Int. Cl.² B21D *39/06*
U.S. Cl. 29—727 **10 Claims**

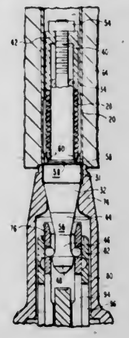
1. An apparatus for guiding tubes having at least one open end into apertures through a tube sheet and expanding those tubes into contact with the tube sheet after properly positioning them in the apertures, said apparatus being releasably retained within the open tube end during the guiding and positioning thereof, said apparatus comprising:

a first compression structure having an opening therethrough, said first compression structure having a thrust portion which is radially smaller than the apertures and radially extends beyond the tube's inner surface, said thrust portion being disposable in axially abutting relationship with the tube's open end to restrain relative axial movement of the tube;

a second compression structure axially displaceable relative to said first compression structure and having ram, driving, and elongated elements respectively disposable inside the tube, protruding from the tube, and extending through said opening, said ram and driving elements being connected to opposite axial ends of said elongated element and radially extending beyond said opening, said driving element including a tip portion having a guide facillitating, inwardly converging wall in a direction away from the tube;

expansion means axially disposed between said first and second compression structures and operationally disposable inside the tube end for radially engaging the tube's inner surface in response to axial compression thereof; and

means for maintaining a predetermined extent of compression on and radial enlargment of said expansion means during tube guidance through the tube sheet aperture so as to provide releasable frictional retention thereof in the tube.

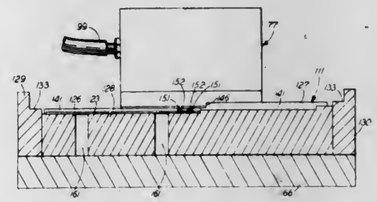


4,235,014

APPARATUS FOR ASSEMBLING A PLURALITY OF ARTICLES

Loring E. DuBois, Kansas City, and Lawrence D. Simpson, Lee Summit, both of Mo., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 863,107, Dec. 22, 1977, Pat. No. 4,170,021. This application Mar. 26, 1979, Ser. No. 24,223
Int. Cl.³ H01R *43/00*; B23K *37/04*
U.S. Cl. 29—760 **9 Claims**



1. A holder for positioning a plurality of chips in relationship to a plurality of leads inserted into the holder, each of the leads to be assembled to at least one of the chips, the holder comprising:

a body portion having a top surface;

a plurality of grooves extending in parallel along the top surface and into the body portion, the grooves having lengths and widths sufficient for positioning the leads upon their insertion into the grooves, each groove having a depth greater than the thicknesses of the leads;

means, located in the grooves, for restricting the depth of insertion of the leads into the grooves to permit only one of the leads to be inserted into each groove and to position an uppermost edge of the inserted lead even with the top of the groove;

means for relocating the restricting means to permit the

inserted leads to move toward the bottom of the groove to vacate a predetermined depth of the grooves adjacent the top surface; and

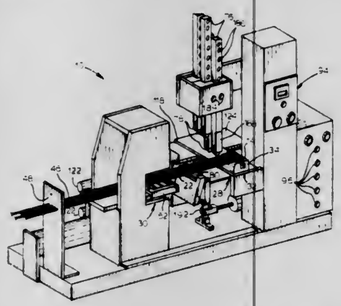
at least one seat for receiving an inserted chip, located at a predetermined position along each groove and extending substantially from the top of the groove to the predetermined depth into the body portion, the seat having substantially vertical surfaces spaced to position the chip in contact with the lead, upon the lead having moved toward the bottom of the groove to expose the vertical surface to the chip.

4,235,015

ELECTRICAL HARNESS FABRICATION METHOD AND APPARATUS

Jack F. Funcik, Downers Grove; Joseph C. Bennet, Lisle; Joseph T. Tubbs, Woodridge, and Thomas E. Schneider, Burbank, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 16, 1979, Ser. No. 12,715
Int. Cl.³ H01R 43/00
U.S. Cl. 29—857 **6 Claims**



1. A method of making an electrical harness, said harness comprising at least one connector having a housing with insulation displacement type contacts loaded therein, each contact connector to an insulation clad wire, said method comprising the steps of:

(a) positioning a connector on a first station;

(b) holding at least a number of wires corresponding to the number of contacts at a second station remote from said first station;

(c) moving said connector to said second station so that each contact is in alignment with each held wire;

(d) simultaneously inserting each wire into its corresponding contact at the second station;

(e) moving said connector back to said first station and simultaneously drawing a predetermined length of wire defined between said connector and said second station; and

(f) cutting all the held wires at the second station.

4,235,016

SAFETY SCISSORS

Theodore W. Kobelt, Plains Road, Box 122, Wallkill, N.Y. 12589

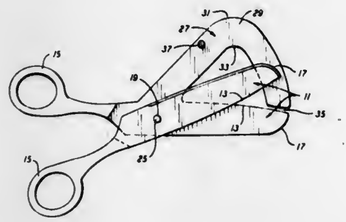
Filed Apr. 26, 1979, Ser. No. 33,385
Int. Cl.³ B26B 29/04
U.S. Cl. 30—233 **3 Claims**

1. Safety scissors comprising:

a pair of scissor blades each having opposed cutting edges and operating handles, each of the pair of scissor blades having an outside end;

pivot means for pivotably connecting said pair of scissor blades together, said pivot means being located between said opposed cutting edges and operating handles;

a guard member generally having a V-shape and rigidly connected at one end to one of said pair of scissor blades from a point substantially adjacent said pivot means and extending therefrom away from the scissor blade at an acute angle to the cutting edge up to an apex point and from there back toward said scissor blade at its outside end



and defining a narrow slot with a minor portion of said scissor blade adjacent said outside end; and

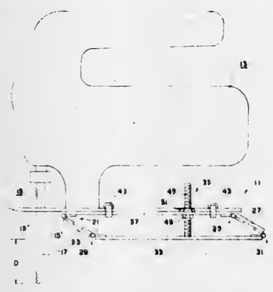
stop means secured to said guard member to prevent the opposing scissor blade from opening beyond the guard member.

4,235,017

SABER SAW ATTACHMENT

Harry Yavis, 438 N. Willett, Memphis, Tenn. 38112

Filed Aug. 16, 1979, Ser. No. 67,184
Int. Cl.³ B27B 11/00; B27G 23/00
U.S. Cl. 30—377 **5 Claims**



1. An attachment means for controlling the depth of cut of a saber saw of the type including a base plate having an underneath side for normally engaging the material to be cut; said attachment means comprising:

(a) a first pivot means for being attached to said underneath side of said base plate;

(b) a first arm means for being attached to said first pivot means and for pivotal movement relative to said base plate, said first arm means having a first end attached to said first pivot means and having a second end;

(c) a second pivot means for being attached to said underneath side of said base plate at a spaced distance from said first pivot means;

(d) a second arm means for being attached to said second pivot means and for pivotal movement relative to said base plate, said second arm means having a first end attached to said second pivot means and having a second end;

(e) a third pivot means for being attached to said second end of said first arm means;

(f) fourth pivot means for being attached to said second end of said second arm means;

(g) first plate means for engaging the material to be cut when said attachment means is attached to said saber saw, said first plate means having a first end for being attached to said third pivot means and having a second end for being attached to said fourth pivot means; and

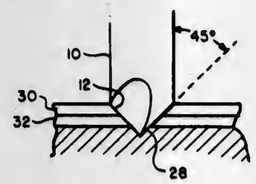
(h) adjustment means for causing said first plate means to be spaced a variable distance below said underneath side of said base plate and for allowing the depth of cut of said saber saw to be varied.

4,235,018

DEVICE FOR USE IN MEASURING THE THICKNESS OF SURFACE LAYERS AND COATINGS

Ove Silberg, 3, Vibrafonvägen, S-245 00, Staffanstorp, Sweden

Filed Apr. 24, 1979, Ser. No. 32,795
Claims priority, application United Kingdom, Apr. 27, 1978, 16750/78
Int. Cl.³ G01B 5/02, 11/02
U.S. Cl. 33—169 F **4 Claims**



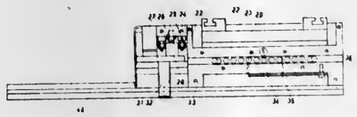
1. A device for use in measuring the thickness of surface layers and coatings, comprising a drill having at least one cutting edge, each said cutting edge forming an angle of 45° with the axis of the drill; means for retaining said drill and for rotating same relative to drill guide means; drill guide means comprising a guide plate having a bore extending therethrough dimensioned to guidingly and rotatably receive said drill during the operation thereof; and reticle means for measuring the width of circular bands formed in the layer or drilled by said drill.

4,235,019

SELFCENTERED AUTOMATIC COORDINATE MEASURING MACHINE

Chi L. Cho, Feldblumenweg 47, Zurich, Switzerland (8048)

Continuation of Ser. No. 853,443, Nov. 21, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 962,995
Claims priority, application Switzerland, Nov. 20, 1976, 14678/76; Nov. 3, 1977, 13487/77
Int. Cl.³ G01B 5/20
U.S. Cl. 33—174 TA **18 Claims**



1. Apparatus for precisely positioning a workpiece having a zero line relative to a pair of intersecting reference axes using first and second physically identified workpiece reference points positioned at known locations relative to the workpiece zero line, comprising

(a) a clamp plate defining a predetermined pattern of clamp plate reference points;

(b) work clamping means for mounting the workpiece on said clamp plate in a predetermined position in which the first workpiece reference point is in precise alignment with a selected one of said clamp plate reference points;

(c) base means for supporting said clamp plate for translational movement of said clamp plate along the pair of intersecting measurement axes, said base means defining a pattern of base means reference points corresponding on a one-to-one basis with the pattern of clamp plate reference points;

(d) mounting error correction means for bringing the zero line of the workpiece into a known position relative to the two intersecting measurement axes by correcting any rotational error in mounting of the workpiece relative to said base means, said mounting error correction means including

(1) bearing means for mounting said clamp plate relative to said base means in a manner to permit universal uniplanar movement relative to said two intersecting measurement axes,

(2) pinning means for pinning said clamp plate to said base means in a manner to permit only rotational movement within the plane of uniplanar movement defined by said bearing means about a rotational axis passing through said selected one clamp plate reference point with which the first workpiece reference point is precisely aligned,

(3) holding means for operating in a first position to prevent said clamp plate from rotating relative to said base means and for operating in a second position to permit said clamp plate to rotate about the rotational axes defined by said pinning means while being supported by said bearing means,

(4) measurement reference defining means for defining a measurement point, said measurement reference defining means including a reference point indicator physically alignable with the workpiece reference points when the workpiece is clamped to said clamp plate by said work clamping means, and

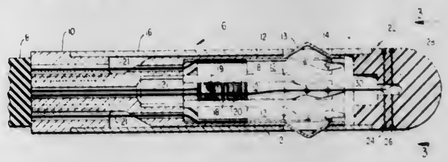
(5) displacement measurement means for measuring the displacement of said base means along the pair of intersecting measurement axes whereby rotational error in the mounting of the workpiece may be corrected by (1) aligning said reference point indicator with the first workpiece reference point after the workpiece is clamped to said clamp plate by said work clamping means and said clamp plate is pinned to said base means by said pinning means, (2) displacing said base means along the pair of intersection axes by the known relative displacement of said workpiece reference points, (3) rotating said clamp plate about the rotational axis defined by said pinning means when said holding means is in said second position to bring the second workpiece reference point into alignment with said reference point indicator, and (4) moving said holding means to said first position to hold said clamp plate and thus the workpiece in a fixed orientation relative to said base means.

4,235,020

INSPECTION SYSTEM FOR HEAT EXCHANGER TUBES

Clarence E. Davis, and Daniel Hoyniak, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 2, 1979, Ser. No. 35,190
Int. Cl.³ G01B 7/12, 7/34
U.S. Cl. 33—178 F **6 Claims**



1. In an apparatus for inspecting a heat exchanger tube, a scanner adapted to be drawn through the tube having a cylindrical body portion, a first flexure spring having one end anchored to said body portion adjacent its outer circumference and a free end contacting the interior wall of said tube as the

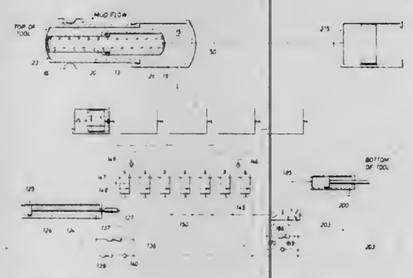
scanner is drawn through said tube, a first bi-axial strain gauge connected to said flexure spring having one winding predominantly responsive to the flexing of said flexure spring and the other winding predominantly responsive to the temperature of said strain gauge connected in series across a source of potential, a voltage divider having two windings connected in series across said source of potential and means generating a signal corresponding to the difference in the potentials of the connection between said strain gauge windings and the connection between the voltage divider windings.

4,235,021

MEASURING WHILE DRILLING TOOL

Jack R. Claycomb, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 16, 1978, Ser. No. 887,225
Int. Cl.³ E21B *47/022*
U.S. Cl. 33—307 **34 Claims**



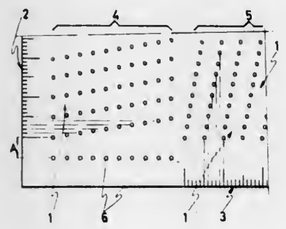
1. A device for forming a mud flow modulated signal installable in a drill string, the device comprising:
(a) An elongate, hollow, outer body adapted to be connected in a drill string;
(b) An elongate, tubular inner body received within said outer body;
(c) Means positioning said inner body in said outer body to form an annular space between said inner body and outer body directing mud flow through said annular space;
(d) A closed, hydraulic reservoir in said inner body and exposed to the mud flow through said annular space;
(e) Pressure responsive means connected to said closed, hydraulic reservoir for limiting the pressure of hydraulic fluid placed in said reservoir.
(f) Hydraulic fluid line means extending from said reservoir for delivering hydraulic fluid under pressure;
(g) A piston in a cylinder;
(h) Constriction means in said annular space which directs the mud flow therethrough which constriction means is located in said outer body and which further directs the mud flow downwardly through said outer body;
(i) Plug means extending into said constriction means for varying the mud flow permitted through said constriction means, said plug means being movable by said piston relative to said constriction means;
(j) Control valve means connected to said piston and cylinder for controllably delivering hydraulic fluid thereto from said hydraulic line means for controllably moving said piston in said cylinder;
(k) Transducer means adapted to respond to a variable of interest and which transducer means receives hydraulic fluid and encodes the variable in a fluid quantity at least partially dependent on the variable of said transducer means;
(l) Value means associated with said transducer means for delivering fluid from said transducer means to said control valve means to controllably open said control valve; and
(m) means for periodically supplying said transducer means with hydraulic fluid.

4,235,022

DEVICE FOR LINEAR DRAWING

Jose M. Fernandez Aldape, Doctor Areilza, 55-40 A, Bilbao, Spain

Filed Feb. 6, 1979, Ser. No. 10,676
Claims priority, application Spain, Feb. 23, 1978, 234.191[U]
Int. Cl.³ B43L *13/00*
U.S. Cl. 33—474 **5 Claims**



1. A drawing device which is used for linear drawing comprising:
a rectangular plate having first and second straight edges which are perpendicular to each other, each having a scale thereon;
a first group of holes arranged in a first plurality of parallel lines which are disposed oblique to said respective first edge of said plate, each of said holes corresponding to a measurement marking on said scale of said first edge;
a second group of holes arranged in a second plurality of parallel lines which are disposed oblique to said respective second edge of said plate, each of said holes corresponding to a measurement marking on said scale of said second edge;
a row of holes located so as to define a straight line which is parallel to said second edge, said holes of said row being aligned with aligned holes of said first group of said holes so as to define lines which are parallel to said first edge and cross said obliquely disposed first plurality of parallel lines, each of said holes of said row comprising means for defining the center of a radius of a circumferential line to be drawn by inserting holding means into a respective said hole of said row and inserting marking means in which said respective hole of said row into a hole of the respective said line is included and which is parallel to said first edge, so that said plate may be rotated by said marking means about said holding means in said radius defining hole for drawing a circumferential line having a specified radius; and
an L-shaped set square for use in combination with said plate, wherein said oblique angle extending lines of holes can be used for drawing both laterally extending and respective orthogonally extending parallel lines, by respectively sliding said plate, with a marking means respectively inserted in a respective one hole of one of the holes of said oblique lines of holes, along and in contact with the corresponding edge of said set square.

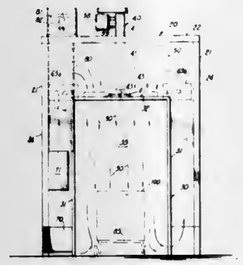
4,235,023

HIGH HEAT TRANSFER OVEN

Willie H. Best, 18C The Heritage, Columbia, S.C. 29201

Filed Jun. 16, 1978, Ser. No. 916,214
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—31 **38 Claims**

1. An oven for drying objects passed therethrough comprising:
(a) a housing having opposed side walls and a top wall forming a roof defining an interior within which said objects are disposed;
(b) heating means for heating the air of said housing; and
(c) a fan assembly for said housing, said fan assembly having a fan with an air discharge front side and an air intake back side disposed within the interior of said housing for delivering air directly from its air discharge side in a turbulent condition against said objects and for circulating the air in essentially unobstructed paths back to the air intake side,



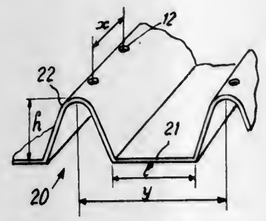
a relatively minor portion of the air passing in heat exchanging relationship to said heating means, a shaft being disposed adjacent to said one of the walls, the inner end of said shaft being connected to said fan, means for journalling said shaft for rotation about its axis, and motor means for rotating said shaft.

4,235,024

FLUIDIZED BED TREATMENT APPARATUS

Raymond Chauvin, Verneuil en Halatte, and Pierre Guillon, Paris, both of France, assignors to Charbonnages de France, Paris, France

Filed Nov. 21, 1978, Ser. No. 962,805
Claims priority, application France, Nov. 22, 1977, 77 35034
Int. Cl.³ F26B *17/00*
U.S. Cl. 34—57 A **3 Claims**



1. In an apparatus for producing a treatment bed consisting of solid particles which are simultaneously subjected partly to a fluidization action and to an at least horizontal circulatory movement therein, said apparatus comprising
a fluidization container,
intake means and
a distributor for the fluidization agent which supplies only part of the bed, and
means for setting up vibrations in the container in a substantially rectilinear manner at an angle of 0 to 80 degrees to the horizontal,
the improvement wherein the fluidization agent distributor consists of a plate comprising a plurality of rows of upwardly directed vents arranged alternating with a plurality of rectilinear unvented strips, the rows of vents and the strips being parallel to the vertical plane in the direction of the vibrations, and wherein said plate is undulated at right angles to the direction of the rows of vents and the strips and rows of vents are positioned substantially at the top of the undulations,
said apparatus, in operation, establishing therein non-fluidized zones of particles adjacent and rectilinear unvented strips, the balance of the particles being fluidized and said non-fluidized zones of particles moving longitudinally in a direction opposite said fluidized particles.

4,235,025

KNEE JOINT FOR ANTHROPOMORPHIC DUMMY

James O. Kortge, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 26, 1979, Ser. No. 61,018
Int. Cl.³ G09B *23/32*
U.S. Cl. 35—17 **1 Claim**



1. A knee joint for an anthropomorphic dummy comprising, in combination:
a femur member having a cylindrical pivot bearing;
a tibia member having a cylindrical socket adapted to receive the femur pivot bearing therein, the radius of the socket being greater than that of the pivot bearing to allow translational movement therebetween;
resilient locating means between the pivot bearing and socket tending to restore the same to a substantially coaxial relationship;
a plurality of pivotably linked arms defining a parallelogram with four apexes, a first and second of the arms being parallel and further being connected pivotably, each at one of two adjacent apexes, to the tibia member and being further connected pivotably, each at one of the other two apexes to a third arm, the third arm being centrally, pivotably supported by the femur coaxially with the pivot bearing, the plurality of arms thereby being effective to link the femur and tibia members, allow rotation and shearing translation therebetween in a direction substantially perpendicular to the tibia member, prevent translation therebetween in a direction not substantially perpendicular to the tibia member and indicate, through movement of the first or second arm relative to the tibia member, the amount of shearing translation.

4,235,026

ELASTOMERIC SHOESOLE

Stanley C. Plagenhoef, Amherst, Mass., assignor to Motion Analysis, Inc., Amherst, Mass.

Filed Sep. 13, 1978, Ser. No. 941,775
Int. Cl.² A43B *13/04, 13/18, 13/20*
U.S. Cl. 36—32 R **10 Claims**



1. An elastomeric shoe bottom comprising a unitary molded structure defining a forepart, shank and heel having an imperforate zone of less than half the thickness at the top side for attachment to an upper and an imperforate zone of less than half the thickness at the bottom side constituting a tread surface, said structure containing intermediate the imperforate top and bottom zones in the region of major impact at the outer side of the heel longitudinally-spaced, parallel openings ex-

tending from the outer side face transversely substantially at right angles to the longitudinal center line, but terminating short of the inner side face of the heel, said openings defining an area at the top side of the heel area at the outer side of the longitudinal center line of the heel which is less in area than the entire heel area which yields at a predetermined pressure to a greater degree than the area at the inner side of the longitudinal center line of the heel.

4,235,027

LAMINATED INSOLE

Tej K. Singh, Baildon, England, assignor to Associated Paper Industries Limited, London, England

Continuation-in-part of Ser. No. 817,000, Jul. 19, 1977, Pat. No. 4,137,110. This application Jan. 29, 1979, Ser. No. 7,529
The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.
Int. Cl.[3] A43B *13/38*; B32B *5/32*
U.S. Cl. 36—44 **2 Claims**

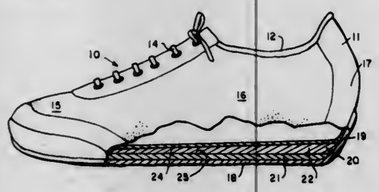
1. An air-permeable wear-resistant insole comprising a web or matt layer of fibres loaded with active carbon and bonded thereto a wear-resistant fabric which is different from and has greater wear-resistance than said web or matt layer, the ply bond strength of said bond between said wear-resistant fabric and said web or matt of fibres being greater than the ply bond strength of said web or matt of fibres itself, said insole being produced by a process which comprises the steps of forming a web or matt layer of fibres loaded with active carbon by an air-laying method onto said wear-resistant fabric, effecting a first impregnation of said web or matt layer of fibres with a latex binder and effecting migration of said binder from the interior of said web or matt to the surfaces thereof, and curing said binder by the application of heat whereby to form an air-permeable insole, improving the bonding between said web or matt and said wear-resistant fabric without lowering the permeability of the web or matt to the point where it fails to achieve its intended object, by effecting a second impregnation by coating the outer surface of said wear-resistant fabric section of said insole with a latex binder which contains a sufficient amount of wetting agent to effect a controlled penetration of said binder through said wear-resistant fabric and into the surface of the web or matt attached thereto but an insufficient amount of said wetting agent to cause complete penetration through to the web or matt layer and curing the said binder by the application of heat.

4,235,028

ORTHOTIC STABILIZER FOR ATHLETIC SHOE

Donnie E. Riggs, 1606 Monteval Ct., San Jose, Calif. 95120

Filed Oct. 30, 1978, Ser. No. 955,978
Int. Cl.[2] A43B *21/36*
U.S. Cl. 36—80 **6 Claims**



1. In combination with a shoe having an upper portion having inner surfaces to receive the foot and a midsole; an orthotic stabilizer comprising:

a semi-pliable body having a concave upper surface formed to receive and cradle the heel and back two-thirds of the foot;

side edges fixed to said body extending upwards along the sides of the foot; and

said side edges having outer surfaces formed to fit the inner surfaces of the shoe upper portion and terminating with upper edges;

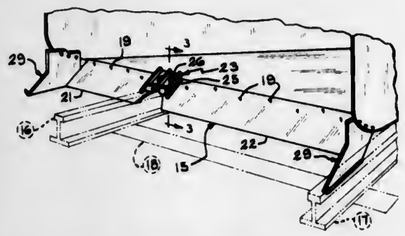
said body having a bottom surface formed to fit the top surface of said midsole and including an aperture extending between the top and bottom surfaces and centered beneath the calcaneous region of the foot whereby said stabilizer will distribute the shock of running over the rear bottom and side portions of the foot.

4,235,029

MACHINE FOR CLEANING RAILWAY TRACKS

Raymond Ulm, R.R. 1, Delphos, Ohio 45833

Filed Aug. 3, 1979, Ser. No. 63,468
Int. Cl.[3] E01B *27/02*
U.S. Cl. 37—104 **3 Claims**



1. A machine for cleaning debris from railway roadbeds, particularly from between the rails of a track and between adjacent tracks, said machine comprising:

(a) a tractor having a short turning radius and wheels of such size that said tractor is capable of crossing railway tracks,

(b) a scraper-loader, having wheels and a load-carrying compartment which has a horizontally-extending, open front end,

(c) power means for raising and lowering the front end of said compartment relative to the level of said wheels,

(d) a scraper blade mounted on said scraper-loader at the front end of said compartment and having

(1) a notch therein which loosely embraces one of the rails of the track,

(1) two wings extending in opposite directions from the notch and having horizontally aligned lower edges, the first one of said wings having a length substantially equal to but no greater than the distance between the flanges of the rails of a track, and the second of said wings having a length at least equal to half of such distance,

(e) a shoe mounted on said blade in overlying position relative to the notch in said blade, said shoe

(1) having a notch which closely embraces one of the rails, and

(2) a bearing surface at the base of the notch which rides on the wheel-engaging surface of said rail,

(f) means for clamping said shoe in various adjusted positions relative to the lower edge of said blade, and

(g) articulated pivot means connecting said tractor and said scraper-loader.

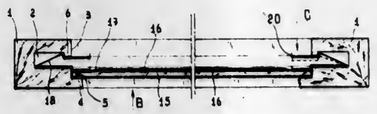
4,235,030

ASSEMBLY IN TWO PARTS WITH WHICH TO CONSTRUCT FRAMES

Pietro Astolfi, Casalecchio, Italy, assignor to Pico-Glass S.n.c. di Beatrice Huber & C., Bologna, Italy

Filed Feb. 27, 1979, Ser. No. 15,881
Claims priority, application Italy, May 23, 1978, 3448 A/78
Int. Cl.[3] G09F *1/12*
U.S. Cl. 40—156 **2 Claims**

1. A picture frame assembly including an elongated strip having an inwardly facing side, from which a positioning ledge extends, an internal holding slot extending along the length of said elongated strip, an abutment surface defining an upper portion of the inner extent of said holding slot, an access slit communicating the remaining portion of the inner extent of said holding slot with the inwardly facing side of the elongated strip, clip means including a V-shaped portion positioned in said holding slot and including a spring-like panel extending diagonally across said holding slot and joined at an apex to a bottom panel engaged with the bottom of the slot, a downwardly extending upper tooth connected to the end of the spring-like panel opposite the apex and engaging the abutment surface and a downwardly extending lower tooth extending downwardly from the edge of the bottom panel opposite the apex for engaging an inwardly facing surface of the elongated strip and clamping means extending inwardly from the lower tooth toward the interior of the frame for planar engagement with planar items mounted in the frame externally of the inwardly facing side of the frame and urging said planar items toward said positioning ledge.

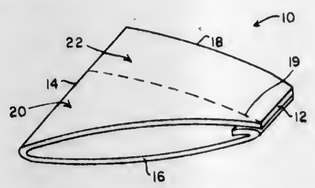


4,235,031

INDEX TAB AND METHOD OF MAKING SAME

Henry Aguilar, 61 Garcia Ave., San Francisco, Calif. 94127

Filed Dec. 7, 1978, Ser. No. 967,216
Int. Cl.[3] B42F *21/00*
U.S. Cl. 40—360 **2 Claims**



1. An index tab for attachment to at least one sheet of paper comprising, a generally flat, tubular body having a lengthwise seam, the body being trapezoidal in shape with two opposed, closed parallel sides of unequal length aligned with the body seam and two non-parallel ends transverse to said sides, with at least one of said ends being open, said body having a paper enclosing portion receptive to a triangular corner of a sheet of paper at said open end and a projecting body portion which projects outwardly from an edge of said sheet of paper, a portion of the longer of said two parallel sides being coextensive with a side of said triangular corner, but the shorter of said parallel sides preventing said triangular corner from entering said projecting body portion.

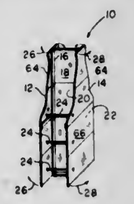
4,235,032

POINT-OF-SALES DISPLAY

Robert G. Robinson, 366 N. Broadway, Jericho, N.Y. 11753

Filed May 3, 1979, Ser. No. 35,788
Int. Cl.[3] G09F *1/08*
U.S. Cl. 40—539 **1 Claim**

1. A product point-of-sales display of the type that is unfoldable from a compact storage condition into an erect self-standing condition, said display comprising a rectangular interconnecting member having attaching flaps along opposite sides thereof delineated by vertically oriented fold lines spaced inwardly and along said opposite sides, a cooperating pair of product-display panels of cardboard construction material each die-cut about its perimeter in the shape of a selected product and disposed in facing relation to each other by each being adhesively secured to a cooperating one of said attaching flaps, said bottom edges of said pair of product-display panels and said interconnecting member cooperating in said erect condition of said display to define an H-shaped configuration for establishing contact with a support surface so as to render said display self-standing, plural elastomeric means connected in spanning relation between locations on said product-display panels so as to exert a biasing force effective to urge said product-display panels into said H-shaped configuration, said product-display panels being foldable about said fold lines of said attaching flaps bodily upon said interconnecting member in opposition to said biasing force of said elastomeric means preparatory to providing said display with said compact storage condition, and fold lines of horizontal orientation in relation to said interconnecting member and said product-display panels provided in spaced-apart locations therein, whereby said display is adapted to be accordion folded along said horizontal fold lines for completing said compact storage condition for said display and for maintaining said opposition to said elastomeric means biasing force so as to obviate the inadvertent unfolding movement of said product-display panels into said H-shaped configuration while said display is in said compact storage condition.



4,235,033

POLYSTYRENE PADDLE SIGN

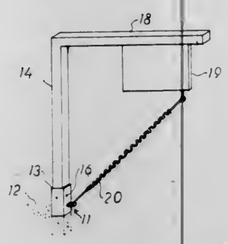
Steven P. Eilers, 11711 Wayside Ave., Louisville, Ky. 40243

Filed Jan. 17, 1979, Ser. No. 4,043
Int. Cl.[3] G09F *21/02*
U.S. Cl. 40—586 **5 Claims**



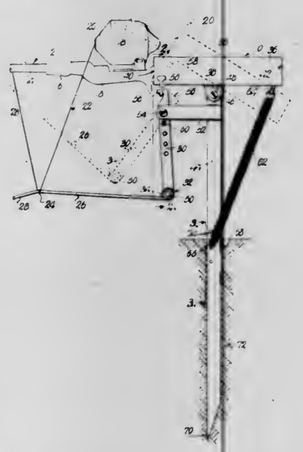
1. A portable sign consisting of a unitarily constructed member of lightweight plastic having a density of 1 to 5 lbs. per cubic foot, said member having a raised face with selected portions having indentations therein being arranged to provide preselected messages to an observer, said member further including a handle unitary therewith.

4,235,034
REMOVABLE SIGN POST HOLDING APPARATUS
John W. Black, 1940 Papago, Sheridan, Wyo. 82801
Filed Aug. 31, 1979, Ser. No. 71,767
Int. Cl.³ G09F 7/18
U.S. Cl. 40—607 12 Claims



1. A removable sign post holding apparatus including a body portion having a post-receiving opening, a plurality of ground-engaging sections extending downwardly from the periphery of said body portion, a connector section extending outwardly from said body portion, an opening in said connector section, a removable cap portion engageable with the post-receiving opening of said body portion, said cap portion including an anvil section of a size larger than the opening of said body portion, a plurality of flange sections extending from said anvil section, said flange sections being of a length adjacent said anvil section less than the corresponding portion of said body portion and are engageable with a surface of said corresponding portion.

4,235,035
TRIPABLE FISHING ROD HOLDER
James R. Guthrie, 430 E. Vest St., Marshall, Mo. 65340
Filed Nov. 17, 1978, Ser. No. 961,636
Int. Cl.³ A01K 91/06
U.S. Cl. 43—15 3 Claims



1. For fishing tackle having a rod, a handle and a reel on the rod, a line leading from the reel to the rod and a loop in the line, an automatic fish snagger comprising:
an elongated normally upright ground stake;
an elongated, normally horizontal, movable handle support on the stake and having an eyelet thereon;
a coil spring interconnecting the stake and the support for yieldably biasing the latter in one direction;
an elongated, releasable latch pivoted to the stake and including a hook normally engaging said eyelet for holding said support against movement in said one direction; and
an elongated, normally horizontal, loop-receiving trip on the latch for releasing the latter in response to said fish tugging on said line,
said stake having a series of openings spaced along its length for selective reception of said spring to vary the tension of the latter, and said latch having a series of holes spaced along its length for selective reception of said latch pivot for varying the sensitivity of the release of the hook from the eyelet.

4,235,036
FISHING LINE SIGNAL DEVICE
Titus C. Dawson, 3322 Glen Haven, Dallas, Tex. 75211
Filed Feb. 1, 1979, Ser. No. 8,414
Int. Cl.³ A01K 97/12
U.S. Cl. 43—17 6 Claims

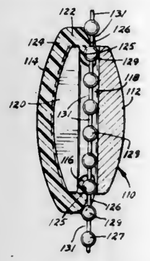


1. An apparatus for signaling the bite of a fish on a fishing line, comprising;
a housing;
a contact means mounted to the housing;
an arm mounted to the housing adjacent to said contact means, the arm being biased toward the contact means so that it is in electrical contact with the contact means while in its natural state;
electrical signal means mounted in the housing and electrically connected to the arm and contact means for providing a signal when the arm is in electrical contact means; and
a cord secured between the end of the arm and a holding means for maintaining the cord sufficiently taut to draw the arm away from the contact means, the holding means being responsive to a jerk on the fishing line to release tension on the cord to allow the arm to contact the contact means to provide a signal.

4,235,037
FISH LINE SINKER
John W. Sivertsen, Minneapolis, Minn., assignor to Carlton F. Peterson, Rush City, Minn., a part interest
Filed Apr. 5, 1979, Ser. No. 27,510
Int. Cl.³ A01K 95/00
U.S. Cl. 43—44.91 3 Claims

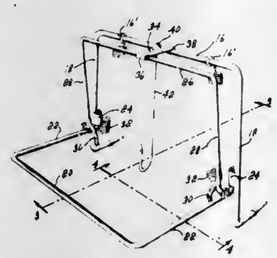
1. A fish line sinker including:
A. a sinker body having a central longitudinal opening extending therethrough and having a longitudinally extending slot open from the central opening to the outside of the sinker body from one end of the central opening to the other;
B. a fish line retaining clip having an ear pivotally mounted with respect to each end of the sinker body central opening and having a longitudinally extending bow integrally connected between said ears;

C. means tending to maintain said retaining clip in alignment with said sinker body slot, said means being manually disengageable to effect rotation of said body with respect to said clip;
D. each of said retaining clip ears being provided with a fish line receiving slot outwardly positioned on its ear of shape and size to receive a fish line and to position it within said sinker body central opening when said clip is aligned with said body opposite said longitudinally extending sinker



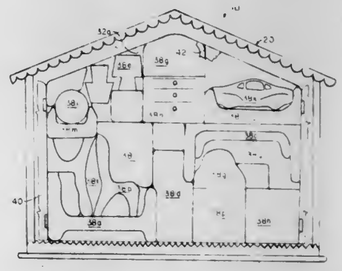
body slot and said fish line receiving slots in said retaining clip ears being of shape and size to confine the fish line within the body central opening when the retaining clip is aligned with the sinker body slot; and
E. said retaining clip ears each being provided with a part spherical cavity in concentric alignment with its line receiving slot, said cavities and said slot being of configuration to snugly receive a fish line and a pair of cylindrical balls situated in concentric alignment with said fish line.

4,235,038
ANIMAL TRAP
Claude Sauvageau, Notre-Dame-de-la-Merci, Quebec, Canada
Filed May 18, 1979, Ser. No. 40,191
Int. Cl.³ A01M 23/30
U.S. Cl. 43—82 4 Claims



1. An animal trap comprising:
(a) a frame made of a U-shaped rod or wire defining a cross member between two parallel legs, and wherein the two legs of the frame have pointed ends for insertion into a tree or into the ground;
(b) a stationary jaw mounted on the frame;
(c) a movable jaw pivotally mounted on the stationary jaw, said movable jaw being a U-shaped rod or wire defining a cross member between two parallel legs, and wherein the cross member between the legs of both the frame and the movable jaw are substantially parallel to each other when the animal trap is set with the legs thereof extending downwardly;
(d) a vertical lever secured to the end of each leg of said movable jaw;
(e) tension springs attached between the cross member of said frame and the ends of said levers for moving said movable jaw in contact with said stationary jaw, said levers serving to increase the leverage action of the springs;
(f) a trigger element interconnecting the cross members of the frame and of the movable jaw, said trigger element being in the shape of a flat strip having the ends thereof slightly curved inwardly to hold said cross members together when the trap is set; and
(g) a bait holder rigidly depending from said trigger element, whereby a slight displacement of the bait by an animal will disengage the trigger element from the movable jaw to release the trap.

4,235,039
PLAY DOLL HOUSE AND FURNITURE PUZZLE
Lula M. Brooks, 10316-111 Place North, Largo, Fla. 33543
Filed Feb. 12, 1979, Ser. No. 11,178
Int. Cl.³ A63H 33/00
U.S. Cl. 46—12 1 Claim



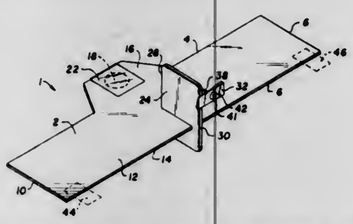
1. In an assemblage of play doll house and furniture, the improvement comprising: the furniture including a plurality of furniture pieces of various sizes but all having spaced surfaces defining one common dimension; the play doll house having an interior space containing the plurality of furniture pieces in puzzle-type nesting array with the respective spaced surfaces of each of the plurality of furniture pieces being in respective planar relation with those of the other furniture pieces of said plurality, the plurality of furniture pieces comprising a variety of types of furniture pieces, plural of which have curvilinear shape, the interior space having enclosing roof, floor, sidewalls and an end wall, of the play doll house, with the end wall defining a said planar relation of the furniture pieces in puzzle-type nesting array, said puzzle-type nesting array of furniture forming an outline shape substantially fitting said interior space, said roof being a gable roof and said interior space having a shape with a single axis of symmetry through the gable roof, the plurality of furniture pieces forming an asymmetrical pattern within said outline shape, means providing first and second degrees of difficulty in assembling the furniture pieces in puzzle-type nesting array in respective first and second orientations one hundred and eighty degrees apart about said single axis of symmetry, including pattern indication means on said end wall, a door on said play doll house defining a second said planar relation of the furniture pieces in puzzle-type nesting array and operable for retaining the furniture pieces in the play doll house, and the play doll house having a recognizable-style exterior such as Swiss Chalet style.

4,235,040
MODEL AIRPLANE
Howard W. Trowbridge, Box 13, Vavenby, British Columbia, Canada (V0E 3A0)
Filed Feb. 12, 1979, Ser. No. 11,760
Int. Cl.³ A63H 27/00; A63B 65/00
U.S. Cl. 46—79 7 Claims

1. A model airplane comprising:

a flat wing with two wing-tips, a front, a back and a top surface;

a flat stabilizer connected to the wings generally midway between the wing-tips, the stabilizer extending perpendicularly away from the top surface of the wing and extending from near the back of the wing towards the front of the wing and having a rear edge; and



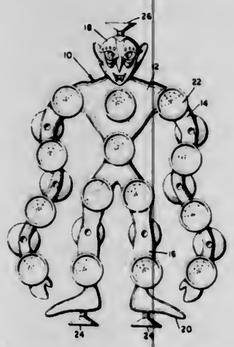
a freewheeling vane connected to the rear edge of the stabilizer and spaced-apart from the top surface of the wing, the vane being rotatable by air about an axis which is generally parallel to the direction of flight of the model airplane, whereby, after the model airplane is tossed in said direction, the vane lifts the front of the wing so the wing planes the air and the airplane flies in a loop, returning to a person who threw it.

4,235,041

FIGURE TOY

Roger H. Sweet, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 22, 1979, Ser. No. 13,855
Int. Cl.³ A63H *13/00*
U.S. Cl. 46—115 **8 Claims**



6. A figure toy comprising a body, a head, two arms, two legs, two feet, and a plurality of suction cups affixed to both the front and back surfaces of said arms and legs, all parts thereof being molded as a single unitary structure.

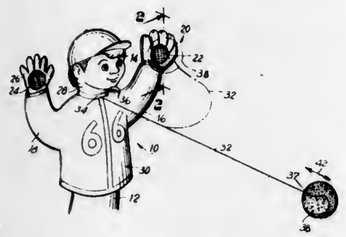
4,235,042

TOSS AND CATCH HAND PUPPET

Isaac Hills, c/o Rincon Mfg. Co., Inc., 168 39th Street, Brooklyn, N.Y. 11232

Filed Jun. 11, 1979, Ser. No. 47,329
Int. Cl.³ A63H *3/14*
U.S. Cl. 46—154 **19 Claims**

1. A toss-and-catch manipulative hand puppet comprising a puppet, said puppet having a hollow body and two opposed hollow limbs, and an object, said limbs extending from said body, so that a human hand is receivable in said hollow body with a different finger of said human hand extending into each of said hollow limbs, a flexible elastic string, one end of said string being connected to a point on said puppet, the other end of said string being connected to a point on said object, a flexible hook patch, and a flexible pile patch, one of said



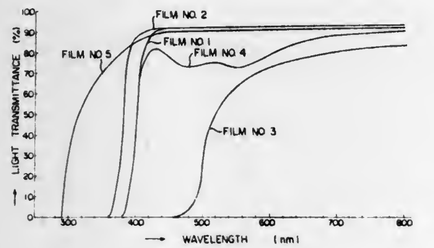
patches being secured to the outer surface of said puppet, the other of said patches being secured to the outer surface of said object.

4,235,043

METHOD FOR CULTIVATING ALGAE AND A COVERING MATERIAL USED THEREFOR

Isamu Harasawa, Kiyose; Yukio Hariki, Funabashi; Katsuhiko Maeda, and Kouichi Nakamura, both of Uozu, all of Japan, assignors to Nippon Carbide Kogyo Kabashiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1979, Ser. No. 20,507
Claims priority, application Japan, Oct. 28, 1978, 53-132116
Int. Cl.³ A01G *7/00*
U.S. Cl. 47—1.4 **9 Claims**



1. A method for cultivating an alga, which comprises growing the alga in a light field substantially free from light of wavelengths of not more than 340 nm.

4,235,044

SPLIT STREAM METHANATION PROCESS

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,815
Int. Cl.² C10K *3/04*; C10J *3/00*
U.S. Cl. 48—197 R **32 Claims**

1. An improved process for the methanation of synthesis gas comprising:

(a) dividing a synthesis gas stream containing hydrogen and carbon monoxide and having an H_2/CO ratio of less than 3/1 into two separate processing streams;

(b) reacting the first of said separate processing streams essentially to completion with steam in a water gas shift zone, thereby producing a converted gas stream containing carbon dioxide and hydrogen;

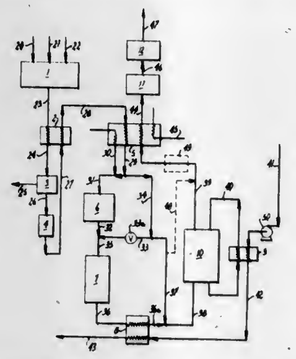
(c) adding a portion of the second, unconverted, separate processing stream to said converted gas stream to produce an adjusted gas stream having a carbon monoxide content of-from about 3% to about 6% by volume, said adjusted gas stream having a high H_2/CO ratio in excess of 3/1 and a high hydrogen content;

(d) adiabatically reacting said adjusted gas stream in a high temperature adiabatic reaction zone to form an effluent gas stream containing methane, excess hydrogen and steam, said effluent gas stream having a temperature on the order of about 1000° F.;

(e) cooling said effluent gas stream from the adiabatic reaction zone by passing said stream in heat exchange with high pressure steam, said effluent gas stream being cooled to from about 500° F. to about 850° F. and thereby producing high pressure superheated steam;

(f) mixing said cooled effluent gas stream and the remaining portion of said second, unconverted, separate processing stream to form a reaction mixture having a H_2/CO ratio on the order of 3/1;

(g) passing said reaction mixture to an isothermal methanation zone maintained at a methanation temperature of



from about 500° F. to about 850° F., essentially all of the carbon monoxide present in said reaction zone being converted to methane; and

(h) cooling the methane-rich effluent gas stream from said isothermal zone in a condensation zone to condense water therefrom,

whereby methane can be produced without undesired catalyst sintering and carbon deposition in the high temperature adiabatic reaction zone, said CO adjustment enabling the CO concentration in said reaction zone to be readily maintained in continuous production operations despite variations in the CO output of the shift zone as a result of catalyst aging and/or fluctuations in the feed gas stream to said shift zone, the high hydrogen to carbon monoxide ratio serving also to drive the adiabatic methanation reaction to near completion and obviating the need for extensive recycle of the effluent from the adiabatic methanation zone, the production of high pressure superheated steam enhancing the efficiency of the overall synthesis gas-methanation production operation.

4,235,045

X-RAY FILM CASSETTE PASS-THROUGH

Edward Nineberg, Evanston, Ill., assignor to Consolidated International Corp., Chicago, Ill.

Filed Jun. 15, 1978, Ser. No. 915,598
Int. Cl.³ E06B *3/34*
U.S. Cl. 49—41 **8 Claims**

1. A pass-through structure for enabling X-ray film cassettes and the like to be transferred from one area to another through a dividing wall, comprising

(a) an outer stationary drum adapted to be mounted in an opening in the said wall,

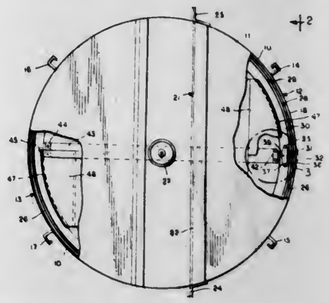
(b) a first opening in said outer drum located on one side of the said wall,

(c) a second opening in said outer drum located on the opposite side of the said wall,

(d) a stationary supporting surface in said outer drum on which cassettes to be transferred may be placed through one of said openings,

(e) an inner drum rotatably mounted within said stationary outer drum,

(f) an opening in said inner drum adapted to be aligned with said first opening in said outer drum when in a first rotated position thereof, and aligned with said second opening in said outer drum when rotated to a second position thereof,



(g) means providing two stationary compartments within said inner drum and around which said inner drum is adapted to rotate, and accessible through the openings in said outer drum and the opening in said inner drum when in alignment therewith,

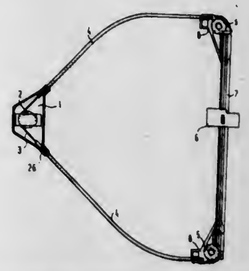
(h) whereby, cassettes deposited through aligned openings into one of said compartments and onto said supporting surface on one side of the wall when said inner drum is in one of said positions thereof, may be removed from the same compartment through aligned openings on the other side of the wall when said inner drum is in the other position thereof.

4,235,046

WINDOW OPERATING MECHANISM

Hans-Peter Hees, Coburg, and Wolfgang Schultheiss, Frohnlach, both of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co. KG, Coburg, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,402
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2750904
Int. Cl.² E05F *11/48*
U.S. Cl. 49—352 **10 Claims**



1. In a motor vehicle window lifting mechanism including a cable drum, a cable wound about said drum, a Bowden cable sheath for guiding cable provided from said drum over a looped path, means for driving said drum so that said cable can be moved in either direction through said looped path, a drive member fixed to said cable for transmitting movement to a

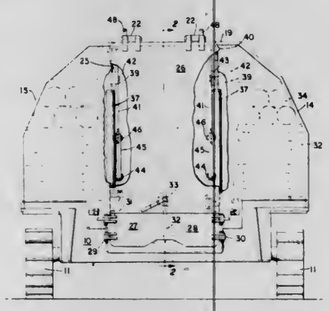
window to be operated, and a guide rail for guiding said drive member, the improvement comprising tensioning means for compensating for variations produced in the length of said cable when said cable is stressed, said tensioning means including a deflecting element which directly engages said cable and is mounted for movement relative to said sheath for applying compensating tension to said cable, and blocking means associated with said tensioning means for countering movement of said deflecting element in a direction in which tension applied to said cable by said tensioning means is released.

4,235,047

ARMORED DOOR OPENER FOR FIELD ARTILLERY AMMUNITION SUPPORT VEHICLE

John Turner, York, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed May 15, 1979, Ser. No. 39,172
Int. Cl.³ E05D 7/00
U.S. Cl. 49—371 **3 Claims**



1. A field artillery ammunition support vehicle comprising an armored body, an armored door closing a rear opening in said body, hinges having horizontal pivots mounting said door to a top of said body for vertical swinging movement of said door to a raised substantially horizontal position, and at least one door opener for said door disposed within said body and adjacent a side of said opening comprising a cylinder pivoted at an end thereof to a floor of said body and extending upwardly therein, a compression spring in said cylinder, a rod in said cylinder compressing said spring as said door is closed, and arm pivoted to said rod, a pivot for said arm on said body adjacent said opening, said arm rotating about said pivot and through said opening as said door is raised, a link pivoted to an outer end of said arm and a fifth pivot on said door connecting said link to said door, said opener being so constructed and arranged that said pivots but for said fifth pivot are aligned in an axis of said cylinder when said door is closed whereby said spring applies an increasing opening force as said door is opened necessary to open said door.

4,235,048

REVERSIBLE WINDOW UNIT FOR ALTERNATELY REFLECTING AND ABSORBING SOLAR ENERGY

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,448
Int. Cl.² E05D 7/02
U.S. Cl. 49—390 **17 Claims**

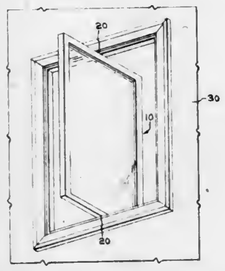
15. A reversible multiple glazed window unit for alternately reflecting and absorbing incident solar energy comprising:

a. at least two transparent substrates in facing relationship;

b. a reflective metal coating deposited on one of the substrates on a surface facing another substrate;

c. an absorptive coating, deposited on said metal, which reflects less and absorbs more incident solar energy than said metal, and which comprises, as its exterior surface, an antireflective material selected from the group consisting of silicon oxide, aluminum oxide and magnesium fluoride;

d. frame means for enclosing the substrates in an integral unit; and



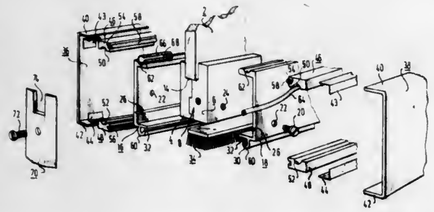
e. means for pivotally mounting the unit in a wall opening so that the unit may be rotated from one orientation to the opposite orientation.

4,235,049

EDGE FITTING ASSEMBLY FOR A PANEL

Mirko Marinoni, and Mario Marinoni, both of Magenta, Italy, assignors to Casma di B. Marinoni & Figli, Magenta, Italy

Filed Feb. 5, 1979, Ser. No. 9,430
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805258; Sep. 19, 1978, 2840727
Int. Cl.² E06B 7/16
U.S. Cl. 49—488 **16 Claims**



1. An edge fitting assembly for a panel comprising:

(a) a bar member elongated in a predetermined direction,

(1) said bar member having two narrow, longitudinal edge faces and a wide, longitudinal face connecting said edge faces,

(2) at least one of said edge faces being formed with a longitudinal groove;

(b) cover means having two first portions respectively enveloping said edge faces and a second portion enveloping said wide face, at least said first portion enveloping said edge face formed with a longitudinal groove defining a longitudinal groove opposite the groove of the enveloped edge face;

(c) securing means on said bar member for securing said bar member to the panel; and

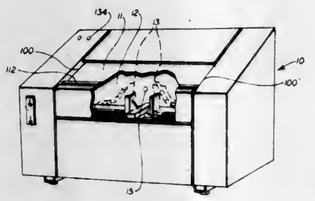
(d) a locking member simultaneously received in the opposite grooves of said edge face with a longitudinal groove and said first portion enveloping said edge face with a longitudinal groove and preventing movement of said second portion of said cover means away from said wide face of said bar member.

4,235,050

SKATE SHARPENING APPARATUS

James H. Hannaford, Calgary; Warren Myrfield, Aldergrove; David H. Weiler; Frederick N. Trofimenkoff, both of Calgary; Joseph A. Conway, and Donald M. Dobie, both of Calgary, all of Canada, assignors to Universal Skate Sharpener Ltd., Calgary, Canada

Filed Sep. 18, 1978, Ser. No. 943,525
Claims priority, application Canada, Jul. 13, 1978, 307281
Int. Cl.³ B24B 19/00
U.S. Cl. 51—34 D **16 Claims**



1. Grinding apparatus comprising in combination clamping means for securing a workpiece; a grinding wheel and means for mounting said grinding wheel to said clamping means for relative movement of said grinding wheel with respect to said workpiece;

sensing means for detecting the grinding resistance of said grinding wheel;

means for producing a biasing force for biasing said grinding wheel such that engagement of said grinding wheel with a surface of the workpiece may be controlled; and

coupling means, independent of said biasing force producing means and having a variable coupling coefficient and responsive to said sensing means, connected between said biasing force producing means and said grinding wheel so as to mechanically couple said biasing force producing means to said grinding wheel for controlling the biasing applied to said grinding wheel.

4,235,051

FINISHING COMPOUND FOR BARREL AND VIBRATORY SURFACE CONDITIONING OF FERROUS AND NON-FERROUS METALS

Paul Spekman, Jr., Bloomington, Minn., assignor to Fremont Industries, Inc., Shakopee, Minn.

Filed Jun. 21, 1979, Ser. No. 50,672
Int. Cl.³ B24B 1/00
U.S. Cl. 51—316 **3 Claims**

1. In the method of imparting a smooth finish to metallic components while subjecting said metallic components to a tumbling action within a finishing media, said method comprising:

(a) immersing a plurality of metallic parts in a treating enclosure containing a finishing media and wherein the media comprises abrasive particles and an aqueous working solution of a metal finishing compound, and wherein said metal finishing compound has a formulation:

Component	Percent by Weight
Tetrasodium salt of ethylene-diaminetetraacetic acid	0.2–2
Triethanolamine	5–15
Sodium salt of the amyl ester of a sulfur containing salt of oleic acid selected from the group consisting of the amyl ester of sulfonated oleic acid and the amyl ester of sulfated oleic acid	5–30
Coco diethanolamine condensation amide modified with tallow	

-continued

Component	Percent by Weight
fatty acid	5–20
Water	40–80

(b) subjecting said metallic components to a tumbling action; and

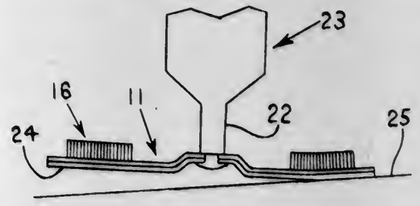
(c) removing a portion of said aqueous working solution from said enclosure and separating said aqueous working solution from entrained abrasive particles.

4,235,052

FAN DISC

Joseph L. Guidry, 219 Dolores, San Francisco, Calif. 94103

Filed Jan. 8, 1979, Ser. No. 1,882
Int. Cl.³ B24D 13/18; B24B 23/02; B24D 9/08
U.S. Cl. 51—358 **5 Claims**



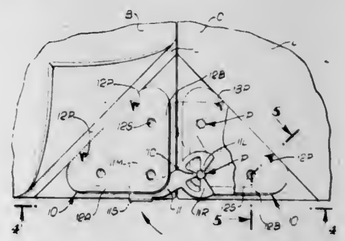
1. An improved backing disc having a front face adapted to engage an abrasive material adapted to be rotated in a predetermined direction and having a plurality of blades extending from a back surface thereof in angularly offset relation to radii of said disc in outward trailing relation to the direction of disc rotation characterized by each of said blades being formed of a plurality of elements of limited cross section together defining a blade which is deflectable upon impact with a solid object.

4,235,053

PROTECTIVE TABLE PAD LATCH

Norman J. Rosen, Altadena, Calif., assignor to Hylo Table Pad Co., Inc., Pasadena, Calif.

Filed Dec. 4, 1978, Ser. No. 966,342
Int. Cl.³ E04B 1/00
U.S. Cl. 52—127 **19 Claims**



1. A protective pad comprising

a plurality of protective surface pads of conventional construction adapted to overlie the top of a surface to be protected when placed on the surface in a side-by-side abutting relationship, each internal corner of each pad being provided with a corner plate secured within the pad intermediate the top and bottom surfaces of the pads, the corner plates for adjacent corners of abutting pads being arranged in the same horizontal plane, the corner plates comprising a pair of similarly defined plates secured to-

gether with a preselected spacing between the plates, the spacing being selected to permit a latch member to be freely moved between the spaced plates, each secured pair of plates including a post member secured to each plate adjacent to and inwardly of the internal corner of each pad arranged in abutting relationship, and

a latch member being adapted to be manually secured to and detached from the post member for one of the corner plates, without any tools, so as to be pivotable about the post member for latching engagement with the post member for the corner plate secured in the abutting pad to thereby latch the pads together so they move in unison, the latch member being essentially embedded in the pads when the latch member is swung into a latched position with said post members to thereby prevent scratching or marring the surface to be protected, the latch member being manually removable from a secured post member when it has been pivoted out of latching engagement with the post member for said abutting pad.

4,235,054

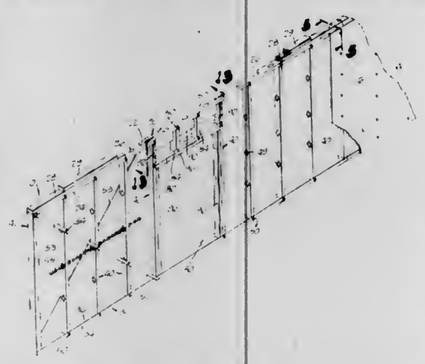
BUILDING WALL STRUCTURE

Daniel K. Cable, Lakewood, and Jack Doke, Los Angeles, both of Calif., assignors to Angeles Metal Trim Co., Los Angeles, Calif.

Continuation of Ser. No. 712,727, Aug. 9, 1976, abandoned, which is a continuation of Ser. No. 35,648, May 8, 1970, abandoned. This application Nov. 14, 1977, Ser. No. 851,289

Int. Cl.[2] E06B 1/04

U.S. Cl. 52—210 **12 Claims**



1. A lightweight, prefabricated wall section module transportable as an integral unit to a building site for erection on a floor in a building construction, said module being sufficiently flexible to conform to irregularities in said floor, said module comprising:

a plurality of vertically extending, flexible studs of non-planar cross-sectional shape, each of which studs is fabricated of lightweight strip steel having a thickness no greater than 18 gauge, said studs being free of reinforcing wood material along their lengths;

an elongated, normally horizontal, flexible floor track member of U-shaped cross section at least 10 feet in length embracing and secured by metal fasteners to the lower ends of said non-planar steel studs, said track member forming the bottom of said module during its transport and erection and being fabricated of lightweight strip steel having a thickness no greater than 18 gauge;

an elongated, normally horizontal, flexible cap member of U-shaped cross section at least 10 feet in length embracing and secured by metal fasteners to the upper ends of said non-planar steel studs, said cap member being fabricated of lightweight strip steel having a thickness no greater than 18 gauge;

and at least one elongated normally horizontal wooden top plate having a length substantially equal to that of said cap member and of said floor track member and extending in the direction of elongation of said steel cap member, said wooden top plate being secured to said cap member by fasteners extending between said wooden top plate and said steel cap member whereby said wooden top plate comprises an integral portion of said module and forms the top of said module during its transport to and erection at said building site;

the length of the module being greater than its height;

said transportable module being free of coextensive wall-surface material, during transportation of said module to said building site.

4,235,055

SYSTEM FOR ANCHORING STRESSED TENSION MEMBERS IN A CONCRETE COMPONENT

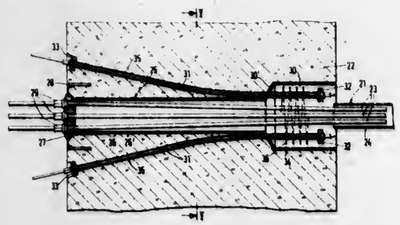
Herbert Schambeck, Frieding near Herrsching, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann A.G., Munich, Fed. Rep. of Germany

Filed Nov. 17, 1978, Ser. No. 961,621

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 2753112

Int. Cl.[3] E04C 3/10

U.S. Cl. 52—230 **8 Claims**



1. System for anchoring stressed tension members in a concrete structure for supporting high loads, such as a diagonal member in a stayed girder bridge, comprising a structural concrete component having a first end surface and an oppositely facing second end surface spaced from said first end surface, sheathing means extending through said concrete component from the first end surface to the second end surface for forming a tubular passageway therethrough, a plurality of first tension elements extending through the tubular passageway formed by said sheathing means from the first end surface to the second end surface of said concrete component, grout enclosing said first tension elements and in combination with said first tension elements completely filling the transverse cross-section of the tubular passageway formed by said sheathing means between the first and second end surfaces of said concrete component, first means for anchoring said first tension elements within said sheathing means relative to said concrete component, wherein the improvement comprises that said sheathing means are disposed in surface contact with and are encased by said concrete component and separate said first tension elements and grout from engagement with said concrete component and at least said first tension elements and grout being removable from said sheathing means after said first means for anchoring said first tension elements are released, said sheathing means includes a sheathing tube extending through said concrete component with the outer surface of said sheathing tube disposed and encased in contacting engagement with said concrete component and laterally enclosing said first tension elements and grout, said anchoring means for said first tension elements are located at the second end surface of said concrete component, said sheathing tube has an axially extending section extending from the first end surface of said concrete component for a portion of the axial length of said sheathing tube, said axially extending section has a larger diameter than and extends radially outwardly from the remainder of said sheathing tube and includes an annular support section forming a transition from the larger diameter axially extending section to the remainder of said sheathing tube, second tension elements located radially outwardly from and around said first tension elements within said larger diameter axially extending section of said sheathing tube, second means for anchoring said section tension elements located within the larger diameter section of said sheathing tube adjacent the first end surface of said concrete component, said second tension elements being substantially parallel with said first tension elements within said larger diameter axially extending section, said second tension elements extending from said larger diameter axially extending section through said transition support section into said concrete component, third means for anchoring said second tension elements located at the second end surface of said concrete component spaced outwardly from said first means for anchoring said first tension members and outwardly from said sheathing means, and means located with said concrete component between said transition support section and the second end surface of said concrete component for maintaining said second tension elements out of contact with said concrete component so that by releasing said third anchoring means said additional tension elements can be removed from said concrete component.

4,235,056

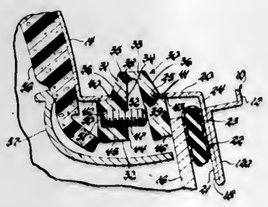
GLASS RETAINING CLIP

Henry W. Griffin, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 7, 1979, Ser. No. 36,783

Int. Cl.[2] E06B 3/62

U.S. Cl. 52—397 **3 Claims**



1. A glass retaining clip for use in a vehicle body having a support structure providing a first wall defining a window receiving opening and a second wall at a predetermined angle to the first wall defining a window opening, and a glass panel positioned within the receiving opening in abutment against the second wall with a seal sandwiched therebetween, the first wall having at least one rectangular aperture therethrough spaced from the glass panel; said glass retaining clip including an anchor and a screw fastener, said anchor comprising a base portion with a retainer stud extending therefrom for insertion into the aperture in the first wall; said base portion and said retainer stud portion presenting spaced apart shoulder surfaces engageable with opposite sides of the first wall; means providing a slot extending through and from the free end of said base portion into said stud portion to divide said base portion into a first leg adapted to abut against the glass panel and a second leg, said second leg having an internally threaded aperture therethrough; said screw fastener being threaded into said threaded aperture and adapted to extend through said second leg whereby to abut against said first leg so that said screw is operable to effect spreading of said first leg relative to said second leg so as to retain the glass panel in abutment against the second wall with the seal compressibly sandwiched therebetween.

4,235,057

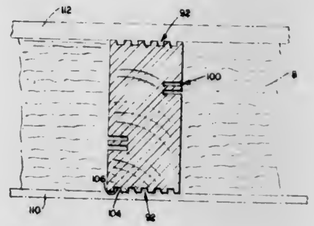
BUILDING STRUCTURAL ELEMENT

Darrel L. Teeters, 12146 Fourth St., Yucaipa, Calif. 92399

Filed Dec. 19, 1978, Ser. No. 970,904

Int. Cl.[3] E04B 1/76; E04C 3/36

U.S. Cl. 52—404 **3 Claims**



1. A building structural element comprising:

a stud having a pair of longitudinal sides, a pair of longitudinal edges and a pair of end edges;

a plurality of edge grooves defined in said edges to extend essentially the entire length of said stud, said edge grooves having partitions completely separating a groove from adjacent grooves to prevent air movement between edge grooves, said grooves on one edge being aligned with edge grooves on the other edge of said stud;

a plurality of side grooves defined in said sides to extend essentially the entire length of said stud, said side grooves having partitions separating a groove from adjacent grooves to prevent air movement between said grooves, said side grooves being located in groups with groups of side grooves on one side face being offset with respect to groups of side grooves on the other side face; and

closing means closing said grooves to trap air in said grooves on all sides of each groove, said means including insulation covering said side grooves and wall covering over said edge grooves.

4,235,058

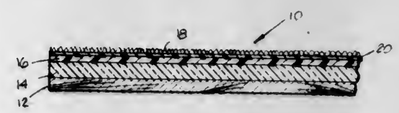
ROOF STRUCTURE AND METHOD OF MAKING THE SAME

Francis J. Patry, Lewiston, Me., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 816,413, Jul. 18, 1977, abandoned. This application Oct. 19, 1978, Ser. No. 952,890

Int. Cl.[2] E04B 5/00

U.S. Cl. 52—408 **21 Claims**



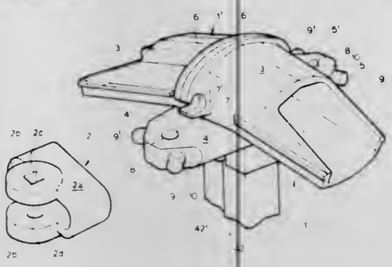
1. A roof structure comprising:

(a) a roof deck;

(b) a roofing membrane located over and above said deck;

(c) means for protecting said roofing membrane from at least the harmful rays of the sun, said means having particulate ballast material located thereon and comprising a non-insulating, polymeric, sheet material positioned over and against the top surface of said roofing membrane, said sheet material being resistant to tearing and having a thickness adequate to protect said roofing membrane from abrasion resulting from movement and impact of particulate ballast material located on and against the top surface of said non-insulating sheet material, said ballast material holding said non-insulating sheet material in place.

4,235,059
JOINT
George A. Wemyss, 12 Regis Ct., Whitehouse Rd., Barnton, Edinburgh EH3 6RG, Scotland
Filed Apr. 24, 1978, Ser. No. 899,457
Claims priority, application United Kingdom, May 4, 1977, 18700/77
Int. Cl.³ E04C 3/30
U.S. Cl. 52—721 19 Claims



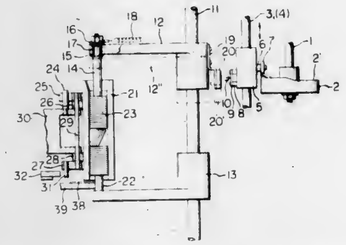
1. A joint for connecting together tubular members, said joint comprising:
(a) first and second members and a clamp for holding the two joint members together,
(b) each joint member includes a first portion having a structure effective for a telescopic fit within a respective one of each tubular member, and a second portion extending outwardly from the first portion,
(c) the second portions of each joint member together forming a connector when the joint members are juxtaposed,
(d) said clamp being effective to pass around the two second portions of the juxtaposed joint members to hold said second portions together to form said connector,
(e) threaded means for coupling a third tubular member,
(f) said threaded means passing through the clamp and the connector and being effective to fix the clamp to the two second portions of the juxtaposed joint members whereby the two joint members are securely fixed to one another.

4,235,060
INSTALLING FIBER INSULATION
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; David S. Wang, Orange, and Aubrey D. Warren, Lakewood, both of Calif.
Filed Dec. 15, 1978, Ser. No. 969,756
Int. Cl.² B28B 1/52
U.S. Cl. 52—743 2 Claims



1. The method of making an elongated heat seal in which the heat-resistant material is a relatively fragile ceramic fiber, comprising:
forming said ceramic fiber into an elongated batt;
wrapping said batt in a film of thermo-plastic material which is fugitive at an elevated temperature, and heat sealing said film to produce a substantial circumferential closure of said film into a generally tubular snug skin around said batt;
attaching a draw cord to one end of said tubular skin and drawing said film enclosed batt through the interior cavity of an elongate tubular resilient wire mesh sleeve to form an assembly, said skin thereby relieving said batt of the tensile forces attendant to said drawing step;
and baking said assembly at said elevated temperature to drive off said film completely leaving substantially only said ceramic fiber bat in place in said cavity and effecting an even expansion of said fragile batt throughout its length.

4,235,061
APPARATUS FOR DETECTING IRREGULAR ARRANGEMENT OF COINS IN COIN PACKAGING MACHINE
Kenkichi Watanabe; Katusuke Furuya, and Hitoshi Kamada, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan
Filed Nov. 21, 1978, Ser. No. 962,601
Claims priority, application Japan, Nov. 25, 1977, 52-142072
Int. Cl.³ B65B 57/14, 11/04
U.S. Cl. 53—54 7 Claims

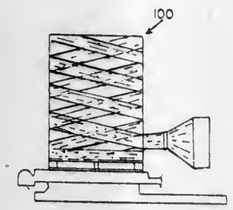


1. An apparatus for detecting irregular arrangement of accumulated coins, the irregular arrangement of accumulated coins having a greater height than a regular arrangement of accumulated coins, the apparatus delivering a predetermined number of accumulated coins from an accumulating cylinder to a packaging zone for packaging and comprising:
a pair of delivery arms, one of which is an upper delivery one and the other of which is a lower delivery one adapted to be insulated from the upper one, rotatable between a coin accumulating zone and a coin packaging zone and vertically slidable to engage with and disengage from the accumulated coins in the coin accumulating zone, and
a detection circuit for detecting the irregular arrangement of the accumulated coins by sensing an increased height of the upper delivery arm when the pair of delivery arms engages with the accumulated coins.

4,235,062
COLLAPSIBLE WEB WRAPPING APPARATUS
Patrick R. Lancaster, III, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech Inc., Louisville, Ky.
Continuation-in-part of Ser. No. 911,652, Jun. 1, 1978, Pat. No. 4,204,377. This application Jul. 26, 1978, Ser. No. 928,236
Int. Cl.³ B65B 11/04
U.S. Cl. 53—399 21 Claims

1. A process of spirally wrapping a web of stretch material on a load comprising a plurality of units to form a unitary package load with a breatheable overwrap comprising:
a. placing a roll of stretchable material on a dispenser means;
b. withdrawing said stretchable material from said dispenser means and collapsing the film web to reduce its width;

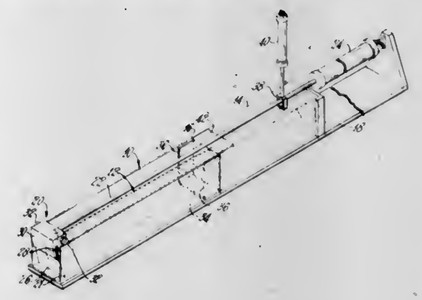
c. holding the leading edge of said film web adjacent a load comprising a plurality of units;
d. causing relative movement between said roll and said load so that stretched material is wrapped around said load;
e. moving said material roll along the axis of the load to form a spiral overwrap of stretched collapsible film on said load in which the spiral portions of the overwrap do not overlap and are spaced apart from each other;
f. reversing the direction of said movement of said stretched collapsed film overwrap to form a second spiral overwrap of stretched material of the same configuration as the first wrap over said first collapsed film web spiral overwrap to form a latticework of intersecting film web wraps;
g. moving the relative position of said load and said material roll to a position at least 90° removed from the position that it originally occupied when the material roll first



moved along the axis of the load without axial movement of the material roll;
h. moving said material roll along the axis of the load while the load is rotating to provide a third spiral stretched collapsed film overwrap on said load of the same configuration as the first wrap which parallels the film web of the first wrap;
i. reversing the direction of said movement of said material roll while the load is rotating to provide a fourth spiral stretched collapsible film overwrap of the same configuration as the first wrap paralleling the film web of the second wrap on said load to form a latticework of overlapping film web wraps defining smaller spaces therebetween than the spaces formed by the original latticework; and
j. fastening said film web underneath an underlying film web layer.

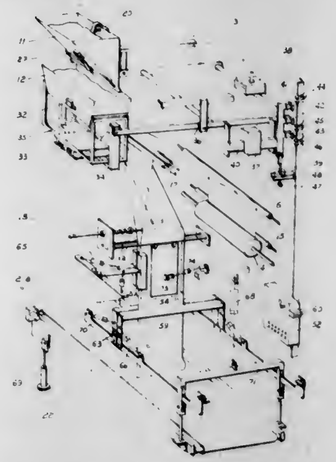
4,235,063
METHOD AND APPARATUS FOR PACKAGING COMPRESSIBLE MATERIAL
Frederic H. Paetz, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Dec. 28, 1978, Ser. No. 974,166
Int. Cl.³ B65B 5/04
U.S. Cl. 53—436 5 Claims

2. The method for packaging compressible material comprising:
(a) positioning compressible material in a guide means;
(b) moving a contact means into contact with said compressible material to compress said compressible material into a carton having a bottom flap and side flaps;



(c) closing said bottom and side flaps, thereby partially enclosing said contact means; and,
(d) removing said contact means from said carton.

4,235,064
BAGGER
Harvey M. Weager, Holland, Mich., assignor to Wilfred O. Schmidt, Grand Rapids, Mich.
Filed Feb. 27, 1978, Ser. No. 881,809
Int. Cl.³ B65B 9/08
U.S. Cl. 53—451 6 Claims



1. A bagger for forming a bag from a single continuous sheet of thermoplastic material comprising in combination
a means for folding said sheet lengthwise about the mid-axis,
a first clamping means for holding the vertical edges of the said folded sheet together over a length exceeding the contemplated bag length,
a second clamping means mounted for upward travel in the plane of the said first clamping means to hold the said folded sheet transversely when at the lowest point of travel; the said first and said second clamping means forming a clamp-held bag with an open upper end appended to the said folded sheet and a non-held vertical side portion extending downward from the said first clamping means to the said second clamping means the edges of the said non-held vertical side portion having been sealed together by the said first clamping means in the preceding cycle of operation,

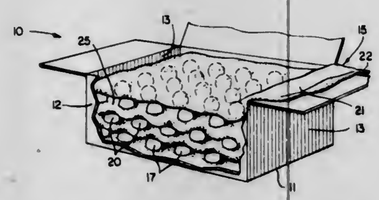
a means to raise the second clamping means and thereby dilate the said clamp-held bag,
a means for filling the said clamp-held bag a content of predetermined weight,
a means to apply heat through the said first and said second clamping means to form a vertical side and a plurality of lower transverse seals,
a slitting means to cut the material between the plurality of transverse seals,
a means to apply blasts of air to cool the seals formed,
whereupon the opening of the said first and said second clamping means, the said bag appended to the said folded sheet is released, and
a power roller means to lower the said appended bag a bag length to present a similar given length of the said folded sheet to the said first and second clamping means for the succeeding cycle of operation with the leading vertical edges of the said folded sheet having been presealed as the consequence of the said first clamping means positioned to generate a length of seal exceeding the bag length in the immediate cycle of operation which overage is positioned by the bag length lowering of the said folded sheet.

4,235,065

METHOD OF PACKAGING FRAGILE ARTICLES

Harry Freeman, P.O. Box 347, Slatersville, R.I. 02876

Filed Mar. 23, 1979, Ser. No. 23,176
Int. Cl.[3] B65B *23/00, 23/02, 23/22*
U.S. Cl. 53—472 **3 Claims**



1. The method of packing fragile articles utilizing a finite sized container having a bottom wall and a sealed expandable and deflatable tubing of a length greater than the longest inside dimension of the container which comprises disposing a sealed end of the deflated tubing in a first layer over the inside bottom of the container with the remainder of the tubing removed from above the first layer, placing a first group of the fragile articles to be packed on the first layer, disposing another portion of the tubing in a second layer over the fragile articles, placing a second group of fragile articles to be packed on the second layer of tubing, and so forth, until the desired quantity of articles are packed and then inflating the tube with gas to cause the tubing to separate the fragile articles and suspend the articles between the inflated layers.

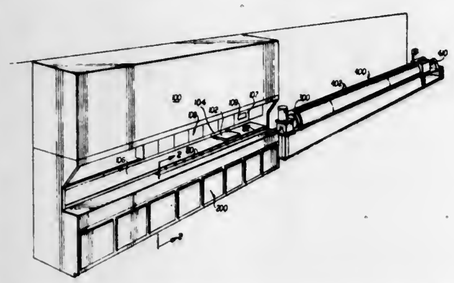
4,235,066

NUCLEAR FUEL ROD LOADING APPARATUS

Harold B. King, Wrightsville Beach; Robert MacIvergan, and Gerald W. McKenzie, both of Wilmington, all of N.C., assignors to General Electric Company, San Jose, Calif.

Filed May 30, 1978, Ser. No. 910,999
Int. Cl.[2] B65B *57/06, 57/14, 5/10*
U.S. Cl. 53—500 **24 Claims**

1. An apparatus for loading fuel rods with nuclear fuel pellets comprising:
(a) an elongated member for receiving a plurality of fuel pellets arranged in a row;
(b) a fuel rod indexer for supporting a plurality of fuel rods;
(c) means for moving said fuel rod indexer to sequentially present each of said fuel rods in position for receiving said row of fuel pellets;
(d) means to transfer said row of fuel pellets from said elongated member into said fuel rod including;
(e) a shuttle positioned below said elongated member; and



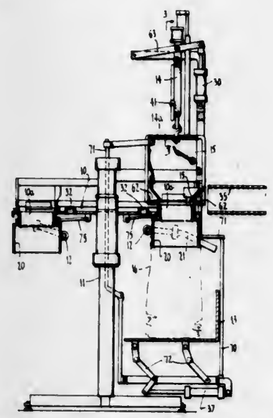
(f) means for moving said shuttle to a receiving position for receiving said fuel pellets from said elongated member and to a loading position wherein said pellets are disposed in alignment with one of said fuel rods.

4,235,067

SEMI-AUTOMATIC BAGGING MACHINE

Ian A. Parsons, Mooroopna, Australia, assignor to E. D. Parsons Engineering, Victoria, Australia

Filed Dec. 26, 1978, Ser. No. 972,990
Claims priority, application Australia, Jul. 21, 1978, PD5165
Int. Cl.[3] B65B *1/32*
U.S. Cl. 53—502 **7 Claims**



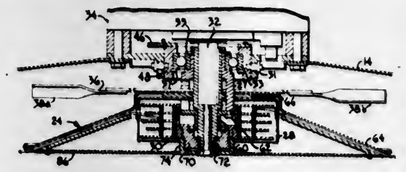
1. A bag filling and weighing machine comprising a rotary table having at least two spaced apart filling inlets; means for releasably clamping to each of said inlets a bag to be filled with articles at a single filling station; driving means for indexing said table stepwise to present each of said inlets in succession to said filling station; latching means; operating means for releasably latching said table against rotary movement each time said table is indexed to present an inlet to said filling station; weighing means at said filling station for taking the weight of a bag being filled at said filling station; and sensing means associated with said weighing means, said operating means associated with said weighing means, said operating means, and said driving means and operable in response to a bag's being filled to a predetermined weight to effect release of said latching means and indexing of said table.

4,235,068

FILAMENT MOWER

Robert C. Comer, Hopkins, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Aug. 2, 1977, Ser. No. 821,144
Int. Cl.[3] A01D *35/262*
U.S. Cl. 56—12.7 **5 Claims**



1. Rotary mowing apparatus, comprising, in combination:
(a) a housing having a top wall and adjoining side walls;
(b) means mounting said housing to enable movement of said housing over a ground surface at a controlled height thereabove, so that said housing, together with said ground surface, defines a grass cutting chamber;
(c) filament mounting means mounted within said chamber for rotation about a nearly vertical axis, said mounting means including an outer surface generally shaped as a truncated cone;
(d) a plurality of flexible nonmetallic filaments mounted to said filament mounting means at positions spaced about said axis and radially spaced therefrom, at least a portion of each of said filaments having a free unsupported length extending generally radially outward from said mounting means during driven rotation thereof, said free unsupported lengths being sufficiently short so that, during cutting operations, said filament segments define a plane substantially perpendicular to said axis, each of said filaments also having a generally constant cross-section throughout its free unsupported length and a thickness of substantially 0.125 inches or less; said free unsupported lengths of said filaments extending from said cone surface proximate the base thereof;
(e) means for agitating uncut grass filaments within said chamber as said housing passes over said ground surface; and
(f) means rotatably driving said filament mounting means at a speed sufficient to stiffen said filaments and to permit impact cutting of uncut grass filaments thereby.

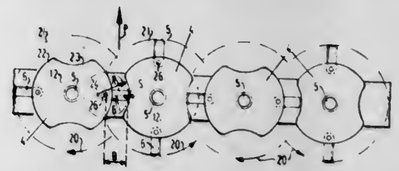
4,235,069

DEVICE FOR MOWING CROP

Pieter A. Oosterling, and Hendricus C. van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Continuation of Ser. No. 16,365, Mar. 1, 1979, abandoned, Ser. No. 923,254, Jul. 10, 1978, abandoned, Ser. No. 850,352, Nov. 10, 1977, abandoned, and Ser. No. 672,980, Apr. 2, 1976, abandoned. This application Nov. 8, 1979, Ser. No. 92,265
Claims priority, application Netherlands, Apr. 11, 1975, 7504372
Int. Cl.[3] A01D *35/264*
U.S. Cl. 56—13.6 **2 Claims**

1. A device for mowing a crop, comprising in combination:
a frame adapted to be attached to a powered vehicle while projecting laterally therefrom, said frame having a series of spaced vertical shafts projecting upwardly therefrom and including means for rotating said shafts so that adjacent pairs thereof rotate in opposition directions;
a disc attached to each shaft in overlying relation to said frame, at least a pair of cutters attached to each disc in uniformly angularly spaced relation therearound and each cutter projecting radially outwardly from its disc whereby the tips of the cutters sweep a circular path which is of larger diameter than the circular path swept by their disc, the spacing between said shafts and the diameter of the paths swept by said discs being such that the paths swept by the tips of the cutters of one disc intersect the path swept by the adjacent disc and such that the paths swept by the tips of the cutters of adjacent discs intersect in forwardly spaced relation to said frame, the cutters of adjacent discs being rotationally staggered such that when



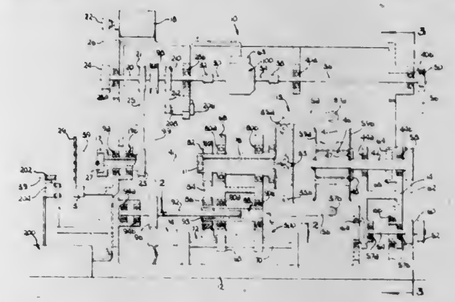
a cutter of one disc is positioned in alignment between its shaft and the shaft of an adjacent disc, adjacent cutters of the adjacent disc are positioned symmetrically forwardly and rearwardly thereof, and the periphery of such adjacent disc being cut away between such adjacent cutters along an arc centered on said one disc along a line passing through the center of its shaft and the center of the shaft of the adjacent disc.

4,235,070

WIRE STRANDING MACHINE AND CONTROL MEANS THEREFOR

Ben Bravin, Los Angeles, Calif., assignor to Dynamex Corporation, Long Beach, Calif.

Filed Sep. 20, 1978, Ser. No. 944,149
Int. Cl.[3] D07B *3/08, 7/10*; B65H *54/02*
U.S. Cl. 57—71 **33 Claims**



1. A wire twisting and winding apparatus comprising:
(a) a frame;
(b) input and reel shafts rotatably mounted on said frame, said shafts being inter-coupled by a variable ratio drive means;
(c) means for driving said input shaft coupled thereto;
(d) a flyer rotatably mounted on a flyer carriage and drivably coupled to said input shaft, said flyer carriage being reciprocally mounted on said frame;
(e) means for reciprocally driving said flyer carriage;
(f) a pivot frame pivotally mounted on said frame;
(g) a reel spindle rotatably mounted on said pivot frame, said reel spindle being drivably coupled to said reel shaft and adapted to removably receive a take-up reel and to rotate said reel relative to said flyer;
(h) means for bunching and guiding a plurality of wire strands to said flyer, said bunching means being mounted on said frame, and said flyer being adapted to direct said bunched wire onto said take-up reel for winding; and
(i) control means coupled to said variable ratio drive means

for adjusting the ratio thereof during the the winding of said bunched wire onto said reel so as to vary the rate of rotation of said reel shaft relative to that of said input shaft by an amount corresponding to the build-up of said wire on said reel,

whereby, said bunched wire is given a single twist for each rotation of said flyer, and said wire is wound onto said reel in distributed layers between left and right flanges thereof.

22. In a wire twisting and winding apparatus having a (i) main frame, (ii) a flyer rotatably coupled thereto, (iii) a reel shaft having a first axis of rotation and being rotatably mounted to said main frame, and (iv) a reel spindle having a second axis of rotation and being drivably coupled to said reel shaft, said reel shaft being adapted to receive a take-up reel, the improvement comprising:

(a) a pivot frame pivotally mounted on said main frame and adapted to rotate about a third axis of rotation parallel to said second axis of rotation, approximately 90° between a first substantially horizontal position and a second substantially vertical position, and

(b) means for coupling said reel spindle to said reel shaft comprising continuous, rotatable torque transmission means adapted to transmit torque from said first axis of rotation, notwithstanding the position of said pivot frame,

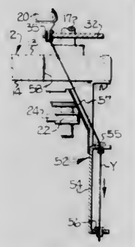
whereby said take-up reel and pivot frame can be pivoted between said first and second positions thereof without disengagement of said torque transmission means, for unloading and operating said take-up reel respectively.

4,235,071

YARN FALSE TWIST APPARATUS

Roy E. Dillon, Rockingham, N.C., assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,447
Int. Cl.³ D01H *15/00*; D02G *1/08*
U.S. Cl. 57—280 **17 Claims**



1. An apparatus for friction false twisting a moving yarn, and characterized by the ability to readily permit thread-up while the apparatus is in operation, and comprising

a mounting bedplate,

at least three spindles mounted to said bedplate for rotation about fixed, parallel axes which are positioned at the corner points of an equilateral polygon having a number of sides corresponding to the number of spindles, each spindle including a plurality of circular discs mounted for rotation therewith, and with the discs of the spindles overlapping at a point centrally between said spindles and defining an operative path of travel extending axially therebetween,

means for concurrently rotating each spindle in a common direction and such that twist is imparted to a yarn moving along said operative path of travel by contact with the rotating discs, and comprising a pulley coaxially fixed to each spindle, and a common endless drive belt operatively contacting each pulley,

movable yarn deflecting means for selectively moving a yarn from an inoperative thread-up position disposed laterally of said operative path of travel, toward said operative path of travel, and comprising at least one arm, and means mounting each such arm to said bedplate for movement in a plane perpendicular to the axes of said spindles, and

yarn guide means cooperating with the free end of the arm closest to said pulleys and for guiding the moving yarn between said operative path of travel and a position exteriorly of the area encompassed by said endless drive belt,

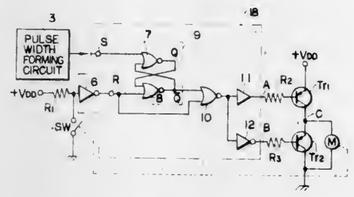
whereby the thread-up of the yarn through the apparatus may be readily accomplished while the spindles are operatively rotating, and without the need to manually thread the yarn through the discs of the spindles, or through the area encompassed by the endless drive belt.

4,235,072

MOTOR DRIVE CIRCUIT IN DIGITAL TYPE ELECTRONIC TIME PIECE

Yasuo Komatsu, Suwa, Japan, assignor to Iida Sankyo Co., Ltd., Iida, Japan

Filed Jun. 27, 1978, Ser. No. 919,582
Claims priority, application Japan, Jun. 27, 1977, 52/83542[U]
Int. Cl.³ G04C *3/00*; G05B *19/40*
U.S. Cl. 368—218 **4 Claims**



1. In a motor drive circuit for a digital electronic time piece having a pulse source for providing a regular pulse signal, an electric motor, a switch means operated in conjunction with rotation of said electric motor for providing a switch signal and a motor drive hold circuit for receiving said regular pulse signal and said switch signal in order to provide a motor drive signal and motor stop signal to said motor, to thereby drive said motor a predetermined amount with each pulse in said regular pulse signal, the improvement comprising:

a voltage source means, operated by said switch means, for supplying a control voltage to said motor drive hold circuit; and

a motor drive hold circuit having a logic circuit means for receiving said regular pulse signal and said switch signal and providing a motor drive signal which commences with each pulse in said regular pulse signal and terminates with each switch signal, said logic circuit means requiring only a small amount of power from said voltage source means during the time period when the motor drive signal is being applied to said electric motor;

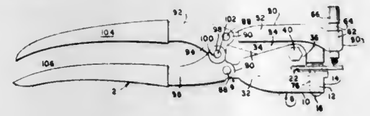
said logic circuit means comprising a flip-flop means for receiving said regular pulse signal as its set input signal and said switch signal as a reset signal, and wherein the $\overline{Q}$ output signal of said flip-flop means and said switch signal are provided as inputs to a NOR gate, the output of which provides said motor drive signal.

4,235,073

CHAIN BREAKER

Wayne R. Tracy, Chicopee, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Filed Dec. 4, 1978, Ser. No. 966,305
Int. Cl.³ B21L *5/00*
U.S. Cl. 59—11 **14 Claims**



1. Chain breaker apparatus comprising

first and second jaws, the first jaw having a pivot pin receiving opening near an upper extremity thereof and the second jaw having a second pivot pin receiving opening near a lower extremity thereof, and

a pivoting means extending through the pivot pin openings for holding the jaws together in pivotal interrelationship,

the first jaw having an outward projecting lower extremity and having a first vertical bore in the extremity for receiving a threaded screw,

the second jaw having an outer extremity with a second vertical threaded bore, the second vertical threaded bore being aligned parallel to the first vertical threaded bore and being displaced outwardly therefrom,

a threaded forcer screw engaged in threads of the second bore and extending downward therefrom and

a breaker tip insert in a lower end of the forcer screw,

the first jaw having an upward facing surface above the first bore,

an anvil plate positioned on the upward facing surface, and extending outward therefrom below the breaker tip,

the first and second pivot pin receiving openings being positioned over the anvil plate,

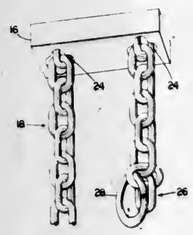
wherein the second jaw has a retaining portion extending between the second opening and the outward extending portion with a bore for receiving the forcer screw, wherein the retaining portion overlies the anvil plate and retains the anvil plate against accidental dislodgement.

4,235,074

LOAD CHAIN END STOP

William M. Larson, Forrest City, Ark., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 13, 1979, Ser. No. 48,294
Int. Cl.³ F16G *13/12*
U.S. Cl. 59—93 **3 Claims**



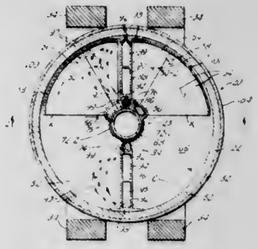
1. In a hoist including a link type load chain; a chain guide for controlling the passage of the load chain therethrough with the chain links end to end in mutually perpendicular relationship; and an end stop for preventing an end of said chain from running through said chain guide, said end stop comprising a ring received through the opening of the next-to-last link of said load chain on a first side of the third last link of said chain, with the last link of said load chain received through the opening of said next to last on the opposite side of said third last link to cause said next-to-last link to be oriented in side to side relationsip to the remainder of the end to end oriented load chain links.

4,235,075

METHOD AND APPARATUS FOR CONVERTING RELATIVELY LOW TEMPERATURE HEAT ENERGY INTO USEFUL WORK

George H. Erb, Rte. 103, Cuttingsville, Vt. 05738

Filed Jan. 23, 1978, Ser. No. 871,509
Int. Cl.³ F03G *7/06*
U.S. Cl. 60—527 **54 Claims**



1. The method of converting heat energy into useful work output comprising the steps of:

providing a rigid container having a port therein, said container being rigid for resisting expansion when the pressure therein rises to relatively high values,

using said heat energy for heating a liquid, providing a heat sink,

using said heat sink for cooling a liquid,

providing multiple small masses of wax material,

bringing said multiple small masses of wax material into heat exchange relationship with the heated liquid in said rigid container for heating said wax material for producing volumetric expansion of said wax material for driving such liquid out of said rigid container through said port,

then bringing said multiple small masses of wax material into heat exchange relationship with the cooled liquid in said rigid container for cooling said wax material for producing volumetric contraction of said wax material for allowing such liquid to return into said rigid container,

repeating said steps of bringing said multiple small masses of wax material into heat exchange relationship with the heated liquid in said rigid container and then bringing said multiple small masses of wax material into heat exchange relationship with the cooled liquid in said rigid container, and

using the resulting flow of such liquid for producing useful work.

4,235,076

VEHICLE ENGINE HAVING TURBOCHARGER BYPASS WITH BOOST CONTROL AND CONVERTER WARM-UP FUNCTIONS

Kenneth R. Meloche, St. Clair Shores; Coburn C. Bland, Jr., Haslett, both of Mich., and Ronald R. Terry, Mineral Ridge, Ohio, assignors to General Motors Corporation, Detroit, Mich.

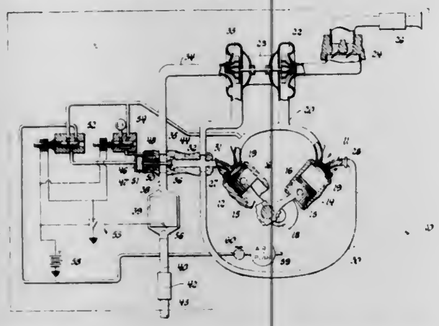
Filed May 3, 1979, Ser. No. 35,524
Int. Cl.³ F01N *5/04*; F02B *37/00*
U.S. Cl. 60—602 **4 Claims**

1. The combination in an automotive vehicle of a turbocharged internal combustion engine with at least one variable volume working and combustion chamber, intake and exhaust systems each connected with said combustion chamber for

respectively conducting intake gases to and exhaust gases from the combustion chamber, a turbocharger having a compressor in the intake system driven by a turbine in the exhaust system that recovers power from the engine exhaust gases, and an exhaust treatment device that utilizes waste heat to encourage reaction of residual products in the exhaust gases, said treatment device being connected in the exhaust system downstream of the turbine,

a bypass passage around the turbine and connecting the combustion chamber directly to the exhaust treatment device,

a valve operable to open and close the bypass passage, and the improvement comprising



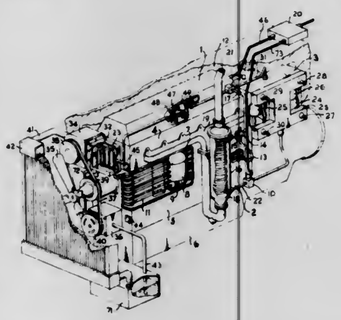
actuating and control means normally operating said valve to close said bypass and operative in response to a selected engine operation related temperature and to intake system pressure into the combustion chamber to operate said valve to open said bypass at temperature levels below a predetermined level of said selected temperature occurring during initial engine warm-up and an intake system pressures into the combustion chamber in excess of a predetermined pressure whereby to provide fast warm-up of the exhaust treatment device after engine starting and to limit compressor outlet pressure to a predetermined level during engine operation.

4,235,077

COMBINATION ENGINE

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

Filed Oct. 30, 1978, Ser. No. 955,898
Int. Cl.³ F01K 23/10, 23/14
U.S. Cl. 60—618 **6 Claims**



1. A combination engine comprising:

(a) a liquid-cooled internal combustion multi-cylinder reciprocating engine section, said section having an exhaust system for exhausting the gases produced during such combustion into the atmosphere, a vapor boiler located within the exhaust system so that the boiler is heated by the heat of the exhaust gases passing through, with the power produced by such section being transmitted to a drive train for said section, with means for converting at least one of the cylinders of the reciprocating engine from an operating to an inoperating condition and back to an operating condition;

(b) a vapor-powered engine section, with the power produced by said vapor-powered engine section being transmitted to a drive train for said vapor-powered engine section;

(c) a recycling circulatory system with means for circulating a liquid coolant through the internal combustion engine section to permit the transfer of heat produced by said internal combustion engine section to the liquid coolant in order to prevent the build-up of excessive temperatures during operation, then circulating the coolant into the vapor boiler in the exhaust system to permit the transfer of heat in the exhaust gas to the coolant resulting in the conversion of at least a portion of the coolant to a vapor, then circulating the vapor to the vapor powered engine section to power said vapor-powered engine section, then circulating the vapor to a condenser in which the vapor is cooled to a liquid which is circulated into the internal combustion engine section for recommencement of the cycle;

(d) means for interconnecting the drive trains of the internal combustion engine section and the vapor powered engine section;

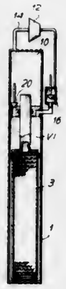
(e) speed regulating means to control the speed of the combination engine and to apportion the portion of power produced by the vapor powered engine section by controlling the flow of vapor thereto and by the internal combustion engine section by controlling the fuel flow thereto.

4,235,078

CRYOGENIC EQUIPMENT FOR VERY LOW TEMPERATURES

Piero Morbidi, Siena, Italy, assignor to Officine Galileo S.p.A., Milan, Italy

Filed Mar. 14, 1979, Ser. No. 20,435
Claims priority, application Italy, Mar. 16, 1978, 9377 A/78
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **5 Claims**



1. Closed circuit gas operated cryogenic apparatus comprising:

(a) a cylinder;

(b) a piston slidably displaceable within said cylinder;

(c) heat exchanger means mounted within said piston;

(d) sealing means mounted to said piston for dividing said cylinder into first and second regions, said first and record regions communicating through said heat exchanger means;

(e) external means for reciprocating said piston;

(f) a third region coupled through first valve means to said first region;

(g) rod means extending from said piston means into said third region;

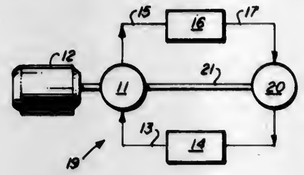
(h) compressor means having evacuating and compressing sides, the evacuating side of said compressor coupled to said third region, the pressurizing side of said compressor coupled to said first region whereby said piston is displaceable by both the expansion of said gas and said external means to provide cooling by said expansion of said gas.

4,235,079

VAPOR COMPRESSION REFRIGERATION AND HEAT PUMP APPARATUS

Paul S. Masser, 5312 E. Royal Palm Rd., Scottsdale, Ariz. 85253

Continuation-in-part of Ser. No. 868,540, Jan. 11, 1978, abandoned. This application Dec. 29, 1978, Ser. No. 974,301
Int. Cl.³ F25B 9/00, 1/00; F25D 9/00
U.S. Cl. 62—87 **4 Claims**



1. A method of improving the efficiency of a vapor compression refrigeration system including a compressor, condenser, high expansion ratio, large displacement, closed expansion motor and evaporator connected in a series arrangement and a prime mover drivingly connected to said compressor comprising the steps of:

operating said compressor to pass a saturated vapor refrigerant from its low side to its high side wherein the refrigerant undergoes isenthalpic compression,

passing said high pressure vapor refrigerant from said compressor to said condenser wherein heat is rejected from the vapor condensed into a liquid at a constant pressure,

passing said liquid from said condenser in a saturated condition to said high expansion ratio, large displacement motor for expansion in a closed housing to a lower pressure liquid vapor mixture causing said motor to provide relative movement of its component parts,

directly coupling the relative movement of the component parts of said motor to said compressor for actuation thereof,

passing said lower pressure liquid vapor mixture to said expander for a heat absorbing function, and

passing the lower pressure liquid from said evaporator back to the lower pressure side of said compressor.

4,235,080

REFRIGERATION AND SPACE COOLING UNIT

James L. Cassidy, 66 Prospect St., Turners Falls, Mass. 01376

Filed Feb. 5, 1979, Ser. No. 9,163
Int. Cl.³ F25B 9/00
U.S. Cl. 62—87 **4 Claims**

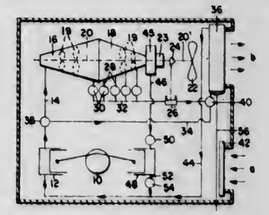
1. A refrigeration method of the evaporation type comprising the steps:

a. compressing the vapor of a suitable working fluid in a compressor to produce a pressurized and heated vapor;

b. leading the pressurized and heated vapor through an engine of the turbine type where its free energy is used to drive the turbine to power a circulating fan and auxiliary equipment thus lowering its pressure and temperature to the point where it is near its point of condensation;

c. passing the vapor as turbine exhaust spent vapor into an abentropic engine having working and non-working sides wherein it is made to do work by virtue of a pressure imbalance between residual vapor pressure and a hard vacuum on the non-working side, the work extracting energy from the spent vapor causing a proportionate amount of it to condense at its boiling point to produce a cold liquid while yielding its latent energy as additional work assisting the turbine;

d. pumping the resultant cold liquid into a heat-exchanger



grill wherein it is warmed by a suitable warmant, such as a stream of warm air being cooled by being forced through the grill which evaporates the contained liquid to produce a vapor;

e. returning the resultant vapor to the compressor to be recycled; and

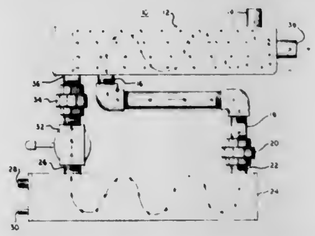
f. repeating the above sequence.

4,235,081

COMPRESSED AIR DRYER

Ralph O. Dowling, Zelienople, Pa., assignor to Kellogg-American, Inc., Oakmont, Pa.

Continuation-in-part of Ser. No. 840,574, Oct. 11, 1977, abandoned. This application Oct. 31, 1978, Ser. No. 956,290
Int. Cl.³ F25D 17/06, 21/00; F28F 1/30
U.S. Cl. 62—93 **8 Claims**



3. The method of operating a compressed air dryer of the type wherein hot moist gas from a compressor flows through an air-to-air heat exchanger to an air-to-refrigerant exchanger and then back through the air-to-air heat exchanger to dehumidfy the air, wherein the improvement comprises flowing the hot moist gas progressively in a series of oppositely directed passes between groups of closely spaced corrugated sheet metal fin elements forming part of the tube bundles in the air-to-air exchanger and then in a series of oppositely directed pases between groups of closely spaced corrugated sheet metal fin elements forming part of the refrigerating tube bundles of said air-to-refrigerant exchanger to capture oil and solid particles and so that the water condensing thereon washes the fin elements, the water collecting on said sheet metal fin elements obviating separators or absorbent material for removing water from the outflow of air from said first heat exchanger.

4. In a compressed air dryer of the type wherein hot moist air flows from the compressor through an air-to- air heat exchanger to an air-to-refrigerant heat exchanger and then back through the air-to-air exchanger to dehumidfy the air, the improvement wherein the air-to-air heat exchanger comprises a first tubular housing having sealed end chambers and an intermdeiate chamber separated therefrom, a plurality of pipes supported longitudinally in said intermediate chamber and

having their opposite ends open respectively to said end chambers, said first housing having an entrance port and an exit port for compressed air in said housing at opposite ends respectively of said intermediate chamber, baffle means on the interior of said first housing to guide the flow of air through the intermediate chamber of said housing from said entrance port to said exit port in a plurality of successive oppositely directed passes, wherein said air-to-refrigerant heat exchanger comprises a second tubular housing, a serpentine refrigeration pipe disposed longitudinally within said second tubular housing, through which a refrigerant medium flows, said second housing having an entrance port for air at one end and an exit port for air at the opposite end thereof, wherein conduit means connects the exit port of the first said housing to the entrance port of said second housing, said second housing having baffle means on the interior thereof to guide the flow of air in successive oppositely directed passes over and around said refrigeration pipe, from the entrance port to the exit port of said second housing, and wherein conduit means connects the exit port of said second housing to one of the sealed end chambers of the said first housing thereby to cause refrigerated dried air to flow through said plurality of pipes therein for initial cooling of air flowing through said first housing.

4,235,082

DETACHABLE OVERLOAD CONTROL COUPLING BETWEEN ROTATING MACHINE ELEMENTS

Karl Grimpe, Mülheim, Fed. Rep. of Germany, assignor to DEMAG, Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,495
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2745489
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.³ F16D *3/56*
U.S. Cl. 64—28 R **4 Claims**



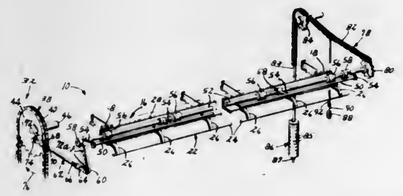
1. Overload apparatus between rotating machine parts comprising
(a) a pair of joined rotating machine parts;
(b) a plurality of opposed radially extending projections spaced circumferentially and uniformly around said joined machine parts;
(c) each said opposed projection being semi-cylindrical to form with the said opposed projection, cylinders;
(d) the opposed surfaces of each said pair of projections being in a plane transverse to the axis of rotation of the joined parts;
(e) each pair of opposed projections joined by a hollow cylindrical carrier link;
(f) each said carrier link comprised of a heavy-duty rigid material embracing said projections under initial stress,
(g) stripper cams circumferentially spaced around said joined rotating parts between said joined projections; the improvement characterized by
(h) each of said opposed projections being removably disposed on said joined rotating parts;
(i) each said semi-cylindrical projection including engaging surfaces arranged at right angles to each other;
(j) one said engaging surface being longer than said other engaging surface;
(k) said shorter engaging surface being said opposed engaging surface for said pair of projections;
(l) base plates on each said semi-cylindrical projection;
(m) said longer engaging surface being on said base plates;
(n) recesses in each said pair of joined rotating parts; and
(o) each said base plate with said longer engaging surface disposed in its respective recess.

4,235,083

METHOD AND APPARATUS FOR PRODUCING PATTERNED EFFECT ON KNITTED FABRIC

David Dale, and Robert C. Barksdale, both of Hamilton, Ala., assignors to Munsingwear, Inc., Minneapolis, Minn.

Filed Nov. 24, 1978, Ser. No. 963,310
Int. Cl.³ D04B *27/12*
U.S. Cl. 66—213 **14 Claims**



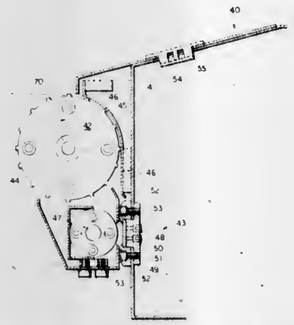
1. An attachment for a warp knitting machine for producing a patterned effect on fabric knitted by the warp knitting machine, the warp knitting machine having at least one warp beam for supplying threads to be knitted, thread separating means for separating threads supplied from said warp beam, means for knitting the threads supplied from said warp beam, and first tensioning means positioned between said warp beam and said knitting means for tensioning the threads being supplied to said knitting means, said attachment comprising:
movable supplemental tensioning means operatively connected to said knitting machine for cyclically varying the tension on first and second groups of threads disposed on opposite sides of said supplemental tensioning means, said supplemental tensioning means including a single tensioning member disposed between the warp beam and the first tensioning means and having a sufficient length for tensioning all of the threads being supplied from said warp beam; and
means for cyclically moving said supplemental tensioning means in first and second opposite directions about a neutral position whereby the tension on the first group of threads disposed on one side of the supplemental tensioning means increases when the supplemental tensioning means moves in the first direction away from the neutral position and the tension on the second group of threads disposed on the other side of the supplemental tensioning means increases when the supplemental tensioning means moves in the second direction away from the neutral position, said moving means including a rotatable rod, first linkage means connecting said rod to said tensioning member, means for rotating said rod including a second linkage means attached to said rotatable rod adjacent a first end thereof and a drive arm connecting said second linkage means to a drive member of the knitting machine, and torque compensating means for equalizing torque applied to said rotatable rod along its length whereby the patterned effect produced on the fabric will be even across the width of the fabric.

4,235,084

AUTOMATIC CONTROL SYSTEM FOR FLAT KNITTING MACHINE

Hideharu Tobe, Tokyo, Japan, assignor to Heiko Seisakusho, Ltd., Tokyo, Japan

Filed Mar. 9, 1979, Ser. No. 19,259
Int. Cl.³ D04B *15/48*
U.S. Cl. 66—232 **7 Claims**



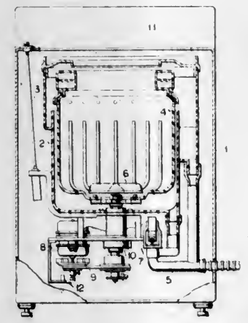
2. An automatic control system for a flat knitting machine comprising a single program sheet which is not endless having marks formed on predetermined columns for verification by a mark reader including an original point mark and a return point mark at initial and terminal points of the program sheet, means for moving the program sheet reciprocally to place the original point mark and return point mark under a mark reader, and photoelectric means for detecting marks within the reading zone defined at the extremities between the original point mark and return point mark during movement of the program sheet between the original point mark and return point mark.

4,235,085

AUTOMATIC WASHER

Fumio Torita, Nagoya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1979, Ser. No. 25,601
Claims priority, application Japan, Apr. 4, 1978, 53-39369; Apr. 4, 1978, 53-39370
Int. Cl.³ D06F *33/02*
U.S. Cl. 68—12 R **8 Claims**



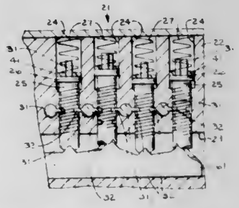
1. An automatic washer for washing a quantity of material, during a series of successive operation steps including at least a washing cycle and a dehydration cycle which operation steps continue for respective corresponding periods of time, said washer comprising:
drive means, having an operating characteristic during said washing cycle dependent on the amount of said quantity of material, for rotating a stirring blade member during said washing cycle and a dehydration tub during said dehydration cycle;
means for measuring said drive means operating characteristic during said washing cycle and for issuing a signal during said washing cycle corresponding to said operating characteristic denoting the amount of said quantity of material; and
control means, coupled to said drive means and responsive to said signal, for presetting the lengths of said respective corresponding periods of time as a function of said amount of said quantity of material.

4,235,086

PIN TUMBLER LOCK

Joseph M. Genakis, 948 W. Boylston St., Worcester, Mass. 01606

Filed May 9, 1979, Ser. No. 37,420
Int. Cl.³ E05B *27/04*
U.S. Cl. 70—364 A **15 Claims**



1. A lock comprising:
housing means defining a keyway and a plurality of tumblerways communicating therewith;
a tumbler disposed in each of said tumblerways and adapted for both reciprocating and rotational movement therein, each of said tumblers movable between locked positions into at least one shear position comprising both a predetermined longitudinal position and a predetermined angular position within its said tumblerway, each of said tumblers comprising one end surface defining an alignment groove extending into said keyway;
release means movable between open and closed positions and adapted for operative coupling with a latch mechanism, said release means being movable from said closed position to said open position with all of said tumblers in said shear positions and being restrained in said closed position with any of said tumblers in one of said locked positions; and
a key insertable into said keyway and having a plurality of alignment ridges that are adapted to enter each of said alignment grooves, the elevation and orientation of said alignment ridges being such as to move said tumblers into their shear positions.

4,235,087

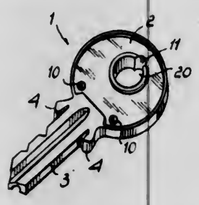
KEY STRUCTURE HAVING A COATED GRIP

Camillo Bianchi, Conegliano, Italy, assignor to Silca S.p.A., San Vendemiano, Italy

Filed May 29, 1979, Ser. No. 43,207
Claims priority, application Italy, Nov. 20, 1978, 23336/78[U]
Int. Cl.³ E05B *19/04*
U.S. Cl. 70—395 **4 Claims**

1. A key structure having a covered, or coated, grip, including a flat head, an elongated shaft extending from said flat head, characterized in that it comprises in said head a pair of

spaced apart through holes interconnecting the two faces of said flat head, two layers covering said two faces of said flat



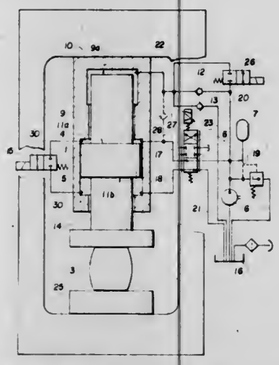
head and joining portions extending through said holes and integrally formed with said layers.

4,235,088

SERVOHYDRAULIC PRESS WITH A CLOSED LOOP CONTROL CIRCUIT AND METHOD OF OPERATING A FLUID PRESSURE OPERATED PRESS

Heinz Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,456
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747548
Int. Cl.³ B21J 9/12; B30B 1/32
U.S. Cl. 72—453.18 13 Claims



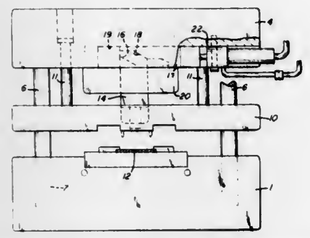
1. A servohydraulic press, comprising, a support frame, a workpiece support base in said frame, working cylinder means mounted in said frame over said workpiece support base, a drive piston guided in said working cylinder means for upward and downward movement and having a ram portion extending out of said cylinder means for engagement with a workpiece positioned on said workpiece support base, a cylindrical extension portion defining a central piston operatively connected to said drive piston, said cylinder means having a second cylinder portion into which said central piston projects, said drive piston having a first drive surface exposed to pressure in said cylinder means and a second opposite return surface in said cylinder means, a pressure connection connected to said cylinder means, a servo-valve operatively connected to said pressure connection being operative for selectively pressurizing and releasing the pressure acting on said drive surface or said return surface for alternately moving said drive piston in a working direction toward the workpiece and in an opposite return direction, and an accumulator connected to said servo-valve for selective communication with said cylinder means on respective drive surface and return surface sides of said piston and said second cylinder portion, said accumulator being effective to receive fluid pressure from said second cylinder portion during the return movement in an amount corresponding to the product of the stroke of said central piston times said central piston surface area, said return surface being considerably larger than required for the needed return force, the pressure energy in excess produced during the return direction of movement of said drive piston forcing fluid from said second cylinder portion to said accumulator.

4,235,089

PROGRESSIVE STAMPING PRESS

John C. Vecchi, 1603 Third St., Natrona Heights, Pa. 15065

Filed May 29, 1979, Ser. No. 43,163
Int. Cl.³ B21D 37/04
U.S. Cl. 72—472 8 Claims



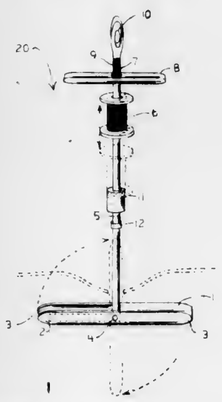
1. In a progressive stamping press having an elongated die support, a plurality of dies on said support spaced apart lengthwise thereof, and a vertically reciprocable ram above the die support, the improvement comprising a plurality of punches carried by said ram above said dies and slidable vertically relative to the ram from a projecting operating position to a retracted inoperative position, and means carried by the ram for selectively moving each punch from either of said positions to the other independently of the rest of the punches so that different punches can punch a strip at different times while a continuous metal strip is passing through the press.

4,235,090

DENT PULLING TOOL

Stacy R. Wightman, Rang Pelletier Sud, St. Armand, Quebec, Canada (J0J1T0), and Lawrence W. Wightman, Stanbridge East, Quebec, Canada (J0J2H0)

Filed Aug. 29, 1978, Ser. No. 937,866
Int. Cl.³ B21D 1/12
U.S. Cl. 72—479 1 Claim



1. A dent pulling tool, comprising:
a shaft;
anvil means pivotally coupled at one end of said shaft;

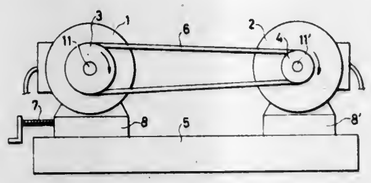
a tool handle formed at one end of said shaft which is opposite said one end;
a limit stop fixed to said shaft abutting the handle of said tool;
means slidably carried by said shaft for reciprocating movement thereof, toward said handle stop and toward the end of said shaft opposite said one end, for forceable impacting of said latter means on said handle stop; wherein
said anvil means comprises an elongate element having an extended groove formed therein, along at least a half length thereof, for receiving said one end of said shaft in said groove and a portion of said shaft adjacent thereto, to dispose said elongate element co-linear with said shaft;
said elongate element has a first half portion thereof which is of a given weight, and a second half portion thereof which is of a weight greater than said given weight;
said second half portion of said element has greater weight to facilitate rotation of said element when inserted through constricted apertures without the use of external devices;
said element has a smooth, continuous surface which extends fully across the width thereof and covers said second half portion of said element;
said element further has uniformly-diminished cross-sections at opposite ends thereof to facilitate insertion and withdrawal of said element through constricted apertures;
said groove is formed in said first half portion of said elongate element;
said slidably-carried impacting means comprises an annular hammer;
said handle contains pulling means; and
said pulling means comprises a loop attached to said handle.

4,235,091

APPARATUS FOR TESTING POWER TRANSMISSION BELT

Hiroshi Takano, Miki; Yasuhiro Hashimoto, Kobe, and Mutsuo Takesako, Akashi, all of Japan, assignors to Mitsuboshi Belting Limited, Kobe, Japan

Filed Oct. 26, 1978, Ser. No. 954,951
Claims priority, application Japan, Oct. 26, 1977, 52/144393[U]
Int. Cl.³ G01N 3/56; G01M 13/02
U.S. Cl. 73—7 22 Claims



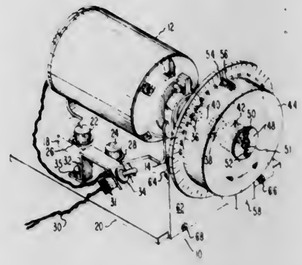
1. An apparatus for testing power transmission belts comprising:
(a) at least one drive motor having a drive pulley mounted on its motor shaft, said drive motor having a synchronous speed,
(b) at least one driven motor having a driven pulley mounted on its motor shaft, said driven motor having a synchronous speed,
(c) means for applying an excitation voltage to said drive and driven motors,
(d) a transformer connected to at least one of said drive motor and driven motor for controlling the excitation voltage applied to the motor to which it is connected, and
(e) at least one test belt mounted between said drive and driven pulleys, the pitch diameters of said drive and driven pulleys being selected so as to rotate said drive motor at a speed lower than its synchronous speed and to rotate said driven motor at a speed higher than its synchronous speed whereby belt characteristics can be evaluated by inspection of the belt.

4,235,092

LOW FRICTION BEARING RUNNING TORQUE MEASURING APPARATUS

James M. Spall, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1979, Ser. No. 46,945
Int. Cl.³ G01M 13/04
U.S. Cl. 73—9 5 Claims



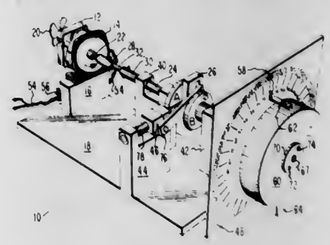
1. An apparatus for applying a radial load to a bearing and measuring the steady state running torque of the bearing comprising:
a bearing having an inner race and an outer race;
radial load means for applying a uniform radial load to the outer race of the bearing;
drive means for rotating the inner race of the bearing at a steady speed;
pendulum weight means for exerting a restoring force on the radial load means; and
means for indicating the angular displacement of the radial load means.

4,235,093

LOW FRICTION BEARING STARTING TORQUE APPARATUS

James M. Spall, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1979, Ser. No. 46,946
Int. Cl.³ G01M 13/04
U.S. Cl. 73—9 5 Claims



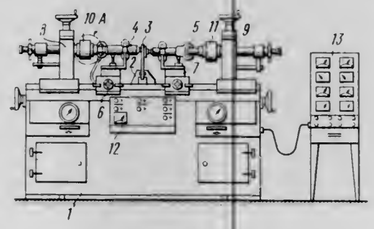
1. An apparatus for applying a radial load to a bearing and measuring the starting torque of the bearing comprising:
a bearing having an inner race and an outer race;
radial load means for applying a uniform radial load to the outer race of the bearing;
sinusoidal drive means for rotating the inner race of the bearing such that the velocity of the inner race is substantially sinusoidal;

pendulum weight means for exerting a restoring force on the radial load means;
means for indicating the angular displacement of the radial load means.

4,235,094
VIBRATION SAFETY TEST BENCH FOR HAND-HELD RIVETING HAMMERS

Vadim V. Matochkin, Bulatnikovsky pereulok, 10, korpus 3, kv. 458; Vladimir S. Nikolsky, ulitsa Priorova, 16, korpus 3, kv. 20; Semen E. Novikov, Altufievskoe shosse, 34a, kv. 255, and Valery N. Ryabinin, ulitsa Petrovka, 36, kv. 8, all of Moscow, U.S.S.R.

Filed Sep. 5, 1979, Ser. No. 72,680
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—11 **1 Claim**



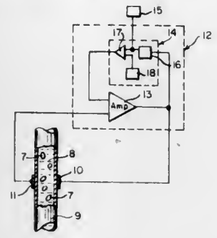
1. A vibration safety test bench for hand-held riveting hammers which comprises:
a bed;
a dummy work rigidly secured to said bed;
a mounting for a riveting hammer under test, which mounting is located on said bed at one side of said dummy work and is adapted for movement along said bed;
a dolly mounted on said bed at the other side of said dummy work in line with said riveting hammer under test;
a mounting for said dolly, which mounting is located on said bed at the other side of said dummy work and is adapted for movement along said bed;
two simulators of operator's hand input mechanical impedance, one of which is rigidly connected to said mounting for a riveting hammer and interacts with said hammer, whereas the other is rigidly connected to said mounting for a dolly and interacts with said dolly;
a vibration pickup designed to sense the vibration of said hammer and mounted on said simulator;
a vibration metering device electrically connected to said vibration pickup.

4,235,095
DEVICE FOR DETECTING INHOMOGENEITIES SUCH AS GAS BUBBLES

Leonard N. Liebermann, La Jolla, Calif., assignor to TIF Instruments, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 826,689, Aug. 22, 1977, Pat. No. 4,138,879. This application Sep. 1, 1978, Ser. No. 939,058
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.³ G01N *29/02*
U.S. Cl. 73—19 **5 Claims**

1. A device for detecting inhomogeneities in a fluid within a conduit comprising: a pair of electromechanical transducers for disposition on such conduit in an acoustically coupled relationship; adjustable gain driving amplifier means responsive to the electrical output of one of said transducers for providing a driving signal for driving the other of said transducers; automatic gain control circuit means connected to the output and at least one input of said driving amplifier means for automatically adjusting the gain of said driving amplifier to maintain said transducers and said amplifier at a predetermined operating point; and indicating circuit means connected to said amplifier for indicating changes in at least one of amplitude and

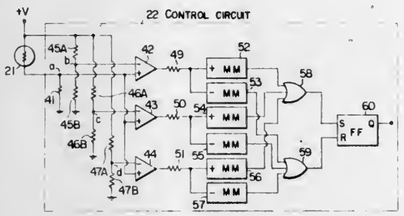


frequency of said driving signal caused by an inhomogeneity in said fluid moving past said transducers.

4,235,096
GAS DETECTION APPARATUS

Eturo Yasuda; Yoshihiro Segawa, both of Okazaki, and Minoru Ohta, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 17, 1979, Ser. No. 4,189
Claims priority, application Japan, Jan. 19, 1978, 53-4867
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 **4 Claims**



1. A gas detection apparatus comprising:
gas detection means for generating a data signal related to a constituent of an exhaust gas;
a plurality of reference signal generators for generating reference signals which are different from each other;
a plurality of comparators each having two input terminals, one input terminal of each of said comparators being connected to one of said reference signals, respectively, the other input terminal of all of said comparators being connected to said data signal, each comparator comparing the input signals to generate a comparison signal; and
logic means for detecting rise and fall of the comparison signals of said plurality of comparators and generating a first gas detection signal when any one of the comparison signals rises, and generating a second gas detection signal when any one of the comparison signals falls.

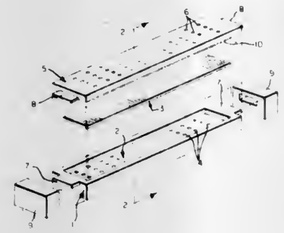
4,235,097
DOSIMETER FOR MEASURING GASEOUS CONTAMINANTS

Elbert V. Kring, Wilmington, Del., and William J. Lautenberger, Philadelphia, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 27, 1979, Ser. No. 24,386
Int. Cl.³ G01N *31/06*
U.S. Cl. 73—23 **5 Claims**

1. A personal dosimeter for measuring the time-average concentration of a gaseous contaminant in the atmosphere comprising
a flat base having a shallow cavity therein;

a detector substance capable of interacting with the gaseous contaminant situated within the cavity; and
a cover sheet, overlaying the base, the interior side of which meshes with the cavity in the base such that the detector substance is enclosed and disposed tightly between the cavity bed and the cover sheet,



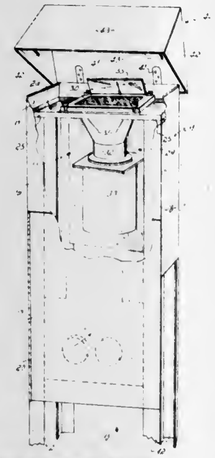


wherein at least one of the base and the cover sheet has a plurality of through-and-through circular channels, each channel having a length-to-diameter ratio of at least 3, and wherein the channels provide the only communication between the atmosphere and the detector substance.

4,235,098
AIR SAMPLING APPARATUS

Wilbur P. Tisch, 8368 Bridgetown Rd., Village of Cleves, Ohio 45002

Filed Aug. 2, 1979, Ser. No. 62,928
Int. Cl.³ G01N *1/24*
U.S. Cl. 73—28 **6 Claims**

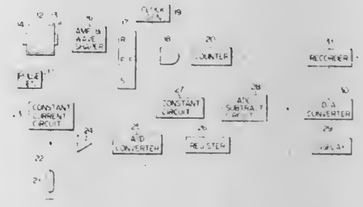


1. In air sampling apparatus having,
a housing,
a roof fixed over said housing and spaced above said housing to permit air to flow into said housing between said roof and said housing,
a filter located below said roof,
means for drawing air through said filter,
a cover plate,
means mounting said cover plate with respect to said filter for movement into and out of positions covering said filter,
and means for moving said cover plate to a covering position when no air is to be drawn through said filter and uncovered position when air is to be drawn through said filter.
6. Air sampling apparatus comprising,
a main housing having an open upper end,
a roof fixed over said housing and spaced above said housing to permit air to flow into said housing between the roof and said housing,
a horizontal support at the upper end of said housing below said roof,
a horizontal aperture plate resting on said support and having a central hole therethrough,
a filter and blower assembly mounted on said aperture plate,
a vertical control housing mounted on said aperture plate and depending therefrom into said main housing,
a filter cover positioned adjacent to said control housing,
filter cover moving means in said control housing and connected to said cover,
control means in said housing connected to said filter cover for moving said filter cover moving means between a position covering said filter and a position uncovering said filter.

4,235,099
ULTRASONIC APPARATUS AND METHOD FOR MEASURING THE DENSITY OF LIQUID

Hideo Ishizaka, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Apr. 26, 1979, Ser. No. 33,527
Claims priority, application Japan, Dec. 27, 1978, 53/163291
Int. Cl.³ G01N *9/00*
U.S. Cl. 73—32 A **9 Claims**



1. A method for measuring the density or specific gravity of a liquid, comprising steps of:
applying ultrasonic waves to a test liquid of an unkown density or an unknown specific gravity;
detecting ultrasonic waves after they pass through the test liquid, the detected ultrasonic waves being a function of the acoustic parameters of the test liquid;
detecting the difference between the acoustic parameters of the test liquid and those of a standard liquid of the same temperature as the test liquid; and
adding the detected difference to the known density or known specific gravity of the standard liquid of the same temperature as the test liquid to obtain the density or specific gravity of the test liquid.

4,235,100
COMPREHENSIVE COOLANT SYSTEM TESTER

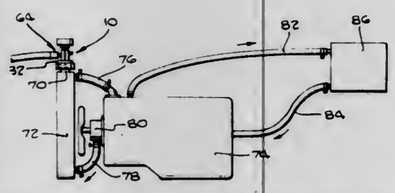
Ricky A. Branchini, 7596 Hillsdale, Pleasanton, Calif. 94566

Filed Sep. 13, 1979, Ser. No. 74,982
Int. Cl.³ G01M *3/32*
U.S. Cl. 73—49.7 **25 Claims**

1. A comprehensive automotive cooling system testing apparatus for testing all of the portions of said system, including the radiator filler cap, radiator, an engine block cooling passage

portions of said system, not withstanding variations in radiator hose diameter or the like, said apparatus comprising:

master pressurization test means for selectively pressurizing said portions with air, said master test means including a central open chamber, means for connecting a source of pressurized air to said central open chamber, said means including a coupling for connecting said chamber to said portion under test, means for visually observing the level of pressure within said portion, and means for releasing said pressure from said portion, whereby the integrity of said portion is determined by the level of pressure said portion will withstand without leaking;



adapting means for securing to said coupling and for attaching said pressurizing means to said radiator filler cap portion of said system;

means for testing said radiator, with said radiator disconnected from said block via said radiator hoses, said testing means including stepped plug means for sealing at least one of said radiator hoses; and

means for testing said block with said radiator disconnected, said means including stepped hollow cylindrical means for coupling said master test means to one of said hoses;

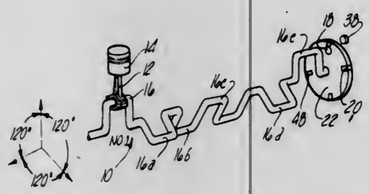
whereby a single master test means may be selectively employed to separately test (1) the filler cap (2) the entire coolant system excluding the filler cap, (3) the radiator and (4) the engine block.

4,235,101

ADJUSTABLE ENGINE CRANKSHAFT POSITION SENSOR WITH PREADVANCE TIMING SIGNAL CAPABILITY AND METHOD OF VARYING ENGINE TIMING

Joachim P. Stadelmann, Madison Heights, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 29, 1978, Ser. No. 964,329
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **23 Claims**



1. A timing signal generator, adapted to be mounted to an engine, the engine having at least one combustion chamber with a first member moveably disposed therein and a second member, including a second member rotatably disposed within the engine, wherein the motion of said first member can be inferred from the motion of said second member, said timing signal generator comprising:

a signal path generator means for generating a signal path comprising:

a magnetic pickoff means, having a central axis, for generating a magnetic flux path along said central axis and adapted to fit within said means for receiving of a bracket so that its central axis is maintained co-linear to the central axis of said means for receiving, said magnetic pickoff further having an output coil for generating a signal in response to interruption in said magnetic flux path;

interrupter means, for interrupting said signal path in timed relationship with the motion of said first moveable member, including:

an index feature located on said second member;

a disk-like member having an array of apertures thereon wherein one of said apertures is designated as an index aperture and located on said disk-like member so that when said index feature is at a first determinable location relative to said engine said index aperture intercepts said signal path;

output signal generator means for generating an output signal in response to the interruption of said signal path;

bracket means adapted to be attached to the engine for holding said signal path generator means in a determinable orientation with respect to said interrupter means and including:

a structure having means for receiving said signal path generator means having a central axis therethrough and;

a mounting plate having on one side a mounting surface adapted to mate with said engine and further adapted on its other side to receive said structure so that the plane of said mounting surface has a determinable relationship to said central axis of said structure;

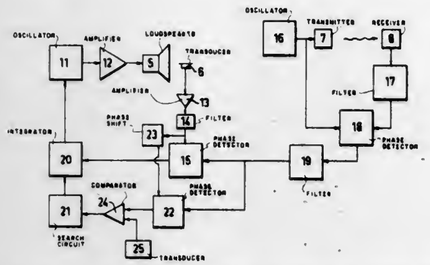
timing means for adjusting said timed relationship by varying the distance between said bracket means and said engine.

4,235,102

METHOD AND APPARATUS FOR MEASURING THE RATIO BETWEEN WEB TENSION AND SUBSTANCE

Hakan I. Karlsson, and Leif T. Östman, both of Spanga, Sweden, assignors to Svenska Traforskningsinstitutet, Sweden

Filed Mar. 9, 1979, Ser. No. 18,916
Claims priority, application Sweden, Mar. 10, 1978, 7802788
Int. Cl.³ G01L *5/10*; G01H *13/00*
U.S. Cl. 73—143 **10 Claims**



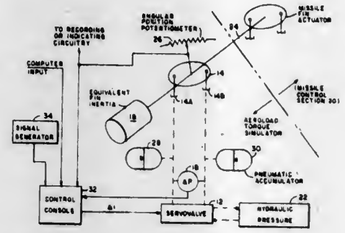
1. A method of measuring the ratio between web tension and web substance comprising the steps of passing the web over spaced supports and causing the web to vibrate at its resonance frequency between the supports by periodic pressure variations, which frequency depends on the ratio between the web tension and substance, measuring the pressure variations or the signal bringing about the pressure variations and producing a first signal, measuring a signal in phase with the vibration of the web and producing a second signal, comparing the phase difference of said first and second signals so that a deviation from a predetermined phase shift produces an output signal, and controlling the frequency of the pressure variations in response to said output signal so that the predetermined phase shift is maintained.

4,235,103

AEROLOAD TORQUE SIMULATOR

James W. Carter, Melrose; Donald C. Lee, Waltham; Vincent A. Simeone, Winchester, and Frank L. Cheever, Sudbury, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1979, Ser. No. 30,203
Int. Cl.³ G01M *17/06, 9/00*
U.S. Cl. 73—168 **2 Claims**



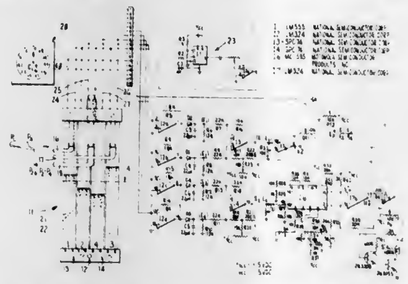
1. An aeroload torque simulator comprising: a servo valve for converting a variable electrical input signal into a variable hydraulic pressure output signal, amplifier means adapted for providing variable output electrical signals to said servo valve in response to selectable amplifier input signals, an actuator coupled to receive said variable hydraulic pressure output signal and adapted for physical coupling to a test article for applying torque loads thereto, a differential pressure transducer coupled to receive the hydraulic pressure output signal of said servo valve for providing a feedback input for said amplifier means, said amplifier means being a summing amplifier adapted for receiving a variable voltage command input and feedback voltage input from said pressure transducer for providing a differential output signal, and a potentiometer coupled to said actuator for providing an electrical indication of the angular position of the actuator physical coupling to said test article for indicating torque loads coupled thereto.

4,235,104

NORMALIZED COEFFICIENT OF LIFT INDICATOR

Arthur W. Hoadley, and Raymond S. Vander Bok, both of Portage, Mich., assignors to The Board of Trustees of Western Michigan University, Kalamazoo, Mich.

Filed Mar. 19, 1979, Ser. No. 21,617
Int. Cl.³ G01C *21/00*
U.S. Cl. 73—180 **12 Claims**



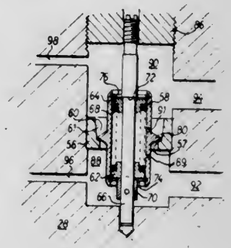
1. In an aircraft instrument system for use on a winged aircraft, an indicator showing a linearly variable ratio of a first pressure differential between a first pressure at a first location on the aircraft and a second pressure at a second location on the aircraft spaced from said first location and a second pressure differential between a third pressure at a third location on the aircraft and a fourth pressure at a fourth location on the aircraft spaced from said third location, first means responsive to said first pressure for producing a first signal, second means responsive to said second pressure for producing a second signal, third means responsive to said third pressure for producing a third signal, fourth means responsive to said fourth pressure for producing a fourth signal, quotient means responsive to said first, second, third and fourth signals for producing a quotient signal representing said linearly variable ratio of said first pressure differential and said second pressure differential, said quotient means being connected to said indicator means, said first, second, third and fourth locations being positioned at a family of points on said aircraft for causing variations in said ratio to remain positively sloped in response to variations in the coefficient of lift (C_{LN}) to thereby provide to the pilot a normalized coefficient of lift (C_{LN^a}) indication at all times as to the aircraft's orientation relative to the maximum coefficient of lift, said normalized coefficient of lift (C_{LN^a}) being wholly independent of flap setting.

4,235,105

HYDRAULIC ACTUATOR CONTROLS

Ronald B. Walters, Wembley, England, assignor to Sperry Corporation, Troy, Mich.

Filed May 21, 1979, Ser. No. 41,254
Claims priority, application United Kingdom, May 26, 1978, 23324/78
Int. Cl.³ G01F *1/22*
U.S. Cl. 73—861.53 **5 Claims**



1. A fluid flow sensor comprising a housing having two flow ports by which the sensor can be connected in the hydraulic flow to be measured and having two chambers with which said ports respectively communicate and a throat interconnecting said chambers, a spool movably disposed in said throat, spring means acting on said spool, said spool having a peripheral edge co-operating with the wall of said throat and being displaceable from an obturating position against the force of said spring means by a pressure difference between the chambers, a valve seat in said housing, said spool being seated against said valve seat when in its obturating position, said throat being so profiled that a varying annular flow orifice is defined between said peripheral edge on the spool and the wall of the throat as the spool is displaced from its obturating position, whereby the pressure difference between said chambers provides a measure of the hydraulic flow between the flow ports; and bleed orifice means defining a residual flow path between said chambers when the spool is in its obturating position to obtain a measurable pressure difference at flow rates insufficient to lift the spool from the valve seat against residval spring forces.

4,235,106

SYSTEM AND METHOD FOR OBTAINING COMPENSATED LEVEL MEASUREMENTS

Frederick L. Maltby, Jenkintown, and David M. Stern, Merion Station, both of Pa., assignors to Drexelbrook Coatrols, Inc., Horsham, Pa.

Filed Dec. 8, 1978, Ser. No. 967,683
Int. Cl.³ G01F *23/26*
U.S. Cl. 73—304 C **26 Claims**

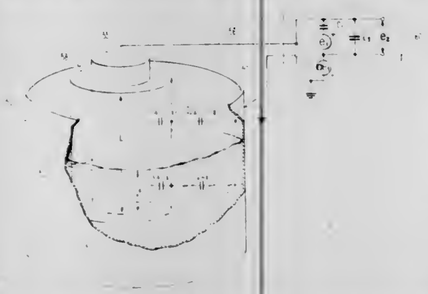
1. A compensated level measuring system for measuring the

level of material housed in a vessel, said material being characterized by certain electrical characteristics such as dielectric constant and conductivity, comprising:

a. first probe means having a first probe portion mounted at a fixed position within said vessel, for obtaining a level signal which is a function of said material level and said electrical characteristics;

b. second probe means having a second probe portion maintained within said vessel at a position always submerged in said material, for obtaining a reference signal which is a function of said electrical characteristics;

c. said second probe means comprising means located exter-



nal to said second probe portion and operable while said second probe portion is submerged in said material for adjusting said reference signal to provide a compensated reference signal;

d. means for deriving a compensated level signal as a predetermined function of said level signal and said compensated reference signal; and

e. wherein said first probe means comprises a first electronic source circuit in combination with said first probe portion for generating said level signal, and said second probe means comprises a second electronic source circuit in combination with said second probe portion for generating said reference signal.

4,235,107

METHOD AND ARRANGEMENT FOR MEASURING THE PHYSICAL TEMPERATURE OF AN OBJECT BY MEANS OF MICROWAVES

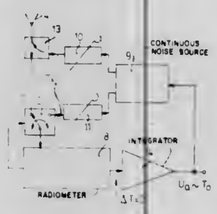
Kai M. Lüdeke, Hamburg; Burkhard Schiek, and Jürgen Köhler, both of Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1979, Ser. No. 6,062

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803480

Int. Cl.³ G01J *5/52*

U.S. Cl. 73—355 EM **15 Claims**



1. A method for measuring the physical temperature of an object with a microwave Dicke radiometer, comprising the steps of:

directing an antenna toward the object;

constantly applying a microwave noise signal to the antenna;

controlling the power of the noise signal with an integrated output signal from the radiometer; and

periodically repeating the step of alternately connecting an input of the radiometer to (A) the continuous noise signal and (B) a signal from the antenna which includes both reflected noise and emission from the object;

whereby the integrated output signal from the radiometer is proportional to the temperature of the object.

4,235,108

DEVICE FOR MEASURING TEMPERATURE USING CO-CRYSTALLIZED ACETYLENIC COMPOSITIONS

Gordhanbhai N. Patel, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 817,069, Jul. 19, 1977. This application Nov. 13, 1978, Ser. No. 960,507

Int. Cl.² G01K *11/12, 11/20*

U.S. Cl. 73—356 **4 Claims**

1. A device for measuring temperature comprising a substrate having deposited thereon at least one thermochromic composition consisting essentially of at least two co-crystallized acetylenic compounds, of different chemical structures, each containing at least one —C≡C—C≡C— group and substituents selected from the group consisting of sulfonate, urethane, and alcohol radicals, at least one of the compounds capable of undergoing a contrasting color change upon exposure to actinic radiation or thermal annealing wherein the composition exhibits a substantially different thermogram than the sum of the thermograms of the individual components as obtained by differential scanning calorimetry, and wherein the composition exhibits a higher or lower rate of color change upon exposure to actinic radiation or thermal annealing than the individual compounds.

4,235,109

STEM SEAT FOR PISTON AND CYLINDER TYPE THERMAL DEVICE

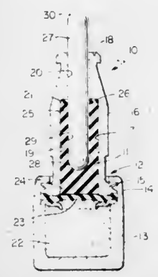
Warren G. Williamson, Louisville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 918,069, Jun. 22, 1978, Pat. No. 4,179,928. This application Jul. 16, 1979, Ser. No. 58,084

The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.

Int. Cl.³ G01K *5/32*

U.S. Cl. 73—368.3 **24 Claims**



1. In a piston and cylinder type thermal device having a resilient stem seat provided with an opening in one end thereof and receiving an actuating stem in said opening that is adapted to reciprocate in said opening in response to the thermal expansion and contraction of a charge of material in said device and operatively acting on said stem seat adjacent the other end thereof, said opening having three portions thereof disposed in serially aligned and interconnected relation, said stem having three portions thereof respectively disposed in said three portions of said opening, said portions of said opening and said stem each having a main diameter, said main diameters of said portions of said stem being substantially the same size, the improvement wherein said opening of said stem seat has one of said portions thereof disposed adjacent said other end of said stem seat and having its said diameter substantially smaller than said diameter of the portion of said stem that is to be received in said one portion when said stem seat is in the unassembled condition thereof, said opening having another of said portions thereof disposed adjacent said one end of said stem seat and having its said diameter substantially smaller than said diameter of the portion of said stem that is to be received in said other portion when said stem seat is in the unassembled condition thereof, the remaining portion of said opening comprising an intermediate portion of said opening that joins with said one portion and said other portion and has its said diameter substantially the same size as said diameter of the portion of said stem that is to be received in said intermediate portion when said stem seat is in the unassembled condition thereof.

4,235,110

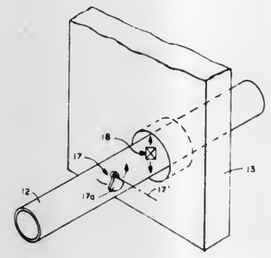
APPARATUS AND METHOD FOR MEASURING THE CREVICE GAP CLEARANCE IN A HEAT EXCHANGER

Gary J. Dau, Palo Alto; Louis J. Martel, Los Altos, and Terry D. Scharton, Santa Monica, all of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jan. 12, 1979, Ser. No. 2,899

Int. Cl.² G01N *19/00*

U.S. Cl. 73—579 **5 Claims**



1. A method of measuring the crevice gap clearance between a tube and a tube support in heat exchangers and the like comprising the following steps: vibrating such tube in proximity to said tube support; monitoring the acceleration of such tube in the tube support region; and determining from such monitored acceleration said clearance.

4,235,111

APPARATUS FOR ULTRASONIC SCANNING

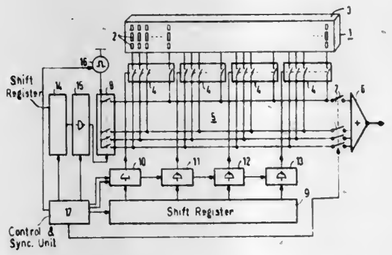
Dieter Hassler, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 830,173

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643918

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 **20 Claims**



1. Apparatus for ultrasonic scanning, comprising an ultrasonic applicator having variable depth of focus during a scanning operation, characterized in that the applicator comprises a plurality of transducer elements arranged spatially adjacent one another for activation in different combinations so as to define respective receiving surfaces of different sizes for effective reception of ultrasonic echo signals from different distance, and control means for automatically controlling the activation of the respective different combinations of said transducer elements of different size during a scanning operation, and operable for changing the number of active transducer elements from a low value to a maximum value, said control means comprising selector means operable for controlling selection of the number of transducer elements of a row which can be active as a block, and transmit control means for activating less than all of a block of transducer elements during transmit mode while accommodating activation of all of the block of transducer elements during received mode, said selector means comprising a first shift register (9) which is loaded with a number of bits to form a block of bits in accordance with the maximum number of transducer elements to be active as a block during a scanning cycle, the control means providing for a plurality of changes in the size of the receiving surface prior to each shifting of the block of bits in said shift register, successive blocks of surface pattern switches controlling coupling with successive sections of individual transducer elements, a series of matrix conductors (5) each connected with respective corresponding surface pattern switches of successive blocks thereof, transmit/receive energy switches (8) selectively controlling the supply of transmit energy to the respective matrix conductors, and said control means comprising a second shift register (14) controlling said transmit/receive energy switches (8) for determining the width of the transmitting surface defined by active transducer elements during emission of a transmit signal.

4,235,112

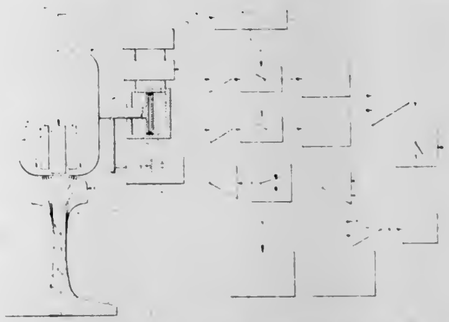
RAIL FLAW DETECTOR POSITION CONTROL

Willard D. Kaiser, Grove City, Ohio, assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Aug. 6, 1979, Ser. No. 63,819

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—634 **6 Claims**



1. An apparatus for ultrasonically inspecting railroad track rail elongated members for abnormalities, the apparatus including a sensor head movably supported fom a carriage so as to be in contact with the member to be inspected, the carriage being movable longitudinally along the member to be inspected and the sensor head being separately movable laterally with respect to the direction of movement of the carriage, the improvement comprising means for automatically positioning the sensor head laterally relative to the carriage comprising:

a pair of passive ultrasound transducers movably supported from the carriage, the transducers of said pair respectively being equally spaced to either side of a line through the

center of an ultrasound generator in the sensor head, said line being parallel to the direction of movement of the carriage, the transducers of said pair being acoustically coupled to the member being inspected and generating electrical signals commensurate with reflected ultrasound energy;

means responsive to the electrical signals generated by the transducers of said pair for generating a position error signal commensurate with any difference between the transducer generated signals;

actuator means for imparting lateral movement to the sensor head and to said passive transducers, said actuator means being supported on the carriage; and

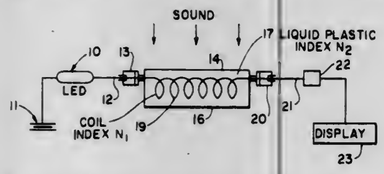
means responsive to said position error signal for delivering a control signal to said actuator means to cause movement of said head and passive transducers in a direction to null the error signal.

4,235,113

OPTICAL FIBER ACOUSTICAL SENSORS

Edward F. Carome, 3850 Merrymound Rd., South Euclid, Ohio 44121

Filed Aug. 21, 1978, Ser. No. 935,515
Int. Cl.³ G02B 5/14
U.S. Cl. 73—655 **17 Claims**



1. A pressure to electromagnetic radiation transducer comprising:

an elongated electromagnetic wave conductive medium of a predetermined normal first index of refraction and adapted to receive electromagnetic waves and conduct them longitudinally therethrough; and

a pressure sensitive cladding encasing said elongated electromagnetic wave conductive medium and having a smooth continuous surface, said cladding having a predetermined normal second index of refraction which is slightly lower than said first index of refraction of said wave conductive medium, the index of refraction of said cladding varying with respect to the pressure thereon;

said electromagnetic wave conductive medium and said cladding being such that the difference between their respective refractive indices varies uniformly along the length of said electromagnetic wave conductive medium and said cladding with pressure applied to said cladding thereby uniformly controlling the intensity and/or phase of electromagnetic radiation traversing said electromagnetic wave conductive medium.

4,235,114

MATERIAL TESTING DEVICE

David B. Mohler, Tipp City, Ohio, assignor to Ledex, Inc., Vandalia, Ohio

Filed Apr. 2, 1979, Ser. No. 26,254
Int. Cl.³ G01N 3/08
U.S. Cl. 73—805 **8 Claims**

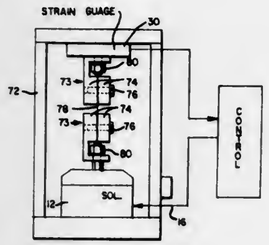
1. A testing device for applying a force to a material test sample, comprising:

a test fixture for engaging the test sample,

a solenoid, operatively coupled to said test fixture, for applying a force to said test sample in response to a solenoid control signal,

strain gauge means, mounted on said test fixture, for providing an electrical output indicative of the force applied to said test sample,

force setting circuit means for providing an electrical output indicative of the predetermined force which is to be applied to said test sample, and



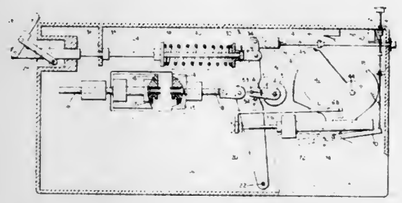
solenoid control circuit means, responsive to the output from said strain gauge means and to the output from said force setting means, for providing a pulse width modulated solenoid control signal to said solenoid, whereby a predetermined force may be applied to said test sample.

4,235,115

ELECTRIC WELDING

Stanley H. Gordon, Concord, Mass., assignor to Thomson General Corporation, Burlington, Mass.

Filed Sep. 25, 1978, Ser. No. 945,431
Int. Cl.³ G05G 17/00
U.S. Cl. 74—2 **10 Claims**



1. Platen driving and control mechanism for a flash-butt welder having a relatively fixed platen and a movable platen supported for flash and continuing upset movement adjacent said relatively fixed platen, comprising

an operating lever rotatable about a fixed pivot and connected to said movable platen to move said movable platen between a fully retracted position and the upset position

control means for controlling the rate of advance of said lever and the platen actuated thereby, including

a cam member having an arcuate cam surface with a flash portion followed by a radially inwardly extending upset portion, said cam member being mounted adjacent said operating lever and being driven therefrom for rotation about a fixed pivot axis

a cam member driving wheel mounted on said operating lever in operating contact with said flash portion of said arcuate cam surface for rotating said cam member about its axis

snubbing means for controlling the rate of rotation of said rotatable cam member, and

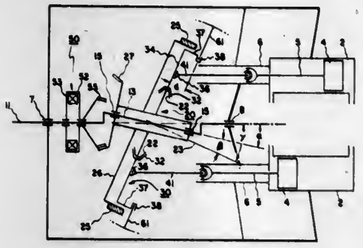
power means connected to said operating lever for moving said lever and said movable platen between said retracted and upset positions and rotatably driving said cam member.

4,235,116

BALANCED VARIABLE WOBBLE PLATE DRIVE

Roelf J. Meijer, and Albertus P. J. Michels, both of Ann Arbor, Mich., assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1978, Ser. No. 904,529
Int. Cl.³ F16H 23/00
U.S. Cl. 74—60 **10 Claims**



1. A balanced variable displacement drive mechanism for a cluster of axially reciprocating members comprising:

a shaft having an axis,

means for mounting the shaft for rotation about the shaft axis,

a wobble plate having means for defining a driving plane,

a swashplate having an axis perpendicular to said driving plane,

bearing means so connecting said wobble plate to said swashplate that the driving plane is maintained perpendicular to the swashplate axis,

means for mounting the swashplate to the shaft for rotation therewith about the shaft axis, and for control movement with respect to the shaft, said control movement tilting the driving plane about a tilt axis perpendicular to and intersecting the shaft axis,

means for restraining the wobble plate from rotation about the shaft axis,

at least three reciprocating member assemblies; each assembly comprising a member, means for mounting the member for reciprocating motion in an axial direction parallel to said shaft axis, and means for connecting the member to the wobble plate for reciprocating motion in response to shaft rotation as a function of the angle of tilt of the driving plane, and

a circular symmetrical balancing ring connected to said swashplate for movement therewith, spaced outward from said wobble plate and intersected by the driving plane; the swashplate and balancing ring together having a combined mass so arranged that the center of gravity of said mass lies in said driving plane, and centrifugal forces on the mass counterbalance other oscillating inertia forces.

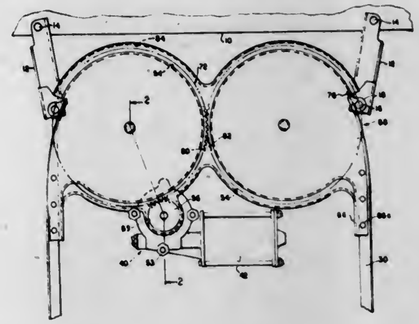
4,235,117

TAILGATE WINDOW REGULATOR

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Dec. 7, 1978, Ser. No. 967,167
Int. Cl.³ E05F 11/48, 15/16
U.S. Cl. 74—89.2 **8 Claims**

1. A tailgate window regulator adapted to be mounted within the interior of a vehicle tailgate for connection to a window movable into and out of the interior of the tailgate, said regulator comprising a pair of rotors, each of said rotors comprising a unitary concentric axially offset gear and tape actuating drum, the gears of said rotors being slightly larger than said drums and being in mesh, a support comprising a flat plate on which said rotors are pivotally mounted, said plate having two generally circular portions joined at their edges and of slightly greater diameter than said drums, generally cylindrically shaped flanges at the edges of said circular portions surrounding a substantial circumferential extent of the adjacent drums and defining therewith generally arcuate tape confining and guide passages, operationally rigid elongated tape guides connected to and extending from said support in generally tangential relation to said drums, flexible tapes having one end fixedly connected to said drums and having window connector brackets at the other ends thereof, said tapes and guides having interfitting configurations providing for only longitudinal sliding of the tapes on said guides, and drive means for rotating one of said rotors whereby said tapes are wound onto or off of said drums to raise or lower the tailgate window.



4,235,118

BICYCLE DERAILLEUR

Roger H. M. Huret, Nanterre, France, assignor to Etablissements Huret & Fils, Nanterre, France

Filed Oct. 12, 1978, Ser. No. 950,815
Claims priority, application France, Jun. 1, 1978, 78 16452
Int. Cl.³ F16H 11/00
U.S. Cl. 74—217 B **3 Claims**



1. In combination, a bicycle derailleur adapted to be mounted on a spindle carried on a bicycle frame for rotative movement about a pivot axis of the spindle in relation to a stop surface in fixed relation to said axis on said bicycle frame, said derailleur including a separate element having an orifice for accommodating said mounting spindle of the derailleur extending therethrough and further including with at least one stop member for limiting the rotation of said derailleur relative to said fixed stop surface of said frame.

4,235,119

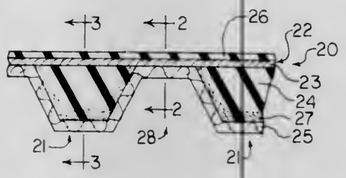
TOOTHED BELT

Robert E. Wetzel, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 2, 1978, Ser. No. 957,280
Int. Cl.² F16G 1/00, 1/22, 1/28
U.S. Cl. 474—205 **6 Claims**

1. A positive drive power transmission belt having a plurality of alternating grooves and elastomeric teeth extending

generally transversely thereof, comprising a tensile member, said teeth bonded to one side of said tensile member, a backing layer of elastomeric material bonded to said tensile member, a covering for said teeth and said grooves, and reinforcing fibers distributed through at least a portion of each of said teeth, characterized in that in the area of said grooves, said backing



layer is free of said fibers, the interface between said tensile member and said covering is substantially free of said fibers, and in said teeth, said fibers are distributed at least in the area immediately adjoining said covering, wherein said tensile member comprises a plurality of convolutions of cords, and characterized in that said fibers are present in at least a portion of the spaces between said cords.

4,235,120

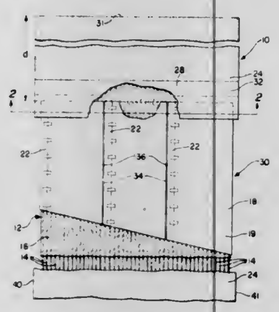
BELT AND METHODS OF MANUFACTURE AND SPLICING

Richard D. Candle, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 14, 1979, Ser. No. 38,758

Int. Cl.³ B65G *15/34*

U.S. Cl. 474—254 **25 Claims**



1. In an elastomeric belt having a reinforcing core extending in the lengthwise direction of the belt, and a pair of outer cover layers of elastomeric material,

an end region facilitating splicing or repair of the belt,

an end surface on said end region,

a separator layer in said end region interposed between said core and at least one of said outer cover layers for facilitating removal of one of said cover layers from said core during splicing or repair, said separator layer terminating at a position spaced from said end surface to protect said core against entry of foreign matter.

4,235,121

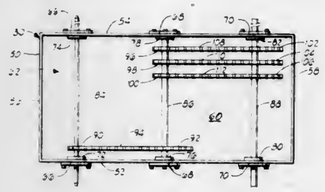
CHAIN SPEED REDUCER ASSEMBLY

Greg Cook, Duncan, Okla., assignor to Cook Machine Company, Duncan, Okla.

Continuation-in-part of Ser. No. 840,969, Oct. 11, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 955,106

Int. Cl.³ F16H *7/14*

U.S. Cl. 474—89 **10 Claims**



3. A chain speed reducer assembly for an oil producing unit comprising:

a chain reducer frame having a first pair of axially aligned support holes, a second pair of axially aligned support holes, and a third pair of axially aligned support holes;

a first bearing block having a support portion and supported by the chain reducer frame so that upon positioning the support portion of the first bearing block in one of the first pair of axially aligned support holes the support portion is selectively rotatable about a central axis thereof, the support portion of the first bearing block having an eccentric shaft support bore axially displaced from the central axis a predetermined offset distance;

first attaching means for securing the first bearing block to the chain reducer frame at a selected angular disposition;

first bearing means supported in the shaft supporting bore of the first bearing block;

a second bearing block having a support portion and supported by the chain reducer frame so that upon positioning the support portion of the second bearing block in the other of the first pair of axially aligned support holes the support portion of the second bearing block is selectively rotatable about a central axis thereof, the support portion of the second bearing block having an eccentric shaft support bore axially displaced from the central axis a predetermined offset distance;

second attaching means for securing the second bearing block to the chain reducer frame at a selected angular disposition;

second bearing means supported in the shaft supporting bore of the second bearing block;

a driver shaft having a first end portion rotatably supported by the first bearing means and a second end portion rotatably supported by the second bearing means;

at least one driver sprocket supported by the driver shaft;

first seal means supported by each of the first and second bearing blocks for sealing between the support portions of the first and second bearing blocks and the chain reducer frame;

a third bearing block having a support portion and supported by the chain reducer frame so that upon positioning the support portion of the third bearing block in one of the second pair of axially aligned support holes the support portion is selectively rotatable about a central axis thereof, the support portion of the third bearing block having an eccentric shaft support bore axially displaced from the central axis a predetermined offset distance, the third bearing block further characterized as having a threaded aperture communicating from the first end thereof to the shaft support bore;

third attaching means for securing the third bearing block to the chain reducer frame at a selected angular disposition;

third bearing means supported in the shaft support bore of the third bearing block;

a fourth bearing block having a support portion and supported by the chain reducer frame so that upon positioning the support portion of the fourth bearing block in the other of the second pair of axially aligned support holes the support portion is selectively rotatable about a central axis thereof, the support portion of the fourth bearing block having an eccentric shaft support bore axially displaced from the central axis a predetermined offset distance;

fourth attaching means for securing the fourth bearing block to the chain reducer frame at a selected angular disposition;

fourth bearing means supported in the shaft support bore of the fourth bearing block;

second seal means supported by each of the third and fourth bearing blocks for sealing between the support portions of the third and fourth bearing blocks and the chain reducer frame;

a first driven shaft having a first end portion rotatably supported by the third bearing means and a second end portion rotatably supported by the fourth bearing means;

at least one driven sprocket supported by the first driven shaft;

at least one drive chain connecting the driver sprocket supported by the driver shaft and the driven sprocket supported by the first driven shaft;

a plurality of driver sprockets supported by the first driven shaft;

a fifth bearing block having a support portion and supported by the chain reducer frame so that upon positioning the support portion of the fifth bearing block in one of the third pair of axially aligned support holes the support portion is selectively rotatable about a central axis thereof, the support portion of the fifth bearing block having a centrally disposed shaft support bore;

fifth attaching means for securing the fifth bearing block to the chain reducer frame;

fifth bearing means supported in the shaft support bore of the fifth bearing block;

a sixth bearing block having a support portion and supported by the chain reducer frame so that upon positioning the support portion of the sixth bearing block in the other of the third pair of axially aligned support holes the support portion is selectively rotatable about a central axis thereof, the support portion of the sixth bearing block having a centrally disposed shaft support bore;

sixth attaching means for securing the sixth bearing block to the chain reducer frame;

sixth bearing means supported in the shaft support bore of the sixth bearing block;

third seal means supported by each of the fifth and sixth bearing blocks for sealing between the support portions of the fifth and sixth bearing blocks and the chain reducer frame;

a second driven shaft having a first end portion rotatably supported by the fifth bearing means and a second end portion rotatably supported by the sixth bearing means;

a plurality of driven sprockets supported by the second driven shaft, the plurality of driven sprockets being disposed so that one of each of the driven sprockets supported by the second driven shaft is aligned with one of the driver sprockets supported by the first driven shaft; and

a plurality of drive chains connecting the driven sprockets supported by the second driven shaft and the driver sprockets supported by the first driven shaft.

4,235,122

BALL CIRCULATION TYPE OF SPIRAL GEARING

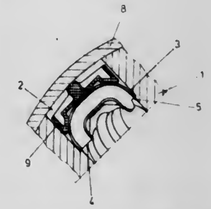
Wolfgang Walter, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 28, 1979, Ser. No. 15,954

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809617

Int. Cl.³ F16H *55/22*

U.S. Cl. 74—424.8 R **10 Claims**



1. In a ball-circulation type of spiral gearing having a nut (1), a ball return tube (3) exclusively establishing a return passage between ball guiding channels of the gearing, within an elongated peripheral slot (2) in the nut, a spacer (9) in engagement with the ball return tube in spaced relation to the ball guiding channels and a cover (8) enclosing the spacer and the ball return tube within the unit, the improvement residing in means (10,11) for holding the spacer and the ball return tube preassembled as a unit independently of the spiral gearing and insertable into the nut through said slot, and means for preventing disassembly of said unit after insertion into the peripheral slot.

4,235,123

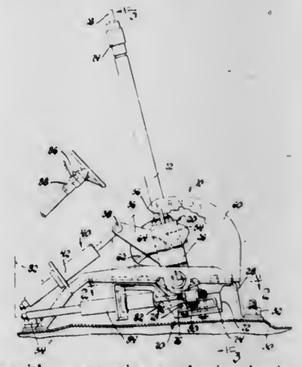
AUTOMATIC TRANSMISSION MANUAL SHIFT CONTROL ASSEMBLY WITH A PARK LOCK MECHANISM

Carl D. Simancik, Troy, and Kenneth M. Zemke, Lake Angelus, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1979, Ser. No. 2,667

Int. Cl.³ G05G *13/00, 5/06, 5/00*; E05B *65/12*

U.S. Cl. 74—475 **2 Claims**



1. For use with an actuating mechanism having a "Lock" mode, in a transmission shift control mechanism including support means, a detent plate mounted on said support means and having a plurality of shift ratio detents and a "Park" detent, a shift lever having a handle end and a pivot end pivotally mounted on said support means, detent means having a detent engaging portion, a detent rod slidably mounted in said shift lever, biasing means for biasing said detent rod toward said handle end of said shift lever and for biasing said detent engag-

ing portion to selectively engage said detents of said detent plate to thereby establish a gear ratio position, a button bore formed in said handle end, and a push button slidably mounted in said button bore and operatively connected to said detent rod and operative on manual movement thereof into said button bore to move said detent rod against the force of said biasing means to thereby move said detent means to detent released position, the improvement comprising a lock pawl slidably mounted on said support means, a lock cable operatively connected between said lock pawl and said actuating mechanism for moving said lock pawl into a "Lock" position corresponding to said "Lock" mode of said actuating mechanism when said detent engaging portion of said detent means is in its "Park" position, thereby preventing said detent engaging portion of said detent means from being removed from its "Park" position so long as said actuating mechanism remains in its "Lock" mode, and a stop plate operatively connected to said detent engaging portion of said detent means for pivotal movement therewith, said stop plate preventing movement of said lock pawl into its "Lock" position at all times except when said detent engaging portion is in its "Park" position.

4,235,124

COUNTERBALANCED ROLLER FOR PAPER MACHINES

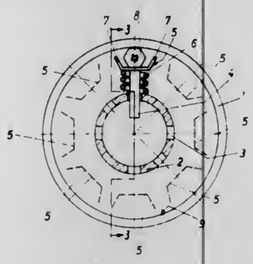
Heinz Banzhaf, and Robert Dietrich, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,429

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659130

Int. Cl.³ F16F *15/22*

U.S. Cl. 74—573 R **14 Claims**



1. A roller for a paper machine, or the like, comprising:

an elongated roller shell; said roller shell including an internal wall;

a clamping device inside said roller shell, angularly fixed with respect to said roller shell, and comprising at least one holder; each said holder extending axially of said roller; biasing means for urging each said holder radially toward said roller shell internal wall; each said holder having an axially elongated radially outer end portion which is shaped and adapted for supporting a counterbalancing weight between said holder outer end portion and said shell internal wall; said outer end portion of each said holder being shaped to enable an elongated counterbalancing weight to be inserted axially of said roller onto said holder.

4,235,125

AUTOMATIC STEPLESS TRANSMISSION

Rafael Perlin, 489 Georges St. #21, Magog, Quebec, Canada

Filed Feb. 6, 1979, Ser. No. 9,801

Int. Cl.³ F16H *7/06*

U.S. Cl. 74—674 **9 Claims**

1. An automatic stepless transmission for converting torque from an input shaft to a load-varying output shaft comprising:

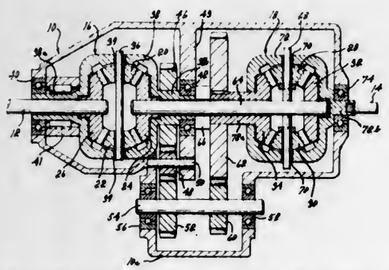
first differential gear means associated with said input shaft and receiving said torque;

second differential gear means associated with said output shaft;

torque-varying connection means between said first differential gear means and said second differential gear means;

second connection means between said first differential gear means and said second differential gear means;

said torque received in said first differential gear means being divided and transmitted to said second differential



gear means into two components: a first torque component acting through said torque-varying connection means and a second torque component applied to said second differential gear means;

said torque-varying connection means having a higher transmission ratio than that of said second connection means and transmitting substantially all of said torque during first stages of operation; subsequently, said torque being gradually divided between said torque-varying connection means and said second connection means in proportion to varying load conditions applied on said output shaft.

4,235,126

TRANSMISSION MECHANISM

Derek Gardner, Hitchin, England, assignor to Borg-Warner Limited, Letchworth, England

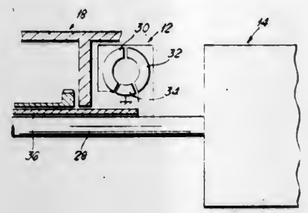
Filed Jun. 28, 1978, Ser. No. 920,042

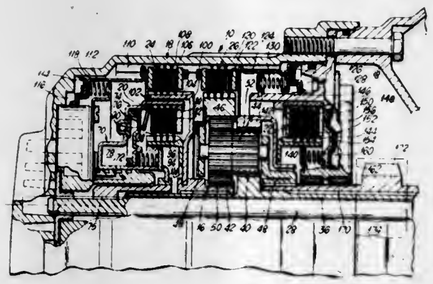
Int. Cl.³ F16H *47/08*

U.S. Cl. 74—688 **4 Claims**

1. A transmission mechanism comprising a drive shaft, a hydraulic torque converter including an impeller driven by said drive shaft and a turbine output element connected to a turbine shaft, a planetary gear set having two sun gears, two ring gears, and a planetary carrier having two sets of intermeshing planetary pinions journalled thereon, said turbine shaft being connected to one of said sun gears, a clutch connected between said drive shaft and the other of said sun gears, a plurality of friction brake devices connected to certain of said elements, so that a plurality of drive ratios is provided by selective engagement of said friction elements and a direct drive ratio is established by engagement of said clutch only, a first one of said brake devices being connected to one of said ring gears and engageable to provide a first low drive ratio, a second one of said brake devices for said other sun gear being engageable to provide a second or intermediate drive ratio, said clutch being engageable to provide a third or direct drive ratio, a radially extending drum having one end connected to said other sun gear and its other end terminating in an outer axial flange which forms a portion of the second friction brake device, and a clutch flange member secured to said radially

extending drum and having an end portion substantially parallel the outer axial flange of said drum, so that the clutch and





second friction brake device are provided in a compact, concentric arrangement.

4,235,127

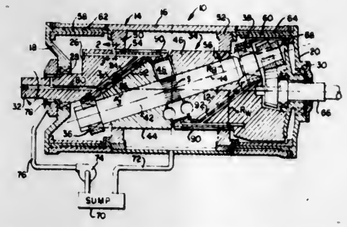
TRACTION SURFACE COOLING SYSTEM FOR TORQUE TRANSMISSIONS

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 6,899, Jan. 26, 1979, abandoned. This application Mar. 23, 1979, Ser. No. 23,399

Int. Cl.³ F16H *57/04*

U.S. Cl. 74—796 **12 Claims**



1. In a traction drive torque transmission having at least two traction surfaces in rolling frictional engagement with each other under normal force loading, a rotatable body movable relative to both such surfaces and a lubricant circulating system by which a liquid lubricant is delivered to and collected from the traction surfaces, the improvement comprising:

traction surface engaging means for removing lubricant from each of the traction surfaces during operation of the transmission; and

means to support said traction surface engaging means from the rotatable body so that said engaging means will be in continuous contact and movable relative to the traction surfaces;

said traction surface engaging means being operative to remove lubricant from the traction surfaces thereby to increase the heat transfer from said traction surfaces to the lubricant.

4,235,128

PLANETARY GEAR PROVIDED WITH FRICTION PLANET WHEELS

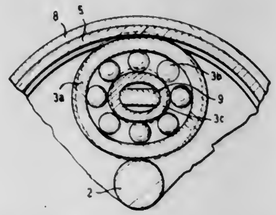
Seppo Kanervo, Mittarikatu 2C, 04400 Järvenpää44, and Erkki Rautiainen, Kuusitie 3 C 55, 00270 Helsinki 27, both of Finland

Continuation-in-part of Ser. No. 710,034, Jul. 30, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,609

Claims priority, application Finland, Oct. 12, 1977, 773028

Int. Cl.³ F16H *13/08*; F16C *13/02*

U.S. Cl. 74—798 **4 Claims**



1. A planetary gear with friction planet wheels, comprising an outer casing, first and second shafts and a plurality of friction planet wheels transmitting power from one shaft to the other and each having an axle, an inner ring which is fixedly mounted on the axle, an outer ring surrounding the inner ring, and rollable elements contained between the inner ring and the outer ring and permitting the outer ring to rotate about the inner ring, and the gear further comprising a flange attached to said first shaft and having the axle of the planet wheels connected thereto, the outer rings of the planet wheels being arranged as rollers between the casing and the second shaft, and the friction planet wheels thus constituting the sole radial bearing for the casing and first and second shafts, the inner ring of each planet wheel being oval in shape in order to facilitate movement of the rollable elements and to relieve point pressure exerted on said rollable elements by virtue of the outer ring being rendered oval in shape by pressure exerted thereon by the outer casing.

4,235,129

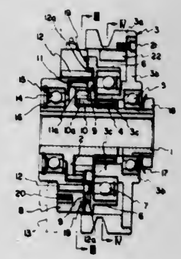
SPEED REDUCTION MECHANISM

Isamu Takasu, 11 of 35, Nishiogi-Kita 3-chome, Suginami-ku, Tokyo, 165, Japan

Filed Mar. 30, 1978, Ser. No. 891,759

Int. Cl.³ F16H *1/28*

U.S. Cl. 74—805 **7 Claims**



1. A speed reducer comprising:

a stationary support having a central bore and a flange-like disc surrounding said central bore,

a driven element rotatably supported in said central bore of

said stationary support and comprising a shaft, an annular flange projecting from said shaft and an annular first gear with internal teeth on said flange,

a driving element surrounding said driven element and rotatably supported coaxially with said driven element, said driving element comprising a disc, an annular flange supported by said disc, and an eccentric inwardly of said annular flange,

a floating disc having a central spring in which said eccentric is rotatable and carrying a second gear with external teeth disposed inside said first gear, said second gear being smaller than said first gear and having fewer teeth, and

means on said stationary support for restraining rotation of said floating disc while permitting its orbital movement by said eccentric, the eccentricity of said eccentric being such as to bring said second gear into mesh with said first gear at one location in its periphery,

whereby orbital movement is imparted to said floating disc by rotation of said driving element to bring teeth of said second gear into mesh with teeth of said first gear progressively around the peripheries of said gears to drive said first gear and said driven element at a reduced speed.

4,235,130

ADJUSTABLE STROKE PISTON AND CRANKSHAFT ASSEMBLY

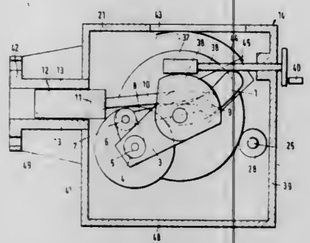
Viktor Dulger, Ludolf-Krehl-Strasse 8, 6900 Heidelberg, Fed. Rep. of Germany, and Franz Ernst, Heidelberg, Fed. Rep. of Germany, assignors to Viktor Dulger, Heidelberg, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,348

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740913

Int. Cl.[2] F16H *21/32*

U.S. Cl. 74—831 **3 Claims**



1. An adjustable stroke piston and crankshaft assembly, comprising, a housing, a piston, a path for said piston having top and bottom dead center positions TDC and BDC, a first connecting rod pivotally connected to said piston, a fixed bearing in said housing at a distance from said TDC position equal to the length of said connecting rod, a guide memeber pivotally connected to said fixed bearing, said guide member having an arc shaped guide path formed on one side of said fixed bearing and a lever arm extending from the other side of said fixed bearing, a crank arm rotatably connected to said lever arm, a second connecting rod having a first pivotal connection with said crank arm and a second pivotal connection with said first connecting rod, said second pivotal connection being confined to movment along said arc shaped guide path, said guide member having an idle position wherein said arc shaped guide path has its center coincident with said TDC position and running positions wherein points of said guide path are at distances from said TDC position which are greater than the length of said first connecting rod, and means for adjustably pivoting said guide member relative to said fixed bearing to vary the displacement stroke of said piston.

4,235,131

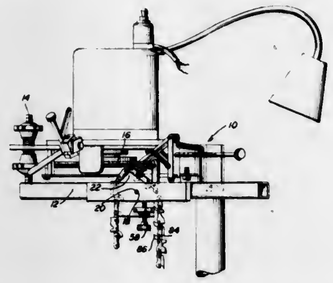
DEPTH GAUGE GRINDING ATTACHMENT FOR SAW CHAIN SHARPENER

Jack F. Simington, Chiloquin, Oreg., assignor to Simington Products Co., Chiloquin, Oreg.

Filed Aug. 14, 1978, Ser. No. 933,787

Int. Cl.[3] B23D *63/16*

U.S. Cl. 76—25 A **3 Claims**



1. In combination with a grinding wheel rotatable about an upstanding axis and having an exposed underside portion, a mount portion swingable in a horizontal plane spaced slightly below said grinding wheel, a support carried by said mount portion and defining a pair of upwardly convergent relatively angulated surfaces oppositely inclined relative to the horizontal, said surfaces having coextensive grooves formed therein extending therealong and opening into each other at adjacent ends, said surfaces being adapted to have a saw chain section draped thereover with the guide lugs of said chain section guidingly and slidingly received in said grooves and with the adjacent side links of said chain section abutting said surfaces on opposite sides of said grooves, said relatively angularly disposed surfaces comprising means for supporting adjacent chain section portions therefrom with the guide lugs of said chain section portions disposed in said grooves and one selected tooth link of said chain section supported from one of said surfaces with the other depth gauge end of said tooth link adjacent the other of said surfaces and thus elevated relative to the associated cutting tooth end of said one tooth link and all of the other chain section portion supported from said other of said surfaces whereby said depth gauge will be fully exposed from above and project upwardly through a horizontal plane below which all other portions of said chain section are disposed and with which said griding wheel may be engaged from above, said support including mounting means mounting said support on said mount portion for limited angular displacement about an axis disposed generally normal to a plane containing said coextensive grooves.

4,235,132

CAP TWISTER BOTTLE OPENER

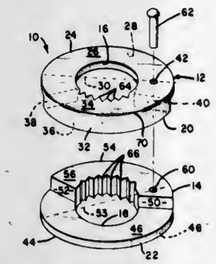
Robert R. Kendall, Box 123, Troy, Pa. 16947

Filed Aug. 27, 1979, Ser. No. 70,151

Int. Cl.[3] B67B *7/00*

U.S. Cl. 81—3.44 **4 Claims**

1. A bottle opener comprising two elongate clamp rings each having a major transverse axis, a central cap-receiving opening and thick and thin circumferential portions extending around the opening, the circumferential ends of the thick portion defining steps extending above the thin portion at the junctions therebetween, all of said steps having approximately the same height; and a pin connection or the like joining the clamp rings for relative rotation of the rings, said connection having a rotational axis extending through the rings at the major transverse axis; one clamp ring including a thick portion extending in a first direction around the opening from a first step on one side of the major transverse axis, past the rotational axis to a second step located on the other side of the major transverse axis, the other clamp ring including a thick portion extending from a first step adjacent the first step of said one clamp ring circumferentially in a direction opposite said first direction around the opening to a second step, the rotational axis extending through the thin portion of the other clamp ring; cap-gripping means on the interior surfaces of said thick portions, said clamp rings being positioned one on top of the other so that the surfaces of said thick and thin portions to either sides of said steps abut each other and the central openings are generally aligned, whereby the openings in the clamp rings may be positioned over a bottle cap and thereafter the clamp rings may be closed and rotated to bring said cap-gripping means into engagement with the cap for subsequent removal.



4,235,133

TORQUE-APPLYING FREELY-REVERSIBLE TOOL AND DRIVE-HANDLE COUPLING

Ignacio Acevedo, 4066 Fenwick Rd., Columbus, Ohio 43220

Filed Jul. 11, 1979, Ser. No. 56,594

Int. Cl.[3] B25B *13/00*

U.S. Cl. 81—58 **7 Claims**



1. A torque-applying coupling having oppositely-opening socket arrangements for interchangeably receiving the shanks of a handle element and tool element, respectively; said coupling comprising:

a torque-applying sleeve having axially outwardly-opening drive sockets at its opposed ends for selectively removably receiving the end of a tool shank;

a tool-receiving socket member at each end of the sleeve axially outwardly thereof having an axially outwardly-opening socket which also communicates at its inner end with a drive socket in the adjacent outer end of the sleeve and permits free passage of the tool shank end and relative rotation therein;

said tool-receiving socket members and said sleeve having exterior spring-engaging surfaces; and

a pair of reversely-wound axially-disposed coil springs disposed around said exterior surfaces of the socket members and sleeve, each one of which has an inner portion extending axially inwardly over the sleeve and an outer portion extending axially-outwardly over the tool socket member which is outwardly of the sleeve.

4,235,134

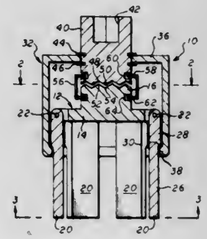
ADJUSTABLE WRENCH

Thomas R. McLendon, 1108 Skrivanek, Bryan, Tex. 77801

Filed Feb. 14, 1979, Ser. No. 11,786

Int. Cl.[3] B25B *13/28*

U.S. Cl. 81—91 C **18 Claims**



1. A clamping apparatus comprising

a plurality of elongated gripping arms,

a rotatable member providing a plurality of equally spaced fulcrums supporting said gripping arms in substantially parallel relation for inward and outward pivotal movement,

first cam means supported for longitudinal sliding movement relative to said gripping arms and engagable therewith to pivot said arms inward upon movement thereof in one direction,

a drive member operatively connected to said rotatable member to rotate the same, and

second cam means responsive to incremental movement of said drive member in either forward or backward direction to move said first cam means longitudinally in relation to said gripping arms to effect inward pivotal gripping movement thereby

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4,235,135

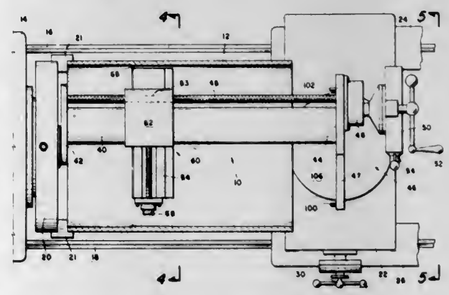
BORING BAR ATTACHMENT FOR ENGINE LATHES

Arthur H. McElroy, P.O. Box 15580, Tulsa, Okla. 74112

Filed May 14, 1979, Ser. No. 38,447

Int. Cl.[3] B23B *3/00, 5/36*

U.S. Cl. 82—2 R **6 Claims**



1. In a boring bar attachment for cutting accurate internal diameter or taper long and large diameter cylinders on an engine lathe, the lathe having a carriage frame, a chuck to which one end of the cylinder is rotatably mounted about a

given center axis, and means to rotate the chuck, the improvement in the boring bar for attachment to the lathe, comprising:

a support bar, longer than the cylinder and positioned inside thereof, the bar having a first end and a second end, the first end having chuck support means non-rotatably attached to the chuck, the second end having an assembly supported upon the carriage beyond the other end of the cylinder,

a lead screw rotatably supported to and extending from the first to the second end parallel to the axis of the support bar, and variable power means supported at the second end to rotate the lead screw at a desired speed,

a travelling block assembly supported upon the support bar for longitudinal movement thereon, a threaded opening in the block to receive the lead screw and thus slide the block for travel from the second end to the first when the lead screw is rotated in one direction and vice versa when the lead screw is rotated in a reverse direction,

the travelling block assembly including a cross-slide supported upon the travelling block for movement transverse to the support bar, means to support a cutting tool at one end of the cross-slide adjacent the internal diameter of the cylinder, and means to accurately move the cross-slide to a position, relative to the internal diameter of the cylinder, to create the desired internal diameter or taper.

4,235,136

TRIMMING DISC RECORDS

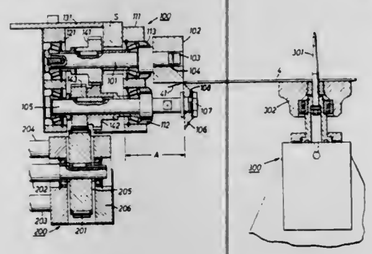
Hermann Strausfeld, Cologne, Fed. Rep. of Germany, assignor to EMI Electrola Gesellschaft mit beschrankter Haftung, Cologne Braunsfeld, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 955,573

Claims priority, application United Kingdom, Nov. 1, 1977, 45371/77

Int. Cl.³ B23B *5/14*

U.S. Cl. 82—57 **10 Claims**



1. In a record transfer press the combination comprising,

a transfer device adapted to move from a first to a second position on the body of the press to thereby transfer an untrimmed record from the pressing station to the flash trimming station, and also adapted to move back to said first position to receive an untrimmed record, and

an apparatus for trimming a record, transferred to the trimming station, comprising a drive unit fixedly attached to the body of the press and disposed adjacent to the trimming station, and a trimming head mounted to said transfer device to move therewith, said trimming head being adapted to drivingly engage the drive unit to trim a transferred record when the transfer device assumes the said first position.

4,235,137

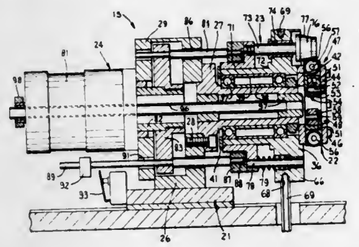
TUBE CUTTER

Galen B. Harman, La Grange, Ind., assignor to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed Dec. 11, 1978, Ser. No. 968,289

Int. Cl.³ B23B *5/14*

U.S. Cl. 82—73 **9 Claims**



1. In an apparatus for cutting a tubular element, said apparatus having a frame, an elongated tubular guide for stationarily supporting the tubular element, and a rotatable cutting head assembly positioned in concentric and surrounding relationship to said tubular guide and rotatable about the axis thereof for permitting cutting of said tubular element, said cutting head assembly including rotatable support means having carrier means movably mounted thereon for radial movement toward and away from the tubular element, said cutting head assembly also including a cutting element mounted on said carrier means for effecting cutting of the tubular element upon radial inward movement of said carrier means during rotation of said support means, cam-type actuator means for effecting inward radial movement of said carrier means, and drive means for movably controlling said actuator means, comprising the improvement wherein said support means includes an elongated sleevelike support structure positioned concentric to said axis and rotatable thereabout, said carrier means with said cutting element mounted thereon being radially movably supported on said support structure adjacent one axial end thereof, said cam-type actuator means including a slide ring externally surrounding said sleevelike support structure and being nonrotatably coupled thereto, said slide ring being axially slidably supported on said sleevelike structure and having cam means mounted thereon and positioned for engaging and radially displacing said carrier means in response to axial displacement of said slide ring, said slide ring being disposed more closely adjacent the other axial end of said sleevelike support structure, and said drive means including a nonrotatable thrust ring disposed in axial bearing engagement with said slide ring for permitting relative rotation therebetween, said thrust ring being axially slidably supported relative to said axis, said drive means also including fluid pressure cylinder means drivingly interconnected to said thrust ring for effecting axial displacement thereof to also cause a corresponding axial displacement of the rotatable slide ring so that said cam means effects radial inward displacement of said carrier means and said cutting element during the rotation of said cutting head assembly, said sleevelike support structure including a radially outwardly projecting portion disposed axially between said carrier means and said slide ring, said projecting portion having opening means extending axially therethrough, said cam means including an elongated element fixedly secured at one end thereof to said slide ring and projecting axially thereof and slidably projecting through said opening means and having a wedgelike cam mounted on the other end thereof adjacent said carrier means.

9. In an apparatus for cutting a tubular element, said apparatus having a frame, an elongated tubular guide for stationarily supporting the tubular element, and a rotatable cutting head assembly positioned in concentric and surrounding relationship to said tubular guide and rotatable about the axis thereof for permitting cutting of said tubular element, said cutting head assembly including rotatable support means having at least three angularly-spaced carrier means movably mounted thereon for radial movement toward and away from the tubular element, said cutting head assembly including a cutting element mounted on a first said carrier means for effecting cutting of the tubular element upon radial inward movement of said carrier means during rotation of said support means, said cutting head also including a roller mounted on each of the second and third said carrier means for engagement with the tubular element upon inward radial movement of said carrier means, cam-type actuator means for effecting inward radial movement of said carrier means, and drive means for movably controlling said actuator means, comprising the improvement wherein said support means includes an elongated sleevelike support structure positioned concentric to said axis and rotatable thereabout, said three carrier means being radially movably supported on said support structure adjacent one axial end thereof, said cam-type actuator means including a slide ring externally surrounding said sleevelike support structure and being nonrotatably coupled thereto, said slide ring being axially slidably supported on said sleevelike structure and having cam means mounted thereon and positioned for engaging and radially displacing said three carrier means in response to axial displacement of said slide ring, said slide ring being disposed more closely adjacent the other axial end of said sleevelike support structure, said drive means including a nonrotatable thrust ring disposed in axial bearing engagement with said slide ring for permitting relative rotation therebetween, said thrust ring being axially slidably supported relative to said axis, said drive means also including fluid pressure cylinder means drivingly interconnected to said thrust ring for effecting axial displacement thereof to also cause a corresponding axial displacement of the rotatable slide ring so that said cam means effects radial inward displacement of said carrier means and said cutting element and rollers during the rotation of said cutting head assembly, said cam means including at least three rollerlike cylindrical cams positioned for radially inwardly camming a respective one of said carrier means, each of said cams being fixedly connected to said slide ring by a similar element which extends axially between the respective cam and said slide ring, each of said cams having a camming surface defined by a conical external cam profile which extends over at least a portion of the axial length thereof, the cam profile on the cam which engages said first carrier means being different from the cam profile on the other cams.

4,235,138

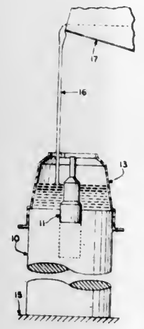
PUNCH AND STRIPPER ASSEMBLY FOR A RECIPROCATING METAL-PUNCHING PRESS

Albert M. Creighton, Jr., Manchester; Charles L. Foss, Jr., Essex, and Neal R. Vandewalle, Topsfield, all of Mass., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 16, 1978, Ser. No. 916,375

Int. Cl.³ B29C *5/00, 17/08*; B26D *7/00*

U.S. Cl. 83—139 **2 Claims**



1. An integral punch and stripper assembly for a reciprocating metal-punching press in which the punch is an elongated member of predetermined length and maximum transverse dimension having a predetermined cross-sectional shape at the outer extremity, the punch extending outwardly said predetermined length from a punch holder having a substantially planar base of substantially greater area than the cross-sectional area of the punch, the stripper being formed by a process of:

providing a plastics material initially in a substantially liquid form capable of being poured from a container and capable of setting after a period of time into a substantially non-compressible, deformable, elastic solid shape;

providing a stripper mold of a material which will not firmly bond to said plastics material and shaped generally in the form of a frusto-conical hollow mold of an axial length greater than the extending length of said punch and with the lower end being open and of an internal diameter substantially equal to the outer diameter of said one end of said punch holder base and with the upper end having an aperture substantially greater in diameter than the maximum diameter of said punch;

placing said stripper mold onto said punch holder with said lower end of said mold encircling said one end of said punch holder and with said punch within said mold;

placing said punch holder in an upright position with said aperture of said mold at the upper end thereof;

thereafter pouring said plastics material through said aperture of said mold into said mold and about said punch until said plastics material fills said mold substantially to said aperture;

thus creating a totally conforming surrounding relationship between the punch and plastic stripper forming material and a slight axial spacing between the longitudinally outermost extremity of the plastic stripper material and the longitudinally outermost extremity of the punch;

thereafter maintaining said punch holder in said upright position until said plastics material has set into said solid shape;

and thereafter pulling said mold upwardly and from engagement with said plastics material creating a closely conforming stripper member completely surrounding the punch, the stripper member defining first peripheral outer sidewall section tapering upwardly and outwardly from its free extremity at a first predetermined angle from the central axis for a first predetermined axial distance, a second peripheral outer sidewall section tapering upwardly and outwardly from the first sidewall section toward the punch holder at a second predetermined angle of taper and for a second predetermined distance, the first predetermined angle of taper being substantially greater than the second predetermined angle of taper and the first predetermined axial distance being substantially less than the second predetermined axial distance so that sufficient lateral and axial bulging of the stripper may occur at the outermost extremity of the stripper providing sufficient resiliency and rebound affect while allowing the stripper to move freely in a turret cavity.

4,235,139

AUTOMATIC SHEARING APPARATUS

Eduard A. Haenni, Zofingen, and Christian Ragettli, Gockhausen, both of Switzerland, assignors to Haemmerle A.G., Zofingen, Switzerland

Filed Jul. 17, 1978, Ser. No. 925,330

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732689

Int. Cl.³ B26D *7/16*

U.S. Cl. 83—278 **3 Claims**

1. In automatic power driven shearing apparatus adapted for simultaneously cutting two perpendicularly intersecting edges of a sheet along a predetermined line by means of a shear having two cutting edges located at right anges to each over and having a support for the sheet with means to move the sheet in the longitudinal or X direction and in the transverse or

Y direction to bring the predetermined line into alignment with the cutting edge, that improvement comprising:

(1) a first moveable table provided with a plurality of equidistant grooves which are parallel to each other and parallel to the longitudinal blade of said shear

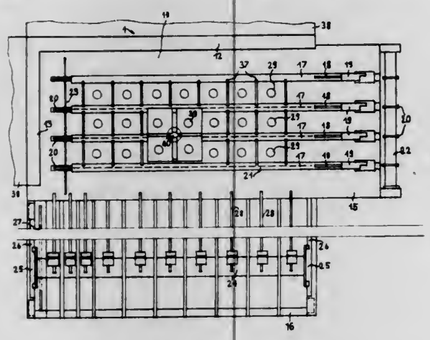
(2) a second moveable table provided with a plurality of equidistant grooves which are parallel to each other and parallel to the transverse blade of said shear

(3) a plurality of driven finger means to push the sheet in the X direction which are slideably moveable in the grooves of said first table, one finger means for each groove

(4) a plurality of driven finger means to push the sheet in the Y direction which are slideably moveable in the grooves of said second table, one finger means for each groove

(5) chain drive means to push the finger means in said first table

(6) chain drive means to push the finger means in said second table



(7) each said driven finger means in said first and second tables mounted to be rotated in one of two positions, the first position in the plane of the sheet being pushed and the second position, 90° from the first, underneath the plane of the sheet;and

(8) a fixed feeding system exerting an adjustable angular force against the movements of said finger means on said first and second tables, comprising a shaft supported by bearings within a sleeve driven by a belt at a pulley at one end thereof having a roller at the other end thereof with a fulcrum formed by a spherical bushing mounted in a fixed plate and a spherical bearing mounted in a moveable control plate adjacent the pulley whereby said roller contacts said plate at an angle determined by the displacement of said sleeve within the bushing and spherical bearing.

4,235,140

PORTABLE CHAIN SAW MILL

Daniel R. Reece, 2081 SW. Bonniebrae Dr., Lake Oswego, Oreg. 97034

Filed Jul. 13, 1979, Ser. No. 57,206
Int. Cl.³ B27B *17/00*
U.S. Cl. 83—794 **14 Claims**

1. In a portable saw mill.

track means adapted to lie on the ground, log-holding means for holding a log in a position parallel

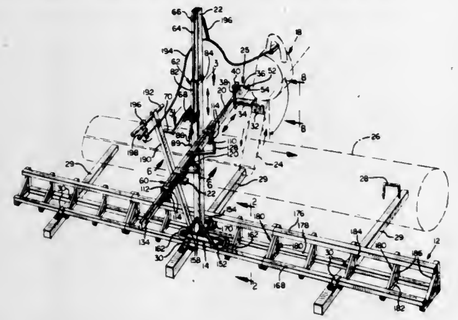
to and to one side of the track means,

carriage means manually movable along the track means,

post means on the carriage means,

a chain saw having a saw bar,

and crossarm means adjustable on the post means and



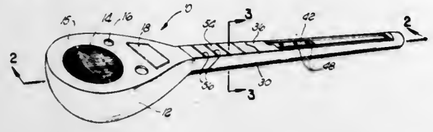
carrying the saw in a position offset from the post means for ripping a log held by the log-holding means.

4,235,141

ELECTRONIC APPARATUS

Franklin N. Eventoff, 2351 Lake View Ave., Los Angeles, Calif. 90039

Filed Sep. 18, 1978, Ser. No. 943,501
Int. Cl.³ G10H *1/00*; H01C *10/00*
U.S. Cl. 84—1.01 **15 Claims**



1. In combination with a variable resistor for controlling the operation of an electronic musical instrument including a tone generator for generating musical notes each having a frequency dependent upon the amount of resistance in an electrical circuit connecting the variable resistor to the tone generator, said variable resistor including low resistance and high resistance conductor strings disposed along their lengths in open circuit relationship, the improvement which comprises:

an apertured but otherwise solid strip of insulating material electrically insulating said low and high resistance conductor strips from each other and defining a plurality of selected discrete open locations spaced from each other lengthwise along said high resistance conductor strip corresponding to the amount of resistance required to produce predetermined musical notes, said apertures being so spaced whereby to limit electrical contact between said strips to said discrete locations.

4,235,142

ELECTRONIC MUSICAL INSTRUMENT OF TIME-SHARED DIGITAL PROCESSING TYPE

Akira Nakada; Eiichiro Aoki; Akiyoshi Oya; Takatoshi Okumura; Yasuji Uchiyama, and Eiichi Yamaga, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

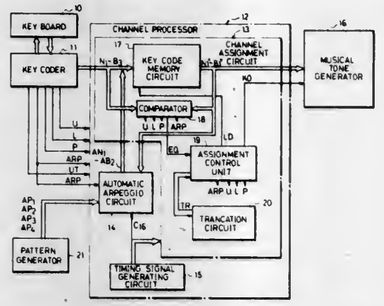
Filed Jan. 4, 1979, Ser. No. 904
Claims priority, application Japan, Jan. 12, 1978, 53-2215
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.03 **4 Claims**

1. In a polyphonic keyboard instrument of the type having key data generating means for generating key data representing depressed keys in a keyboard, channel assignment means for assigning said key data to available ones of a predetermined

number of tone production channels, and means for producing musical tones according to the key data assigned to said channels, improvements which comprise:

means for providing, at suitable time intervals, periods of time in which no key data is provided by said key data generating means and for producing a special performance designating signal in each of said periods of time;

means for providing key data directly specifying musical tones for special performance; and



means for supplying said key data of musical tones for special performance to said channel assignment means when said special performance designating signal is produced;

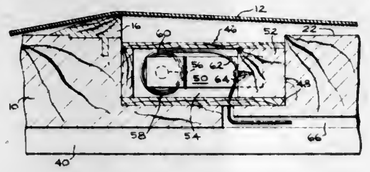
said channel assignment means assigning said key data of musical tones for special performance supplied upon production of said special performance designating signal to a predetermined tone production channel, said producing means thereby producing the musical tone directly specified by said key data assigned to said predetermined tone production channel.

4,235,143

SIMULATED VIOLONCELLO

Robert S. Hoexter, 2540 Craig Rd., Ann Arbor, Mich. 48103

Filed Nov. 6, 1978, Ser. No. 957,728
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.16 **9 Claims**



1. A simulated violoncello comprising

an elongated body shaped in conformity with the fingerboard of a violoncello,

a series of strings stretched along said body,

a pair of panels adapted for confinement between the knees and adjustably attached to said body for movement to a desired position along a lower portion of the length of said body, said panels being shaped in conformity with the knee-confined side portions of the resonance box of a violoncello,

an elongated support member, said panels being connected to the ends of said member,

a rail having trapezoidal cross-section formed along the back of said body and extending along a lower end portion of the length thereof,

a block defining a channel opening along a surface thereof and conforming to said rail for slidable engagement therewith, and

fastening means projecting through said member and block for securing the same to said rail.

7. A magnetic pick-up of a string instrument comprising

a housing defining an enclosed chamber,

a mass of hardwood disposed in one end of said housing,

a vibratile member constructed of a relatively board, flat rectangular strip of a softwood secured at one end thereof to said mass and cantilevered into said chamber, and

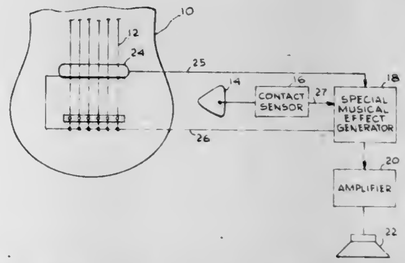
electromagnetic circuit means disposed in said chamber and attached to said housing an vibratile member for generating an electric signal in response to vibrations of said vibratile member.

4,235,144

MEANS FOR CONTROLLING SPECIAL MUSICAL EFFECTS

Raymond Lubow, Hollywood, and John R. Brand, Arcadia, both of Calif., assignors to Tel-Ray Electronics Manufacturing Co., Inc., North Hollywood, Calif.

Filed Jun. 6, 1979, Ser. No. 46,017
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.16 **25 Claims**



1. Means for generating a special musical effect in synchronization with use of a musical instrument having one or more strings, said generating means comprising:

a special musical effect means comprising means for altering an electrical signal related to the frequency and amplitude of vibration of at least one of said one or more strings in accordance with a predetermined altering profile;

a pick means;

sensing means for determining when contact is broken between said pick means and one of said one or more strings; and

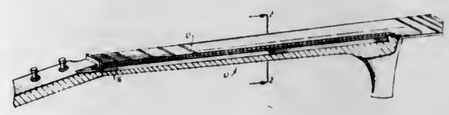
initiating means responsive to said sensing means for causing said special musical effect means to alter said electrical signal in accordance with said predetermined altering profile.

4,235,145

STRINGED MUSICAL INSTRUMENT NECK ADJUSTABLE TO COUNTERACT WARPING

Andrew B. Adams, Jr., General Delivery Box 844, Shepardstown, W. Va. 25443

Division of Ser. No. 916,250, Jun. 16, 1978, Pat. No. 4,167,133. This application Feb. 8, 1979, Ser. No. 10,466
Int. Cl.³ G10D *3/00*
U.S. Cl. 84—293 **5 Claims**



1. A neck straightening means for a stringed musical instru-

ment, said instrument having a neck and strings extending thereover, said neck straightening means comprising:

an elongated conduit having a length substantially commensurate with said neck;

a body located within said conduit adjacent a first end thereof, said body being axially movable within said conduit:

a substantially longitudinally inextensible member within said conduit, a first end of which is connected to said axially movable body and a second end of which is connected adjacent the second end of said conduit; and

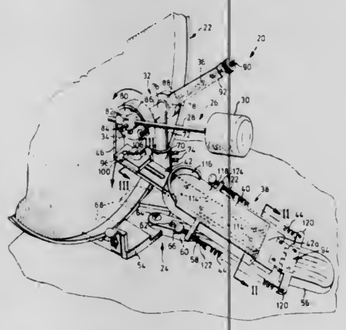
means positioning said inextensible member in the shape of an arc within said conduit, said first and second ends of said inextensible member adapted to be located closer to said strings than the central region thereof, said positioning means resisting movement of said central region in a direction toward said strings.

4,235,146

BASE DRUM PEDAL ASSEMBLY

James R. Purdy, 125 Burgess Ave., Toronto, Canada (M4E 1X3)

Filed Feb. 14, 1979, Ser. No. 11,988
Int. Cl.³ G10C *13/14, 13/26;* G10D *13/02*
U.S. Cl. 84—422 R **8 Claims**



1. A bass drum pedal assembly comprising:

a base;

a beater head including a beater arm and a beater element carried at an outer end of said arm;

means on said base supporting said beater head adjacent an inner end of said arm for pivotal movement about an axis which is disposed generally horizontally when the assembly is in use and is spaced above said base, whereby said beater element can move between a forward, beating position for contact with a drum, and a retracted position;

means biasing said beater head towards said retracted position of the beater element;

a foot pedal comprising: a foot plate; a foot plate support pivotally coupled at a heel end thereof to said base and inclined upwardly towards a toe end thereof disposed generally below said beater head, said foot plate being mounted on said support for free sliding movement longitudinally thereof towards and away from a rest position adjacent said heel end of the support; and means biasing said foot plate towards said rest position; and,

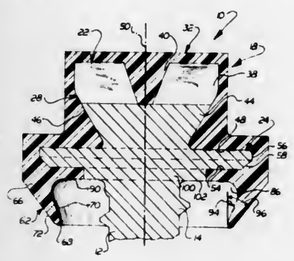
means coupling said foot plate support to said beater head so that downward movement of the foot pedal causes said head to pivot about said axis to bring said beater element towards its beating position.

4,235,147

FASTENER HAVING SEALING HEAD

Harry C. Weidner, Jr., Shaker Heights, Ohio, assignor to The Atlas Bolt & Screw Company, Cleveland, Ohio

Filed Aug. 16, 1978, Ser. No. 934,494
Int. Cl.³ F16B *23/00*
U.S. Cl. 85—9 R **10 Claims**



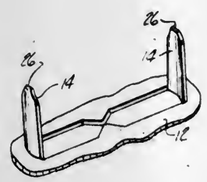
1. A fastener for providing a sealed connection between a plurality of members, said fastener comprising a longitudinally extending metal shank, a thread convolution formed on the shank for engaging at least one of the plurality of members, a metal shank head connected to one end portion of said shank and integrally formed with said shank, said shank head including a circular collar disposed in a coaxial relationship with said shank and a head end portion projecting outwardly from said collar in a direction away from said shank and disposed in a coaxial relationship with said collar, said collar extending radially outwardly from said shank for a greater distance than said head end portion and having a first annular side surface area facing toward said shank, a second annular side surface area facing toward said head end portion and a third side surface area interconnecting said first and second side surface areas, said metal shank head further including a cylindrical section disposed between said collar and said shank, said cylindrical section having a cylindrical side surface with a diameter which is less than the diameter of said collar and greater than the diameter of said shank, said head end portion including surface means for defining at least one recess in said head end portion, and an outer head of polymeric material molded over and at least partially enclosing said metal shank head, said outer head of polymeric material including a first portion at least partially enclosing said head end portion and engaging said recess in said head end portion to retard relative movement between said outer head of polymeric material and said head end portion upon application of forces to said outer head tending to rotate said fastener about the longitudinal central axis of said shank, said outer head of polymeric material including a second portion covering said first, second and third surface areas of said collar, said second portion including an annular section of polymeric material having a first annular side surface abutting said first surface area of said collar and a second annular side surface facing toward said shank, said annular section of polymeric material being disposed in abutting engagement with said cylindrical side surface of said cylindrical section throughout the circumferential extent of said cylindrical side surface, said annular section of polymeric material having a thickness between said first and second sides which is equal to the axial extent of said cylindrical section, said outer head of polymeric material further including a circular skirt projecting outwardly from said second side of said annular section in a direction toward said shank, said skirt sloping axially and radially toward said shank from an annular base portion integrally formed with said annular section of said outer head to an annular edge portion which circumscribes said shank and is spaced apart from said shank, said annular base portion having an inside diameter which is substantially smaller than the outside diameter of said collar and an outside diameter which is greater than the outside diameter of said collar, said annular edge portion having an inside diameter which is less than the inside diameter of said base portion and which is less than the outside diameter of said collar, said skirt having an annular inner surface which slopes inwardly from said base toward said shank to said annular edge portion at a first angle to the longitudinal central axis of said shank and which cooperates with said second side of said annular section of said outer head to at least partially define an annular cavity which circumscribes said shank and has a greater radial extent adjacent to the base portion of said skirt than adjacent to said edge portion of said skirt, said skirt having an annular outer side surface which slopes inwardly from said base portion toward said shank to said annular edge portion at a second angle to the longitudinal central axis of said shank, said skirt being deflectable inwardly toward said shank and said collar under the influence of forces applied against said skirt by one of the members upon connection of the fastener with the members, said skirt being clamped between said collar and the one member to decrease the volume of said annular cavity and to enable said outer side surface of said skirt to be pressed into tight sealing engagement with the outer surface of the one member.

4,235,148

CONNECTOR PLATE

Richard J. Menge, 4103 Anchor Dr., Brighton, Mich. 48116

Filed Dec. 19, 1977, Ser. No. 862,109
Int. Cl.³ E04C *3/292*
U.S. Cl. 85—13 **3 Claims**



1. A connector plate comprising:

a metal sheet, and

at least one pair of prongs integrally formed with said sheet by punching said prongs from said sheet so that said prongs are substantially parallel to each other and substantially perpendicular from said plate and so that the displacement of said prongs forms an elongated slot in said sheet, said slot having a tapering reduced central portion, and wherein said prongs have tapering necked-down, torn tips formed by breaking apart from each other at the narrowest point of the tapering reduced central portion of the slot when the prongs are punched from the sheet to thereby form a dull point on each prong,

whereby said connector plate may be handled without injury and whereby said connector plate will firmly attach to a wooden truss element for long periods of time.

4,235,149

SELF-THREAD CREATING FASTENER AND METHOD AND APPARATUS FOR MAKING THE SAME

Donald R. Veidman, 9517 S. Ridgeland Ave., Oak Lawn, Ill. 60453

Filed Aug. 17, 1978, Ser. No. 934,365
Int. Cl.³ F16B *25/00*
U.S. Cl. 85—47 **7 Claims**

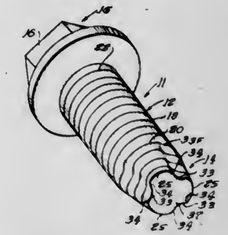
1. A thread forming screw formed from a blank having a cylindrical shank and a tapered conical end comprising

a continuous, constant diameter helical screw thread on said cylindrical shank defining a holding section,

a tapered, threaded lead-in section on said tapered conical end at one end of said screw of less axial extent than said screw thread and defining a continuation of said helical screw thread for forming a thread in the workpiece,

an enlarged head means at the other end of the screw including means for turning the screw to form the thread and to turn said helical screw thread into the workpiece and to hold a part to the workpiece,

a plurality of spaced lobes each with outer convex surfaces formed in said threaded lead-in section collectively defining a thread forming section on the tapered end of the screw, said lobes extending from said helical screw thread to the forward end of said thread forming section,



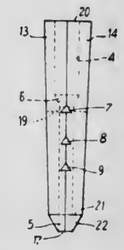
and concave surfaces formed in said tapered end extending between and spacing each of said lobes circumferentially and providing substantial concavities between lobes to reduce the friction and turning torque when forming threads in the workpiece, and curved ramp surfaces joining each of said concavities and each of said lobes and smoothly blending said lobes and said concavities to each other thereby eliminating sharp interfaces therebetween, said concavities and lobes providing a polygonal cross sectional shape for said tapered lead-in section.

4,235,150

EXPANSIBLE ANCHOR PLUG

Jean-Claude Nony, Les Clairieres 125 avenue de Flandre, 59290 Wasquehal, France

Filed Oct. 18, 1976, Ser. No. 733,273
Claims priority, application France, Oct. 16, 1975, 75 31671
Int. Cl.³ F16B *13/06*
U.S. Cl. 85—84 **7 Claims**



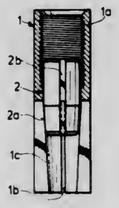
1. In an expansible anchor plug comprising an elongated body having a square section and axially pierced by a longitudinal hole, said plug having over part of its length transverse notches formed on two contiguous lateral faces symmetrically with respect to their intersection, the improvement according to which the body is made of a thermoplastic material, has substantially the shape of a segment of a pyramid having a square section, and formed with a slot extending over part of its length and lying in an axial plane.

4,235,151

EXPANSION DOWEL

Karl E. Udert, Triesen; Hans Oechsle, Nenzing, and Heinz Pfeiffer, Gisingen, all of Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation of Ser. No. 787,794, Apr. 15, 1977, abandoned.
This application May 26, 1978, Ser. No. 910,016
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1976, 2617191
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—84 **3 Claims**



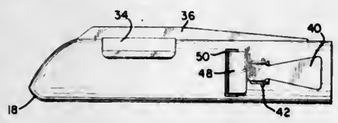
1. Expansion dowel to be secured in a borehole in a hard receiving material of variable hardness comprising an axially extending sleeve having a first end and a second end, a bore extending therethrough from the first end to the second end, said sleeve being slotted for at least a portion of the axial length thereof from the first end toward the second end, said bore having tapered surfaces disposed in diverging relationship from the first end toward the second end of said sleeve, and an axially extending expansion body insertable into the bore in said sleeve in contact with the surface of the bore therein and being displaceable therethrough in the direction toward the first end of said sleeve for expanding said sleeve in the radial direction from the unexpanded condition into the expanded condition for securing said sleeve in the expanded condition in anchored engagement within the borehole and with said expansion body being retained in said bore, a part of said expansion body being deformable, said expansion body having a first end and a second end oriented in the same direction as the first and second ends of said sleeve and the outer surface of said expansion body tapering outwardly from the first end thereof for a portion of the axial length thereof toward said second end, wherein the improvement comprises that said sleeve consists of a first axially extending part extending from the first end thereof and a second axially extending part extending from the second end thereof and the opposite ends of said first and second parts spaced from the respective ends of said sleeve terminating in a common transverse plane intermediate the first and second ends of said sleeve, said first part of said sleeve having an axial length less than the depth of the borehole so that said first part is completely received in the borehole, the bore in the second part of said sleeve having a female thread for at least an axially extending portion thereof extending from the second end of said sleeve, said sleeve being slotted for at least a major portion of the axial length of said first part, said tapered surfaces of said bore being located in said first part of said sleeve, said expansion body being insertable into the bore in said sleeve through the second end thereof and being movably displaceable through said second part without exerting any expanding effect on said second part of said sleeve, in the unexpanded condition of said sleeve the tapered outer surface of said expansion body being complementary to and in contact with the tapered surface within said bore at a position spaced from the first end of said sleeve so that by subsequently driving said expansion body toward the first end of said sleeve said first part thereof is expanded outwardly placing said sleeve in the expanded condition in anchored engagement in the borehole while said expansion body has a strength characteristic relative to said sleeve so that it remains in the undeformed condition, said expansion body has at least one axially extending recess formed therein and extending inwardly from the outer surface thereof and for substantially the full axial length thereof from the first end to the second end with said expansion body being deformable generally in the circumferential direction along the axial direction of said recess only after said expansion body has anchored said sleeve in the borehole so that the circumferential dimension of said recess can be reduced for reducing the circumferential dimension of said expansion body and permitting said expansion body to pass axially through said first part of said sleeve toward the first end thereof while retaining the anchored engagement of said sleeve and with substantially the full axial length of said expansion body remaining with the bore in said sleeve whereby in the anchored expanded condition of said sleeve said expansion body is displaceable through said bore for at least a predetermined distance from the second end thereof, and in the anchored expanded condition after a certain expansion pressure for achieving anchored engagement of said sleeve has been reached without deforming said expansion body, further force applied in the axial direction toward the first end of said sleeve against said expansion body causes it to deform along the recess therein permitting a reduction in the circumferential dimension of said expansion body and axially displacing said expansion body through said bore for at least the predetermined distance from the second end of said bore.

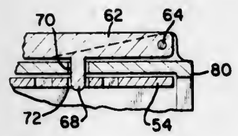
4,235,152

STABILIZER FOR GUNS

Marthinus J. Bekker, 3 Pomeroy Rd., Hatfield, Salisbury, and Douglas J. M. Hall, 23 Taunton Rd., Mandara, Salisbury, both of Southern Rhodesia

Filed Jan. 11, 1978, Ser. No. 868,631
Int. Cl.[3] F41C *21/18*
U.S. Cl. 89—14 C **5 Claims**





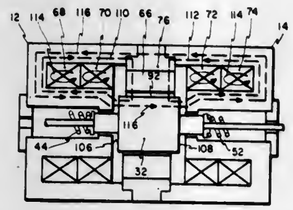
1. A stabilizer for a gun having flash hider means comprising a plurality of ports in the gun barrel adjacent its muzzle end for discharging combustion gases transversely of the longitudinal axis of the barrel, the stabilizer comprising a tubular element dimensioned to fit at a predetermined rotational position on the flash hider means and containing a stabilizing vent disposed to direct said combustion gases primarily to one side of a vertical plane extending along said axis when said element is at said position, and further comprising locating means for securing the element to the gun at said position, said locating means comprising means for engaging in a port of said flash hider means.

4,235,153

LINEAR MOTION, ELECTROMAGNETIC FORCE MOTOR

John E. Rinde, Endicott, and Richard M. Perry, Johnson City, both of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Division of Ser. No. 738,207, Nov. 3, 1976, Pat. No. 4,144,514.
This application Nov. 2, 1978, Ser. No. 957,266
Int. Cl.[2] F01B *25/26, 31/12*; F15B *9/03, 9/09*
U.S. Cl. 91—1 **6 Claims**



1. Control apparatus for producing movement of a device in proportion to a current signal comprising an electro-magnetic motor for producing a linear movement in either of two opposite directions comprising:

(a) a housing of electromagnetically conducting material;

(b) a non-magnetic shaft mounted in said housing for linear movement in either of two opposite directions;

(c) an annular armature of magnetically conducing material connected to said shaft;

(d) spring means comprising a first spring member and a second spring member, said first spring member being mounted on one side of said armature and said second spring member being mounted on the other side of said armature, each of said spring members have one end engaging said shaft and the other end engaging said housing;

(e) means for limiting movement of said armature in both directions, said means comprising a first member positioned between one side of said armature and said housing and a second member positioned between the opposite side of said armature and said housing;

(f) an annular samarium-cobalt permanent magnet mounted in said housing and extending around the periphery of said armature and forming a radial air gap between said magnet and said armature;

(g) said magnet comprising a plurality of radially abutting segments;

(h) a plurality of electrical coils fixedly mounted in said housing with at least one coil mounted on each side of said permanent magnet;

(i) means for energizing said coils with a first polarity for moving said shaft in one direction and with a second polarity for moving said shaft in an opposite direction;

(j) means for generating a plurality of input command signals for said motor;

(k) means for sensing the position of said motor and for generating a plurality of first feedback signals;

(l) a valve controlled by said motor;

(m) a power actuator connected for operation by said valve;

(n) means for sensing the position of said actuator and for generating a plurality of second feedback signals; and

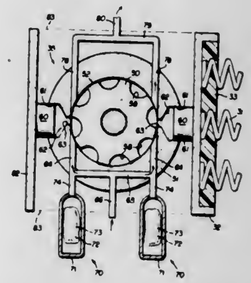
(o) a plurality of servoamplifiers with each being responsive to one of said input command signals, to one of said first feedback signals and to one of second feedback signals wherein each of said servoamplifiers controls current supplied to a corresponding electrical coil for moving said nonmagnetic shaft of said motor.

4,235,154

VIBRATION MOTOR

Joseph G. Hotton, Sterling Heights, Mich., assignor to Neumann Engineering & Manufacturing Company, Madison Heights, Mich.

Division of Ser. No. 898,905, Apr. 24, 1978, Pat. No. 4,154,641.
This application Mar. 29, 1979, Ser. No. 25,279
Int. Cl.[3] F15B *21/02*
U.S. Cl. 91—39 **1 Claim**



1. A vibration motor for providing rapid vibrations that cause melting of the contacting portions of plastic work-pieces due to frictional generation of heat, said motor comprising:

a housing having an interior cylindrically shaped rotor chamber and a pair of piston cylinders opening into the rotor chamber, with the axes of the piston cylinders being normal to the axis of the rotor chamber, said piston cylinders formed in said housing diametrically opposite from each other;

a cylindrically shaped rotor closely fitted within the rotor chamber and having means for rotating the rotor about its axis within its chamber;

a plurality of short grooves formed in the peripheral surface of the rotor, with the grooves extending circumferentially in alignment in a plane perpendicular to the rotor axis, and the grooves each being spaced apart circumferentially from its next adjacent groove, and with the rotor peripheral surface portions between said pairs of adjacent grooves forming a sealing land spaced closely to the wall defining the rotor chamber, and with the grooves being aligned with the axes of said piston cylinders;

a piston fitted within each piston cylinder for axial reciprocating movement therein, and with the space defining the opening between each piston cylinder and the rotor chamber and between the rotor chamber and each adjacent piston end defining a fluid pressure chamber for each said piston;

fluid inlet passageways extending through the housing into the rotor chamber adjacent one side of each said fluid pressure chamber, and fluid outlet passageways extending through the housing into the rotor chamber adjacent to the opposite side of each said fluid pressure chamber, said fluid inlet passageways connected together by a common inlet fluid passageway, means for providing fluid under pressure to said common fluid inlet passageway, pressure stabilizing accumulators connected to each of said fluid inlet passageways, said fluid outlet passageways connected together by a common fluid outlet passageway, and said common fluid outlet passageway connected to said means for providing fluid under pressure;

said rotor being rotated at a predetermined speed, said rotor grooves being so formed that when one groove opens into both the fluid inlet passageway and the fluid chamber of one of said pistons, its diametrically opposite groove opens the fluid outlet passageway and the fluid chamber of the opposite piston, wherein the pistons generally reciprocate in the same direction, with one piston being moved by pressurized fluid while the other piston is drained

whereby said one piston is moved outwardly of said housing, relative to the rotor axis, and said other piston is moved inwardly of said housing; and

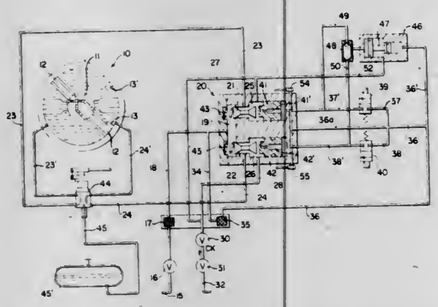
resilient spring means connected with one of said pistons for resiliently opposing outward movement of that one piston and for resiliently urging that one piston inwardly; and said pistons being coupled together by a rigid connection so that movement of one piston carries the other piston in the same direction of movement, and said accumulators providing even pressure of inlet fluid stabilizing the pressure flow from said fluid pressure means thereby eliminating pulses of pressure.

4,235,155

DELAYING CONTROL FOR HYDRAULIC MOTORS

Homer J. Shafer, 2300 Park Ave. West, Mansfield, Ohio 44906

Filed Jan. 2, 1979, Ser. No. 14
Int. Cl.³ F15B *13/16*
U.S. Cl. 91—361 **8 Claims**



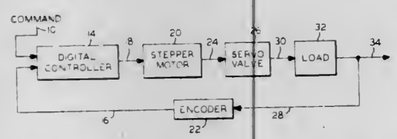
1. In a fluid system for operating a fluid piston hydraulic motor, a power fluid supply, control means for supplying power fluid to said motor and exhausting it therefrom, and electrically operated pilot valve means for operably connecting said power fluid supply through pilot lines to said control means, said pilot valve means operated by limit switches in said motor to control the stopping position of said piston in either direction, the improvement comprising means for momentarily delaying shutting off the control means after actuation of the pilot valve means, said delaying means comprising a dashpot cylinder connected to said pilot lines for momentarily continuing to supply power fluid to said control means after said pilot valve means is moved to a closed position disconnecting the fluid supply from the control means.

4,235,156

DIGITAL SERVOVALVE AND METHOD OF OPERATION

Zenny Olsen, Southington, Conn.

Filed Nov. 16, 1978, Ser. No. 961,251
Int. Cl.³ F15B *9/03, 9/09*
U.S. Cl. 91—363 R **6 Claims**



1. In a digital feedback control system for controlling a load whose output is controllable by flow of fluid therethrough, the combination comprising:

a. servovalve means including a valve operating member movable therewithin;

b. fluid circuit means adapted for connection between a source of pressurized fluid and said servovalve means and between said servovalve means and the load, for providing fluid communication between the source of pressurized fluid and said servovalve means and between said servovalve means and the load, the rate and direction of fluid flow through said servovalve means and thereby through the load being dependent on the position of said operating member in said servovalve means said valve operating member being movable to a null position in which it prevents fluid flow in said servovalve;

c. stepper motor means operatively connected to said valve operating member to change the position of said valve operating member by steps in response to pulses applied to said stepper motor means;

d. digital feedback means adapted to be connected to the fluid-controlled load to sense changes in the output of the load and generate digital feedback signals indicative of changes in the load output; and

e. digital controller means, adapted to be connected to a source of digital command signals indicative of a desired load output, and connected to said digital feedback means for reception of the digital feedback signals, for determining the actual load output from the feedback signals, comparing the actual load output with the desired load output, and generating and applying to said stepper motor means signals to position said valve operating member, in response to the difference between the actual load output and the desired load output, for flow of fluid through the load to reduce the difference between the actual load output and the desired load output, said digital controller means including position-storing means for storing a digital number, monitoring the step signals generated and applied to said stepper motor means by said digital controller means, and incrementing and decrementing the digital number in accordance with the signals applied to said stepper motor means by said digital controller means, the position of said valve operating member being represented by the digital number, a predetermined null valve of the digital number representing the null position of said servovalve, said digital controller means further including nulling means operable to monitor the digital feedback signals received by said digital controller means, to generate and apply to said stepper motor means signals for positioning said valve operating member to counter any changes in output indicated by said digital feedback signals, and to reset the position-representing digital number to the predetermined null value when no further changes in output are indicated by the feedback signals, said digital controller means generating and applying to said stepper motor means signals to cause said position-storing means to increment or decrement said stored digital number to equal the predetermined null value when the desired load output equals the actual load output, fluid flow in said fluid circuit means thereby being prevented when the actual and desired load outputs are equal.

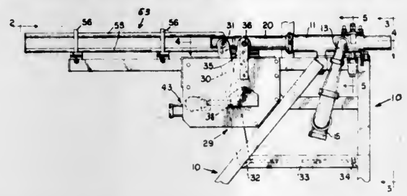
4,235,157

VOLUMETRIC METERING STUFFER WITH PRODUCT SEALS

Daniel L. Orloff, Madison, Wis., assignor to Oscar Mayer & Co. Inc., Madison, Wis.

Continuation-in-part of Ser. No. 760,860, Jan. 21, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,788
Int. Cl.³ F01B *9/00*; F16J *15/18*
U.S. Cl. 92—140 **5 Claims**

1. In a volumetric metering stuffer having a ram housing for receiving and transmitting a product intermediate the opposite ends of the ram housing and dispensing the product at one opposite end, and a ram operable in said housing having a product engaging end for engaging a metered quantity of said product within said one opposite end and discharging said metered quantity from said one opposite end of said housing and a driven end slidable into and out of the other opposite end of said housing, the improvement comprising, sealing means at said other opposite end of said housing between said housing and said ram driven end to prevent leakage of said product, and drive means operably connected to said driven end of said ram for translatorily reciprocating said ram along substantially a straight line to prevent application of sidewise thrust on said sealing means, said drive means comprising, a guide link stationarily pivotally mounted at one end, an operating link pivotally connected at one end to said other driven end of said ram, anchor means at the other end of said operating link for permitting endwise movement of said other end, a reciprocating drive mechanism, and means pivotally interconnecting the other end of said guide link and the mid-point of said operating link to said reciprocating drive mechanism.

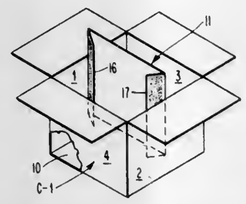


4,235,158

METHOD OF MAKING HIGH STRENGTH SHIPPING CARTON

A. David Johnson, Jr., Radnor, Pa., assignor to Wayne Automation Corporation, King of Prussia, Pa.

Filed Jan. 18, 1978, Ser. No. 870,467
Int. Cl.³ B31B *7/00*
U.S. Cl. 493—334 **4 Claims**



1. The method of increasing the compressive and lateral strength of a four panel carton by:

providing an open, fully erected and complete four panel carton;

inserting an independent divider inside of said carton to extend between two opposite panels and at the same time applying adhesive means on tab areas respectively on opposite edges of the divider; and

pressing each said tab area against its panel so that the adhesive means can form a bond between the tab area and panel and secure the panels and tab areas together.

4,235,159

MACHINE FOR MANUFACTURE OF HIGH STRENGTH SHIPPING CARTONS

A. David Johnson, Jr., Wayne; George E. Ginther, Sr., King of Prussia, and Joseph L. Bachman, Wayne, all of Pa., assignors to Wayne Automation Corporation, King of Prussia, Pa.

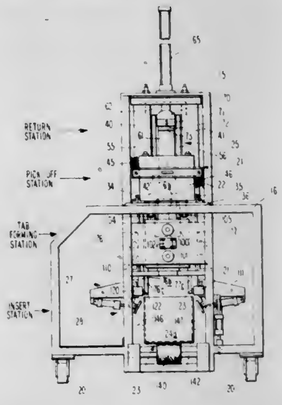
Filed Oct. 23, 1978, Ser. No. 953,350
Int. Cl.³ B31B *11/02, 11/26*
U.S. Cl. 493—309 **15 Claims**

1. In a machine for fixedly joining a four panel, open, fully erected and complete carton and a carton divider:

a magazine supporting a stack of dividers arranged one beside the other along a first axis, the magazine including means to move the dividers one after another to a pick-off station and releasably retain the divider in the pick-off station;

a divider transporter mounted for reciprocating motion along a second axis transverse said first axis in a working stroke serially along said second axis from a return station, to said pick-off station, to a tab forming station, to an insert station and thence in a return stroke to the return station;

a carton transporter for supporting a plurality of four panel, open, fully erected and complete cartons and delivering the cartons one by one to said insert station, maintaining a carton in the insert station for a divider insertion and joining operation and removing a joined divider and carton from said insert station;



pick-off means on said divider transporter to engage a divider in the pick-off station and move the divider to the tab forming station;

means in said tab forming station to receive a divider from said pick-off station and form tabs on two opposite edges of the divider;

gripper means on said divider transporter to engage said formed divider in the tab forming station and move the divider out of the tab forming station into a carton maintained in the insert station with the tabs located respectively adjacent a pair of opposite panels of the carton; and

means in said insert station to apply adhesive between said tab and its panel and to press the tab and panel together after insertion to provide for said adhesive to securely join the same together.

4,235,160

PROCESS FOR MAKING FILTER CUPS

Wallace E. Olney, and Robert G. Wright, both of Portage, Mich., assignors to Brown Company, Kalamazoo, Mich.

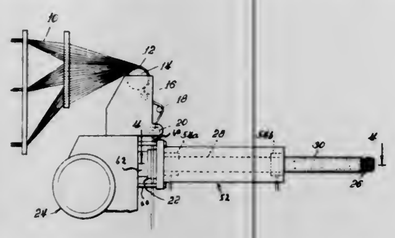
Division of Ser. No. 686,109, May 13, 1976, Pat. No. 4,098,177.
This application Jun. 21, 1978, Ser. No. 917,686
Int. Cl.³ B31D *5/00*; B31F *7/00*
U.S. Cl. 493—63 **14 Claims**

1. A process for making filter cups having an annular bottom and integral upstanding fluted sides projecting upwardly from the periphery of said annular bottom which comprises

(1) assembling into a composite web, a plurality of webs of filter paper composed essentially of bleached cellulose fiber from chemically processed wood pulp, which is uncalendered, is unsized, is creped from about 6 to about 15 percent, and has a basis weight between about 28 and about 40 pounds.

(2) passing the composite web into a die which cuts the

composite web into a circular composite disc and forms flutes therein radiating out from a central circuit portion,
(3) forcing the fluted circular component disc into nested cups and moving the nested cups axially through a cylindrical tube having substantially the diameter of the central portion of the nested cups,
(4) heating and cooling the nested cups while in said tube,

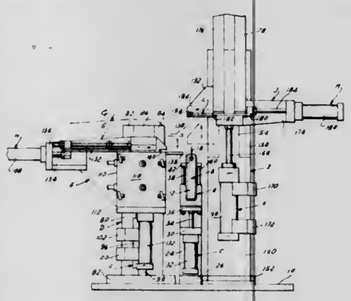


(5) transferring the cooled nested cups from said tube to a frusto-conical die having a circular top having substantially the same diameter as the central portion of the nested cups and a central die-hole, said die having sides flaring outwardly and downwardly from said circular top at an angle approximating the natural flare of the nested cups, and
(6) punching an axial hole in said nested cups while on said die by means of a punch complementary to said die.

4,235,161
AUTOMATIC TAG ATTACHING APPARATUS

Steven Kunreuther, New York, N.Y., assignor to Kunreuther & Beringhause, Carle Place, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,259
Int. Cl.[3] B31F *5/00*
U.S. Cl. 493—376 **55 Claims**

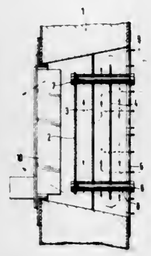


1. Apparatus for automatically attaching one or more members to an article utilizing a fastener attacher of the type having a hollow needle, through which a fastener is dispensed when the attacher is actuated, said apparatus comprising a support, means for mounting the attacher to said support in a fixed position relative thereto, means for actuating the attacher and means for positioning a member on the needle, said positioning means comprising a carriage and means for moving said carriage relative to said support in a direction substantially parallel to the axis of the needle, said carriage comprising means for feeding a member from a first position, out of alignment with the needle, to a second position, in alignment with said needle, said carriage moving means moving said carriage between a position wherein said member is spaced from the needle and a position wherein said member is located on the needle, and means for actuating said member feeding means.

4,235,162
EXHAUST VENT FOR COOLING RIGS TRANSPORTED ON VEHICLES

Hartmut Schmidt, Düsseldorf, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,657
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703062
Int. Cl.[3] B60H *1/26*
U.S. Cl. 98—19 **3 Claims**

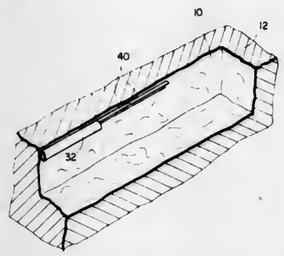


1. In an exhaust vent for cooling rigs transported on vehicles, the interior of which is cooled by the introduction of a low boiling liquified gas, the improvement being a plurality of inserts mounted at the exhaust vent to comprise means which force the outflowing gas to be deflected several times, said inserts comprising parallel sheet metal plates between which the gas flows in a meandering fashion, at least some of said parallel plates being perforated, said perforations in said plates being staggered to force the gas exhausting therethrough to flow in a labyrynth path, said parallel plates including an intermediate plate which is perforated, said vent having a peripheral inner wall, said perforated intermediate plate extending to said peripheral inner wall of said vent whereby all exhaust gas must flow through its perforation, said plates further including a plate on one side of said intermediate plate which is not perforated and is spaced from said inner wall of said vent whereby the gas flows therearound, and said plates including a plate on the other side of said intermediate plate which is perforated and is spaced from said inner wall of said vent whereby the gas flows therearound and therethrough.

4,235,163
MINE FACE VENTILATION SYSTEM

Edward F. Divers, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 6, 1979, Ser. No. 55,216
Int. Cl.[3] E21F *1/04*
U.S. Cl. 98—50 **7 Claims**



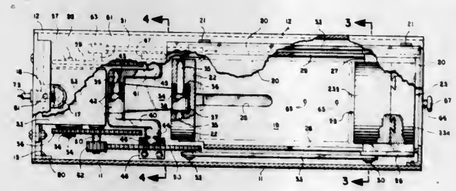
1. An apparatus for supplying ventilating air to the working face of an underground mine tunnel, said apparatus comprising:

a closed duct air conduit system extending from a ventilated mine crosscut to the mine working tunnel;
an air blower operatively associated with said duct system for forcing air into said duct system from the crosscut causing air to be expelled in a jet from the end of said duct system located in the working tunnel;
a trough arcuately shaped in opened cross-section connected to said duct system at one end and extending along the working tunnel towards the face of the tunnel, said trough's opened side being away from the most adjacent mine wall and said trough being located at the end of said duct system to provide that the jet of air which is expelled from said duct system is channeled to the working face of the tunnel along said trough.

4,235,164
APPARATUS FOR CRUSHING BEVERAGE CANS

A. Phil Allen, 180 W. Pebblewood La., Centerville, Utah 84014, and Richard M. Hunsaker, 4668 Westview Dr., Salt Lake City, Utah 84117

Filed Jun. 8, 1979, Ser. No. 46,652
Int. Cl.[3] B30B *1/26, 9/32*
U.S. Cl. 100—53 **10 Claims**

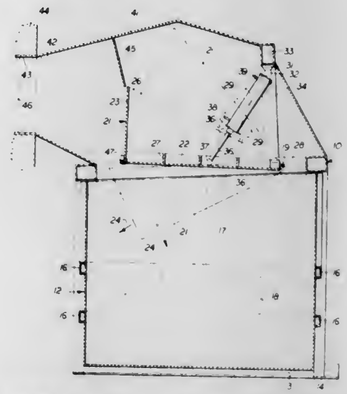


1. A beverage can compactor comprising:
an elongate, can-receiving, compaction chamber having a generally cylindrically curved bottom;
a pair of substantially flat, disk-like platens adapted for reciprocation movement from the respective ends of said compaction chamber toward the central portion of said compaction chamber and then back to the respective ends of said compaction chamber,
a first rotating crank positioned adjacent one end of said compaction chamber for rotation about an axis normal to the longitudinal axis of said compaction chamber;
a first push rod connecting said first crank with one of the disk-like platens, so that as the first crank rotates, the push rod imparts reciprocating, translational motion to said one of the disk-like platens;
second and third rotating cranks positioned for rotational movements in spaced, parallel planes along the mutually opposite sides of said compaction chamber;
second and third push rods connecting the second and third cranks, respectively, to mutually opposite sides of the other disk-like platen, so that as the second and third cranks rotate, the push rods impart reciprocating, translational motion to said other disk-like platen; and
means for rotating the second and third cranks in phase about their common axis and for rotating the first crank about said common axis but 180° out of phase with respect to the second and third cranks,
whereby the pair of platens move from the opposite ends, respectively, of the compaction chamber towards each other during one-half cycle in the rotation of the first, second, and third cranks and then move away from each other back to their respective ends of the compaction chamber as the first, second, and third cranks complete the second half-cycle of the rotation.

4,235,165
COMPACTOR FOR WASTE MATERIAL

Gordon H. Feaner, Columbus, Miss., and Gary R. Feaner, Tuscaloosa, Ala., assignors to Marathon Equipment Company, Inc., Vernon, Ala.

Continuation of Ser. No. 924,698, Jul. 14, 1978, abandoned. This application Aug. 21, 1979, Ser. No. 68,381
Int. Cl.[3] B30B *15/30*
U.S. Cl. 100—53 **7 Claims**



1. A compactor for waste material comprising:
(a) a supporting frame
(b) an open top container for receiving waste material to be compacted and adapted for movement selectively to a first position within said supporting frame and to a second position outwardly of said supporting frame
(c) a ram unit pivotally supported at one end by said supporting frame with the other end thereof being movable selectively to an extended packing position within said container, a retracted loading position in spaced relation above said container and an intermediate closing position adjacent the top of said container
(d) a housing encasing said ram unit and having a feed opening adjacent said other end of said ram unit for introducing waste material into said container while said ram unit is in said retracted loading position
(e) a power unit operatively connected to said ram unit for moving said ram unit selectively to said extended packing position, said retracted loading position and said intermediate closing position, and
(f) at least one resilient roller-like member carried by said ram unit in position to engage the adjacent portion of said supporting frame with a friction fit while said ram unit is in said intermediate closing position to retain said ram unit in said intermediate closing position until sufficient force is exerted by said power unit to distort said resilient roller-like member and move the same downwardly along with said ram unit into said container.

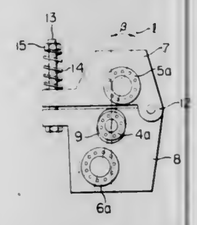
4,235,166
FIXING APPARATUS

Haruo Tsunoi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,556
Claims priority, application Japan, Sep. 22, 1977, 52-114159
Int. Cl.[3] B30B *3/04*
U.S. Cl. 100—158 R **10 Claims**

1. A pressure fixing device wherein a toner image on a surface of a toner image bearing member is fixed thereon by pressure, comprising:
first and second rollers for pressing and conveying an image bearing member therebetween; and
a third roller press-contacted to said first roller;

wherein each of said first, second and third rollers is made of a material suitable for applying sufficient pressure to the image bearing member to fix the image thereon;
wherein said first roller is positioned between said second and third rollers and has a diameter smaller than the diameters of said second and third rollers; and



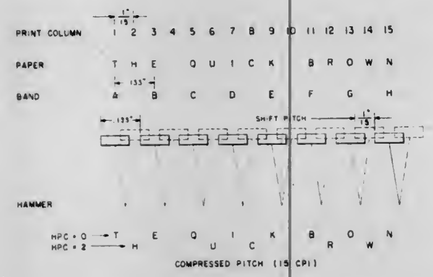
wherein said three rollers are so arranged that, when no pressure for fixing the image is applied, said second roller and said third roller have their axes at angles with respect to the axis of said first roller which are measured in opposite directions, as viewed when facing the surface of the image bearing member.

4,235,167

HIGH SPEED DUAL PITCH IMPACT PRINTER

Kenneth Staugaard, Rochester, Mich., assignor to Computer Peripherals, Inc., Minneapolis, Minn.

Filed Mar. 12, 1979, Ser. No. 19,393
Int. Cl.³ B41J 9/12, 1/20
U.S. Cl. 101—93.09 **20 Claims**



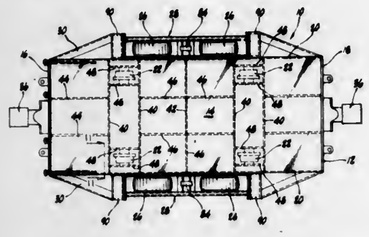
1. An impact printer capable of printing at one or another character pitch,
a plurality of removable type character carrying members, one member having characters defining standard pitch and another member having characters defining compressed pitch, each of said characters being spaced at a predetermined distance thereon,
a plurality of impact members adjacent a selected one of said type character carrying members and spaced at a like predetermined distance as said characters,
means for conditioning said impact members in accordance with the pitch of said characters on the selected one of said type character carrying members, and,
means for plural print column shifting of said impact members for printing at one rate in standard pitch mode and for singular print column shifting of said impact members for printing at a higher rate in compressed pitch mode.

4,235,168

VEHICLE WITH CONVERTIBLE WHEELS

Michael J. Amoroso, Marion, Ill., assignor to M.A.T. Industries, Inc., West Frankfort, Ill.

Filed Jun. 29, 1978, Ser. No. 920,535
Int. Cl.³ B61F 13/00
U.S. Cl. 105—215 C **17 Claims**



15. A vehicle with convertible wheels comprising:
(a) a frame including a longitudinal axis and having guide means on each side thereof,
(b) spaced front and rear rail bearing wheels mounted to the frame in rotatable relation on each side of said axis,
(c) a pair of carriages each received in sliding relation by an associated guide means on one side of said frame for vertical movement of each carriage relative to said frame from an upper retracted position to a lower position, each carriage including spaced front and rear ground engageable wheels rotatably mounted to the carriage for vertical movement with said carriages,
(d) counterbalance means operatively connected between the frame and each carriage to facilitate movement of said carriages between the upper and lower positions,
(e) means for selectively holding the carriages in the upper and lower positions,
(f) each carriage including front and rear ends interconnected by inner and outer longitudinal side members,
(g) said ground engageable wheels being rotatably mounted between said side members,
(h) the frame including front and rear relatively outstanding portions disposed adjacent said front and rear carriage ends and receiving said carriage therebetween,
(i) said outstanding portions providing housings,
(j) said counterbalance means including a spool mounted within each housing, each spool having at least one constant force spring having one end wound on said spool, and the other end being connected to adjacent ends of said carriage means,
(k) each end of each carriage including a depending portion having a longitudinally extending portion,
(l) each outstanding portion of said frame including a cut-out portion receiving said carriage extending portion, and
(m) said other end of said spring being connected to said extending portion.

4,235,169

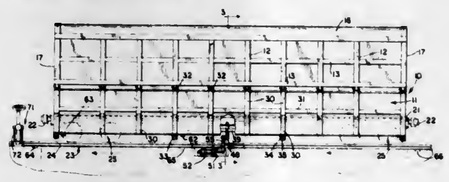
DOOR LOCKING MECHANISM FOR SIDE DUMP RAILWAY HOPPER CARS

William H. Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Jul. 10, 1978, Ser. No. 923,130
Int. Cl.³ B61F 9/00
U.S. Cl. 105—251 **14 Claims**

1. For a railway hopper car having a hopper including a downward and outward extending slope sheet structure terminating adjacent to a side discharge opening, and,
a door hingedly connected to said car for swinging movement between open and closed positions relative to said opening, the improvement of a locking arrangement comprising,

a latch support connected to said hopper adjacent to said discharge opening,
a latch element pivotally connected to said support for pivotal movement about an axis extending generally longitudinally of said car,
a keeper member on said door,
a longitudinally extending actuating member supported on said hopper car for longitudinal movement below said slope sheet structure,



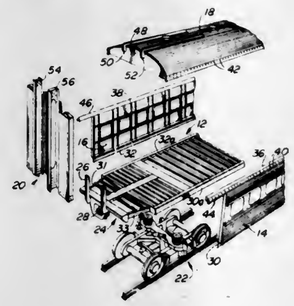
means for moving said actuating member longitudinally,
flexible connecting means connected to said actuating member and said latch element, and
said latch element, in a locked position with respect to said keeper member being pivotally movable during movement of said actuating member to an unlatched position whereupon said door is moved by gravity to an open position.

4,235,170

RAILWAY CAR UNDERFRAME END SILL

Horace P. Bauer, Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Oct. 30, 1978, Ser. No. 955,983
Int. Cl.³ B61D 1/00, 17/04, 49/00
U.S. Cl. 105—402 **8 Claims**



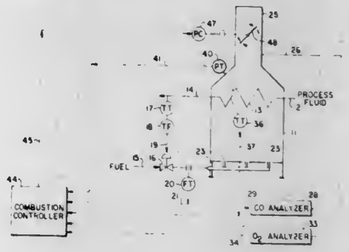
1. An end underframe structure for a railway car comprising:
(a) a primary end sill extending transversely across the front of said car,
(b) a secondary end sill spaced and parallel to said primary end sill,
(c) a bolster member,
(d) a first pair of side buffer members connecting said primary and secondary end sills,
(e) a girder web positioned over said sills and said first pair of buffer members and being connected thereto for forming an open box structure having increased strength,
(f) a second pair of side buffer members connecting said secondary end sill to said bolster member, and
(g) a draft sill member centrally disposed between said first and second pairs of said side buffer members and extending longitudinally with respect to said car from the center of said primary end sill to the center of said bolster member.

4,235,171

NATURAL DRAFT COMBUSTION ZONE OPTIMIZING METHOD AND APPARATUS

Donald J. Leonard, Lagunitas, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 21, 1978, Ser. No. 972,110
Int. Cl.³ F23H 5/18
U.S. Cl. 110—188 **3 Claims**



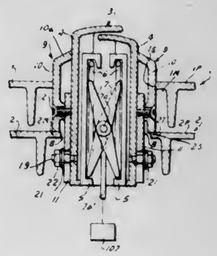
1. Method for optimizing the operation of a natural draft combustion zone having a fuel supply, multiple burners a combustion air supply and through which a conduit containing a process fluid to be heated passes, which comprises:
(a) increasing the flow rate of said combustion air as necessary to maintain the CO concentration in the flue gas below a predetermined maximum, as necessary to maintain the O_2 concentration in the flue gas above a predetermined minimum, as necessary to maintain the draft in the combustion zone above a predetermined minimum, as necessary to maintain the temperature of the outer surface of said conduit below a predetermined maximum and whenever the rate of increase in the rate at which fuel is supplied to the combustion zone exceeds a predetermined maximum; and
(b) decreasing the flow rate of said combustion air whenever an increase in said combustion air flow rate is not necessary to accomplish step (a).

4,235,172

GRATE WITH COMPENSATING MEANS FOR USE IN INDUSTRIAL FURNACES

Johannes J. Martin; Walter J. Martin, and Erich Weber, all of Munich, Fed. Rep. of Germany, assignors to Josef Martin Feuerungsbau GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,356
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1978, 2809845
Int. Cl.³ F23B 1/22
U.S. Cl. 110—281 **17 Claims**



1. In a grate for industrial furnaces or the like, the combination of alternating aligned elongated first and second grate bars which partially overlap each other, said bars including marginal portions having top faces and side faces; means for recip-

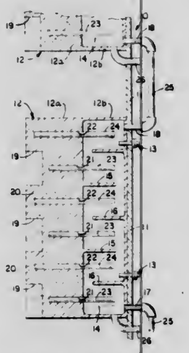
rocating said second bars lengthwise with respect to said first bars; a mobile compensating device adjacent to said marginal portions of said bars; means for yieldably urging said device toward said bars; and sealing means including auxiliary bars interposed between said second bars and said device, said auxilary bars abutting the side faces of marginal portions of said second bars and overlying the top faces of marginal portions of said first bars, said side faces of said first bars being out of contact with said device and said auxiliary bars.

4,235,173

FURNACE COOLING APPARATUS

Kenneth C. Sharp, 30 Mountcombe Close, Upper Brighton Hill, Surbiton, Surrey, Great Britain

Filed Apr. 13, 1979, Ser. No. 29,777
Claims priority, application United Kingdom, Jul. 11, 1978, 43453/78
Int. Cl.³ F23M 5/08; C21B 7/10
U.S. Cl. 110—336 **7 Claims**



1. In a furnace wall construction, a plurality of staves having inside and outside surfaces, said inside surfaces being arranged for engagement with the outside of a refractory furnace lining, and cooling means including means defining elongated hollow enclosed spaces within said staves and extending outwardly from points close to said inside surfaces of said staves, each of said enclosed spaces containing a fluid for rapid outward transmission of heat from a refractory lining engaged with said inside surfaces of said staves, said cooling means including wick means extending longitudinally within said enclosed spaces for effecting the flow of fluid in a liquid phase to be vaporized at inner end portions of said spaces with the vaporized fluid being condensed at the outer end portions of said spaces.

4,235,174

HEAT RECOVERY FROM WET WOOD WASTE

Robert M. Spurrell, Auburn, Wash., assignor to Weyerhaeuser Company, Tocoma, Wash.

Filed Nov. 24, 1978, Ser. No. 963,624
Int. Cl.³ F23G 5/00
U.S. Cl. 110—346 **5 Claims**



1. A method of improving the recovery of heat from wet wood waste, comprising:
predrying the wood waste by the steps of
screening the waste into oversize and accepted fractions,
feeding said oversize and a portion of the accepted fraction into a fluid bed reactor wherein said feed is about 10–25% by weight of the total wood waste flow,
combusting said oversize and a portion of the accepted fraction in the fluid bed reactor,
combining the products of combustion from the fluid bed reactor with such air as is necessary to limit exit gas temperatures to less than about 1,200° F., and
contacting the balance of the accepted fraction from the initial screening step with the combined hot gas flow
wherein said accepted fraction is dried to a moisture content of about 10–30% moisture, by weight; and
combusting the dried accepted fraction in a wood waste heat recovery boiler.

4,235,175

LOOP FORMING AND CUTTING APPARATUS FOR TUFTING MACHINE

James T. Cobble, Dalton, Ga., assignor to B & J Machinery Company, Inc., Dalton, Ga.

Filed Oct. 26, 1978, Ser. No. 954,936
Int. Cl.² D05C 15/00
U.S. Cl. 112—79 R **13 Claims**

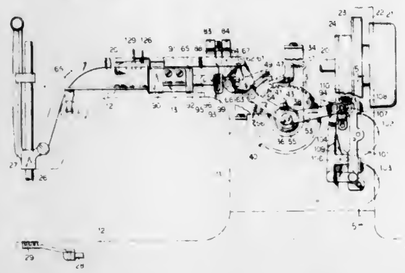
1. A yarn loop forming and cutting apparatus for use in a cut pile tufting machine and comprising
a looper having an elongate forwardly directed bill and which defines a longitudinally extending substantially straight edge,
a cutting blade having an elongate cutting edge,
means for movably mounting said blade to said looper such that the cutting edge of said blade cooperates with said edge of said bill to form a forwardly facing bight therebetween, and including means for resiliently biasing said blade in a direction toward said edge of said looper bill, and means for limiting the movement of said blade toward said edge of said looper bill and such that the bight remains open a distance sufficient to admit yarn loops therein,
whereby loops of yarn may be moved rearwardly along said bill and severed upon reaching the bight formed between said edge of said looper bill and said blade cutting edge.

4,235,176

STITCH PATTERN GENERATING SYSTEM FOR A SEWING MACHINE

Chikao Yamashita; Takao Sugaya, and Noriyuki Yoshida, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 22, 1979, Ser. No. 5,588
Claims priority, application Japan, Feb. 8, 1978, 53-13111
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 D **6 Claims**



1. In a regulating system of a sewing machine, which is provided with stitch forming instrumentalities, responsive to pattern information for regulating at least one of said stitch forming instrumentalities including:
at least one information-carrying member (38 and/or 40)

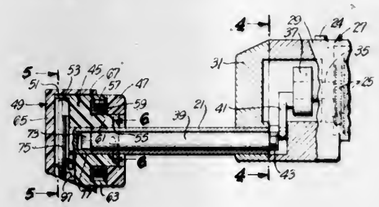
having a plurality of pieces of pattern information recorded thereon for forming a plurality of stitch patterns;
scanning means (49 and/or 50) for selectively picking up the pattern information from said information-carrying member upon the relative rotation of said at least one information-carrying member relative to said scanning means;
a step motor (35) operatively connected to said at least one information-carrying member for rotating said at least one information-carrying member;
drive means (192) responsive to control signals applied thereto for driving said step motor selectively in forward and reverse directions;
the improvement comprising:
wherein said at least one information carrying member on which said pattern information is recorded contains information in the form of an information group for each stitch pattern within each of defined regions on said information-carrying member, each pattern information in one of said groups being so arranged as to make it possible to be sequentially picked up at least once by said scanning means upon one reciprocating rotation, within one of said defined regions, of said at least one information-carrying member relative to said scanning means;
control means (253-255) for applying said control signals to said drive means for intermittently rotating said at least one information-carrying member in timed relation with said sewing machine, according to individually predetermined sequences for each stitch pattern and for said one reciprocating rotation of said at least one information-carrying member; and
manually operated pattern selection means (17, 18, 228) for selecting one of the stitch patterns, said pattern selection means being connected to said control means for selectively rendering one sequence corresponding to a desired stitch pattern effective, and being connected to said drive means for driving said step motor to position said at least one information-carrying member for enabling said scanning means firstly to pick up a predetermined starting information in the group corresponding to the desired stitch pattern upon start of running of said sewing machine;
whereby each set of pattern information for successively forming one stitch pattern is sequentially picked up as a result of intermittent rotation of said at least one information-carrying member at a rate of a small angle per step of said step motor.

4,235,177

SUTURING DEVICE

Norman B. Arbuckle, Costa Mesa, Calif., assignor to Raymond C. Kelder, Rancho Mirage, Calif., a part interest

Filed Feb. 23, 1979, Ser. No. 14,706
Int. Cl.³ D05B 1/00
U.S. Cl. 112—169 **11 Claims**



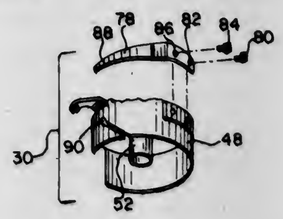
1. A suturing device comprising:
a drive shaft;
means for oscillating said drive shaft generally about an oscillatory axis;
a suturing needle;
means for drivingly coupling said suturing needle to said drive shaft whereby said drive shaft can drive said suturing needle back and forth along a first path;
a loop arm;
means for mounting said loop arm for movement along a second path, said second path being generally transverse to said oscillatory axis and at least portions of said paths being adjacent;
means for drivingly coupling said loop arm to said drive shaft to permit the drive shaft to move said loop arm back and forth along said second path; and
said loop arm mounting means including a rod extending generally transverse to said oscillatory axis and means for mounting the loop arm on said rod for movement in both directions along the rod.

4,235,178

BOBBIN THREAD TENSION DEVICE

Manfred Ackermann, Elmhurst, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Mar. 26, 1979, Ser. No. 23,573
Int. Cl.³ D05B 57/26; B65H 59/06
U.S. Cl. 112—229 **5 Claims**



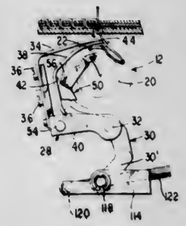
1. A bobbin thread case means having an apertured circular shell which permits the passage of thread therethrough and a bobbin thread tension means arranged on the other surface of said shell comprising:
a pivotally mounted bobbin thread control means the free end of which is laterally displaceable relative to the aperture in said shell through which the thread passes, the free end of said control means being pivotally movable in a path extending substantially parallel to the circular shell and adapted to selectively regulate the size of said thread aperture whereby varying the bobbin thread tension.

4,235,179

UNDERBED THREAD TRIMMER PICKING ARM

Roger J. Ross, Mont St-Gregoire, Canada, assignor to The Singer Company, Stamford, Conn.

Filed Jul. 19, 1979, Ser. No. 58,871
Int. Cl.³ D05B 3/00, 65/02
U.S. Cl. 112—286 **2 Claims**



1. In a sewing machine including a circularly moving looptaker having a face, said looptaker concatenating a needle thread with a bobbin thread from a bobbin contained within said looptaker, a thread trimming mechanism comprising a

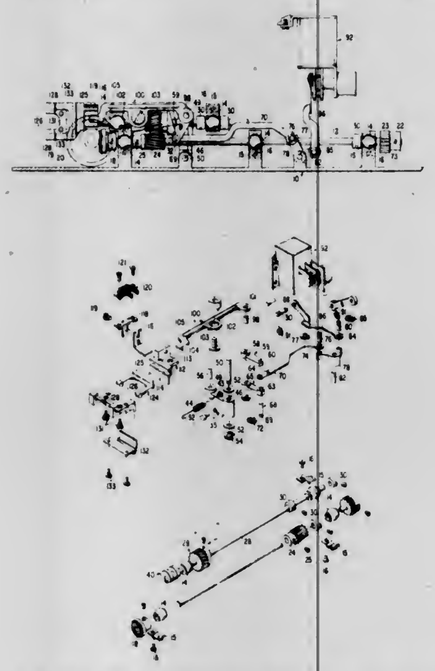
plurality of thread influencing members each separately supported for movement transversely across the face of said looptaker, means operatively connected to said sewing machine for selectively moving said thread influencing members across the face of said looptaker in response to the rotation of said looptaker, said thread influencing members comprising a thread cutting blade for severing said bobbin thread and a limb of said needle thread, a thread catching arm for engaging a limb of needle thread and said bobbin thread, said thread catching arm drawing said bobbin and said needle threads into severing relation with said thread cutting blade, and a thread picking arm including means thereon for engaging said bobbin thread and a limb of said needle thread for retaining said bobbin thread and drawing it backwardly across the face of said looptaker after said bobbin thread and a limb of said needle threads have been severed.

4,235,180

COMPACT FEED BAR

William Weisz, Tenafly, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 19, 1980, Ser. No. 122,773
Int. Cl.³ D05B 27/02
U.S. Cl. 112—323 **4 Claims**



1. A work feed mechanism for a sewing machine having a work supporting bed, and a throat plate carried on said bed and formed with feed dog accommodating slot defining a direction of work feed transversely across said bed, said work feed mechanism comprising:

a feed bar pivotally supported substantially centrally thereof in said bed for pivotable motion in a plane, said feed bar extending substantially perpendicular to said feed dog accommodating slot in said throat plate;

a feed dog;

means for accommodating motion of said feed dog in a linear path;

means for connecting said feed dog to a first end of said feed bar;

means for driving the second end of said feed bar a selectable amount for selectable motion of said feed dog; and

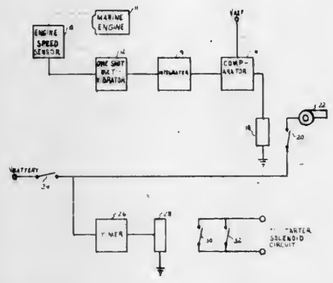
means for selecting the amount of feed motion over a range from a maximum feed stroke down at least to a minimum feed stroke.

4,235,181

AUTOMATIC BLOWER CONTROL SYSTEM FOR INBOARD MARINE ENGINES

Donald B. Stickney, Milwaukie, Oreg., assignor to Oregon Link, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 766,929, Feb. 9, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,438
Int. Cl.³ B63J 2/06
U.S. Cl. 114—211 **7 Claims**



1. An automatic blower control system for use in combination with an inboard marine engine having associated therewith an exhaust blower for ventilating the compartment in which said engine is disposed, a power source for said blower, a blower switch coupled between said blower and said power source, and an engine starting circuit including a starter solenoid circuit, said system comprising

first switching means having normally open contacts coupled in series with said starter solenoid circuit and having a control input;

means coupled between said blower switch and said starter solenoid circuit for providing a voltage proportional to time elapsed from the time said blower switch is closed, a first source of reference d.c. voltage, an operational amplifier having a first input coupled to said first source of reference d.c. voltage, a second input coupled to said means for providing said time proportional voltage, and operating to produce a relatively higher output only when said time proportional voltage exceeds said first reference d.c. voltage whereby said starter solenoid circuit is completed only after the expiration of a predetermined period of time after said blower switch is closed;

sensing means associated with said engine and operating in response to operation of said engine to generate an output signal having a frequency proportional to the speed of said engine;

a one-shot multivibrator coupled at its input to the output of said sensing means, and operating to produce at its output a pulsed signal of fixed pulse amplitude fixed pulse width and a frequency directly proportional to the frequency of said sensing means output signal;

an integrator coupled at its input to the output of said multivibrator and operating to produce at its output a d.c. voltage of a level directly proportional to the frequency of said multivibrator output signal;

a second source of reference d.c. voltage of a level directly proportional to a preselected minimum speed of said engine;

a voltage comparator having first and second inputs, said first input being coupled to said second source of reference d.c. voltage, said second input being coupled to the output of said integrator, and operating to produce at the output thereof a maximum d.c. voltage level when the voltage level at said second input is relatively higher than the voltage level at said first input and a minimum d.c. voltage level when the voltage level at said second input is relatively lower than the voltage level at said first input;

second switching means having normally closed contacts coupled in series between said exhaust blower and said power source for said blower and a control input coupled to the output of said voltage comparator such that said normally closed contacts remain closed in response to a minimum d.c. voltage coupled to said control input and open in response to a maximum d.c. voltage coupled to said control input whereby said exhaust blower is automatically actuated when the speed of said engine falls below said preselected minimum speed; and

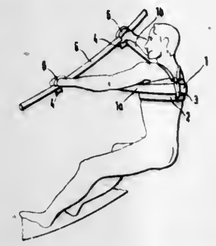
third switching means having normally open, manually operable contacts coupled in parallel with said first switching means whereby said starter solenoid circuit may be manually completed prior to the expiration of said predetermined period of time.

4,235,182

TRACTION ARRANGEMENT FOR USE BY A SAIL SURFER OR WATER SKIER

Reinhard Bürger, Karlsbader Str. 19, 6100 Darmstadt, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,915
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723541; Jun. 29, 1977, 2729228; Dec. 23, 1977, 2757545; Feb. 6, 1978, 2805000
Int. Cl.³ A63C 11/10; B63H 21/56
U.S. Cl. 440—34 **39 Claims**



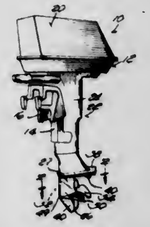
1. A traction arrangement for use by a sail surfer or water skier who is pulled along by holding onto a bar-shaped member connected to pulling means, comprising a harness arranged to be worn by a user and having a guiding element which is arranged to be located on the user's body; an elongated integral pulling element arranged to be worn by the user and movable in the direction of elongation thereof with guidance by said guiding element of said harness, said integral pulling element having two pulling portions which extend from the user's body toward the bar-shaped member and have leading ends spaced from one another; means for detachably connecting said pulling portions of said pulling element to the bar-shaped member and including two connecting elements each provided at the leading end of a respective one of said pulling portions, each of said connecting elements being flexible so as to be deformable about the bar-shaped member by a pressure of the user's hands and frictionally engageable with the bar-shaped member in deformed condition so that, in deformed condition, under the action of pressure of the user's hands and frictional engagement between said connecting elements and the bar-shaped member, said connecting elements are in frictional connection with the bar-shaped member and retained on the latter, whereas in the event of a fall or when the user wishes to disengage the bar-shaped member, cessation of pressure by the user's hands suffices to terminate the frictional connection.

4,235,183

MARINE PROPULSION DEVICE INCLUDING PROPELLER PROTECTION MEANS

Ralph S. Evinrude, Jensen Beach, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 738,528, Nov. 3, 1976, Pat. No. 4,096,819. This application Feb. 21, 1978, Ser. No. 879,445
Int. Cl.² B63H 5/13, 21/26
U.S. Cl. 440—71 **11 Claims**



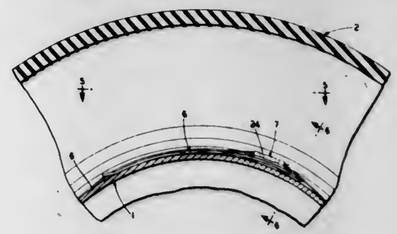
1. A marine propulsion device comprising a lower unit including a gear case normally submerged in water, a propeller shaft mounted in said gear case for rotation about an axis and carrying a propeller, a laterally extending anti-cavitation plate extending above said propeller, and a pair of generally flat, horizontally extending side fins affixed on and extending laterally in substantially coplanar relationship from the opposite sides of said lower unit at a location on said lower unit above said gear case and beneath said anti-cavitation plate, and within an imaginary extension parallel to said propeller axis of the periphery of the path of propeller rotation, each of said fins having a laterally extending trailing edge located wholly forwardly of said propeller.

4,235,184

STRAPPING, SEAL AND COUNTERWEIGHT DEVICE FOR MOUNTING TIRE PRESSURE WARNING SYSTEM SENSORS ON TIRE RIMS

Ben M. Schiavone, Cortland, Ohio, assignor to Sharon Steel Corporation, Sharon, Pa.

Filed Mar. 23, 1979, Ser. No. 23,153
Int. Cl.³ B60C 23/04
U.S. Cl. 116—34 R **14 Claims**



1. A mounting device for mounting a low tire pressure sensor transmitting means on a selected portion of a tire rim of a vehicle wheel including, a length of steel strapping conforming to the shape of the rim and engageable with a sensor having first and second strap ends; a strip-like metal counterweight having a lengthwise contour different from the curvature of a tire rim on which said sensor is to be mounted properly tensioned by said steel strapping; an elongated strip-like metal strapping seal having a body portion terminating in ears extending from the ends of the body portion, the body portion also terminating at its edges in reversely bent U-shaped seal flanges extending longitudinally of the body portion and later-

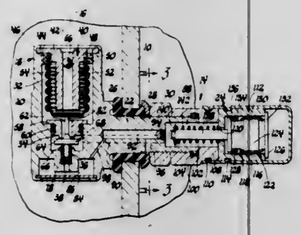
ally toward each other spaced above the body portion to form a seal channel; the seal ears being mounted on the counterweight with the elongated seal extending longitudinally of the strip-like counterweight; the first and second ends of the steel strapping being overlapped in and extending through said seal channel; and the strapping being engaged over and along the counterweight; whereby when the strapping engaged with a sensor is tensioned around a rim and the seal crimped by a strapping and sealing tool, the counterweight is deformed to conform generally with the rim curvature, and the sensor and counterweight are held in predetermined fixed relative positions on the rim within a tire mounted on the rim at all times and at all reasonable wheel speeds.

4,235,185

LOW TIRE PRESSURE SENSOR AND AIR SWITCH THEREFOR

Robert J. Byram, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1979, Ser. No. 58,738
Int. Cl.³ B60C 23/04
U.S. Cl. 116—34 R **3 Claims**



1. An air switch for a low tire pressure sender to emit a pneumatic signal when tire pressure drops to a limit value, comprising:

a valve cavity having first, second, and third ports, means including the first port for selectively admitting air under pressure from the tire to the valve cavity, the second port vented to atmospheric pressure, the third port comprising an outlet, a control member movable within the cavity for selectively placing the said first and second ports into communication with the third port, and bias means for urging the control member into a normal position to close the first port, and

bellows means adapted to be exposed to the tire pressure and mounted in operative engagement with the control member, the bellows means being precharged to a reference pressure and adapted to expand with decreasing tire pressure for moving the control member from its normal position when the tire pressure decreases to a low limit value to open the first port to communication with the third port and emit a pneumatic signal to the outlet, the bellows means, upon expansion, further being effective to move the control member into position to close the second port thereby preventing passage of tire air through the second port.

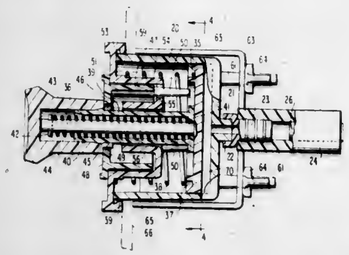
4,235,186

OIL LEVEL INDICATOR

James W. Frohose, Haskins, Ohio, assignor to Jasper Corporation, Easton, Md.

Filed Apr. 25, 1979, Ser. No. 33,243
Int. Cl.³ G01F 23/04, 23/06
U.S. Cl. 116—227 **3 Claims**

1. An oil level indicator comprising a tube element adapted to be positioned in a crankcase with an open end of the tube element at a predetermined level therein, an indicator assembly coupled with the tube element remotely from the crankcase, and mounting means for the indicator assembly, the improvement comprising a cup formed of molded plastics, a molded plastics face plate covering the open end of the cup, a snap action bayonet coupling means molded integrally on the face plate and cup to cooperatively hold the face plate and cup in assembled relationship, said coupling means comprising circumferentially spaced and circumferentially tapered ramp elements on the exterior of said cup adjacent the mouth of the cup and being molded integrally with the cup, each ramp element having a detent groove near one end thereof, said face plate having a marginal ring flange overlapping the exterior of the cup adjacent to the mouth of the cup, circumferentially spaced radially inwardly projecting lips on said ring flange integrally molded therewith in close surrounding relationship to the exterior of the cup and spaced from the mouth of the cup by a distance substantially the same as the thickness of said ramp elements axially of the cup whereby said lips are engageable lockingly below the ramp elements, protruding detent elements integrally molded on the interior of said ring flange



between said lips and the mouth of the cup and being positioned to ride on the exterior faces of the tapered ramp elements and to snap lockingly into said grooves of the ramp elements, a piston, piston rod and marginal piston seal unit engageable movably within the cup, there being a space within the cup between the cup end wall and said piston in communication with said tube element, a return spring for said unit interposed between the piston of said unit and said face plate, a safe oil level indicator tube in surrounding relationship to the piston rod of said unit and having an end wall adapted to bear on said piston, a compression spring within the bore of the safe oil level indicator tube and being captive between said end wall and an abutment element on said piston rod spaced from said end wall, a knob having snap locked assembled engagement with said safe oil level indicator tube outside of said cup, and a low oil level indicator sleeve surrounding the safe oil level indicator tube and movable axially relative thereto in response to displacement of said unit by said knob when there is no vacuum in said space.

4,235,187

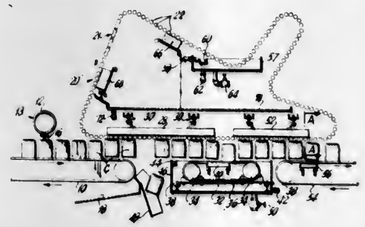
CAN HANDLING EQUIPMENT

Rohinton M. Mirza, Union City, N.J., assignor to Metalwash Machinery Corp., Elizabeth, N.J.

Continuation-in-part of Ser. No. 925,491, Jul. 12, 1978. This application Oct. 30, 1978, Ser. No. 956,461
The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.
Int. Cl.² B05C 9/12, 11/02; B08B 3/08; B65G 49/02
U.S. Cl. 118—58 **8 Claims**

1. Can handling equipment comprising a coating station at which a coating is applied to can bodies, a drying station at which said coating is dried, and overhead transfer conveyor for transferring can bodies from said coating station disposed between said coating and drying stations and comprising a receptacle for containing a coating solvent, and endless belt conveyor having an upper, can carrying course disposed within said receptacle at a level such that the lower portions of can bodies supported thereon are dipped below the level of said solvent, said endless belt conveyor comprising means preventing slippage between cans delivered to the conveyor and the belt contacting surface thereof, and means causing can bodies to fall from said overhead transfer conveyor to said endless belt conveyor and to be returned from said endless belt conveyor to said overhead transfer conveyor.

7. Can handling equipment for removing with solvent a bead



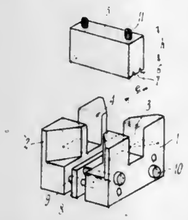
of excess coating material from the lowermost edges of cans which comprises a receptacle for containing the solvent, an endless belt conveyor having an upper can carrying course disposed within said receptacle, and means for controlling the level of the solvent in the receptacle and for controlling the disposition of the upper course of the belt in the receptacle so that only the beaded lowermost portions of the cans are immersed therein.

4,235,188

ADJUSTMENT OF THE QUANTITY OF IMPREGNATING OR COATING MATERIAL

Georges Chiron, and Maurice R. Gilles, both of Chambery, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 862,502, Dec. 20, 1977, Pat. No. 4,189,506. This application May 4, 1979, Ser. No. 36,056
Claims priority, application France, Dec. 21, 1976, 76 38465
Int. Cl.² B05C 3/172
U.S. Cl. 118—101 **10 Claims**



1. Apparatus for adjusting the quantity of viscous matter for impregnating or coating linear material such as strand or textile ribbon, characterized in that it comprises compression means containing an entrance orifice, at least one calibrated spaced bordered by two flat surfaces facing each other, and an exit orifice, all at close intervals and in alignment with each other and which compress the impregnated linear material during its passage, and further comprises decompression means between the compression means which are transversely oriented in relation to the direction of the entrance orifice—exit orifice and which assure drainage and evacuation of the pressed viscous material.

4,235,189

APPARATUS FOR APPLYING PULVERULENT COLORING MATTER TO WEBS OF CIGARETTE PAPER OR THE LIKE

Hans H. Severin, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,197
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752865
Int. Cl.³ B05C 1/08, 19/00
U.S. Cl. 118—119 **6 Claims**



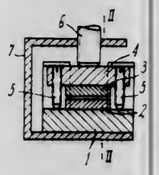
1. Apparatus for applying pulverulent coloring matter to a running web one side of which is at least partly adhesive, particularly for applying particles of bronzing material to a web of cigarette paper or the like, comprising a magazine for a supply of coloring matter; a transfer device positioned to apply coloring matter to said one side of the running web; means for transporting coloring matter from said magazine to said transfer device, said transporting means comprising a helical conveyor and said conveyor comprising a rotary component having a helical groove and a sleeve surrounding said rotary component, said sleeve having an opening through which some of the transported coloring matter is discharged into the range of said transfer device, an inlet located upstream of said opening and arranged to deliver coloring matter to said groove and an outlet communicating with said magazine and located downstream of said opening to return into said magazine coloring matter which advances in said groove beyond said opening; means defining a chamber for coloring matter which is transported by said conveyor, said transfer device extending into and receiving coloring matter from said chamber and said chamber receiving a portion of the coloring matter which is transported by said conveyor, said outlet being located downstream of said chamber, as considered in the direction of transport of coloring matter from said magazine, to return the remaining portion of said transported coloring matter into said magazine, said inlet being located upstream of said chamber, as considered in the direction of transport of coloring matter from said magazine to said chamber, and said transfer device being arranged to draw from said chamber coloring matter in quantities exceeding the quantity which is retained by said one side of the web so that the non-retained matter forms a surplus; and means for conveying said surplus to said conveyor.

4,235,190

CONTROL OF IMPREGNANT OR COATING MATERIAL

Georges Chiron, Chambery, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 862,508, Dec. 20, 1977, Pat. No. 4,186,220. This application May 4, 1979, Ser. No. 36,055
Claims priority, application France, Dec. 21, 1976, 76 38466
Int. Cl.[2] B05C 3/172
U.S. Cl. 118—120 10 Claims



1. Apparatus for use in the drying of impregnated or coated materials such as fibers, strands, ribbons or the like, characterized in that it comprises:

two parts each bearing a rigid element, theelement of one part being situated in such a position with relation to the coresponding element on the other part that these two elements are separated by a calibrated space and cooperate with the drying of the matter deposited on the linear material;

means acting on the corresponding elements to control the calibrated space;

means providing for lateral movement of the linear material to sweep the calibrated space; and

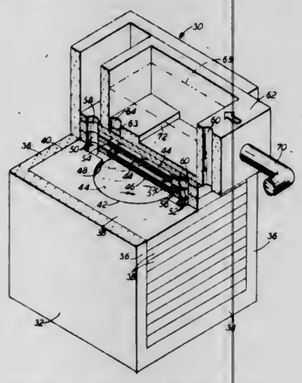
means holding the two parts of the apparatus and the means for controlling the calibrated space.

4,235,191

APPARATUS FOR DEPOSITING MATERIALS ON STACKED SEMICONDUCTOR WAFERS

Werner F. Esselunn, Wyomissing, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 891,867, Mar. 30, 1978, Pat. No. 4,160,682. This application Mar. 2, 1979, Ser. No. 16,685
Int. Cl.[3] H01L 21/208
U.S. Cl. 118—415 10 Claims



1. An apparatus for depositing material onto a plurality of semiconductor wafers comprising:

means for holding the wafer in a stacked relationship in communication with a common passageway; and

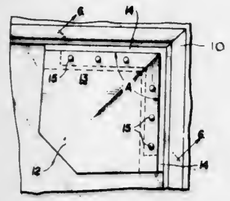
a reservoir for holding the material, said reservoir having an aperture therein and being moveable into and out of alignment of the aperture with the passageway sufficiently to permit selective flow of the material through the passageway and onto the stacked wafers.

4,235,192

CORNER PAINTING SHIELD

Thomas G. Brubaker, 307 N. Lee St., Falls Church, Va. 22046

Filed Dec. 13, 1979, Ser. No. 103,044
Int. Cl.[3] B05C 11/00
U.S. Cl. 118—504 1 Claim



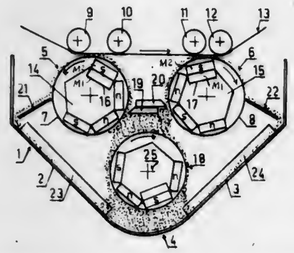
1. A corner painting shield the body of which is made of a relatively rigid resilient material substantially pentagon-shaped with a handle portion opposite the vertex of two adjoining sides the edges of which have resilient strips affixed thereto said painting shield body being folded to substantially 140° on a line from the center of said handle portion to said vertex whereby when the shield is positioned on a generally planar surface with the vertex in a said corner and adequate pressure is applied at the handle portion, said fold angle and the planar angle formed by said sides expand until said resilient strips continuously engage the corner structure to effect the shielding function.

4,235,193

MAGNETIC BRUSH APPARATUS FOR DEVELOPING CHARGE IMAGES

Otto M. Groen, Grubbenvorst; Andreas M. G. Bongers, Ittervoort; Bernard J. E. Peeters, Helden, and Peter H. M. Lammers, Grubbenvorst, all of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Aug. 11, 1978, Ser. No. 933,111
Claims priority, application Netherlands, Aug. 22, 1977, 7709230
Int. Cl.[3] G03G 15/09
U.S. Cl. 118—658 9 Claims



1. In an apparatus for magnetic brush development of electrostatic charge images on a moving substrate, comprising a trough-shaped reservoir having two oppositely disposed elongate side walls sloping into the reservoir bottom, a plurality of developing rollers in an upper region of said reservoir and lying parallel to said walls, each of which rollers comprises a non-magnetizable cylinder rotatable about stationary magnets inside the cylinder, means between the bottom of the reservoir and the developing rollers for transporting developing powder to said rollers, and means for mixing with powder in the reservoir developing powder returned into the reservoir from said rollers, the improvement comprising that

(a) the developing rollers are constituted by two said developing rollers each of which is located outside the other's sphere of influence and the respective cylinders of these rollers have opposite directions of rotation so that their surfaces at the side thereof toward said substrate move away from each other;

(b) said powder transporting means comprises at least one non-magnetizable cylinder lying parallel to said developing rollers and rotatable about stationary magnets inside the cylinder for supplying developing powder from a bottom region of the reservoir to a region thereof between said developing rollers; and

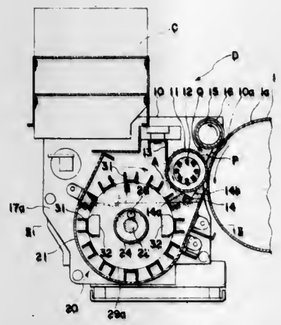
(c) said mixing means comprises oppositely disposed groups of parallelly erect partitions fixed to said sloping walls with the partitions on one of said walls lying in planes at acute angles to the axes of the developing rollers and the partitions on the other of said walls, viewed in the same direction, lying in planes at obtuse angles to said axes.

4,235,194

DRY PROCESS DEVELOPING APPARATUS FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Kenichi Wada; Susumu Tanaka, both of Sakai; Yoshihiro Isono, Itami; Kenji Tabuchi, Sakai; Tateki Oka, Sakai, and Hiroaki Mizunoe, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1979, Ser. No. 16,610
Claims priority, application Japan, Mar. 9, 1978, 53-27295; Mar. 9, 1978, 53-27296; Mar. 24, 1978, 53-34719
Int. Cl.[3] G03G 15/09
U.S. Cl. 118—657 4 Claims



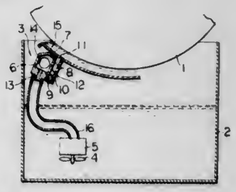
1. A dry process developing apparatus for use in an electrophotographic copying machine, comprising: a developing casing; a non-magnetizable developing sleeve rotatably mounted in said developing casing and a multipolar magnet member rotatably mounted in said developing sleeve for transporting, around the peripheral surface of the sleeve, developing material having smaller diameter particles containing magnetizable material and small diameter toner particles of non-magnetizable material for developing an electrostatic latent image formed on an image bearing member into a visible image by bringing said developing material and the electrostatic latent image into contact; means for driving said multiplier magnet member and said developing sleeve in the same direction of rotation at different speeds, the speed of rotation of said developing sleeve causing the movement of those particles of the developing material which at the most are only slightly affected by said multipolar magnet member in the direction of rotation of said developing sleeve, and the speed of rotation of said multipolar magnet causing movement of those particles of the developing material affected by said multipolar magnet member around the peripheral surface of the sleeve in a direction of rotation opposite the direction of rotation of said multipolar magnetic member and at a speed greater than the speed of said developing sleeve; and at least first and second scraper members in sliding contact with the peripheral surface of said developing sleeve, one scraper being directed in a direction for scraping off said slightly affected particles of material carried by said developing sleeve and the other scraper being directed in a direction for removing said affected particles of material carried around said developing sleeve by said multipolar magnet.

4,235,195

LIQUID DEVELOPMENT APPARATUS

Masahiro Yoshino, Atsugi, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 28, 1978, Ser. No. 937,130
Claims priority, application Japan, Aug. 30, 1977, 52/104058
Int. Cl.[3] G03G 13/10; G03D 3/04
U.S. Cl. 118—662 21 Claims



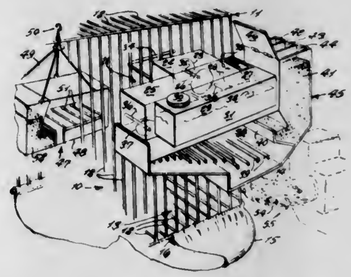
1. A development apparatus for use with an electrophotographic copying machine employing a liquid developer, comprising a liquid developer distributor having developer impingement means with at least one outlet for impinging a liquid developer against the surface of a latent electrostatic image bearing photoconductor so as to cover the latent image area, developer inlet means with at least one inlet for introducing the liquid developer into said liquid developer distributor and developer buffer means comprising at least one coil extending between said outlet of said developer impingement means and said developer inlet means whereby said liquid developer passes through said coil.

4,235,196

BIRD FEEDER, CAGE AND BAG ASSEMBLY

Samuel S. Moliteral, 8 Washington Ave., Iselin, N.J. 08830

Filed Jan. 26, 1979, Ser. No. 7,152
Int. Cl.[3] A01K 39/04
U.S. Cl. 119—18 3 Claims



1. A bird cage comprised of spaced parallel bars in combination with a feeder, having upper and lower levels adapted to be removably attached to said cage, said feeder comprising access means from the cage to said upper level of said feeder which includes a water container having an opening for drinking access, said lower level of said feeder separated from said

upper level by a partition having access means for a bird, said lower level including a feeding trough in further combination with a water reservoir in the upper level connected to the water container in still further combination with an enclosed feed storage compartment extending upward from said trough and laterally clearing said container wherein the said opening is dimensioned to prevent full entry of the bird into said water container, said trough having an opening so spaced beneath said partition that the bird can feed therein but cannot enter the trough bodily and wherein the container and reservoir are connected with a hole at level above the container floor to provide automatic refill from said reservoir.

4,235,197

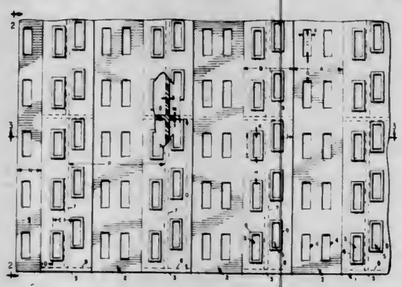
SURFACE DECKING

Carl F. Curtis, R.R. #1, Effingham, Ill. 62401, and Edward D. Curtis, 1408 Techny La., Louisville, Ky. 40222

Continuation of Ser. No. 727,458, Sep. 28, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,998

Int. Cl.³ A01J *1/00*

U.S. Cl. 119—28 **9 Claims**



1. Surface decking comprising a molded, unitary, resilient sheet material formed throughout with a plurality of parallel rectangular corrugations of substantial length, width and thickness, the bottom parts of said corrugations forming a lower surface adapted to lie on a floor, ground or other generally flat surface and the upper parts of said corrugations forming an upper surface, a plurality of rows of spaced openings in the bottom part of each corrugation, and a plurality of rows of spaced openings in the upper part of each corrugation, said rows on the upper part are parallel to the length of the corrugation, said last named spaced openings having upwardly extending rims, the tops of said rims are of substantial width sufficient to act as bearing surfaces for animals, persons or objects in contact with the upper surface of said decking, and downwardly extending, reinforcing ribs disposed on the opposing side of the bearing surface, said ribs are centrally located between each pair of adjacent rows of rimmed openings.

4,235,198

IMMERSABLE DEVICE FOR A PROGRESSIVE DISTRIBUTION IN PARTICULAR FOR FEEDING FISH

Olivier P. Goguel, 80 rue Michel Ange Str., 75016 Paris, France

Filed Jun. 21, 1978, Ser. No. 917,551

Claims priority, application France, Jun. 22, 1977, 77 19094

Int. Cl.³ A01K *61/02, 97/02*

U.S. Cl. 119—51 R **14 Claims**

1. An immersible progressive distribution device, particularly for feeding fish, comprising

a rigid enclosure including a peripheral vertical wall defining compartment means open at the bottom, and a supporting wall extending inwardly from the peripheral wall and having an opening;

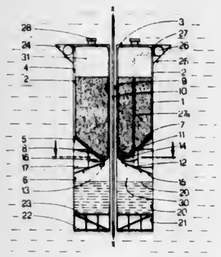
said compartment means including a lower compartment below the supporting wall;

an envelope supported on said supporting wall and having an inside volume to contain a product to be distributed;

said envelope being provided with an opening at the lower end thereof and aligned with the opening of the supporting wall;

said opening of the supporting wall and said opening of the envelope defining a distribution orifice for the product,

closing means supported by the enclosure opposite the distribution orifice for blocking the orifice;



means for actuating the closing means; and

said peripheral vertical wall extending a sufficient distance below the supporting wall so that an air chamber is formed below the distribution orifice in the lower compartment to prevent water from contacting the product in the envelope when the device is immersed.

4,235,199

BATTERY ARRANGEMENT FOR LAYING HENS

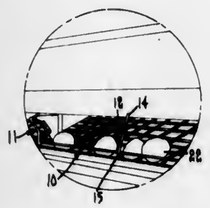
Josef H. Kühlmann, Konigstrabe 51, D-4401 Laer, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 56,047

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 7911073[U]

Int. Cl.³ A01K *31/16*

U.S. Cl. 119—48 **13 Claims**



1. In a battery arrangement for laying hens, with a plurality of cages, a floor sloping forwardly and downwardly and an egg-transporting device associated with all cages in one horizontal row, a cable adjustable in height being provided in the free passage between the said egg-transporting device and the bottom of the cage, the improvement comprising generally vertically extending arms to carry said cable, said arm being spaced longitudinally apart and being adapted to pivot about horizontal axes, said cable being adapted to be moved in the direction of its longitudinal axis by a tensioning device which engages one end of said cable, while a spring return device engages the other end thereof.

4,235,200

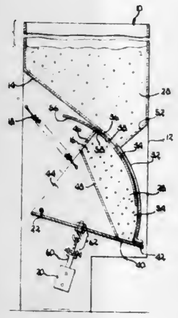
AUTOMATIC ANIMAL FEEDER

Michael A. Shay, 8272 Myrtlewood Cir., Westminster, Calif. 92683

Filed Feb. 26, 1979, Ser. No. 16,118

Int. Cl.³ A01K *5/02*

U.S. Cl. 119—51.11 **16 Claims**



1. An automatic animal feeder comprising;

(a) a housing having a opening at its top for letting dry feed pass through, and having an arcuate front face at its bottom portion;

(b) a hopper contained within the upper portion of said housing for storing large amounts of said dry feed, said hopper having an opening at its top for receiving said dry feed, an outlet at its lowest extremity for allowing said dry feed to descend therefrom, bottom walls set at an incline toward said outlet for promoting the flow of said dry feed toward and through said outlet;

(c) a food delivery chamber contained within said bottom portion of said housing and positioned below said hopper, said food delivery chamber comprising a back panel, a top panel, a bottom panel, the top and bottom ends of said back panel being coupled to the adjacent ends of said top panel and said bottom panel respectively, thereby forming an enclosure along with said front face and the sides of said bottom portion of said housing, said enclosure receiving dry food from said hopper when said food delivery chamber is in the loading mode with the end of said bottom panel opposite said back panel contacting the lowest edge of said front face thus preventing the loss of any of said dry feed from said enclosure, said top panel having a dividing means extending from said end of said top panel opposite said back panel partially into said enclosure for removing any of said dry feed which may be trapped between said outlet and said front face when said food delivery chamber pivots from said loading mode to the delivery mode, said top panel further having sealing means extending upwards and backwards from said end of said top panel opposite said back panel for closing off said outlet so that said dry feed does not escape from said hopper while said food delivery chamber is in said delivery mode;

(d) mounting means connected to said food delivery chamber for mounting said food delivery chamber on a pivot pin about which said food delivery chamber pivots from said loading mode to said delivery mode and back, said pivot pin extending transversely across said bottom portion of said housing;

(e) retention means for retaining said food delivery chamber in and for returning it to one of said delivery and loading modes; and

(f) means for causing said food delivery chamber to pivot into the other of said modes for a period of time, whereby said food delivery chamber alternately pivots from said loading mode, during which time said portion of said dry feed enters into said food delivery chamber from said hopper, to the delivery mode, during which time said portion of dry feed is discharged from said enclosure of said food delivery chamber into an area accessible to an animal.

4,235,201

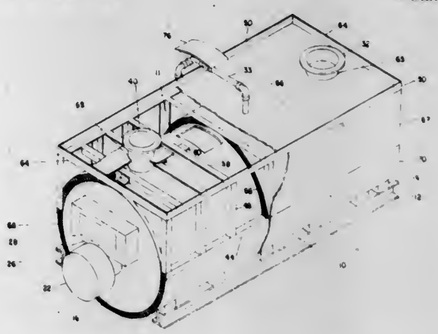
SAFETY TOPDECK FOR BOILERS

Richard C. Hahn, 2111 Adams Blvd., Saginaw, Mich. 48602

Filed Nov. 16, 1978, Ser. No. 961,287

Int. Cl.³ F22B *37/36*

U.S. Cl. 122—494 **4 Claims**



1. In combination with a boiler, including a generally horizontal, longitudinally extending, hollow, cylindrical shell having a cylindrical sidewall:

a layer of insulation enveloping the outer surface of said shell;

a walkway overlying said shell and said layer of insulation;

frame means for mounting said walkway on said shell including:

radially outwardly projecting support members fixed to opposite sides of said sidewall; and

upstanding support means mounted on said radially outwardly projecting support members;

a layer of protective material enveloping the lower portion of said layer of insulation; and

means coupling said layer of protective material to said radially outwardly projecting support members.

4,235,202

INTERNAL COMBUSTION ENGINE

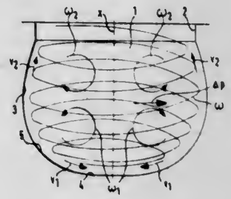
Uwe Buddenhagen, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremburg, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,471

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809914

Int. Cl.³ F02B *3/00*; F02F *3/26*

U.S. Cl. 123—276 **5 Claims**



1. An internal combustion engine having in a respective piston crown a combustion chamber for accommodating, at the end of a compression stroke, substantially all of the air for combustion, said combustion chamber comprising a constricted throat, a combustion chamber wall, and a combustion chamber bottom, and, for imparting to air for combustion a

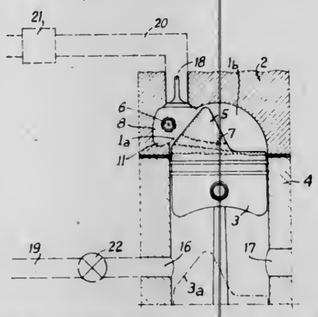
rotation about the longitudinal axis of said combustion chamber, being in the shape of a body of revolution; the maximum combustion chamber diameter, the combustion chamber depth, the inclination or curvature of said combustion chamber wall, and the inclination or curvature of the transition from said wall to said combustion chamber bottom being matched, taking into account the respectively specified combustion chamber volume, in such a way that when air for combustion is introduced and rotates in said combustion chamber, the friction occurring between said combustion wall and the rotating air is utilized for producing a boundary layer or interface flow, resulting in velocity components of a predetermined intensity extending in a direction at least substantially perpendicular to the rotating motion of the air, said velocity components in turn generating secondary turbulences for aiding mixture of fuel and air for combustion, the ratio of the combustion chamber volume to the combustion chamber depth being 20.00 cm^2 to 22.29 cm^2, the diameter of said combustion chamber throat being 0.839 to 0.911 times the maximum combustion chamber diameter D, the depth of said throat being 0.036 to 0.125×D, the maximum combustion chamber depth measured from said piston crown being 0.732 to 0.839×D, the radius giving the inclination or curvature of said combustion chamber wall having a length of from 0.875 to 0.929×D and a starting point which moves on an imaginary circle which is at a distance of 0.375 to 0.446×D from the longitudinal axis of said combustion chamber and at a depth of 0.375 to 0.464×D measured from said piston crown, and the radius giving the transition from said combustion chamber wall to said combustion chamber bottom having a length of 0.321 to 0.446×D and a starting point which moves on an imaginary circle which is at a distance of 0.54 to 0.179×D from the longitudinal axis of said combustion chamber and at a distance of 0.321 to 0.446×D from said combustion chamber bottom.

4,235,203

TWO-ZONE COMBUSTION CHAMBER

Georges Thery, 6 place du General Leclerc, Pierrefitte, France (93380)

Continuation of Ser. No. 688,407, May 20, 1976, abandoned. This application Jan. 26, 1979, Ser. No. 6,571
Claims priority, application France, Jun. 4, 1975, 75 17449
Int. Cl.³ F02B *5/00, 23/08*; F02F *3/24*
U.S. Cl. 123—275 **9 Claims**



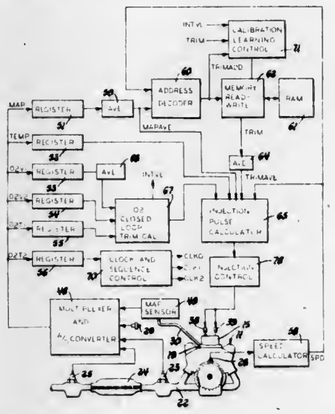
1. An internal combustion engine of the controlled-ignition type comprising at least one piston, a cylinder, and a cylinder head to define a combustion chamber, the head of said piston including a projection so that when said piston is at its top dead center position, said projection divides said combustion chamber into a temporary precombustion zone and a combustion zone, and when said piston is moved away from its top dead center position, said precombustion zone is opened to said combustion zone, said precombustion zone including means to receive a fluid of rich mixture and said combustion zone including means to receive a fluid or poor mixture, said precombustion zone being formed at least partially in said cylinder head by a recess formed therein, the recess of said precombustion zone including a fluid container at the base thereof for receiving said rich mixture such that the lower temperature of said cylinder head has a cooling effect on said precombustion zone before ignition to enhance condensation of said rich mixture and collection of same in said fluid container, said recess having a wide opening connected to said combustion zone for permitting, as said piston descends, an efficient sweeping of said recess and said fluid container to transfer unburnt rich mixture to said combustion zone to complete combustion, the exterior peripheral surface of the base of said projection including at least a groove formed therein which temporarily cooperates with said cylinder head to define at least one curved channel connecting said precombustion zone and said combustion zone for the passage of ignited gases when said projection is in said top dead center position such that the lower temperature of said cylinder head has a cooling effect on said channel, said channel extending in a plane substantially perpendicular to the axis of said cylinder and being formed in the base of said projection so that said channel enables ignition to be maintained while gases are passing from said precombustion zone to the base of said combustion zone through said channel.

4,235,204

FUEL CONTROL WITH LEARNING CAPABILITY FOR MOTOR VEHICLE COMBUSTION ENGINE

John O. Rice, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 827,742, Aug. 25, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 26,243
Int. Cl.³ F02M *7/00, 51/00*
U.S. Cl. 123—440 **14 Claims**



1. In combination:

a motor vehicle engine having an exhaust discharge passage and a sensor responsive to the exhaust gas content therein;

fuel supply apparatus effective to supply fuel to the engine in amount determined by at least one trimming factor having a value specific to the value of an engine operating condition, the engine and fuel supply apparatus being characterized by a transport delay between the initiation of a change in fuel supply and the sensing of a resultant change in exhaust content;

first means effective to compare successive values of the engine operating condition and to provide a signal if the values are substantially the same for a time period at least equal to the transport delay; and

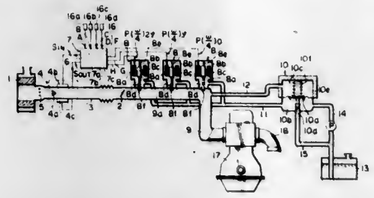
second means effective, in response to the signal, to adjust the trimming factor specific to the value of the engine operating condition during the time period in accordance with the exhaust content as sensed after the time period in direction to produce a desired exhaust content.

4,235,205

FUEL FEED DEVICE FOR ENGINE

Toyoaki Fukui, Katsuragoshomachi; Tatsuro Nakagami, Kyoto; Norio Endo, Kameoka; Takao Miki, Himeji, and Takashi Ishida, Oimachi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; Mitsubishi Denki Kabushiki Kaisha and Mikuni Kogyo Kabushiki Kaisha, all of Tokyo, Japan

Filed Jul. 11, 1979, Ser. No. 56,515
Claims priority, application Japan, Jul. 13, 1978, 53-85358
Int. Cl.³ F02B *3/00*; F02M *13/06*
U.S. Cl. 123—472 **10 Claims**



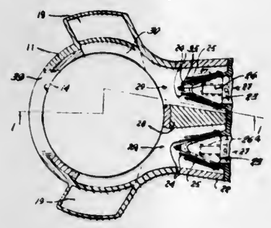
1. A fuel feed device for an engine comprising an air flow rate detecting device for generating an electric signal having a frequency proportional to varying suction air flow rate; a plurality of electromagnetic valves disposed at a junction of a suction manifold for controlling the fuel feed rate to said suction manifold; a fuel pressure regulator for maintaining a fixed pressure differential between the fuel feed pressure to said electromagnetic valves and the suction pressure near a fuel outlet; and an electric control means for driving said electromagnetic valves with a shifted phase with one another in synchronism with a frequency of the electric signal generated from said air flow rate detecting device.

4,235,206

TWO CYCLE INTERNAL COMBUSTION ENGINE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation of Ser. No. 839,180, Oct. 4, 1977, Pat. No. 4,161,163, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, and Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 361,407, May 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, said Ser. No. 375,065, is a division of Ser. No. 416,213, Nov. 15, 1973, Pat. No. 4,000,723, and Ser. No. 416,215, Nov. 15, 1973, Pat. No. 3,905,341. This application Dec. 14, 1978, Ser. No. 969,355
The portion of the term of this patent subsequent to Sep. 16, 1992, has been disclaimed.
Int. Cl.³ F02B *33/04*; F16K *15/16*
U.S. Cl. 123—73 V **1 Claim**



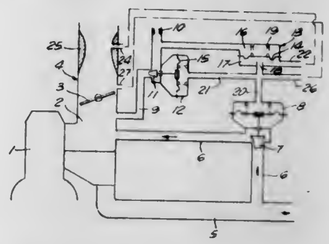
1. A fuel intake system for an internal combustion engine having fuel intake porting, a fuel intake channel communicating with the intake porting and extended therefrom to a fuel supply offset from the cylinder and providing for flow of fuel from said supply to the intake porting, a valve body in the fuel intake channel having two planar converging walls defining a wedge-shaped valve body structure having its base presented upstream of the fuel flow toward the fuel supply and having a transverse apex member presented downstream toward the intake porting, each of the converging walls having an inlet opening therein and a reed valve overlying each opening, the reed valves being connected with the valve body structure in regions remote from said apex member, with the edge portions of the reed valves adjacent the apex member free to flex away from said inclined walls and thereby uncover the inlet openings, and said apex member having a subsonic teardrop aerodynamic contour with the rounded surface thereof presented upstream of the direction of fuel flow toward the interior of the valve body.

4,235,207

INTERNAL COMBUSTION ENGINE

Hiroyuki Nishimura, Kounosu, Japan, assignor to Honda Gikea Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1979, Ser. No. 9,370
Claims priority, application Japan, Mar. 6, 1978, 53-24433
Int. Cl.³ F02M *25/06*; F02B *75/10*
U.S. Cl. 123—568 **15 Claims**



1. In an internal combustion engine having an intake passage for delivering an air-fuel mixture into the engine, the intake passage having a venturi portion, the combination of: an exhaust passage for carrying exhaust gases from the engine, means including a passageway for introducing additional gas into one of said passages, a first control valve in said passageway, an air conduit connecting said intake passage to atmosphere, a second control valve in said air conduit, each of said control valves having a vacuum responsive actuator, and a regulating valve for controlling vacuum intensity in the actuator for each of said control valves, said regulating valve being responsive to differential vacuum pressure between vacuum pressure in said venturi portion and vacuum pressure in said air conduit.

4,235,208

EXHAUST GAS RECIRCULATION REGULATING SYSTEM

Toshio Shioya, Urawa, and Kiyoshi Ishii, Tachikawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

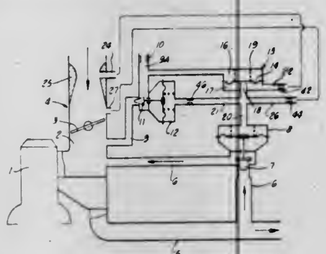
Filed May 29, 1979, Ser. No. 43,001
Claims priority, application Japan, Jun. 16, 1978, 53-72055
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **7 Claims**

1. In an internal combustion engine having an intake passage with a throttle valve for delivering an air-fuel mixture into the engine and an exhaust passage for carrying exhaust gases from the engine, an exhaust gas recirculation system comprising

(a) a passageway between the intake passage and the exhaust passage for passing exhaust gases from the exhaust passage to the intake passage;

(b) a first control valve in the passageway;

(c) an air conduit connecting the intake passage to atmosphere, a second control valve in the air conduit, each of the control valves having a vacuum response actuator for opening its respective valve in response to said opening of the throttle valve and closing the respective valve in response to closing of the throttle valve;



(d) a regulating valve responsive to vacuum intensity in the air conduit for affecting vacuum intensity in the actuator for each of the control valves; and

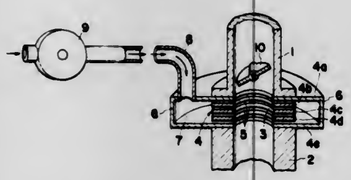
(e) means for causing the regulating valve to rapidly decrease the vacuum intensity in the actuator for the first control valve in response to closing of the throttle valve for rapidly stopping exhaust gas recirculation.

4,235,209

DEVICE FOR INTRODUCING ADDITIONAL AIR INTO INTAKE PASSAGE LEADING TO COMBUSTION CHAMBER

Jack K. Ibbott, 4-17-7 Nishi Azabu, Minato-ku, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 911,941
Int. Cl.³ F02M *73/04*
U.S. Cl. 173—585 **9 Claims**



1. A device for introducing additional air into an air-fuel mixture flowing through an intake passage from a fuel feeding apparatus to combustion chambers of an internal combustion engine of a vehicle, said device comprising:

a member adapted to be mounted between the fuel feeding means and the combustion chambers of an internal combustion engine;

said member having an opening forming a portion of an intake passage for leading an air-fuel mixture to the combination chambers when said member is so mounted;

space means, extending through said member from the exterior thereof to said opening and arranged peripherally of said opening, for, when said member is so mounted, allowing additional gas to be introduced through said space means into the air-fuel mixture in said intake passage; and

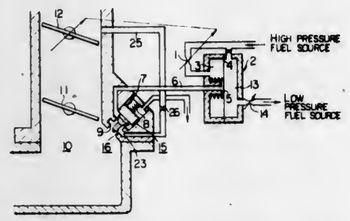
means for maintaining, at all operating speeds and conditions of the engine, the pressure of said additional gas at said exterior of said member at a level approximately at least twice as high as the internal pressure within said intake passage, and for thereby maintaining a pressure ratio across said space means of approximately at least 2:1.

4,235,210

FUEL SUPPLY APPARATUS FOR INTERNAL COMBUSTION ENGINES

Masaharu Sumiyoshi; Setsuro Sekiya; Katsuhiko Motosugi, all of Toyota; Junzo Uozumi, Nagoya; Tsuneo Ando, Chiryu; Yuzo Takeuchi, and Mikio Minoura, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obbu, both of, Japan

Filed Apr. 27, 1978, Ser. No. 900,507
Claims priority, application Japan, May 4, 1977, 52-51555
Int. Cl.³ F02B *3/00*; F02M *69/04*
U.S. Cl. 123—471 **7 Claims**



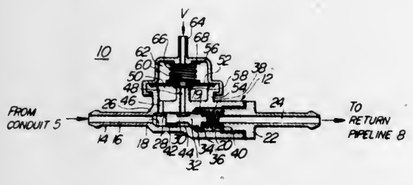
1. A fuel discharge apparatus for discharging fuel into an air intake passage of an internal combustion engine, comprising a fuel discharge port opened to said air intake passage, a fuel control means for delivering a controlled quantity of fuel to said fuel discharge port through a fuel passage interconnecting said fuel control means and said fuel discharge port and means for introducing air into said fuel passage, characterized in that said fuel control means comprises a fuel whirling chamber (**21**; **34**) coaxially disposed upstream of said fuel passage and communicating through a central opening (**20**; **33**) with said fuel passage, a fuel control member (**7**; **29**) axially movable with respect to said whirling chamber (**21**; **34**) and a fuel inlet port (**22**; **35**) provided on the peripheral wall of said whirling chamber (**21**; **34**) for introducing fuel into said whirling chamber (**21**; **34**) in a direction tangential to the circumference of said whirling chamber, said fuel control member (**7**; **29**) having a frusto-conical portion (**19**; **31**) coaxially disposed within said whirling chamber (**21**; **34**) for cooperating with said central opening (**20**; **33**) to control the fuel delivered from said whirling chamber (**21**; **34**) to said fuel passage and a cylindrical core portion (**18**; **30**) integral with said frusto-conical portion (**19**; **31**) and projecting coaxially into said fuel passage.

4,235,211

FUEL PRESSURE REGULATOR

Kazuyoshi Sugaya, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 17, 1979, Ser. No. 40,049
Claims priority, application Japan, May 19, 1978, 53/60527
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—511 **4 Claims**



2. A fuel pressure regulator for use in a fuel injection system for an internal combustion engine which system is of the type in which a fuel is supplied by a fuel pump from a fuel tank through a main fuel conduit and through fuel injectors into the engine and a part of the fuel supply by said pump is returned through a return pipeline to said fuel tank to regulate the fuel pressure at which the fuel is fed to said fuel injectors, said fuel regulator comprising:

an inlet connected to said main fuel conduit;

an outlet connected to said return pipeline;

a fuel passage extending between said inlet and outlet;

said fuel passage including a fuel chamber therein;

a restriction means disposed in said fuel passage upstream of said fuel chamber;

a first valve member disposed in said fuel passage between said fuel chamber and said outlet and being movable to an open position when the fuel pressure in said fuel chamber exceeds a first predetermined pressure level, to allow the fuel to flow from said fuel chamber to said outlet and thus into said return pipeline;

a bypass passage extending in bypassing relationship to said restriction means and having a downstream end open to said fuel chamber; and

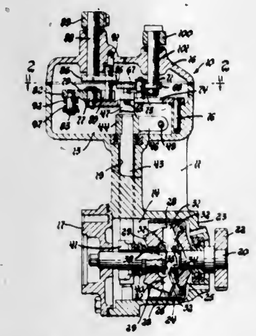
a second valve member disposed in said bypass passage and being movable to an open position when the fuel pressure in said inlet exceeds a second predetermined pressure level higher than said first predetermined pressure level, to allow the fuel to flow from said inlet through said bypass passage to said fuel chamber and to said outlet whereby the fuel pressure in said inlet is kept substantially at said second predetermined pressure level.

4,235,212

CAM ACTUATED FUEL MODULATING ENGINE GOVERNOR

Edwin E. Hebb, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1978, Ser. No. 970,456
Int. Cl.³ F02D *1/04*
U.S. Cl. 123—365 **3 Claims**



1. A diesel engine governor comprising

a housing

a rotatable input shaft mounted in said housing and carrying a speed responsive actuating mechanism,

a motion lever operably connected with and movable by said actuating mechanism against the force of biasing means disposed in said housing whereby said motion lever is moved in response to changes in the rotational speed of said input shaft,

a cam plate pivotally mounted in said housing and connected with said motion lever to oscillatingly position the cam plate as a function of the motion lever position, said cam plate having a cam slot formed therein,

a cam follower lever having one end pivotally fixed in said housing and including a cam follower intermediate the ends and engaging said cam slot for oscillatingly positioning said follower lever as a function of the cam plate position,

a differential lever having a central pivot point intermediate first and second ends, said pivot point being connected with the end of said follower lever opposite said one end for movement therewith in a predetermined path as a function of the rotational speed of said input shaft and the force of said biasing means,

manual fuel control means connected with said differential lever first end and movable to oscillatingly move said differential lever, and

injector rack actuating mechanism connected with said differential lever second end and movable therewith in response to movements of both said manual fuel control means and said speed responsive actuating mechanism,

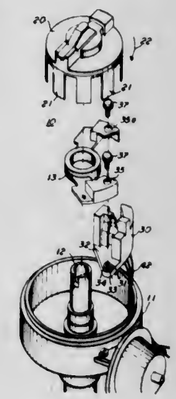
said cam plate cam slot being configured in relation to its connecting speed responsive mechanism to provide for maintenance of predetermined minimum and maximum governed speeds as well as modulation of the maximum fuel rack position at speeds intermediate said governed speeds.

4,235,213

HALL EFFECT IGNITION SYSTEM HOUSING

Roy H. Jellissen, River Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 790,788, Apr. 24, 1977, Pat. No. 4,124,936.
This application Sep. 14, 1978, Ser. No. 942,245
Int. Cl.³ F02P *3/06*
U.S. Cl. 123—146.5 A **13 Claims**



1. In an automotive ignition distributor system, having a swing arm pivotable about the axis of a distributor shaft, an improved housing for a magnetic circuit and a circuit board, said magnetic circuit interruptable by a high permeability vane moving through an air gap in said magnetic circuit, said circuit board having a Hall effect sensor attached thereto, said housing comprising:

a base;

means including a plurality of predetermined reference surfaces attached to said base for contacting and positioning said circuit board at a reference location with respect to said base;

means including a recessed portion attached to said base for adjustably receiving a first portion of said magnetic circuit;

means for fixedly locating the first portion of said magnetic circuit with respect to said circuit board;

means including a recessed portion attached to said base for adjustably receiving a second portion of said magnetic circuit;

means for fixedly locating the second portion of said magnetic circuit with respect to said circuit board to form a predetermined air gap therebetween; and

means affixed to said base for locating said base on said

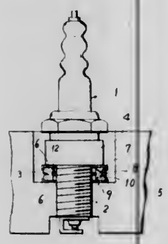
swing arm, and thereby locating said base with respect to the distributor shaft axis, said means predeterminedly located with respect to the reference location for said circuit board, whereby said housing enables accurately defining said air gap with respect to said circuit board and Hall effect sensor and with respect to said distributor shaft axis.

4,235,214

SECONDARY AIR GUIDE RING FOR IGNITION PLUG

Kiyoshi Ito, Kawasaki, Japan, assignor to Kabushiki Kaisha IDK, Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,434
Claims priority, application Japan, Mar. 13, 1978, 53-028482
Int. Cl.³ F02P 1/00
U.S. Cl. 123—169 V **3 Claims**



1. A secondary air guide ring for an ignition plug, said secondary air guide ring being mounted on the outer periphery of a male thread portion of the ignition plug for mounting the same in the cylinder head, said secondary air guide ring providing a hermetical seal between the ignition plug and cylinder head and being provided with a check valve mechanism communicating the inside and outside of the cylinder and functioning to prevent counter flow of gas within the cylinder, said check valve mechanism comprising an air guide hole formed in the peripheral wall of the ring body and serving to introduce air into the inside of the ring, a valve chamber communicating with the cylinder chamber through a thread gap between the ignition plug and the cylinder head, said valve chamber communicating with said air guide hole and flaring toward the inner side of the ring body made of a soft metal, a peripheral groove formed in the inner periphery of the ring body and crossing with the opening of said valve chamber, a ball valve body made of a hard metal fitted in said valve chamber for reciprocation therein to open and close said air guide hole, said ball valve body being in a position to be capable of freely moving in the valve chamber and normally in the position to open the air guide hole, and a retainer ring being like a wire fitted in said peripheral groove to prevent detachment of said ball valve body from said valve chamber.

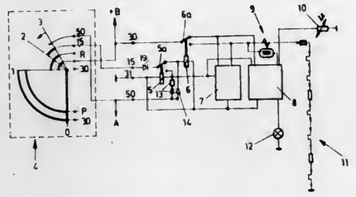
4,235,215

PRELIMINARY HEATING CONTROL INSTALLATION FOR AIR-COMPRESSING INTERNAL COMBUSTION ENGINES

Manfred Stotz, Aichwald; Gerhard Komander, Altbach, and Wolfgang Hilpert, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 27, 1978, Ser. No. 955,262
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750464
Int. Cl.³ F02N 17/00
U.S. Cl. 123—179 H **16 Claims**

1. A preliminary heating control installation for air-compressing internal combustion engines, comprising control means for controlling the preliminary heating time in dependence on engine temperature and on a time limit, heating current circuit means including at least one heater plug means, relay means having a winding connected in the heating current circuit means and contact means controlling an indicating lamp means, characterized in that an additional circuit means is



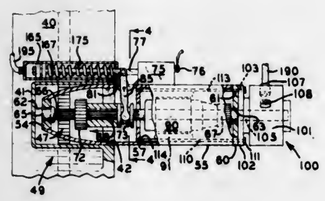
provided, which detects the failure of at least one heater plug means and which renders this failure visible by engagement of the indicating lamp means at least substantially during the duration of the starting operation.

4,235,216

AUXILIARY STARTER MECHANISM FOR AUTOMOBILE ENGINES AND THE LIKE

Norval W. Miles, 24833 16th Ave., Space #46, Madera, Calif. 93637

Filed Feb. 26, 1979, Ser. No. 15,357
Int. Cl.³ F02N 7/00
U.S. Cl. 123—179 E **4 Claims**



1. An auxiliary starter mechanism for a vehicle having an engine and a primary starting system including a shaft mounting a drive gear endwardly movable along the shaft to and from a cranking position with the drive gear in driving relation to the engine and the shaft being rotational about its longitudinal axis to rotate the drive gear thereof in driving relation to the engine and a mechanism operable to move the drive gear along the shaft to and from the cranking position, the auxiliary starter mechanism comprising:

A. a motor driven by gas pressure borne by the vehicle and connected in rotational driving relation to the shaft of the primary starting system;

B. a gas conduit mounted on the motor in position to introduce a gas thereto in driving relation to the motor and having a remote end portion;

c. a reservoir containing a gas under pressure and having a coupling operable to release the compressed gas therefrom;

D. a connector mounted on the remote end portion of said gas conduit and adapted to be attached to the coupling of said reservoir to permit gas under pressure to flow from the reservoir into the gas conduit;

E. a gas cylinder borne by the vehicle, linked to said mechanism of the primary starting system and operable when pressurized to move the drive gear of the primary starting system along the shaft to said cranking position; and

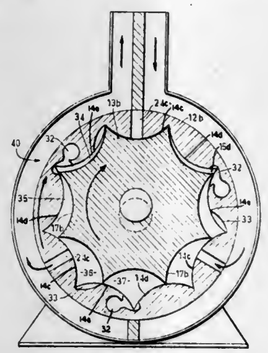
F. a gas conduit interconnecting the first of said gas conduits and the gas cylinder to pressurize said gas cylinder with gas under pressure from the reservoir.

4,235,217

ROTARY EXPANSION AND COMPRESSION DEVICE

Robert W. Cox, 33 Chapel Hill Rd., Kenmore, Queensland, 4069, Australia

Filed Jun. 7, 1978, Ser. No. 913,498
Int. Cl.³ F02B 55/14; F01C 1/10; F04C 18/10
U.S. Cl. 123—232 **2 Claims**



1. An internal combustion engine of the rotary piston type comprising an inner and outer rotor, provided with spaced longitudinal ridges in the outer rotor and substantially conforming flutes in the inner rotor, said flutes extending between longitudinal apices portions spaced evenly around said inner rotor and adapted for engagement between the longitudinally extending valleys formed in said outer rotor at the junction of said ridges, and the diameter of the base circle coincident with the base of said valleys and the diameter of the tip circle coincident with said apices being in the ratio of the respective number of ridges and flutes, there being one more ridge in said outer rotor than the number of flutes in said inner rotor, and the axes of rotation of the respective rotors being offset a distance substantially equal to the differences of the radii of the base circle diameter and the tip circle diameter whereby rotation of one said rotor will cause rotation of the other said rotor, and the depth of each respective ridge from said base circle being substantially equal to the difference between the diameter of said base circle and the diameter of said tip circle, said ridges being arcuate in cross-section such that each said apex remains in contact with a said ridge during rotation of said rotors, said outer rotor having a cylindrical outer surface and there being provided fixed wiping seals adapted to bear against said outer surface of the outer rotor in the respective zones on said outer surface through which the plane passing through said axes pass forming chambers at opposite sides of seals and constituting inlet and outlet chambers respectively and said outer rotor being provided with ridges equal in number to a multiple of three and each group of three ridges comprising a trailing ridge provided with a port communicating with said outer surface, an intermediate ridge and a leading ridge and there being provided a combustion chamber communicating with the valley between said leading ridge and said intermediate ridge and a transfer port in the leading face of said leading ridge.

4,235,218

TRUING AND DRESSING APPARATUS FOR GRINDING WHEELS

Wataru Iida, Aichi, and Toshio Tsujiuchi, Anjo, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed Jan. 31, 1979, Ser. No. 8,172
Claims priority, application Japan, Feb. 20, 1978, 53/18215
Int. Cl.³ B24B 53/14
U.S. Cl. 125—11 CD **5 Claims**

1. An apparatus for truing and dressing a grinding wheel made of cubic boron nitride and rotatably mounted on a wheel support of a grinding machine, comprising in combination:

a first support base fixedly secured on said wheel support at the rear of said grinding wheel;

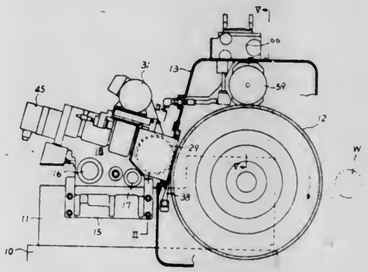
a traverse carriage slidably mounted on said first support base so as to be moved in a direction parallel to the axis of said grinding wheel;

a first support head slidably mounted on said traverse carriage so as to be moved toward and away from the grinding surface of said grinding wheel;

a truing wheel provided at an outer peripheral surface thereof with abrasive grain as hard as diamond and rotatably carried on said first support head;

in-feed means for feeding said first support head toward said grinding wheel so as to give an in-feed movement of a predetermined amount to said truing wheel;

a first deive motor for rotating said truing wheel;



traverse feed means for moving said traverse carriage to perform a truing operation by said truing wheel on said grinding wheel;

a second support base fixedly mounted on said wheel support independently of said first base;

a second support head slidably mounted on said second support base so as to be moved toward and away from the grinding surface of said grinding wheel;

a dressing roll made of metal and rotatably supported on said second support head and over said grinding wheel;

feed means for feeding said second support head toward said grinding wheel by a predetermined feed amount so as to cause said dressing roll to be ground by said grinding wheel prior to said truing operation;

a second drive motor for rotating said dressing roll; and

means for supplying free abrasive grain between said grinding wheel and said dressing roll to perform a dressing operation on said grinding wheel after said truing operation.

4,235,219

CONTROLLING THE DAMPING OF FLUES

Peter DeFoe, 1235 Meadows Sweet Rd., Golden, Colo. 80401

Filed Apr. 2, 1979, Ser. No. 26,045
Int. Cl.³ F23L 3/00; G05D 23/02
U.S. Cl. 126—288 **10 Claims**

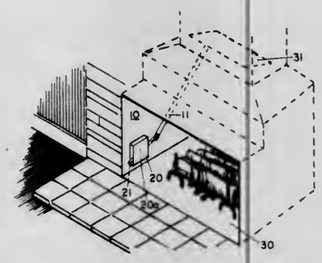
1. A controller comprising

a first latch member;

a pivoted control lever engagable by said first latch member;

a bimetallic strip acting upon said first latch member to release said control lever when a first threshold tempera-

ture is reached a second latch member which engages said control lever when reached by said first latch member;



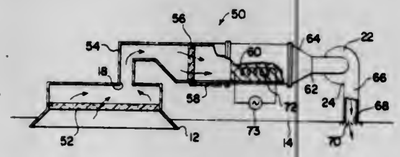
said first latch member and said latch member having a common pivot.

4,235,220

COOKING STOVE EXHAUST AIR FILTRATION SYSTEM

Robert J. Hepner, 21458 Ellen Dr., Fairview Park, Ohio 44126

Filed Jun. 7, 1979, Ser. No. 46,228
Int. Cl.[3] F24C *15/20*
U.S. Cl. 126—299 D 16 Claims



1. An air filtration system for a cooking stove including a vent hood for collecting exhaust air from a room in which a stove is used, air conduit means for said exhaust air, said air conduit means having an inlet at said vent hood, a motor operated fan within said air conduit means for drawing the exhaust air through said air conduit means, and at least one degreasing filter for removing grease from the exhaust air as the air is drawn into said vent hood through said air conduit means, the improvement comprising: said air conduit means having an outlet end opening into said room, an activated charcoal filter in said air conduit means between said inlet end and outlet end, and electrical resistance heating means for regenerating said activated charcoal filter, said electrical resistance heating means including a heating element embedded within said activated charcoal filter.

4,235,221

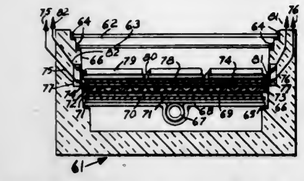
SOLAR ENERGY SYSTEM AND APPARATUS

Gerald G. Murphy, 153 Rock Hill Rd., Clifton, N.J. 07013

Filed Aug. 23, 1979, Ser. No. 68,906
Int. Cl.[3] F24J *3/02*; F03G *7/02*; G05D *11/00*
U.S. Cl. 126—415 12 Claims

1. A solar energy collection and distribution system comprising: a set of solar energy collecting units adapted to receive and absorb incident solar energy, a support platform assembly adapted to hold and support said energy collecting units on or near the surface of a body of water, means pertaining to the collecting units adapted to mount, position and direct each of said collecting units in a manner to orient the respective energy absorbing surfaces therein to achieve substantial exposure thereof to desired incident solar radiation thereon, protective means for the collecting units and for the platform assembly including barrier means at least partially surrounding the platform assembly in the body of water and adapted to protect the assembly from stress due to water body movement, a thermal absorber fluid for the collecting units, means whereby a portion of the collecting units produces thermal energy output only, means whereby a second portion of the collecting units produces combined thermal energy output and electrical energy output, means whereby a third portion of the collecting units concentrates incident solar radiation thereon to produce a higher absorber fluid output temperature than otherwise, a storage reservoir adjacent to said body of water for receiving the absorber fluid and for storing thermal energy collected





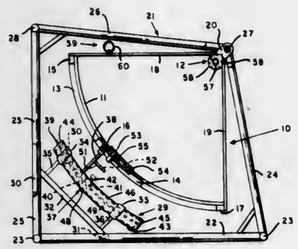
therein, pump means and conveying duct means adapted to circulate the absorber fluid from the reservoir through the collecting units and return, external conveying means including second pump means and thermally insulated external fluid duct means for conveying portions of the absorber fluid from the reservoir to one or more thermal energy utilization points and for returning portions of the conveyed absorber fluid back to the reservoir.

4,235,222

HEAT-RESPONSIVE ALIGNMENT SYSTEM AND SOLAR COLLECTION DEVICE

Istrate Ionescu, P.O. Box 697, Stratford, Conn. 06497

Filed Oct. 19, 1978, Ser. No. 952,759
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—425 9 Claims



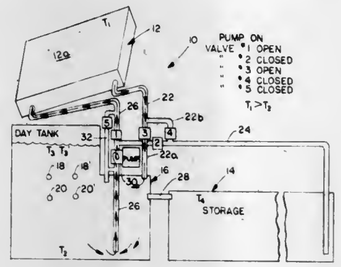
1. An apparatus which is adapted to be aligned with the position of the solar elevation over a wide azimuth angle and to adjust itself to remain aligned with the solar elevation changes in either direction, comprising a support structure adapted to support the apparatus on a fixed surface, a movable carriage pivotally attached to said support structure for rotational movement only along a vertical path which corresponds to the path of the solar elevation, said carriage supporting a solar radiation reflector in a position such that the alignment axis of said reflector corresponds to the path of the solar elevation as the degree of such elevation changes over an angle of up to about 48° during the year, a heat-responsive adjustment means supported by said support structure beneath said reflector and having a movable member which is movable in response to a temperature increase within said adjustment means and which is connected to said carriage to cause pivotal movement of said carriage in a given direction over an angle of up to about 48°, a wide angle lens supported by said carriage and adapted to admit direct solar radiation through said reflector to said heat-responsive adjustment means when aligned with the position of the solar elevation over a wide azimuth angle to cause a temperature increase within said adjustment means and to cause pivotal movement of said carriage, said lens having a focus axis which is a few degrees in advance of the alignment axis of said reflector in the direction in which the solar elevation is changing, and a sun shield supported by said carriage in a position between said lens and said heat-responsive adjustment means and adapted to shade the latter when the focus axis of the lens is not aligned with the solar elevation over a wide azimuth angle, whereby when the solar elevation moves out of alignment with said reflector, it moves into alignment with the focus axis of said lens causing solar radiation to be admitted through the reflector to said heat-responsive adjustment means to cause pivotal movement of said carriage until the focus angle of the lens is in advance of and out of alignment with the solar elevation and said heat-responsive adjustment means is shaded by said sun shield.

4,235,223

SOLAR-LIQUID HEAT SYSTEM

DeWayne A. Coxon, Cedar Springs, Mich., assignor to Jordan College, Cedar Springs, Mich.

Filed Feb. 21, 1978, Ser. No. 879,382
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—437 5 Claims



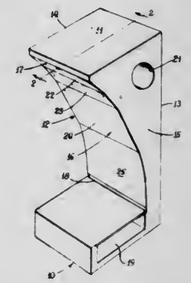
1. A solar heating system employing a liquid heat exchange medium and capable of salvaging the heat from intermittent and/or low intensity solar radiation, having, in combination with a solar collector and a main liquid storage, an added rapid-response day storage with a liquid volume only a small fraction of that of said main storage; conduit and valving means for selectively interconnecting said solar collector with said day storage and with said main storage for recirculation of liquid; and temperature responsive flow control means operatively connected to said conduit and valving means for causing preferential flow of heated liquid from said solar collector to said day storage; said temperature responsive flow control means being responsive to a predetermined elevated temperature in said day storage to cause liquid flow from said collector to said main storage; and being responsive to a predetermined low temperature in said collector and a predetermined temperature differential of said main storage over said day storage to cause flow from said main storage to said day storage.

4,235,224

SOLAR HEAT COLLECTOR BLOCK

Peter H. Yarwood, 910 E. Sayles Dr., Palatine, Ill. 60067; Arthur J. Czajkowski, 1807 Victoria St., and Edward R. Bunk, 1018 Argonne Dr., both of North Chicago, Ill. 60064

Filed Sep. 20, 1978, Ser. No. 944,181
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—438 5 Claims



1. A solar collector comprising a substantially vertically disposed rectangularly shaped unit formed from a block of rigid insulating material and defining a vertical front, a spaced apart vertical back, a horizontal top and a spaced apart horizontal bottom, the solar collector unit disposed in such a manner that said front receives the direct sun's rays, a sun reflecting surface formed on said insulating material within the front of said unit, said block of material being recessed to form a horizontally disposed duct positioned in the bottom of said unit, means covering the top of said duct and for receiving solar energy said duct extending substantially the full depth of the collector and utilized to receive the sun's heat rays from the reflecting surface formed within the front of said unit, and said sun reflecting surface formed of a plurality of flat surfaces disposed at different angles relative to the vertical front surface and adjoining one another in forming a continuous surface, and a remaining continuously curved surface joining the last of said flat surfaces and extending down to a juncture with the rearward end of the duct, and the angles of said reflecting flat surfaces and the contour of the curved surface being such that the duct receives concentrated reflected sun heat rays over a substantial extent thereof.

4,235,225

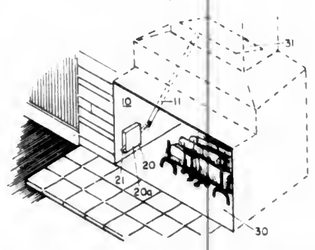
SEMI-TUBULAR PARABOLIC MULTIPLE CORE HELIX SOLAR CONCENTRATOR

David H. Doebel, 17745 Fruitport Rd., Spring Lake, Mich. 49456

Filed Feb. 26, 1979, Ser. No. 14,956
Int. Cl.[3] F24J *3/02*; H01L *31/00*
U.S. Cl. 126—438 9 Claims

1. A passive tracking radiant solar energy collector-concentrator device comprising a helix shaped semi-tubular elongated concave-parabolic reflector, wherein said helix shaped semi-tubular concave-parabolic reflective surfaces have as much as a 360 degree spiral running the length of said helix shaped concave-parabolic reflector, said reflector supported by two end pieces, said end pieces supporting a plurality of energy absorber collecting cores, said collecting cores disposed specifically within the sharp shifting focal axis of said reflector element so that the sun's reflective rays impinge on one or more of said collecting cores at all times during the solar day, said collecting cores being disposed within the primary direct and non-reflective incident solar radiant energy to increase the solar energy collection of said collecting cores, said collecting cores disposed to accommodate a heat exchange medium, said heat exchange medium to receive the energy from said collector cores and absorb said energy for use by a utilization means, said helix shaped semi-tubular concave-parabolic reflector and

control lever when reached by said first latch member;



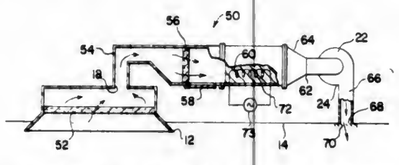
said first latch member and said latch member having a common pivot.

4,235,220

COOKING STOVE EXHAUST AIR FILTRATION SYSTEM

Robert J. Hepner, 21458 Ellen Dr., Fairview Park, Ohio 44126

Filed Jun. 7, 1979, Ser. No. 46,228
Int. Cl.³ F24C *15/20*
U.S. Cl. 126—299 D **16 Claims**



1. An air filtration system for a cooking stove including a vent hood for collecting exhaust air from a room in which a stove is used, air conduit means for said exhaust air, said air conduit means having an inlet at said vent hood, a motor operated fan within said air conduit means for drawing the exhaust air through said air conduit means, and at least one degreasing filter for removing grease from the exhaust air as the air is drawn into said vent hood through said air conduit means, the improvement comprising: said air conduit means having an outlet end opening into said room, an activated charcoal filter in said air conduit means between said inlet end and outlet end, and electrical resistance heating means for regenerating said activated charcoal filter, said electrical resistance heating means including a heating element embedded within said activated charcoal filter.

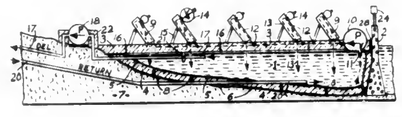
4,235,221

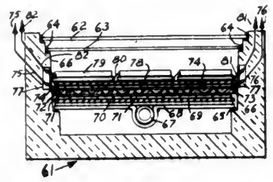
SOLAR ENERGY SYSTEM AND APPARATUS

Gerald G. Murphy, 153 Rock Hill Rd., Clifton, N.J. 07013

Filed Aug. 23, 1979, Ser. No. 68,906
Int. Cl.³ F24J *3/02*; **F03G** *7/02*; **G05D** *11/00*
U.S. Cl. 126—415 **12 Claims**

1. A solar energy collection and distribution system comprising: a set of solar energy collecting units adapted to receive and absorb incident solar energy, a support platform assembly adapted to hold and support said energy collecting units on or near the surface of a body of water, means pertaining to the collecting units adapted to mount, position and direct each of said collecting units in a manner to orient the respective energy absorbing surfaces therein to achieve substantial exposure thereof to desired incident solar radiation thereon, protective means for the collecting units and for the platform assembly including barrier means at least partially surrounding the platform assembly in the body of water and adapted to protect the assembly from stress due to water body movement, a thermal absorber fluid for the collecting units, means whereby a portion of the collecting units produces thermal energy output produces combined thermal energy output and electrical energy output, means whereby a third portion of the collecting units concentrates incident solar radiation thereon to produce a higher absorber fluid output temperature than otherwise, a storage reservoir adjacent to said body of water for receiving the absorber fluid and for storing thermal energy collected





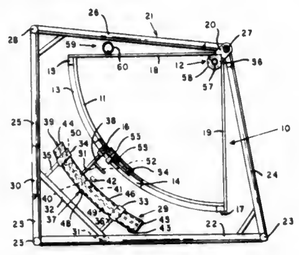
therein, pump means and conveying duct means adapted to circulate the absorber fluid from the reservoir through the collecting units and return, external conveying means including second pump means and thermally insulated external fluid duct means for conveying portions of the absorber fluid from the reservoir to one or more thermal energy utilization points and for returning portions of the conveyed absorber fluid back to the reservoir.

4,235,222

HEAT-RESPONSIVE ALIGNMENT SYSTEM AND SOLAR COLLECTION DEVICE

Istrate Ionescu, P.O. Box 697, Stratford, Conn. 06497

Filed Oct. 19, 1978, Ser. No. 952,759
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—425 **9 Claims**



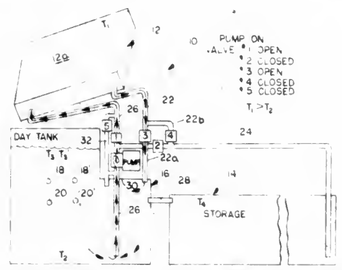
1. An apparatus which is adapted to be aligned with the position of the solar elevation over a wide azimuth angle and to adjust itself to remain aligned with the solar elevation changes in either direction, comprising a support structure adapted to support the apparatus on a fixed surface, a movable carriage pivotally attached to said support structure for rotational movement only along a vertical path which corresponds to the path of the solar elevation, said carriage supporting a solar radiation reflector in a position such that the alignment axis of said reflector corresponds to the path of the solar elevation as the degree of such elevation changes over an angle of up to about 48° during the year, a heat-responsive adjustment means supported by said support structure beneath said reflector and is connected to said carriage to cause pivotal movement of said carriage in a given direction over an angle of up to about 48°, a wide angle lens supported by said carriage and adapted to admit direct solar radiation through said reflector to said heat-responsive adjustment means when aligned with the position of the solar elevation over a wide azimuth angle to cause a temperature increase within said adjustment means and to cause pivotal movement of said carriage, said lens having a focus axis which is a few degrees in advance of the alignment axis of said reflector in the direction in which the solar elevation is changing, and a sun shield supported by said carriage in a position between said lens and said heat-responsive adjustment means and adapted to shade the latter when the focus axis of the lens is not aligned with the solar elevation over a wide azimuth angle, whereby when the solar elevation moves out of alignment with said reflector, it moves into alignment with the focus axis of said lens causing solar radiation to be admitted through the reflector to said heat-responsive adjustment means to cause pivotal movement of said carriage until the focus angle of the lens is in advance of and out of alignment with the solar elevation and said heat-responsive adjustment means is shaded by said sun shield.

4,235,223

SOLAR-LIQUID HEAT SYSTEM

DeWayne A. Coxon, Cedar Springs, Mich., assignor to Jordan College, Cedar Springs, Mich.

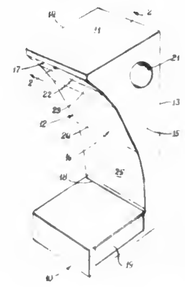
Filed Feb. 21, 1978, Ser. No. 879,382
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—437 **5 Claims**



1. A solar heating system employing a liquid heat exchange medium and capable of salvaging the heat from intermittent and/or low intensity solar radiation, having, in combination with a solar collector and a main liquid storage, an added rapid-response day storage with a liquid volume only a small fraction of that of said main storage; conduit and valving means for selectively interconnecting said solar collector with said day storage and with said main storage for recirculation of liquid; and temperature responsive flow control means operatively connected to said conduit and valving means for causing preferential flow of heated liquid from said solar collector to said day storage; said temperature responsive flow control means being responsive to a predetermined elevated temperature in said day storage to cause liquid flow from said collector to said main storage; and being responsive to a predetermined low temperature in said collector and a predetermined temperature differential of said main storage over said day storage to cause flow from said main storage to said day storage.

Peter H. Pawlak, 910 E. Skyline Dr., Palatine, Ill. 60067; Arthur J. Czajkowski, 1007 Victoria St., and Edward R. Bunk, 1018 Argonne Dr., both of North Chicago, Ill. 60064

Filed Sep. 20, 1978, Ser. No. 944,181
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—438 **5 Claims**



1. A solar collector comprising a substantially vertically disposed rectangularly shaped unit formed from a block of rigid insulating material and defining a vertical front, a spaced apart vertical back, a horizontal top and a spaced apart horizontal bottom, the solar collector unit disposed in such a manner that said front receives the direct sun's rays, a sun reflecting surface formed on said insulating material within the front of said unit, said block of material being recessed to form a horizontally disposed duct positioned in the bottom of said unit, means covering the top of said duct and for receiving solar energy said duct extending substantially the full depth of the collector and utilized to receive the sun's heat rays from the reflecting surface formed within the front of said unit, and said sun reflecting surface formed of a plurality of flat surfaces disposed at different angles relative to the vertical front surface and adjoining one another in forming a continuous surface, and a remaining continuously curved surface joining the last of said flat surfaces and extending down to a juncture with the rearward end of the duct, and the angles of said reflecting flat surfaces and the contour of the curved surface being such that the duct receives concentrated reflected sun heat rays over a substantial extent thereof.

4,235,225

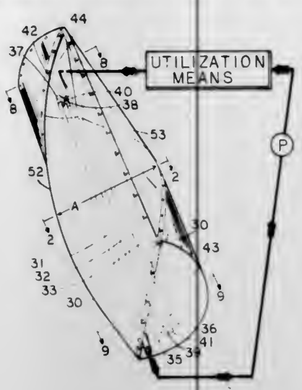
SEMI-TUBULAR PARABOLIC MULTIPLE CORE HELIX SOLAR CONCENTRATOR

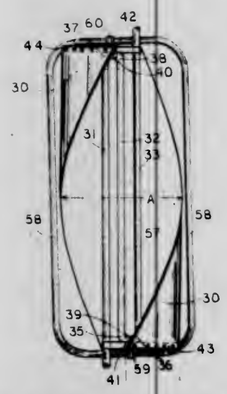
David H. Doebel, 17745 Fruitport Rd., Spring Lake, Mich. 49456

Filed Feb. 26, 1979, Ser. No. 14,956
Int. Cl.³ F24J *3/02*; **H01L** *31/00*
U.S. Cl. 126—438 **9 Claims**

1. A passive tracking radiant solar energy collector-concentrator device comprising a helix shaped semi-tubular elongated concave-parabolic reflector, wherein said helix shaped semi-tubular concave-parabolic reflective surfaces have as much as a 360 degree spiral running the length of said helix shaped concave-parabolic reflector, said reflector supported by two end pieces, said end pieces supporting a plurality of energy absorber collecting cores, said collecting cores disposed specifically within the sharp shifting focal axis of said reflector element so that the sun's reflective rays impinge on one or more of said collecting cores at all times during the solar day, said collecting cores being disposed within the primary direct and non-reflective incident solar radiant energy to increase the solar energy collection of said collecting cores, said collecting cores disposed to accommodate a heat exchange medium, said heat exchange medium to receive the energy from said collector cores and absorb said energy for use by a utilization means, said helix shaped semi-tubular concave-parabolic reflector and

said collecting cores being enclosed by a transparent covering which when placed over said helix reflector and said collecting





cores institutes an atmospheric protector and heat loss inhibitor.

4,235,226

COLLECTOR PANEL FOR SOLAR ENERGY

Werner Scherber, Salem, and Günther Dietrich, Daisendorf, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 786,443, Apr. 8, 1977, Pat. No. 4,148,294. This application Jan. 30, 1978, Ser. No. 873,472
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616662; Feb. 9, 1977, 2705337; Dec. 16, 1977, 2756142
Int. Cl.³ F24J 3/02
U.S. Cl. 126—449 **10 Claims**



1. A panel capable of absorbing incident solar radiation at a high rate and of emitting only a small portion of the absorbed energy as thermal radiation, said panel comprising:

(a) a substrate formed of a metallic layer of electrically conductive material; and

(b) a multiplicity of projections electrochemically deposited on firmly secured to and substantially completely covering a face of said substrate and extending outwardly away from said face to respective peaks thereof spaced laterally apart;

(1) the average peak-to-peak spacing of said projections in a direction parallel to said face being between 0.1 to 1 μm, and

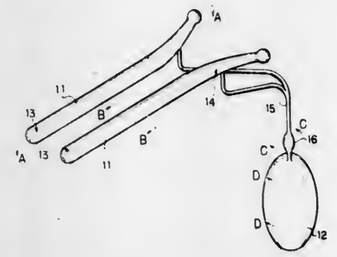
(2) the surface portions of said projections consisting essentially of metal.

4,235,227

ARTIFICIAL CORPUS CAVERNOSUM DEVICE

Hideo Yamanaka, No. 8-20, 4-chome, Meguro Hon-cho, Meguro-ku, Tokyo, Japan

Filed Nov. 8, 1978, Ser. No. 958,708
Int. Cl.² A61F 5/00
U.S. Cl. 128—79 **10 Claims**



1. An artificial corpus cavernosum device comprising:

an at least one artificial corpus cavernosum penis of elongated tubular pouch made of an artificial thin membrane to be implanted into the penis and for selectively receiving and being filled with a fluid therein for erecting the penis;

a container means made of an artificial thin membrane for storing said fluid under normal condition when the penis is not inflated and hence not erected, the container means being implantable into the scrotum;

a slenderized conduit means for connecting said at least one artificial corpus cavernosum penis to said container means in fluid communication with one another; and

a check valve interposed in fluid communication with said container means and having a valve member provided with a through-hole(s) for allowing said fluid once forcibly delivered from said container means to pass to said artificial corpus cavernosum penis and to return to said container means again little by little through said through-hole(s),

said container means being provided with a thick-wall projection having at the center thereof a sunk recess, said projection being attached on the inner face of said container means, whereby the tip end of a needle of an injection tube may be pierced through said center of said thick-wall projection so that said tip end is within the sunk recess, thereby injecting said fluid into said container means without injuring the artificial membrane of said container means.

4,235,228

ORTHOPEDIC CAST MATERIAL

John F. Gaylord, Jr., and John F. Gaylord, III, both of Matthews, N.C., assignors to Medical Specialties, Inc., Charlotte, N.C.

Filed Jul. 27, 1979, Ser. No. 61,371
Int. Cl.³ A61F 5/04
U.S. Cl. 128—91 R **14 Claims**



1. A prepadded, unitized orthopedic cast material characterized by the ability to be quickly applied, and improved comfort to the wearer, and comprising

a layer of plaster splint material,

a relatively thick padding layer comprising a hydrophobic textile material overlying at least one side of said plaster splint layer, and

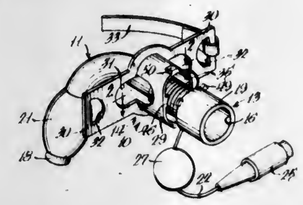
a covering fabric comprising a hydrophobic textile material enclosing said plaster splint layer and said padding layer, to thereby maintain the assembly thereof.

4,235,229

ADJUSTABLE TRACHEOSTOMY TUBE ASSEMBLY

Alan B. Ranford, Des Peres, and Fred E. Satchell, Chesterfield, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jun. 6, 1979, Ser. No. 47,824
Int. Cl.³ A61M 25/02
U.S. Cl. 128—207.17 **11 Claims**



1. In a tracheostomy tube assembly (10) including a tracheostomy tube (11) having one end adapted for insertion into the trachea and the opposite end adapted to extend from the trachea through a stoma cut in a patient's throat and a collar (14,60,84,91) adapted to be fitted on the exterior of the throat and having an opening (35,63,85,99) through which the tracheostomy tube (11) passes, the improvement comprising a deformable inherently resilient sleeve (29,61,82,94) carried by said collar (14,60,84,91) and extending outwardly therefrom, a portion (39,39,74,96) of the tracheostomy tube (11) extending through said sleeve (29,61,82,94), said sleeve having an internal circumference greater than the external circumference of the portion (39,74) of the tracheostomy tube (11) extending through said sleeve, said sleeve (29,61,82,94), when said tube portion (39,74) is placed therewithin, having portions (46,66,81,97) having a width along a first axis sufficient to engage said tube portion (39,39,74,96) within said sleeve to hold the tracheostomy tube (11) at a selected height therein and having portions having a width along a second axis greater than the tube width therein, whereby the application of inward pressure (47,68,83,100) at opposite sides of the sleeve along the second axis to compress the sleeve deflects the sleeve portions (46,66,81,97) adjacent the first axis outwardly away from the tube portion (39,39,74,96) thereby permitting axial adjustment of the tracheostomy tube (11) within the collar (14,60,84,91) and whereby, upon removal of said pressure, the sleeve, due to its inherent resiliency, returns to its undeflected condition in engagement with the tube portion.

4,235,230

IODINE COMPOSITION AND METHOD FOR PREVENTION AND TREATMENT OF DIALYSIS INDUCED PERITONITIS

Robert L. Stephen; Carl Kabiltz; Dietz van Dura; Curtis L. Atkin, and Stephen C. Jacobsen, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Feb. 12, 1979, Ser. No. 11,356
Int. Cl.³ A61J 7/00; A01N 59/12
U.S. Cl. 128—213 A **17 Claims**

1. A method for prevention or treatment of dialysis induced peritonitis comprising the steps of:

(a) preparing a first physiological solution which is free of protein material and of reducing substances capable of converting I_2 or HIO to I^-;

(b) preparing a second physiological solution having a combined I_2, HIO concentration in the range of 0.1 to 15 ppm;

(c) flushing a patients' peritoneal cavity with said first solution to remove materials comprising said reducing substances and protein material contained within said cavity; and

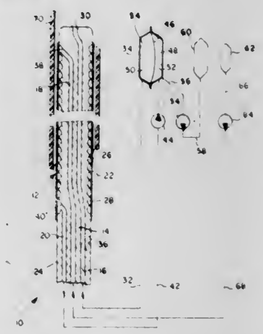
(d) contacting said cavity with said second solution for a period of at least 30 seconds.

4,235,231

PORTABLE ARTIFICIAL KIDNEY

Johannes G. Schindler, Marburg, and Wilfried Schael, Bad Homburg von der Hohe, both of Fed. Rep. of Germany, assignors to Dr. E. Fresenius Chemisch Pharmazeutische Industrie KG, Bad Homburg, von der Hohe, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,859
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734248
Int. Cl.³ B01D 13/00
U.S. Cl. 128—214 R **9 Claims**



1. A portable diafiltration system for use as an artificial kidney in the circulating blood stream of a living being comprising:

(a) catheter filter means adapted to be inserted into the circulating blood stream members of said living being for obtaining a continuous flow of filtered liquid, said catheter filter means including;

(i) a solid body portion having a least three ducts therein, each said ducts having an opening communicating with

the surface of said body portion for providing a liquid flow path thereto;

(ii) a semi-permeable membrane means circumscribing part of said body portion and covering at least two of said duct openings for filtering said blood stream and providing a filtrate;

(b) suction means operatively coupled to the first of said membrane covered ducts for drawing off said filtrate;

(c) reservoir means operatively coupled to said suction means and communicating with the uncovered duct, said reservoir means discharging its contents into said uncovered duct in an amount essentially equal to the amount of said filtrate received into said reservoir via said first membrane covered duct; and

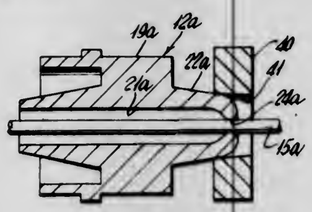
(d) means operatively coupled to and communicating with the second membrane covered duct for supplying a liquid to the surface of said filter membrane in contact with said body portion.

4,235,232

HUB DEVICE FOR PREVENTING LIQUID LEAKAGE

George D. Spaven, South Plainfield; Joseph J. Thomas, and Howard Beroff, both of Bridgewater, all of, assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 22, 1978, Ser. No. 936,267
Int. Cl.³ A61M 25/02
U.S. Cl. 128—214.4 **2 Claims**



1. A hub suitable for use in a catheter placement unit, which includes a catheter tube comprising:

an annular, flexible body having a passageway therethrough for the passage of said catheter tube through said body;

an annular flange extending coaxially from said body about said passageway and defining a coaxial extension for said passageway;

an annular dimple on the free end of said flange projecting into and restricting said passageway and providing free sliding, sealable engagement with the periphery of said tube;

the outer wall of said flange tapering toward the axis of said passageway from said body to said dimple; and,

a generally annular, rigid compression ring adapted to slide over said flange and compress said dimple against said catheter tube to lock and seal said catheter tube in place in said body; the interior wall of said ring being cooperatively tapered for engagement with said tapered flange wall;

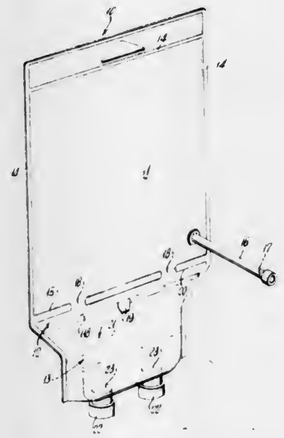
said tapering outer wall of said flange providing a flexible, thin wall portion of said flange in the vicinity of said dimple to facilitate the compression of said dimple about said catheter tube.

4,235,233

BAG FOR COLLECTING, STORING AND ADMINISTERING INCLUDING FILTERING BLOOD, BLOOD COMPONENTS, INTRAVENOUS FLUIDS AND SIMILAR FLUIDS

Herman C. Mouwen, Ventura, Calif., assignor to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Newbury Park, Calif.

Continuation-in-part of Ser. No. 793,654, May 4, 1977, abandoned. This application Mar. 14, 1979, Ser. No. 20,158
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 D **8 Claims**



1. A bag for collecting, storing and filtering blood, intravenous and similar fluids, said bag being sealed about is periphery and comprising an upper, center and lower portions, said upper portion being an air-tight fluid storage section including means for filling said upper portion with the desired fluid, a portion of the periphery of said upper portion being contiguous with said center portion, said center portion comprising at least one opening extending between said upper portion and the lower portion of the bag, said opening being temporarily sealed to prevent the flow of fluid from the upper portion to the lower portion, means on the outside of the bag for breaking said temporary seal to allow flow of fluid to said opening and into the lower portion, said lower portion being contiguous to the center portion on the side opposite said upper portion, a substantially flat piece of filter media mounted in said lower portion, said filter media extending substantially the entire width of said lower portion and being disposed at an angle of less than 45 degrees to the primary plane of the bag, whereby fluids may be rapidly filtered with a minimum of blocking of the filter media, and said lower portion of said bag having an outlet for administering the fluid to a patient, said outlet being disposed on the side of the filter media opposite the opening in the center portion whereby the fluid administered from said bag may be filtered immediately prior to administration.

4,235,234

SUBCUTANEOUS INJECTION SYSTEM

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

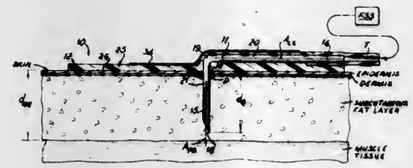
Filed Nov. 30, 1978, Ser. No. 964,953
Int. Cl.³ A61M 5/00
U.S. Cl. 128—216 **6 Claims**

1. An injection needle assembly connectable to the tubing from a fluid supply source for injecting fluids into the subcutaneous fat layer of a patient below the skin without penetrating the muscle tissue comprising:

an elongate injection needle defining a fluid passage therethrough, said injection needle having an inlet end to be connected to the tubing from the fluid supply soure and a sharpened outlet end opposite the inlet end adapted to puncture the patient's skin and subcutaneous fat layer, said needle defining a right angle bend therein forming a locating section on said needle adjacent the inlet end thereof and a penetrating section on said needle adjaclent the sharpened outlet end thereof oriented normal to said locating section;

a locator pad having opposed top and bottom surfaces, said bottom surface adapted to lie against the patient's skin; and

a needle mount integral with said locator pad on the top surface thereof, said needle mount enclosing said locating section and said right angle bend of said needle so that said



locating section of said needle lies along said top surface of said locator pad generally parallel to said bottom surface and said inlet end of said needle projecting from said needle mount parallel to said bottom surface for connection to the tubing, said penetrating section of said needle extending through said locator pad and projecting from said bottom surface, said needle mount and said locator pad maintaining said needle fixed with respect to said bottom surface and said penetrating section fixed normal to said bottom surface with said sharpened outlet and located a prescribed distance from said surface to positively control the depth of penetration of said sharpened outlet end of said needle into the subcutaneous fat layer of the patient when said bottom surface is in juxtaposition with the patient's skin.

4,235,235

SYRINGE

Hendrik M. Bekkering, Olst, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

Filed Dec. 11, 1978, Ser. No. 968,642
Claims priority, application Netherlands, Dec. 23, 1977, 7714308
Int. Cl.³ A61M 5/00
U.S. Cl. 128—218 P **11 Claims**

1. A syringe comprising:

a rotationally symmetrical barrel in the shape of a hollow cylinder with an open front end;

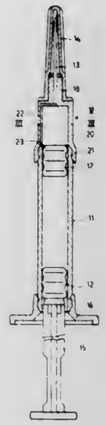
a plunger, sealably disposed within said barrel and movable with respect thereto;

a cylindrical stopper, having an outside diameter which is slightly larger than an inside diameter of the barrel and including means which seal the front end of the barrel; and

a needle holder, including a collar which is attached in sealing relationship to the front end of the barrel, a neck for sealable attachment to an injection needle, the neck having a rotationally symmetric rear face which includes an aperture which functions to conduct fluid to the needle, and a hollow, internally cylindrical shaft having a rear end which is sealably connected to the collar and a front end which is sealably connected to the neck; wherein

inner walls of the shaft and the rear face of the neck define one or more slots which extend from the rear end of the shaft to the aperture; and

the space bounded by inner walls of the shaft and the rear face of the neck, apart from said slots, is longer than the stopper and has the same rotational symmetry and approximately the same diameter as the outer diameter of the stopper, so that the stopper can substantially fill the space



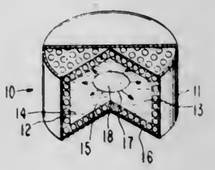
but does not cover the ends of the slots at the rear end of the shaft.

4,235,236

DEVICE FOR DISPENSING DRUG BY COMBINED DIFFUSIONAL AND OSMOTIC OPERATIONS

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Feb. 12, 1979, Ser. No. 11,121
Int. Cl.³ A61M 7/00
U.S. Cl. 128—260 **21 Claims**



1. A device for the controlled delivery of a beneficial agent to an environment of use, said device comprising:

(a) a microporous wall having a plurality of micropaths through the wall, said microporous wall surrounding and defining:

(b) a compartment;

(c) a beneficial agent in the compartment; and,

(d) an expandable member in the compartment, said member comprising a flexible, semipermeable film surrounding an osmotically effective solute, a gas generating couple, or a swellable polymer; and,

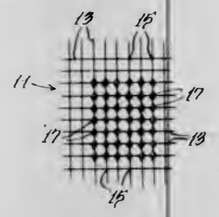
(e) wherein, when the device is in operation in the environment of use, the device continuously delivers agent by combined diffusional and osmotic operations, to the environment of use over a prolonged period of time.

4,235,237

ABSORBENT OPEN NETWORK STRUCTURE

Frederick K. Mesek, Tinley Park; George A. M. Butterworth, Western Springs, and Talivaldis Cepuritis, Kenilworth, all of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed May 8, 1978, Ser. No. 904,056
Int. Cl.[3] A61F *13/16*
U.S. Cl. 128—284 1 Claim



1. An absorbent article which consists essentially of an open network structure of fibrous elements defined by a woven scrim having a plurality of intersections, and discrete water-insoluble but water-swellable particles integral with the scrim at the intersections wherein the particles are disposed on and partially envelop the fibrous elements.

4,235,238

APPARATUS FOR SUTURING COELIAC TISSUES

Hisao Ogiu, and Hideki Shimonaka, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 4, 1979, Ser. No. 35,805
Claims priority, application Japan, May 11, 1978, 53-62911; May 11, 1978, 53-62912; Jun. 1, 1978, 53-74942; Jun. 8, 1978, 53-78230
Int. Cl.[3] A61B *17/04*
U.S. Cl. 128—334 R 28 Claims



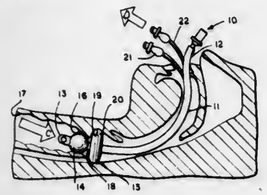
1. A coeliac tissue-suturing apparatus comprising:
a flexible tubular member having a passage extending therethrough and inserted into a channel of an endoscope;
a needle having one end concentrically fixed to that end of the tubular member which is inserted into the endoscope and having the other end made into a sharp tip, said needle having substantially the same outer diameter as the tubular member and adapted to protrude from a distal end of the endoscope;
a first-stop receiving chamber communicating with the atmosphere and the passage of the tubular member;
a first stop for setting suturing thread on tissues around a coeliac bleeding spot at the commencement of a suturing operation, said first stop being adapted to fix one end of the suturing thread extended along the tubular member, and normally received in the first stop receiving chamber; and
a pushing member inserted into the tubular member for pushing the first stop out of the first-stop receiving chamber.

4,235,239

CUFFED ENDOTRACHAEL TUBE AND METHOD

James O. Elam, 6723 S. Euclid Ave., Chicago, Ill. 60649

Continuation-in-part of Ser. No. 800,420, May 25, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,854
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—207.15 2 Claims



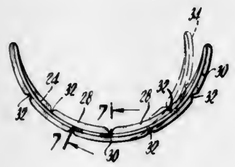
1. A method for using a cuffed endotracheal tube, comprising the steps of:
providing an elongated flexible air tube having proximal and distal end portions wherein a pair of enlargement means, at least the upper one of which is an inflatable-deflatable cuff, encircles said tube intermediate said proximal and distal end portions thereof;
inserting said tube through the mouth of a patient into the trachea to provide a passage for artificial respiration with said cuff deflated until the lower of said enlargement means is positioned by the subglottic structure of the glottis;
providing the lower of said enlargement means so as to be sized and shaped to fall short of fully occupying the cavity defined by the wall of the trachea but sized greater than the opening partially defined by the lower lateral surfaces of the larynx at least after said inserting step;
withdrawing said tube so as to cause the lower of said enlargement means to move upwardly in the trachea until resistance is encountered indicating that said lower enlargement means is positioned against the opening partially defined by the lower lateral surfaces of the larynx;
inflating said cuff to a size and shape fully occupying the cavity defined by the superglottic structure of the glottis following said withdrawing step; and
inserting said tube through the mouth of said patient further into the trachea with said cuff inflated such that resistance indicates that said cuff is anchored in the opening partially defined by the glottis and the lower of said enlargement means is resting at or below the opening partially defined by the lower lateral surfaces of the larynx.

4,235,240

UNDERGARMENT REINFORCEMENTS

Sydne Cousins, New York, N.Y., assignor to Bonnie Enterprises, Inc., Cranford, N.J.

Filed Aug. 21, 1978, Ser. No. 935,299
Int. Cl.[2] A41C *1/14*
U.S. Cl. 128—476 7 Claims



1. A stiffening structure for a woman's undergarment, defining a sleeve therein, comprising a main support member having ends and a periphery, said main support member being three-

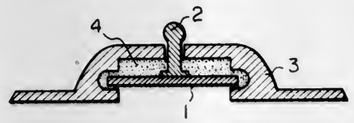
dimensionally tapered with smaller ends and periphery for added flexibility, a pair of flanges appended to said main support member and on opposite sides thereof, said flanges each defining a series of spaced bifurcations for providing additional flexibility for said structure, and said member and said flanges being generally of a crescent shape for providing a support function for a part of the woman's body.

4,235,241

ELECTRODES FOR LIVING BODY

Katsuhiko Tabuchi, Chiba, and Toshiaki Kato, Ichikawa, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1978, Ser. No. 939,856
Claims priority, application Japan, Sep. 8, 1977, 52-108201; Feb. 9, 1978, 53-13996; Feb. 10, 1978, 53-14329
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—639 11 Claims



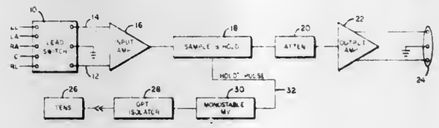
1. In an electrode for the living body comprising a dish-like casing of an electrically insulating material and an electrode plate fixed to the casing at the cavity thereof, the lower surface of the electrode plate being exposed bare and a lead wire being connected to the upper surface of the electrode plate, the improvement that the electrode plate is formed of titanium hydride admixed with a silver halide, the silver halide being admixed with the titanium hydride in an amount from 1 to 100 parts by weight per 100 parts by weight of the titanium hydride.

4,235,242

ELECTRONIC CIRCUIT PERMITTING SIMULTANEOUS USE OF STIMULATING AND MONITORING EQUIPMENT

David C. Howson, and James E. Heule, both of Minneapolis, Minn., assignors to Med General, Inc., Minneapolis, Minn.

Filed Apr. 2, 1979, Ser. No. 25,857
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—695 6 Claims



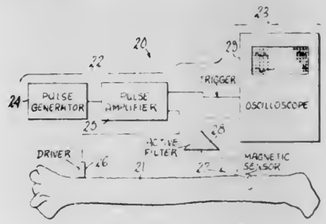
1. An electronic circuit for permitting simultaneous use of patient monitoring equipment and body tissue stimulating equipment, comprising:
(a) first input means for receiving physiologically generated signals from the body of a patient;
(b) second input means for receiving electrical stimulation signals applied to said patient, said electrical stimulation signals being of a substantially higher frequency and amplitude than said physiologically generated signals;
(c) a sample and hold circuit coupled to said first and second input means for temporarily interrupting the transmission of said physiologically generated signal to store a quantity proportional to the amplitude of said physiologically generated signal at a time coincident with the onset of one of said electrical stimulation signals and for resuming the transmission of said physiologically generated signal from a voltage level defined by said quantity following the termination of said electrical stimulation signal; and
(d) an output circuit means coupled to the output terminal of said sample and hold circuit and adapted to be coupled to said patient monitoring equipment for matching the amplitude of the signals appearing at the output terminal of said sample and hold circuit to a level compatible with said patient monitoring equipment.

4,235,243

METHOD AND APPARATUS FOR FACILITATING THE NON-INVASIVE, NON-CONTACTING STUDY OF PIEZOELECTRIC MEMBERS

Subrata Saha, 178 Highland St., New Haven, Conn. 06511

Filed Oct. 23, 1978, Ser. No. 953,640
Int. Cl.[3] A61B *5/10*
U.S. Cl. 128—740 15 Claims



1. A method of facilitating the non-invasive study of a portion of a piezoelectric member comprising the steps of:
generating a stress wave in said member at one end of the portion under study; and
sensing the magnetic field generated by said stress wave at the other end of the portion of said member under study.

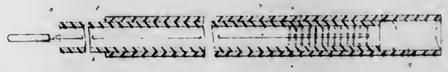
4. A method of facilitating the non-invasive study of a portion of a bone member comprising the steps of:
applying a driver to the bone member at one end of the portion under study, said driver being adapted to receive an electrical pulse and generate a mechanical pulse in response thereto;
supplying an electrical pulse to said driver;
placing a sensor adapted to sense a magnetic field proximate said bone member at the other end of said portion,
sensing the magnetic field generated in the bone with the sensor by the pulse supplied by the driver; and
generating an electrical signal in response to the sensed magnetic field.

4,235,244

MICROBIOLOGICAL SPECIMEN SAMPLING DEVICE

John E. Abele, Concord, and Robert G. Brown, Stow, both of Mass., assignors to Medi-Tech, Incorporated, Watertown, Mass.

Filed Jul. 27, 1978, Ser. No. 928,702
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—749 21 Claims



1. A microbiological specimen sampling device for obtaining contamination-free specimens,
said device comprising a first outer catheter body having a distal end and a proximal end,
a second catheter body having a distal end.

a sample collector contained within said second catheter body,

a removable water soluble plug engaging and sealing a portion of said first catheter body toward said distal end in position between said distal end of said first catheter body and said distal end of said second catheter body,

means for moving said first catheter axially with respect to said second catheter body and means for extending said sample collector beyond both said catheter body distal ends to permit said plug to be discharged and said sample collector advanced to obtain a sample.

4,235,245

DEVICE FOR PICKING UP TISSUES FROM A BODY CAVITY

Masayoshi Naito, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1978, Ser. No. 958,622

Claims priority, application Japan, Nov. 8, 1977, 52-149795[U]

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—756 **6 Claims**



1. A device for picking up tissues from a body cavity comprising;

a flexible outer sheath comprising a coiled wire element having two ends;

an extension wire extending through said outer sheath and having two ends;

a connector fixed at one of said two ends of said extension wire and having an outer diameter larger than the inner diameter of said outer sheath for abutting on one of said two ends of said outer sheath;

a tissue picking-up section connected to one of said two ends of said extension wire by said connector;

a wire holding section for holding the other end of said extension wire and receiving the other end of said outer sheath;

a chamber formed in said wire holding section and allowing said extension wire to extend through said chamber; resilient urging means provided in said chamber and contacting said other end of said outer sheath for resiliently urging said other end of said outer sheath toward said tissue picking-up section; and

said other end of said outer sheath being pulled into said chamber against said resilient urging means to prevent said extension wire from being applied with sufficient force to break said extension wire, as said outer sheath is bent.

4,235,246

EPICARDIAL HEART LEAD AND ASSEMBLY AND METHOD FOR OPTIMAL FIXATION OF SAME FOR CARDIAC PACING

Lee E. Weiss, Pittsburgh, Pa., assignor to Arco Medical Products Company, Leechburg, Pa.

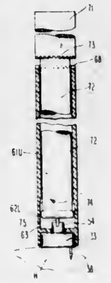
Filed Feb. 5, 1979, Ser. No. 8,991

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—785 **14 Claims**

1. A lead for delivering signals from a signal source such as a cardiac pacer to a body organ such as a patient's heart, the lead having a proximal end adapted to connect to the signal source, a flexible conductor length adapted for connecting signals from the proximal end to a distal end, and a distal electrode end adapted for delivering the signals and for being fixed to an organ such as the patient's heart, the distal electrode end being characterized by comprising the following improvements:

movable fixation means normally mounted within said distal end for attaching to the wall of the body organ, said fixation means being rotatable within and out of said distal end at an angle substantially normal to the axis of said conductor length and having a receiving portion adapted



to extend through said end, said receiving portion having means for receiving a rotating tool outside of said end for rotating said fixation means along an axis substantially normal to said conductor length; and

stimulating electrode means connected to said conductor length and rigidly fixed relative to said distal end for insertion into the organ wall for delivering the stimulation signals.

4,235,247

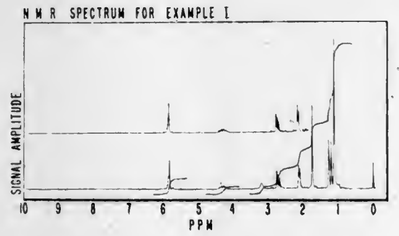
ORGANOLEPTIC USES OF 3-HYDROXY-1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1-BUTANONE

Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

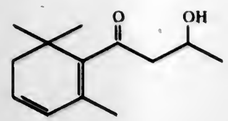
Division of Ser. No. 872,975, Jan. 27, 1978, This application Sep. 15, 1978, Ser. No. 942,529

Int. Cl.³ A24B *15/30*

U.S. Cl. 131—17 R **4 Claims**



1. A process for augmenting or enhancing the sweet, floral, dried fruit like, natural tobacco aroma or taste characteristics of smoking tobacco comprising the step of intimately admixing with smoking tobacco from 50 ppm up to 1,500 ppm by weight of said smoking tobacco of substantially pure 3-hydroxy-1-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-1-butanone having the structure:



4,235,248

APPARATUS FOR REGULATING THE CONFIGURATION OF THE UPPER SURFACE OF A SUPPLY OF TOBACCO IN A DISTRIBUTOR FOR USE IN CIGARETTE MAKERS OR THE LIKE

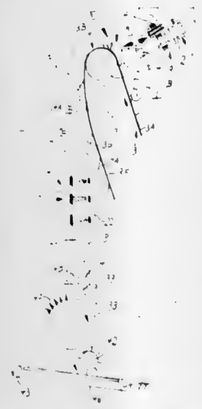
Peter Schumacher, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,737

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758358

Int. Cl.³ A24C *5/39*

U.S. Cl. 131—21 A **15 Claims**



1. Tobacco processing apparatus, particularly a distributor for use in cigarette making machines or the like, comprising a substantially upright magazine arranged to store a supply of tobacco and having an inlet and an outlet below said inlet, said magazine comprising a front wall, a rear wall and two spaced-apart side walls, means for feeding tobacco to said magazine via said inlet, said feeding means being adjustable to feed varying quantities of tobacco, as considered in a direction from one of said side walls toward the other of said side walls; means for receiving tobacco from said outlet; means for simultaneously monitoring different portions of the upper surface of the supply of tobacco between the walls of said magazine, including at least two level detectors spaced apart from each other, as considered in said direction, and arranged to transmit first signals denoting the vertical levels of the corresponding portions of the upper surface of the supply of tobacco between the walls of said magazine; means for evaluating said first signals including means for generating second signals denoting the difference between the vertical levels of said portions of said upper surface; and means for adjusting said feeding means in response to said second signals so as to reduce said difference.

4,235,249

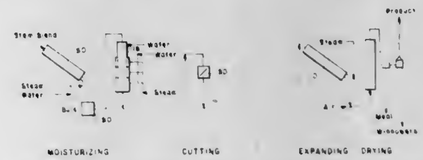
METHOD AND APPARATUS FOR PRODUCING EXPANDED TOBACCO FROM WHOLE TOBACCO STEMS

John D. Psaras, and Leroy R. Sachleben, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corp., Louisville, Ky.

Continuation of Ser. No. 705,740, Jul. 15, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,640

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—137 **31 Claims**



1. A process for the production of cut and expanded tobacco particles from whole tobacco stems which comprises:

(a) opening the cellular structure of said stems to the infusion of moisture without significant physical degradation of said cellular structure;

(b) inducing moisture into said cellular structure in an amount in the range of from 20 to 40 weight percent, said range being a first induced moisture content and simultaneously therewith, heating said stems to a temperature of at least 120° F.;

(c) equilibrating the moisture content in said opened and induced stems;

(d) moisturizing said equilibrated stems to a second induced moisture content in the range of from 30 to 60 weight percent at a temperature of at least 160° F.;

(e) cutting said stems after step (d) above, at said second induced moisture content, into a plurality of moisturized tobacco stem particles;

(f) expanding said cut particles; and

(g) drying said expanded particles to a final moisture content in the range of from 13 to 25 weight percent.

4,235,250

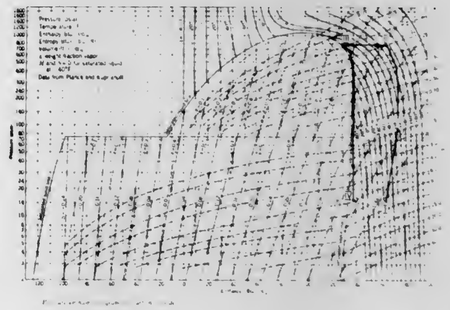
PROCESS FOR THE EXPANSION OF TOBACCO

Francis V. Utsch, Chester, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 29, 1978, Ser. No. 891,290

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—140 P **5 Claims**



1. In a process for the expansion of tobacco comprising the steps of: (1) contacting tobacco with carbon dioxide gas at a pressure of at least 250 psig for a time sufficient to impregnate the tobacco with the carbon dioxide gas to form a gaseous

carbon dioxide-tobacco system, (2) releasing the pressure and (3) thereafter subjecting the carbon dioxide-treated tobacco to rapid heating conditions to remove the carbon dioxide and thereby expand the tobacco, the improvement comprising cooling the gaseous carbon dioxide and tobacco system in step (1) to a temperature close to the saturation temperature of carbon dioxide but not lower than −23° C.

4,235,251

STABILITY OF TOBACCO CASING SYSTEMS CONTAINING PALLADIUM

Herman G. Bryant, Jr., Durham; James F. Bullock, Creedmoor, and Robert G. Honeycutt, Rougemont, all of N.C., assignors to Liggett Group Inc., Montvale, N.J.

Filed Feb. 21, 1979, Ser. No. 13,574
Int. Cl.³ A24B 15/42
U.S. Cl. 131—140 B **12 Claims**

1. A method for the deposition of palladium on smoking tobacco comprising

(a) adding palladium to an aqueous casing system which contains from about 0.25 to about 1.0 percent by weight of at least one polysaccharide compound selected from the group of natural gums and lower alkyl, hydroxy lower alkyl and lower alkoxy ethers and esters of cellulose, and

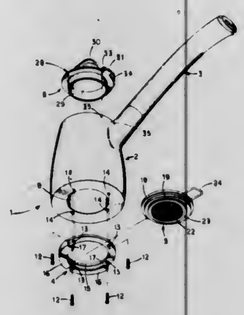
(b) admixing the palladium containing casing system with tobacco to deposit thereon said palladium.

4,235,252

SMOKING PIPE

Daniel C. Bianchino, Box 10,, Intervale, N.H. 03845

Filed Mar. 6, 1979, Ser. No. 18,287
Int. Cl.³ A24F 1/24
U.S. Cl. 131—193 **8 Claims**



1. A smoking pipe comprising:

a bowl adapted to receive an ignitable smoking product therein, said bowl having a bore defining a wall of continuous thickness and a top opening and an opposing bottom opening, said wall having a breather hole adjacent to the top opening extending linearly and completely through said wall;

cover means cooperating with the top opening of the bowl and operable between first and second positions in which the cover means respectively covers and uncovers the top opening, said cover means being in its first position when a smoking product in the bowl is to be ignited;

holder means cooperating with the bottom opening of the bowl;

a screen member received and held by the holder means and removably fitted adjacent to the bottom opening of the bowl, said screen member being capable of complete retraction and separation from the holder means and the rest of the pipe, said screen member including cross grid portions exposed at all times directly to the atmosphere and defining a plurality of openings in the screen member, said screen member including the cross grid portions and openings defined therein being operable to retain and support a smoking product within the bowl while simultaneously permitting passage of a flame by way of the openings defined by the cross grid portions to ignite the smoking product directly by way of said openings, said screen member thereafter being operable to support and confine ashes produced by the combustion of the smoking product above the screen member in the region of the bowl above the screen member; and

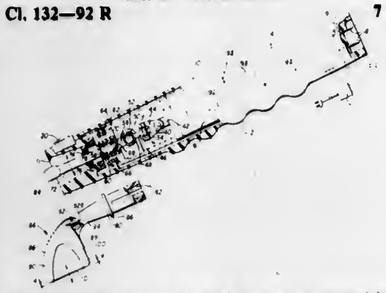
pipe stem means having a passageway therein in direct line with the breather hole in the bowl and directly cooperating with the breather hole in the bowl for discharging smoke produced as a result of ignition and combustion of the smoking product in the bowl.

4,235,253

ELECTRIC DENTAL FLOSSER

Dawne A. Moore, Dallas, Tex.

Filed May 7, 1979, Ser. No. 36,337
Int. Cl.³ A61C 15/00
U.S. Cl. 132—92 R **7 Claims**



1. An electrically driven dental floss device comprising: a tip having a forked end; means to tauntly secure a short piece of dental floss across said forked end of said tip; a body handle; power means; switch means to momentarily energize said motor, an output shaft being adapted to detachably receive said tip; and connector means being adapted to connect said motor to said output shaft for moving said tip in a reciprocating straight line manner vertically relative to a tooth from a chewing surface of the tooth to under the gingival margin, the length of said reciprocating motion not to exceed two millimeters.

4,235,254

FLOW OPERATED VALVE

William D. Kirby, 2121 Hamilton Ct., Richland, Wash. 98255

Filed Aug. 30, 1978, Ser. No. 938,084
Int. Cl.³ F16K 31/163
U.S. Cl. 137—119 **5 Claims**



1. A flow-operated valve, comprising:

an enclosed hollow body;

a shaft rotatably mounted within said body about a longitudinal axis;

a liquid inlet in open communication with the interior of said body;

a plurality of liquid outlets each in open communication with the interior of said body, said outlets having inner ends within said body arranged along a line that is parallel to said longitudinal axis;

a plurality of valves equal in number to the number of said outlets, each of the valves being located within said body and being individually hinged to the interior of said body about a common pivot axis parallel to said longitudinal axis for movement between first positions wherein an individual valve overlaps and seals the inner end of one of said outlets and second positions wherein it is clear thereof;

means within said body operably connected between said liquid inlet and said shaft for incrementally pivoting said shaft relative to said body about said longitudinal axis in a progressive sequence in response to initiation and cessation of flow at said liquid inlet;

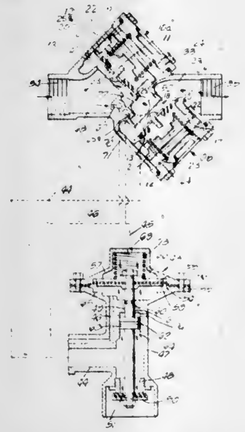
and individual valve operator means on said shaft within said body and operably engageable with corresponding individual valves for sequentially moving the valves between their first and second positions in response to incremental pivotal movement of said shaft about said longitudinal axis.

4,235,255

TIRE INFLATION GUIDE

George W. Hughes, 2601 Mills, Houston, Tex. 77026

Filed Nov. 23, 1979, Ser. No. 96,761
Int. Cl.³ F16K 15/20
U.S. Cl. 137—224 **5 Claims**



1. A tire inflation guide having a tubular housing, internal threads in said housing adjacent its lower end adapted to mount the housing on the usual tire valve, an insert in the housing having air passageways extending transversely there through, a plurality of ports in flow connection with said air passageways, a flexible o-ring mounted on the outer surface of the housing and over said air outlets, a valve stem in the upper portion of said housing yieldably maintained in close position and adapted to be moved downwardly against the end of the stem of the valve of the tire to permit flow of air therein.

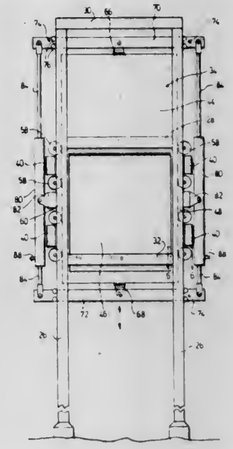
4,235,256

DAMPER ASSEMBLY FOR GAS DUCT

Alan Crawshay, Trail, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed May 7, 1979, Ser. No. 40,001
Int. Cl.³ F16K 3/312, 25/00, 31/124
U.S. Cl. 137—240 **9 Claims**

1. A damper assembly for use with a rectangular cross section gas duct having upstream and downstream duct sections with opposed open ends of equal height and equal width spaced apart to define a transverse slot therebetween, comprising, in combination, a rectangular frame having vertical side members and horizontal cross members attached thereto to provide a planar surface adapted to be flexibly secured to flanges on said duct members, said vertical side members extending both above and below the duct a distance at least equal to the height of the duct and said horizontal cross members comprising frame cross members substantially coextensive with the upper and lower edges of said flanges and a top frame cross member spaced from the upper edge of the duct a distance substantially equal to the height of the duct, a damper plate having a length at least twice the height of the duct and a width substantially equal to the width of the frame, said plate comprising a lower portion having an opening formed therein at one end thereof substantially equal to the duct opening and



an upper baffle portion, said damper plate slidably supported within said frame for vertical reciprocal travel whereby the opening in the damper plate and said baffle portion can be moved into and out of alignment with the duct, a pair of upper and lower cross-bars pivotally secured to upper and lower ends of said plate respectively mounted in said frame for reciprocal vertical travel therein, piston-cylinder means engaging each end of the upper and lower cross-bars for raising and lowering the cross-bars and damper plate whereby the opening formed in said damper plate can be aligned with the duct, and sealing means to prevent egress of gas from said assembly when said damper plate is in an opened, closed or transitional position and to prevent movement of gas between said upstream and downstream sections of the duct when said damper plate is in a closed position.

4,235,257

ELASTIC SEATING ELEMENT FOR A CUTOFF DEVICE

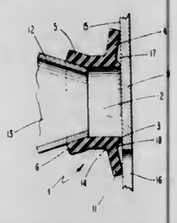
Franz-Josef Wolf, Sprudelallee 19, 6483 Bad Soden-Salmunster, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,455
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812224
Int. Cl.³ F16K 25/00
U.S. Cl. 137—242 **5 Claims**

1. An elastic seating element for use in combination with a fluid flow cutoff device of the type including first means defining a first portion of a flow-through passage, second means defining a second portion of said flow-through passage, and a seating element having an opening extending therethrough and disposed between said first and second passage defining means, said second passage-defining means comprising a sealing member having a seal face and an aperture therein forming said second passage portion, said sealing member mounted for

sliding movement of its seal face across said seating element between flow-open and flow-closed positions, wherein said second passage portion is aligned with said opening in said flow-open position and said seal face covers said opening in said flow-closed position, said seating element being of the type comprising a supporting portion mounted to said first passage-defining means to align said opening and said first passage portion, and a seating portion including a surface oriented transversely relative to said opening and facing said second passage defining means, the improvement wherein:

said seating element comprises a rim extending around an



end of said opening in facing relation to said seal face and projecting axially outwardly relative to a juncture between said rim and said transverse surface, said transverse surface forming an edge means spaced radially outwardly of said rim and said supporting portion, said seating element and said seal face being pressed axially together in said flow-open and flow-closed positions, said rim, transverse surface and edge means being of integral one-piece construction such that axial pressing forces transmitted to said rim and edge means press said rim and said edge means against said face in said flow-open and flow-closed positions.

4,235,258

DRIVING DEVICE FOR OPENING AND CLOSING A VALVE

Takayoshi Uno, deceased, late of Osaka, Japan (by Motoka Uno, heir); by Takaaki Uno, heir, Nara, Japan; by Yoshishige Uno, heir, Tokyo, Japan; by Hiroyoshi Uno, heir, Yao, Japan; Takashi Ida, Suita, Japan; Minoru Onaka, Osaka, Japan, and Hayato Shigeta, Osaka, Japan, assignors to Tomoe Technical Research Company, Osaka, Japan

Continuation-in-part of Ser. No. 686,996, May 17, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,623

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—556 **1 Claim**

1. A driving device for opening and closing a valve comprising:

a cylindrical body having a cylindrical inner surface provided with at least one axially extending slender slot therein, the cylindrical body being adapted to be mounted on the upper portion of a valve body;

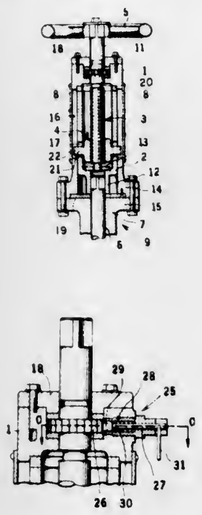
an actuating cylinder rotatably housed within said cylindrical body and having an outer surface having a diameter slightly less than the diameter of the inner surface of the cylindrical body, the actuating cylinder being provided with at least one substantially helical guide groove in the circumferential wall thereof, and adapted to be connected to a valve stem;

a spindle having an upper portion rotatably supported by said cylindrical body and a lower end portion rotatably supported by a bearing in said actuating cylinder, the spindle including a threaded portion and being aligned coaxially with the valve stem, said cylindrical body and said actuating cylinder;

a piston member within the actuating cylinder and having an internal screw thread engaged with said threaded portion of the spindle and at least one rod-shaped projection extending radially outwardly through said guide groove of the actuating cylinder and into said slender slot of the cylindrical body, rotation of the projection and the piston member being prevented by the slender slot; and

a transparent plate mounted on the outer circumferential surface of the cylindrical body for sealing said slender slot of the cylindrical body while permitting visual observation of the position of the rod-shaped projection; and

stop means for controlling the rotation of the spindle mounted on the upper portion of the cylindrical body and comprising a ring gear mounted on said spindle, each tooth of the ring gear having two franks symmetrically arranged with respect to the plane formed by connecting the center of the spindle and the center of a tooth crest of the ring gear, a stop bar supported so as to be moveable radially relative to the cylindrical body and having a wedge-shaped head engageable with said ring gear, and a spring biasing said stop bar radially inwardly relative to



the ring gear, the wedge head having a pair of surfaces forming an included angle which is bisected by the axis of the stop bar such that rotation of the spindle by fluid pressure on the valve is prevented but manual rotation of the spindle in either direction is permitted, and manual rotation of the spindle to open the valve can be effected by applying sufficient torque to one frank of each tooth of the ring gear through the spindle to urge one of the surfaces of the wedge-shaped head out of engagement with the one frank of the tooth of the ring gear against the bias of the spring and manual rotation of the spindle to close the valve can be effected by applying sufficient torque to the other frank of each tooth of the ring gear through the spindle to urge the other of the surfaces of the wedge-shaped head out of engagement with the other frank of the tooth of the ring gear against the bias of the spring.

4,235,259

FITTING REPLACEMENT METHOD

David L. Hudock, 435 Washington Ave., Egg Harbor City, N.J. 08215

Filed Dec. 8, 1978, Ser. No. 967,624

Int. Cl.³ F16L *55/18*

U.S. Cl. 138—97 **1 Claim**

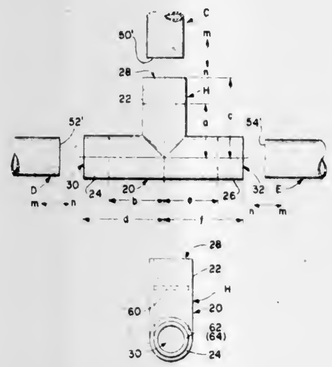
1. A method for repairing a fluid leak at a one-piece rigid standard fitting which couples the terminal ends of a plurality of fluid conduits in fluid communication with each other in a fluid system and wherein said fitting includes a plurality of standard fitting branches equal in number to said plurality of fluid conduits and having lengths a and b which terminate in outermost standard fitting branch ends and in which the terminal end areas of said fluid conduits are cooperably received and affixed, said method comprising the steps of:

(a) severing said fluid conduits from said standard fitting adjacent said outermost standard fitting branch ends and defining new terminal ends on said fluid conduits;

(b) removing said standard fitting from said system;

(c) providing a one-piece rigid replacement fitting having a plurality of replacement fitting branches equal in number to said standard branches on said standard fitting and being geometrically compatible with said standard fitting branches and terminating in outermost replacement branch ends;

(d) dimensioning said replacement fitting branches to have lengths c and d which are greater then lengths a and b, respectively, of the corresponding standard fitting branches and to have a cross-sectional dimension adapted to allow said replacement fitting branches to cooperably receive the new terminal end areas of said fluid conduits;



(e) applying affixing material to the interior surfaces of said replacement fitting branches and the exterior surfaces of the new terminal end areas of said plurality of conduits for permanently bonding the new terminal end areas of the conduits to the replacement fitting branches when such new terminal end areas are received in such branches;

(f) moving said new terminal end areas out of their original position relative to each other;

(g) placing said replacement fitting between said new terminal end areas and in said fluid system with said replacement fitting branches each spaced closely adjacent an associated one of said plurality of fluid conduits;

(h) moving the new terminal end areas of said plurality of conduits into associated ones of said replacement fitting branches and back to their original positions; and

(i) providing said replacement fitting branches with internal shoulders spaced from the replacement fitting branch terminal ends by respective distances sufficient to define engagement means for said new terminal ends of said conduits when moved into their reassembled position within said replacement fitting branches.

4,235,260

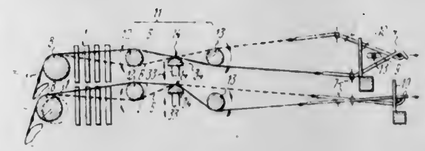
METHOD AND APPARATUS FOR TENSIONING WARP THREADS AT WEAVING A CLOTH ON A LOOM

Anatoly G. Selivanov, Donskaya ulitsa, 24, kv. 110; Grigory N. Gromeiko, Sevastopolsky prospekt, 16, kv. 40; Leonty N. Kirillov, ulitsa Vavilova, 58, korpus 2, kv. 115, all of Moscow; Nina S. Zavolokina, ulitsa Sovkhoznaya, 3, Pavlovo-Posad Moskovskoi oblasti; Maria G. Vlascheako, ulitsa Lobachevskogo, 44, kv. 59, Moscow; Serafima A. Chichëva, poselok Dzerzhinskogo Ljuberetsko raiona, 22, kv. 17, Moskovskoi oblasti, and Valery V. Zhivetin, ulitsa Sofii Kovalevskoi, 4, kv. 123, Moscow, all of U.S.S.R.

Filed Dec. 29, 1978, Ser. No. 974,220

Int. Cl.³ D03D *49/22*

U.S. Cl. 139—98 **8 Claims**



1. A method of tensioning warp threads in the production of a cloth on a loom including the steps of forming a shed from the warp threads, inserting a weft thread into the shed, beating up the weft thread to a fell of the cloth, letting off the warp, taking up the cloth and changing the shed, characterized in that in the course of shedding different amounts of tension are applied to the warp threads of the respective shed sides and when the shed is changed, the length of the warp threads of each shed side is compensated for, and wherein during the process of shedding, of compensation of the length of the warp threads at a change of the shed, and of adjustment of the tension applied to the shed sides, the warp threads are subjected to a tension of an amount close to the looming-up tension of the warp threads and are maintained at this tension while the main shaft of the loom turns through an angle of from 250° to 340°; the tension on the warp threads being increased during the remaining 20°–110° of the rotation of the main shaft and being at a maximum during beating up of the weft thread.

4,235,261

PAIR OF GRIPPERS FOR WEAVING LOOMS WITHOUT SHUTTLE
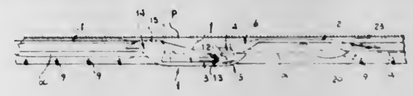
Graziano Genini, Stabio-Via Gaggiolo, Switzerland, assignor to Albatex A.G., Vaduz, Liechtenstein

Filed Jun. 6, 1978, Ser. No. 913,071

Claims priority, application Switzerland, Jun. 9, 1977, 7102/77

Int. Cl.³ D03D *47/20*

U.S. Cl. 139—448 **1 Claim**



1. A pair of carrying grippers comprising weft thread grasping and holding members mounted on head parts of the grippers, said grasping and holding members being disposed entirely on opposite sides of a sliding plane, along which said head parts move only side by side, cooperating between them for exchanging a weft thread, one of said grippers comprising a pair of pegs for positioning the end of the weft thread, said pegs being arranged close to the free end of the thread grasping and holding means of said one gripper, on opposite sides thereof, and in a position such as to cause the weft thread to be positioned between said guide and the first of said pegs only

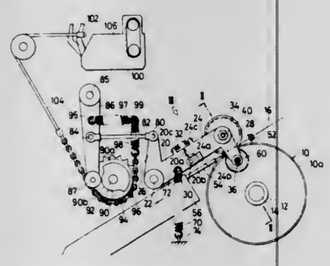
slightly inclined in respect of the sliding plane, said one gripper comprising a basic gripper body, the rear part of which is fixed to a gripper advancement strap, and the head part of which is equipped with said weft thread grasping and holding means, and a unitary cover on said basic body and having a head part with an opening for housing said weft thread grasping and holding means, said pegs projecting from said cover and fitting into said basic body or vice versa, said cover having a rear part whose side close to the sliding plane projects beyond said plane in respect of the head part of the gripper, so as to form a guide for the weft thread in the form of a groove parallel to the plane itself.

4,235,262

WEFT FEEDING MECHANISM OF A SHUTTLELESS WEAVING LOOM

Masayuki Ushiro, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 7, 1978, Ser. No. 967,097
Claims priority, application Japan, Dec. 20, 1977, 52/152413
Int. Cl.³ D03D *47/34*
U.S. Cl. 139—452 **8 Claims**



1. In a shuttleless weaving loom
a weft inserting device;
a weft selector for selecting a weft yarn to be inserted into a warp shed, almongst a plurality of yarns in accordance with a predetermined weft pattern and producing a signal indicative of the selected weft yarn;
a plurality of weft drive devices, one for each of said weft yarns, for driving the weft yarns to said weft insertion devices, each of said weft drive devices including:
a feed roller constantly driven by a shaft which rotates in synchronism with the weaving cycle of said loom;
a pressure roller;
means having a lever on which said pressure roller is rotatably mounted and which is responsive to said signal for moving said lever toward said feed roller to bring said pressure roller into contact with the outer periphery of said feed roller; and
another roller carried on said lever which is in drive connection with said pressure roller and disposed opposite the inner periphery of said feed roller so as to be held out of contact with said inner periphery when said pressure roller is brought into contact with the outer periphery of said feed roller and brought into contact with said inner periphery when said pressure roller is held out of contact with said outer periphery of said feed roller.

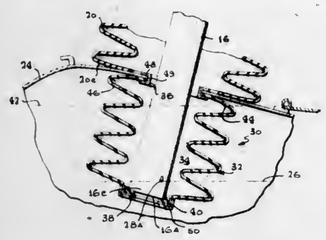
4,235,263

VAPOR RECOVERY FUEL TANK FILLER SYSTEM

Leo C. Lake, Jr., Mission Viejo, Calif., assignor to Yamaha Motor Corporation, Buena Park, Calif.

Filed Mar. 26, 1979, Ser. No. 23,703
Int. Cl.³ B65B *3/26*
U.S. Cl. 141—1 **12 Claims**

1. In a fuel tank filler system for receiving the nozzle of a vapor recovery fuel dispenser head deeply enough to enable operation of the dispenser head to fill a tank, the improvement comprising:
walls forming a chamber lying within the tank which has a nozzle-receiving opening near the upper end of the chamber, an exit opening near the lower end of the chamber through which fuel can flow into the tank, and a liquid-passing drain opening near the upper end of the chamber which is positioned to allow the flow of fuel from the tank, when the tank is substantially full, into the chamber;



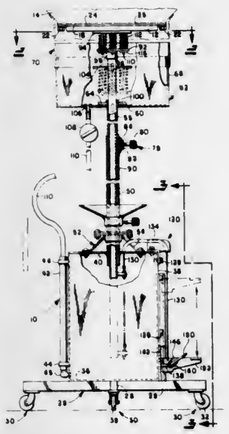
said chamber having nozzle seal means sealable to the end of a dispenser head nozzle inserted into said chamber, for permitting fuel which is flowing through the nozzle to flow through said exit opening into said tank while preventing the flow of fuel directly from said nozzle into said chamber, whereby to avoid filling said chamber until the tank is sufficiently full to permit the flow of fuel from the tank through said drain opening into the chamber.

4,235,264

APPARATUS AND METHOD FOR FACILITATING REMOVAL OF TRANSMISSION PANS

Kenneth R. Rau, 6930 Wadsworth Rd., Medina, Ohio 44256, and John K. Rau, 295 E. 238th St., Euclid, Ohio 44123

Filed Dec. 26, 1978, Ser. No. 973,390
Int. Cl.³ B65B *3/06*
U.S. Cl. 141—1 **25 Claims**



1. An apparatus for facilitating with no or minimal spillage of fluid the removal of a transmission pan from a transmission housing of the type having at least one fastener securing the pan to the housing, comprising:
pan retention means in one position operable for retaining such pan in sealed engagement with such housing independently of such fastener and in another position for permitting disengagement of such pan from such housing, and

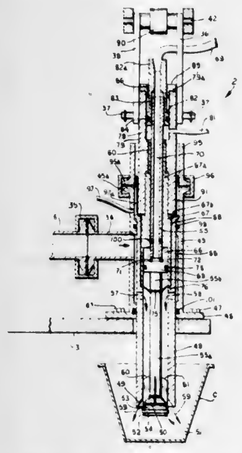
catch basin means operatively associated with said pan retention means for receiving such fluid as said pan retention means moves from said one position to said another position,
said catch basin means being movable while said pan retention means is in said one position from a remote position permitting access to the fastener for removal of the same to an operative position surrounding such pan, and said pan retention means including a pan engagement member and actuating means for moving said pan engagement member between said one and another position when said catch basin means is in said operative position.

4,235,265

ASEPTIC CONTAINER FILLER APPARATUS

James J. Feliks, Doraville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 5, 1979, Ser. No. 17,614
Int. Cl.³ B65B *3/12, 31/02*
U.S. Cl. 141—85 **23 Claims**



1. Apparatus for aseptically filling a container (C) disposed within a sterile walled enclosure structure (3) pressurized with a sterile inert gas, said apparatus comprising a nozzle (48) movably mounted in an aperture formed in a wall of said enclosing structure and located above said container, a housing (45) secured to said wall in fluid tight relation and disposed about said nozzle, a rolling seal (91) secured in fluid tight relation to the interior of said housing and to the exterior of said nozzle and forming a fluid tight cavity therebetween, means (97) for supplying inert sterile gas under pressure somewhat above atmospheric pressure to said cavity, and aseptic means (56-58) for supplying sterile flowable material to the interior of said nozzle.

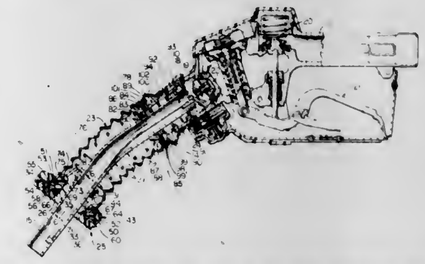
4,235,266

LIQUID DISPENSING NOZZLE HAVING VAPOR RECOVERY SEALING ARRANGEMENT

Jack A. McMath, Fort Thomas, Ky., assignor to Dover Corporation, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,814
Int. Cl.³ B65B *3/18*
U.S. Cl. 141—285 **26 Claims**

1. A liquid dispensing nozzle comprising a body; a spout extending from said body and having its free end for disposition in an opening of a fill pipe or the like; means to return vapor from the tank being filled; sealing means to form a seal between the fill pipe opening and said vapor return means when said spout is disposed in the fill pipe; means to continuously urge said sealing means towards the free end of said spout; said sealing means including means to provide communication from the tank being filled to said vapor return means when said sealing means is in sealing engagement with the fill pipe, a sealing member having a surface engaging the fill pipe,



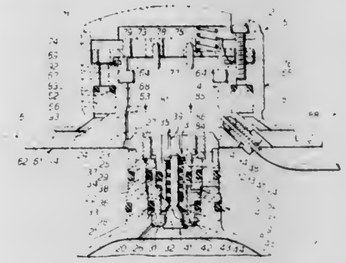
and said sealing member having its fill pipe engaging surface eccentrically disposed with respect to the longitudinal axis of said spout when in a rest position; and means to connect said sealing means to said vapor return means.

4,235,267

VALVED COUPLINGS

Arthur L. Brake, Winscombe, and David A. C. Harper, Almondsbury, both of England, assignors to Bristol Aerojet Limited, Avon, England

Filed Nov. 27, 1978, Ser. No. 963,789
Claims priority, application United Kingdom, Nov. 25, 1977, 49261/77
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—293 **11 Claims**



1. A valved coupling for high pressure fluids, comprising:
a first element having a tubular portion with an axial bore therethrough and first coupling means thereon;
a second tubular element for receiving the tubular portion of the first element and having second coupling means thereon for cooperation with the first coupling means to releasably couple the elements together;
said elements having passages therein defining a first flow path for fluid through said elements;
a first valve in the first element for controlling flow through the first flow path;
a second flow path in the first and second elements extending from a location downstream of the first valve to a vent;
a second valve for controlling flow through the second path; and
a valve operating means connected to operate said first and second valves incident to coupling said elements together such that the second valve is first closed and then the first valve is opened, and during uncoupling, the first valve is closed then the second valve is opened, said elements having a bore therethrough and a valve operating member axially movable in the bore under the control of the valve

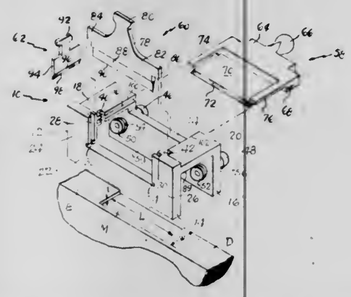
operating means in one direction to open the first valve and in the opposite direction to close the first valve, said second valve comprising a valve member concentric with the valve operating member and axially movable relative to said bore and said valve operating member, a first valve seat on said valve operating member facing generally in said one direction, a second valve seat on said valve member facing in said opposite direction and cooperating with said first valve seat to define said second valve, and stop means engaged by said valve member not earlier than closure of said first valve in movement of said valve member in said opposite direction.

4,235,268

TOOL FOR FORMING DOOR MORTICE

Clarence H. Savary, 1011 1/2 N. 3rd St., Ironton, Ohio 45638

Filed Jan. 22, 1979, Ser. No. 5,675
Int. Cl.³ B27M *3/00*
U.S. Cl. 144—27 **12 Claims**



1. A tool for forming a rectangular mortice on the edge of a door or doorjamb, said mortice being of a length L, width W and depth d, which comprises:

frame means adapted to be clamped to said edge of said door or doorjamb;

first and second cutters each having a cutting blade of a length L;

first and second guide means substantially perpendicularly formed in said frame means for respectively receiving said first and second cutters therein; and third and fourth guide means substantially perpendicularly formed in said frame means for respectively receiving said first and second cutters therein, said third and fourth guide means substantially perpendicular to said first and second guide means, respectively.

4,235,269

TURNING TOOL WITH TIP STORAGE AND RETRACTABLE LEVER

Hans Kraus, Covina, Calif.

Filed Jul. 31, 1978, Ser. No. 929,331
Int. Cl.³ B25G *1/12*
U.S. Cl. 81—438 **9 Claims**

1. A turning tool comprising:

a handle rotatably mounted on a shaft having an axis,

a housing rotatably mounted on the shaft,

a ferrule coaxial with and secured to the shaft to rotate therewith,

releasable means in the housing cooperable with the secured ferrule to drive the shaft,

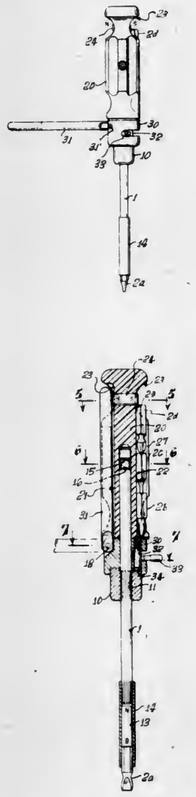
a first recess in the handle parallel to said axis and having an open end,

a plurality of interchangeable tips storable in the first recess in end-to-end relation,

handle magnet means protruding from the handle to partially overly said open end of the first recess and to contact and releasibly retain an end one of the tips adjacent the recess open end in position for manual grasping,

tip retaining means at the end of the shaft for releasibly holding a selected one of said tips,

a lever pivotally connected to the housing and pivotable between a retracted storage position and a radially extended service position, and



a second recess in the handle radially spaced from and parallel to the first recess to receive the lever in its retracted storage position wherein the lever is substantially within the recess,

said handle magnet means being positioned in the handle magnetically to engage and releasibly retain the lever in its retracted storage position.

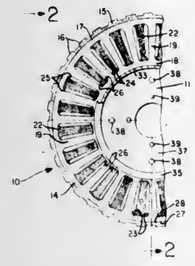
4,235,270

TIRE WITH SUPPORTING AND CUSHIONING WALLS

Joel M. Kahaner, Akron, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 30, 1978, Ser. No. 920,666
Int. Cl.³ B60B *9/00*
U.S. Cl. 152—7 **26 Claims**

1. A tire rotatable about an axis comprising an annular body of resilient elastomeric material having a generally cylindrical outer member at the outer periphery, a generally cylindrical inner member spaced radially inward from said outer member and axially extending circumferentially spaced-apart connecting wall members between said outer member and said inner member, said wall members being the only structural connections between said inner and outer members, said wall members having a circumferential spacing and a cross section sufficient to limit the maximum compressive loading of said wall members during flexing so that the stresses developed in said members will not cause said members to undergo flex fatigue, each of said wall members having curved portions adjacent



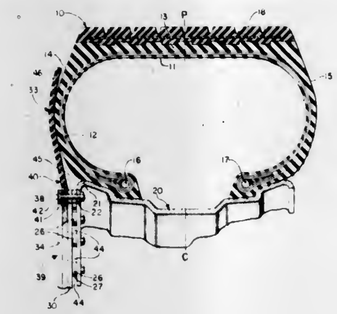
said inner and outer members for providing increased support to said wall members at said inner and outer members, said annular body having at least two supporting rings in side-by-side relationship, and an annular tread member extending around and being mounted on the outer peripheral surface of said outer member of each of said rings.

4,235,271

TIRE SIDEWALL PROTECTOR SHIELD ASSEMBLY

Richard J. Olsen, Massillon; George T. Watts, North Canton, and Robert I. Griffiths, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 13, 1979, Ser. No. 57,227
Int. Cl.³ B60C *19/12*; B62B *9/16*
U.S. Cl. 152—186 **15 Claims**



14. A tire rim and shield assembly comprising elements of

(a) a tire rim having a tire-supporting flange axially spaced from the centerplane of said rim, said flange including a terminal portion directed generally radially inwardly toward the axis of rotation of said rim, said terminal portion including a plurality of apertures spaced apart about its circumference, said apertures extending through said terminal portion in a direction generally parallel to said axis;

(b) a plurality of spacers contacting said terminal portion in a direction generally parallel to said axis, said spacers being positioned apart from one another about the circumference of said terminal portion, each of said spacers having an aperture extending therethrough generally parallel to said axis, each of said spacer apertures being in alignment with a corresponding one of said apertures of said flange portion;

(c) a first annular ring contacting said plurality of spacers in a direction generally parallel to said axis, said first ring having a plurality of apertures extending therethrough generally parallel to said axis, said apertures of said first ring being spaced apart from one another about the circumference of said first ring and being in alignment with said apertures of said terminal portion;

(d) a second annular ring having a plurality of apertures extending therethrough generally parallel to said axis, said apertures of said second ring being spaced apart about the circumference of said second ring and being in alignment with said apertures of said flange portion, each of said apertures of said second ring being enlarged at its end distal said centerplane;

(e) an annular resilient shield interposed between said first and second rings, said shield extending radially outwardly of said axis from said first ring; and

(f) removable fastening means passing through said aligned apertures of said elements in a direction generally parallel to said axis;

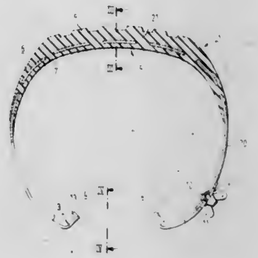
there being provided between said terminal portion and first annular ring a plurality of radially extending passages for removal of material accumulating during operation.

4,235,272

SNOW ANTI-SKID DEVICE FOR A MOTOR VEHICLE WHEEL

Walter Landsrath, Riottestrasse 7, 6600 Saarbrücken, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,479
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1978, 2806419; Jul. 19, 1978, 2831809
Int. Cl.³ B60C *27/00*
U.S. Cl. 152—213 R **15 Claims**



1. An anti-skid device for mounting on a wheel comprised of a wheel rim and a tire, said device comprising:

a yoke having a central section for engaging the tread face of said tire;

a pair of limb means, one each extending outwardly from each of the opposite ends of said central section, each of said limb means being arcuately bendable and having a free end; and

magnetic attachment means secured to each of said free ends for engaging the shoulder of said wheel rim so that when said device is mounted on said wheel, said limb means yield to forces acting in the radially inward direction upon said central section of said yoke in order to not transmit said force to said magnetic attachment means, at least one of said attachment means including a magnetic claw means having a portion which extends beyond the width of said limb means so that when a force acts upon said central section in a substantially circumferential direction, the width of said at least one magnetic claw means acts against said wheel rim to prevent tilting of said yoke to preserve the placement of said device upon said wheel.

12. An anti-skid device for mounting on a wheel comprised of a wheel rim and a tire, said device comprising:

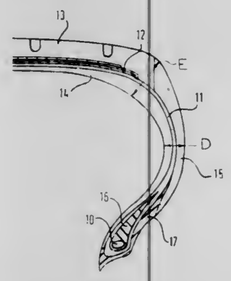
a yoke having a central section for engaging the tread face of said tire;
a pair of limb means, one each extending outwardly from each of the opposite ends of said central section, each of said limb means being arcuately bendable and having a free end; and
magnetic attachment means secured to each of said free ends for engaging the shoulder of said wheel rim, so that when said device is mounted on said wheel, said limb means yield to forces acting in the radially inward direction upon said central section of said yoke in order to not transmit said force to said magnetic attachment means, at least one of said attachment means comprises a claw element having two, spaced apart plates of a magnetizable material with at least one elongated magnet disposed therebetween so that its poles lie on opposite plates, said plates extending parallel to the plane of the yoke, so that when a force acts upon said central section in a substantially circumferential direction, the width of said at least one claw element securely grips said wheel rim at spaced apart locations to preserve the placement of said device upon said wheel.

4,235,273

PNEUMATIC TIRES

Reginald H. Edwards, Sutton Coldfield, and John A. Holdsworth, Redditch, both of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 681,039, Apr. 28, 1976, abandoned, which is a continuation of Ser. No. 515,245, Oct. 16, 1974, abandoned. This application Dec. 8, 1977, Ser. No. 858,795
Claims priority, application United Kingdom, Oct. 20, 1973, 48981/73
Int. Cl.³ B60C 17/00
U.S. Cl. 152—330 RF **5 Claims**



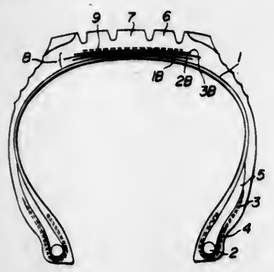
1. A pneumatic tire for use in a lubricated tire and wheel assembly capable of operation in a totally deflated condition which comprises a tread, braced by a breaker assembly, sidewalls and beads; said sidewalls hving smooth continuous interior and exterior surfaces and being arcuate throughout their extent and extending radially and axially outwardly from the beads to the region of maximum width of the tire, substantially midway between the beads and shoulder, then curving axially inwardly from that region and terminating at the shoulder, the sidewall rubber having a hardness between 45 and 65 Shore A and a rebound resilience of at least 85% measured at 50° C. by the Dunlop Pendulum method; a reinforcing carcass in the sidewalls, said carcass having cords extending in substantially radial planes, the width of said tread being at least 35% greater than the distance between the heels of the beads of the tire when inflated, the sidewalls each having, at their thinnest point, a thickness of at least 5% but not more than 10% of the overall width of the tire, at least 25% of said sidewall thickness consisting of rubber on the interior of the carcass of the tire, the tire having an aspect ratio, when inflated, of less than 75% and the part of the sidewall which is thinnest being immediately adjacent to the region of maximum width of the tire and having in that region substantially equal thicknesses of rubber on each side of the carcass, the thickness of the sidewall increasing from there towards the tire shoulder, at least 25% of the thickness of the sidewall in the entire region of the sidewall between the thinnest part of the sidewall and the tire shoulder comprising rubber on the inside of the tire carcass cords such that the carcass plies are positioned at or close to the center of the sidewall throughout said entire region.

4,235,274

TREAD REINFORCING CONSTRUCTION OF PNEUMATIC RADIAL TIRE FOR HEAVY-LOAD VEHICLES

Yasuo Suzuki, Akigawa; Masaru Abe, Kodaira, and Toshiro Tezuka, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 768,449, Feb. 14, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 237
Claims priority, application Japan, Feb. 13, 1976, 51/14542
Int. Cl.³ B60C 9/18
U.S. Cl. 152—354 R **9 Claims**



1. A tread reinforcing construction of a pneumatic radial tire, comprising a rubberized carcass ply composed of cords embedded therein and arranged substantially parallel with the radial direction of the tire, a rubberized belt superimposed about said rubberized carcass ply and arranged at a crown portion of the tire, said rubberized belt being composed of a plurality of metal cord plies each formed of conventional steel cords embedded therein and having a high rigidity in the circumferential direction, the width of said belt being greater than the width of the center portion of said tread portion, and at least one additional rubberized reinforcing layer interposed between said belt and a tread rubber portion, said reinforcing layer composed of a reinforcing element embedded therein and formed of a bundle of at least two helically formed filaments assembled together without twisting at random, said reinforcing element having a cord angle of between 10 degrees and 75 degrees, each of said helically formed filaments being made of steel, said reinforcing element having an elongation at tensile breaking strength which is at least 1.2 times larger than the smallest elongation at breaking strength of the metal cord plies constituting a main layer of said belt, and said additional reinforcing layer as a whole having a rigidity in the circumferential direction which is smaller than that of said belt.

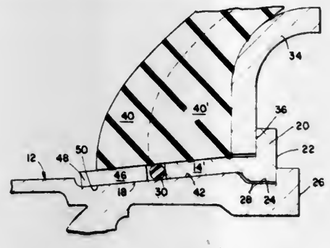
4,235,275

RIM CONSTRUCTION FOR TROUBLE-FREE TIRE MOUNTING

Charles C. Sons, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1978, Ser. No. 949,321
Int. Cl.² B60B 25/10; B60C 25/12
U.S. Cl. 152—410 **6 Claims**

1. A tire arrangement, comprising:
a cylindrically symmetrical rim base;
a circular bead seat band structure having an axially extending slot therethrough, said band structure having an inner cylindrically symmetrical surface fitting matingly against said base and a flange extending outwardly radially from a first end thereof;
means supported by said base for preventing said band structure from sliding off of said base;
an elastomeric ring fitting over and in contact with said base, said elastomeric ring fitting against a second end of said band structure;
a retainer ring fitting over said band structure and having an inner portion abutting against said flange;



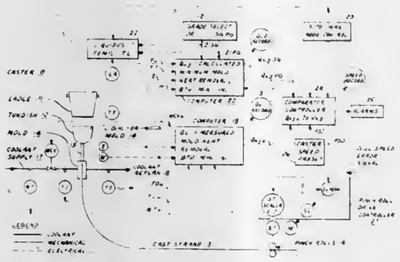
a tire having a bead portion thereof in contact with said band structure, said elastomeric ring and said retainer ring;
an auxiliary circular seat band structure having an axially extending slot therethrough, said auxiliary band structure having an inner cylindrically symmetrical surface fitting against said base on an opposite side of said elastomeric ring from said first mentioned band structure, said tire bead portion contacting said auxiliary band structure.

4,235,276

METHOD AND APPARATUS FOR CONTROLLING CASTER HEAT REMOVAL BY VARYING CASTING SPEED

Herbert L. Gilles, and Johnson Shipman, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 16, 1979, Ser. No. 30,580
Int. Cl.³ B22D 11/16
U.S. Cl. 164—4 **24 Claims**



1. A method of controlling heat removal from a continuous metal caster having cooling means for solidifying strand casting and variable drive means with a presetable feedback loop for controllably withdrawing the strand as cast, the method which comprises:
(a) determining actual heat removal rate QL_{1i} of the cooling means during strand casting;
(b) determining a calculated minimum level of heat removal rate according to either:

$$QL_2 = \left[k_2 + \frac{C_p \times \Delta T_2 \times w \times t \times \rho}{3456\,(w + t)} \right] S = \text{BTU/min./in.}$$

or

$$QA_2 = k_2 + \frac{C_p \times \Delta T_2 \times w \times t \times \rho}{3456\,(w + t)} = \text{BTU/in.}^2$$

where:
k_2 = predetermined constant
C_p = liquid specific heat = BTU/# per °F. = 0.19
ρ = density, #/ft.³
S = speed, inches per min. (IPM)
t = slab thickness or narrow face of mold, inches
ΔT_2 = superheat above liquid temperature, = TT-TL, °F.
TL = Liquidus temperature, °F.
TT = Tundish temperature, °F.
w = slab width or wide face of mold, inches, as required of the cooling means to prevent strand breakout during casting;
(c) comparing outputs from only step (a) with step (b) and as a result generating a speed error signal according to either:

$$\Delta QL = QL_{1i} - QL_2 \geq 0$$

No speed corrective action needed, or

$$\Delta QL = QL_{1i} - QL_2 < 0$$

Take speed corrective action,

based on a predetermined difference between the actual and calculated heat removal rates; and
(d) modifying the preset speed of the caster drive means as a function of only the speed error signal so that the actual heat removal rate will exceed the calculated minimum level thereof.

13. Apparatus for controlling heat removal from a continuous metal caster having cooling means for solidifying strand casting and variable drive means with a presetable feedback loop for controllably withdrawing the strand as cast, the apparatus comprising:
(a) first plural means for determining actual heat removal rate QL_{1i} of the cooling means during strand casting;
(b) second plural means for determining a calculated minimum level of heat removal rate according to either:

$$QL_2 = \left[k_2 + \frac{C_p \times \Delta T_2 \times w \times t \times \rho}{3456\,(w + t)} \right] S = \text{BTU/min./in.}$$

or

$$QA_2 = k_2 + \frac{C_p \times \Delta T_2 \times w \times t \times \rho}{3456\,(w + t)} = \text{BTU/in.}^2$$

where:
k_2 = predetermined constant
C_p = liquid specific heat = BTU/# per °F. = 0.19
ρ = density, #/ft.³
S = speed, inches per min. (IPM)
t = slab thickness or narrow face of mold, inches
ΔT_2 = superheat above liquid temperature, = TT-TL, °F.
TL = Liquidus temperature, °F.
TT = Tundish temperature, °F.
w = slab width or wide face of mold, inches, as required of the cooling means to prevent strand breakout during casting;
(c) third means for comparing outputs from only means (a) with means (b) and as a result generating a speed error signal according to either:

$$\Delta QL = QL_1 - QL_2 \geq 0$$

No speed corrective action needed, or

$$\Delta QL = QL_1 - QL_2 < 0$$

Take speed corrective action,
based on a predetermined difference between the actual and calculated heat removal rates; and

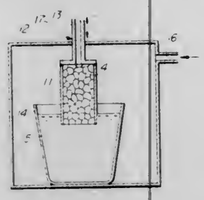
(d) said third means including control means for modifying the preset speed of the caster drive means as a function of only the speed error signal so that the actual heat removal rate will exceed the calculated minimum level thereof.

4,235,277

METHOD OF FORMING THREE-DIMENSIONAL NETWORK POROUS METALLIC STRUCTURE HAVING CONTINUOUS INTERNAL CAVITY

Tatsushi Aizawa, Chiyodamura; Tatsuo Natori, Kashiwa; Masakatsu Hayashi, Ushikumachi, and Takeo Tanaka, Minorimachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 27, 1978, Ser. No. 946,339
Claims priority, application Japan, Dec. 16, 1977, 52-150563
Int. Cl.³ B22D *25/02, 18/04*
U.S. Cl. 164—36 **7 Claims**



1. A method of forming a three-dimensional network porous metallic structure having a continuous internal cavity, comprising the steps of: preparing a three-dimensional network pattern made of a resin; filling the internal cavity of said pattern with a mold-forming material; extinguishing said pattern to form a mold having a three-dimensional network cavity; placing a molten metal reservoir, containing molten metal, in a pressure vessel; bringing a portion of said mold into contact with said molten metal held in the reservoir located in said pressure vessel, said mold being held in a holding device which has a passageway which is in communication with said mold and extends external to said pressure vessel, said holding device enclosing said mold except for said portion of said mold and the part of the mold in communication with the passageway; raising the pressure in said pressure vessel to 2 atmospheres to thereby raise the pressure on the molten metal in the molten metal reservoir so as to feed said molten metal by pressure into the internal cavity of said mold; and removing said mold after the solidification of said metal in the internal cavity of the mold.

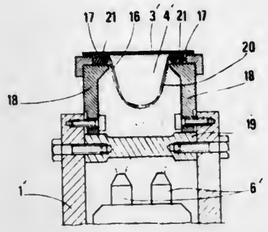
4,235,278

RING FOR A CASTING MACHINE WHEEL

Marc Delatte, St. Cloud, and Philippe Chevalier, Champigny-sur-Marne, both of France, assignors to Aluminum Pechiney, Lyons, France

Filed Dec. 4, 1978, Ser. No. 965,926
Claims priority, application France, Dec. 22, 1977, 77 39910
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—433 **8 Claims**

1. In a continuous casting machine of the wheel and band type, the improvement wherein said wheel includes a pair of axially spaced apart circular flanges, a deformable thin metal ring the lateral edges of which overlap at least a portion of the flanges with the portion of the metal ring in between the lateral edges defining a mold groove located between said flanges, a circular joint of flexible material disposed on each of the portions of the flanges overlapped by said lateral edges whereby a circular joint is disposed between each flange portion and overlapping edge to effect a joinder therebetween, the band of the casting machine engaging said overlapping edges, and said



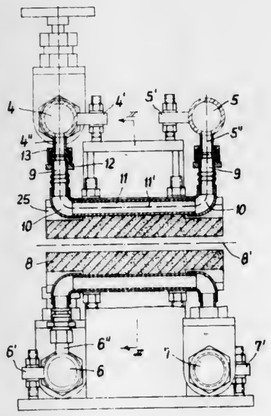
joinder being effected in response to pressure applied by the circular joints to define said mold groove between the band and the portion of the ring between the flanges, while enabling relative movement between the overlapping portions of the ring and the flanges.

4,235,279

APPARATUS FOR COOLING A CONTINUOUS CASTING MOLD

Peter Feuchter, Oberhausen; Ulrich Katschinski, and Erling Roller, both of Essen, all of Fed. Rep. of Germany, assignors to Fried. KRUPP Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 918,706
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2728993
Int. Cl.³ B22D *11/24*
U.S. Cl. 164—443 **5 Claims**



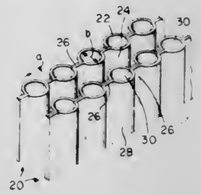
1. An apparatus for continuous casting of metal comprising:
a graphite mold block having a molding chamber extending in a first direction therethrough;
a base;
means for supporting the graphite mold block in fixed relation with respect to the base;
a cooling system disposed exterior of the graphite mold block;
means for supporting the cooling system exterior of and separately from the graphite mold block;
the cooling system comprising:
a plurality of cooling pipes extending in the same direction as the molding chamber, each pipe having an inlet at one end and an outlet at the other end;
cooling fluid feeding means;
cooling fluid discharge means, and
expandable compensator joints connecting the inlets of the cooling pipes to the fluid feeding means and for connecting the outlets of the cooling pipes to the discharge means, said expandable compensating joints also supporting the cooling pipes adjacent the graphite mold block, whereby upon supplying cooling fluid at a static pressure sufficient to expand the expandable compensating joints, the cooling pipes are urged into abutment with the graphite mold block and remain in abutment regardless of expansion and contraction due to thermal gradients and variations.

4,235,281

CONDENSER/EVAPORATOR HEAT EXCHANGE APPARATUS AND METHOD OF UTILIZING THE SAME

Robert E. Fitch, Kent, and Clifford R. Perry, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1978, Ser. No. 894,253
Int. Cl.³ F28B *9/04*; F28D *3/04*; F28F *3/12*
U.S. Cl. 165—1 **7 Claims**



1. A method of accomplishing heat exchange between a first liquid medium and a second vaporized medium which is to be condensed by being placed in heat exchange relationship with said first liquid medium, said method comprising:

a. providing a heat exchange apparatus having a heat exchange section with a vertical axis, a horizontal "X" axis, and a horizontal "Y" axis perpendicular to the "X" axis, said heat exchange section comprising a plurality of heat exchange panel units, each of said panel units having an upper end and a lower end, and comprising:

1. a pair of thin film sheets having inner and outer surfaces and aligned with one another along said vertical axis and said horizontal "X" axis, said sheets being joined to one another at their inner surfaces along a plurality of vertically extending bond line portions spaced from one another at generally regular intervals along said horizontal "X" axis,

2. said pair of sheets defining therebetween a plurality of vertical tubular condensing chambers adapted to receive said pressurized gaseous condensing medium therein, each chamber in its pressurized condition being defined by inner surfaces of two single thickness sheet portions of said two sheets, and each chamber being separated from an adjacent chamber of the same panel unit by a related double thickness bond line portion of the two sheets,

said panel units being aligned generally parallel to the vertical axis and the "X" axis, said panel units being positioned adjacent one another and spaced from one another at geneally regular intervals along the "Y" axis so as to provide pairs of adjacent panel units, each pair of panel units defining therebetween an evaporating area,

b. directing said vaporized heat exchange medium under pressure into said condensing chambers,

c. directing said liquid evaporating medium as falling films onto the outer surfaces of the panel units at the upper end thereof,

whereby said liquid medium is placed in heat exchange relationship with said gaseous medium across the single thickness portion defining the condensing chambers,

said method being further characterized in that:

a. said sheets are made of a thin film plastic material having a thickness dimension between 0.0005 to 0.010 inch,

b. the bond line portions of each of the panel units have a width dimension between about 0.02 to 0.40 inch,

c. the diameter of each of the condensing chambers is between about 0.25 to 2.0 inch, and

d. said panel units are spaced from one another along said "Y" axis between about 0.20 to 3.0 inches.

4,235,280

SPRAY NOZZLE FOR COOLING A CONTINUOUSLY CAST STRAND

Jimmy L. Helms, Ridgewood, N.J., and Richard J. Tegtmeier, Pound Ridge, N.Y., assignors to Concast Incorporated, Montvale, N.J.

Filed Jan. 22, 1979, Ser. No. 5,414
Int. Cl.³ B22D *11/124*
U.S. Cl. 164—444 **6 Claims**



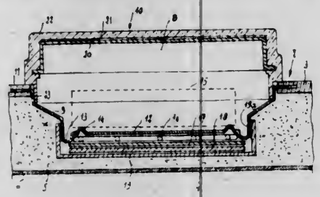
1. A continuous casting installation comprising:
(a) an open-ended mold having a non-horizontal casting passage for forming a continuously cast strand;
(b) a zone, defined by cooling means for cooling a strand emerging from said mold and passing through said zone, located outside of said mold which zone curves along on arcuate path towards the horizontal and is arranged to receive the strand formed in said mold;
(c) conveying means associated with said zone for conveying the strand through said zone; and
(d) said cooling means defining said zone supplying cooling fluid to said zone so as to cool the strand, said cooling means including at least one nozzle provided with a slot-like opening defined by a portion of said nozzle for providing cooling fluid to said zone, and at least a portion of said opening being arcuate, said portion of said opening being formed so as to produce a curved spray pattern, and said nozzle being located laterally of said zone and being arranged such that the spray pattern emitted via said arcuate portion of said opening at least approximately follows the curvature of said zone, said zone having a first radius of curvature and said arcuate portion of said opening having a second radius of curvature, and the ratio of said second radius of curvature to said first radius of curvaturebeing substantially smaller than unity.

4,235,282

HEATING AND REFRIGERATING TRAY CABINET FOR DISTRIBUTING HOT AND COLD DISHES

Modeste de Filippis, 11 Ave. Felix Faure, Lyons 7eme, Rhone, and Jean Rollet, "Les Vignes", Dardilly, Rhone, both of France

Filed Jan. 3, 1978, Ser. No. 866,285
Claims priority, application France, Dec. 31, 1976, 76 39877; Dec. 1, 1977, 77 36933
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—61 **27 Claims**



12. A tray cabinet comprising:
a refrigerating device to pump refrigerated air into shelving capable of receiving removable trays;
at least one removable tray;
means for individually heating at least one thermally-insulated space formed in said trays;
each said tray comprising an upper plate of molded plastic material forming cavities in which food or other articles may be placed, and a lower plate of molded plastic material and welded to said upper plate all around the base of said tray;
said lower plate of said tray having at least one hole therein through which a foam generating mixture is injected so that foam expands in place, adheres strongly to the internal faces of said plates, and solidifies, completely filling the enclosed space formed between said two plates;
each tray comprising a heating space formed between a stainless metal shell of which the periphery is embedded in the thickness of said upper plate, said upper plate being injection-molded, and a detachable insulating cover engageable in said metal shell; and
said base of said metal shell of each tray being covered externally, in order, by a flat heating element covered in insulation, by a stainless metal plate fixed to the bottom of said metal shell, by a layer of ceramic fiber, and finally by a shield which is fixed all around said metal shell, said element being held pressed against the base of said metal shell by said metal plate.

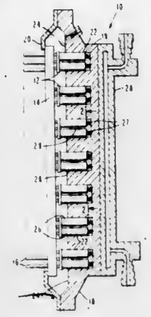
4,235,283

MULTI-STUD THERMAL CONDUCTION MODULE

Omkarnath R. Gupta, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,635
Int. Cl.³ H01L *23/42*
U.S. Cl. 165—80 C **9 Claims**

1. A thermal conduction module for removing heat from one or more chips located therein comprising:
a housing made of heat conductive material forming a cap over the chips;
one or more openings in said housing extending perpendicular from the surface facing the chips, one opening opposite each of the chips;
more than one heat conductive element in each of said openings free to move independently in a lengthwise direction with respect to said heat conductive element within said opening;
end spring means located in each opening for applying lengthwise force to each of said heat conductive elements so that the end of each heat conductive element opposite said spring end contacts the adjacent chip to lower the thermal resistance of the interface between the chip and the heat conductive element; and
side spring means located between sides of adjacent heat



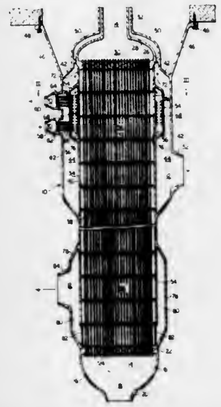
conductive elements forcing them away from one another and into contact with said opening wall to thereby lower the thermal resistance between said heat conductive elements and the opening walls.

4,235,284

HEAT EXCHANGER WITH AUXILIARY COOLING SYSTEM

John H. Coleman, Salem Township, Westmoreland County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1976, Ser. No. 751,430
Int. Cl.² F28F *9/00*
U.S. Cl. 165—141 **2 Claims**



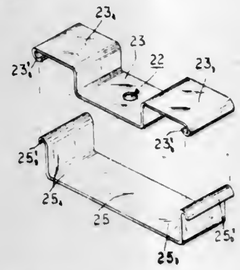
1. A heat exchanger comprising:
vertically arranged first heat transfer tubes;
a secondary coolant flowing through said first heat transfer tubes;
a housing surrounding said first heat transfer tubes and having first openings near the top thereof;
a shroud surrounding the upper portion of said housing;
a primary coolant flowing upwardly through said shroud, through said first openings, and downwardly within said housing passing in heat transfer relationship with said first heat transfer tubes; and
an auxiliary cooling means disposed in fluid communication with the downward flow of said primary coolant for cooling said primary coolant thereby increasing the natural circulation of said primary coolant.

4,235,285

SELF-FASTENED HEAT SINKS

Philip A. Johnson, Melrose, Mass., and Alfred F. McCarthy, Belmount, N.H., assignors to Aavid Engineering, Inc., Laconia, N.H.

Division of Ser. No. 882,364, Mar. 1, 1978, Pat. No. 4,203,488. This application Oct. 29, 1979, Ser. No. 89,022
Int. Cl.³ H01L *23/40*
U.S. Cl. 165—80 B **2 Claims**



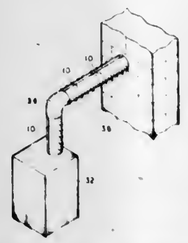
1. Self-fastened heat-sink apparatus comprising first and second broad-area metal heat-transfer elements each having a broad-area side shaped to abut closely with one of two oppositely-disposed spaced surfaces of a body from which heat is to be withdrawn and dissipated, each of said elements having first and second connection means each integral therewith and projecting therefom substantially in opposite directions from laterally-opposite edges thereof, said elements and connection means being of sheet metal, the first connection means and the second connection means of both of said elements each being separable and disposed respectively as cooperating halves of a clasp which locks and orients said elements toward one another for abutting and holding engagements of the broad-area sides thereof with the spaced surfaces of a body therebetween, said first and second connection means each including two separate parallel clasp parts partly rolled outwardly and inwardly, respectively, from two different elongated projections from edges of said first and second heat-transfer elements, said clasp parts being open to receive and catch with one another in pawl-like fashion when said elements are moved toward one another to produce said abutting engagements, said connection means exhibiting resilience and resiliently urging said elements toward one another for said abutting and holding engagements, whereby said elements are separable to accommodate insertion of a body therebetween and may then be clasped and locked together by way of said clasp parts while maintaining resilient abutting engagements with surfaces of the body therebetween.

4,235,286

HEAT RECLAIMING FLUE PIPE

Adolph Behlau, 331 Monroe Ave., Cherry Hill, N.J. 08002

Filed Mar. 9, 1979, Ser. No. 19,307
Int. Cl.³ F28D *7/02*
U.S. Cl. 165—164 **1 Claim**



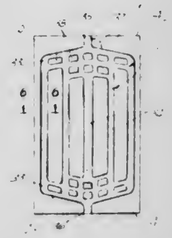
1. A heat reclaiming flue pipe comprising:
a cylindrically shaped sheet metal flue pipe section of standard diameter and length, said sheet metal flue pipe section being comprised of a substantially flat piece of sheet metal rolled into cylindrical form and including means adjacent the edges of said piece for maintaining the same in cylindrical form;
a first end of said flue pipe section having a diameter substantially equal to the major portion of said section and the second end thereof being of reduced diameter adapted to fit within the first end of a similarly constructed flue pipe section;
a plurality of substantially circular holes formed in said flat piece of sheet metal, said holes being arranged such that for each hole there is a complementary hole in axial alignment therewith but located one hundred eighty degrees therefrom, and
a plurality of cylindrically shaped metal pipes, each of said metal pipes being located between one of said holes and one of said complementary holes and being in substantial alignment with the others of said pipes, said metal pipes being substantially hollow and being open at each end but otherwise having solid cylindrical walls with no openings therein, the outer diameter of each of said pipes being substantially equal to the diameter of said holes so that said pipes may be force fit into said holes and securely held by said sheet metal around said holes, the length of said pipes being greater than the diameter of said flue pipe section so that the ends of said pipes extend outside of said flue pipe section, whereby hot gases and smoke passing through the flue pipe heats the metal pipes which in turn heats the air within the metal pipes which passes therefrom to heat the room wherein the flue is located.

4,235,287

HEAT EXCHANGE PANEL

Charles A. Kleine, Florissant, Mo., and Verne L. Middleton, East Alton, Ill., assignors to Olin Corporation, New Haven, Conn.

Filed May 2, 1975, Ser. No. 573,953
Int. Cl.³ F28F *3/14*; F24J *3/02*
U.S. Cl. 165—170 **8 Claims**



1. A metal panel having a desired system of internal tubular passageways for a heat exchange medium disposed between spaced apart portions of the thickness of said panel, said passageways defining opposed headers connected by connecting portions of said passageways extending therebetween, wherein said heat exchange medium flows from header to header through said connecting portions, said headers having entry and exit portions extending therefrom to opposed edges of said panel to provide ingress and egress openings for said heat exchange medium, said entry and exit portions intersecting each respective header at the center thereof, said entry and exit portions having a central axis, wherein said headers include a plurality of portions of said metal which are bonded together to provide interruption in the flow of said heat exchange medium and wherein said headers possess outer edges defining the perimeter thereof adjacent the entry or exit portions, respectively, extending therefrom, and wherein the apex of the perimeter of at least one of said outer edges defines an external angle of at least 91° and less than 100° with respect to the

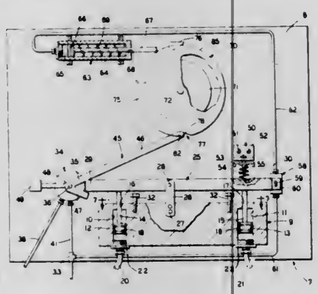
central axis of said entry and exit portions, respectively, to provide uniform fluid distribution and enable efficient drainage of fluid from the heat exchanger, wherein a plurality of said panels are connected by a common manifold communicating with the entry portions of each of said panels for distributing said heat exchange medium into said panels and a common collection manifold communicating with the exit portions of each of said panels for collection of said heat exchange medium from each of said panels.

4,235,288

WELL PUMPING CONTROL SYSTEM

Willie L. Watson, Fredericksburg, Ohio, assignor to Multi-Products Co., Millersburg, Ohio

Filed Sep. 22, 1978, Ser. No. 944,889
Int. Cl.³ E21B 29/02
U.S. Cl. 166—64 **28 Claims**



1. A system for automatically operating a fluid delivery control valve in a gas well including:
(a) beam means pivotally mounted for movement between actuating and deactuating positions;
(b) first piston means operatively engageable with the beam means for moving said beam means between the actuating and deactuating positions, said first piston means being operatively connected to the well and operated by and in relationship to pressures developed within the well;
(c) first valve means movable between open and closed positions by the beam means, the first valve means being adapted to be operatively connected to the fluid delivery control valve for operating said control valve in response to operation of said first valve means by the beam means;
(d) timer means;
(e) link means operatively engageable with the timer means, with the first valve means, and with the beam means, said link means being actuated by the beam means for controlling said timer means;
(f) second piston means operatively engageable with the timer means and actuating the timer means when the beam means moves from deactuating to actuating positions; and
(g) the link means deactuating the timer means and permitting the first valve means to move to closed position after a predetermined time period, whereupon the fluid delivery control valve is deactuated by the first valve means upon closing of the first valve means to stop the flow of fluid from the well.

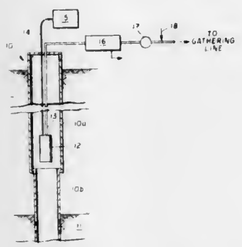
4,235,289

METHOD FOR PRODUCING CARBON DIOXIDE FROM SUBTERRANEAN FORMATIONS

Robert F. Weeter, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 10, 1979, Ser. No. 38,034
Int. Cl.² E21B 43/16
U.S. Cl. 166—267 **8 Claims**

1. A method for producing carbon dioxide in a single phase state at the surface from a subterranean formation through a well completed into said formation, said method comprising:
boosting the pressure of said carbon dioxide at a depth in said well to a value sufficient to allow the pressure of said



carbon dioxide to be reduced by an amount equal to the static fluid head and friction loss in the well above said depth and still produce said carbon dioxide at the surface at a pressure greater than the critical pressure of the produced carbon dioxide.

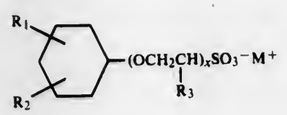
4,235,290

LIGNOSULFONATES AS ADDITIVES IN OIL RECOVERY PROCESSES INVOLVING CHEMICAL RECOVERY AGENTS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 850,114, Nov. 10, 1977, Pat. No. 4,157,115, and Ser. No. 591,573, Jun. 30, 1975, abandoned, and Ser. No. 715,957, Aug. 19, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,585
The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.
Int. Cl.³ E21B 43/22
U.S. Cl. 166—273 **4 Claims**

1. A method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein aqueous solutions of surfactant and polymer are injected into the subterranean formation comprising:
(a) injecting through the injection well into the formation an aqueous solution of lignosulfonates,
(b) then injecting into the formation via the injection well an aqueous surfactant solution comprising alkyl benzene alkoxylated sulfonates having the following general formula:



(I)

where
R_1 and R_2 are hydrogen or alkyl with at least one being an alkyl group of from 6 to 20 carbon atoms,
x is a number from 1 to 10,
M^+ is a cation selected from the group consisting of lithium, sodium, potassium, ammonium and
R_3 is either $-CH_3$ or hydrogen also containing lignosulfonates of steps (a) and (b) being present in amounts effective for reducing the extent of adsorption of surfactant and polymer by the formation matrix,
(c) subsequently injecting into the formation via the injection well a solution of polymer and
(d) producing oil from the formation via the production well.

4,235,291

TREATING WELLS TO MITIGATE FLOW-AFTER-CEMENTING

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 796,912, May 16, 1977, Pat. No. 4,120,360. This application Oct. 16, 1978, Ser. No. 951,436
The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.
Int. Cl.³ E21B 33/138, 33/14
U.S. Cl. 166—292 **5 Claims**

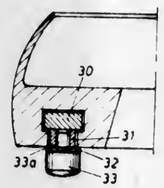
1. A method of cementing a well that penetrates the earth, comprising the steps of:
(a) blending hydraulic cement with water swellable clay, said clay being present in an amount within the range of 0.05 to 2.0 weight percent based on cement and water to form a pumpable thixotropic cement slurry that exhibits essentially zero water separation at downhole conditions;
(b) injecting said slurry down said well; and
(c) maintaining said slurry in said well to allow said slurry to set.

4,235,292

HOOF COVERING

Helmuth Dallmer, No. 25, Wiebelsheidestrasse, 5760 Arnsberg 1, Fed. Rep. of Germany

Filed Apr. 11, 1979, Ser. No. 28,936
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 2902189
Int. Cl.³ A01L 1/04, 7/04
U.S. Cl. 168—4 **6 Claims**



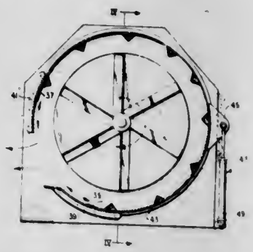
1. A hoof covering for horses comprising:
(a) a horseshoe-shaped steel yoke of predetermined configuration conforming to the arcuate shape of a hoof of a horse and having a predetermined thickness;
(b) a horseshoe-shaped plastic body formed integrally of wear-resistant plastic material, said plastic body having a lower side with a substantially planar tread surface, a planar upper surface which serves as a support for the hoof and an upwardly extending side wall disposed about at least a major portion of said horseshoe-shaped plastic body and capable of being bent into the desired shape for mounting the hoof covering on the hoof by adhesive means, said lower side of said plastic body defining a horseshoe-shaped groove opening into said substantially planar tread surface, said groove having a depth greater than said predetermined thickness of said horseshoe-shaped steel yoke;
(c) said horseshoe-shaped steel yoke of predetermined configuration being positioned in said horseshoe-shaped groove of said plastic body;
(d) means for retaining said horseshoe-shaped steel yoke in said horseshoe-shaped groove of said plastic body; and
(e) a plurality of calks secured to said steel yoke at spaced intervals and projecting beyond said substantially planar tread surface of said plastic body.

4,235,293

SELF-CLEANING FAN HOUSING

Malcolm P. Ellis, Ashland, Me., assignor to Thomas Equipment Ltd., Centreville, Canada

Filed Jul. 16, 1979, Ser. No. 57,934
Claims priority, application Canada, May 17, 1979, 327818
Int. Cl.³ A01D 33/02
U.S. Cl. 171—17 **7 Claims**



1. A fan housing comprising two side plates and a scroll, angle elongated scraper members secured transversely between the side plates, the scroll resting on the scraper members and being slideably mounted on side plates, and a reciprocating actuator secured to the scroll such that upon operation of the actuator, the scroll is oscillated across the scraper members so dislodging deposit from the inside of the scroll.

4,235,294

SOIL CULTIVATING MACHINE

Bruno Barlage, Riesenbeck, Fed. Rep. of Germany, assignor to H. Neimeyer Sohne GmbH & Co. KG, Riesenbeck, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,726
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1978, 2835634
Int. Cl.³ A01B 33/00
U.S. Cl. 172—48 **5 Claims**



1. A machine movable in a given direction of travel for cultivating the soil comprising a main beam extending substantially horizontally and transversely with respect to the direction of travel of the machine; a tool shaft mounted parallel to and spaced below the main beam; a plurality of wobble bearings disposed spaced apart side-by-side on the tool shaft; a plurality of tool holders each supported on one of said wobble bearings and each comprising an upwardly extending lever arm guided for to-and-fro movement by the associated wobble bearing in a direction transverse to the direction of travel, each tool holder having a pair of bores which open towards the bottom and taper upwardly, wherein, in each pair of bores, the bores are disposed one behind the other in the direction of travel of the machine, with one bore disposed at a greater distance from the tool shaft than the other, the front bore in the direction of travel of the machine being situated in front of the tool shaft and the rear bore in the direction of travel of the machine being situated behind the tool shaft and the wobble

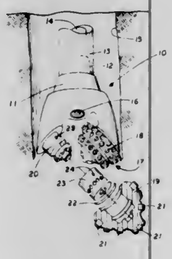
bearings of adjacent tool holders being respectively angularly offset from one another in the peripheral direction of shaft travel; a tine for each tool holder bore having an upwardly tapered end portion for insertion into the bore; and means for releasable fixing each tine in its bore comprising for each a threaded bore in the upper end portion of the tine, an aperture through the upper end of the tool holder and axially aligned with the threaded bore and a bolt received through the aperture and engageable in the threaded bore.

4,235,295

EARTH BORING BIT WITH RENEWABLE BEARING SURFACE

Steve W. Zyglewyz, De Soto, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 5, 1979, Ser. No. 17,677
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—371 **7 Claims**



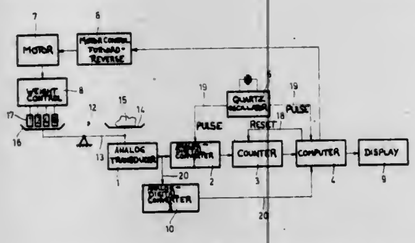
1. In an earth boring bit having a bit body with a bearing pin extending from said bit body and a rolling cutter mounted for rotation about said bearing pin, the improvement comprising:
a bearing element located between said bearing pin and said rolling cutter and
means for selectively locking said bearing element to one of said bearing pin and rolling cutter for selectively allowing said bearing element to rotate and be locked to one of said bearing pin and rolling cutter.

4,235,296

CONTROL CIRCUIT FOR THE SWITCHING MOTOR OF SELF-STABILIZING BALANCES

Erich Knothe, Bovenden; Franz-Josef Melcher, Hardegsen, and Franz Rossmann, Gottingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Jan. 29, 1979, Ser. No. 7,649
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2805989
Int. Cl.³ G01G *1/34, 7/00*
U.S. Cl. 177—204 **20 Claims**



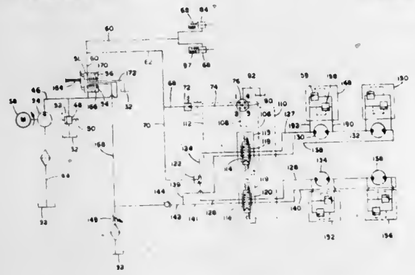
1. An automatic control circuit for a switching motor of an electomechanical, self-stabilizing balance having electromagnetic compensation and including an analog transducer which produces an analog measured value which is used to initiate operation of the switching motor whenever an upper or lower limiting value is exceeded and can be processed for display on a display, the control circuit comprising analog-to-digital converter circuit means coupled to said analog transducer and responsive to its output for producing high-speed coarse or preliminary information and fine information; computer means coupled to said analog-to-digital converter circuit means and responsive to its output for producing at least one switching signal in event at least one of the upper or lower limiting values is exceeded; and motor control circuit means coupled to said computer means and responsive to output thereof for producing signals to trigger said switching motor upon receipt of a switching signal from said computer means.

4,235,297

TWO-MAN UTILITY VEHICLE

Frank T. Porta, Charleston, W. Va., assignor to HPS Company, Inc., Charleston, W. Va.

Filed Mar. 22, 1979, Ser. No. 22,710
Int. Cl.³ B62D *11/04*; F15B *13/06*
U.S. Cl. 180—6.48 **7 Claims**



1. A hydraulically driven utility vehicle comprising:
a. hydraulically operated, reversible propulsion means on each side of said vehicle,
b. a source of pressurized hydraulic fluid contained on said vehicle,
c. a first hydraulic flow control valve coupled between said hydraulic source and said propulsion means on one side of said vehicle,
d. a second hydraulic flow control valve coupled between said hydraulic source and said propulsion means on the other side of said vehicle, and
e. a control stick hydraulically coupled to said first and second flow control valves for controlling vehicle speed and direction of steering by selectively positioning said first and second flow control valves whereby movement of said stick causes said flow control valves to proportionally direct hydraulic fluid from said source to said propulsion means to control speed and steering of said vehicle.

4,235,298

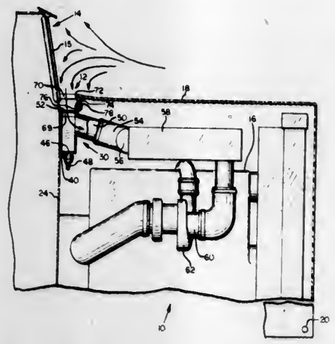
TRUCK OR TRUCK TRACTOR WINDSHIELD AIR RAM ARRANGEMENT

Roger W. Sackett, Beaverton, and Thomas R. Liethen, Portland, both of Oreg., assignors to Freightliner Corporation, Portland, Oreg.

Filed Feb. 28, 1979, Ser. No. 15,764
Int. Cl.³ B60K *13/02, 13/06*
U.S. Cl. 180—54 A **5 Claims**

1. In a truck or truck tractor,
a cab having a windshield,
a hood positioned forwardly of the windshield and spaced from the lower portion of the windshield to form an air entrance slot,
a trough mounted below the slot,

wipers mounted in said trough on either side of the centerline thereof,
said trough having a raised central portion formed with a pocket,



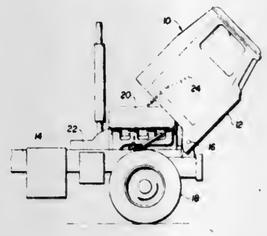
engine means having an air intake,
and filter means connecting the pocket to the air intake of the engine means.

4,235,299

GEAR SHIFT CONNECTING APPARATUS

Roy Reynolds, Waukesha, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 8, 1978, Ser. No. 931,994
Int. Cl.³ B62D *27/06*
U.S. Cl. 180—328 **7 Claims**



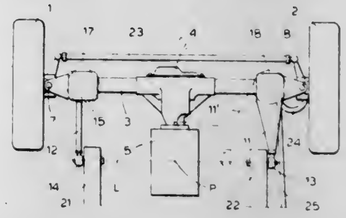
1. A gear shift connecting apparatus of the type operable to latch/release a gear shift rod of a tiltable tractor cab to a chassis portion of the tractor, said gear shift connecting apparatus comprises:
housing means operably mounted upon one of the gear shift rod of the tiltable tractor cab and the tractor chassis;
connection means operably mounted upon the other of the gear shift rod and the tractor chassis; and
hydraulically actuated connecting/release means mounted within said housing means for connecting the gear shift rod to the tractor chassis when the tractor cab is in a normal lowered position and releasing the gear shift rod from the tractor chassis when the tractor cab is raised in a tilted posture, said connecting/release means including,
a cylindrical sleeve means mounted within the interior of said housing means for operably receiving said connection means,
locking means carried within apertures fashioned radially through said cylindrical sleeve means for selectively engaging or releasing said connection means,
a locking/disabling sleeve telescopically surrounding said cylindrical sleeve means for operably retaining said locking means in an actuated position or permitting said locking means to become disabled and release from engagement with said connection means,
means for biasing said locking/disabling sleeve in a locking position,
an upper annular recess in the inner rim portion of said locking/disabling sleeve for permitting said locking means carried within said apertures to travel radially away from the central axis of said cylindrical sleeve means and out of engagement with said connecting means when said annular recess is axially brought into juxtaposition with said locking means, and
annular hydraulic chamber means between said cylindrical sleeve means and said locking/disabling sleeve for axially telescoping said locking/disabling sleeve with respect to said cylindrical sleeve means to selectively bring said annular recess into axial juxtaposition with said locking means and for permitting release of said locking means.

4,235,300

FRONT WHEEL SUSPENSION FOR ELECTRIC VEHICLES WITH FRONT WHEEL DRIVE

Jan W. Capjon, Spro, Norway, assignor to A/S Strømmeas Vaerksted, Strømmen, Norway

Filed Feb. 28, 1979, Ser. No. 16,212
Claims priority, application Norway, Mar. 17, 1978, 780969
Int. Cl.³ B60K *7/00*
U.S. Cl. 180—254 **7 Claims**



1. Front wheel suspension for electric vehicles with front wheel drive and steering, characterised by the combination of
at least two arms provided between a rigid front axle and frame members of the vehicle, at least one of said arms being articulated to the axle and all arms extending mainly horizontally from the axle and being connected to the frame members by means of ball joints,
a differential unit arranged at the central part of the axle between the arms,
an electromotor mounted directly on the differential unit and extending away from the axle as a cantilever mainly horizontally and in the same direction as the arms so that the centre of gravity of the motor is all the time lying substantially stationary on a line (L) through said ball joints, and
springs provided between the axle and the frame members.

4,235,301

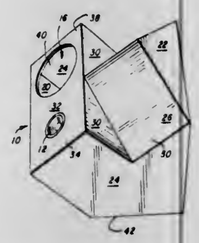
FOLDED COLUMN SPEAKER ENCLOSURE

Robert W. Mitchell, 707 Myrtle Ave., Saint Joseph, Mich. 49085

Filed Jun. 4, 1979, Ser. No. 45,337
Int. Cl.¹ H05K *5/00*
U.S. Cl. 181—148 **9 Claims**

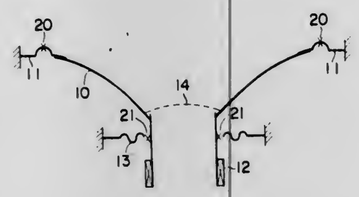
1. A loudspeaker enclosure device for reducing acoustical cancellation and enhancing the audible sound output connected to a source of audio signal and comprising:
a basic speaker responsive to said audio signal for emitting sound waves from the front surface of said speaker into a listening area and from the back surface of said speaker into said enclosure;

a substantially enclosed structure for defining a sound wave conduit, said structure comprising:
a bottom panel extending in a horizontal plane substantially parallel to the floor;
an end panel connected to said bottom panel and extending in a vertical plane substantially perpendicular to said bottom panel; said end panel having a speaker portion with a speaker opening for receiving said basic speaker and a port portion with a port opening for allowing sound waves emitted from said basic speaker into said structure to emerge from said structure;
a top panel extending in a horizontal plane in parallel spaced relation to said bottom panel;



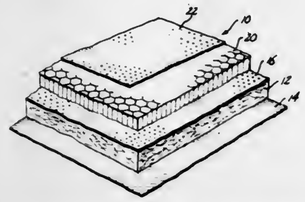
a shelf extending in a horizontal plane between and in parallel spaced relation to said bottom and top panels and connected to said end panel;
a pair of side panels extending in a vertical plane perpendicular to the plane of said end panel and connected to said bottom, top and end panels and said shelf; and,
a plurality of at least six reflector panels connected to said structure for reflecting and directing the sound waves emitted into said structure from said basic speaker along a wave path through said conduit from said basic speaker to said port opening so that the sound wave emitted from said port opening is phase shifted and additive to the sound wave emitted from the basic speaker into the listening area.

4,235,302
LOUDSPEAKER
Kenkichi Tsukamoto, 47, Koyamashimofusa-cho, Kita-ku, Kyoto-shi, Kyoto-fu, Japan
Filed Mar. 6, 1978, Ser. No. 883,986
Claims priority, application Japan, Mar. 15, 1977, 52/28408; Mar. 15, 1977, 52/28409; Jul. 13, 1977, 52-83938
Int. Cl.³ H04R 7/20
U.S. Cl. 181—172 **8 Claims**



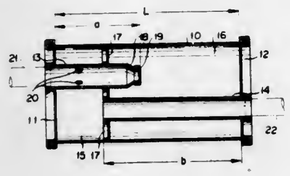
1. In a loudspeaker comprising a frame, a diaphragm assembly having a voice coil fixedly secured to a diaphragm of material possessing a given elastic hysteresis characteristic, and supporting means for supporting said diaphragm assembly from said frame, the improvement wherein at least part of said supporting means is of a material possessing an elastic hysteresis characteristic substantially lower than said given elastic hysteresis characteristic so as to minimize absorption of diaphragm vibrations by said supporting means and thereby increase the response of said diaphragm to any low amplitude signals applied to said voice coil, said supporting means being provided where said voice coil is fixedly secured to the diaphragm of said diaphragm assembly and further including an annular damper member between said frame and said material of substantially lower elastic hysteresis characteristic.

4,235,303
COMBINATION BULK ABSORBER-HONEYCOMB ACOUSTIC PANELS
Louis G. Dhoore, Seattle, and William H. Schultz, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Nov. 20, 1978, Ser. No. 962,714
Int. Cl.³ B64D 33/02; E04B 11/00
U.S. Cl. 181—214 **22 Claims**



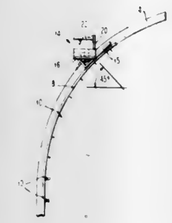
1. A combination bulk absorber-honeycomb acoustic panel comprising:
an impervious back sheet;
a perforated septum sheet;
a broadband noise-suppressing bulk absorber layer mounted between said back sheet and said septum sheet;
a perforated face sheet; and
a rigid noise-suppressing honeycomb layer mounted between said septum sheet and said face sheet.

4,235,304
MUFFLER
Eizo Suyama, Mitaka, Japan, assignor to Nihon Radiator Co., Ltd., Tokyo, Japan
Filed Aug. 25, 1977, Ser. No. 827,549
Claims priority, application Japan, Aug. 31, 1976, 51-115747[U]; Jan. 18, 1977, 52-3790[U]; Apr. 13, 1977, 52-45231[U]; Apr. 22, 1977, 52-45899[U]
Int. Cl.³ F01N 1/08
U.S. Cl. 181—265 **10 Claims**



1. A muffler having an exhaust gas in-flow tube adapted to be connected to an exhaust supply tube comprising:
a cylindrical body closed at opposite ends with end members;
said exhaust gas in-flow tube penetrating and being secured to one of said end members;
an exhaust gas out-flow tube penetrating and secured to the other end member; and
at least one perforated partition wall member for supporting both said tubes and dividing the interior of said body into sections;
said exhaust gas in-flow tube having an end portion closed with a porous body and communicating with one of the sections of the body interior through said porous body;
said exhaust gas out-flow tube being open at opposite ends, one of said ends communicating with another said section of the body interior;
at least one of said exhaust gas in-flow and out-flow tubes being provided in the peripheral wall thereof with a shunting hole; and said exhaust gas in-flow tube communicating with the interior of said muffler exclusively through said porous body and any shunting hole provided in the peripheral wall of said exhaust gas in-flow tube; wherein said exhaust gas in-flow tube is provided with a reduced-diameter throttling portion closed with said porous body comprised of a heat-resistant, continuous, porous cap fitted on said reduced-diameter portion.

4,235,305
SYSTEM FOR INSPECTING REINFORCING CABLES
Gunnar Nygren, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden
Continuation of Ser. No. 773,494, Mar. 2, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,014
Int. Cl.² E04G 3/16
U.S. Cl. 182—82 **17 Claims**



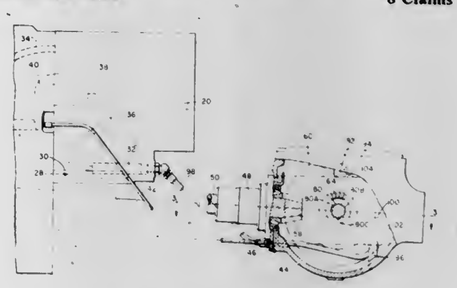
1. In association with a building comprising,
a dome,
pilasters extending downwardly from the top of said dome,
tubes extending circumferentially in the wall of said dome,
reinforcing cables extending in said tubes,
and anchoring means for said cables in connection with at least some of said pilasters;
a system for installing, tensioning, inspecting and post-tensioning said cables, comprising rail means mounted on the wall of said dome along each side of each pilaster having connection with said anchoring means, carriage means carried by and drivable on said rail means on each side of each pilaster, each carriage comprising, mounted thereon, drive means, working and inspecting platform means, and means for pivotally mounting said platform means on said carriage means to maintain said platform means in a horizontal position.

4,235,306
EMERGENCY ESCAPE DEVICE
Larry G. Ross, and Lyola J. Ross, both of P.O. Drawer Z, Burney, Calif. 96013
Filed Jan. 29, 1979, Ser. No. 7,030
Int. Cl.³ E06C 1/56; A62B 1/16
U.S. Cl. 182—100 **3 Claims**

1. Emergency building escape means comprising in combination: (1) elongated, length adjustable first support means suitable to be attached to a wall primarily within a window casement; (2) second support means slideably connected to said first support means in such manner as to be moveable over the width of the opening; (3) third support means comprising the combination of means to contact the exterior wall adjacent said window together with hand hold means attached thereto attached to said second support means; (3) third support means comprising an elongated flexible member fastened to said hand hold means and including means for gripping the same by human hands for the purpose of slow descent on the exterior of the building from said opening.



4,235,307
REMOTE TRANSMISSION LUBRICATION SYSTEM
Edgar P. Browning, Cedar Falls, and Terry L. Sturtz, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Oct. 27, 1978, Ser. No. 955,497
Int. Cl.³ F01M 1/08; F16H 1/44
U.S. Cl. 184—6.12 **8 Claims**



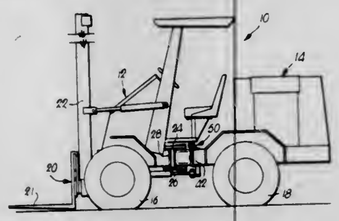
1. In a vehicle having a transmission including a fluid reservoir portion vented to exterior air and a gear carrying distally located portion, a fluid lubrication system comprising: fluid transfer means connected to said reservoir portion of said transmission and having an inlet for drawing a fluid-air mixture from said reservoir portion of said transmission and an outlet for output of the fluid-air mixture; first passage means connected to said outlet of said transfer means and to said distally located portion of said transmission for the passage of the fluid-air mixture from said transfer means into said distally located portion of said transmission; means sealing said distally located portion of said transmission from the exterior air; separator means disposed in said distally located portion of said transmission for separating the fluid-air mixture into fluid and air; and overflow passage means disposed in said separator means and connected to said reservoir portion of said transmission for substantially limiting the fluid to a predetermined height and to cause the fluid above the predetermined height to overflow thereinto to be returned to said reservoir portion of said transmission under the pressure of the air accumulating in said distally located portion of said transmission.

4,235,308
LOCKING BRAKE FOR ARTICULATED VEHICLE
Charles J. Davis, Afton, Okla., assignor to The General, Inc., Wichita, Kans.
Filed Jan. 11, 1979, Ser. No. 2,599
Int. Cl.³ B62D 53/00; B66F 9/06
U.S. Cl. 187—9 R **6 Claims**

1. In combination with a vehicle having a pair of sections

interconnected for relative rocking movement about a longitudinal generally horizontal axis with respect to the normal path of travel, a safety brake means comprising:

a brake for holding said sections against said rocking movement; and



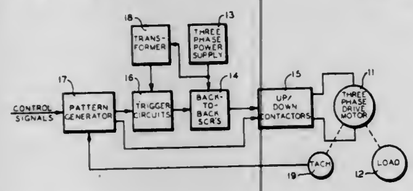
automatic means for temporarily actuating said brake in response to the existence of a certain predetermined condition involving said vehicle.

4,235,309

CONTROL FOR STARTING ELECTRIC MOTORS

Joseph W. Kuhl, Toledo, Ohio, assignor to Schindler Haughton Elevator Corp., Toledo, Ohio

Filed Oct. 18, 1978, Ser. No. 952,301
Int. Cl.³ B66B 1/30
U.S. Cl. 187—29 R **14 Claims**



1. In an elevator system including an electric drive motor, a source of electric power, means for generating a desired starting speed pattern signal, and means responsive to the pattern signal for connecting the power source to the drive motor to control the drive motor according to the desired starting speed pattern, the pattern signal generating means comprising:

a source of a signal representing rated speed for the drive motor;

means responsive to said rated speed signal for generating an output signal defining a predetermined value of jerk; and

means responsive to said output signal for generating the pattern signal defining said predetermined value of jerk and a predetermined value of acceleration.

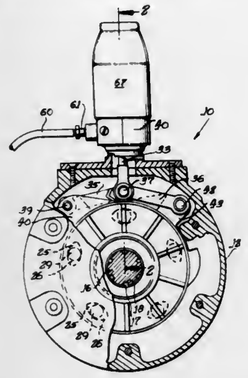
4,235,310

AUTOMATIC ADJUSTER FOR HYDRAULICALLY ACTUATED DOUBLE DISC BRAKE

Robert L. Kibler, St. Joseph, and Peter Wolf, Baroda, both of Mich., assignors to Lambert Brake Corporation, St. Joseph, Mich.

Filed Mar. 7, 1979, Ser. No. 18,336
Int. Cl.³ F16D 65/74
U.S. Cl. 188—71.5 **12 Claims**

1. A brake and brake wear take-up device, comprising, in combination, brake disc means disposed about a rotatable shaft for applying braking action to the shaft, actuator discs carried for selectively axially engaging the brake disc means and which, when rotated and axially shifted, positively engage the brake disc means and energize the brake, a link assembly connected to the actuator discs for shifting the actuator discs, a walled cylinder, a piston slidable in the cylinder and having a first large radius surface for engaging the cylinder wall and a second small radius surface concentric with but spaced apart from the cylinder wall, a conical member mounted for limited axial motion relative to the cylinder, the conical member engaging the piston second surface to permit the piston to move



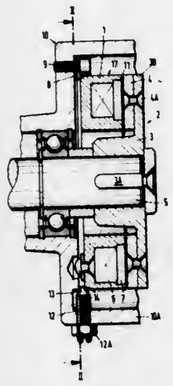
through the conical member in a first direction, but to inhibit piston motion through the conical member in an opposite direction.

4,235,311

MECHANISM FOR ADJUSTING THE AIR GAP BETWEEN THE COMPONENTS OF AN ELECTROMAGNETIC BRAKE

Karl E. Brinkmann, Dörentrup, and Bernd L. Assmann, Barntrup, both of Fed. Rep. of Germany, assignors to K. Ernst Brinkmann, Industrieverwaltung, Barntrup, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,537
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747466
Int. Cl.³ F16D 63/00
U.S. Cl. 188—71.7 **11 Claims**



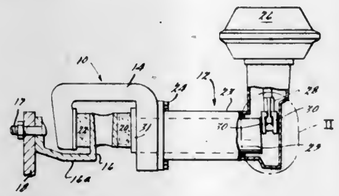
1. A device for braking a first member which is rotatable with respect to a stationary second member, particularly a brake for a shaft which is rotatable with respect to a stationary part of a machine, comprising a first component; means for securing said first component to said first member so that the first component shares all angular movements of said first member; a second component adjacent said first component; means for non-rotatably coupling said second component to said second member with freedom of movement in the axial direction of said first component, including a polygonal array of elongated leaf springs having median portions secured to said second component and end portions, and means for fastening said end portions to said second member; and means for adjusting said second component with respect to said second member in said axial direction, said adjusting means being accessible at the exterior of said second member.

4,235,312

BRAKE ACTUATOR ASSEMBLY

Wayne H. Garrett, Troy, and Ted Zbikowski, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1978, Ser. No. 955,813
Int. Cl.³ F16D 51/00, 55/08
U.S. Cl. 188—72.7 **9 Claims**



1. An actuator assembly for a vehicle brake, comprising:

(A) a wedge member mounted for reciprocal, longitudinal brake apply and return movement along a line of action and having a generally polygonal transverse cross section with opposite flat wedge faces, converging in the direction of brake apply movement, and end faces;

(B) a tappet mounted for reciprocal brake apply and return movement along a path intersecting said line of action and presenting a flat inner end face spaced from one of said wedge faces; and

(C) a bearing assembly disposed generally in the space between said tappet end face and said one wedge face and including

(1) a plurality of rollers in rolling contact with said tappet end face and said one wedge face, and

(2) a generally U-shaped roller cage embracing said wedge member and including

(a) a generally planar base portion generally paralleling said one wedge face and defining a plurality of transversely extending slots spaced along said line of action and each journally receiving a respective one of said rollers, so that said roller cage moves with, but at generally half the speed of, said wedge member as the latter moves in the brake apply and return directions, and

(b) end portions slideably guiding at their inner faces on the end faces of said wedge member adjoining said one wedge face as the bearing assembly moves with but relative to said wedge member.

4,235,313

SEAL CONSTRUCTION FOR SLIDING PART OF PIN SLIDE TYPE DISC BRAKE

Hiroshi Hirashita, Hanyu, Japan, assignor to Akebono Brake Industry Co. Ltd., Tokyo, Japan

Filed Dec. 28, 1978, Ser. No. 973,820
Claims priority, application Japan, Feb. 2, 1978, 53-10783
Int. Cl.² F16D 65/02, 55/224
U.S. Cl. 188—73.3 **6 Claims**

1. A seal structure for a sliding part of a pin-slide type disc brake, comprising:

a disc;

a pair of friction pads for braking said disc;

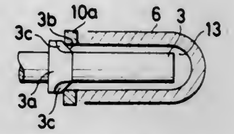
a caliper member for urging said friction pads against said disc;

a support member;

a slide pin secured to one of said caliper and support members;

a cylinder portion provided on the other of said caliper and support members for receiving said pin for sliding movement therein to slidably mount said caliper member on said support member, one end of said cylinder portion being closed, the other end being open and having an edge portion; and

a seal ring secured to said edge portion of said cylinder portion, said seal ring having an inner circumferential face arranged to sealingly engage the outer circumferential surface of said slide pin, said slide pin having a flange



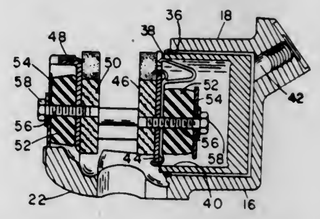
portion thereon extending radially outwardly from said outer circumferential surface, said flange portion having a tapered face with a concave flow passage therein, said face being arranged to radially expand said inner circumferential face of said seal ring when said slide pin is inserted into said cylinder portion to allow air which is compressed in said cylinder portion by said slide pin to communicate with said flow passage thereby being vented to the outside of said cylinder portion.

4,235,314

NON-SQUEAL DISC BRAKE

Timothy A. Reagan, 527A Bruning La., Chattanooga, Tenn. 37415

Filed Apr. 12, 1979, Ser. No. 29,206
Int. Cl.³ F16D 65/00
U.S. Cl. 188—73.5 **5 Claims**



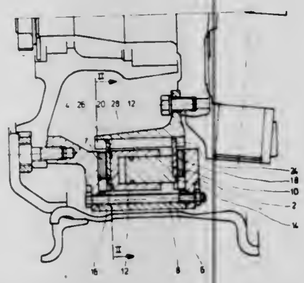
1. A disc brake comprising a rotatable disc, a caliper having means straddling a portion of the periphery of said disc, a brake pad supported by the caliper at each face of the disc, each brake pad having a rigid base member and a pad of friction material secured to a face thereof, each pad of friction material facing said disc, an axially movable piston in the caliper hydraulically movable into engagement with the base member of one of said pads to force said pads of friction material into braking engagement with said disc, a resilient member abutting the base member of at least one of said brake pads remote from said pad of friction material, and means for compressing and securing said resilient member against said base member for dampening vibrations of said base member, said means comprising a bearing plate and means for securing said bearing plate to said base material, said resilient member being sandwiched between said base material and said bearing plate and being thicker than said bearing plate in the direction therebetween.

4,235,315

FULL DISK BRAKE

Wilhelm Schlamann, Isernhagen; Joachim Feldmann, Neustadt, and Erich Reinecke, Beinhorn, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,931
Int. Cl.³ F16D 69/04
U.S. Cl. 188—73.6 4 Claims



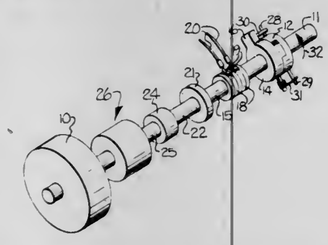
1. A full disk brake assembly provided with an external cylindrically contoured housing comprising a plurality of circumferentially disposed housing segments, each comprising a fixed section and a pivotable removable section with the removable sections being removably secured by mounting screws to and between adjacent peripheries of a pair of oppositely facing rotatable brake disks, a brake pad support fixed against rotation and comprising a plurality of arcuate segments disposed adjacent and spaced apart from each brake disk for carrying respective brake pads frictionally engageable with the brake disks, said removable sections of the housing segments being pivotable out of position to permit removal of the brake pad supports with the brake pads, and pins disposed in the brake disks such as to engage correspondingly formed holes in the fixed housing sections for locking the position of the brake disks and the housing segments relative to each other after loosening the mounting screws.

4,235,316

SENSOR FOR BRAKING SYSTEMS

Folke I. Blomberg, Duvstigen 4, S-181, 40 Lidingo, Sweden

Continuation-in-part of Ser. No. 657,104, Feb. 11, 1976, Pat. No. 4,061,212, and Ser. No. 847,669, Nov. 1, 1977. This application Oct. 20, 1978, Ser. No. 952,960
Claims priority, application Sweden, Jan. 30, 1978, 7801119
Int. Cl.² B60T 8/16
U.S. Cl. 188—181 R 31 Claims



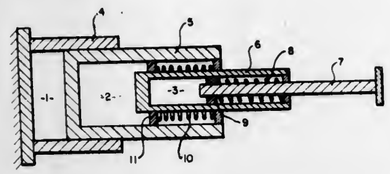
19. In a braking system for a vehicle wheel and having anti-lock control means; and sensor means for actuating the anti-lock means including a flyweight coupleable for rotation in response to wheel rotation, freewheel means operatively interconnecting the flyweight and the wheel for selectively decoupling the flyweight from the wheel upon a torque being exerted therebetween due to a change in rotational speed of the wheel, and control means for exerting on the flyweight a torque resisting decoupled rotation of the flyweight, the improvement in said control means comprising means operable independently of said freewheel means for constantly exerting a torque of at least a predetermined magnitude on the flyweight during braking of the wheel.

4,235,317

APPARATUS FOR ABSORBING MECHANICAL ENERGY IN PARTICULAR ENERGY OF VERY STRONG SHOCKS

Jeremi Maciejewski, Al. Niepodleglosci Str., 142A,, Warsaw, Poland

Filed May 10, 1978, Ser. No. 904,501
Claims priority, application Poland, May 10, 1977, 198005
Int. Cl.³ F16F 9/30
U.S. Cl. 188—268 4 Claims



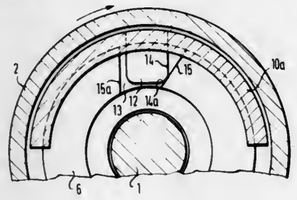
1. Apparatus for absorbing high and low energy vibrations and shocks comprising at least two cylinders of decreasing diameter, each closed at one end arranged telescopically one within the other to define therebetween a series of chambers each enclosed by the next succeeding cylinder, the largest of said cylinders being immobile and the remaining cylinders being movable relative to each other, the smallest cylinder having an externally engagable plunger means movably mounted therein and having means for defining therewith an enclosed chamber, each of said enclosed chambers being filled with a medium capable of absorbing both energy vibration and shock, spring means acting on a portion of said plunger means to place said medium in said chamber of the smallest cylinder under stressed condition, the elasticity of the medium decreasing and the viscosity of the medium increasing successively from the largest chamber to the smallest chamber, at least one of said chambers being filled with a polysiloxane having a viscous flow under static conditions and a high elasticity under dynamic conditions.

4,235,318

BICYCLE WHEEL HUB WITH COASTER BRAKE

Josef Keller, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,141
Claims priority, application Fed. Rep. of Germany, May 7, 1977, 7714501[U]
Int. Cl.² F16D 41/34
U.S. Cl. 192—6 R 6 Claims



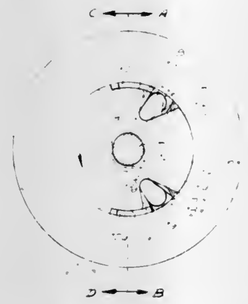
1. A hub for a wheel of a vehicle comprising:
(a) a support defining an axis of rotation;
(b) a hub shell mounted on said support for rotation about said axis in a predetermined direction, said hub shell having an internal face bounding a cavity in said hub shell;
(c) brake means in said cavity including a circumferentially split sleeve member and a cone member;
(d) brake actuating means including means for moving one of said split sleeve member and said cone member axially relative to the other member and for thereby expanding said sleeve member into frictional engagement with said internal face thereby to effect transmission of a circumferential force from said hub shell to said sleeve member during said rotation of the hub shell;
(e) a lug rigidly connected to said sleeve member, said lug projecting fron said sleeve member toward said axis;
(f) engagement means on said support brought into abutting engagement with said lug during rotation of said hub shell for preventing rotation of said sleeve member; and
(g) force converting means operatively interposed between said sleeve member and said engagement means for deriving from said circumferential force a radially outward force which is exerted on said sleeve member, said force converting means comprising a fulcrum portion formed on said lug and a bearing face on said support, said fulcrum portion and said bearing face engaging each other to effect pivoting movement of said sleeve member on said support about a pivot axis generally parallel to said axis of rotation.

4,235,319

CLUTCH MECHANISM

Juan Vazquez Rubianes, Barcelona, Spain, assignor to Industrias Techno Matic, S.A., Spain

Filed May 10, 1978, Ser. No. 904,594
Claims priority, application Spain, May 17, 1977, 459,059
Int. Cl.² B60K 41/24
U.S. Cl. 192—8 R 3 Claims



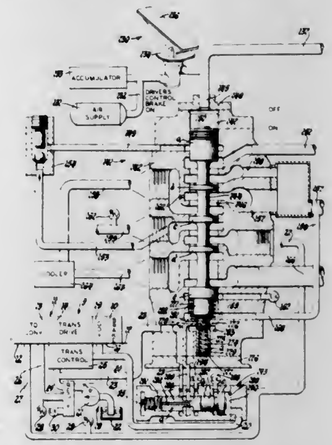
1. A clutch mechanism comprising a support element having a circular opening therein, a disc located concentrically in said opening, a wedge element disposed in a wedge-shaped recess in a periphery of said disc and elastically urged by spring means towards a lug which is angularly disposed with respect to said element and towards an apex of said wedge-shaped recess formed between said disc and in said support member, said lug being connected to a drive shaft mounted co-axial with the opening so that turning the shaft moves said lug through an angle to co-act with said wedge element and rotate said disc, a support plate co-axial with said disc connecting said lugs to said shaft, said wedge element being rotatably seated in an angled portion of its respective recess and having projecting flange means extending between said support plate and said disc and adjacent said support element to retain and guide said wedge element there being more than one recess in the periphery of said disc each associated with its own wedge element and lug so that turning the shaft in either direction moves a lug against a wedge element to rotate the disc in said direction and turning the disc in either direction moves a wedge element towards said apex.

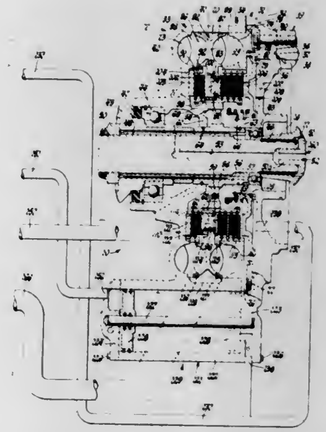
4,235,320

RETARDER AND FRICTION BRAKES

James C. Polak, Indianapolis; Harry Fackenthal, Indianapolis; Carl A. Lentz, Mooresville; Walter E. Palmer, and Robert H. Schaefer, both of Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1978, Ser. No. 913,969
Int. Cl.³ B60K 41/20
U.S. Cl. 192—4 B 24 Claims





1. In a brake assembly: hydrodynamic brake means having a bladed stator and a bladed rotor forming a brake chamber with an inlet and an outlet operative during rotation of said rotor with fluid in said brake chamber to pump fluid from said inlet and said outlet and provide hydrodynamic brake torque; a source of fluid under pressure having a regulated pressure varying with the speed of said rotor; an exhaust; brake control means connected to said inlet, said source and said exhaust and including brake demand signal means providing a brake demand signal operative in brake off position to connect said inlet to said exhaust, and in the brake on position to connect said outlet to said inlet and to regulate the fluid pressure supplied to said inlet by selectively connecting said inlet to said exhaust

and connecting said source to said inlet to regulate the pressure in said inlet and said brake chamber proportional to said brake demand signal from said brake demand signal means at pressure values up to the regulated pressure of said source varying with the speed of said rotor.

4,235,321

SAFETY CLUTCH FOR THE DRIVE OF FLOOR CLEANING MACHINES

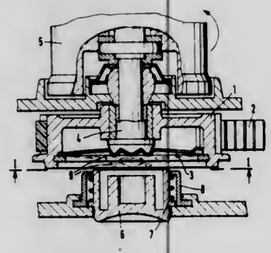
Klaus Stein, No. 12, Diesterwegstrasse, 5620 Velbert-Neviges 15, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,238

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741912

Int. Cl.³ F16D 7/02

U.S. Cl. 192—56 R **6 Claims**



1. A safety clutch for the drive of a floor cleaning machine comprising:

(a) a rotary drive member and a rotary driven member mounted for independent rotation about a common axis;

(b) one of said members comprising means defining at least one first cam-shaped dog spaced from said axis and facing the other of said members; and

(c) the other of said members comprising a dished axially resilient disc, a drive disc and means securing said resilient disc at its circumference to said drive disc to prevent rotation of said resilient disc relative to said drive disc, said resilient disc being movable between convex and concave configurations and including at least one second cam-shaped dog complementary to said at least one first dog and located inwardly of said circumference of said resilient disc, said resilient disc being adapted to retain said at least one second dog at either a stable engaged position in contact with said at least one first dog or a stable disengaged position axially spaced from said at least one first dog;

(d) whereby torque is transmitted from said drive member to said driven member when said at least one second dog is in said engaged position and upon exceeding a predetermined torque said at least one second dog is axially forced from said engaged position to said disengaged position.

4,235,322

FLUID COUPLING DEVICE HAVING MORE RESPONSIVE ENGAGEMENT AND DISENGAGEMENT

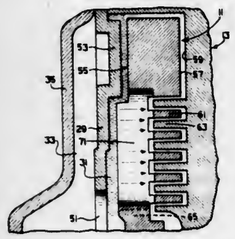
Alex Sutaruk, Carpinteria, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 21, 1978, Ser. No. 898,592

Int. Cl.² F16D 35/00

U.S. Cl. 192—58 B **8 Claims**

1. A fluid coupling device comprising a first rotatable coupling member defining an axis of rotation, cover means associated with said first member to define a fluid chamber therebetween, valve means disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first coupling member, said valve means being operable to control the flow of fluid between said reservoir chamber and said operating chamber, and including means associated with said valve means to effect the operation of said valve means in response to variations in a predetermined condition, said second coupling member being generally disc-like and having one face disposed adjacent said valve means and an opposite face, said opposite face of said second coupling member and the adjacent surface



of said first coupling member cooperating to define a plurality of interdigitated lands and grooves defining a shear space therebetween and operable to transmit torque in response to the presence of fluid therein, said second coupling member defining fluid passage means operable to communicate fluid generally axially between said one face and said interdigitated lands and grooves said interdigitated lands and grooves being substantially uninterrupted by said fluid passage means.

4,235,323

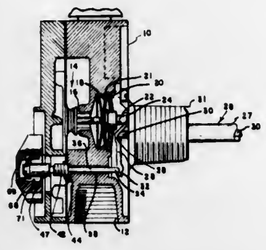
SLIP CLUTCH ASSEMBLY

Theodore J. Dykzeul, Rolling Hills, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 9, 1978, Ser. No. 914,071

Int. Cl.² B60L 5/00

U.S. Cl. 192—95 **6 Claims**



1. A slip clutch for fixed angular adjustability of a member on a shaft which comprises the assembly of:

(a) a shaft bearing external threads on one end and having a short reduced diameter portion at its opposite end;

(b) a bevelled annular shoulder positioned between said reduced diameter portion and the full diameter portion of said shaft;

(c) a ring member received over the end of said shaft, and having a radial tab;

(d) a spring washer also received over the end of said shaft and resiliently biasing said ring member against said bevelled annular shoulder;

(e) an outwardly flared annular wall at said opposite end of said shaft securing said assembly against axial displacement and biasing said spring washer against said ring member; and

(f) a knob member received over said shaft and having a radial groove to receive said tab.

4,235,324

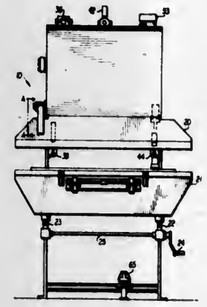
SAFETY CONTROL MECHANISM FOR PRESS BRAKE ASSEMBLY

Kenneth Neild, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,914

Int. Cl.³ F16D 71/02; F16P 3/22

U.S. Cl. 192—131 H **17 Claims**



1. In a press brake housing assembly having a reciprocating ram driven by torque transmitted through a clutch and brake mechanism, a safety control mechanism for selectively reciprocating said ram into contact with a workpiece while preventing an operator from positioning one or both hands adjacent to the ram until said ram comes within a predetermined distance from said workpiece, said safety control comprising:

motive means for driving said ram through a reciprocal cycle of movement;

hand control means effective when actuated by two hands of an operator to energize said motive means for driving said ram from a top dead center position toward said workpiece;

further control means effective when actuated by said operator to maintain said motive means energized; and

safety means for inhibiting operation of said further control means until said ram is within a predetermined distance from said workpiece.

4,235,325

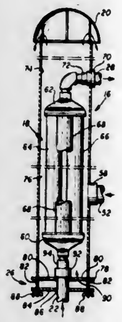
HEATER TREATER WASTE HEAT RECOVERY SYSTEM

Carl L. Miller, Rte. 1, Box 6619, Midkiff, Tex. 79755

Filed Dec. 26, 1978, Ser. No. 972,722

Int. Cl.³ C10G 1/00

U.S. Cl. 196—46 **8 Claims**



1. In a heater treater having a crude oil inlet and a treated oil outlet, and an internal heating apparatus having a combustion-type gas burner means connected for heating the contents thereof and further including a waste gas outlet from said internal heating apparatus so that products of combustion from the burner heat the crude oil contained within the heater treater, the combination with said heater treater of a waste flue gas heat exchanger;

said heat exchanger includes an upright, elongated housing;

means by which said housing is supportedly attached externally of the heater treater with a lower end thereof underlying the waste flue gas outlet and an upper end which terminates in proximity of the uppermost end of the heater treater;

an upper header, a lower header, a plurality of heat exchanger tubes having opposed ends with one opposed end of each tube being connected to the upper header and the other opposed end being connected to the lower header;

said upper and lower headers being arranged within said housing in spaced relationship therewith, means connecting said flue gas outlet to the lower marginal end of said housing in close proximity of said lower header so that flue gases can flow in heat exchange relationship respective to said tubes;

pipe means connecting said heat exchanger upstream of said crude oil inlet so that untreated crude oil flows through said pipe means and through said tubes and into said crude oil inlet;

means forming an adjustable air inlet at the lower end of said housing by which air can be admixed with flue gases to thereby control the temperature of the crude oil flowing therethrough;

said adjustable air inlet includes means forming a central opening through which said pipe means extends into fluid communication with said lower header so that untreated crude oil is preheated as it flows through said pipe means, into said lower header, through said tubes, into said upper header, and to said crude oil inlet.

4,235,326

MAIN FRAME CONSTRUCTION OF CONVEYOR

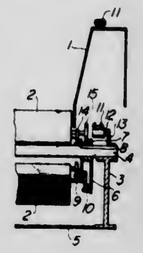
Toshiharu Nakao; Katsuya Teranishi, and Makoto Kawagoshi, all of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi-Mito Kogyo, Ltd., both of, Japan

Filed Aug. 26, 1976, Ser. No. 718,010

Claims priority, application Japan, Sep. 10, 1975, 50-108887

Int. Cl.³ B66B 9/14

U.S. Cl. 198—326 **2 Claims**



1. A main frame construction of a conveyor comprising:

continuous flights of steps in an endless form;

guide tracks for guiding said steps;

endless handrails moving at the same speed and in the same direction as those of said steps;

main frame bodies consisting of vertical members, and upper and lower horizontal members which are integral with each of said vertical members, respectively, said main frame bodies being positioned on each side of said continuous flights of steps of an endless form, respectively;

transverse beams interconnecting said upper horizontal members of said main frame bodies; and

connecting members interconnecting said lower horizontal members of said main frame bodies,

said main frame bodies, transverse beams and connecting members being combinedly constructed to provide a

structure having a box-like cross-section, wherein a plurality of guide rollers are positioned on said upper horizontal members of said main frame bodies, for guiding said handrails on their return run.

4,235,327

ESCALATOR WITH DRIVER DEVICE FOR CARRYING OF TRANSPORTATION CARTS

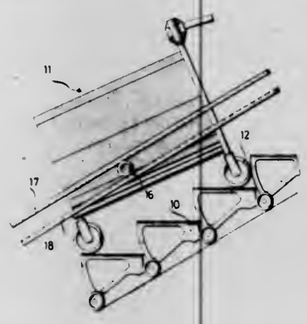
Helmut Heusler, and Bruno Kiefer, both of Dortmund, Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,286

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809435

Int. Cl.³ B62B 5/02; B65G 17/46; B66B 9/12

U.S. Cl. 198—326 **8 Claims**



1. An escalator having balustrades and with a driver device for carrying of transportation carts, particularly trunk wagons on escalator steps, comprising

means for securing the transportation cart against rolling off the escalator steps,

said means comprising a carrying and abutment device is arranged on both sides of the transportation cart along the balustrades,

a transportation cart,

an axles rigidly connected to and on each side of said transportation cart,

said means is for carrying said transportation cart along in cooperation with the escalator steps,

said axles penetrate through longitudinal slots formed in the balustrades, respectively,

said means includes guide rollers mounted on free ends of said axles, respectively,

said means further includes guide means for constraining said guide rollers therebetween, said guide means being mounted inside of the balustrades on the longitudinal sides of the latter.

4,235,328

TAPED PRODUCTS PROCESSOR

Larry J. Marshall, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 721,700, Sep. 9, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,550

Int. Cl.³ B65G 17/00

U.S. Cl. 198—343 **11 Claims**

1. A drive for a semi-automatic processing mechanism, comprising:

a base;

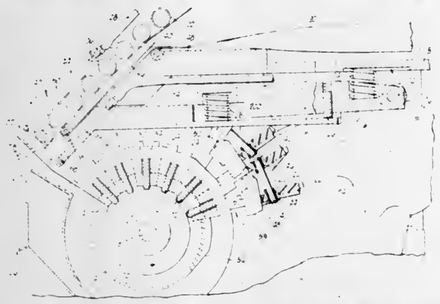
a shaft rotatably mounted on said base;

means for forcibly rotating said shaft;

a first wheel fixed to said shaft, said first wheel having a friction drive surface about the total periphery thereof;

a second wheel fixed to said shaft, said second wheel having a positive drive surface about the total periphery thereof; and

a work carrier coaxially arranged relative to said shaft, said work carrier including a friction follower extending to



said first wheel and constantly containing said friction drive surface of said first wheel and a locking member extending for selective positive engagement with said second wheel at any engagement point on said second wheel defined by said positive drive surface.

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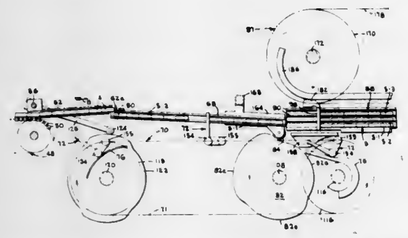
ARTICLE GROUPING AND TIERING APPARATUS

Donald C. Crawford, and John S. Aterianus, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 4, 1976, Ser. No. 711,656

Int. Cl.³ B65G 47/26

U.S. Cl. 198—419 **3 Claims**



1. An article handling apparatus comprising a conveyor for storing and feeding a single file of articles, laterally spaced first rails portions for receiving and supporting a leading portion of the articles of the file, said rails being keyed to a transverse shaft located adjacent the entrance end of said rails, a lever having one end secured to said shaft and a cam follower roller rotatably mounted on the other end, a cam, said roller rollingly engageable with the surface of said cam, said cam being operative to oscillate said lever and rock said shaft so that said rails are momentarily displaced upwardly in response to the rotation of said cam, laterally spaced second rail portions in alignment with and defining a continuation of said first rail portions, said second rail portions being pivotally mounted at the end adjacent said first rail portions, a cam follower roller mounted for rotation below and adjacent the other end of said second rail portions, a cam profiled to define at least two camming surfaces, said last mentioned roller in rolling contact with second mentioned cam, regularly spaced generally L-shaped article feeding lugs pivotally mounted on chains located below and generally parallel to said rails, said lugs projecting between said second rail portions to engage the trailing end of the article or articles being fed, a magazine including at least two vertically spaced article receiving and storing compartments, said compartments defining a continuation of said second rail portions and formed with laterally spaced article receiving and supporting ledges, and a drive mechanism concurrently synchronously driving said cam and said chains to effect upward displacement of said first rail portions to thereby produce misalignment with said second rail portions so that feeding of articles to said second rail portions is interrupted and orbital movement of said lugs to feed articles supported thereby to the compartment of said magazine in alignment with said second rail portion.

4,235,330

APPARATUS FOR TRANSPORTING PORTIONS OF OR ENTIRE SMOKERS' PRODUCTS

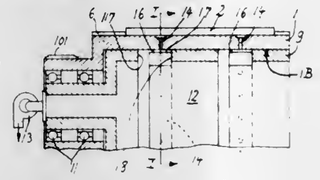
Wolfgang Zausch, Drage, and Uwe Heitmann, Schwarzenbek, both of Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,972

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833346

Int. Cl.³ B65G 29/00, 47/91

U.S. Cl. 198—480 **10 Claims**



1. Apparatus for transporting articles which constitute or form part of smokers' products from a first to a second transfer station, comprising a core having a suction chamber, at least one shallow arcuate peripheral channel communicating with said chamber substantially along the full length of said channel, as considered in the circumferential direction of said core, and extending between said stations, and a bottom surface in said channel; and a hollow rotary cylindrical conveyor having a cylindrical internal surface surrounding the periphery of said core and being slightly spaced apart from said bottom surface, and an annulus of suction ports extending inwardly from the periphery of said conveyor and communicating with said channel during travel between said stations so as to attract articles which are fed to the periphery of said conveyor at said first station, said surfaces defining a plurality of flow restricting paths for air entering said channel via ports which are not overlapped by articles and flowing toward and into said chamber.

4,235,331

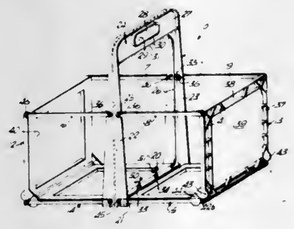
COLLAPSIBLE BASKET

Claude F. Bates, III, and Duane R. Olson, both of 17801 SW. 112 Pl., Miami, Fla. 33157

Filed May 16, 1979, Ser. No. 39,514

Int. Cl.³ B65D 6/16, 71/00

U.S. Cl. 206—170 **3 Claims**



1. A collapsible basket comprising, in combination, a rectangular, vertically-extending frame member, said frame member having a side-to-side, substantially flat bottom wall portion, the ends of said bottom wall portion merging with vertically-upwardly-extending, parallel, substantially flat, side wall portions, the upper ends of said side wall portions being transversely interjoined by a transversely-extending basket handle portion, a pair of rectangular bottom panel members, means pivotally journaling marginal inner edge portions of said bottom panel members with respect to opposed lower end portions of said frame member side wall portions, a pair of rectangular side panel members, means pivotally securing said side panel members along the lower edge each with respect to outer marginal edge portions of said bottom panel members, and parallel guide mechanism interconnecting said side wall portions of said frame member with opposed upper edge portions, respectively, of said side panel members to permit the upward folding of said bottom panel members and said side panel members against opposite sides of said frame member, said parallel guide mechanism comprising elongated link members pivotally interconnecting said side wall portions of said frame member with said upper edge portions of said side panel members, said means pivotally securing said side panel members with respect to said bottom panel members comprising abutment mechanism preventing pivotal movement beyond right-angular disposition therebetween when said side panel members are moved downwardly and outwardly with respect to said frame member into their extended positions of use, and handle means extensible outwardly of the other side of said bottom wall portion of said frame member for carrying said basket when in collapsed and inverted condition, said side panel members and said bottom members all being of identical construction, said abutment mechanism comprising outwardly-projecting portions integrally formed with said side and bottom panel members and having abutting edge portions defined by pivotal radii subtending an angle of 45 degrees with reference to the planes of their respective panels, marginal inner edge portions of said bottom panel members being operative to rest against upper surface portions of said flat bottom wall portion of said frame member when said basket is in its extended position of use, said frame member, said bottom panel members and said side panel members each being integrally formed of a synthetic plastic material.

4,235,332

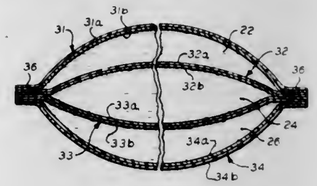
STERILIZATION SYSTEM

Harold W. Andersen; Shirley R. Andersen, both of Oyster Bay; Clifford Zaner, Holbrook, and Charles H. Harrison, Oyster Bay, all of N.Y., assignors to Anprosol Incorporated, Oyster Bay, N.Y.

Division of Ser. No. 924,018, Jul. 12, 1978. This application Mar. 23, 1979, Ser. No. 23,495

Int. Cl.³ B65D 81/32, 85/00; G01N 31/22, 21/06

U.S. Cl. 206—219 **8 Claims**



1. A package for components for a mixture of the type in which the components are to remain separate until mixed for use, comprising a plurality of layers of superimposed plastic film heat sealed at their edge portion to define a plurality of compartments each sealed from one another, and color indicator means in at least one of said compartments which when

mixed with at least one of the components in another compartment effects a color change of at least one of said components to thereby provide visual indication of an internal leak between compartments before the package is opened, thereby providing a visual integrity check at the time the packaging is about to be used.

4,235,333

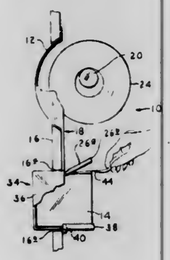
BATHROOM EQUIPMENT

Philip Boone, 15 Fenwick Rd., Winchester, Mass. 01890

Continuation-in-part of Ser. No. 798,465, May 19, 1977, Pat. No. 4,106,617. This application May 30, 1978, Ser. No. 906,671

Int. Cl.[3] **B65H** *19/02*

U.S. Cl. 206—233 **20 Claims**



1. A bathroom fixture components of which are adapted to mounting on a vertical bathroom wall section adjacent to a toilet bowl to provide both conventional dry toilet-tissue and a plurality of units of a material having at least additional cleansing properties for supplemental use therewith comprising:

a holder component for carrying and dispensing said dry toilet-tissue;

a housing component having access means thereinto for storing a supply of said supplemental cleansing units therewithin;

means for storing said units in said housing component in a given stacked arrangement for a controlled withdrawal of said units;

means forming an aperture in a given portion of said housing component for withdrawing said units in a given order;

closure means for closing and opening said aperture;

panel means constituting a section of said wall having high tensile strength adapted to serve both a conventional enclosing function of a wall and as a rigid support section for affixing said holder and housing components thereto so that they are mounted firmly against a pivotal or random displacement and in a given spatial relation;

support means for mounting said toilet-tissue holder fixedly on said panel means;

a support bracket for mounting said housing component comprising laterally spaced engageable means rigidly attached to said panel means adapted to be engaged by complementary laterally spaced engaging means of said housing component, said means permitting a given manually-actuated movement of said housing component in a predetermined plane, and

limit stop means for fixing the limit of said movement of the housing component.

4,235,334

CASSETTE STORAGE CASE

Chul S. Ahn, 1801 Dae Myung Dong, Nam Ku, Dae Ku City, Kyung Sang Puk Do, Rep. of Korea

Filed Jan. 12, 1979, Ser. No. 2,986

Int. Cl.[3] **B65D** *85/67, 43/10, 11/20*

U.S. Cl. 206—387 **8 Claims**

1. A storage case for an individual tape cassette having a pair of tape reels, a trapezoidal protrusion formed on each side thereof, and capstan drive and head openings along one edge thereof, said comprising:

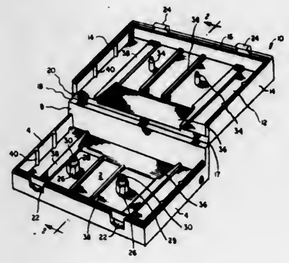
a generally rectangular base for supporting a cassette;

opposed upstanding side walls joined to said base and terminating in upper edges disposed below the upper surface of the cassette;

an upstanding front wall joined to said base and said side walls and terminating in an upper edge disposed below the upper surface of the cassette;

an upstanding back wall higher than said front and side walls joined to said base and said side walls opposite said front wall, against which said capstan drive and head openings of the cassette are positioned;

a pair of spaced upstanding pillars joined to said base and located so that each pillar will mate with one of the tape reels of the cassette;



a lower trapezoidal recess formed in said base adjacent to said back wall for receiving the trapezoidal protrusion on one side of the cassette;

a cover hinged to said back wall along substantially the entire coextensive lengths thereof, said cover comprising a generally rectangular top wall hinged along its rear edge to the top edge of said back wall, an upper trapezoidal recess formed in said top wall adjacent to said back wall for receiving the trapezoidal protrusion on the other side of the cassette, opposed side flanges joined to and projecting from said top wall toward said base when said case is closed, and a front flange joined to said top wall and said side flanges; and

closure means for maintaining said case in a closed position.

4,235,335

RIBBON PACKAGE

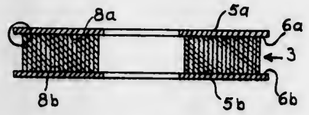
Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, Canada

Filed Mar. 7, 1979, Ser. No. 18,257

Claims priority, application Canada, Apr. 21, 1978, 301668

Int. Cl.[3] **B65D** *85/67, 85/671*

U.S. Cl. 206—389 **7 Claims**



1. A package for dispensing a singular ribbon of thin non-adhesive material, said package comprising:

a roll formed of a continuous coil of said ribbon, the edges of said coil being substantially aligned to form a substantially flat surface on one side of said roll, and

a member having a flat pressure sensitive adhesive surface, said flat adhesive surface being pressed into adherence with said flat surface, the adherence of said flat adhesive surface to said edges being sufficient to maintain said ribbon in a coiled condition but insufficient to prevent progressive dispensing thereof, said pressure sensitive adhesive permitting re-attachment of said flat member to said edges.

4,235,336

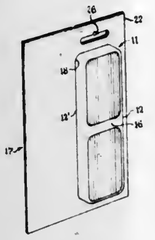
FLASH ARRAY PACKAGE

Philip R. Dudas, South Euclid, Ohio, and Laurence E. Boyce, Sr., Charlestown, Ill., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,104

Int. Cl.[3] **B65D** *85/42, 73/00;* **G03B** *15/02*

U.S. Cl. 206—419 **4 Claims**



1. A packaged photoflash array, said array comprising a body portion having a front face, and a pair of connectors extending from opposite ends of said body portion and offset rearwardly from said front face, and a display sheet provided with an opening through which the front part of said body portion is inserted, said connectors being adjacent to the rear surface of said display sheet, and a member extending over the rear of said flash array for holding said array in said display sheet in cooperation with said insertion of the front part of the body portion through the opening and said adjacency of the connectors to the rear surface of the display sheet, said front part of the body portion of the array being uncovered so as to be in full view for inspection.

4,235,337

RAPIDLY OPENING SEALED PACKAGE FOR WOUND DRESSING ADHESIVE TAPE

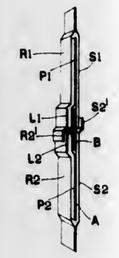
Angelo Dotta, Via Altagella 10,, Bologna, Italy

Filed Dec. 22, 1978, Ser. No. 972,514

Claims priority, application Italy, Jan. 6, 1978, 12409 A/78

Int. Cl.[3] **A61F** *13/02;* **A61L** *15/06*

U.S. Cl. 206—441 **11 Claims**



1. A rapidly opening sterilizable sealed package for wound dressing adhesive tape comprising:

an unfolded adhesive support carrying a wound dressing pad midway on one side thereof;

a pair of protecting films applied to one side of said adhesive support in opposed positions along the length thereof so as to meet substantially centrally over said wound dressing pad where they are separated from one another and have folded-back laps; and

a first pair of outer sheaths overlying and attached to said pair of protecting films, at least one of which has a folded-back portion adhesively attached to one of said folded-back laps of said protecting films and the other of which is adhesively attached to the folded back lap of the other of said protecting films, said sheaths being separably adhesively attached to one another in a position adjacent and on said one side of said wound dressing pad,

a second pair of outer sheaths coextensive with said first pair of outer sheaths on the other opposite side of said adhesive support,

said second pair of outer sheaths being firmly secured to said first pair of outer sheaths at respective free ends thereof remote from said wound dressing pad so as to form gripping extensons, which when pulled apart in opposite directions, cause said outer sheaths to separate centrally and in their outward movement away from one another will also move said protecting films outwardly to uncover said wound dressing pad.

4,235,338

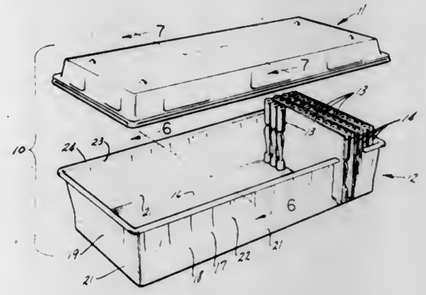
UNITARY MOLDED CONTAINER LID AND TRAY FOR ARTICLE PACKAGING

David R. Dugan, Warsaw, and Kenneth E. Prince, Indianapolis, both of Ind., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 837,951, Sep. 29, 1977, abandoned. This application Apr. 20, 1979, Ser. No. 31,883

Int. Cl.[3] **B65D** *85/20*

U.S. Cl. 206—443 **35 Claims**



1. A container package comprising:

(A) a unitary molded hollow tray having a generally planar bottom wall peripherally encompassed by a thin relatively flexible continuous upstanding wall flaring upwardly and outwardly relative to said bottom wall, said upstanding wall having a continuous lower wall portion adjoining said bottom wall in essentially normally disposed relationship and including:

(i) a continuous upper wall portion having a continuous rim,

(ii) a peripherally interspaced array of indents molded therein, said indents being offset interiorly from said upper wall portion and respectively defining an interiorly facing surface region disposed in proximately perpendicular relationship with said bottom wall and providing resistance to lateral deformation of said upstanding wall,

(iii) a peripherally interspaced array of intermediate rib sections respectively occupying the interspaces between said indents and diverging outwardly and upwardly relative thereto;

(B) a plurality of rows of dimensionally corresponding containers gravitationally resting in axially upstanding and

snug side-by-side relationship within said tray and having axial end portions projecting above the rim of said tray;

(C) a separator sheet of plastic material freely disposed in snug upstanding position between and separating each of said rows of containers; and

(D) a domed lid of unitary molded construction snugly attached over the rim of said tray and enclosing the axial end portions of said containers projecting above the rim of said tray, said lid including;

(i) a planar top wall,

(ii) a continuous outwardly flared perimetrical wall of thin, flexible construction depending peripherally from said top wall,

(iii) an endless marginal ledge extending laterally outwardly from said perimetrical wall and peripherally carrying a continuous depending skirt detachably attached over the rim of said tray in snug snap-fit relationship, and

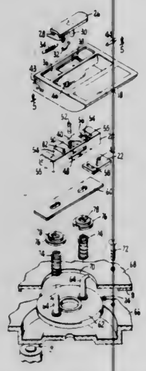
(iv) a peripherally interspaced array of inwardly offset tabs respectively defining interiorly facing surfaces aligned in proximately perpendicular relationship with said top wall and having a lower end extending downwardly beyond the inner periphery of said ledge and forming a projecting tongue disposed in adjacently spaced juxtaposed relationship with said peripheral skirt to provide said snap-fit relationship.

4,235,339

LATCH AND CARRYING HANDLE ASSEMBLY FOR MAGNETIC RECORDING DISC CARTRIDGE

Dean L. Christensen, Long Beach; Leonard C. Badour, Santa Ana, and Frank S. Ebey, Lakewood, all of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Jun. 4, 1979, Ser. No. 45,362
Int. Cl.³ G11B *23/02*; B65D *85/30*
U.S. Cl. 206—444 **11 Claims**



1. In a magnetic recording disc cartridge having a recording disc contained within an upper housing and a separably mating lower housing and in which separation of said lower housing is effected by lifting said recording disc axially away from magnetic engagement with the portion of said lower housing which extends transversely of the disc axis, an improved latch and carrying handle comprising

a handle pivotally mounted to said upper housing for movement about a pivot axis which extends generally parallel to the plane of said recording disc, said movement being between one position lying generally parallel to said disc plane and another position generally normal to said disc plane and generally parallel to said disc axis;

lifting means selectively engageable with said recording disc for moving said disc axially away from said lower housing, said lifting means comprising a pivotally mounted lifting bar and a disc-engaging element connected to said lifting bar eccentrically of the axis of said lifting bar pivot whereby pivotal movement of said lifting bar will effect a lifting of the disc-engaging element and thus of the disc;

latch means slidably mounted to said lifting bar for reciprocating movement, in a direction generally normal to said lifting bar pivot axis, between a first position out of engagement with said handle and a second position engaging said handle such that, when said latch means is in said second position, pivotal movement of said handle will effect corresponding pivotal movement of said lifting bar, thereby lifting the disc; and

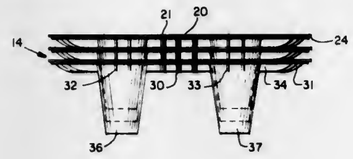
movable trigger means engageable with said latch means for moving said latch means between said first position and said second position.

4,235,340

SALT GRID FOR A BRINE TANK

Richard E. Clack, DeForest, Wis., and Jack E. Wies, Forest Lake, Minn., assignors to Clack Corporation, Windsor, Wis.

Filed Jun. 21, 1979, Ser. No. 50,659
Int. Cl.³ B65D *21/00*
U.S. Cl. 206—515 **14 Claims**



1. A unitary, one-piece salt grid for supporting granular salt and elevating the granular salt above at least a portion of a concentrate brine in a brine tank, said salt grid comprising:

a platform having an upper surface suitable for supporting a supply of granular salt thereupon, said upper surface of said platform being sized to substantially span a generally horizontal interior area defined in the brine tank between side walls of the brine tank at a predetermined spaced position above a bottom of the brine tank;

brine passage means in said platform for permitting flow of brine formed by dissolution of granular salt with water to the bottom of said tank; and,

a plurality of supporting feet also forming an integral part of the platform, each of said supporting feet having an upper open end which extends into a downwardly tapered frusto-conical body section thereof having an axial extent which is sufficient to support the upper surface of said platform at said predetermined spaced position above the bottom of the brine tank.

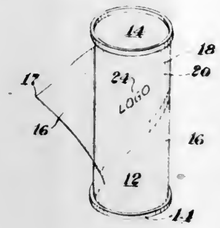
4,235,341

SPIRALLY WOUND CONTAINER WITH STRIPPABLE LAYER

Leandra P. Martin, Granville, and Robert A. Luecke, Newark, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1978, Ser. No. 944,035
Int. Cl.³ B65D *7/26*
U.S. Cl. 206—601 **6 Claims**

1. A multi-ply spirally wound container openable by rupture of ply seams comprising a base fibrous ply, an inner thermoplastic film ply adhered to and surrounding the base ply, said inner film ply being transparent film, the exterior of the base ply containing graphics readable through the inner film ply, an outer film ply surrounding the inner film ply, said outer film ply being peelable from the inner film ply, the inner film ply being of such a strength and gauge that it can rupture together with the base ply when the container is twisted or hit upon a hard object, said container being closed at both ends thereof to contain product therein.

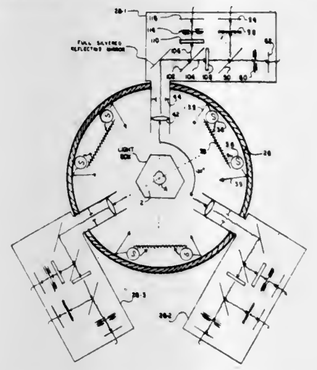


4,235,342

SORTING APPARATUS USING PROGRAMMABLE CLASSIFIER

Richard R. M. Braham, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed May 5, 1978, Ser. No. 903,069
Int. Cl.³ B07C *5/344*
U.S. Cl. 209—564 **13 Claims**



1. In an apparatus for sorting articles based upon the intensity of light reflected therefrom at a first and a second color wavelength, the apparatus including

(a) a viewer element adapted to view a viewed area through which an article to be sorted passes;

(b) an electrical signal generator element adapted to generate a first and a second electrical signal respectively representative of the intensity of light reflected from the article at the first and the second color wavelengths,

wherein the improvement comprises:

an article classifier for classifying the article to be sorted on the basis of the intensity of light reflected from the article at the first and second color wavelengths,

the classifier including a random access memory element having a plurality of memory storage locations defining a matrix array therein, each memory location being addressable by a different combination of reflected light intensities at the first and second color wavelengths,

each memory location having stored therein a classification signal representative of the acceptability of an article exhibiting the reflected light intensities at the first and second color wavelengths corresponding to the address of the memory storage location to electrically define in the matrix array the boundaries of an acceptability profile of the type of article being sorted,

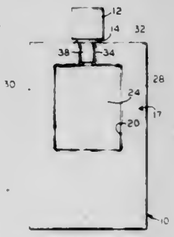
and wherein the signal generator generates a multi-bit digital signal representative of the light reflected at the first and second color wavelengths, and wherein each memory storage location is defined by a predetermined number of significant bits of the signal representative of the light reflected from the article at the first color and by a predetermined number of significant bits of the signal representative of the light reflected from the article at the second color.

4,235,343

CONTAINER ASSEMBLY

Harold E. Thompson, 722 Maple Heights Dr., Galien, Ohio 44833

Filed Jul. 30, 1979, Ser. No. 61,672
Int. Cl.³ B65D *21/02*
U.S. Cl. 215—6 **2 Claims**



1. A container assembly comprising a large and at least one smaller container, said large container having four flat sides at right angles to each other and opposite ends that are flat and parallel and intersect said sides at right angles, one side of the large container having a cavity therein which removably receives in nested relation the smaller container, the exposed surface of said smaller container, blending with the adjacent surface of the larger container thereby to provide an uninterrupted surface contour on the containers so assembled, said cavity having two first walls which are flat and parallel and two second walls which are also flat and parallel, the first walls intersecting the second walls at right angles, said cavity further having a flat bottom which is at right angles to said walls, said smaller container having a shape that complements the shape of said cavity, the first walls of said cavity being parallel to two opposite sides of said larger container, the second walls being parallel to the opposite ends, said walls being spaced inwardly from the respective sides and ends

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4,235,344

IRRIGATION CAP

Lee K. Kulle, Mundelein, and William L. Rudzena, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

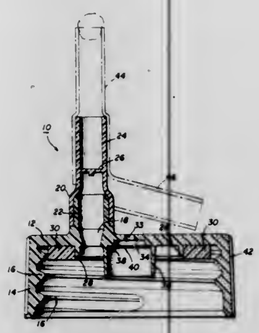
Filed Jan. 29, 1979, Ser. No. 7,488
Int. Cl.³ B65D *41/20*
U.S. Cl. 215—250 **6 Claims**

1. A dispensing closure for closing an externally threaded container having a pour lip, the dispensing closure having a top portion with an annular internally threaded skirt depending downwardly therefrom, the improvement comprising, in combination:

said top portion defining a first opening surrounded by an upwardly-extending port adapted for receiving a spike within walls of the port; a membrane sealling the port and lying in a plane above the plane of the top portion, the membrane being adapted for piercing by the spike when the spike is inserted into the port;

said top portion defining a second opening with a hydrophobic filter positioned to close said second opening and be in communication on one side with the volume below said top portion and on the other side with the air above the

top portion; a filter seat for seating said hydrophobic filter; and



means carried by the underside of the top portion for sealing engagement with the pour lip of the container.

4,235,345

FOLDABLE PACKAGING CASE

Kenneth R. VandeDrink, 28 Shady La., Elgin, Ill. 60120, and Edward J. Cole, 5125 W. Birchwood, Skokie, Ill. 60076

Filed Jul. 27, 1979, Ser. No. 61,375
Int. Cl.³ B65D 6/22
U.S. Cl. 220—6 **13 Claims**



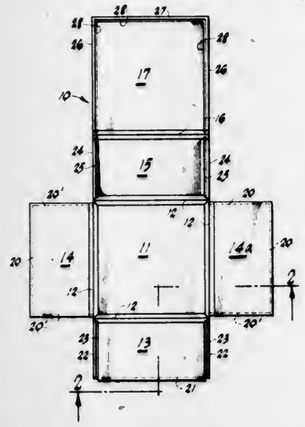
1. In a foldable packaging case having two foldable side wall members including first and second panels that fold inwardly generally onto each other, two end wall panel members between said foldable side wall members, panel hinge means between said first panel, said second panel and said two end wall panel members for enabling the first and second panels to fold inwardly, a fold-up floor member sized to fit between said two foldable side wall members and said two end wall panel members, means for hingedly mounting said floor member to one of said end wall panel members, the improvement comprising said panel hinge means being a snap-together, snap-apart hinge means molded of a synthetic resin with and onto said first panel, said second panel and said two end wall panel members, wherein a plurality of said snap-together, snap-apart hinge means are provided, including first snap-together, snap-apart hinge means pivotally interconnecting said first panel to a corner portion of one of said two end wall panel members, second-snap together, snap-apart hinge means pivotally interconnecting said second panel to a corner portion of another of said two end wall panel members, each said first panel and second panel corner portions having a generally L-shaped cross-section including a leg protruding generally transversely from one of said end wall panel members, third snap-together, snap-apart hinge means pivotally interconnecting said first panel to said second panel, each of said snap-together, snap-apart hinge means including a pivot pin and a narrow saddle structured for snapping, releasably mating, pivotable interengagement with said pivot pin, said snap-together, snap-apart hinge means further including rotation limiting means which includes a longitudinally extending stop surface on said saddle at its remote end, a longitudinally extending stop edge on each of said first and second panels, said first and second snap-together, snap-apart hinge means being at the remote end of each of said respective legs of the panel corner portions, said longitudinally extending stop surface on said respective saddles of the first and second hinge means being at the extreme remote end of each respective leg, said longitudinally extending stop edge on each of said first and second panels being a surface that is generally parallel to the longitudinal extent of each of said first and second panels, a flat on each of said first and second panels, each said flat being generally transverse to the longitudinal extent of said first and second panels and extending beyond the respective stop edges, and said respective pivot pins extend from said respective flats.

4,235,346

COLLAPSIBLE LIGHTWEIGHT SHIPPING CONTAINER

Joseph Liggett, 6 Riverview Ter., New York, N.Y. 10022

Filed Sep. 19, 1979, Ser. No. 77,053
Int. Cl.³ B65D 7/24, 7/42
U.S. Cl. 220—7 **26 Claims**



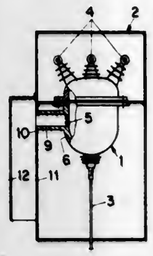
1. A packing and shipping container comprising a unitary blank of molded, foamed plastic material in which a bottom panel is hingedly joined to four peripheral side panels and a top panel is hingedly joined to one of said side panels in a manner to provide an essentially co-planar and stackable association of panels when in knockdown configuration, with edges of said side panels and top panel having interlocking means as the side panels are raised to positions perpendicular to the bottom panel, and as the top panel is lowered over the assembled side panels, and in which compressive strength of the assembled container is enhanced by at least one of the structural features that comprise enlarging surface area of the side panels to increase their strength, providing interlocking means at the hinged juncture between adjacent panels, and providing interlocking means on top and bottom container surfaces to assure accurate side wall alignment of stacked containers.

4,235,347

AIR-TIGHT MOLDED RESIN ENCLOSURE WITH A SAFETY MEMBRANE FOR ELECTRIC DEVICES

Rene Cothier, Sainte-Adresse, and Sylvain Cagnioux, Le Havre, both of France, assignors to CEM Compagnie Electro-Mecanique, Paris, France

Filed Apr. 5, 1979, Ser. No. 27,398
Claims priority, application France, Apr. 21, 1978, 78 11862
Int. Cl.³ F16K 13/04, 17/40; H05K 5/06
U.S. Cl. 220—89 A **8 Claims**



1. An air-tight molded resin enclosure for a fluid under pressure, comprising:

a wall forming at least part of said enclosure;

a safety membrane integral molded with a portion of said wall;

means for priming a rupture of said membrane at a fluid pressure less than the pressure required to rupture the wall of the enclosure, said means for priming including:

a peripheral groove which follows the periphery of said safety membrane, and

a plurality of radial grooves which extend outwardly from the center of said safety membrane to said peripheral groove,

wherein said peripheral and radial grooves are in one face of said safety membrane; and

an external tubular flange, integrally molded with the wall and extending outwardly from the wall, said flange being joined to said wall at the peripheral groove and said flange being aligned with said peripheral groove such that said flange is separated from the safety membrane by said peripheral groove,

wherein said safety membrane, said peripheral groove, said plurality of radial grooves and said external flange are all formed when said wall is molded, and are all formed directly by the shape of the mold used to mold said wall,

whereby the safety membrane ruptures before the wall ruptures when the fluid pressure in the enclosure is increased, and further whereby, upon rupture of the safety membrane the fluid contained under pressure in the enclosure flows through the ruptured membrane and through the external flange.

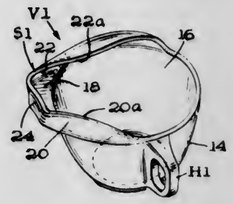
4,235,348

DRINKING VESSELS FOR RECLINING POSITION USAGE

Lionel E. Watson, P.O. Box 3966, Ft. Pierce, Fla. 33450

Filed Jan. 18, 1979, Ser. No. 4,368
Int. Cl.³ A47G 19/22
U.S. Cl. 220—90.4 **15 Claims**

1. In a liquid drinking vessel of the type adaptable for use by and while a user is in a partially or essentially fully reclining position, wherein the vessel includes a body of generally hollow form about a center vertical axis, with a closed bottom end, generally uninterrupted peripheral side wall terminating in an open upper end, with a liquid-directing generally open troughed spout portion integrally formed with and projecting generally laterally outwardly away from the axis and body at its open upper end to terminate in a mouth/lip-engageable terminal edge, the improvement wherein said spout's-mouth-/lip-engageable terminal edge includes an upstanding outer wall portion, said outer wall portion having a width and a concave configuration for complemental mating with a user's lips, said open troughed spout portion comprising an upwardly facing bottom surface extending radially and laterally from said open end, said bottom surface being substantially planar



from said open end of the vessel to said outer wall portion at central, and radial and lateral end locations of said bottom surface, said concave configuration being concave inwardly toward said central vertical axis, said upstanding outer wall portion and said bottom surface facilitating improved spill resistance.

4,235,349

ONE-PIECE SAFETY CLOSURE FOR RIGID CONTAINERS HAVING A BEAD FINISH

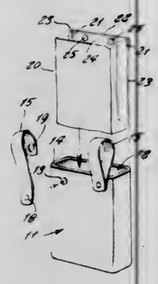
Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 20, 1979, Ser. No. 67,857
Int. Cl.³ B65D 43/04
U.S. Cl. 220—281 **10 Claims**



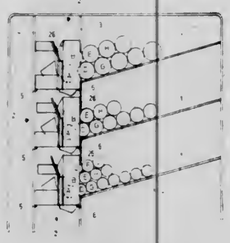
1. A safety package comprising a container having an annular vertical neck defining a generally horizontal external shoulder spaced below the end of the neck, a closure molded from a resilient plastic material, said closure having a generally horizontal circular panel portion and a generally vertical flange portion surrounding the container neck and having a horizontal, annular bottom rim surface abutting said horizontal shoulder, cooperating surfaces on said closure and container neck for securing the closure thereon in sealing relationship, said cooperating surfaces permitting downward movement of said closure relative to said neck, and a segment of said closure bottom rim surface being sloped upwardly and inwardly, whereby the application of a vertical downward force to the top rim surface of the closure only at a region overlying said inclined surface segment will produce an outward bulging of a segment portion of said vertical flange beyond the extremity of said horizontal shoulder on said container neck.

4,235,350
BED SIDE RAIL CONTAINER WITH REMOVABLE LINER
Pearl T. Valentino, 846 50th St., D-2, Brooklyn, N.Y. 11220
Filed Aug. 20, 1979, Ser. No. 67,673
Int. Cl.[3] B65D 90/04
U.S. Cl. 220—404 2 Claims



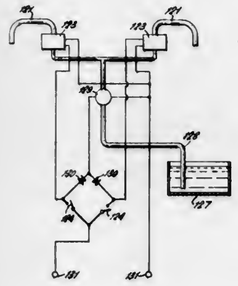
1. A handy bed side rail container, comprising in combination, a plastic box, a paper bag liner inside said box and a pair of straps for attachment around a side rail of a bed wherein said box has an opening on its top, said box being generally flat and having male snap fastener elements near its upper edge for attachment to female snap fastener elements on said straps.

4,235,351
MERCHANDISE DISPENSING DEVICE FOR A VENDING MACHINE
Richard Kölbl, Herrieden; Bernd Mehlan, Petersaurach; Josef Gress, Bechhofen; Frank Dörrbeck, and Rudolf Leichs, both of Herrieden, all of Fed. Rep. of Germany, assignors to Sielaff GmbH & Co. Automatenbau Herrieden, Herrieden, Fed. Rep. of Germany
Filed Jun. 27, 1978, Ser. No. 919,748
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2733968
Int. Cl.[3] B65G 59/06
U.S. Cl. 221—92 2 Claims



1. A merchandise dispensing device for a vending machine having inclined compartments in which the merchandise of different diameter capable of rolling are stored, comprising: a dispensing part with a dispensing compartment floor, capable of pivoting on an axle from an intake position to a dispensing position; a support arch around the axle to facilitate a prop of the merchandise in the dispensing position; a guide plate adjustably mounted on an angled segment of a guide strip and at an acute angle to said inclined compartment and a lower edge of said guide plate forming a barrier flange being adjustable in height for preventing a jamming of the merchandise; a roll-on surface between the support arch and the dispensing compartment floor forming an obtuse angle with the dispensing compartment floor on to which the merchandise rolls in the intake position; and a surface part is being bent upwardly on a side of the dispensing compartment floor opposite to the roll-on surface.

4,235,352
WATER SUPPLY APPARATUS
Alec T. Newman, and David Rhodes, both of Banbury, England, assignors to General Foods Limited, Banbury, United Kingdom
Filed Nov. 23, 1977, Ser. No. 854,241
Claims priority, application United Kingdom, Dec. 1, 1976, 50171/76
Int. Cl.[3] B67D 5/52
U.S. Cl. 222—129 2 Claims

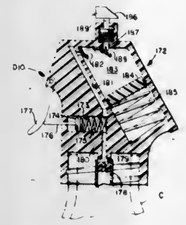


1. Water supply apparatus comprising: a body; a reservoir for water within the body; two outlet nozzles mounted onto the body; means for pumping water from the reservoir to each nozzle; valve means for opening and closing each outlet nozzle; means for varying the rate of pumping of the means for pumping in accordance with the number of valves, which are open, so as to maintain a rate of flow above a predetermined level through each open nozzle, each said valve means being operable by an electrical switch having an operating element, each operating element being disposed adjacent the outlet end of its respective nozzle in a recess formed in the body of the apparatus such that the switch can be operated, in use, by pressure transmitted through a container being filled, said means for pumping being electrically driven, said means for varying the rate of pumping comprising means for varying the magnitude of the electrical power supplied to the means for pumping, said means for varying the magnitude of the electrical power comprising a pair of diodes in parallel front to back relationship together connected in series with the means for pumping and a power input, each diode being connected in series with a respective one of said switches.

4,235,353
TRIGGER OPERATED DISPENSING DEVICE WITH ACCUMULATING CHAMBER
Nicholas G. Capra, East Hanover, N.J., and Ronald L. Antenore, Coral Gables, Fla., assignors to James D. Pauls and J. Claybrook Lewis and Associates, Limited, Miami Lakes, Fla.
Division of Ser. No. 729,830, Oct. 5, 1976, Pat. No. 4,167,964.
This application Mar. 24, 1978, Ser. No. 889,904
Int. Cl.[2] B05B 11/02
U.S. Cl. 222—256 3 Claims

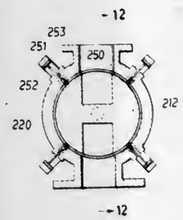
1. A dispensing device for discharging material under pressure, includes accumulating chamber means for receiving and acumulating material to be dispensed, normally closed discharge valve means connected with the accumulating chamber means and operable to an open position to discharge the material from the accumulating chamber means under pressure over a sustained period of time for use as desired, said discharge valve means including a movable member operable to open and close the valve means and having a passage therethrough

communicating the accumulating chamber means with atmosphere when open, expansible chamber means connected with the accumulating chamber means and operable to repeatedly introduce material from a container into the accumulating chamber means for storage under pressure of a quantity of the material greater than the volumetric capacity of the expansible chamber means, whereby a prolonged, pressurized discharge of the accumulated material can be obtained from the accumulating chamber means when the discharge valve means is opend and a manually operable pivoted trigger pivotally se-



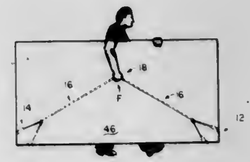
cured one end thereof to the dispensing device and connected with the expansible chamber means to operate the expansible means to alternately draw material into the expansible chamber means and then pressurize the material and discharge it into the accumulating chamber means, said pivoted trigger enabling the dispensing device to be operated with one hand while being held in that hand, by simply squeezing the trigger means to charge material into the accumulating chamber means, and then operating the discharge valve means to discharge the material therefrom.

4,235,354
SEALING STRUCTURE FOR ROTARY VALVES
Tatuo Aonuma, Kashiwa; Michio Kiuchi, Nagareyama; Hirozi Watanabe, and Takeshi Akao, both of Noda, all of Japan, assignors to Kokkoman Shoyu Co., Ltd., Noda, Japan
Division of Ser. No. 740,391, Nov. 10, 1976, Pat. No. 4,180,188.
This application Apr. 5, 1979, Ser. No. 27,501
Claims priority, application Japan, Nov. 18, 1975, 50/137794; Dec. 2, 1975, 50/160983[U]
Int. Cl.[3] G01F 11/10
U.S. Cl. 222—368 7 Claims



1. A sealing structure for a rotary valve, comprising:
a rotary member provided with a plurality of pockets opening toward the outer periphery of said rotary member;
a casing enclosing the outer periphery of said rotary member;
sealing members provided between the outer periphery of said rotary member and the inner periphery of said casing;
said sealing members being formed to be adjustably projectable in the radial direction;
a plurality of cavities, slidably containing said sealing members, disposed at fixed angular intervals along the entire inner peripheral wall of said casing enclosing the outer periphery of said rotary member such that said sealing members are free to project radially inwardly to seal the periphery of said rotary member;
said casing being provided with holes extending radially through said casing and connecting each said cavity with the outer periphery of said casing;
rod-shaped pushing members slidably fitted in said holes such that said sealing members are projected radially inwardly by said rod-shaped pushing members; and
each said rod-shaped pushing member being actuatable at an external end thereof which protrudes to the outside of said casing.

4,235,355
DEVICE FOR CARRYING SHEET OR PANEL MATERIAL
David G. Henry, and Karen A. Paulsen, both of 167 McKendry Dr., Menlo Park, Calif. 94025
Filed Oct. 27, 1978, Ser. No. 955,463
Int. Cl.[3] B65D 71/00
U.S. Cl. 224—45 P 7 Claims



1. A device for carrying sheet material comprising:
a pair of bracket means for engaging the two lower corners of a sheet of material, each bracket means including
a flat, continuous, elongated strip of material formed into a generally U-like shape having a base portion, two depending and spaced apart leg portions, and two seating portions defining a pair of seating surfaces, said two seating portions being located between said base portion and a respective one of said leg portions,
said base portion extending between and adjoining said two seating portions,
said base portion being bent out of an imaginary plane defined by said leg portions so that said base portion is located on one side of said sheet of material and said leg portions are located on the other side of said
sheet of material when said bracket means engages said corner; and
flexible line means coupling said leg portions of a first bracket means to said leg portions of a second bracket means;
whereby when said first bracket means and said second bracket means engage respective ones of said corners, a person may lift said sheet of material by grasping said flexible line means and exerting an upward force thereupon.

4,235,356
CONCEALMENT HOLSTER
Maxwell G. Atchisson, 6695 Ridgemoor Dr., Doraville, Ga. 30360
Filed May 8, 1979, Ser. No. 37,168
Int. Cl.[3] F41C 33/02
U.S. Cl. 224—192 5 Claims

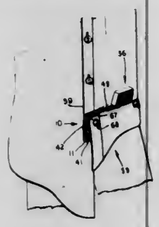
1. A concealment holster for a firearm, comprising:
a unitary member forming and defining a pouch for receiving and retaining a handgun in an inverted butt-up position;
said unitary member having an elongated substantially flat bottom portion with a generally curved interior surface configured to accommodate and support the barrel of the handgun disposed in the inverted position within said

pouch, and further having a pair of side portions each extending away from said bottom portion to terminate at an outer edge in spaced apart relation to said bottom portion so as to provide external support for the handgun, at least one end of said pouch being open to accommodate a longitudinal extremity of the handgun;

each said side portion having a tab portion at either end of said outer edge, with the tab portions at corresponding ends of each side portion being in mutually confronting relation;

the exterior of said unitary member along said elongated bottom portion forming a curved surface about which the shirttail of the wearer is folded to locate the holster in concealment within the trousers of the wearer;

means securing together said confronting tab portions at each end of said outer edge so as to maintain said outer edges between said secured tab portions open to permit



holstering and unholstering the handgun from the pouch, so that the butt of the holstered handgun extends upwardly through the opening between the secured tab portions;

means for detachably connecting said pouch to said shirttail of a wearer with the shirttail folded around the curved exterior bottom surface of the pouch to support the weight of the pouch and a handgun holstered in the pouch in said inverted position, and with said shirttail folded upwardly along a side portion of the pouch for engagement by said connecting means, so that the holster and handgun are concealed from view within trousers of the wearer; and said connecting means comprising pin means extending through one of said tab portions to engage the upwardly folded shirttail along one side of the pouch, and to engage the shirt along the opposite side of the pouch, so as to maintain the pouch attached to the shirt.

4,235,357

SUBSTRATE SEPARATING MACHINE AND METHOD

David H. Young, Warrington, Pa., assignor to MTI Systems Corporation, Ivyland, Pa.

Filed Sep. 11, 1978, Ser. No. 941,181

Int. Cl.³ B26F *3/00*

U.S. Cl. 225—1 **28 Claims**

28. A method of subdividing into individual substrates a wafer which is prescored with a pattern of intersecting score lines defining the substrates, said method comprising the steps of:

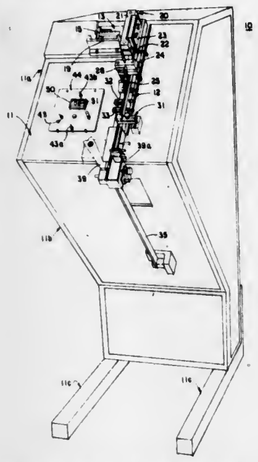
advancing the wafer progressively over a ledge substantially paralleling one set of score lines;

halting the advance when the wafer extends cantilevered beyond the ledge by substantially the distance between the score lines;

breaking off the cantilevered portion of the wafer;

advancing the broken-off portion over a second ledge substantially paralleling the other set of score lines;

halting the last-named advance when the portion extends cantilevered beyond the second ledge by substantially the distance between the score lines; and



breaking off the substrate cantilevered beyond the second ledge.

4,235,358

DEVICE FOR THE EDGE OR CENTER CONTROL OF MOVING WEBS

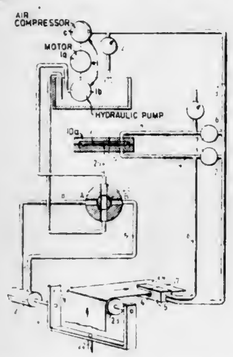
Hermann Klein, Reichshof, Fed. Rep. of Germany, assignor to Elektro-Mechanik GmbH, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,629

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730733

Int. Cl.³ B65H *25/08, 25/26*

U.S. Cl. 226—22 **5 Claims**



1. A device for controlling the position of a web which is advanced over a guide member comprising:

a diaphragm housing having a chamber,

a control diaphragm movably mounted in said housing and dividing said chamber into a first and a second control space,

sensor means arranged along an edge of the web and having a sending and receiving nozzle adapted to overlie respective opposite sides of the web as it is advanced,

fluid pressure supply means connected to said first control space and said sending nozzle,

a conduit connecting said receiving nozzle and said second control space,

said receiving nozzle being disposed with respect to said sending nozzle in dynamic fluid communication with fluid pressure emitted by said sending nozzle responsive to the position of the web,

said diaphragm being movable responsive to a fluid pressure variation between said spaces from a zero position wherein each of said spaces is equally pressurized,

throttle means operatively connected to one of said first and second control spaces for varying the pressure thereof,

a mounting means for rotatably supporting the guide member,

adjusting means operatively connected to said mounting means for shifting said mounting means and guide member, and

a reversing means connected to said diaphragm and said adjusting means for shifting said mounting means and guide member responsive to movement of said diaphragm, a first flow line, a first fixed throttle in said first flow line for fixedly throttling flow therethrough, said first flow line being connected to said conduit and said fluid pressure supply means, and wherein said fluid pressure supply means includes a second flow line, a second fixed throttle in said second flow line for fixedly throttling flow therethrough, said second flow line connecting said fluid pressure supply means and said first control space, and said throttle means including an adjustable throttle discharging to atmosphere disposed in fluid communication with said second flow line.

4,235,359

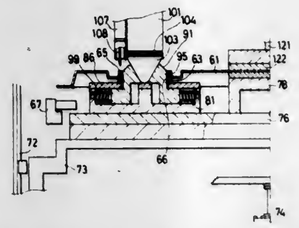
APPARATUS FOR WELDING FITTINGS TO A CONTAINER

Eiichiro Ikuno, Yokohama, and Tomoki Yoshizumi, Ichihara, both of Japan, assignors to Nittetsu Steel Drum Co., Ltd., Tokyo, Japan

Division of Ser. No. 43,097, May 29, 1979. This application Jun. 18, 1979, Ser. No. 49,632

Int. Cl.³ B23K *37/02*

U.S. Cl. 228—29 **1 Claim**



1. Apparatus for manufacturing a metal container of light-gauge metal sheet, which comprises a container member having an inwardly projecting cylindrical neck formed along the periphery of a closure flange receiving opening and a closure flange adapted to receive a detachable plug, the closure flange being press-fitted in the receiving opening so that the neck and flange ends form a flushed annular face and fastened to a container wall, comprising:

an elevatable clamp table;

means for raising and lowering the clamp table;

a clamp fastened to the clamp table and having a collapsible claw, the claw expanding to fit in an opening in the closure flange press-fitted in the receiving opening in the container member;

a rotatable reference shaft having means at the lower end thereof, for entering and expanding the collapsible claw when the clamp table rises;

means for rotating the reference shaft; and

a welding torch fastened to the reference shaft so as to face the annular face formed by the neck and flange bottoms.

4,235,360

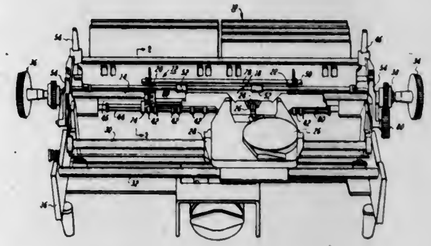
BI-DIRECTIONAL PIN FEED APPARATUS

Leo Levinson, Berkeley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1978, Ser. No. 929,478

Int. Cl.³ G03B *1/24*

U.S. Cl. 226—76 **9 Claims**



1. In a printing device including a main frame and a printing station, a bi-directional pin feed apparatus for selectively feeding marginally punched record material in opposite directions past said printing station comprising:

a shaft reversibly rotatably mounted to said main frame;

a platen mounted about said shaft for rotation therewith;

a pin wheel feeding device for feeding marginally punched record material disposed about said platen in opposite directions past said printing station, said pin wheel feeding device including a housing coupled to said shaft adjacent an end of said platen for rotation therewith, said housing having a plurality of openings formed therein, said pin wheel feeding device further including a cam member fixed in position relative to said housing and a plurality of pins disposed within said housing in respective alignment with said plurality of openings, said pins cooperating with said cam member during rotation of said housing to project from their respective openings for a single predetermined segment of their path of circumferential movement, said predetermined segment being predominately vertically downward; and

guide means connected to said main frame and including a pair of guide members positioned on either side of said single predetermined segment of the path of circumferential movement of said pins, said guide members being spaced from said housing to define a gap therebetween through which perforated record material is advanced during rotation of said shaft by the projecting pins.

4,235,361

PROCESS FOR PRODUCING A PRESSURE VESSEL HEAD OR SHELL

George Hays, St. Louis, and Edward J. Clarkin, Florissant, both of Mo., assignors to Nooter Corporation, St. Louis, Mo.

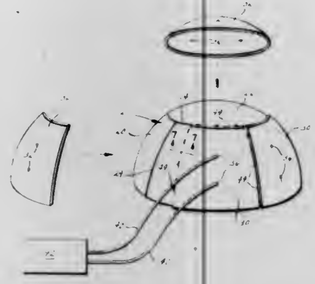
Filed May 18, 1979, Ser. No. 40,596

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—173 A **16 Claims**

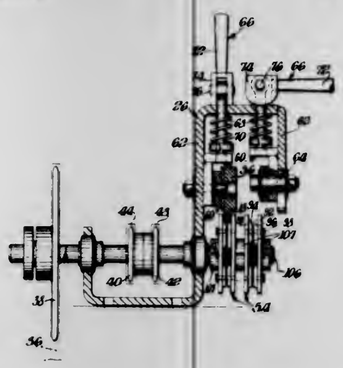
1. A process for fabricating a layered pressure vessel component such as a head or a shell, said process comprising: providing a first layer that is curved, placing a plurality of segments against the first layer with the segments being curved to conform to the contour of the first layer and having their edges adjacent to each other; as to each segment, reducing the pressure between that segment and the first layer so that air at

atmospheric pressure will force the segment tightly against the first layer; and while the segment is forced tightly against the



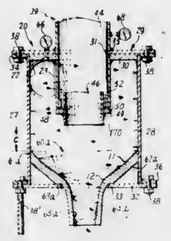
first layer, welding the segment at its periphery to the first layer.

4,235,362
WIRE-FEEDING APPARATUS
Nicholas Hubenko, Forest Hills, N.Y., assignor to Pfizer Inc., New York, N.Y.
Filed Mar. 21, 1979, Ser. No. 22,451
Int. Cl.³ B65H 17/22
U.S. Cl. 226—181 **14 Claims**



10. A wire-feeding apparatus for the controlled feeding of wire comprising a set of two opposed aligned rollers mounted on substantially parallel axes of rotation and with peripheral edges close to each other, one of said rollers being a driven feed roller and the other of said rollers being a pinch roller, said feed roller comprising circular outer flanges and inner disks with beveled edges, with detachable fasteners holding said flanges and disks together, to facilitate disassembly and reassembly, drive means connected to said feed roller for rotating it at a controlled rate, both of said rollers having indented V-shaped peripheral cross sections, said peripheral cross section of said feed roller having a relatively sharp obtuse angle, said peripheral cross section of said pinch roller having a relatively shallow obtuse angle, said angles accommodating a wide range of wire diameters, said peripheral cross section of said feed roller having a pair of sloped walls, said walls being serrated to facilitate gripping said wire, and resilient means urging said peripheral edges of said rollers together for gripping said wire between them.

4,235,363
METHOD OF INSTALLING REPLACABLE SLEEVE IN FIXED VORTEX FINDER
Delbert I. Liller, P.O. Box 64, Deer Park, Md. 22150
Division of Ser. No. 2,731, Jan. 11, 1979, Pat. No. 4,224,143.
This application Jul. 9, 1979, Ser. No. 56,108
Int. Cl.³ B23K 31/02
U.S. Cl. 228—182 **4 Claims**

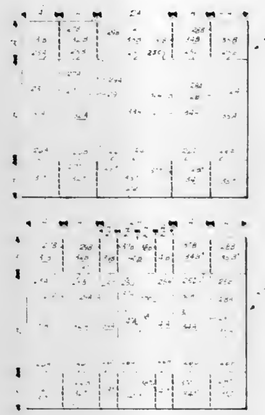


1. A method of installing and adjusting the sleeve in a vortex finder of a cyclone having a displaceable bottom dish in order to change the diameter dimension of the vortex finder, which vortex finder constitutes the sole outflow of the light fractions separated in a centrifugal cyclone, a jigging cyclone or a clarifying cyclone, said method comprising the steps of:
(a) providing a sleeve kit having a plurality of sleeve units of equal length but graduated diameters with a relationship of length to the inner bowl diameter B of said cyclone of at least 0.3B,
(b) graduating the said diameters of said sleeve units relative to the inner bowl diameter B of the cyclone between 0.3B and 0.5B,
(c) welding a connecting means to a sleeve unit, the connecting means being in the form of a collar adapted to position the sleeve in the vortex finder (d) displacing said bottom dish, and
(e) stitch welding said collar connecting means at the lower edge of said vortex finder from the bottom of the cyclone with said bottom dish displaced out of the way to thereby avoid the need to remove the cyclone top.

4,235,364
MULTI-PURPOSE CONTAINER BLANK
Harold L. Baker, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Jul. 23, 1979, Ser. No. 59,853
Int. Cl.³ B65D 5/22, 5/20
U.S. Cl. 229—34 R **2 Claims**

1. A blank for forming a number of various sized containers comprising
a rectangular sheet of material having a pair of parallel transverse edges and a pair of parallel longitudinal edges;
said blank having a pair of transverse score lines parallel to said transverse edges, each of said score lines being spaced from its adjacent transverse edge a first distance;
said blank having a first pair of longitudinal score lines parallel to said longitudinal edges and extending between said transverse score lines, each of said longitudinal score lines being spaced from its adjacent longitudinal edge said first distance;
said blank having a second pair of longitudinal score lines positioned inwardly of said first pair of longitudinal score lines, parallel to said first pair of longitudinal score lines and extending between said transverse score lines, each of said second pair of longitudinal score lines being spaced from its adjacent longitudinal score line of said first pair of longitudinal score lines and said first distance and said second pair of longitudinal score lines being spaced from each other twice said first distance;

said blank having perforations extending between each of said transverse score lines and its adjacent transverse



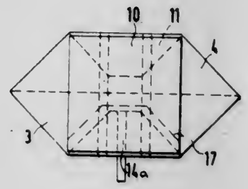
edge, said perforations being aligned with said longitudinal score lines.

4,235,365
THREE-LAYERED POLYPROPYLENE FILMS
Toshiya Yoshii; Toshihiro Yamane, both of Ohtsu, and Yasuo Saito, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Continuation of Ser. No. 890,943, Mar. 28, 1978, abandoned.
This application Oct. 1, 1979, Ser. No. 80,300
Claims priority, application Japan, Apr. 15, 1977, 52-42645
Int. Cl.³ B32B 7/02
U.S. Cl. 229—55 **6 Claims**



1. A three-layered heat sealable polypropylene film comprising a core layer of biaxially oriented polypropylene sandwiched between biaxially oriented ethylenepropylene copolymer layer (A) and uniaxially oriented ethylenepropylene copolymer layer (C) wherein the ethylene-propylene copolymers contain from 1 to 4 weight % ethylene, units based on total weight of the copolymer, and wherein the birefringence value of said layer (A) ranges from 0.0030 to 0.0100 and the birefringence value of said layer (C) ranges from 0 to 0.0010.

4,235,366
PLASTICS SACK WITH INTERNAL CLOSURE MEMBER, BASE COVER SHEET AND EMPTYING MEANS
Fritz Achelpohl, Lengerich, and Horst Schmidt, Kattenvenne, both of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany
Filed Dec. 11, 1978, Ser. No. 967,994
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755514
Int. Cl.³ B65D 33/38
U.S. Cl. 229—60 **6 Claims**



1. A plastics sack formed from a tube section and having a base, the base being formed by pulling an end of the tube section open to form corner tucks of generally triangular shape, the tucks having facing bases spaced apart by an exposed region of an inner surface of the tube section; a closure member covering and welded to the exposed region and portions of the corner tucks, end portions of the closure member and end portions of the bases of the tucks defining side flaps, the side flaps having portions thereof folded back onto the base; and a base cover sheet adhered to and covering at least a first of the folded back side flaps and being adhered to the closure member, and portions of the tucks; a second of the folded back side flaps being movable with respect to the base cover sheet to define a funnel for emptying the plastics sack.

4,235,367
SECONDARY CENTRIFUGE TUBE SEAL
Howard R. Davidson, Palo Alto, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jun. 18, 1979, Ser. No. 49,389
Int. Cl.³ B04B 15/00
U.S. Cl. 233—26 **6 Claims**



1. A centrifuge rotor sealing arrangement comprising:
a rotor having at least one cavity for receipt of a sample carrying centrifuge tube;
a spacer member positioned within said cavity over said tube, said tube being sealed prior to placement within said cavity, said spacer member completely covering the top of said tube, said spacer member having on its top outer surface a frustoconical area facing the interior wall of said cavity, said frustoconical area and said wall form a V-

shape cross-sectional channel, said spacer having a bottom outer surface which rests on a shoulder within said cavity;
an annular sealing member placed over said spacer member and having an interior frustoconical surface and an outer cylindrical side surface, said annular sealing member being positioned in said V-shaped channel; and
a plug member threadably engaged within said cavity over and in contact with said annular sealing member, said plug when being moved toward said tube causing said annular sealing member to be wedged within said V-shape channel to establish a secondary seal over said tube, so that, if any fluid would escape from said sealed tube, said annular sealing member will prevent any fluid escaping said rotor.

4,235,368

THERMOSTAT ASSEMBLY

Robert M. Neel, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Aug. 27, 1979, Ser. No. 70,220
Int. Cl.[3] H01H 37/04; H05K 1/00
U.S. Cl. 236—94 11 Claims



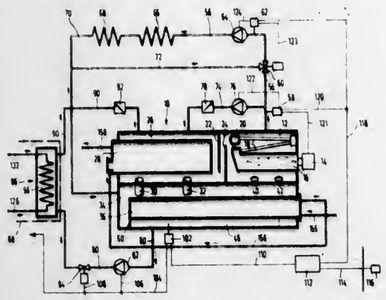
1. A thermostat assembly comprising:
a housing assembly;
switching means mounted on said assembly for selective operation by the user;
an indicator mounted on said assembly for signaling to the user;
a circuit unit mounted within said assembly and interconnected to receive signals from said switching means and to deliver signals to said indicator;
a temperature sensor mounted within said assembly and responsive to ambient air temperature to deliver a temperature-representative signal to said circuit unit;
connecting means for coupling said circuit unit to an external device to be controlled in response to operation of said switching means and governed in response to said temperature-representative signal;
a mounting plate affixable to a wall surface and having means for removably securing said assembly latchably thereto in a fixed position fully juxtaposed therewith;
a plurality of electrical contact pads mounted in one to face the other of said assembly and said plate;
a plurality of resilient electrical contact fingers mounted in the other of said assembly and said plate and aligned to mate and slide into contacting engagement with said pads as said assembly and said plate are secured together;
means for coupling one of said pads and said fingers to said external device;
and means for coupling the other of said pads and said fingers to said circuit unit.

4,235,369

PLANT FOR SPACE HEATING AND SERVICE WATER HEATING

Rudolf Huber, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 11, 1978, Ser. No. 950,288
Claims priority, application Switzerland, Oct. 12, 1977, 12443/77
Int. Cl.[3] F25B 29/00
U.S. Cl. 237—2 B 23 Claims



1. A plant for space heating and service water heating, said plant comprising
a combination boiler having a first water chamber for receiving water to be heated therein, a second water chamber communicating with said first chamber to receive heated water therefrom, a first heat-exchange surface in said second chamber for conveying a flow of service water therethrough in heat exchange relation with heated water in said second water chamber, a third water chamber in communication with at least said second water chamber to receive heated water therefrom and a second heat-exchange surface in said third water chamber connected in series with said first heat-exchange surface relative to the flow of service water for pre-heating the flow of service water;
a heat pump having a condenser section therein for conveying a heated medium therethrough; and
a circuit connected between said third water chamber, said condenser section and said second water chamber for conveying a flow of heated water from said third water chamber into heat exchange relation with the heated medium in said condensor and subsequently into said second water chamber.

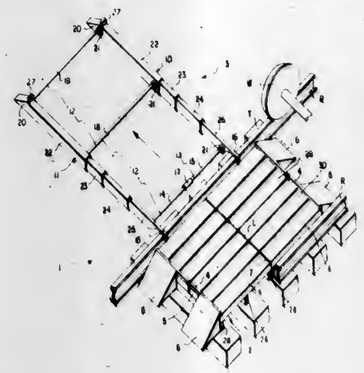
4,235,370

PORTABLE SET-OFF DEVICE FOR RAILROAD MOTORCARS

Kenneth D. Newby, P.O. Box 441, Moorcroft, Wyo. 82721

Filed Feb. 22, 1979, Ser. No. 14,096
Int. Cl.[2] E01B 23/00
U.S. Cl. 238—10 R 24 Claims

1. A portable set-off device for a railroad motorcar comprising:
a. a collapsible platform for placement in the space between the railroad track rails, said collapsible platform having end edges;
b. a telescoping ramp for placement beside and substantially perpendicular to the railroad track rails; and
c. inclined ramp means, mounted on the end edges of said collapsible platform, for permitting a wheel of the motorcar to be rolled back up onto the platform in the event that the motorcar has rolled off into the space between the railroad track rails, said inclined ramp means being oriented substantially parallel to the railroad track rails in the space therebetween and along the end edges of the collapsible platform, said end edges being transverse to the railroad track rails.

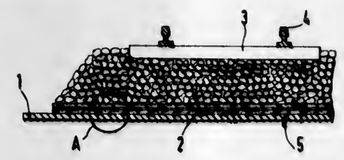


4,235,371

TRACK ARRANGEMENT FOR A RAILROAD

Karl-Albert Kohler, Grünwald, Fed. Rep. of Germany, assignor to Getzner Chemie Gesellschaft mbH & Co., Bludenz-Bürs, Austria

Filed Nov. 29, 1978, Ser. No. 964,688
Int. Cl.[3] E01B 19/00
U.S. Cl. 238—382 8 Claims



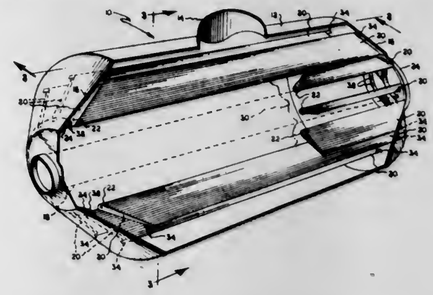
1. Insulation layer for damping train-generated noise along the tracks over which a train rides, said insulation layer arranged to be positioned between a support for the track and ballast supporting the track, said insulation layer comprising at least two layers of a resiliently deformable material, wherein the improvement comprises that said at least two layers include a first generally planar layer having an upwardly directed surface and a downwardly directed surface and the thickness dimension thereof extending between the upwardly and downwardly directed surfaces, a second generally planar layer having an upwardly directed surface and a downwardly directed surface and the thickness dimension thereof extending between the upwardly and downwardly directed surfaces and said second layer located below said first layer and arranged to receive downwardly directed compressive force from said first layer, the upwardly directed surface of said first layer being arranged to be in direct contact with the ballast and being three dimensionally deformable under the influence of the ballast, and the downwardly directed surface of said first layer being free relative to the upwardly directed surface of said second layer and transmitting only downwardly directed compressive force to said second layer.

4,235,372

DIFFUSER

Graham R. Salter, Ransomville, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Jul. 25, 1979, Ser. No. 60,490
Int. Cl.[3] H01S 3/22; B05B 1/14
U.S. Cl. 239—11 21 Claims



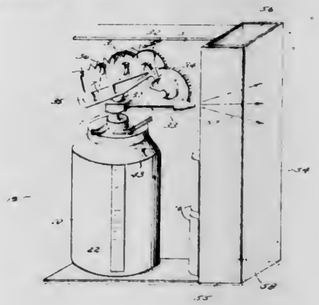
1. An apparatus for diffusing a radially expanding fluid from a supersonic flow to a subsonic flow thereof, which comprises a housing having a central region receiving radially outwardly expanding supersonic flow of fluid and also having a fluid outlet, and means disposed in the path of said radially expanding fluid in surrounding relation to said central region for generating an uninterrupted, coalesced series of detached bow shock waves upstream therefrom and for controlling the flow of fluid therethrough to said outlet.

4,235,373

FLUID DISPENSER

Peter J. Clark, Hemel Hempstead, England, assignor to Strattwell Developments Limited, London, England

Filed Oct. 12, 1977, Ser. No. 841,599
Claims priority, application United Kingdom, Oct. 12, 1976, 42308/76
Int. Cl.[3] A61L 9/04
U.S. Cl. 239—34 9 Claims



1. A fluid dispenser comprising a container for fluid, release means coupled with the container which release means has an outlet for said fluid and is operable to effect release of a portion of said fluid from the container via the outlet, actuating means operatively coupled with the release means for effecting periodic operation of the release means, and a convection chamber having a lower aperture for entry of air and an upper aperture for exit of air which convection chamber is provided with a downwardly extending inner adsorbent surface arranged to receive the released portion of said fluid to permit dispersion downwardly on the surface and vaporisation of the fluid into the convection air flow, said downwardly extending surface

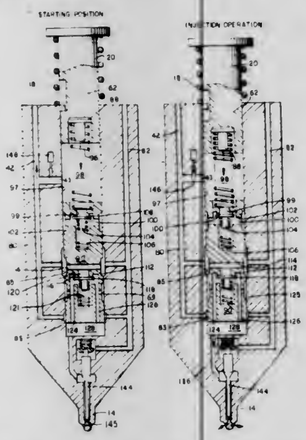
being provided with a progressing series of generally transversally extending individual channels each having at least one centrally depressed chevron shape as seen in front elevation, and a plurality thereof having at least two transversally adjacent centrally depressed chevron shapes which adjoin at an apex; the central depressions of said chevron shapes in a plurality of instances of adjacent paired ones of said channels being transversally staggered, so that as a released fluid portion is received on said internal surface it is conducted laterally leftwards and rightwards toward said central depressions and overflows down said internal surface from upper ones to lower ones of said channels.

4,235,374

ELECTRONICALLY CONTROLLED DIESEL UNIT INJECTOR

Richard P. Walter, Southfield; Albert E. Sisson, Farmington Hills; Louis R. Erwin, Livonia, and Charles R. Kelso, Farmington, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 25, 1979, Ser. No. 6,949
Int. Cl.³ F02M 47/02
U.S. Cl. 239—90 **10 Claims**



1. A fuel injector adapted to be disposed in timed operative relationship to the combustion chamber of an internal combustion engine in response to an electronic control unit, said injector comprising:

(a) a body having a bore;

(b) a primary pumping plunger and a secondary plunger spaced therefrom, said primary and secondary plungers being positioned within said bore for axial movement;

(c) a nozzle situated at the end of the said bore remote from said primary pumping plunger for releasing fuel into the combustion chamber;

(d) a timing chamber defined in said bore between said primary pumping plunger and said secondary plunger adapted to create a coupling between said plungers;

(e) a metering chamber defined in said bore between said secondary plunger and said nozzle;

(f) passages in said body adapted to introduce fuel under pressure into said timing chamber and said metering chamber;

(g) electronically operated control valve means situated intermediate said passages and said timing chamber to seal said timing chamber and control the coupling of said primary to said secondary plungers;

(h) said control valve means adapted to be selectively energized by the electronic control unit to regulate (1) the timing of the discharge of fuel from the metering chamber through the nozzle, and (2) the quantity of fuel discharged through the nozzle; and

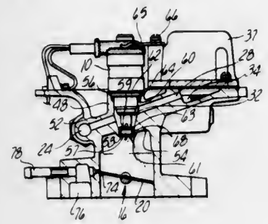
(i) passage means and check valve means supported by said secondary plunger for controlling the flow of fuel between said body passages and said timing and metering chambers.

4,235,375

FUEL INJECTION VALVE AND SINGLE POINT SYSTEM

Angelo R. Melotti, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 7, 1978, Ser. No. 875,833
Int. Cl.³ F02M 51/08, 61/14
U.S. Cl. 239—125 **4 Claims**



1. A hot fuel handling arrangement for the fuel injection of an internal combustion engine at an injection point, said arrangement comprising:

an independently formed injector jacket located at the injection point having an inlet fuel passage for receiving pressurized fuel and for communicating said fuel to an accumulation chamber defined by an inside wall of said injector jacket, said injector jacket further having a fuel exit passage directly connected to the accumulation chamber for communicating fuel from said accumulation chamber, said inlet fuel passage forming a circulation path with said exit passage to maintain a constant movement of fuel from said inlet passage through said accumulation chamber and out said exit passage, said circulation causing entrained vapor and bubbles within the system to move toward said exit passage, wherein said exit passage is elevated with respect to said inlet passage to enhance the flow of the entrained vapor and bubbles toward said exit passage; and

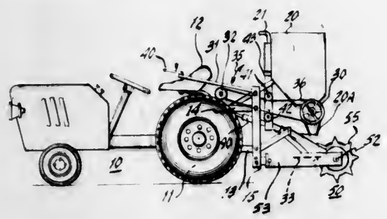
electronically controlled fuel injection valve means to meter said fuel from the accumulation chamber into said injection point.

4,235,376

DISPENSING APPARATUS FOR USE WITH A TRACTOR

Robert F. Cohen, 14 Susan Pl., Edison, N.J. 08817, and Leonard Cohen, 1594 Putney Rd., Valley Stream, N.Y. 11580

Filed Oct. 22, 1979, Ser. No. 86,942
Int. Cl.³ B05B 9/06; A01C 7/08
U.S. Cl. 239—155 **9 Claims**



1. In combination with a tractor of the type employing two rear wheels, with an operator's seat located adjacent said wheels and relatively central thereto, said tractor employing an attachment frame assembly extending from the rear and beyond said wheels for attaching various implements thereto, a dispensing apparatus comprising:

(a) a pivotable frame member pivotally secured to said attachment frame and comprising a first and a second parallel, longitudinal member extending towards said seat, with said first member pivotally mounted on said attachment frame and extending above and adjacent to one rear wheel, with said second frame member pivotally mounted on said attachment frame and extending above and adjacent said other rear wheel,

(b) a rotatable shaft positioned between said first and second longitudinal members and relatively transverse thereto, a first friction wheel secured to said shaft near said first member, a second friction wheel secured to said shaft near said second member, said first and second wheels adapted to coact with said associated rear wheels when said frame member is pivoted in an operating mode,

(c) a cannister housing secured to said attachment frame assembly and having located therein a rotatable material dispensing cylinder, said cylinder coupled to a drive pulley for rotating the same,

(d) a pulley coupled to said rotatable shaft and positioned between said first and second friction wheels,

(e) an endless belt located about said drive pulley and said rotatable shaft pulley and operative to rotate said dispensing cylinder when said shaft pulley is rotated,

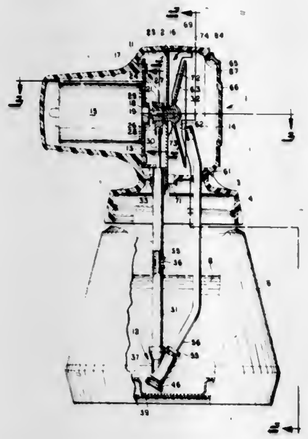
(f) a pivotable lever coupled to one of said first and second longitudinal members and operative to pivot said frame member to cause said friction wheels to engage said rear wheels of said tractor, when said lever is pushed downwardly, said lever capable of being pivoted in said downward position to extend underneath said operator's seat to thereby maintain engagement of said friction wheels with said rear wheels of said tractor.

4,235,377

PORTABLE PAINT SPRAYING DEVICE

Howard C. Davis, and Donald L. Cooper, both of Columbus, Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Continuation-in-part of Ser. No. 740,109, Nov. 9, 1976, abandoned. This application Nov. 29, 1978, Ser. No. 964,449
Int. Cl.³ B05B 3/08
U.S. Cl. 239—215 **25 Claims**



1. A portable pump spraying device comprising a container for the liquid to be sprayed, a housing removably connected to said container, said housing containing a spraying chamber with an egress slot therein, pump means for delivering liquid to said spraying chamber from said container, a vertically oriented disc in said spraying chamber, drive means for rotating said disc, and means for directing the liquid delivered to said spraying chamber by said pump means onto said vertically oriented disc, the rotation of said disc being operative by centrifugal force to impel a portion of the liquid directed thereon through said egress slot as a spray, and interceptor means within said spraying chamber to define the spray pattern angle and assist in returning excess liquid to said container for recirculation by said pump means, said egress slot being substantially vertical, including trailing and leading edges, and said interceptor means including a baffle positioned adjacent said trailing edge of said egress slot, said baffle extending both above and below said trailing edge and across the peripheral edge of said disc to trim the lower edge of the spray pattern and intercept the attenuated liquid in the region of said trailing edge of said egress slot for return to said container, thereby to keep liquid from dripping onto the external surfaces of said housing and disc adjacent the trailing edge of said slot, said interceptor means including a second baffle between the first baffle and said slot for finely trimming the lower edge of the spray pattern previously cut by said first baffle.

4,235,378

WATER PLAY TOY

Arthur K. Melin; Richard L. Gillespie, both of San Gabriel; Darle L. Kerkenbush; Jim L. Whittington, both of Diamond Bar, and Douglas A. Geller, Monrovia, all of Calif., assignors to Wham-O Mfg. Co., San Gabriel, Calif.

Filed Jul. 16, 1979, Ser. No. 58,069
Int. Cl.³ B05B 3/00
U.S. Cl. 239—229 **15 Claims**



1. A water play toy comprising:

a housing having an inlet coupling, said housing forming a first chamber;

a source of water connected to the housing at the inlet coupling;

a conduit extending through the housing from the inlet coupling to an outlet location;

a second chamber located within the first chamber at the outlet location from the housing, said chamber communicating with the conduit;

a plurality of individual outlets from the second chamber opening to the exterior of the housing; and

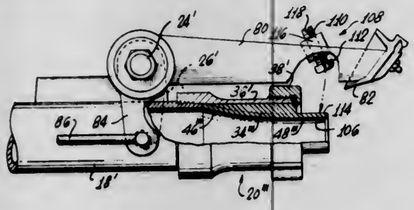
a plurality of flexible hollow tubular means secured to each of the individual outlets at one end thereof with the opposite ends being free.

4,235,379

INTERCHANGEABLE NOZZLE APPARATUS FOR FULL OR PART CIRCLE IRRIGATION SPRINKLERS

John D. Beamer, West Covina, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Continuation-in-part of Ser. No. 873,225, Jan. 30, 1978, abandoned. This application Apr. 24, 1978, Ser. No. 899,062
Int. Cl.³ B05B 3/08
U.S. Cl. 239—230 24 Claims



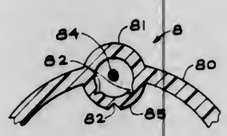
1. For use in an irrigation sprinkler including a water discharge tube, an interchangeable nozzle apparatus comprising:
an elongated tubular housing having a generally cylindrical hollow interior, said housing being attached to a water discharge end of said discharge tube and extending axially outwardly therefrom;
an insert member disposed in said housing and abutting said water discharge end of said discharge tube, said insert member having an inlet and an outlet communicating through a passage, said inlet having an inside diameter substantially equal to the inside diameter of said discharge end of said discharge tube, said outlet having an inside diameter less than the inside diameter of said inlet, and said insert including longitudinally extending external ribs defining an exterior surface sized to slidably fit within said housing; and
said insert is releasably retained in said housing by a collar which bears against a shoulder on said ribs and urges said inlet into abutting contact with said discharge end of said discharge tube.

4,235,380

MULTIPLE CHAMBER DRIP IRRIGATION HOSE

William A. Delmer, 16901 Bedford La., Huntington Beach, Calif. 92649

Division of Ser. No. 861,119, Dec. 16, 1977. This application May 15, 1979, Ser. No. 39,176
Int. Cl.³ B05B 15/00
U.S. Cl. 239—450 2 Claims



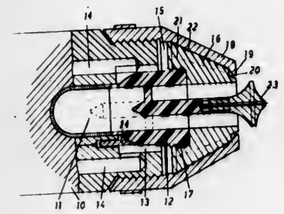
1. A multichamber drip irrigation hose for distributing irrigation water and the like in controlled amounts, comprising:
a primary and at least one secondary tube of flexible, water-impermeable material and joined at a common wall;
said common wall having a series of first holes placing the interior of said primary tube in communication with the interior of said secondary tube;
said secondary tube having a series of second holes leading from the interior of said secondary tube to the exterior; and
with said secondary tube having a circular cross section divided into approximately equal upper and lower portions separated from each other by the walls of said primary tube, said lower portion of the secondary tube forming said common wall, said common wall having upper and lower surfaces, said common wall having at least one groove in each of said upper and lower surfaces to allow an increase in water pressure in the primary tube to flatten the adjacent secondary tube and close the groove in said lower surface limiting flattening of said secondary tube.

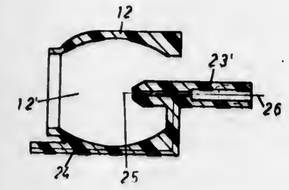
4,235,381

DEVICES FOR COVERING OBJECTS WITH ELECTROSTATIC DUST

Juan R. Vila, Calle Santander, 29 A., Barcelona, Spain

Filed Feb. 2, 1979, Ser. No. 9,060
Claims priority, application Spain, Apr. 7, 1978, 468,633
Int. Cl.³ B05B 5/04
U.S. Cl. 239—696 8 Claims





1. In an electrostatic spray coating apparatus for coating objects with electrostatic powder including a housing member, a discharge nozzle, an internal flow passage in said housing member for conducting compressed gas to the nozzle, a deflector coaxially disposed adjacent the discharge end of the nozzle, a source of compressed gas and a source of powder and means to produce a powder-gas mixture and feed it to the flow passage, means for ionizing the powder-gas mixture and a source of high voltage connected to the ionizing means, the improvement comprising a hollow charging chamber within the nozzle connected to the flow passage and through which the powder-gas mixture flows, said charging chamber having an oval shape with the long axis aligned with said flow passage, an electrode having an inner end extending into said chamber and the outer end disposed in the deflector at the discharge end of said nozzle, and means to provide an auxiliary flow of ionized gas to the discharge nozzle.

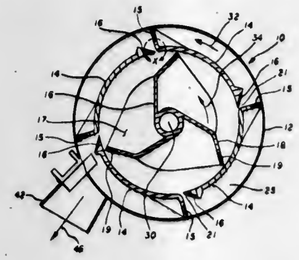
4,235,382

METHOD AND APPARATUS FOR RECHIPPING WOOD CHIPS

William C. Smith, West Vancouver, Canada, assignor to Rader Companies Inc., Portland, Oreg.

Filed Feb. 26, 1979, Ser. No. 15,125
Int. Cl.³ B02C 18/14
U.S. Cl. 241—28 6 Claims

1. Apparatus for rechipping oversize wood chips into smaller chips comprising, in combination:
a cylindrical drum adapted to be rotated about its longitudinal axis and having
(a) a wall comprising a plurality of segments defining a corresponding plurality of slots in the wall, said slots extending substantially longitudinally along the drum wall,
(b) a plurality of knives, each knife being mounted in a wall segment;
means for introducing oversize chips into the drum;
an anvil rotor having a plurality of arms on each of which a corresponding blade is mounted, said anvil rotor adapted to be rotated concentrically within the drum;



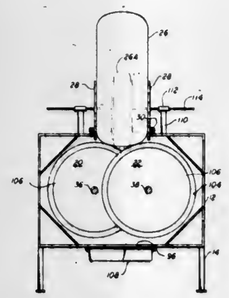
means for rotating the anvil rotor and drum in the same direction at different rotational speeds with the rotor arm speed being greater than the drum speed, whereby oversize chips are positioned and orientated against the drum inner wall by centrifugal force where they are engaged by the anvil rotor arm blades and moved along the wall to the next drum knife where the relative movement of the blade pushing the chip past the knife cuts a slice from a chip to pass through a slot for discharge from the rechipping apparatus.

4,235,383

TIRE DISINTEGRATOR

Richard F. Clark, 3620 Oakwood Dr., Bettendorf, Iowa 52722

Filed Aug. 3, 1979, Ser. No. 63,222
Int. Cl.³ B02C 18/22
U.S. Cl. 241—38 5 Claims



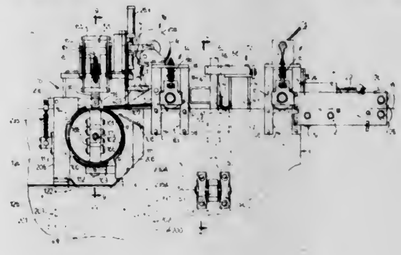
1. A tire disintegrator for grinding defective tires into a residue for recycling, said disintegrator comprising:
a first set of spaced, axially aligned abrasive wheels,
a second set of spaced, axially aligned abrasive wheels,
said first set and said second set being mounted on parallel axle shafts,
said axle shafts being spaced apart a distance greater than the radius of said wheels,
means counterrotating each set downwardly and toward each other to frictionally retain tires places thereover in abrasive contact with said wheels,
said wheels enclosed within a housing, said housing having a top opening in the top thereof through which tires may be inserted and a bottom opening at the bottom thereof through which tire residue may pass,
a pair of side guides adjacent said top opening to maintain tires in a substantially upright position over said wheels,
said tire guides being laterally adjustable to receive tires therebetween of various widths.

4,235,384

APPARATUS FOR PROVIDING TAPED COILS OF SHEET MATERIAL

Herbert M. Stoehr, New Berlin, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Aug. 4, 1978, Ser. No. 930,888
Int. Cl.³ B21C 47/00
U.S. Cl. 72—148 15 Claims



1. In a mechanism for forming a coil from a web of sheet material:
a rotatable expandable and contractable mandrel, said mandrel being expanded at the commencement of and during winding and being contractable after winding is completed;
a pair of adjustably positionable hold-down plates adjacent said mandrel and a plurality of web guide means including adjustably positionable guide plates disposed around the periphery of said mandrel, said web guide means having one position at the commencement of windind and while said mandrel is expanded for initially directing the incoming leading edge of a web of sheet material around and against said mandrel to enable commencement of coil winding, said web guide means being positionable away from said one position when coil winding commences;
and a plurality of adjustably positionable cage rollers disposed around the periphery of said mandrel for bearing against a coil being wound on said mandrel to ensure formation of a tight coil, said cage rollers being positionable out of engagement with said coil when coil winding is completed.

4,235,385

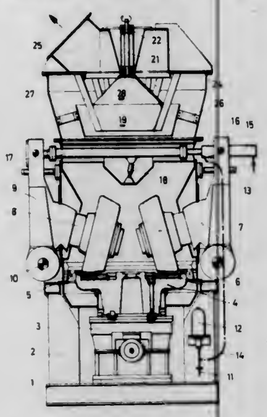
ROLLER MILL WITH LIQUID-GAS SUSPENSION

Horst Brundiek, Neuss, Fed. Rep. of Germany, assignor to Loesche GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,740
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2838782
Int. Cl.³ B02C 15/04
U.S. Cl. 241—110 4 Claims

1. A roller mill having:
a grinding pan designed for turning about an upright axis,
a driving system for the pan and placed under it, rocking levers,
grinding rollers turningly supported on the rocking levers, the rocking levers being designed for pushing the rollers against the pan for rolling motion of the rollers on the pan and milling material on the pan, and
an air-liquid or hydropneumatic system for springingly acting on the rocking levers for pulling them together with a

weighting effect on the rollers, characterised in that a hydraulic suspension cylinder is placed at one side of the



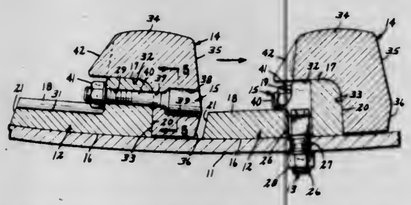
suspension system only and is turningly fixed, near its center of gravity, directly in a rocking lever.

4,235,386

SHELL LINER ASSEMBLY FOR ORE GRINDING MILLS

Darrell R. Larsen, Salt Lake City, Utah, assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Filed Aug. 11, 1978, Ser. No. 932,711
Int. Cl.[2] B02C *17/22*
U.S. Cl. 241—183 **18 Claims**



1. An improved liner assembly for the cylindrical shell of an ore grinding machine, comprising:

(a) a plurality of first liner segments of predetermined size and configuration, each defining a first mounting surface constructed for mounting engagement with the inner surface of the cylindrical shell, and each of said first liner segments defining a second mounting surface;

(b) a plurality of second liner segments of predetermined size and configuration, each defining a third mounting surface constructed to conform to the second mounting surface of a first liner segment, each of said second liner segments further defining a grinding surface for comminuting the ore;

(c) first connecting means for mounting each of said first liner segments directly to the cylindrical shell of the ore grinding machine independently of said second liner segments;

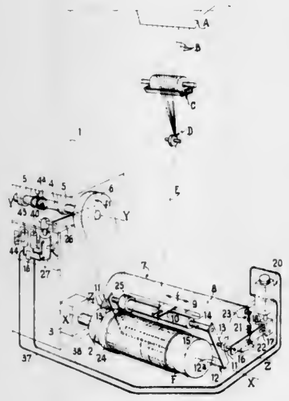
(d) and second connecting means for mounting each of said second liner segments to an associated one of said first liner segments independently of said cylindrical shell, said second connecting means constructed and arranged to permit removal of a second liner segment from the associated first liner segment without removing the associated first liner segments from the cylindrical shell.

4,235,387

WINDING APPARATUS, ESPECIALLY FOR STRANDS FORMED OF THERMOPLASTIC MATERIAL

Jean R. Nicoulaud, Chalie-les-Eaux, and Georges Fromaget, La Motte Servolex, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jul. 24, 1978, Ser. No. 927,606
Claims priority, application France, Aug. 3, 1977, 77 23947
Int. Cl.[3] B65H *54/08, 54/28*
U.S. Cl. 242—18 G **10 Claims**



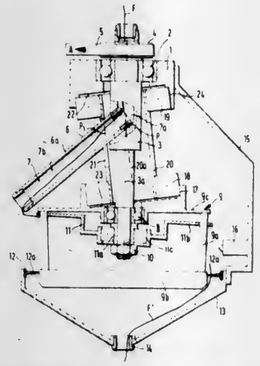
1. Winding apparatus, particularly for winding strand or rovings formed of thermoplastic material such as glass drawn from a bushing, said apparatus comprising a fixed frame, a collet rotatably mounted on the frame for receiving the strand, means for rotating the collet, a strand traverse guide assembly including an arm mounted by a pivot on the frame, a traverse guide mechanism mounted on said arm, said arm and said guide mechanism being mounted for conjoint rocking movement about the axis of said pivot, so that the traverse guide mechanism is movable toward and away from the axis of rotation of the collet, and control means for effecting said rocking movement of the traverse guide mechanism in a direction away from the collet according to the radial growth of a spool being formed on the collet, said control means comprising a control loop, said control loop comprising a follower mounted on said arm for rocking motion with respect to said arm in response to radial growth of said spool, biasing means for urging said follower against the collet, variable speed drive means including a positive drive transmission tending when activated to move said arm in a direction to shift said follower away from the collet, thereby producing rocking withdrawal movement of the guide mechanism and the follower away from the axis of rotation of the collet against the action of said biasing means, and when not activated to substantially lock said guide mechanism and follower against rocking movement, and an excitation element operatively connected to said follower, said excitation element being continuously moveable in response to movements of said follower under the influence of radial growth of a spool being formed on the collet to activate said positive drive transmission to withdraw the traverse guide mechanism and the follower at a rate equal to the rate of radial growth of the spool.

4,235,388

THREAD STORAGE AND DELIVERY DEVICE

Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulriceham, Sweden

Filed Sep. 10, 1979, Ser. No. 73,852
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839437
Int. Cl.[3] B65H *51/20*
U.S. Cl. 242—47.01 **4 Claims**



1. A thread storage and delivery device comprising a rotatably driven axle having a hollow end portion that is rotatably journalled in a fixed support member, a storage drum supported at the opposite end of the axle, and a hollow arm that projects radially outwardly from the axle at an inclination in the direction towards said opposite end thereof to have its outer end orbit the storage drum in consequence of axle rotation, the interior of said arm being communicated with the interior of said hollow portion of the axle so that thread can be drawn into said one end of the axle to be wound about the storage drum by said arm, said device being characterized by:

a retaining element whereby the storage drum is locked against rotation with the axle, said retaining element

A. being in surrounding relation to the axle,

B. having opposite end portions respectively so connected to said support member and to the storage drum that the retaining element is rotatable about its axis relative to them,

C. having an opening which is elongated substantially parallel to its axis and through which said arm projects, said opening having edge portions slidingly engaged by said arm as the axle rotates to drive the retaining element for rotation about its axis, and

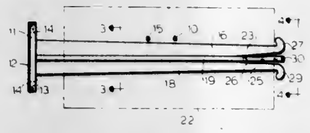
D. having its axis inclined to and substantially intersecting the axis of said axle.

4,235,389

PAPER TOWER HOLDER AND THE LIKE

Virginia V. Ness, 57 W. Shore Rd., Belvedere, Calif. 94920

Filed Jun. 18, 1979, Ser. No. 49,236
Int. Cl.[3] B65H *19/02*
U.S. Cl. 242—55.2 **5 Claims**



1. A holder for paper towels, including in combination:

a base having two opposite generally flat surfaces,

a standard extending from said surface of said base and integral therewith and having

a major portion comprising a series of radially outwardly-extending flat strips extending out at intervals from a juncture at a common center line, all the strips being of identical radial extent along any intersecting plane parallel to said base, the outer edges of all strips tapering in the same manner from a widest portion at the base to a narrow portion distant from the base, and

a minor portion distant from the base and comprising an extension of each of the strips with them separated from each other at the center by a distance increasing with the distance from the base, so that the strips of said minor portion may be forced in toward the center with springy resilience tending to restore them to a normal outward position, each said strip terminating at an out-turned finial,

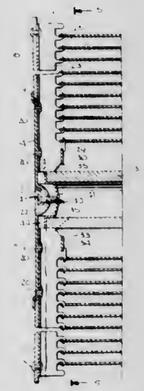
whereby a roll of paper can be placed on the standard by urging the finials inward and then pushing the paper roll toward the base until the finials emerge from the opposite end of the roll and by spring-action expand to overlie and engage that end of the paper roll and retain it in place on the standard.

4,235,390

FABRIC REEL FOR PLUSH FABRICS

Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Filed Aug. 15, 1978, Ser. No. 933,824
Int. Cl.[3] B65H *75/02*
U.S. Cl. 242—77.1 **1 Claim**



1. A reel for pile fabric comprising

a pair of end frames, each said end frame including a plate having a centrally located hole; a plurality of hook-containing sections for impaling a fabric material thereon secured to said plate, said sections extending outwardly from said plate in a radiating pattern; a flat board disposed about said plate and having a central aperture receiving said plate therein; and a lock plate mounted centrally of said sections in locking relation with said sections and having a central aperture therein;

a hollow spacer bar between said end frames, said bar being received at each end within said central aperture of each respective lock plate and in engagement with said sections;

a spacer cap mounted on at least one end of said spacer bar; and

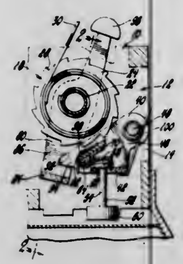
a screw threaded into said hole of said plate of the end frame facing said one end of said spacer bar, said screw being disposed in abutment with said cap to move said end frame away from said spacer upon threading of said screw into said end frame.

4,235,391

LOCKBAR RELEASE FOR INERTIA LOCKING SEAT BELT RETRACTOR

Charles B. Steger, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1979, Ser. No. 93,937
Int. Cl.[3] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A 1 Claim



1. In a seat belt retractor having a belt reel journaled on a frame for belt winding and unwinding rotation, a ratchet plate carried by the reel, and a lockbar selectively movable between a locking position engaging the ratchet plate to lock the reel against belt unwinding reel rotation and an unlocking position disengaged from the ratchet plate to permit belt unwinding reel rotation, the improvement comprising:

a support link;

first pivot means mounting the lockbar on the support link for pivotal movement between the locking and unlocking positions;

second pivot means mounting the support link on the frame to permit pivotal movement of the support link between a normal position supporting the lockbar in proximity with the ratchet plate and a position away from the ratchet plate, the relationship between the first and second pivot means causing the belt loads to induce movement of the support link away from the ratchet plate;

latch means acting between the frame and the support link for latching the support link against belt loads acting thereon at the normal position supporting the lockbar in proximity with the ratchet plate for selective movement between the locking and unlocking positions; and

means actuable to disengage the latch means from latching engagement with the support link whereby seat belt loads imposed on the support link via the lockbar are effective to pivot the support link about the second pivot means away from the ratchet plate and thereby move the lockbar from the locking position to unlock the reel for belt unwinding rotation.

4,235,392

TEXTILE BOBBIN

Frank L. Allen, Jr., Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 29, 1979, Ser. No. 42,850
Int. Cl.[3] B65H *75/12*; B32B *27/40*; B05D *3/02*
U.S. Cl. 242—118.32 5 Claims

1. An improved wood textile bobbin having a single protective wear resistant coating that rapidly forms a tack free surface upon application which is formed from a coating composition consisting essentially of by weight percent:

(a) about 40 to 65 percent solids consisting of;

(i) a ricinoleic acid/diphenylmethane diisocyanate prepolymer (MDI); and

(ii) a moisture activated, blocked, hydroxyl functional acrylic resin; and

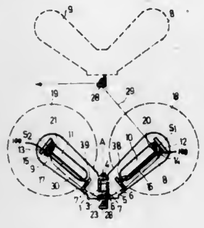
(b) balance a solvent for the solids of (a) which solvent contains no hydroxide group or water.

4,235,393

METHOD AND APPARATUS FOR CONTINUOUSLY TAKING-OFF A THREAD ALTERNATELY FROM ONE OF TWO PARALLEL BOBBIN PACKAGE ARRANGED SIDE BY SIDE

Eduard Schenkel, Seuzach, and Dieter Thalmann, Winterthur, both of Switzerland, assignors to Rieter Machine Works Ltd, Winterthur, Switzerland

Filed Feb. 21, 1979, Ser. No. 13,746
Claims priority, application Switzerland, Feb. 24, 1978, 200978
Int. Cl.[3] B65H *49/00*
U.S. Cl. 242—128 20 Claims



1. A method of continuously taking-off a thread alternately from one of two bobbin packages arranged side by side in a creel for textile machines to a common thread guide, wherein one of the bobbin packages momentarily serves as a reserve bobbin package and the other bobbin package as a withdrawal bobbin package from which the thread is in the process of being unwound, comprising the steps of:

guiding the leading thread end of the reserve bobbin package, in the thread take-off direction, through a thread take-off guide opening operatively associated with such reserve bobbin package for guiding thread during take-off from said reserve bobbin package;

then guiding the thus removed leading thread end, in a direction opposite to said thread take-off direction, through a location at least near to and communicating with a thread take-off guide opening operatively associated with the withdrawal bobbin package from which the thread is being unwound for guiding thread during take-off from said withdrawal bobbin package; and

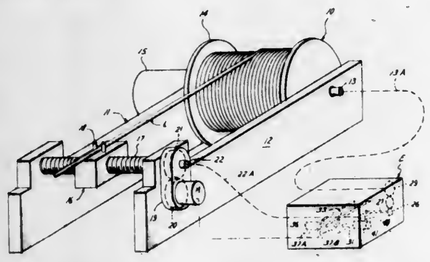
knotting the leading thread end to a tail thread end of the withdrawal bobbin package.

4,235,394

APPARATUS FOR GUIDING SUPERIMPOSED LAYERS OF LINE ONTO AND OFF OF A POWER DRIVEN REEL

Robert A. Fry, 910 Forsythe, Houston, Tex. 77073

Filed Jun. 22, 1979, Ser. No. 51,011
Int. Cl.[3] B65H *54/28*
U.S. Cl. 242—158.2 10 Claims



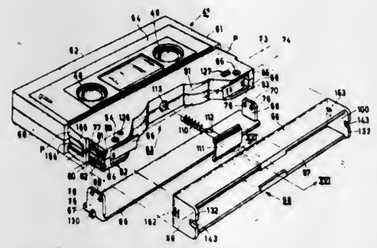
1. In combination with a power driven reel about which a plurality of superimposed layers of line may be wound or from which a plurality of superimposed layers of line may be unwound; apparatus comprising means mounted in front of the reel for shifting back and forth in a lateral direction parallel to the axis of the reel in order to guide the line as it is wound onto or off of the reel, means for so shifting said guide means, means responsive to rotation of the reel for initiating operation of said shifting means, and means responsive to shifting of said guide means for interrupting operation of said shifting means when said guide means has been moved to a position which it should occupy in order to cause the line to move laterally of the reel in accordance with a predetermined pattern, the initiation and interruption of the operation of the shifting means being repeated as the reel continues to rotate.

4,235,395

MAGNETIC TAPE CASSETTE WITH PIVOTING COVER

Hendrik C. Wardenaar, Eindhoven, Netherlands; Franz Werner, Vienna, Austria; Petrus J. J. Aarts, Eindhoven, Netherlands, and Franz Beitler, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,296
Claims priority, application Netherlands, May 9, 1978, 7804936
Int. Cl.[3] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—199 28 Claims



1. A magnetic tape cassette comprising

a housing, having first and second plane parallel main walls, two side walls connected to the main walls, a rear, and a front having an opening between said main walls,

two adjacent reel hubs rotatably arranged between said main walls;

a length of magnetic tape having respective ends connected to the reel hubs, a portion of said length being stretched along said front opening for cooperation with parts of a magnetic tape apparatus, and

cover means, connected to and pivotable relative to the housing about an axis parallel to said main walls and the cassette front, between a closed position and an open position,

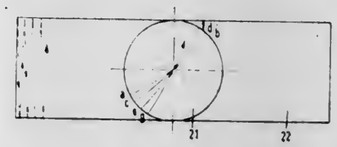
wherein said cover means comprises a single cassette cover arranged to substantially cover the entire front of the housing when in the closed position, and connecting means for pivotally connecting said cover to the housing for movement from the closed position to a first open position by pivoting in a first direction toward the first main wall, and to a second, different open position by pivoting in a second direction toward the second main wall.

4,235,396

NIGHT SIGHTING ARRANGEMENT

Günter Pusch, Bannholzweg 12, 6903 Neckargemund-Dilsberg, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,834
Int. Cl.[3] F41G *7/00*
U.S. Cl. 244—3.11 10 Claims



1. A night sighting method for automatic guidance of missiles comprising the steps of: displaying an image for observation and target recognition in Cartesian coordinates; displaying an image for target identification and aiming procedures, and missile guidance correction in polar coordinates; and displaying image background in a different color and different geometric and thermal resolution than the target.

4,235,397

FLOW DEFLECTOR BLADES

Christopher J. Compton, Hatfield, England, assignor to British Aerospace, Weybridge, England

Filed Apr. 26, 1979, Ser. No. 33,714
Claims priority, application United Kingdom, Apr. 29, 1978, 17156/78
Int. Cl.[3] B64C *3/48*, *15/02*
U.S. Cl. 244—12.5 6 Claims



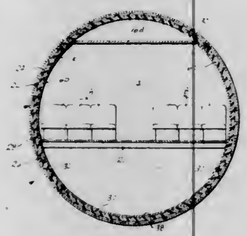
1. A resiliently deformable flow deflector blade including a first surface, a second surface facing generally opposite to said first surface, a leading edge member, a trailing edge member, a leaf spring member connecting the leading edge member and the trailing edge member, and filler portions sandwiching said leaf spring member and shaped to provide a desired external contour at said first and second surfaces when the blade is undeformed, said leaf spring member comprising a leading region connected to said leading edge member near said first surface of said blade, a trailing region connected to said trailing edge member near said first surface, and an intermediate region between said leading region and said trailing region with said leaf spring being of arcuate form so that both when the blade is undeformed as well as deformed, said intermediate region will always lie adjacent said second surface of said blade, said filler portions being of a rubber material to adopt alternative desired contours when said blade is deformed.

4,235,398

THERMAL INSULATION FOR AIRCRAFT FUSELAGE

William R. Johnson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 18, 1978, Ser. No. 970,773
Int. Cl.³ B32B 3/12
U.S. Cl. 244—119 13 Claims



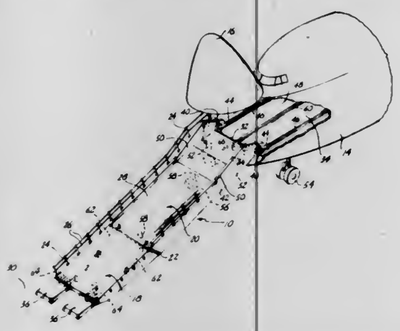
1. A shell for an aircraft fuselage, said shell comprising the combination of: a metal outer skin, a metal inner skin, a honeycomb core sandwiched between said inner and outer skins, and a foam insulation panel including a plurality of standoff portions integral therewith and bonded to said inner skin.

4,235,399

CARGO RAMP

Thomas H. Shorey, Freeland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 9, 1979, Ser. No. 28,334
Int. Cl.³ B64D 9/00
U.S. Cl. 244—137 R 31 Claims



1. A cargo ramp stowable in a first position onboard a cargo carrying vessel and deployable to a second position wherein said cargo ramp extends angularly between the terminus of a cargo deck of said cargo carrying vessel and the surface of a cargo handling zone, said cargo ramp comprising:

first and second ramp sections each having an upper surface, a lower surface, first and second end regions and first and second oppositely disposed side surfaces;

hinge means for pivotably connecting said first end region of said second ramp section to said second end region of said first ramp section;

actuator means for swinging said second ramp section about said hinge means during movement of said cargo ramp between said first and second positions; and

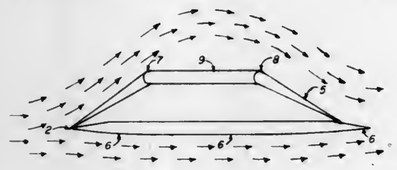
upper support and deployment means for supporting said first end region of said first ramp section when said cargo ramp is moved between said first and second positions and retrieved from said second position to said first position and for forming an interface between said cargo ramp and said cargo carrying vessel when said cargo ramp is maintained in said second position, said upper support and deployment means including roller means configured for engagement with guide means mounted on said cargo deck of said vessel to permit said cargo ramp to be moved inwardly and outwardly across said terminus of said cargo deck, said upper support and deployment means further including first and second elongate support arms mounted with said first support arm extending longitudinally outward from said first end region of said first ramp section at a position proximate to said first side surface and with said second support arm extending longitudinally outward from said first end region of said first ramp section at a position proximate to said second side surface, said roller means of said support and deployment means including first and second roller mounted carriages for interconnection with said first and second support arms, said first and second roller mounted carriages and the outer region of said first and second support arms being configured and arranged to form a first ball-and-socket coupling for interconnecting said first support arm with said first roller mounted carriage and for forming a second ball-and-socket coupling for interconnecting said second support arm with said second roller mounted carriage.

4,235,400

HI-LO TWO SPEED WING

Floy Haworth, Monett, Mo., assignor to Juanita June Haworth, Monett, Mo., a part interest

Filed May 10, 1979, Ser. No. 27,102
Int. Cl.³ B64C 3/38, 3/44
U.S. Cl. 244—218 5 Claims



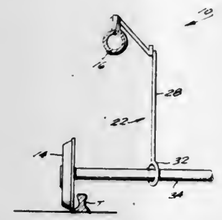
1. An improvement in heavier-than-air aircraft having a fuselage and a tail assembly, the improvement being a variable wing design having two high speed airfoils on each side of the fuselage, comprising an upper airfoil spaced above a lower airfoil at their attachment to the fuselage and converging toward each other at a juncture near their wing tips to form a triangular shaped air passageway therebetween, each said upper airfoil having a leading edge section immediately above each air passageway, of proper size and shape and hinged at its rear edge to said upper airfoil such that when said leading edge section is pivoted downward it contacts the leading edge of said lower airfoil and closes off the air passageway forming a sloping upper surface to direct airflow up and over the upper airfoil; each of said upper airfoils also including a trailing edge section of proper size and shape and hinged at its front edge to said upper airfoil such that when said trailing edge section is pivoted downward it contacts the upper surface of said lower airfoil at a location forward of the trailing edge thereof closing the passageway and forming a downward sloping surface from said upper airfoil, consequently with said leading and trailing edge sections unpivoted the wing design is of two spaced apart wings for high speed flight and with the sections pivoted into their lower airfoil contacting positions a single high lift low speed wing is formed.

4,235,401

AUTOMATIC TRAIN STOPPING

John Greene, Jr., Leeds, Ala., assignor to Gregory S. Prince, Chevy Chase, Md., a part interest

Filed Mar. 14, 1979, Ser. No. 20,500
Int. Cl.³ B60T 7/12
U.S. Cl. 246—172 6 Claims



1. In combination with a railroad car having a plurality of wheel sets and brakes, the wheels adapted to ride on a railroad track, and a pneumatic brake line;

mean for facilitating stopping of the railroad car in response to at least one of said wheels going off the track by automatically piercing said pneumatic brake line to release air therefrom, said means comprising

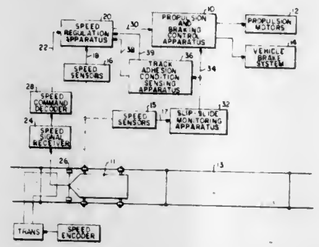
a piercing mechanism mounted adjacent said brake line and comprising an arcuate cutting blade mounted for pivotal movement with respect to said brake line from a position wherein it does not pierce said brake line to a position wherein, under the force of the railroad car weight, said brake line is pierced; and means interconnecting said piercing mechanism to at least one of said railroad car wheel sets so that upon vertical movement of a said wheel of said wheel set a vertical distance corresponding to approximately half the height of the rail said piercing mechanism is activated, said interconnecting means including a lever operatively attached to said arcuate cutting blade for effecting pivotal movement thereof.

4,235,402

TRAIN VEHICLE SPEED CONTROL APPARATUS

Thomas C. Matty, North Huntingdon, and Howard N. Miller, McMurray, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 618,095, Sep. 30, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,823
Int. Cl.² B61L 3/12
U.S. Cl. 246—182 B 1 Claim



1. In train vehicle speed control apparatus for determining the operation of a train vehicle having at least one wheel operative with a track, the combination of:

means for sensing the actual rate of change of the speed of said wheel;

adhesion condition sensing means operative with said actual rate of change sensing means for determining when said actual rate of change is greater than a predetermined rate of change;

means operative with said adhesion condition sensing means for providing a first speed control signal when said actual rate of change is not greater than said predetermined rate of change;

means operative with said adhesion condition sensing means for providing a second speed control signal when said actual rate of change is greater than said predetermined rate of change, and

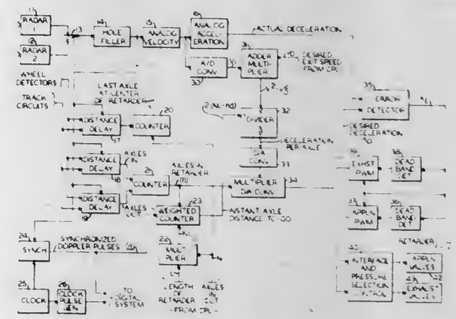
means for controlling the speed of said train vehicle in response to one of said first speed control signal and said second speed control signal, with the first speed control signal having a frequency different than the second speed control signal, and with said speed controlling means being responsive to the pulse period of the first and second speed control signals.

4,235,403

SPEED CONTROL APPARATUS AND METHOD FOR RAILROAD CAR RETARDERS

Harold C. Gillen, Plum Borough, and Donald R. Little, Hempfield Township, Westmoreland County, both of Pa., assignors to American Standard Inc., Swissvale, Pa.

Filed Apr. 23, 1979, Ser. No. 32,046
Int. Cl.³ B61K 7/12
U.S. Cl. 246—182 A 11 Claims



1. A speed control arrangement for a railroad car retarder, to achieve a selected leaving speed for each cut of cars as it exits the retarder, comprising:

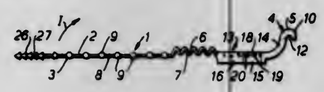
(a) speed measuring means operable for producing signals representing actual speed and deceleration of a particular cut moving through said retarder and other pulse signals representing successive incremental distances traveled within said retarder by that cut,

(b) distance register means coupled to receive wayside cut detection signals and said incremental distance signals and jointly responsive thereto and to previously registered signals of retarder length and total axles on said particular cut for continuously producing a signal representing the instantaneous remaining axle braking distance within said retarder for said particular cut,

(c) processing means coupled for receiving the actual speed signal, the selected leaving speed signal, and the corresponding remaining braking distance for said particular cut and operable in response for generating an output signal representing the desired instantaneous deceleration for said particular cut, and

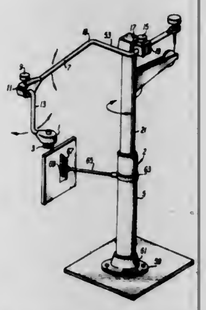
(d) a servo control means coupled for comparing the desired deceleration signal from said processing means and the actual deceleration signal from said speed measuring means and connected for controlling the retarder braking force to equalize the two deceleration signals to achieve said desired leaving speed for said particular cut as the last axle exits said retarder.

4,235,404
CABLE STRAP
Willibald Kraus, Kaiserslautern, Fed. Rep. of Germany, assignor to TRW Inc., Cleveland, Ohio
Filed Mar. 29, 1979, Ser. No. 24,765
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1978, 2813484
Int. Cl.³ F16L 3/08
U.S. Cl. 248—74 PB 14 Claims



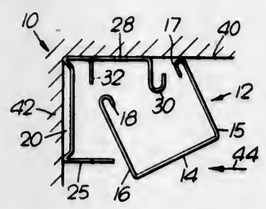
1. A cable strap comprising a flexible encircling element having engaging means thereon, said engaging means including cross pieces extending at right angles to the length of the encircling element, spaced at intervals from one another and connected by a central strip, retaining means having a locking element adapted to interengage with the engaging means, said locking element being hook-shaped and being formed with a central recess, said engaging means being detachably interengageable with the locking element, and an extensible section between the encircling element and the retaining means.

4,235,405
SUPPORT APPARATUS FOR A CAMERA
Alexander Carey, Gaithersburg, Md., assignor to ENG Helicopter Satellites, Ltd., Gaithersburg, Md.
Filed Mar. 23, 1979, Ser. No. 23,218
Int. Cl.³ F16M 13/00
U.S. Cl. 248—123.1 8 Claims



1. Apparatus for supporting a camera and scanning the camera in a plurality of directions, comprising:
- a support sleeve;
- a support shaft telescopically engaging said support sleeve for rotating about a support shaft axis and sliding axially with respect to the support sleeve;
- means for resiliently supporting said support shaft in said support sleeve;
- extending arm means having a rear shaft portion and a front arm portion, the rear shaft portion supported for axial rotation in a bearing block means, the bearing block means pivotally connected to a top end of said support shaft for rotation with the support shaft about the support shaft axis and for adjustable pivotal movement about a pivoting axis;
- tilting shaft means connected at one end to an extending end of said front arm portion for adjustable tilting rotation and having means at an opposite end for supporting a camera; and
- a counterbalance spring means disposed within said support shaft for applying a counter-balancing force to an extending end of said rear shaft portion to counter-balance the weight of said camera, one end of said counterbalance spring means connected to said support shaft and an opposite end of the counterbalance spring means connected to a tension adjust means mounted for partial rotation on said rear shaft portion, said tension adjust means including means for adjusting the magnitude of the counterbalancing force applied by said counterbalance spring means.

4,235,406
SUPPORT BRACKET FOR A VENETIAN BLIND
Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Netherlands
Filed Nov. 22, 1978, Ser. No. 963,132
Int. Cl.³ A47H 1/14
U.S. Cl. 248—251 3 Claims



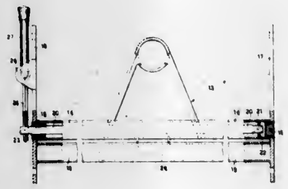
1. A support bracket for a venetian blind headrail which is of generally channel-shaped cross-section, formed of a lower web and front and rear flanges, and having an inturned rim at the upper free edges of the front and rear flanges, said bracket comprising, in combination:
- (a) a rear wall;
- (b) a bottom wall extending forwardly from the rear wall;
- (c) a top wall extending forwardly from the rear wall to overlie a portion of a headrail supported on the bottom wall;
- (d) a hook member at the front end of the top wall, said hook member being engageable in the rim of the front flange of the headrail;
- (e) a downward projection from the top wall positioned to lie immediately in front of the rim of the rear flange of the headrail to prevent forward movement of a headrail in position on the bracket, the rear surface of the projection being located rearwardly of the front edge of the bottom wall; and
- (f) said bottom wall supporting the weight of the headrail when in use.

4,235,407
POT HANGERS
Thomas C. Haas, 2360 Vallejo St., San Jose, Calif. 94574
Filed Feb. 28, 1979, Ser. No. 15,891
Int. Cl.³ A47H 1/10
U.S. Cl. 248—318 13 Claims



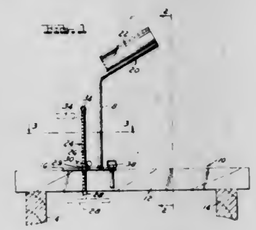
1. A pot hanger for suspending a flower pot or the like having upper and lower collar rim edges comprising:
- a single continuous length of wire having,
- an upper hook portion;
- a pair of spaced apart suspension arm portions extending downwardly from said hook portion; and
- a pair of opposed, mutually facing clamping portions extending from respective free ends of said arm portions, each of said clamping portions including,
- (a) a double hairpin bend section having a first bend opening upwardly towards said hook portion and a second bend opening downwardly away from said hook portion, said second bend forming a loop admitting an upper rim of a pot collar,
- (b) a thrust section extending from said double hairpin bend section angularly downwardly and away from said double hairpin bend section, but in alignment with the exterior of a pot collar to be supported,
- (c) a cantilever section extending from the downward end of said thrust section back toward said double hairpin bend section, said cantilever secion supporting the outside of the lower rim of a pot collar to be supported, each of the opposed, mutually facing clamping portions having a cantilever section extending in a direction opposite the other, whereby a pot may be braced against twisting and rotational forces.

4,235,408
SWIVEL-CHAIR FRAME
Richard F. Sapper, Stuttgart, Fed. Rep. of Germany, assignor to Knoll International, Inc., New York, N.Y.
Filed Feb. 27, 1978, Ser. No. 881,817
Int. Cl.² A45D 19/04; A47J 47/16
U.S. Cl. 248—608 1 Claim



1. In a swinging-seat swivel chair that includes a frame comprising a vertical stud carrying a horizontal hollow pin at the end of which there are pivoted two supporting arms for a seat, and a torsion bar being housed in the interior of the pin with one end coupled to the pin and the other end coupled to the arm at said other end of the torsion bar, the improvement comprising a rigid longitudinal member substantially parallel to and spaced from said pin and rigidly interconnecting said arms.

4,235,409
FISHING ROD HOLDER
Raymond V. Cummings, 8656 Marsh Rd., Algonac, Mich. 48001
Filed Mar. 12, 1979, Ser. No. 19,498
Int. Cl.³ A01K 97/10; A45B 25/28
U.S. Cl. 248—538 1 Claim

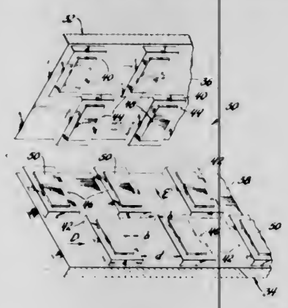


1. A fishing rod holder to be attached to a dock having a slot therethrough comprising;
- a base portion with a width greater than the width of said slot;
- an anchor having a first position for allowing an anchor portion below the base to be vertically movable through the slot, said anchor rotatable into a second position where said anchor portion is no longer so movable;
- said anchor portion comprising a screw threaded cross member of a length greater than the width of the slot joined to a screw threaded stem which passes upward through the base, the stem and cross member joined to resemble an inverted T;
- a fishing rod handle holding means comprising a post having an inclined upper portion and connected to the top side of the base and a tubular socket seated on and along said upper portion for insertion of a fishing rod handle therein;
- means for causing the base and said anchor portion when in the second position to grasp the dock therebetween comprising a wing nut on the threaded portion of the stem extending above the base which may be turned to decrease the distance between the base and the cross member thereby causing the dock to be grasped; and
- the base having a hole spaced from where the anchor passes through the base a distance greater than the width of the slot for insertion of a peg so that when the anchor is inserted through the slot and a peg is inserted through the hole into the slot the base will not rotate with respect to the slot.

4,235,410
REINFORCEMENT PANEL AND MOLD FOR MAKING SAME
Gullmar V. Nelson, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.
Division of Ser. No. 13,838, Feb. 22, 1979, This application Nov. 16, 1979, Ser. No. 94,777
Int. Cl.² B29F 1/00
U.S. Cl. 249—60 1 Claim

1. A mold assembly for making a reinforcing panel structure, said mold assembly comprising; a female mold and a male mold, each of said molds having a base surface with four sided projections extending upwardly from said base surface to a raised surface, each of said projections of each mold being spaced from the next adjacent projection in that mold in a first

direction a distance equal to the dimension of the projection in said first direction plus a predetermined dimension and spaced from the next adjacent projection in that mold in a second direction transverse to said first direction a distance equal to the dimension of the projection in said second direction plus a predetermined dimension, said projections of said female mold being disposed in the spaces between said projections of said male mold and spaced from said projections of said male mold by said predetermined dimensions when said female and male molds are mated, said raised surface of said projections of said respective molds being spaced from said base surface of the



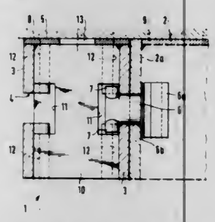
opposite mold when said molds are mated, and an embossment on each of said raised surfaces smaller in dimension than each respective projection, said embossments of said respective molds engaging said base surface of the opposite mold when said molds are mated.

4,235,411

DEVICE FOR CONNECTING STRUCTURAL FORM PANELS

Josef Maier, Kreuzbühlstr. 5, D-7611 Steinach, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,138
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851549
Int. Cl.[2] E04G 9/00; B28B 7/12
U.S. Cl. 249—193 **10 Claims**



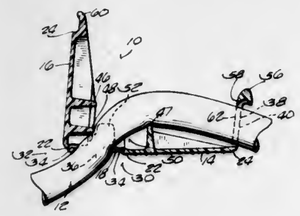
1. In a device for the connection of concrete-form panels, particularly in the region of building offsets wherein the form panels are at least at their margin provided with webs or the like which form their lateral faces and which may have engagement areas for fastening means, such as recesses for bolts with stop projections or the like that extend transversely of the bolt elongation, the improvement comprising a connecting element dimensioned to fit between the webs of the adjacent form panels to be fixed thereat and having two sides at least one of which is provided adjacent the lateral faces of the form panels to be connected with at least one longitudinal slot extending in longitudinal direction for the engagement of the fastening means; and a form skin attachable to at least one face of the connecting element which is situated at right angles to the slotted sides.

4,235,412

TUBE CLAMPING DEVICE

Lucien M. Rath, Milwaukee, and W. Martin Schultze, New Berlin, both of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Filed Oct. 30, 1978, Ser. No. 955,810
Int. Cl.[3] F16K 7/06
U.S. Cl. 251—10 **1 Claim**



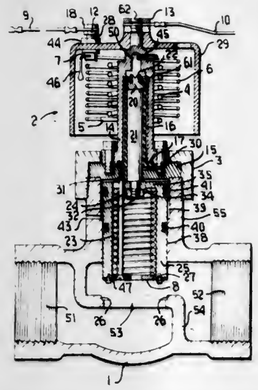
1. A clamping device for a fluid conduction tube comprising:
a first body member having an inner edge and an outer edge, an upstanding shoulder of resilient material extending from said outer edge and having a hole of fixed size adapted to freely accommodate the tube, said upstanding shoulder including a downwardly facing retaining lip formed thereon, said lip defining the upper edge of said hole;
a second body member having an inner edge and an outer edge, a tab extending laterally outwardly of said outer edge of said second body member, said tab adapted for snap engagement with said retaining lip on said upstanding shoulder when said clamping device is in its folded together closed position;
a third body member having first and second side edges and a hole of fixed size adapted to freely accommodate the tube centerally located between said side edges, said third body member further including a pair of upstanding guide ribs located tangentially along said hole in said third body member;
a first resilient hinge pivotally connecting said inner edge of said first body member with said first side edge of said third body member;
a second resilient hinge pivotally connecting said inner edge of said second body member with said second side edge of said third body member;
said first, second and third body members being pivotally movable along said first and second resilient hinges between an unfolded position in which said first, second and third body members are disposed in a generally coplanar relationship and the tube passes through said holes in said first and third body members, thereby movably attaching said device upon the tube, and a folded together position in which said first and second body members generally face each other with said tab and said lip in snap-fit engagement, said third body member being generally perpendicularly deposed therebetween and a portion of the tube being confined between said first and second body members intermediate said holes in said first and third body members; and
crimp means for clamping said confined portion of the tube, thereby effectively blocking fluid conduction through the tube, said crimp means including a spaced pair of parallel ridges located on said second body member and a single ridge located on said first body member and registering with said pair of ridges when said first, second, and third body members are in said folded together position.

4,235,413

ELECTRICALLY ACTUATED VALVE

William E. Baker, 10627 Sugar Hill, Houston, Tex. 77042

Filed Jun. 7, 1978, Ser. No. 913,372
Int. Cl.[3] F16K 31/04; F01B 19/04
U.S. Cl. 251—11 **20 Claims**



1. In an electrically actuated heat motor of the type in which a biased piston is translatable in a piston housing in response to an actuating current to change the condition of working fluid in the heat motor, an improvement comprising:
a first metal tube having relatively low electrical resistance and capable of conducting fluid flow therethrough;
a second metal tube having relatively high electrical resistance and capable of conducting fluid flow therethrough;
means connecting said first and second tubes in series across a source of electrical current and in fluid flow communication with one another;
means connecting said first tube in fluid flow communication with said piston housing to permit pressurized fluid to flow from said first tube to said housing to apply a force to one end of said piston in opposition to said bias;
a quantity of working fluid disposed in said first and second tubes, said working fluid being of the type which expands to more than fill said tubes upon being heated in said second tube by passage of current from said source through said tubes; and
sealing means for preventing said working fluid from leaking from said housing.

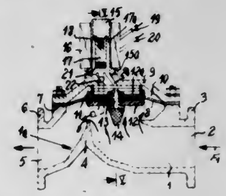
7. The heat motor according to claim 1 further comprising:
a valve body including an inlet, an outlet, a valve opening, and a valve seat surrounding said valve opening, said valve opening providing the sole flow path between said inlet and outlet for fluid flowing therethrough; and
a cylindrical plug secured to the end of said piston remote from said one end, said plug extending into said valve body and being positioned so that one surface thereof abuts said valve seat and closes said valve opening when said piston is fully translated by said working fluid, said plug having unequal cross sectional areas which, together with the cross sectional area of said piston is fully balanced with respect to internal valve pressure.

4,235,414

ELECTROMAGNETIC VALVE FOR FLUID CIRCUITS CONTAINING IMPURITIES

Jean Z. Lis, 44, rue du Temple, 75004 Paris, France, assignor to Societe Industrielle de Boulogne, Boulogne and Jean Z. Lis, Paris, both of, France

Filed Sep. 20, 1978, Ser. No. 943,986
Claims priority, application France, Sep. 28, 1977, 77 29195
Int. Cl.[3] F16K 31/385
U.S. Cl. 251—24 **3 Claims**



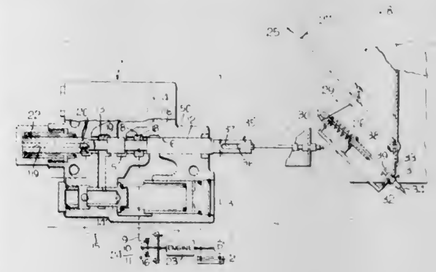
1. A flap valve having an axis and including a flap, the opening and closing of which are controlled by a differential pressure produced by opening and respectively closing an escape circuit, and wherein said escape circuit comprises channel means within said flap, a filter protruding in the circulating circuit of the valve being mounted on said flap at an inlet of said channel means, said escape circuit further defining a channel coming to an outlet pipe of the valve and being obliquely directed with respect to said axis of the valve for producing a suction effect in said escape circuit upon circulation of a fluid in the valve in opened position while providing an aspiration and consequently a continuous circulation of fluid through said filter and the complete escape circuit, said escape circuit further having at least one point thereof a passage cross-section greater than the largest size of particles which are to pass through said filter; and wherein said flap is of a membrane type and includes a membrane with a bearing plate mounted onto said membrane, a seat for the valve and a spring means biasing said bearing plate towards said seat, an electromagnetic core being further provided for obturating said escape circuit and thereby closing the valve.

4,235,415

AUXILIARY SPRING ASSISTED VALVE LINKAGE

Edward B. Heckenkamp, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1978, Ser. No. 972,475
Int. Cl.[3] F15B 13/06
U.S. Cl. 251—77 **10 Claims**



1. A control valve comprising, a housing defining a central opening, a spool reciprocally mounted in said central opening of said housing, resilient means normally biasing said spool toward a return position, said housing and said spool selec-

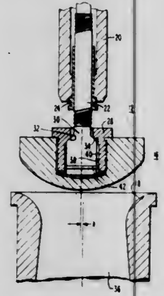
tively defining an operating position and a return position of said spool, said housing and said spool defining a fluid pressure chamber for receiving pressurized fluid for biasing said spool to the operating position, passage means defining by said housing and said spool for supplying pressurized fluid to said fluid pressure chamber when said spool is in the operating position, an actuating linkage for selectively positioning said valve in the operating position and the return position, a loss motion connection for connecting said linkage to said spool to permit said linkage to move to an intermediate position when said spool is in the operating position, biasing means normally biasing said linkage to the intermediate position when said linkage positions said spool in the operating position and is manually released and thereby permitting said spool to remain in the operating position regardless of the spurious decreases of pressure in said pressure chamber.

4,235,416

VIBRATION RESISTANT VALVE

Bernard L. LaCoste, Wilmington, Del.; Lloyd W. Smith, Nether Providence, Delaware County, and Thomas J. Finnimore, East Nottingham Township, Chester County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1978, Ser. No. 959,042
Int. Cl.³ F16K 25/00
U.S. Cl. 251—86 **7 Claims**



1. A vibration resistance valve apparatus comprising:
a stem structure which is axially displaceable between an open and a closed position, said stem structure including an elongated stem and a support body attached to one end of said stem, said support body having a bearing surface and a guide surface;
a valve seat structure having a spherical seat surface;
a valve body having a spherical surface portion which is engageable with said seat surface for preventing fluid flow therebetween, said valve body having an opening therein for housing said support body, said valve body having a bearing surface and a guide surface which bound said opening, said valve body's bearing surface being rotatably supportable by said support body and said valve body's guide surface being separated from said support body; and
a stabilizing ring being attached to one of said bodies and being unattached to the other body, said stabilizing ring extending into said separation between said guide surfaces of said valve body and said support body, said stabilizing ring being axially narrow compared to said guide surfaces' length, said stabilizing ring lying in a plane, wherein said plane is defined by the contact line between the spherical valve body and seat when said valve is engaged with said seat.

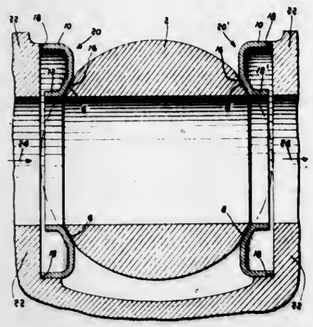
4,235,417
Patent Not Issued For This Number

4,235,418

BALL VALVE HAVING METAL SEAT RINGS

Angelo Natalizia, Cranston, R.I., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 725,205, Sep. 22, 1976, Pat. No. 4,126,298.
This application Jul. 20, 1978, Ser. No. 926,469
Int. Cl.³ F16K 5/06
U.S. Cl. 251—359 **8 Claims**



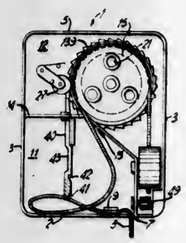
1. A metallic valve seat, for use in a valve housing defining a chamber and inlet and outlet ports, said chamber having a closure member therein, comprising:
a first metal portion, stamped from a sheet of resilient metal and having a substantially U-shaped cross-section with a base and first and second concentrically disposed legs, for engaging said housing around one of said inlet and outlet openings; and
a soft deformable metal layer deposited on said base for engaging said closure member.

4,235,419

STORING DEVICE FOR A CABLE FIXED ON EITHER OF ITS ENDS

Wilfried Schuck, Berliner Strasse 286, D-605 Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,770
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646283; May 13, 1977, 2721679; Oct. 8, 1977, 2745366
Int. Cl.³ B66D 1/00, 1/76; B65H 75/02
U.S. Cl. 191—12 R **30 Claims**



1. A cable winding device for a cable fixed at both ends, comprising housing means including a storage space for the cable, respective entrance and exit openings for the cable, an operating pulley, at least one pressure roller cooperating with the operating pulley to urge the cable against the operating pulley with sufficient force to assure positive drive of the operating pulley by withdrawal of the cable from the housing, a drive spring cooperating with the operating pulley so as to be increasingly tensioned as the cable is withdrawn from the device, frictional clutch means operatively interconnecting the spring and the operating pulley with such frictional engagement that the clutch means slips when the spring is substantially fully tensioned by withdrawal of the cable from the device thereby maintaining the spring in said substantially fully tensioned state and permitting further withdrawal of the cable while the spring remains in the substantially fully tensioned state, and a locking device adjacent the exit opening for holding a segment of the cable, the locking device comprising a chamber having a toothed surface, a toothed clamping wheel resting freely on the toothed surface and means defining a cable guiding surface spaced sufficiently from the toothed clamping wheel to form with the toothed clamping wheel a restricted passage for the cable.

4,235,420

TWO PIECE CAST RATCHET WINCH

Karl J. Ross, Maumee, and Francis B. Johnson, Defiance, both of Ohio, assignors to American Gage & Manufacturing Co., Wauseon, Ohio

Filed Nov. 20, 1978, Ser. No. 962,291
Int. Cl.³ A63B 61/04
U.S. Cl. 254—218 **11 Claims**

1. In a power pull comprising a frame having an anchor defined thereon, a ratchet winch rotatably mounted on said frame having a retaining dog, a cable wound on said winch, and an operating lever pivotally mounted on said frame operatively associated with said ratchet winch, the improvement comprising said winch constituting first and second molded portions, said portions each including a hub portion and a flange portion each having a periphery, ratchet teeth defined on the periphery of one of said flange portions, said portions each including an axial shaft receiving bore concentrically extending through said hub portions and a radially extending hub portion face adapted to engage the face of the other hub portion, a cable anchor recess defined in said hub face of each hub portion, a cable receiving recess defined in said hub face of each hub portion of lesser axial dimension than said cable anchor recesses, said cable receiving recesses intersecting the associated cable anchor recess and the associated hub portion periphery, and releasable fastening means maintaining said first and second winch portions in assembled relation with said hub portion faces in engagement wherein said cable anchor recesses together defined a cable anchor chamber and said cable receiving recesses together define a cable chamber adjacent said cable anchor chamber.

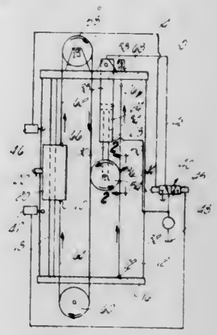


4,235,421

LOAD MOVING APPARATUS

Aretee J. Phillips, 121 W. Houstonia, Royal Oak, Mich. 48073

Filed Mar. 9, 1979, Ser. No. 18,991
Int. Cl.³ C02F 5/02
U.S. Cl. 254—386 **12 Claims**



1. A load moving apparatus comprising: a support member, a carriage member supported relative to said support member for reciprocating movement in a first predetermined path, a load device supported relative to said support member for reciprocating movement in a second predetermined path, a pair of first pulleys supported on said carriage member for movement therewith and rotation relative thereto, a pair of

second pulleys mounted on said support member at opposite ends of said first predetermined path and being spaced apart a distance of least twice the distance of said second predetermined path, a pair of flexible elements each having one end fixed to one of said members and the other end fixed to said load device, said flexible members each being guided over a pulley of said first pair and a pulley of said second pair of pulleys, one flexible element of said pair of flexible elements being operative to move said load device in one direction and the other of said pair of flexible elements being operative to move said load device in the other direction upon movement of said carriage member, a fluid operated actuator having a piston, a rod extending from one side of said piston and having its end connected to said carriage member, said actuator having an overall length in its extended position which is less than the spacing of said pair of second pulleys, said actuator being supported relative to said support member and being operative to move said load device at a speed and through a distance at least twice the speed and distance of movement of said carriage member.

4,235,422

FLAME CUTTING INSTALLATION

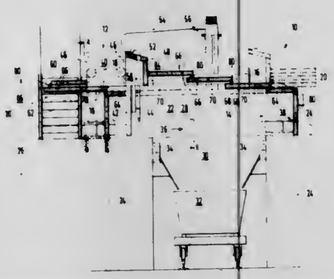
Karlheinz Schmunck, Offenback; Klaus Herbener, Bruchköbel; Alfred Baier, Kronberg, and Alfred Pfeuffer, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 54,014

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2836958

Int. Cl.³ B23K 7/00

U.S. Cl. 266—50 **9 Claims**



1. In a flame cutting installation having at least one movable flame cutting assembly with a flame cutting torch which moves above and across a continuously cast strand in a fixed cutting zone for transversely cutting the strand into a plurality of separate workpieces with the fixed cutting zone being defined by the area of travel of all of the torches from the beginning to the end of the cutting operation and with each torch having a movable cutting zone within the fixed cutting zone with the movable cutting zone being movable with its torch along the path of travel of its torch, the improvement being a protection device enclosing said whole fixed cutting zone in which said torches move longitudinally during the cutting operation, said protection device comprising a cover having stationary and adjustable cover parts, said adjustable cover parts being mounted to said flame cutting assembly for movement therewith, and said protection device thereby comprising means for preventing a dispersion of the noise and of the heat in said fixed cutting zone to the environment.

4,235,423

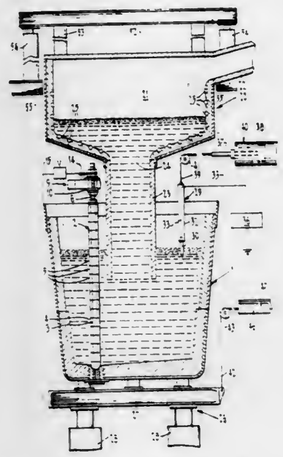
INDICATION OF LEVELS IN RECEPTACLES

Kenneth G. Kemlo, Lambton, Australia, assignor to The Broken Hill Proprietary Company Limited, Victoria, Australia

Division of Ser. No. 816,930, Jul. 19, 1977, Pat. No. 4,150,974. This application Feb. 6, 1979, Ser. No. 9,944

Int. Cl.² C21C 5/46

U.S. Cl. 266—99 **8 Claims**



1. An apparatus for determining the interface between molten metal and slag in a container, comprising a container, an electrode adapted for positioning within said container in electrical contact with the material in the container, and indicating means for indicating at least a first range of voltages produced at said electrode by an electrochemical reaction between said molten metal and said electrode as well as at least a second range of voltages produced at said electrode by an electrochemical reaction between said slag and said electrode, means for supporting said electrode independently of said ladle, and adapted to enable said electrode to be raised or lowered within, and relative to, said container whereby, after moving said electrode to a position within said container, subsequent relative movement between said electrode and the material in said container will allow said indicating means to determine a situation where the electrode and the interface are at the same level in said container by indicating a change in voltage from one of said range of voltages to the other.

4,235,424

AIR COOLED ELECTRODE SYSTEM FOR ELECTRICALLY HEATED MOLTEN BATH FURNACES

Leslie Bassett, Mount Clemens, Mich., assignor to Upton Industries, Inc., Roseville, Mich.

Filed Dec. 11, 1978, Ser. No. 968,065

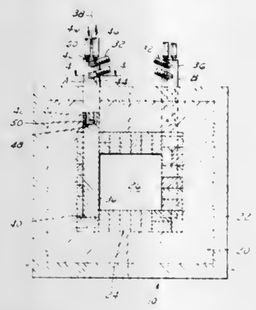
Int. Cl.³ C21D 1/46

U.S. Cl. 266—120 **14 Claims**

1. An electrode comprising an elongated shank made from an electrical conductive metal and having a longitudinally extending axis, said shank having in one end thereof a pair of elongated holes which extend into said shank and terminate a distance from the other end of said shank, each hole having an axis which is spaced from and is parallel to said longitudinally extending axis, a connecting hole extending laterally into said said shank to connect the inner ends of said elongated holes, plug means located in and closing the outer end of said connecting hole, said elongated holes and said connecting hole forming an air cooling passage whereby when the electrode is in use air may be directed through said cooling passage to assist in removing heat generated by the electrode.

5. In an electrically heated molten salt bath furnace, the

combination with a wall enclosing a central chamber for containing the molten salt bath, an electrode laid in a recess extending along a side of said chamber below the surface of the molten salt bath therein so as to expose only one face of the electrode to the molten salt bath, said electrode comprising an elongated shank made from an electrical conductive metal and having a longitudinally extending axis, said shank having in one end thereof a pair of elongated holes which extend into said shank and terminate a distance from the other end of said



shank, each hole having an axis which is spaced from and is parallel to said longitudinally extending axis, a connecting hole extending laterally into said shank to connect the inner ends of said elongated holes, plug means located in and closing the outer end of said connecting hole, said elongated holes and said connecting hole forming an air cooling passage which has an entrance and an exit, and blower means connected to the entrance to said cooling passage for directing air through said cooling passage to remove heat from said electrode and to direct the heated air to the exit.

4,235,425

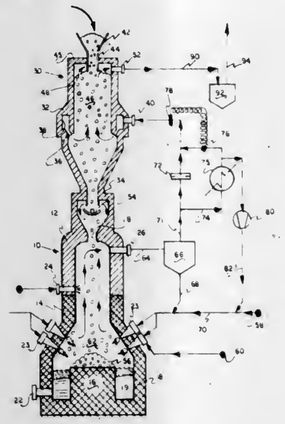
IMPACT BED GASIFIER-MELTER

Donald Beggs, Charlotte, N.C., and John C. Scarlett, Toledo, Ohio, assignors to Midrex Corporation, Charlotte, N.C.

Filed Jul. 16, 1979, Ser. No. 57,932

Int. Cl.³ F27B 1/18

U.S. Cl. 266—147 **9 Claims**



1. Apparatus for producing molten pig iron from iron oxide pellets comprising:

(a) a vertical shaft furnace, including means at the top thereof for feeding a solid particulate charge to the interior of said furnace, means at the bottom of said furnace for discharging particulate material therefrom, means intermediate the ends of the furnace for introducing hot reducing gas to the interior of the furnace, and gas removal means at the top of the furnace for withdrawing furnace off-gas;

(b) a generally upstanding closed chamber connected to the particle discharge outlet of said shaft furnace for introducing particulate material to the interior of said chamber, and having an iron notch for removing molten iron from the bottom of said chamber, a central impact bed hearth in the bottom of said chamber surrounded by a molten metal pool;

(c) heating means for directing sufficient heat onto said impact bed hearth to melt any metallic material on said hearth and form a hot gas;

(d) humidifying means for introducing water to the interior of said chamber above said heating means to humidify the hot gas in the chamber;

(e) means communicating with said chamber for withdrawing humidified hot gas from said chamber;

(f) means for injecting the withdrawn hot gas from chamber into said direct reduction furnace as reducing gas; and

(g) a gas passageway communicating with said withdrawal means and said injecting means.

4,235,426

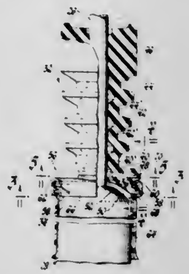
SHOCK ABSORBER WITH COMPRESSION SPRING AND DUST TUBE

Leo S. Sullivan, Jr.; Patsy DeVincent, both of Dayton, and Wendell M. Oldham, Jr., Trotwood, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1979, Ser. No. 29,360

Int. Cl.³ F16F 9/38, 9/48

U.S. Cl. 267—8 R **3 Claims**



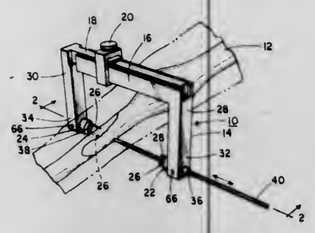
1. In combination a hydraulic shock absorber and a compression spring for use in a vehicle suspension, said shock absorber having a piston operatively mounted for reciprocating movement therein and having a cylindrical piston rod extending from an upper end thereof, a cover plate secured to an upper portion of said piston rod, said compression spring being of polymeric material and disposed between said cover plate and the upper end of said shock absorber, said spring having a central axial opening formed therein with a plurality of axially spaced convolutions providing internal rings of reduced diameter circumferentially gripping said piston rod, said compression spring having a lower end portion disposed adjacent to the upper end of said shock absorber, a cylindrical dust tube extending axially from said lower end portion of said compression spring around said piston rod, attachment means securing said dust tube to said lower end portion of said compression spring, and a rigid insert plate disposed in said lower end portion of said compression spring to restrict the deflection of the material of said compression spring from downward flow onto said shock absorber to thereby prevent said compression spring from dislodging said dust tube from said attachment means.

4,235,427
SPRING
Walter Bialobrzeski, 68 Summerwood Rd., Wallingford, Conn. 06492
Continuation-in-part of Ser. No. 902,256, May 2, 1978, which is a continuation-in-part of Ser. No. 387,948, Aug. 13, 1973, abandoned. This application May 7, 1979, Ser. No. 36,530
Int. Cl.³ F16F 1/36
U.S. Cl. 267—153 18 Claims



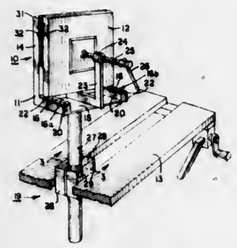
1. A spring element comprising a longitudinally extending hollow body member of plastic material having a longitudinal axis with inner and outer convolutions along the length thereof, said inner and outer convolutions being of different thickness, said element being hollow with at least one end unenclosed, said convolutions having inner valleys and outer ridges, said valleys and ridges defined on radii which determine the thickness of said convolutions, and the wall portions extending between said convolutions are of tapering thickness, said element being precompressed along said longitudinal axis to a degree sufficient to cause the material thereof to exceed its yield point at least in said convolutions and give it a permanent set of decreased axial dimension in an unloaded condition and impart resilience thereto in the axial direction, the predominant set of said element occurring in the thinner walled convolutions, said convolutions being of essentially annular shape perpendicular to the longitudinal axis.

4,235,428
BONE TRANSFIXATION PIN GUIDE
Jack H. Davis, 650 Sycamore, Glencoe, Ill.
Filed Mar. 15, 1979, Ser. No. 20,865
Int. Cl.³ B23Q 1/00
U.S. Cl. 269—53 6 Claims



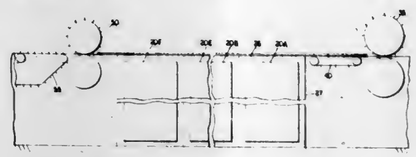
1. A bone transfixion pin guide for guiding the insertion of a bone transfixion pin into an insertion site in a bone, comprising:
a body defining a longitudinal axis and having a first transversely extending end portion and a second transversely extending end portion, said first end portion and said second in portion spaced longitudinally apart from each other and extending generally in the same transverse direction;
means on said first end portion for defining an entrance channel for said bone transfixion pin;
means on said second end portion for defining an exit channel for said bone transfixion pin, said exit channel in axial alignment with said entrance channel; and
means on said first end portion and on said second end portion for affixing the body in relation to the insertion site, said means for affixing the bone transfixion pin guide in relation to the insertion site being means for piercing the fleshy tissue adjacent said insertion site;
whereby a physician may insert a bone transfixion pin into the bone by affixing the body in relation to the insertion site so that the entrance channel and exit channel lie along the desired path of the bone transfixion pin.

4,235,429
SELF-CONTAINED VISE AND SUPPORT ASSEMBLY
Palmer C. Hanson, Manitowish Waters, Wis. 54548
Filed Sep. 4, 1979, Ser. No. 72,018
Int. Cl.³ B23Q 1/04
U.S. Cl. 269—71 9 Claims



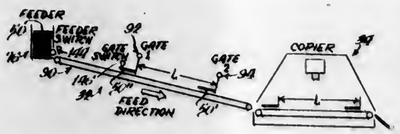
1. A self-contained vise and support assembly comprising,
a base means forming a fixed clamping surface, and including a portion having at least one channel extending outward from said fixed clamping surface,
a jaw member forming an adjustable clamping surface confronting said fixed clamping surface to retain an object therebetween,
a flat strip member lying over said at least one channel,
said strip member having a plurality of apertures opening toward said jaw member and disposed in a plane lying substantially perpendicular to the plane of said fixed clamping surface,
attachment means coupled to said jaw member and having a projecting portion extending therefore to a free end, said attachment means to selectively engage at least one aperture of said strip member,
said free end of said attachment means being capable of unrestrained movement within said channel during engagement with said strip member,
said attachment means being restrained by said strip member in said at least one aperture at a point spaced from said free end of said projecting portion of said attachment means and providing unrestrained pivotable movement of said jaw member about the point of restraint of said attachment means, and
force applying means for applying force to said pivotally mounted jaw member to selectively urge said adjustable clamping surface toward said fixed clamping surface for clamping an object between said clamping surfaces.

4,235,430
METHOD AND APPARATUS FOR MANUFACTURING BUSINESS FORMS
James B. Fulk, P.O. Box 947, Los Gatos, Calif. 95030
Filed Apr. 26, 1979, Ser. No. 33,684
Int. Cl.³ B65H 39/00
U.S. Cl. 270—52 22 Claims



1. A method of producing a plurality of processed paper web units of business forms in a continuous operation from a plurality of supply rolls of unprocessed paper webs comprising;
advancing at least a first group of webs from some of the supply rolls into and through at least a first group of processing units,
processing the webs in said first group of webs in said respective processing units while they are moving therethrough,
advancing the webs of said first group in superimposed relationship along a common straight line path,
forming a line of holes in all of the webs in said first group in a direction extending longitudinally of said straight line path, and while said webs are moving in superimposed relationship,
advancing at least a second group of webs from other of said supply rolls into and through at least a second group of spaced processing units,
processing the webs in said second group of webs in the respective units of said second group of processing units while they are moving therethrough.
advancing the webs of said second group in superimposed relationship with each other and with the superimposed webs of said first group and along said common straight line path,
forming a line of holes in all of the webs of said second group, along a straight line coincident with said line of holes formed in the first group of webs, while all of said webs of both groups are moving in superimposed relationship, and
thereafter performing a further processing operation simultaneously upon all of the webs of both groups.

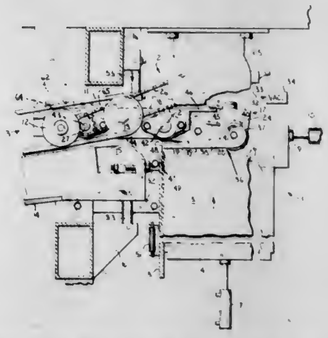
4,235,431
METHOD AND APPARATUS FOR TRANSPORTING DOCUMENTS WITH PRESELECTED INTERDOCUMENT SPACING
Martin T. Abrams; John R. Sargis, both of Chicago; Paul H. Seger, Lombard; Albert Beitner, Arlington Heights, and Clifton C. Bishop, Elmhurst, all of Ill., assignors to AES Technology Systems, Inc., Elk Grove Village, Ill.
Filed Dec. 4, 1978, Ser. No. 965,886
Int. Cl.³ B65H 9/06, 5/02
U.S. Cl. 271—10 22 Claims



1. A method of sequentially transporting individual groups of documents along a path from at least one source of documents located exterior of the path so that the documents in each group transported are spaced apart at selected distances from each other, said method comprising the steps of:
A. feeding all of the documents for a predetermined group of documents from said source of documents to said path;
B. advancing said documents along said path;
C. interrupting the advancement of said documents along said path at predetermined positions to effect said selected spacing distance between the documents in the predetermined group; and
D. terminating all movement interruptions of the last fed document and of the previously fed documents in the predetermined group to allow said documents in the predetermined group to continue said movement uninterrupted as a group along said path at said selected spaced apart distances.

15. A document feeding device for sequentially transporting predetermined groups of documents along a path from at least one source of documents located exterior of the path so that the documents in each group transported are spaced apart at selected distances from each other said device comprising:
selectively actuated feeding means adapted to sequentially deliver documents individually from a source of documents to a path;
continuously operating means for moving said documents along said path;
a plurality of gate means disposed at spaced apart positions along said path for temporarily interrupting the movement of each of said documents along said path and for aligning each of said documents relative to said path; and
control means responsive to the presence of documents in said path for effecting actuation of said gate means to terminate the temporary interruptions of the last fed document and of the previously fed documents in the predetermined group substantially simultaneously to allow said continuously operating document moving means to move each aligned document from said gate means further along said path at selected spaced apart distances without further interruptions by said gate means and for effecting actuation of said feeding means to feed a subsequent document to said path.

4,235,432
SHEET FEEDING
Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.
Filed Jun. 30, 1978, Ser. No. 920,654
Int. Cl.³ B65H 3/08, 5/06
U.S. Cl. 271—11 3 Claims



3. In a device for feeding sheets of flexible material one-by-one in succession from the top of a rising stack of sheets:
(a) a frame,
(b) a vertical backup plate on said frame for aligning the downstream edges of the sheets in the stack,

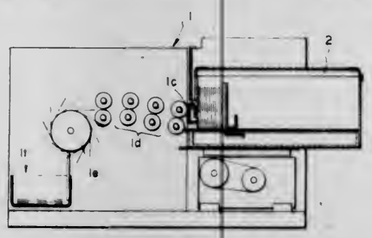
(c) a feeding head extending upstream from above said backup plate, said head including:
(1) vacuum means to separate the topmost sheet of the stack from the next sheet therebelow,
(2) and means to drive said topmost sheet downstream from the stack,
(d) said vacuum means comprising:
(1) a body overlying said means to drive said topmost sheet and forming a vacuum plenum,
(2) and a source of vacuum connected to said plenum,
(e) and means to adjustably seal the space between the lower portions of the ends of said body and the said topmost sheet upon engagement of said head with said sheet, said sealing means comprising: a seal plate pivotally mounted on each end of said body and with said seal plates being independent of each other, each said seal plate comprising:
(1) an upstream portion pivotally mounted to said body,
(2) and a tapered tongue extending downstream from said upstream portion to adjacent said backup plate,
(3) said tongue having a lower edge engageable with said topmost sheet.

4,235,433

PAPER SHEET STORAGE BOX FOR PAPER SHEET DISPENSER

Akira Hirata, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1979, Ser. No. 16,490
Claims priority, application Japan, Mar. 3, 1978, 53/27362[U]
Int. Cl.³ B65H 1/02
U.S. Cl. 271—162 **5 Claims**



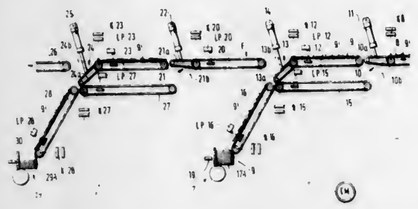
1. A paper sheet storage box adapted to be removably set in a paper sheet dispenser, comprising:
a front cover hinged to the leading side of said storage box;
opening and closing means for opening said front cover, when said storage box is inserted into said dispenser to be set therein, and for closing said front cover when said storage box is removed from said dispenser;
primary retaining means for retaining said front cover in a locked condition when the latter is closed by said opening and closing means; and
auxiliary retaining means for ensuring the retaining action of said primary retaining means, said auxiliary retaining means including a retaining pin mounted on one side wall of said storage box, and an auxiliary engagement member having elasticity and carried on the inner side of said front cover at such a position as to be snugly snapped on said retaining pin when said front cover is closed by said opening and closing means, wherein said opening and closing means includes a pair of cam forming lands formed on either side wall of said dispenser, and a pair of rollers mounted rotatably one on either side of said front cover to be moved while rolling on the cam surfaces of said lands.

4,235,434

APPARATUS FOR DIVERTING GROUPS OF PAPER SHEETS OR THE LIKE TO PROCESSING MACHINE

Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed May 22, 1978, Ser. No. 908,546
Claims priority, application Switzerland, Jun. 1, 1977, 6700/77
Int. Cl.³ B65H 29/64
U.S. Cl. 271—280 **14 Claims**



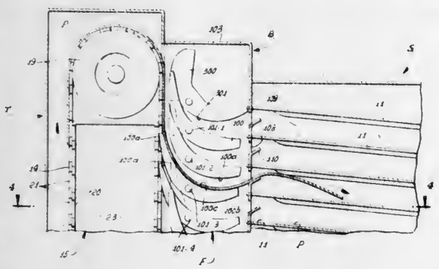
1. Apparatus for intermittently delivering sheets to at least one consuming machine, comprising transporting means defining a predetermined path for advancement of successive sheets, particularly a series of groups of sheets, said transporting means including a preceding and a next-following sheet advancing section each having a sheet-discharging end and a third section located upstream of said preceding section, as considered in the direction of advancement of sheets along said path; a first switch provided at the discharging end of said next-following section; means for moving said switch to and from a position in which said switch diverts sheets from said path into said consuming machine; means for temporary storage of sheets adjacent to said consuming machine; a second switch disposed between said preceding and next-following sections; means for moving said second switch between a first position in which said second switch guides sheets from said preceding section into said next-following section and a second position in which said second switch diverts sheets leaving said preceding section into said storage means; means for receiving sheets from said path; a third switch between said third and preceding sections; and means for moving said third switch between first and second positions in which said third switch respectively guides sheets toward said preceding section and diverts sheets to said receiving means.

4,235,435

SHEET SORTER

Frederick J. Lawrence, San Francisco, Calif., assignor to Stewart & Shea, Newport, Calif.

Filed Aug. 25, 1978, Ser. No. 936,724
Int. Cl.³ B65H 29/58, 31/24
U.S. Cl. 271—292 **13 Claims**



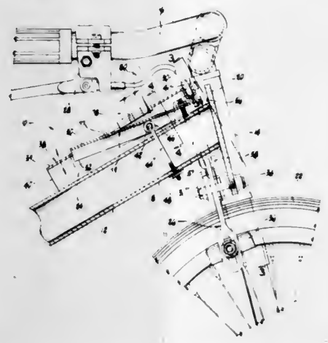
11. In a sheet sorting machine having a sheet transport for moving successive sheets past a plurality of trays spaced alongside the transport; and finger means actuatable between open and closed positions for picking off successive sheets from said belts and directing said sheets into said trays; said finger means including fingers pivotally mounted in side by side spaced and longitudinally nested relation: the improvement wherein said fingers are provided on a number of spaced pivot supports and have pick off ends extending past a next adjacent pivot support in nested relation to the pick off ends of said fingers on said adjacent pivot support to the region of the second adjacent pivot support, said fingers having sheet directing ends and an arched surface extending from the extremity of the finger pick off ends to the extremity of the sheet directing ends for turning a sheet from said transport to a tray when said fingers are open; the pick off end of said fingers on any one pivot support when closed extending upstream to a location in said region of the second adjacent pivot support in interference with the feeding of a sheet over the arched surface of the next adjacent finger; actuator means for pivoting only any one pivot support and the next adjacent downstream pivot support simultaneously to open positions preventing interference between a sheet and the pick off end of the fingers of said next adjacent downstream pivot support when sheets are being deflected by said fingers on said any one pivot support.

4,235,436

WORK CONTROL APPARATUS FOR AN EXERCISER

Cleve L. Lee, St. Louis, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.

Filed Jan. 29, 1979, Ser. No. 7,023
Int. Cl.³ A63B 69/16
U.S. Cl. 272—73 **9 Claims**



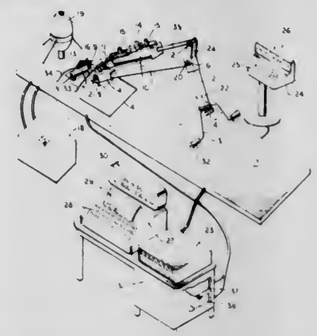
1. A work control assembly in an exerciser having a frame, and a driven member rotatively mounted on the frame, the assembly comprising:
(a) a brake means operatively mounted on the exerciser frame and engaging the driven member.
(b) a support means operatively mounted to the frame, and including a pivot axis,
(c) a lever means pivotally mounted to the support means for rotation about the pivot axis and connected to the brake means for selectively determining the braking pressure exerted on the driven member,
(d) resilient means between the brake means and the lever means tending to resist rotational movement of the lever means in one direction,
(e) means slidingly mounted to one of said support means and lever means and selectively engaging the other of said means to hold the lever means in a predetermined position relative to the support means against the action of the resilient means, and
(f) the brake means including:
1. a handle mounted to the exerciser frame, and
2. a cable connected between the handle and the lever means for rotating the lever means in said one direction.

4,235,437

ROBOTIC EXERCISE MACHINE AND METHOD

David A. Ruis, 1904 Gleawood Ave., Atlanta, Ga. 30316; Russell W. Polhemus, 1775 Creat Trail, Smyrna, Ga. 30080, and Wayne J. Book, 431 Hardendorf Ave., Atlanta, Ga. 30307

Filed Jul. 3, 1978, Ser. No. 921,568
Int. Cl.³ A63B 21/24
U.S. Cl. 272—134 **22 Claims**



1. A programmable exercise machine for defining and recording an exercise path comprising:
a rigid frame;
at least two links connected to one another and attached at at least one point to said rigid frame, said links being movable relative to one another and to said rigid frame;
user interaction means attached to one of said links for contacting a body part of the user and for receiving user-exerted forces so as to be movable to any desired position in at least two degrees of freedom relative to said frame;
independent powering means associated with each link, each said powering means being operative to drive said associated link in a predetermined path of motion relative to said other links and to said frame and exerting resisting forces to oppose said user-exerted forces; and
automatic control means operative to receive and store signals corresponding to magnitude and direction of an arbitrary user-defined exercise path in said two degrees of freedom, and further operative for controlling said powering means in response to said stored signals to define movement of said user interaction means along said path in response to the magnitude and direction of said user-exerted force.

19. The method of defining and controlling an exercise through manual force applied to a user interaction point of an exercise machine, comprising the steps of:
manually moving the user interaction point a first time to define an arbitrary exercise path within a predetermined region having at least two degrees of freedom;
storing said defined exercise path; and then
manually moving the user interaction point a second time while applying a machine exerted force to said user interaction point in response to said stored exercise path to inhibit the user interaction point from movement to a location not along said defined exercise path.

4,235,438

PINBALL GAME SPINNING TARGET

Michael L. Hally, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

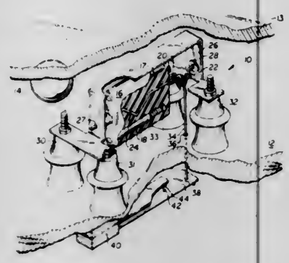
Filed Mar. 8, 1979, Ser. No. 18,491
Int. Cl.³ A63B 67/14
U.S. Cl. 273—127 D **7 Claims**

1. A target for use in a game in which a pinball traverses a flat playfield, said target comprising:
a rod suspended above the playfield and having a crank

portion at one end, said rod being freely rotatable about an axis parallel to the playfield and sufficiently above the playfield for the pinball to pass below the axis of rotation of the rod;

a generally flat target element nonrotatably mounted to said rod and rotatable therewith and having a principal axis of inertia generally coincident with the axis of rotation of the target element and the rod so that the product of inertia of the target element about said principal axis is substantially zero, the plane of the target element being coincident with that of the crank portion of the rod;

an armature depending from the crank portion of the rod to



bias the target element so that it is maintained in a vertical attitude until impacted by the pinball;

a pair of weights having a mass density relatively greater than the mass density of the target element, said weights being embedded in the target element in its respective extremities remote from said principal axis so that the target element together with the weights has a relatively high moment of inertia about the axis of rotation of the target element to sustain rotation proportionate to the force of impact of the pinball on the target element; and

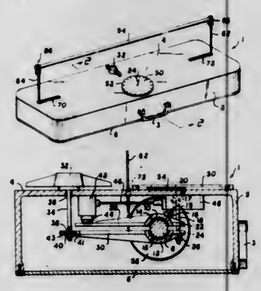
means for tabulating the number of revolutions of the target element when impacted by the pinball for scoring purposes.

4,235,439

FRICTION TYPE EXERCISING DEVICE

Benito De Donno, North Vancouver, Canada, assignor to Super Stretch Co., Ltd., West Vancouver, Canada

Filed May 21, 1979, Ser. No. 40,503
Int. Cl.³ A63B 21/22
U.S. Cl. 272—132 **10 Claims**



1. An exercising device comprising:

a base member;

a shaft rotatably mounted within the base member;

a pulley mounted on each end of the shaft;

means for engaging the pulleys and the shaft, when the pulleys are rotated in one direction, and for permitting free rotation of the pulleys about the shaft when the pulleys are rotated in an opposite direction to the one direction;

resilient means connected to the pulleys and biasing the pulleys to rotate in said opposite direction;

a cable connected to each pulley to rotate the pulleys in the one direction when the cables are pulled away from and unwound from the pulleys;

first and second brake shoes, each said brake shoe having a shaft receiving recess, the shaft being between the recesses of the brake shoes;

hinge means to one side of the shaft and urging each said brake shoe against the shaft;

first and second levers connected to the first and second brake shoes respectively and extending to a side of the shaft opposite the one side of the shaft;

adjustable means connecting the first lever to the base member for adjustably urging the first brake shoe against the shaft;

load measuring means connecting the second lever to the base member for measuring a force exerted by the shaft against the second brake shoe; and

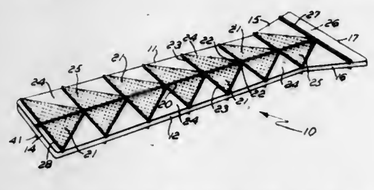
indicating means for indicating the force measured by the load measuring means.

4,235,440

DEVICE FOR ALIGNING THE FACE AND SWING OF A GOLF CLUB

Anne F. Hinckley, Hope, R.I.

Filed Jan. 22, 1979, Ser. No. 5,001
Int. Cl.³ A63B 69/36
U.S. Cl. 273—183 A **3 Claims**



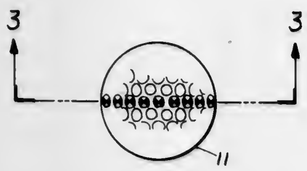
1. A device for aligning the face and swing of a golf club comprising an elongated body having two side surfaces with generally parallel edges flared at one end and terminating in ends at right angles to said edges, a direction line on each side surface extending longitudinally of said body midway between said edges, a series of arrows of generally triangular shape with a point end and a base end having said point end on said direction line and said base end at right angles thereto from side to side of said body, said arrows being raised from the face of the body and said two side surfaces each having arrows pointing in opposite directions.

4,235,441

DIFFRACTIONATED GOLF BALL

Richard Ciccarello, 7 Park Ave., Glen Cove, N.Y. 11542

Continuation-in-part of Ser. No. 937,474, Aug. 28, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,658
Int. Cl.³ A63B 43/00, 69/36
U.S. Cl. 273—213 **2 Claims**



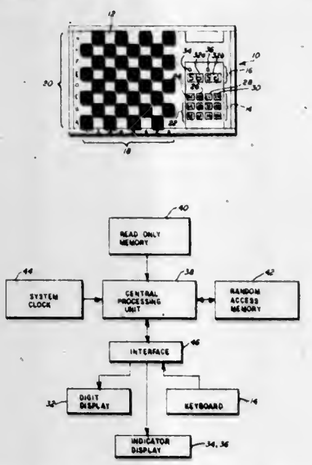
1. As an article of manufacture, a golf ball, wherein the great circle of cavities therein is provided with at least three (3) contiguous diffraction discs, to form a curvilinear alignment of discs to the eye of the golfer.

4,235,442

ELECTRONIC BOARD GAME SYSTEM

Ronald C. Nelson, Forest Park, Ill., assignor to Fidelity Electronics, Ltd., Miami, Fla.

Filed Aug. 26, 1977, Ser. No. 828,147
Int. Cl.³ A63F 3/02
U.S. Cl. 273—237 **11 Claims**



1. In an electronic board game of the type in which a plurality of pieces are movable between discrete positions on a game board and normally played between two players, a game playing system for use by one player in which the system responds to pieces moved by the one player by making responsive moves of pieces normally moved by the other player; comprising:

memory means having a distinct address for each of said discrete board positions and having stored at selected ones of said board position memory addresses first data signals representative of said game pieces to represent the position of said pieces on the game board and having stored at the remaining ones of said board position addresses second data signals representative of an empty board position;

a plurality of manually actuatable data input keys for producing position data signals to identify said memory addresses and thereby define said discrete board positions;

addressable input/output buffer means;

means responsive to sequential manual actuation of said data input keys for storing said position data signals in said input/output buffer means at addresses determined by the sequence of key actuation to thereby store in said input-/output buffer means data signals defining a first discrete position from which a piece is being moved and a second discrete position to which said piece is being moved;

means for displaying the data signals stored in said input-/output buffer means whereby said first and second discrete positions are displayed for a player;

a manually actuatable function key for implementing a move represented by said position data signals stored in said input/output buffer means and for alternatively implementing sequential display of the position of each piece on the game board;

means responsive to actuation of said function key for reading said position data signals stored in said input/output buffer means and for alternatively producing a premature signal when said data input keys have not been actuated to define said first and second discrete positions and an enter signal in response to actuation of said data input keys to define said first and second discrete positions;

means responsive to said premature signal for reading game piece data signals from a first one of said board position memory addresses and for alternatively producing an empty control signal when said empty data signals are stored at said first board position memory address and a filled control signal when said game piece data signals are stored at said first board position memory address;

means responsive to said empty control signal for causing said premature signal responsive means to read data signals from a second one of said board position memory addresses;

means responsive to said filled control signal for storing in said input/output buffer means said game piece data signals read from said board position memory address and discrete position signals corresponding to said board position memory address from which said game piece data signals are read whereby the identity of said discrete position and the game piece located at said discrete position may be displayed;

piece moving means, including means responsive to said enter signal and to said position data signals stored in said input/output buffer means for reading from said memory means game piece data signals stored at a first board position memory address corresponding to said first discrete position, and means for storing said game piece data signals in said memory means at a second board position memory address corresponding to said second discrete position, whereby a player's piece is moved in accordance with the position data signals stored in said input/output buffer means;

whereby the position data signals representative of said responsive move is displayed.

4,235,443

BOARD GAME WITH DIRECTIONAL INDICATOR

Giovanni C. Facchini, 17 Gordon Ter., Ayr, Ayshire, Scotland (KA8 OEF)

Filed Sep. 15, 1978, Ser. No. 942,780
Claims priority, application United Kingdom, Oct. 6, 1977, 41665/77
Int. Cl.³ A63F 3/00
U.S. Cl. 273—277 **5 Claims**



1. Apparatus for playing a game comprising a generally rectangular board having long and short sides, said board having at each corner and halfway along each of said long sides areas representing pockets, a plurality of markers representing balls, said markers movably locatable on said board, and a direction indicator having markings for selectively indicating the location of any of said pocket areas and for selection of the direction of play after selection of one of said pocket areas, random selection means, said random selection means for selecting any of said pocket areas and the direction of play

after the selection of said pocket area, said random selection means including markings mutually corresponding to said direction indicator markings.

4,235,444

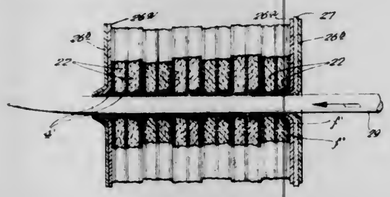
TARGET PARTICULARLY FOR ARCHERY

Leonard S. Meyer, 6449 Bridgewood Rd., Columbia, S.C. 29206

Continuation-in-part of Ser. No. 726,201, Sep. 24, 1976, Pat. No. 4,121,959, which is a continuation-in-part of Ser. No. 631,893, Nov. 14, 1975, Pat. No. 4,076,246, which is a continuation-in-part of Ser. No. 533,942, Dec. 18, 1974, abandoned. This application Sep. 11, 1978, Ser. No. 941,290

Int. Cl.³ F41J 3/00

U.S. Cl. 273—403 **8 Claims**



8. An archery target comprising an assembly of components each having at least one membrane penetrable by arrows cast at the target, the assembly having a front or target face and a back face and the components being assembleable in different positions in the assembly, the membranes being resilient and tear resistant, and providing for formation of sleeve shaped portions of the membranes projecting toward the back of the target during penetration of the arrow and engaging the shaft of the arrow around the penetration apertures and also providing for inversion of the sleeve shaped portions to positions projecting toward the front of the target upon withdrawal of the arrow, the membranes being multi-layered with layers having surfaces of different coefficient of friction exposed in opposite directions in the target, the surface of relatively high friction being exposed on the face of the member toward the front or face of the target and the surface of relatively low friction being exposed on the face of the member toward the back of the target, thereby providing greater frictional resistance of the sleeve shaped portions on the shaft of the arrow during penetration of the arrow as compared with the frictional resistance during withdrawal of the arrow, and the components each having indicia on at least one face thereof indicating which faces of the membranes have higher and lower coefficient of friction.

4,235,445

SEALING SYSTEM FOR PISTON ROD OF HOT GAS ENGINE

Sven G. K. Lundholm, Mantalskroken 9, S-222 47 Lund, and Sven Ä. V. Ringqvist, Bagevägen 56, S-230 47 Akarp, both of Sweden

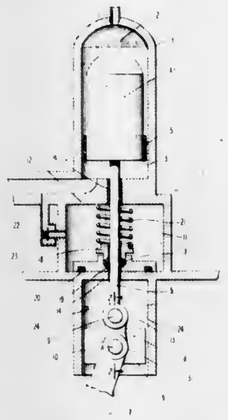
Filed Jan. 25, 1979, Ser. No. 6,806

Int. Cl.³ F16J 15/24; F16K 39/00

U.S. Cl. 277—30 **7 Claims**

1. In a sealing system restricting fluid passage around the periphery of a piston rod between a piston cylinder and a crankshaft space in a hot gas engine, where one end of said piston rod is attached to a piston in said piston cylinder and the other end of the piston rod is in the crankshaft space for attachment to a crosshead movably guided by the walls of said crankshaft space and driving the crankshaft of said engine and where the sealing system includes an intermediate chamber between said piston cylinder and crankshaft space through which said piston rod passes and in which is secured an annular seal element around said piston rod proximate a first wall separating said intermediate chamber from said crankshaft space for restricting fluid passage between the crankshaft space and the intermediate chamber, the improvement comprising:

means articulately attaching the other end of said piston rod



to said crosshead for permitting relative radial movement between said piston rod and crosshead and minimizing radial forces imposed on said seal element by said piston rod.

4,235,446

SEALING BUSHING FOR A MEMBER ROTATABLE ABOUT AN AXIS AND EXTENDING THROUGH A WALL OF A HOUSING

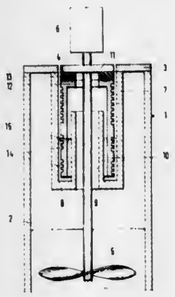
Leendert A. Verhey, Hazerswoude-Rijndijk, Netherlands, assignor to B. V. Neratoom, The Hague, Netherlands

Filed Feb. 22, 1979, Ser. No. 14,324

Claims priority, application Netherlands, Mar. 1, 1978, 7802285

Int. Cl.³ F16J 15/40

U.S. Cl. 277—135 **5 Claims**



1. A sealing bushing for a member having a shaft rotatable about an axis and extending through a wall of a housing, said bushing comprising a first metal sleeve fixedly secured to the wall and concentric with the shaft of the rotatable member, which shaft extends through the sleeve, and a second metal sleeve having one end fixedly connected to the shaft, said second sleeve being concentrically received in the first sleeve secured to the wall, the outer surface of the second sleeve connected to the shaft and the inner surface of the first sleeve secured to the wall being dimensioned to define a small radial clearance between them maintaining a sealing liquid in said clearance, wherein the improvement comprises an annular means of a material having substantial vibrational damping characteristics resiliently and sealingly connecting said second sleeve to the shaft, whereby vibrations of the rotating shaft will not cause physical contact between the rotating and fixed parts of the sealing bushing.

4,235,447

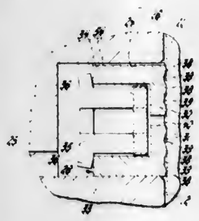
LOW FRICTION OIL CONTROL PISTON RING

Ellard D. Davison, Jr., 38 Newberry Place, Grosse Pointe Farms, Mich. 48236, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 10, 1978, Ser. No. 923,016

Int. Cl.³ F16J 9/06

U.S. Cl. 277—138 **3 Claims**



1. In combination in an internal combustion engine,

means defining a lubricated cylinder closed at one end,

a piston reciprocally movable in the cylinder and having a head portion opposing the closed end of the cylinder and a skirt which engages the walls of the cylinder to absorb thrust loads during reciprocating movement therein, the piston being provided with a plurality of outwardly opening circumferential piston ring grooves including at least one compression ring groove located closely adjacent the head end of the piston and at least one oil control ring groove disposed on the skirt side of said at least one compression ring groove with means venting the back of the oil ring groove to the piston interior for draining oil delivered thereto,

a compression piston ring in each of said at least one compression ring grooves, and

the improvement comprising a low friction oil control piston ring in said at least one oil ring groove, said oil control ring comprising,

a split annular metal ring having flat upper and lower sides, an inner wall and a generally cylindrical outer wall,

said outer wall having formed thereon a plurality of axially spaced circumferential ridges with intermediate shallow valleys blended together as viewed in cross-section to form a smoothly curved shallow wave-like pattern, said ridges being of equal diameter and thereby adapted to simultaneously engage the cylinder wall, and

oil return pasasages communicating said valleys with said inner wall and the back of said ring groove to carry excess oil from the valleys to the ring interior for return through the piston interior to the engine sump, the openings of said return passages into the valleys extending up their respective sides and spaced from the adjacent peaks of the ridges to control the hydrodynamic oil pressure developed on said valley sides during reciprocating motion of the ring in said lubricated cylinder.

4,235,448

SKIING SIMULATOR

Brooks Thomas, 921 Nardo, Encinitas, Calif. 92024

Filed Dec. 9, 1977, Ser. No. 859,040

Int. Cl.³ A63C 17/04

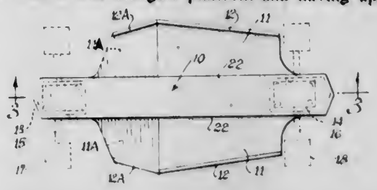
U.S. Cl. 280—11.1 BT **2 Claims**

1. A wheeled sport device comprising:

an elongate platform having a center line in the elongate direction, an upper side and lower side;

first and second skateboard truck, axle and dual wheel assemblies at either end of said elongate platform on said center line and having mounting surfaces engaging said platform on said lower side; and

first and second foot plates in side by side arrangement on either side of said elongate platform and having upper



surfaces substantially lower than said upper side of said elongate platform, each said upper surface having first and second sections converging downwardly to an intersection substantially transverse to said center line from either end of said foot plate.

4,235,449

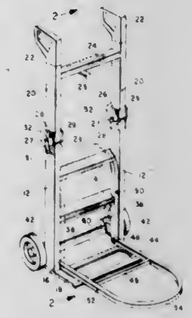
COMBINED HAND TRUCK AND STEP STOOL

Phil K. Tarran, 121 W. Orange Ave., Vista, Calif. 92083

Filed Jun. 19, 1978, Ser. No. 916,948

Int. Cl.³ B62B 1/04

U.S. Cl. 280—30 **9 Claims**



1. A combined hand truck and step stool comprising:

a frame having a pair of elongated side rails with longitudinally spaced interconnecting cross braces fixed therebetween;

said frame having a lower end with a rigidly attached bed and an extended load supporting foot fixed thereto;

wheels rotatably mounted on said lower end;

said side rails having hinged upper portions selectively movable to a folded position at an acute angle to the respective lower portions of the side rails;

and a support having means for connection between the lower portion of said frame and said upper portions to form a substantially triangular braced structure with the bed becoming the top step of the stool formed in the folded position of the frame.

4,235,450

CATAMARAN BOAT DOLLIES

Clarence G. Conover, Rte. 1, Box 127-0, Ruskin, Fla. 33570

Filed Feb. 10, 1978, Ser. No. 876,643

Int. Cl.² B60P 3/10

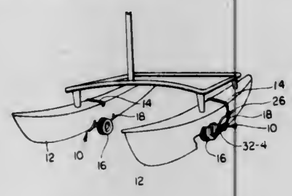
U.S. Cl. 280—47.32 **9 Claims**

9. A catamaran boat transportation system, comprising in combination:

a first and a second dolly for a first and a second catamaran hull respectively;

said first and second dollies comprising a first and second rigid cradle means for receiving opposite side of the first and second catamaran hull respectively;

a first and a second wheel for respectively supporting said first and second cradle means;



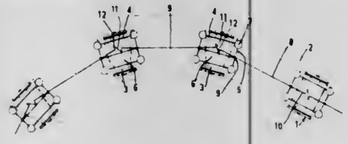
means for mounting said first and second wheels to said first and second cradle means to be disposed on one side of each of the first and second catamaran hulls creating rotational moments in said first and second cradle means enabling said first and second cradle means to clamp engage opposite sides of the first and second catamaran hulls respectively.

4,235,451

ARTICULATED AUTOMOTIVE VEHICLE

Jean-Paul M. Leriverend, Le Gradn-Quevilly, France, assignor to Ville De Rouen, France

Filed Jun. 27, 1978, Ser. No. 919,671
Int. Cl.³ B10D *7/00*
U.S. Cl. 280—408 **2 Claims**



1. An articulated automotive vehicle, wherein the bodies with which it is formed sit on a gantry arranged between adjacent bodies above a single axle guided by said gantry, said bodies bearing on two pivots of the gantry cross beams and being articulated on the same connecting-rod at two points symmetrically located relative to the gantry center so that the axle always takes a position which is substantially along the bisectrix of the angle formed by the longitudinal axes of the two bodies it supports.

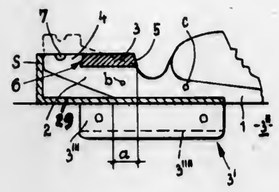
4,235,452

CROSS-COUNTRY SKI SHOE AND BINDING

Josef Linecker, Rosengasse 5, A 5230 Mattighofen, Austria

Filed Apr. 3, 1978, Ser. No. 892,770
Claims priority, application Austria, Apr. 13, 1977, 2578/77; Feb. 9, 1978, 924/78
Int. Cl.³ A63C *9/00*; A43B *5/04*
U.S. Cl. 280—615 **40 Claims**

1. A binding for use with a cross-country ski and adapted to hold in position an elastically deformable, forwardly extending portion of a ski shoe sole, the sole and the sole portion extending in the same direction, which comprises a front jaw adapted to be affixed to the ski, the front jaw including a stirrup shaped to receive the forwardly extending sole portion and to deform the forwardly extending sole portion elastically in an end position of the sole portion for snapping engagement with the stirrup, thereby to anchor the forwardly extending sole portion



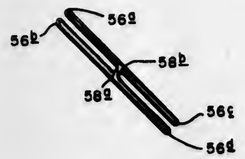
to the binding in the end position by elastic engagement of the sole portion with the stirrup.

4,235,453

SPECIALLY FOLDED VEHICLE SAFETY BAG

Lawrence C. Lawson, Warren; Richard L. Cascadden, Rochester; Tsuneyo Ross, St. Clair Shores, and Patrick T. Greene, Mt. Clemens, all of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 13, 1974, Ser. No. 469,585
Int. Cl.³ B60R *21/08*
U.S. Cl. 280—743 **2 Claims**



1. A safety bag adapted to be inflated in a vehicle to cushion a passenger of the vehicle, said safety bag having a deflated, folded condition and an inflated, unfolded condition, said bag when in deflated, folded condition comprising:

a first side, a second side, a third side and a fourth side, said first side and said second side being substantially parallel to one another, said third side and said fourth side being substantially parallel to one another and substantially perpendicular to said first and second sides;

five first-pleat-folds and four between-first-pleat-folds disposed substantially parallel to one another and adjacent and substantially parallel to said first side, one said between-first-pleat-fold being disposed between adjacent first-pleat-folds, thereby forming four first-pleats;

three second-pleat-folds and two between-second-pleat-folds disposed substantially parallel to one another and adjacent and substantially parallel to said second side, one said between-second-pleat-fold being disposed between adjacent second-pleat-folds, thereby forming three second-pleats;

three first-cross-pleat-folds and three between-first-cross-pleat-folds disposed adjacent and substantially parallel to said third side of said bag and forming three first-cross-pleats; and

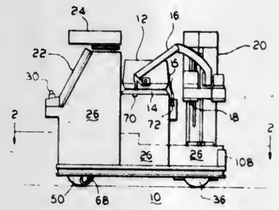
three second-cross-pleat-folds and three between-second-cross-pleat-folds disposed adjacent and substantially parallel to said fourth side of said bag and forming three second-cross-pleats, said first-cross-pleats and said second-cross-pleats being arranged substantially transverse to said first-pleats and said second-pleats, at least one of said cross-pleat-folds intersecting at least one of said first-pleat-folds whereby said bag inflates with reduced impact on the occupant.

4,235,454

STABILIZATION SYSTEM FOR A MEDICAL DIAGNOSTIC DEVICE

Floyd L. Gray, Hales Corner; Jerome H. Adam, Waukesha; Larry Susami, Wauwatosa, and Rick A. Zamzow, Waukesha, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 3, 1978, Ser. No. 957,530
Int. Cl.³ B60S *9/18*
U.S. Cl. 280—766 **8 Claims**



1. A stabilization system for a mobile medical diagnostic device having a movable detector head that is raised in preparation for diagnostic analysis and is lowered and secured in preparation for mobile movement and having two longitudinal sides and being supported by wheel assemblies on a supporting surface, said system comprising:

at least one extendable support located near one of the longitudinal sides of the device,

means for automatically extending said at least one extendable support to the supporting surface when the detctor head is not secured, and

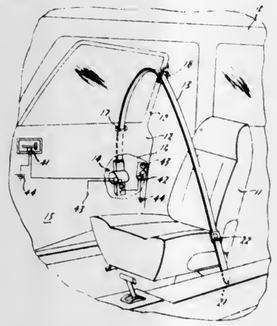
means for automatically retracting said support to facilitate mobility of the device when said detector head is lowered and secured.

4,235,455

VEHICLE SEAT BELT RETRACTOR MECHANISM

Alford F. Collins, Westland, and Bill A. Dixon, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 12, 1979, Ser. No. 29,410
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—803 **4 Claims**



1. A seat belt retractor mechanism having a seat belt reel rotatably journalled in a support frame mounted within a door of a vehicle;

the reel having at least at one of its ends a circular ratchet plate;

a locking bar means pivotally mounted on the support frame for movement into ratchet plate engagement to hold the reel against rotation in seat belt protraction direction;

an inertia sensor means comprising a pendulum device engageable with the locking bar means for driving the latter into ratchet plate engagement upon rapid acceleration or deceleration of the vehicle;

the pendulum device being mounted on the support frame in position to act directly on the locking bar to pivot the latter into ratchet plate engagement;

and electromagnet means mounted on the support frame in offset relation to the pendulum device and in abutting relation to a biasing means coupled to the locking bar;

the biasing means being magnetically gripped by the electromagnet means upon energization of the latter to resist movement of the locking bar into ratchet plate engagement by the pendulum device until the acceleration or deceleration forces acting on the pendulum device exceed a magnitude above that resulting from normal swinging closure or opening of the door thereby causing flexure of the biasing means in a direction to permit the locking bar to engage the ratchet plate;

a source of current for energizing the electromagnet means;

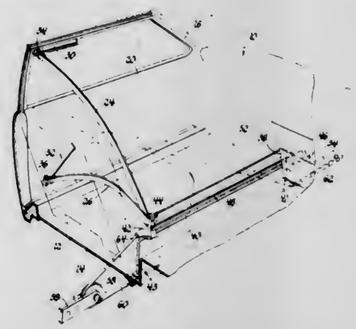
and switch means responsive to a predetermined condition of a vehicle component for controlling current to the electromagnet means.

4,235,456

PASSIVE OCCUPANT RESTRAINT SYSTEM

Horacio Shakespear, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 27, 1978, Ser. No. 946,387
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **5 Claims**



1. In a vehicle body having a door pivoted about its forward end laterally adjacent a seat mounted in an occupant compartment, a passive occupant restraint belt system comprising:

a belt having an outboard end mounted on the door and an inboard end mounted on the body inboard and forward of the occupant seat;

a longitudinally extending track mounted on the vehicle body inboard the occupant seat;

a carriage mounted on the track slidably engaging the belt intermediate the inboard and outboard ends, so that outward swinging opening movement of the door moves the outboard belt end outwardly and forwardly of the seating position and induces sliding movement of the belt through the carriage and forward movement of the carriage to stow the belt in an occupant access position forwardly of the occupant;

mechanical drive means interconnecting the door and the carriage independent of the belt to move the carriage rearwardly on the track during closing movement of the door to establish the belt in a restraining position closely adjacent the occupant whereby the carriage is effectively coupled with the door so that occupant restraining load inducing forward movement of the carriage is counterbalanced by the occupant restraining load urging closure of

the door to maintain the belt in the occupant restraining position.

3. In a vehicle body having a door pivoted about its forward end laterally adjacent a seat mounted on the vehicle body floor, said seat having a first seating position for a first occupant adjacent the door, a second seating position inboard the first seating position for seating a second occupant and a third seating position for seating a third occupant adjacent the second seating position, a passive occupant restraint belt system for restraining the first and second occupants and permitting ingress and egress of both occupants through the door comprising:

a longitudinally extending track mounted on the vehicle body floor between the first and second seating positions; and constructed in a non-obstructing manner permitting occupant movement between the first and second seating positions;

a belt carriage movable on the track between a rearward position adjacent the hips of the first and second occupants and a position spaced forwardly of the seat to permit unobstructed ingress and egress of the second occupant from the second seating position;

a first restraint belt for the first occupant including an outboard end mounted on the door and an inboard end mounted on the carriage;

a second restraint belt for the second occupant having an outboard end mounted on the carriage and an inboard end retractably mounted on the vehicle body between the second and third occupants;

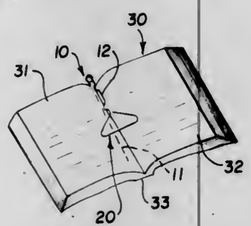
and means for moving the carriage forwardly when the door is open to dispose the inboard end of the first belt and outboard end of the second belt forwardly of the seat to permit unobstructed ingress and egress of both the first and second occupants through and for moving the carriage to the rearward position when the door is closed to dispose the first and second belts in their respective restraining positions about the first and second seat occupants when the door is closed.

4,235,457

BOOK READERS CLIP

Jack J. Brewer, 5012 Oak Timers Ct., Colleyville, Tex. 76034

Filed Mar. 2, 1979, Ser. No. 16,943
Int. Cl.[1] B42D *9/00*
U.S. Cl. 281—42 **3 Claims**



1. A book readers clip for holding the pages of a book open at a desired location comprising: an integral spring wire article having a straight back tine, a coil spring formed at one end of said tine, a retainer and page holder member substantially shorter than said back tine and secured with said coil spring at one end and extending along said tine including a laterally extending page holder portion formed on the free end of said retainer member and a plurality of spaced bends each having a substantially U-shape formed in said retainer member between said coil spring and said lateral page holding portion of said member, said bends extending toward said tine and said bend nearest said coil spring being approximately one-half the depth of the other of said bends, said coil spring biasing said retainer member toward said tine.

4,235,458

PROCESS FOR THE PRODUCTION OF HOT MELT COATING COMPOSITIONS CONTAINING MICROCAPSULES

Robert A. Austin, Chillicothe, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 729,323, Apr. 29, 1977. This application Jan. 8, 1979, Ser. No. 1,719
The portion of the term of this patent subsequent to Oct. 23, 1996, has been disclaimed.
Int. Cl.[1] B41M *5/22*; **C09D** *11/12*
U.S. Cl. 282—27.5 **5 Claims**

1. A liquid chromogenic coating composition having utility in the manufacture of pressure-sensitive carbonless transfer sheets comprising:

(a) a hot melt suspending medium, said hot melt suspending medium being water soluble and having a melting point of from about 50° C. to about 140° C. and a melting point range of less than about 15° C.; and

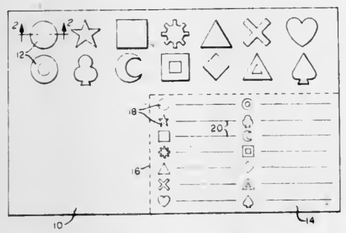
(b) a microencapsulated chromogenic material, said chromogenic material being a color precursor of the electron donating type said chromogenic material being mixed with a carrier oil to form an oil solution of said chromogenic color precursor material, said oil solution being microencapsulated by combination with one or more wall forming compounds.

4,235,459

MARKING SYSTEM

Dennis Callahan, 316 Burnside St., Apt. 207, Annapolis, Md. 21403

Filed Jun. 15, 1978, Ser. No. 915,816
Int. Cl.[1] B42D *15/00*; **B42F** *21/06*; **G09F** *3/10, 7/12*
U.S. Cl. 283—7 **1 Claim**



1. A system for marking a plurality of separate objects comprising a substrate separate from the objects to be marked, a plurality of distinctly different, adhesive backed, markers separably adhered to the substrate, an image of each of said markers being printed on the same substrate to which the markers are adhered, a blank line printed on said substrate adjacent each of the printed images for noting the object to which the corresponding separable marker has been applied following its separation from said substrate and application to said object, each of said markers and its printed image having a shape which is distinctly different from the shape of each of the other markers and its printed image, and each of said markers having sufficient thickness to enable distinguishing by feel the shape of one marker from another when each is applied to a different article, said substrate including a separable card portion, said printed images and blank lines being on the separable card portion, and the separable markers being carried on the substrate outside the perimeter of said card portion.

4,235,460

EXPANSION JOINT

Donald K. Hagar, 2439 Walnut St., Allentown, Pa. 18104

Filed Aug. 10, 1978, Ser. No. 932,613
Int. Cl.[3] F16L *51/02*
U.S. Cl. 285—229 **10 Claims**



1. An expansion joint to be interposed between sections of a conduit to accommodate relative movement between the conduit sections, the expansion joint comprising:

a pair of frame sections, each frame section being for attachment to one conduit section;

a sleeve-like connector of flexible fabric material, said connector having opposite ends, each end being coupled to one of said frame sections, said connector having a plurality of inner corners;

said connector having at each inner corner in the region of each end a substantially continuous outwardly extending portion which is folded back on itself so that at least two segments of fabric material overlie each other at each folded back portion;

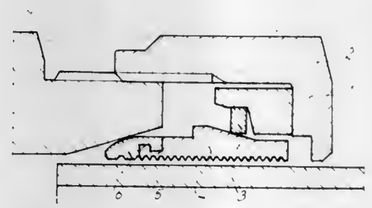
said folded back portions contributing to forming bloused corners in said connector, said bloused corners including portions disposed outwardly of said inner corners to relieve stresses in said connector and to reduce the possibility of rupturing of the connector.

4,235,461

COUPLING BETWEEN MECHANICAL ELEMENTS

Olov M. Normark, Astrakangatan 2, Vällingby, Sweden (S-162 32)

Filed Oct. 31, 1978, Ser. No. 956,430
Int. Cl.[2] F16L *17/02*
U.S. Cl. 285—340 **8 Claims**



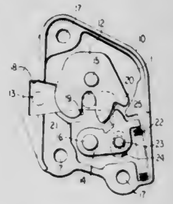
1. In a coupling for connecting together a pair of elongate mechanical elements, said coupling including a contact member for engaging an outer surface of one of said elements and means for applying inward radial pressure to said contact member causing said contact member to grip against said outer surface, the improvement wherein said radial pressure applying means includes a substantially planar annular spring disc having its inner periphery contacting the outer surface of said contact member and means for applying axial pressure to said disc to deform said disc from an unstressed planar condition into a stressed dished condition in which said disc applys radial pressure to said contact member, said axial pressure applying means including means defining a surface inclined relative to said disc in the unstressed planar condition of the disc and having face to face contact with said disc when said disc is deformed into said stressed dished condition.

4,235,462

DOOR LOCKING APPARATUS FOR VEHICLES

Nozomu Torii, Hekinan, and Yoshiaki Ishikawa, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 22, 1978, Ser. No 888,998
Claims priority, application Japan, Apr. 20, 1977, 52-50200
Int. Cl.[1] E05C *3/26*
U.S. Cl. 292—216 **5 Claims**



1. A door locking apparatus for vehicles, which comprises:

a striker member fixed to a vehicle body;

a latch member rotatably supported in a main body of a door and engageable with said striker member;

at least one latch portion formed on the latch member;

a pawl rotatably supported on the door and urged in the direction toward said latch member to engage the latch member and limit rotation thereof, said pawl having an irregularly shaped groove therein at the area of contact with the latch member; and

a generally anvil-shaped body of resilient shock absorbing material fitted in said groove and retained in the groove by projecting portions thereof engaged in undercut parts of the groove, said shock absorbing body having an elongate surface defining a contact zone with the latch member and being stressed by dimensional differences between the shock absorbing body and the groove into an arcuate, convex configuration for smooth engagement with the latch member.

4,235,463

CLOSURE DEVICE FOR CONTAINER DOORS

Gianfranco Benevenuta, Fraz. Data 27, I-10084 Forno Canavese (Turin), Italy

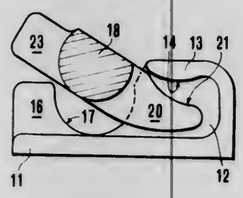
Filed Mar. 20, 1979, Ser. No. 22,338
Claims priority, application Italy, Nov. 17, 1978, 69624 A/78
Int. Cl.[1] E05C *9/08*
U.S. Cl. 292—218 **2 Claims**

1. In a closure device for a container, comprising two lateral posts, an upper bar and a lower bar defining an access opening to the container, two doors closing said access opening, hinges connecting each door to one of said lateral posts, collar supports aligned along the edge of each door remote from said hinges, an upright rod rotatably mounted in said collar supports of each door, an operating handle connected to each said upright rod at a middle position thereof, a catch connected to each end of each said upright rods, and keepers mounted on

said upper and lower bars in register with each said catches, the improvement that:

each said keeper has a flat base having a flat forward surface; a first and a second wedge-shaped projections from said base, said flat forward surface of said base being disposed equally on opposite sides of said projections; each said projection being tapered towards the other projection; a seating between said first and second projections defined by a part-cylindrical surface on each said projection substantially tangential to said flat forward surface of said base; and a double flange providing a head extending transversely from said first projection remote from said base; and

each said catch comprises a stem having an at least partially cylindrical cross-section corresponding to said seating of each keeper; a first pair of projections from said stem; a first wedge-shaped space between the projections of said first pair, the cross-section of said first space corresponding to said first wedge-shaped projection of each keeper; a



second pair of projections from said stem, substantially opposite said first pair of projections; and a second wedge-shaped space between the projections of said second pair, the cross-section of said second space corresponding to said second wedge-shaped projection of each keeper;

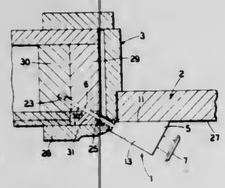
whereby in the closed condition of the container each stem of a catch occupies the seating of a keeper, the wedge-shaped projections of each keeper are wedged in the spaces between the projections of a catch, and the first pair of projections of each catch is positively engaged below the head of a keeper, said head of each keeper having an internal surface, facing the base of the keeper, said surface having a convexly-curved profile, and the projections of the first pair of projections of each catch having an external surface having a concavely-curved profile corresponding to the profile of the internal surface of the keeper head; said pairs of projections having edge surfaces that are substantially tangential to the cylindrical surface of the stem and substantially parallel to and closely adjacent said flat forward surface of the base in said closed condition of the container.

4,235,464

DOOR LOCK CONSTRUCTION

Richard E. Cantley, 1469 Shelley St. NE., North Canton, Ohio 44720

Filed Jun. 20, 1979, Ser. No. 50,172
Int. Cl.³ E05C *17/54*
U.S. Cl. 292—288 **11 Claims**



1. In combination with an inwardly swinging door and adjacent door frame, an improved door lock construction including:

(a) a block of rigid material having a surface adapted to abuttingly engage the inside surface of the door;

(b) rigid rod means mounted on the block and projecting outwardly therefrom, said rod means forming an exterior angle with the door-engaging surface of the block in the range of approximately 120° to 165°; and

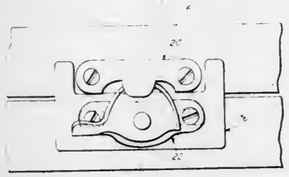
(c) hole means formed in the door frame, said hole means having a size and configuration complementary to the size and configuration of the rod means for receiving the same, and said hole means projecting inwardly and away from the adjacent door at an angle with respect to the inside door surface, whereby the door-engaging surface of the block lies in abutting relationship with the door surface when the door is closed and the rod means is inserted into the door frame hole means preventing opening of the door.

4,235,465

BURGLARPROOF GUARD FOR WINDOW LOCK

Michael Costello, 304 Meridian St., East Boston, Mass. 02128

Continuation-in-part of Ser. No. 719,946, Sep. 2, 1976, Pat. No. 4,102,546. This application Jan. 9, 1978, Ser. No. 868,076
Int. Cl.³ E05C *3/04*
U.S. Cl. 292—346 **1 Claim**



1. In a sash lock having a latch and keeper for a double-hung window having upper and lower sashes forming a gap therebetween when closed, an improved latch, comprising

(a) a base member adapted to be fixed to the top of said lower sash,

(b) a cam rotatably mounted to said base and engageable with said keeper mounted to the bottom of said upper sash when said sashes are closed,

(c) said base being formed with a contoured forward marginal edge defining a pair of coplanar tabs one at each end thereof adapted to extend over said gap,

(d) said edge being formed with a center recess between said tabs to allow clearance for said keeper when said window is being opened.

4,235,466

BODY SIDE PROTECTIVE MOLDING

Paul Mandrik, Mt. Clemens, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

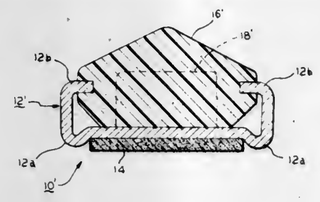
Filed Feb. 24, 1976, Ser. No. 660,916
Int. Cl.² B32B *33/00*
U.S. Cl. 293—128 **2 Claims**

1. A body side protective molding for attachment to the generally vertical surfaces of the sheet body for an automotive vehicle comprising, in combination:

a continuous metallic generally U-shaped base carrier strip having a generally longitudinal dimension substantially greater than its transverse dimension and having spaced leg portions projecting away from a continuous generally flat bottom portion connecting said leg portions said legs forming exterior longitudinally extending lateral side members of said molding;

a layer of adhesive material bonded at a first surface thereof to the flat side of said carrier strip over a substantial portion of the transverse dimension of said carrier strip and wherein the opposite surface of said layer of adhesive material provides an exposed surface for adhesive attachment to the surface portion of said body after being pressed into engagement therewith;

a plastic member mounted to said carrier strip and retainingly engaged by and between said leg portions to complete said molding and to provide an ornamental surface thereof the transverse width of said plastic member being significantly less than the transverse width of said carrier strip as defined by said exterior lateral side members and



wherein said plastic member projects from and on opposite sides of a plane intersecting terminal points of the free ends of said leg portions; and,

wherein said carrier strip is a rolled channel section each end of which receives a plug member which extends into the open passage of said channel section, and wherein said plastic member extends along said carrier strip and includes an internal enclosed passage at each of its ends to receive an extended portion of said plug therein, said enclosed passage extending into said plastic member a distance at least equal to the length of said extended portion.

4,235,467

BUMPER STRUCTURES, PARTICULARLY FOR VEHICLES

Guy R. M. Gardou, Orsay, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Jan. 29, 1979, Ser. No. 7,245
Claims priority, application France, Feb. 6, 1978, 78 03265
Int. Cl.² B60R *19/08*
U.S. Cl. 293—135 **11 Claims**



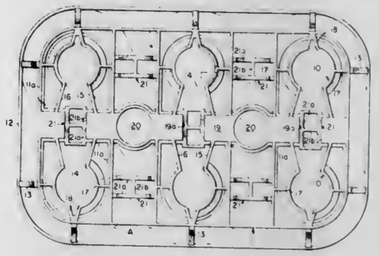
1. A bumper structure comprising at least two flexure elements extending transversely between two abutment zones situated at their ends, these elements being intended, by their bending, to absorb at least partially the energy of a shock having a longitudinal component, characterized by the fact that the two flexure elements are rigidly connected to each other in their middle part and that, on the one hand, the moment of inertia of the first flexure element, in the longitudinal direction, is minimal in the middle part of this element and increases, on both sides, up to a maximum value for a section situated between the middle part and the ends of this first element then decreases as far as the sections situated at the ends of the first element, and that, on the other hand, the second element presents, in its middle part, the section having the maximum moment of inertia in the longitudinal direction, the moment of inertia of the sections of this second element decreasing, on both sides of the middle part, up to the ends of the second element.

4,235,468

BOTTLE CARRIER

Gerald Erickson, P.O. Box 747, Palm Beach, Fla. 33480

Filed Apr. 13, 1979, Ser. No. 29,715
Int. Cl.³ B65D *71/00*
U.S. Cl. 294—87.2 **14 Claims**



1. An integrally formed one piece injection molded bottle carrier in which a plurality of bottles can be carried in a close cluster without substantial concealment or cover of the upper portions of bottles by the carrier comprising a plurality of bottle neck engaging means for receiving and supporting therein the necks of bottles, a relatively rigid frame for supporting the neck engaging means in spaced apart relationship to each other within the confines of the outer perimeter of the frame to insure that the bottles are closely clustered together, a bottle retaining loop bar separated from and spaced beneath the frame for engaging the outer portions of the bottles to maintain them in close clustered relationship, the area within the confines of the loop bar being larger than the area within the confines of the frame, and a plurality of spaced apart depending supports extending diagonally outwardly from the outer perimeter of the frame to the loop bar for supporting the bottle retaining loop bar in spaced apart relation to the frame and exposing the bottles to view through the spaces defined between the frame and the loop bar and between adjacent depending supports.

4,235,469

PIPE HANDLING APPARATUS

Lawrence A. Denny, Orange, Calif., and James E. Aswell, Houston, Tex., assignors to Den-Con Tool Company, Orange, Calif.

Filed May 11, 1979, Ser. No. 38,248
Int. Cl.³ E21C *19/00*
U.S. Cl. 294—96 **5 Claims**

1. An apparatus for engaging the interior of a tubular member for movement and handling thereof, comprising:

(a) a plurality of slips for engaging an inner wall of the tubular member;

(b) ramp means for urging said plurality of slips outwardly during relative movement therebetween to engage the inner wall of the tubular member;

(c) fluid power cylinder means for causing relative movement between said plurality of slips and said ramp means;

(d) leveling beam means for transferring movement from said fluid power cylinder means to said plurality of slips to cause substantially uniform engagement between said plurality of slips and the inner wall of the tubular member and balanced loading during movement and handling thereof;

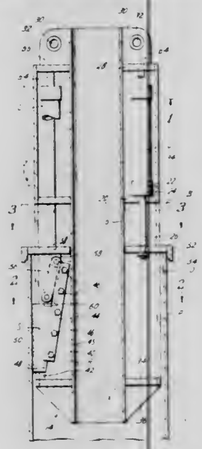
(e) guide rod means for guiding movement of said slips and

said leveling beam means with respect to the tubular member;

(f) an outer body member having:

(1) an outer end plate for attachment to said guide rod means;

(2) a support plate for mounting said fluid power cylinder



means therewith, said support plate having an opening for passage therethrough of said guide rod means;

(g) said leveling beam means having an opening for passage of said guide rod means therethrough; and

(h) an inner body member having an inner support member for mounting said ramp means therewith, said inner body member having said guide rod means attached thereto.

4,235,470

UTILITY VEHICLE WITH A SELF-CONTAINED DRIVER COMPARTMENT

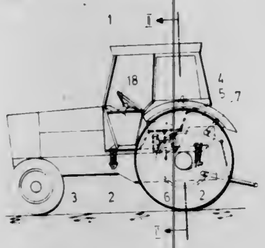
Wolfgang Kauss, Berlin, and Ludwig Muncke, Feldkirchen-Westerham, both of Fed. Rep. of Germany, assignors to Fritzmeier AG, Lenzburg, Switzerland

Filed Jul. 3, 1978, Ser. No. 921,609

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730139

Int. Cl.³ B60P 3/03

U.S. Cl. 296—190 **24 Claims**



1. Utility vehicle with a self-contained driver compartment and with spring and damping elements by which the driver compartment is elastically supported on the rest of the vehicle mass, characterized by the fact that there is provided centrally between the driver compartment (1) and the vehicle mass (3) a guide arrangement (6; 6'; 6'') which guides the driver compartment (1) in all motions relative to the vehicles mass (3) and which consists of a vertical guide (11, 12; 20, 21) as well as two rotational guides coupled with said vertical guide, the axes of said rotational guides run parallel and transverse to the length of the vehicle.

4,235,471

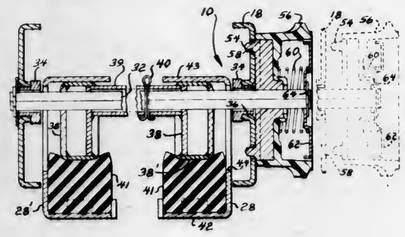
ANGULAR VIBRATION ISOLATOR FOR SEAT BACK

Harvey N. Tengler, New Berlin, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 21, 1978, Ser. No. 972,112

Int. Cl.² A47C 1/024, 3/00

U.S. Cl. 297—361 **9 Claims**



1. A combination seat back angle adjustor and angular motion vibration isolator for a vehicle seat comprising a seat frame; a seat bottom cushion carried by said seat frame; a seat back frame; a seat back cushion carried by said seat back frame; pivot means on said seat frame and seat back frame for pivotally mounting said seat back frame for angular tilting movement relative to said seat frame; angular adjustment means mounted on said seat frame and said seat back frame at a location spaced from said pivot means to selectively adjust the normal angular position of said seat back frame relative to said seat frame over a predetermined adjustment range; said angular adjustment means including a pair of rigid, cooperating contacting elements at each side of said seat back frame which prevent forward movement of the seat back frame in any position of adjustment; said angular adjustment means further including resilient means comprising a spring member which is slightly compressed or preloaded when the seat is not occupied and which normally biases said pair of rigid cooperating contacting elements into contact with each other, one of said contacting elements being integral with said seat back and the other being integral with said seat frame, said contacting elements being separable with one of them compressing the spring member for permitting a limited amount of angular rotation of said seat back in a rearward direction when said seat back is driven against the back of an occupant of the seat by fore and aft or pitching type vehicular vibrations which exert a force greater than the preloading.

4,235,472

SLEEPING DEVICE FOR SITTING POSITION

Robert Sparks, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jun. 22, 1978, Ser. No. 918,148

Int. Cl.³ A47C 4/52

U.S. Cl. 297—392 **1 Claim**



1. A portable device adapted to be used for sleeping in a sitting position comprising a lower lap engaging surface which contacts the persons lap to support the device, including a chin rest to support a chin, an appropriate distance above the lap when sitting, including arm rest channels formed in the device adapted to receive and support a persons arms above the lap wherein said channels are at different levels, one of said channels formed through the interior of said device below the chin rest and the other of said channels adjacent said chin rest at the same level above the lap.

4,235,473

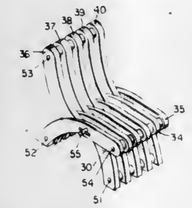
FURNITURE CONSTRUCTION

Antonio F. Aginar, 188-22 Jamaica Ave., Hollis, N.Y. 11423

Filed Aug. 14, 1978, Ser. No. 933,490

Int. Cl.³ A47C 7/00

U.S. Cl. 297—440 **7 Claims**



1. A furniture piece comprising (a) a first plurality of units, each first plurality unit being of uniform thickness and having parallel side faces with at least one shaped edge surface, the composite of a portion of said edge surfaces defining at least one functional surface of said furniture piece when the units of said first plurality are positioned in a predetermined spaced face-to-face arrangement, (b) a plurality of discrete spacer means, (c) a second plurality of units of a configuration distinct from the units of said first plurality, each unit of said second plurality being disposed in said predetermined arrangement in face-to-face relationship with at least one unit of said first plurality transverse to the functional surface defined by said first plurality, said second plurality of units bearing at least a portion of the load of said first plurality of units, at least one of said spacers or a unit of said second plurality being disposed between the opposed faces of adjacent units of said first plurality and spacing said units of said first plurality from one another in said spaced arrangement, the units of each of said first and second plurality and said spacing means being provided with openings which are registered in said predetermined arrangement, and (d) interconnecting means operable to pass through said openings to maintain the units of said first and second plurality and said spacer means in said spaced arrangement.

4,235,474

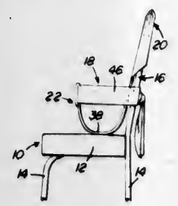
HARNESS FOR RETAINING A BABY IN A CHAIR

Linda H. Rosenberg, 4007 Sanlee Rd., Randallstown, Md. 21133

Filed Jul. 31, 1978, Ser. No. 929,824

Int. Cl.³ A47C 31/00

U.S. Cl. 297—465 **1 Claim**



1. In combination with a chair having a generally horizontally disposed seat and upstanding back oriented in rigid relationship with the front and side edges of the seat being open, a harness for retaining a baby in the chair, said harness comprising a body member constructed of flexible fabric material and including a chair back receiving pocket, a crotch engaging portion and a tie strap, said pocket comprising a rectangular panel reversely folded to form a top edge and a pair of panels secured together along the generally parallel side edges with the bottom edges left unattached to form a downwardly opening pocket for sliding downwardly over the top edge portion of the chair back, said pocket forming panels having substantial vertical dimension whereby the pocket will receive a substantial portion of the chair back, said crotch engaging portion including an extension unitary with the lower edge of the front panel of the pocket, said extension having inwardly curving side edges originating at the side edges of the lower end of the front panel of the pocket and merging into generally parallel side edges defining a crotch strap extending between the legs of a baby, said tie strap extending perpendicular to the forward end of the crotch strap and being fixedly secured thereto, said tie strap being narrower than the crotch strap and extending an equal distance to both sides thereof, the extension and crotch strap having a length to position the forward end of the crotch strap and the central portion of the tie strap in position for engagement with the midsection of the chest and stomach area of a baby with the tie straps extending under the armpit area of the baby and around the side edges of the chair back below the pocket; said tie strap terminating in free ends to enable the tie strap to be secured in place by tying a knot behind the chair back, the forward end of the crotch strap extending across the inner surface of the tie strap, folded over the top edge of the tie strap and extending downwardly across the outer surface of the tie strap to a terminal end edge coinciding with the bottom edge of the tie strap, the end portion of the crotch strap being secured to the tie strap by stitching with the multiple layers of material defining a generally rectangular stiffened area engageable with the front midsection of the baby and maintaining the straps in a flat unfolded condition, the free end portions of the tie strap being tapered to facilitate the formation of a knot, said extension and crotch strap extending along the surface of the chair back and seat with the weight of the baby being supported by engagement with the chair seat with the baby oriented in substantially upright seated position on the crotch portion of said harness and having freedom of movement of the arms and legs.

4,235,475

MINERAL MINING EQUIPMENT

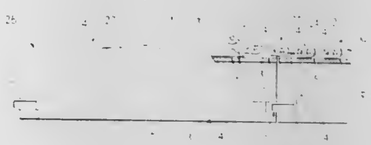
Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 17, 1974, Ser. No. 506,710

Claims priority, application United Kingdom, Oct. 19, 1973, 48747/73

Int. Cl.² E21C 29/10

U.S. Cl. 299—43 **7 Claims**



1. Mineral mining equipment comprising a mineral mining machine which is use traverses to and fro along a path adjacent

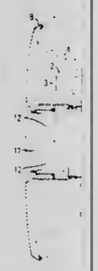
to an armored face conveyor arranged along a mineral face and which has a sprocket assembly including at least one driven sprocket, a flexible round link chain at least a portion of which is extendable along at least a portion of the path of the machine such that during the traverse of the machine along the path links of the chain are associated with the sprocket assembly and sequentially are drivably engaged by the driven sprocket to haul the machine along the path, and a track component securable to the armored face conveyor, the track component having formations for fixedly engaging those links of the chain which currently are not being fed around the sprocket assembly which is arranged to feed the associated links in sequence from the track component around the driven sprocket at back to the track component, in which the mining machine comprises a scraper blade arranged to pass along the track component to clear the track component of any broken mineral before the chain links are re-engaged with the track component.

4,235,476

WHEEL COVER FOR VEHICLE WHEELS

Krister E. G. Arvidsson, Västra, Frölunda, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Jul. 10, 1979, Ser. No. 56,397
Claims priority, application Sweden, Aug. 8, 1978, 7808477
Int. Cl.³ B60B 7/04, 7/06
U.S. Cl. 301—108 R **8 Claims**



1. Wheel cover for vehicle wheels, comprising a disc-shaped member designed to cover the portion of a wheel rim in which the wheel nuts are located, and spring members joined to the disc-shaped member which are intended to engage a wheel hub to hold the disc-shaped member on the rim, characterized in that the disc-shaped member has a central opening and in that at least two opposing, axially directed spring members are arranged at the edge of the opening, said spring members having inner legs with opposing gripping surfaces intended to grip around the wheel hub between them, and outer legs with opposing gripping surfaces intended to grip around between them a plate which closes the opening, the outer legs being disposed to be pressed apart as the plate is inserted between their gripping surfaces to increase the grip of the inner legs around the hub by leverage effect between the outer and the inner legs.

4,235,477

VARIABLE LOAD VALVE DEVICE

James E. Hart, Trafford, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Mar. 15, 1979, Ser. No. 20,676
Int. Cl.³ B60T 8/22
U.S. Cl. 303—22 R **14 Claims**

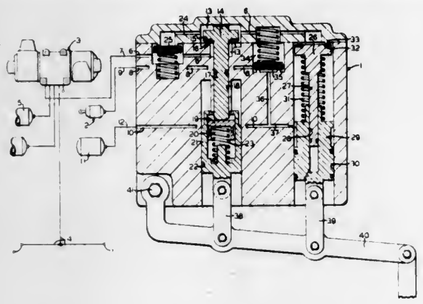
8. For use in a railway vehicle brake control system including a brake pipe, an auxiliary reservoir charged to the pressure of said brake pipe, a brake cylinder, and a brake control valve operative responsive to variations in said brake pipe pressure for supplying pressure from said auxiliary reservoir to said brake cylinder and for releasing brake cylinder pressure therefrom, a variable load valve device interposed between said brake control valve and said brake cylinder, being mounted on either the sprung or unsprung portion of said vehicle and comprising:

(a) passage means having an inlet connected to said control valve and an outlet connected to said brake cylinder;

(b) a volume;

(c) modulating means for effecting the connection of fluid pressure at said passage means to said volume to modulate brake cylinder pressure according to the vehicle load;

(d) cut-off valve means in said passage means ahead of said modulating means for controlling fluid pressure communi-



cation between said auxiliary reservoir and said brake cylinder via said control valve;

(e) means for biasing said cut-off valve means toward an open position; and

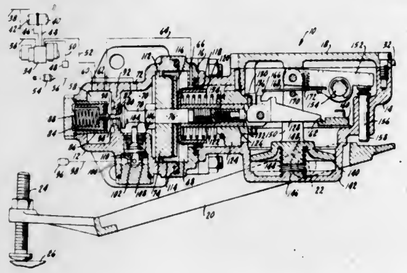
(f) vehicle load sensing means for adjusting said bias means in accordance with the vehicle load, whereby said cut-off valve means is operative from said open position to a closed position in which said fluid pressure communication between said auxiliary reservoir and said brake cylinder is terminated when the fluid pressure in said auxiliary reservoir is depleted to a predetermined value.

4,235,478

EMPTY AND LOAD BRAKE DEVICE

Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Mar. 26, 1979, Ser. No. 23,700
Int. Cl.³ B60T 8/20
U.S. Cl. 303—23 R **11 Claims**



10. An empty and load device for a railroad vehicle air brake system for controlling brake application pressure comprising:

housing means having an inlet connected to a pressure source and an outlet connected to an air brake cylinder, valve means in said housing means for controlling communication between said inlet and outlet,

pressure proportional piston means movable in said housing means and positioned to open and close said valve means to provide less than full inlet pressure at said outlet,

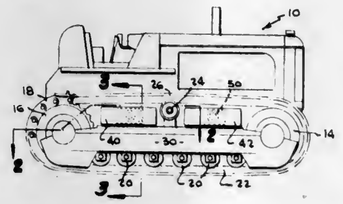
a load sensing arm movably attached to said housing means, and means responsive to the position of said load sensing arm for effecting direct full communication between said inlet and outlet.

4,235,479

CRAWLER VEHICLE WITH DIRT REMOVING PLATE

Angelo Puglise, Rte. 2, #6 W. Levert Dr., Luling, La. 70070

Filed Aug. 16, 1979, Ser. No. 67,108
Int. Cl.³ B62D 55/00
U.S. Cl. 305—12 **7 Claims**



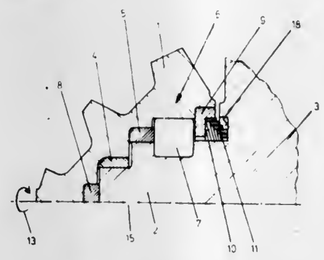
1. A crawler type vehicle of the type having a frame and front idler and rear sprockets over which a crawler track extends in an upper flight and a lower flight, the improvement comprising pusher plate means mounted beneath but closely adjacent said track upper flight for transverse movement with respect to the vehicle between a retracted position and an extended position and power actuator means mounted on said frame for moving said pusher plate means from said retracted position to said extended position to expel accumulated dirt or the like from beneath the upper flight and for returning the pusher plate to its retracted position.

4,235,480

SEAL RING FOR DRILL BIT ASSEMBLIES

Armin Olschewski; Heinrich Kunkel, both of Schweinfurt; Manfred Braudenstein, Aschfeld, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 969,005
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756929
Int. Cl.³ F16C 19/00, 33/76
U.S. Cl. 308—8.2 **14 Claims**



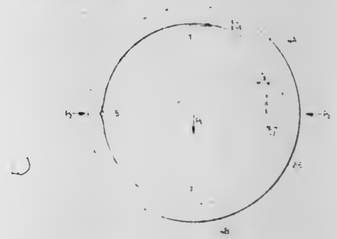
1. In a drill bit comprising a cutter rotatably supported by at least one bearing on a trunnion of the drill bit body, the inner axial end of the cutter spaced from the drill bit body and defining an annular gap, a seal ring of flexible metallic strip material of spiral form engaging in the annular gap between the cutter and the drill bit body, the individual spirals of said strip being in overlapping relation, said seal ring oriented in a predetermined manner to rotate relative to the drill bit body or cutter and serve as a forwarding screw thread to effect pumping of any liquid in the area of the annular gap by hydrodynamic action.

4,235,481

BEARING DEVICE FOR INTERNAL COMBUSTION ENGINE

Tatsuhiko Fukuoka, Toyota; Akira Sakai, Toki, and Yoshimi Matsuda, Toyota, all of Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Nov. 9, 1978, Ser. No. 959,255
Claims priority, application Japan, Nov. 16, 1977, 52-137595; May 19, 1978, 53-59781; Jun. 2, 1978, 53-66519; Jun. 30, 1978, 53-80260
Int. Cl.³ F16C 9/02, 9/04
U.S. Cl. 308—23 **18 Claims**



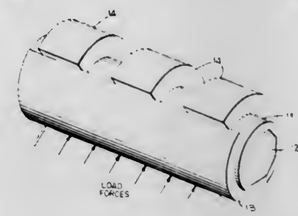
1. In a bearing assembly of an internal combustion engine in which the crankshaft thereof is supported by said bearing assembly at three or more points by means of crankshaft bearings, the improvement in said bearing assembly which is characterized in that the clearances between said crankshaft and said crankshaft bearings are varied in accordance with the intensities of the impact loads which are exerted on the respective crankshaft bearings.

4,235,482

HIGH CAPACITY RUBBER BUSHING

Donald L. Gibson, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jul. 28, 1978, Ser. No. 929,071
Int. Cl.³ F16C 27/02, 27/06
U.S. Cl. 308—26 **10 Claims**



1. A bushing for providing a connection which supports a substantially unidirectional force between a pair of tensioned link members one of which has a bushing bore therein, comprising a rigid elongate core, a first elastomeric semicylinder having a predetermined wall thickness and a predetermined axial length bonded on substantially all of the inside surface thereof to one side of said rigid core, at least one additional elastomeric semicylinder having a wall thickness substantially greater than and a cumulative axial length substantially less than said predetermined wall thickness and axial length respectively when in an uncompressed state and being bonded on substantially all of the inside surface thereof to the other side of said rigid core, said first semicylinder and additional semicylinder being sized for a press fit in said bushing bore and assuming a compressed state therein such that the axis of said elongate core is substantially coincident with the axis of the bushing bore, whereby the bushing is retained frictionally within the bushing bore by the compression of said additional elastomeric semicylinder, and said first elastomeric semicylinder may with-

stand a predetermined radial force load without exceeding the endurance limit of the elastomer.

4,235,483

BEARING SUPPORT STAND

Gerd Schulze, Oberhausen, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,740

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744697

Int. Cl.³ F16C *27/00, 27/04*

U.S. Cl. 308—26 **8 Claims**



1. A bearing support stand for a rotating shaft comprising: a supporting plate; bearing means comprising a single self-aligning roller bearing carried by said supporting plate; spring means resilient in the direction of said shaft and substantially rigid in a plane perpendicular to said shaft; said supporting plate resting on said spring means; said supporting plate being parallel to a horizontal plane passing through said shaft, said spring means comprising a double spring with individual springs connected by said plate so that said bearing means is guided axially when said double spring deflects, said plate being guided parallel to a horizontal plane intersecting said shaft.

4,235,484

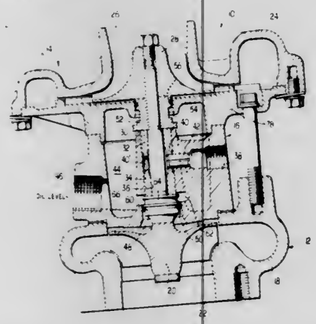
BEARING CARRIER WITH INTEGRAL LUBRICATING SEALING FEATURES

Bruce R. Owen, Indianapolis, and Charles R. Sarle, Noblesville, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Feb. 22, 1979, Ser. No. 13,974

Int. Cl.³ F16C *33/10*

U.S. Cl. 308—122 **8 Claims**



1. A bearing carrier comprising a housing defining a lubricant drain chamber, an elongated housing portion projecting into said drain chamber, said housing portion having ends spaced from adjacent ends of said housing, a lubricant boss connecting a radial portion only of said housing portion to said housing with remote end portions of said housing portion being otherwise completely free of said housing both axially and circumferentially, bearing means carried by said housing portion and having an open end at each end of said housing portion, a shaft rotatably journalled in said bearing means and extending through and beyond each end of said housing portion, a lubricant passage extending through said lubricant boss from the exterior of said housing to said bearing means, a lubricant drain passage opening from said lubricant drain chamber, said housing portion ends being spaced from said housing defining open space means for permitting lubricant flung from said shaft at ends of said bearing means to flow towards said lubricant drain without being directed back towards said shaft, said lubricant drain passage being disposed adjacent one end of said housing, said housing one end has an opening through which said shaft passes, and a dam forming internal projection on said housing one end extending axially inwardly of said drain chamber into axial overlapping relation to said lubricant drain passage wherein said housing may be mounted in an upstanding position without draining lubricant being redirected towards said shaft.

4,235,485

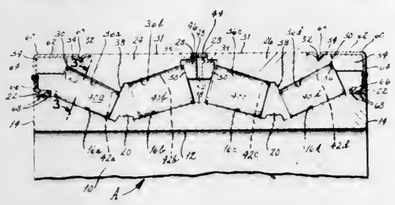
UNITIZED MULTIROW TAPERED ROLLER BEARING

Gerhard Reiter, Massillon, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Dec. 21, 1978, Ser. No. 971,919

Int. Cl.³ F16C *33/78*

U.S. Cl. 308—187.1 **20 Claims**



1. A multirow bearing comprising: a unitary inner race having a pair of tapered intermediate raceways and a pair of tapered end raceways, the intermediate raceways being located between the end raceways and having their large ends presented toward each other, the end raceways having their large ends presented away from each other and away from the intermediate raceways; a segmented outer race having a pair of intermediate raceways surrounding the intermediate raceways of the inner race and a pair of end raceways surrounding the end raceways of the outer race so that each raceway on the inner race surrounds and corresponds to a different raceway on the inner race; tapered rollers arranged in rows between corresponding raceways of the inner and outer races, there being a different row of tapered rollers between each set of corresponding intermediate and end raceways; means located between the intermediate rows of tapered rollers and abutting against the large ends of those rollers for separating the rollers of the two intermediate rows in the axial direction; end rib rings located against the ends of the outer race and projecting inwardly past the large diameter ends of the end raceways to abut the large ends of the rollers in the end rows so as to prevent those rollers from being expelled from the bearing; seal cases fitted over the end rib rings, the seal cases being configured to capture the rib rings therein such that the rib rings cannot move axially away from the outer race and further being secured to the outer race to unitize the bearing at least for handling purposes; and sealing means on the seal cases and cooperating with the inner race to form barriers at the ends of the bearing.

4,235,486

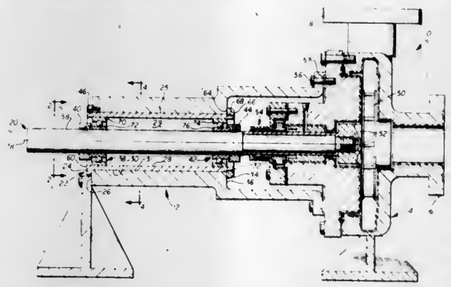
REPLACEABLE BEARING ASSEMBLY FOR A PUMP APPARATUS

Carl B. Holtzclaw, 6412 W. County Rd., Odessa, Tex. 79762

Filed Nov. 6, 1978, Ser. No. 957,711

Int. Cl.³ F16C *33/00*

U.S. Cl. 308—189 R **9 Claims**



1. A pump apparatus having a housing within which a pump impeller is rotatably mounted, a shaft sealingly extending from said housing and connected to rotate said impeller; the combination with said pump apparatus of a replaceable bearing assembly;

said replaceable bearing assembly includes a pump body connected to and extending from said housing with said shaft being received within said pump body; said pump body having a shoulder formed at an outboard and an inboard location, a liner for said pump body, said liner is in the form of a hollow cylinder having an outwardly directed flange at an outboard end and a marginal threaded outer surface at the inboard end, a nut which threadedly engages said threads;

means forming a counterbore through said pump body in axial alignment with said shaft for receiving said liner in close tolerance relationship therewithin; means forming a counterbore through said liner to provide the inside diameter of the liner with an annulus between said shaft and said liner;

spaced bearing means located within said annulus and attached for providing low frictional support between said shaft and liner;

said flange of said liner abuttingly engages the outboard shoulder of the pump body, the threaded end of the liner extends inboard of said inboard shoulder, so that said nut can engage said threads to secure the liner within the body with the nut and flange of the liner placing the liner in tension due to the compression of the nut and flange against the body.

4,235,487

ROLLING BEARING CAGE

Lothar Schard, Stuttgart, Fed. Rep. of Germany, assignor to SKF Industries, Inc., King of Prussia, Pa.

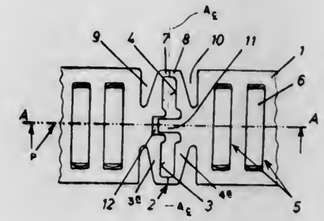
Filed Oct. 10, 1978, Ser. No. 949,514

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 7732101[U]

Int. Cl.³ F16C *19/20, 33/46*

U.S. Cl. 308—217 **5 Claims**

1. A cage for a rolling bearing made of a resilient material comprising an elongated strip member having terminal end portions adapted to be formed to an annular shape wherein the terminal end portions abut, a plurality of spaced pockets in the strip member for rolling elements, each terminal end portion of said strip member including a pair of lug members defined by a recess which extends inwardly from opposite sides of said strip to a point adjacent the center plane of the strip member defining a hinge connection for each lug member so that each lug member functions like a spring and has limited pivotal movement in a peripheral direction, a leg extension projecting circumferentially from the outer free end of each lug member outboard of the center plane, the leg extensions of the lug



members at one terminal end portion of said strip member aligned with and abutting the leg extensions of the other terminal end portion so that the axial end faces of the lug members are circumferentially spaced apart.

4,235,488

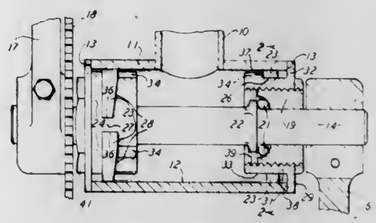
BICYCLE PEDAL CRANK HANGER

Stephen Maddick, 16614 Washington Ave., Union Grove, Wis. 53182

Filed Aug. 30, 1979, Ser. No. 71,300

Int. Cl.³ F16C *3/06*

U.S. Cl. 308—23.5 **5 Claims**



1. A bicycle pedal crank hanger for converting from a large hanger to a smaller hanger, comprising a bicycle frame sleeve having a circular open end at each end thereof, and an end surface fully co-incident with a plane transverse to the longitudinal axis of said sleeve at each opposite end of said sleeve, arcuate ribs affixed inside said sleeve at each said open end and spaced inwardly from said end surfaces and extending around the interior of each end of said sleeve and presenting an interior projection in said sleeve of a diameter less than the inner diameter of said sleeve, said ribs at each end of said sleeve being spaced apart in end-to-end relation to present one discontinuous circle of rib around the interior of each end of said sleeve and with the spaced-apart ends of said ribs presenting an opening therebetween, each of said ribs having a shoulder faced axially inwardly in said sleeve and toward each other and having a length thereof adjacent said rib opening and disposed at an angle relative to the transverse plane of said sleeve to present said shoulders as cam surfaces and with said cam surfaces oriented from said respective adjacent openings toward the interior of said sleeve at each end of said sleeve, an adapter at each end of said sleeve and having a circular portion and lugs extending outwardly thereon at one end of said portion for respectively passing through said openings and abutting said cam surfaces to lock said adapter to said sleeve, said circular portion having an outer diameter which is snugly mated with the inner said diameter of said ribs to bear on said ribs, each said adapter having a shoulder in snug overlying contact with said sleeve end surfaces for stable support on said sleeve, an axle rotatably supported in said adapter and having pedal

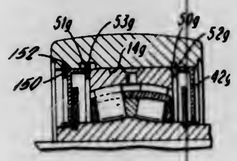
crank arms attached thereto for a forward direction of rotation of said axle and with the said orientation of said cam surfaces being in the direction of said forward rotation to assure that said adapters remain secure with said ribs and said sleeve.

4,235,489

EXTERNAL DEVICE FOR SELECTIVELY CONVERTING A PILLOW BLOCK BETWEEN FREE AND HELD POSITIONS

Joseph H. Schickling, Cherry Hill, N.J., and Walter Hyduk, Southampton, Pa., assignors to SKF Industries, Inc., King of Prussia, Pa.

Filed Aug. 15, 1978, Ser. No. 933,858
Int. Cl.[3] F16C 43/00
U.S. Cl. 308—236 11 Claims



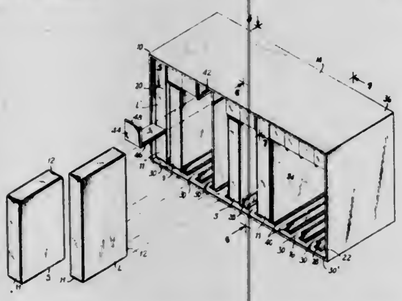
1. A pillow block assembly including a housing having an internal seat for a bearing having inner and outer rings and retaining means on opposite sides of said outer rings for limiting axial displacement of the bearing in the bearing seat, said retaining means comprising a pair of axially spaced circumferential grooves in the seat of the pillow block and a pair of retaining rings engaging in said grooves, one of said grooves being enlarged to permit limited axial displacement of the retaining ring mounted therein and means for selectively positioning one of said pair of retaining rings in said groove in a position preventing axial movement of the outer ring in the pillow block housing.

4,235,490

VIDEO CASSETTE STORAGE AND EJECTION DEVICE

Gary M. Schwartz, East Windsor, and Louis Simon, Branchburg, both of N.J., assignors to Le-Bo Products Company, Inc., Maspeth, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,154
Int. Cl.[2] A47B 81/06
U.S. Cl. 312—15 10 Claims



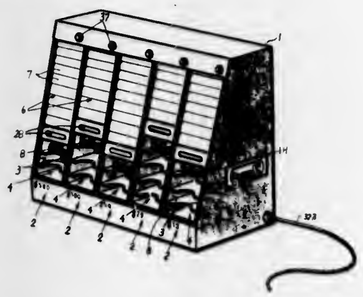
1. A container for storing and for selectively presenting a plurality of stored generally rectangular polyhedral objects of substantially equal thickness and depth, each of said polyhedral objects have a front portion and a substantially planar rear panel, said container comprising: a longitudinally extending box having at least longitudinally extending rear and bottom walls; transversely extending end walls affixed to and joining the respective transverse ends of said rear and bottom walls; said rear, bottom and end walls forming said box and defining a storage area; a plurality of transversely extending lower guide walls mounted to said bottom wall and projecting upwardly therefrom, said lower guide walls and said end walls forming partitions defining a plurality of object storage locations, each of said storage locations being of a longitudinal extent slightly in excess of said thickness of said polyhedral objects, the thickness and spacing of said partitions being constructed and arranged such that when said polyhedral objects are transversely placed into adjacent storage locations, the longitudinal space between said adjacent polyhedral objects is minimal and insufficient to accommodate a human finger; and a plurality of transversely extending ejection members, each mounted to said rear wall in a manner to have at least a contact surface thereof at least selectively project into one of said storage locations; each of said contact surfaces being movable from a first position to a second position and being adapted to directly contact said rear panel of one of said polyhedral objects when said polyhedral object is inserted into said storage location and when said rear panel is at said first position; said ejection member being constructed and arranged that when one of said polyhedral objects is moved rearwardly into said storage areas by being directly pushed inwardly at said front portion, thereby moving a corresponding one of said contact surfaces from said first toward said second position, upon said polyhedral object being released, said ejection member directly abuts said polyhedral object and urges said polyhedral object a sufficient transverse distance such that said polyhedral object rear panel is moved outwardly from said first position, whereby at least a portion of said front portion of said polyhedral object may be grasped by human fingers.

4,235,491

REPOSITORY FOR STORAGE OF PAPER MONEY OR OTHER VALUABLES

Kurt A. Körber, Hamburg, and Johannes Mielke, Reinbek, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,317
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1978, 2801737; May 18, 1978, 2821629
Int. Cl.[3] A47B 77/08; E05G 3/00
U.S. Cl. 312—223 20 Claims



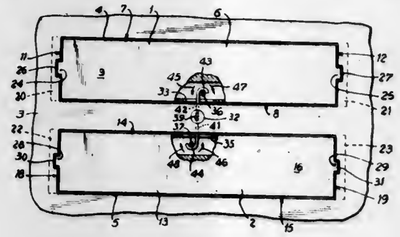
1. A safe for storage of paper money or other valuables, comprising a container having a plurality of compartments for storage or valuables therein, each of said compartments having an open side affording access to its interior; closing means for said open sides of said compartments, said closing means being movable between a plurality of positions in each of which a different number of said open sides is accessible; releasable means for locking said closing means in each of said positions thereof; means for generating signals at desired intervals; and means for releasing said locking means with a predetermined delay following the generation of a signal to permit movement of said closing means to a different position.

4,235,492

VEHICULAR AUDIO EQUIPMENT SECURING DEVICE

Thurman W. Conger, P.O. Box 995, Wewoka, Okla. 74884

Filed Apr. 27, 1979, Ser. No. 33,901
Int. Cl.[3] A47B 67/02; E05B 65/46
U.S. Cl. 312—242 4 Claims



1. A vehicular audio equipment securing device for releasably securing an audio equipment unit in an automotive vehicle having a dashboard with an opening formed therethrough, said audio equipment unit being accommodated in the opening of the dashboard and having a unit housing with a top, a bottom, a front, a back and a pair of spaced parallel sides, said vehicular audio equipment securing device comprising

a pair of spaced parallel support members extending behind and substantially perpendicularly to the dashboard at the sides of the opening of said dashboard;

guide means on the sides of the unit housing and on the support members in cooperative engagement for slidably mounting said unit housing behind said dashboard, said dashboard having a hole formed therethrough in close proximity with the opening therethrough;

a slot formed through one of the top and bottom of said unit housing equidistant from the sides thereof intermediate the front and back of said unit housing, said slot being substantially parallel to the fornt and back of said unit housing;

a pin secured in said unit housing in operative proximity with said slot and accessible via said slot, said pin and said slot being mutually perpendicular;

a key-operated lock mounted in the hold through said dashboard; and

a securing arm rotatably affixed to the lock behind said dashboard and rotatable, in a plane through the center of said slot and parallel to said front and back of said unit housing, by a key in said lock to an unlocked position in which the arm is in spaced relation with and at a distance from said unit housing and the slot and pin of said unit housing whereby said audio equipment unit is freely removable from said dashboard, and to a locked positon at an angle with said unlocked position in which said arm extends through said slot and is hooked to said pin and locked in position whereby said arm obstructs movement of said unit housing through said opening of said dashboard so that said unit is secured behind said dashboard, said arm having a free end bent in substantially C-type configuration for releasably hooking to said pin.

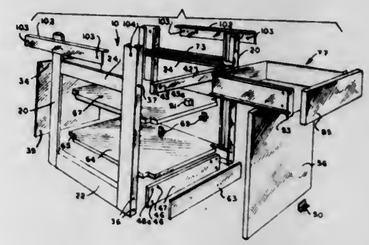
4,235,493

KNOCKDOWN CABINET ASSEMBLY

David F. Bridges, and Alton H. Britt, Jr., both of Cleveland, Miss., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Dec. 11, 1978, Ser. No. 968,448
Int. Cl.[3] A47B 43/00
U.S. Cl. 312—257 R 10 Claims

1. A composite wood and metal knockdown cabinet assembly comprising a pair of rectangular sheet metal side frames, each frame having two spaced sheet metal vertical members having along a major portion of their length a modified U shaped cross-section with one leg of the U being longer than the other leg of the U, each leg having a terminal inward right angle bend extending partly across and parallel to the base of the U, one end section and at least one other section at or near the other section at or near the otner end of the vertical member having no right angle bend on the longer leg of the U, said frame having at least two spaced horizontal metal channels bridging the space between the vertical members, each channel having a U shaped cross-section throughout its length and a width corresponding to the length of the section in the vertical member having no right angle bend in the longer leg of its modified U shaped cross-section, each horizontal channel being end-lap fastened to a section of said vertical member having no right angle bend on the longer leg of the U in such manner that the U base outer surface of the metal channel is



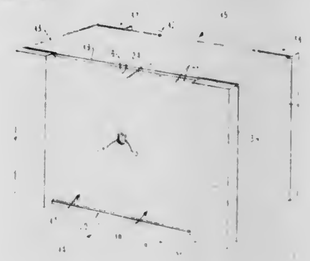
affixed to the interior surface of the longer leg of the U in the vertical member and the ends of the channel abut the vertical member's interior surface along the base of its U shaped cross-section, means attached to the rear vertical members of the side frames for cross-bracing the rear of the cabinet assembly, and horizontal structural members attached to the front vertical members of the side frames for horizontally bracing the front of the cabinet assembly and bridging the space between the front vertical members of the side frames and fastened thereto in such manner that the corner edges of the horizontal members are overlapped by the interior surfaces of those sections of the vertical member where the modified U shaped cross-section thereof contains only the base of the U and the longer leg of the U shaped cross-section is devoid of its right angle bend.

4,235,494

DATA PROCESSOR ENCLOSURE WITH TAMBOUR DOOR

Richard C. Chu, Poughkeepsie; James J. LaDue, Wappingers Falls, and Clifford I. Shelkofsky, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,767
Int. Cl.[2] E05B 9/14; A47N 1/00
U.S. Cl. 312—297 7 Claims



1. A processor enclosure of the type having a supporting frame and a relatively wide front with an opening for access to

apparatus within the enclosure, wherein the improvement comprises,

a horizontally slideable door having a horizontal length to cover a predetermined portion of said opening when the door is closed,

first stationary track means mounted along the top and bottom of the frame to support the door along said predetermined portion of said opening,

a canister extending horizontally along the opening from approximately one end of the stationary track means to a vertical corner edge of the enclosure, the portion of the opening covered by the door being approximately twice the portion covered by the canister, and means for pivoting the canister at the edge of the enclosure to swing between an open position and a closed position,

a second track means mounted in the canister and having a length in a U shape to receive said door completely within the canister and separated from said first stationary track means when the door is open and to receive an edge of the door to provide a seal when the door is closed, a first portion of said U shaped track being aligned with said stationary track means,

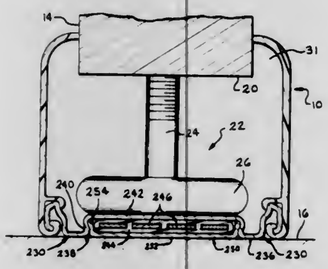
said door having a vertical tambour structure that is flexible at least in the portion that is moved through the bend in the U shaped track during opening and closing of the door.

4,235,495

ENERGY SUPPLY SYSTEM INCLUDING FLAT POWER CABLES FOR A SPACE DIVIDER SYSTEM

Robert L. Propst, Ann Arbor, and Michael A. Wodka, Ypsilanti, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed May 14, 1979, Ser. No. 38,535
Int. Cl.³ H02G *3/28*
U.S. Cl. 339—22 R **7 Claims**



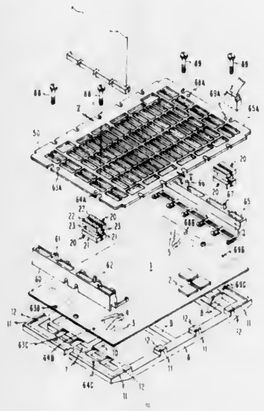
1. In a portable space divider system comprised of a plurality of movable upright wall panels arranged end-to-end on a supporting surface, each of said panels having upright ends and a lower edge extending longitudinally between said ends, movable track means associated with each of said wall panels, said track means having top and bottom surfaces and being positioned on said supporting surface to support said associated wall panel in a position in which said lower edge of said panel is spaced above said supporting surface, means forming a longitudinal channel in the bottom surface of said track means, said channel defining a downwardly opening compartment defined by side and top wall portions on said track means, a generally flat cable unit comprised of a plurality of side-by-side conductors disposed in an insulating medium, said flat cable unit being positionable on said supporting surface so as to be disposed in said compartment to extend longitudinally of said wall panel between the ends thereof, said flat cable unit and said compartment having selected heights that are substantially equal so that said flat cable unit substantially spans the distance between said supporting surface and said top wall portion.

4,235,496

CIRCUIT BOARD AND CARD INTERCONNECTION SYSTEM

Conrad J. Aug, Preston, and Arthur P. Reckinger, Jr., Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,134
Int. Cl.³ H01R *13/629, 23/72*
U.S. Cl. 339—45 M **6 Claims**



1. In an electronic system having a plurality of printed circuit cards and a planar printed circuit board with a plurality of transversely projecting contact means, means for connecting said cards to said planar printed circuit board comprising:

elongated interposer means having first connector means at one end thereof for mating with contact means on said planar printed circuit board and a polarized second connector means at the opposite end thereof,

an array board having contact means matched to said polarized connector means and connected to further contact means on said array board,

said further contact means adapted to receive a printed circuit card connector, and

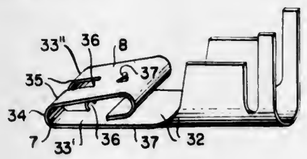
means for disengaging said planar board from said interposer means including a pair of cofunctioning counter-rotating levers pivotally mounted on said array board and adapted to engage the abutting surface of said planar board to remove the planar board contact means from said connector means.

4,235,497

SPRING CONTACT ELEMENT AND INSULATING CASE THEREFORE

Hans Simon, Bruchhausener Strasse, 5463 Unkel, Rhein, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,339
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711709
Int. Cl.³ H01R *13/28*
U.S. Cl. 339—47 R **38 Claims**



1. A resilient metallic contact element comprising

a resilient elongated conductive strip means for mechanical connection to a cable and electrical connection to a counter contact element;

said strip means having at one end thereof crimpable fastening means for electrically connecting said one end to a cable;

said strip means having a base leg extending outwardly from said fastening means and being reversely bent on itself via a bend having a predetermined radius to provide a leg with a free end disposed at an acute angle to said base leg;

said base leg and said free leg each having a notch therein extending inwardly of said bend toward said crimpable fastening means for a distance to approximately the middle of said free leg;

said notches being symmetrical, having spaced parallel sides and being in vertical alignment with one another with said leg with the free end having its terminal end being reversely bent upon itself by a reverse bend of about 180° to constitute a support yoke means facing said base leg; and

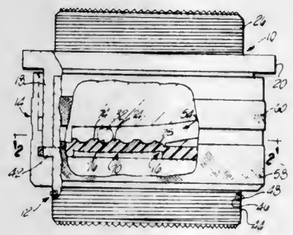
a locking tongue means struck out of and raised above the upper surface of said leg with the free end extending toward said crimpable fastening means and located a selected distance from said first mentioned reverse bend.

4,235,498

ELECTRICAL CONNECTOR WITH LOCKING MEANS

Gene L. Snyder, Bainbridge, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 26, 1979, Ser. No. 60,717
Int. Cl.³ H01R *4/54*
U.S. Cl. 339—90 R **6 Claims**



1. In a separable connector of the type having first and second connector bodies adapted to be mated together, said second body being provided with a bayonet pin extending radially outward therefrom, a coupling nut rotatably mounted on the first body and provided with a groove arranged to be threadedly engaged by the pin for pulling the bodies together upon rotation of the nut in one direction and locking means operative between the coupling nut and the first body for restraining said nut against unwanted rotation in the other direction, the improvement wherein said locking means comprises:

a locking ring being carried on the nut for movement therewith and adapted to engage said pin,

said groove having oppositely facing forward and rearward axial walls with the forward axial wall being adapted to engage the pin when the coupling nut is rotated in the one direction and the rearward axial wall being interrupted at a predetermined location to define a gap,

said locking ring being disposed in said gap and including an elongated spring having a top axial surface in opposed relation to the forward axial wall of said groove,

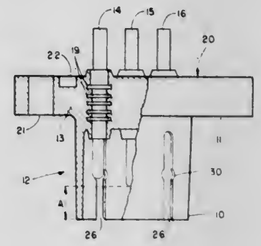
said top axial surface defining a successive series of peaks and valleys along the length of the spring, each peak extending into the path of said pin and being deflected thereby as said pin advances transversely thereacross and along said groove, each valley being adapted to trap said pin and hold the pin in each successive advanced position, whereby when the coupling nut is axially advanced to a predetermined position relative to the second body by rotation in the one direction said coupling nut is held against rotation and the first body is held in its advanced position relative to the second body.

4,235,499

PLUG CONNECTION FOR CONTACT SUPPORTS

Ottmar Kreissl, Karlsfield; Manfred Nusselein, Hilden, and Wolfgang Essrich, Haan, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg, Aktiengesellschaft, Munich and Souriau-Electric GmbH, Erkrath, both of, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 927,147
Int. Cl.³ H01R *13/62, 13/50*
U.S. Cl. 339—91 R **3 Claims**



1. Plug connection comprising interengaging electrical contact supports, said contact supports being constituted of an electrically insulating material; a first one of said contact supports being a unitary, hollow cylindrically-shaped body including at least two longitudinal slots through the unitary body, snap lock recesses being formed in each of said slots; and a second one of said contact supports being a unitary body shaped so as to be insertable into said first contact support and including projections on the unitary body engaging in said longitudinal slots of said first contact support, said projections snapping into respective ones of said snap lock recesses in the final inserted end position of said plug connection, and said longitudinal slots of said first contact support having a gap width slightly smaller than the external diameter of said projections on said second contact support which engage the longitudinal slots in said first contact support.

4,235,500

CIRCUIT CONNECTOR

Peter Belopavlovich; Leonard H. Michaels, and Richard Zic, all of Chicago, Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Filed Nov. 8, 1978, Ser. No. 958,611
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—176 MF **18 Claims**

1. A connector assembly for electrically connecting a substantially flat flexible first conductor element to a second conductor element, said connector assembly comprising

a housing of insulating material defining

a first conductor receiving surface for receiving such a first conductor element thereon, and

a plurality of contact receiving openings communicating with said first conductor receiving surface;

a plurality of unitary contact means disposed in said openings and each including

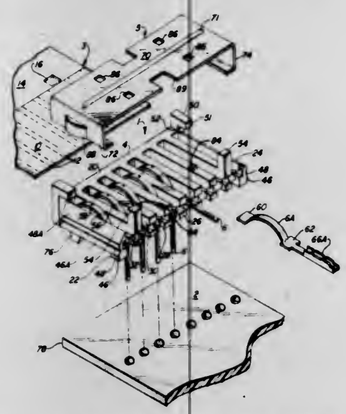
a resiliently depressable contact portion normally protruding above said first conducting surface for contacting said first conductor element when disposed over said surface; and

a terminal portion for conductive engagement with a second conductor element;

a cover in superposed spaced relation to said first conductor

receiving surface for receiving said first conductor element therebetween; and

means for securing said cover to said housing for pressing such an interposed conductor element against said contact portions to establish and maintain conductive engagement therewith, said cover securing means including a first



latch means to selectively maintain said cover in a retracted position superposed said housing for insertion of said conductor element therebetween with near-zero force; and a second latch means to selectively maintain said cover in a position pressing said conductor element against said contact portions.

4,235,501

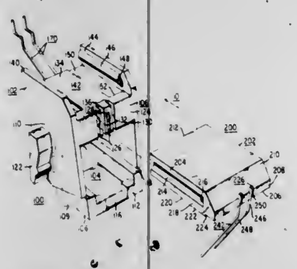
CONNECTOR

James W. Ericsson, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1979, Ser. No. 22,120

Int. Cl.³ H01R *13/506*

U.S. Cl. 339—191 M **17 Claims**



1. A connector (100) comprising:

a dielectric enclosure (102) having a plug receiving cavity (104) open to the front of the enclosure with a wall (106) forming one wall of the cavity, the wall having a cavity surface (130), a front surface (124), and an exterior surface (134), the wall including a plurality of spaced orifices (128) that extend from its front surface toward its rear and a plurality of substantially parallel first grooves (126) on its front surface, each first groove extending from the front end of an associated individual orifice (128) to the cavity surface (130); and

a plurality of first spring contact structures (170), each first contact structure being accommodated in an associated orifice and having a front spring contact section (172) with a first portion (174) positioned within an associated groove and a second portion (176) extending in cantilever fashion within the plug receiving cavity; characterized in that:

the front surface comprises at least one second groove (132), where the second groove extends from the exterior surface to the cavity surface; and

means for mounting (142) an adapter (200) having one or more spare second spring contact structures (234), each second contact structure having a front section (244) with a first portion (246) and second portion (248) such that at least some part of each first portion positions within an associated second groove and the second portion extends in cantilever fashion within the plug receiving cavity when the adapter is mounted.

4,235,502

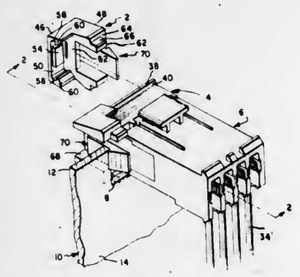
MOUNTING MEANS FOR MOUNTING A CONNECTOR IN A PANEL

Richard L. Marks, Mechanicsburg, and Charles H. Weidler, Lancaster, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 879,575, Feb. 21, 1978, Pat. No. 4,168,874. This application Apr. 23, 1979, Ser. No. 32,047

Int. Cl.³ H01R *13/506*

U.S. Cl. 339—278 R **7 Claims**



1. A molded thermoplastic latching device which, along with a similar latching device, is intended for assembly to a connector housing to provide latching means on said housing to latch said housing to a panel when said housing is inserted into an opening in said panel, said housing having a mating face, a rearward face, external sidewalls and internal endwalls between said faces, said latching device comprising:

an L-shaped member having first and second arms, said first and second arms having first and second internal surfaces and first and second external surfaces respectively, said internal surfaces intersecting to form a pocket which is dimensioned to receive a rearward corner of said housing with said rearward face against said first internal surface and with one of said endwalls against said second internal surface,

attaching means on said first arm for attaching said L-shaped member to said housing at said rearward corner,

said second arm having a free end and having bearing surface portions on said free end for bearing against one side of said panel and against portions of said opening in said panel, and

latch arm means for engagement with said panel, said latch means comprising a flexible latch arm which extends parallel to said second arm, said latch arm being spaced from said second internal surface and being flexible towards said second internal surface, said latch arm having a free end and having rearwardly facing shoulder means on said free end for bearing against the other side of said panel whereby,

upon assembling one of said latching devices to each of the rearward corners of said housing and inserting said housing into opening in said panel until said bearing surface portions

are against said one side of said panel and against said opening, said latch arms will be flexed towards said second internal surfaces until said shoulders are through said openings, and said shoulders will then bear against the other side of said panel.

4,235,503

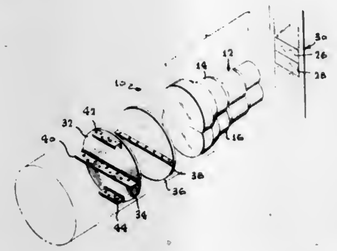
FILM PROJECTION LENS SYSTEM FOR 3-D MOVIES

Chris J. Condon, 16606 Oakview Dr., Encino, Calif. 91436

Filed May 8, 1978, Ser. No. 903,932

Int. Cl.³ G02B *27/26*

U.S. Cl. 350—1.2 **5 Claims**



1. A film projection lens system comprising:

lens elements defining first and second adjacent image projection paths to provide image paths from an illuminated image to a screen;

first and second polarizing filters respectively positioned along said first and second image paths, said polarizing filters being positioned to differently polarize images on said first and second paths;

ultra-violet filter means positioned on both of said paths and positioned between said polarizing filters and the illuminated image for reducing the ultra-violet rays along the image paths impinging on the polarizing filters to reduce ultra-violet degradation of the polarizing filters; and

a heat sink attached to said ultra-violet filter means to remove heat therefrom.

4,235,504

HOLOGRAPHIC DISK SCANNER

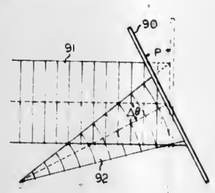
Hiroyuki Ikeda, Yokohama, and Moritoshi Ando, Tokyo, both of Japan, assignors to Fujitsu Limited, Japan

Continuation-in-part of Ser. No. 692,350, Jun. 3, 1976, Pat. No. 4,165,464. This application Dec. 9, 1977, Ser. No. 859,183

Claims priority, application Japan, Jun. 10, 1975, 50-70378; Dec. 16, 1976, 51-151618; May 13, 1977, 52-55009; Oct. 5, 1977, 52-119636

Int. Cl.³ G02B *5/32*

U.S. Cl. 350—3.71 **17 Claims**



1. A light scanning apparatus for scanning an object to be scanned in a given scanning direction, comprising:

a disk having a plurality of holograms for diffracting scanning beams impinging thereon, said plurality of holograms being of a type constructed by applying both a plane wave laser beam and a spherical wave laser beam onto a photosensitive layer coated on a transparent plate, said plane wave laser beam intersecting said photosensitive layer at a predetermined offset angle;

laser beam source means for radiating a scanning laser beam, said scanning laser beam acting as a reproduction wave and being radiated sequentially onto said plurality of holograms in a direction normal to the surface of each of said plurality of holograms; and

motive means for moving said scanning laser beam and said disk relative to each other so as to cause said scanning laser beam diffracted by each of said holograms to scan said object to be scanned in said given scanning direction, said scanning laser beam being formed by a spherical wave laser beam.

4,235,505

MULTI-COLOR HOLOGRAMS WITH WHITE-LIGHT ILLUMINATION

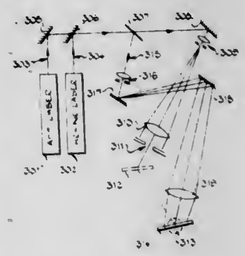
Parameswaran Hariharan, Turrumurra; Zoltan S. Hegedus, Manly, and William H. Steel, Seaforth, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Canberra, Australia

Filed Jun. 19, 1978, Ser. No. 916,782

Claims priority, application Australia, Jun. 20, 1977, PD0520

Int. Cl.³ G03H *1/30*

U.S. Cl. 350—3.77 **11 Claims**



1. A method of making a transmission hologram which yields multicolour three dimensional images of a three dimensional subject when the transmission hologram is illuminated with white light, the method comprising the steps of:

recording successively in respective high resolution photosensitive media a plurality of component holograms of images of the subject and a suitably positioned slit, each component hologram being formed using a coherent light source of a different wave length to which the respective photosensitive medium is sensitive, the reference beam geometry for all component holograms being the same, and

forming the respective photosensitive media with recorded component holograms into a sandwich structure.

4,235,506

IMAGE STABILIZED OPTICAL SYSTEM

Takemi Saito, Kawagoe; Kenjiro Okamura, Omiya, and Kunio Ando, Warabi, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jul. 20, 1978, Ser. No. 926,382

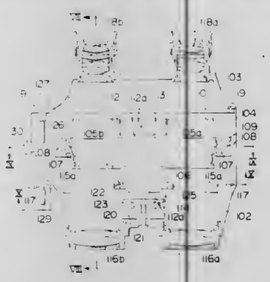
Claims priority, application Japan, Jul. 22, 1977, 52/88145

Int. Cl.³ G02B *13/00*

U.S. Cl. 350—16 **6 Claims**

1. An image stabilized optical system in which a pair of telescopic optical systems each consisting of an objective, an eyepiece and an erect prism located therebetween, said erect prism being capable of having its incident light optical axis and its emanating optical axis aligned with each other, are arranged so that the main optical axes of said pair of telescopic optical systems are in parallel to each other characterized in that the objectives and the eyepieces of said pair of telescopic optical systems are fixed to a casing of the image stabilized optical

system and the erect prisms of said pair of telescopic optical systems are rotatably mounted on the casing by means of gimbals provided with a rotor, the two axes of rotation of the gimbals intersecting at right angles with each other wherein one of said two axes of rotation of said gimbals intersects at a right angle with said main optical axes of the pair of telescopic optical systems, and the other axis of rotation passes through the middle point of the spacing between the main optical axes



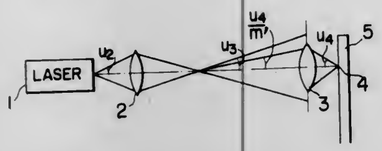
of said pair of telescopic optical systems and is perpendicular to the plane which includes the main optical axes of said pair of telescopic optical systems, an electric motor for driving said rotor, said motor being located at the intersection of the two axes of rotation and the axis of rotation of the rotor being parallel to the main optical axes, precessing means for moving said gimbals with the casing to permit an object to be followed as the casing is panned, said precessing means including a first member connected to said rotor.

4,235,507

OPTICAL SYSTEM TO CONDENSE LIGHT FROM A SEMICONDUCTOR LASER INTO A CIRCULAR SPOT

Keiji Kataoka, Kawagoe, and Seiji Yonezawa, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 30, 1978, Ser. No. 937,982
Claims priority, application Japan, Sep. 16, 1977, 52-111399; Apr. 7, 1978, 53-40333
Int. Cl.³ G02B *21/00*
U.S. Cl. 350—19 **6 Claims**



1. An optical system comprising a semiconductor laser having a radiant region of different longitudinal and lateral dimensions, an objective lens for focussing the light from said semiconductor laser onto a predetermined recording medium, and a coupling lens interposed between said semiconductor laser and said objective lens for casting the light from said semiconductor laser onto said objective lens to cover the full aperture of said objective lens so that the light cast onto said objective lens is focussed by said objective lens as a circular spot on said recording medium.

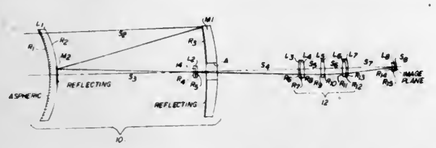
4,235,508

DUAL FOCAL LENGTH OBJECTIVE

Edward K. Kaprelian, Mendham, N.J., assignor to Questar Corporation, New Hope, Pa.

Filed Jul. 17, 1978, Ser. No. 925,548
Int. Cl.³ G02B *17/00*
U.S. Cl. 350—27 **5 Claims**

1. A parfocalized dual focal length objective comprising a catadioptric primary image former (**10**) producing a primary image (**14**), a field lens in the plane of the primary image (L_2), a symmetrical, axially movable relay lens system (**12**) positionable at either of its two conjugate distances for reimaging the primary image at a final focal plane, and a negative field flat-



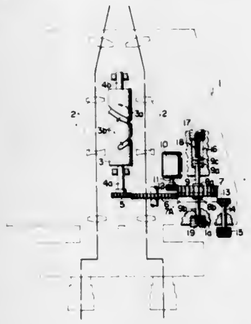
tener (L_8) positioned forward of the final focal plane, said axially movable symmetrical relay system (**12**) comprising two spaced apart doublets (L_3, L_4 and L_6, L_7) and a bioconvex crown singlet (L_5) between and spaced equidistantly from said doublets.

4,235,509

ELECTRICALLY DRIVEN OPTICAL INSTRUMENT WITH MANUAL DRIVE

Yutaka Takabayashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1979, Ser. No. 15,892
Claims priority, application Japan, May 12, 1978, 53-63625
Int. Cl.³ G02B *7/08*
U.S. Cl. 350—41 **6 Claims**



1. An electrically driven optical instrument with manual drive comprising a cam member for causing a movement of an optical lens for the purpose of changing its magnification or the like, a transfer shaft which is axially displaceable in response to an external operation, a drive transmitting, transfer gear rotatably mounted on the transfer shaft for transmitting a drive to the cam member, a reversible motor including an output gear which is normally in meshing engagement with the transfer gear for automatically driving the cam member, a manually driven gear mounted on an operating shaft which is exposed externally of the optical instrument, and means for causing a displacement of the transfer shaft between a first position in which the transfer gear meshes with the output gear and a second position in which it meshes with the manually driven gear.

4,235,510

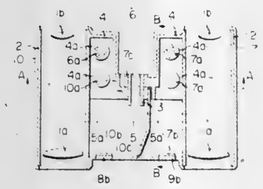
BINOCULARS WITH COVER MEMBERS

Akira Sato, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 30, 1979, Ser. No. 25,543
Claims priority, application Japan, Mar. 31, 1978, 53-36554
Int. Cl.² G02B *7/06, 23/18*
U.S. Cl. 350—76 **4 Claims**

1. In binoculars including left and right parallel optical systems each including an objective lens and an eyepiece, left and right holding cylinders accommodating therewithin said

optical systems, respectively, a central shaft disposed equidistantly from said left and right optical systems, left and right coupling means for rotatably coupling said holding cylinders to said central shaft, a mechanism including operating means for simultaneously moving predetermined portions of said left and right optical systems to effect distance adjustment, and wherein said holding cylinders, said coupling means and said mechanism are adapted to be rotated about said central shaft, the improvement comprising a plastic cover for containing



therein substantially all of the portions except the openings of said holding cylinders and said operating knob, said cover comprising left and right separate cover members which rotate about said central shaft integrally with said left and right holding cylinders, respectively, wherein surfaces of said left and right cover members overlap so as to be in reverse relationship, the inner overlapped portion being formed as an inwardly curved surface gradually to be separated from the outer overlapped portion.

4,235,511

OPTICAL FIBER CABLE CONSTRUCTIONS AND METHODS AND APPARATUS FOR FABRICATING SAME

Shinichi Yonechi, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1978, Ser. No. 928,024
Claims priority, application Japan, Jul. 25, 1977, 52-89464; Nov. 25, 1977, 52-141831; Dec. 30, 1977, 52-158044
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.23 **18 Claims**



1. An optical fiber cable unit for accommodating a plurality of optical fibers comprising:

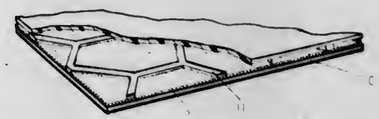
a plurality of splicing tapes, each said splicing tape shaped to have a groove in the longitudinal direction of said cable unit, each said splicing tape having a symmetrical transverse cross-section, said splicing tapes arranged in a symmetrical radial fashion with respect to a center line of a cable formed thereby to define peripheral compartments which are open in the direction facing the periphery of said cable unit, each of said compartments having a cross-section sufficient to accommodate in a loosely-fitting manner at least one of said optical fibers.

4,235,512

RETRO-REFLECTIVE ASSEMBLY AND METHOD OF MANUFACTURING SAME

Steven H. Brasfield, Jackson, Mich., and Paul Shalita, Roslyn Heights, N.Y., assignors to Ferro Corporation, Cleveland, Ohio

Filed May 7, 1979, Ser. No. 36,435
Int. Cl.³ G02B *5/128*
U.S. Cl. 350—105 **8 Claims**



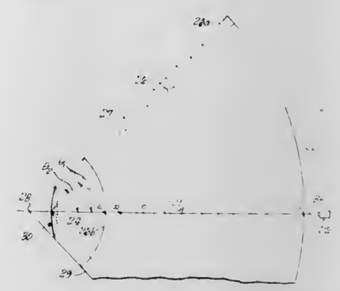
1. In a process for forming an encapsulated retro-reflective assembly having a supporting open network disposed between a base member adapted to contain retro-reflective elements and an overlying encapsulating film, the improvement of forming said supporting open network in the absence of substantial heat or pressure, said process comprising printing an adhesive material onto said base member to form a plurality of upstanding supports thereon, said supports constituting a precise pattern of at least equal height throughout and having a greater height than such retro-reflective elements, and adhering an encapsulating film to said upstanding supports, said film being substantially free of ripple or wave effects due to said precise pattern of said upstanding supports, and said absence of substantial heat or pressure in forming said upstanding supports enabling a wider choice of materials for said supports or encapsulating film.

4,235,513

HIGH-GAIN PROJECTION SCREEN

Petro Vlahos, Tarzana, Calif., assignor to National Association of Theatre Owners, Inc., New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,465
Int. Cl.³ G03B *21/60*
U.S. Cl. 350—129 **7 Claims**



1. Projection screen for a motion picture theater and the like having an optical projector and having a generally flat viewing area with two side boundaries which diverge generally radially from a point near the screen and with an unsymmetrical rear boundary which intersects the side boundaries at respective area corners one of which in nearer to the screen than the other, said screen carrying a two-dimensional array of lenticules each having a specularly reflective surface which has the optical form of a surface of revolution with respect to a generator axis that is generally perpendicular to the viewing area to distribute reflected light from the projector over said viewing area; the improvement characterized in that

each lenticule is substantially symmetrical with respect to a plane of symmetry through the generator axis, and

each lenticule is mounted on the screen with said plane of symmetry perpendicular to the lenticule array and inclined from perpendicular to the viewing area in the direction toward the area corner nearer to the screen,

the angle of said inclination being selected with respect to the relative distances of said area corners from the screen to compensate said unsymmetry of the rear boundary of the viewing area.

4,235,514

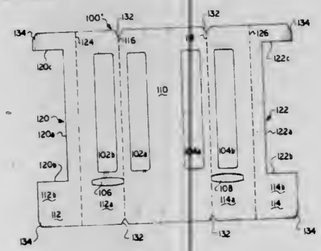
COLLAPSIBLE STEREOSCOPIC VIEWER AND FILM STRIP THEREFOR

Robert G. Carver, Ashland, Ohio, assignor to Creative Cartons of Ashland, Inc., Ashland, Ohio

Division of Ser. No. 904,857, May 11, 1978, Pat. No. 4,175,828. This application May 9, 1979, Ser. No. 37,466

Int. Cl.³ G02B 27/22

U.S. Cl. 350—133 **11 Claims**



1. A film strip holder for receiving a pair of film strips in spaced registration for stereoscopic viewing, said holder comprising:

(a) a rear wall having a pair of spaced longitudinal slots therein;

(b) a pair of reinforced front wall assemblies, each contiguous with said rear wall along spaced, longitudinal fold lines, said front wall assemblies having longitudinal slots therein in registration with the slots in said rear wall;

(c) a film strip receiving pocket peripherally disposed about the registering longitudinal slots; and,

(d) a pair of transverse slits, each of said slits formed in said front wall assemblies proximate the longitudinal slots therein, providing means for access to said pocket.

4,235,515

STEREOSCOPIC VIEWING SYSTEM

David M. Shelman, 2005 Robinson St., and Elliot A. Rudell, 2422 Curtis Ave., both of Redondo Beach, Calif. 90278

Continuation-in-part of Ser. No. 632,224, Nov. 17, 1975, abandoned. This application Jun. 29, 1978, Ser. No. 920,280

Int. Cl.³ G02B 27/14, 27/24

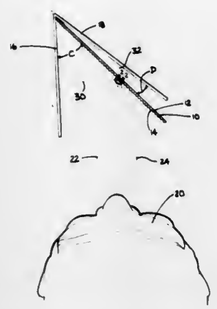
U.S. Cl. 350—138 **16 Claims**

1. A stereoscopic viewing system comprising:

(a) a triangular prism bearing, on one face, a plurality of parallel, longitudinal and laterally spaced-apart, straight line V-grooves defining a plurality of straight, longitudinal and laterally spaced-apart triangular prisms and an opposite plano face;

(b) a first stereoscopic imaging surface at an occluded angle to said one face from 40° to about 60°; and

(c) a second stereoscopic imaging surface at an occluded angle to said plano face from 1° to about 15°; said prism



and imaging surfaces lying along planes having a common intersection parallel to said grooves of said prism.

4,235,516

COMPLEX SPATIAL MODULATOR

James S. Shreve, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1979, Ser. No. 19,032

Int. Cl.³ G02F 1/03

U.S. Cl. 350—150 **7 Claims**



1. An apparatus for effecting both amplitude and phase spatial modulation of a coherent light beam, comprising,

a first birefringent crystal modulation means for accepting a coherent input light beam which is plane polarized in a first direction and providing an output light beam which is spatially amplitude modulated in accordance with a desired first image which is applied to said modulation means and which is plane polarized in a second direction, said birefringent crystal modulation means including a birefringent crystal means for changing its degree of birefringence in accordance with said first applied image, said birefringent crystal means being oriented so that said first direction is between the slow and fast axes of the crystal means,

means for focusing said spatially amplitude modulated beam onto a second birefringent crystal modulation means,

said second birefringent crystal modulation means including a birefringent crystal means for changing its degree of birefringence in accordance with a second image which is applied to said second modulation means, said second crystal means being oriented with one of its slow and fast axes parallel to said second direction so that the phase of said spatially amplitude modulated beam is spatially modulated,

a solid, transparent medium interposed between said first and second modulation means, and means to constrain the optical path of said coherent light beam to lie within said medium,

whereby said apparatus assures a contaminant-free path for said light beam and the amplitude and phase of said coherent light beam are both modulated by said apparatus.

4,235,517

POWER LASER EMITTING PLASMA CONFINING WAVE BEAM

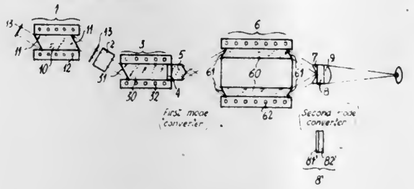
Georges R. P. Marie, 17, Avenue Raymond Croland, Fontenay-aux-Roses, France (92260)

Filed Feb. 10, 1978, Ser. No. 876,713

Claims priority, application France, Feb. 8, 1977, 77 03419; Dec. 28, 1977, 77 39449

Int. Cl.³ H03F 7/00

U.S. Cl. 350—157 **10 Claims**



1. A generator and amplifier of plasma confining, electromagnetic, light or infrared wave beam comprising:

a generator of a TM_0 mode wave beam;

a solid state laser beam amplifier having a doped active material in the shape of an annular sleeve member;

means for applying said TM_0 mode wave beam to said solid state laser for amplification thereof, with said TM_0 mode wave beam coaxial with said sleeve member; and

a mode converter converting said amplified TM_0 mode wave beam to a negatively azimuthally phase shifted, circular polarized wave beam.

4,235,518

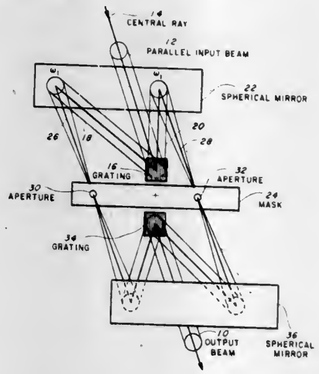
HIGH EFFICIENCY LASER SPECTRUM CONDITIONER

Norman R. Greiner, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 4, 1978, Ser. No. 948,375

Int. Cl.³ G02B 5/18

U.S. Cl. 350—162 R **2 Claims**



1. A device for producing a substantially parallel beam of laser radiation having a predetermined set of frequencies comprising:

a first grating disposed at a first predetermined location on a focal plane, said first grating aligned to diffract a multiple frequency laser beam into a plurality of spatially separated single frequency beams;

a first spherical mirror aligned to focus said single frequency beams on a predetermined area of said focal plane;

an apertured mask disposed at said predetermined area of said focal plane, said apertured mask having apertures at preselected points to transmit a preselected set of single frequency beams;

a second spherical mirror aligned to direct said preselected set of single frequency beams to a second predetermined location on said focal plane;

a second grating disposed at said second predetermined location on said focal plane, said second grating aligned to diffract said preselected set of single frequency beams to a substantially parallel output beam having a predetermined set of frequencies;

whereby disposition of said first and second grating on said focal plane allows said single frequency beams to be focused on said predetermined area of said focal plane with central rays of said single frequency beams parallel so as to enhance reconstitution of said substantially parallel output beams.

4,235,519

COMPACT RETROFOCUS TYPE WIDE ANGLE OBJECTIVE

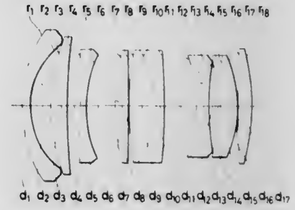
Kazuo Fujibayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1979, Ser. No. 30,085

Claims priority, application Japan, Apr. 17, 1978, 53/45137

Int. Cl.³ G02B 9/64

U.S. Cl. 350—214 **5 Claims**



1. A compact retrofocus type wide angle objective lens system comprising: from front to rear, a negative meniscus first lens convex toward the front, a positive second lens with its front surface having a strong positive power, a bi-concave third lens with its strong power surface facing the rear, a positive fourth lens with its front surface having a strong positive power, a positive cemented fifth lens with its cemented surface being convex toward the rear and having a positive power, and with its first surface being convex toward the front, a bi-concave sixth lens, a positive meniscus cemented seventh lens convex toward the rear, and a positive eighth lens with its strong power surface being faced toward the rear, and satisfying the following relationships:

$$\frac{0.33}{f} < \left| \frac{N_5 - N_6}{r_{10}} \right| < \frac{0.42}{f} \quad (1)$$

$$1.4 < \left| \frac{f_5 - 6}{f_7 - 11} \right| < 1.82 \quad (2)$$

$$0.4 < \frac{r_7}{r_9} < 0.64 \quad (3)$$

$$0.75 < \frac{d_6}{d_{11}} < 0.95 \quad (4)$$

$$20 < \nu_9 - \nu_8 < 28 \quad (5)$$

$$-0.1/f < 1/f_{1-4} < 0.15/f \quad (6)$$

where f is the focal length of the entire system; r_i is the radius of curvature of the i-th surface; d_j is the j-th axial lens thickness

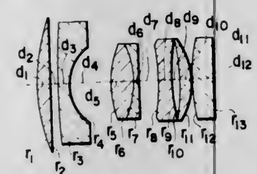
or air separation; N_k is the index of refraction of a material from which the k-th lens element is made; νl is the Abbe number of a material from which the l-th lens element is made; and f_{m-n} is the overall focal length of the m-th to n-th surfaces.

4,235,520

WIDE-ANGLE RETROFOCUS LENS SYSTEM

Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 25, 1978, Ser. No. 909,447
Claims priority, application Japan, Jun. 10, 1977, 52/67974
Int. Cl.³ G02B *13/04*
U.S. Cl. 350—215 **7 Claims**



1. A wide-angle retrofocus lens system comprising a front lens group with a first lens component comprising a positive meniscus lens having its convex surface on the object side and a second lens component comprising a negative meniscus lens having its convex surface on the object side and a rear lens group with a third lens component comprising a positive cemented lens component of a positive lens and a negative lens, a fourth lens component comprising a negative lens, a fifth lens component comprising a positive meniscus lens having its convex surface on the image side, and a sixth lens component comprising a positive lens, and said lens system satisfying the following conditions:

(1) $0.35 < |f_R/f_F| < 0.8$
(2) $0.25f < d_4 < 0.5f$
(3) $|P_{45}| > 0.5/f$
(4) $r_4 < 0.4f$
(5) $n_2 < 1.53$
(6) $0.1f < d_7 < 0.2f$
(7) $n_3 > n_4$

wherein the reference symbol f represents an equivalent focal length of the total lens system, the reference symbol f_F represents an equivalent focal length of the front lens group, the reference symbol f_R represents an equivalent focal length of the rear lens group, the reference symbol d_4 represents an air space between the front lens group and the rear lens group, the reference symbol P_{45} represents a power of the air lens to be formed between the fourth lens component and the fifth lens component, the reference symbol r_4 represents radius of curvature of the surface on the image side of the second lens component, the reference symbol d_7 represents an air space between the third lens component and the fourth lens component, the reference symbols n_2, n_3 and n_4 represent refractive indices of the second lens component and both the lenses of the third lens component, respectively.

4,235,521

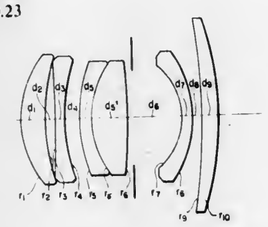
PHOTOGRAPHIC LENS SYSTEM

Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,364
Claims priority, application Japan, Nov. 29, 1977, 52-142167
Int. Cl.³ G02B *9/60*
U.S. Cl. 350—216 **6 Claims**

1. A photographic lens system comprising a first lens component of a positive meniscus lens with its convex surface on the object side, a second lens component of a biconcave lens, a third lens component having a positive refracting power, a fourth lens component of a negative meniscus lens with its convex surface on the image side and a fifth lens component of a positive meniscus lens with its convex surface on the image side, the said lens system satisfying the following conditions:

(1) $1.3 < f/f_{123} < 1.7$
(2) $-1.2 < f/f_{45} < -0.4$
(3) $0.11 < D_5/f < 0.16$
(4) $0.16 < d_6/f < 0.23$



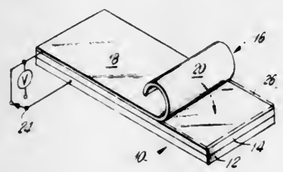
wherein the reference symbol f represents the focal length of the total lens system, the symbol f_{123} represents the composite focal length of the first, second and third lens components, the symbol f_{45} represents the composite focal length of the fourth and fifth lens components, the symbol D_5 represents the axial thickness of the third lens component and the symbol d_6 represents the axial air space between the third and fourth lens components, respectively.

4,235,522

LIGHT CONTROL DEVICE

George R. Simpson, and Herbert W. Sullivan, both of New York, N.Y., assignors to Bos-Knox, Ltd., Tulsa, Okla.

Filed Jun. 16, 1978, Ser. No. 916,093
Int. Cl.³ G02F *1/01*
U.S. Cl. 350—266 **5 Claims**



1. An electrically operated light control device comprising an array of a plurality of electrostatically actuated elements, each element comprising;

a planar stationary electrode,

an electrode moveable between a position overlying the stationary electrode and a position removed from the stationary electrode, and

non-conductive means between the electrodes for keeping the electrodes electrically separated,

the moveable electrode being in the form of a sheet of flexible material having one end fixed with respect to the stationary electrode and the opposite end free with respect to the stationary electrode,

the sheet having a permanent mechanical stress which biases the sheet into a curl away from the stationary electrode to remove the moveable electrode from the stationary electrode in the absence of applied force,

the stationary electrode having, in linear arrangement separated into along the path of movement, at least three discrete conductive regions arranged as a series progressing from the vicinity of the fixed end of the moveable electrode,

the conductive regions most remote from the fixed end of the moveable electrode of each element of the array being

connected together and connectable to a source of electrical potential,

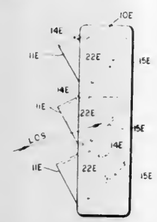
the mechanical stress being insufficient to overcome the electrostatic force created when an electrical potential is applied between the moveable electrode and a conductive region adjacent the moveable electrode to cause the moveable electrode to overlie the conductive region.

4,235,523

CONTROLLED REFLECTION READOUT FOR DISPLAYS

James M. Lapeyre, New Orleans, La., assignor to Digicourse Inc., New Orleans, La.

Continuation of Ser. No. 774,508, Mar. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 670,965, Mar. 26, 1976, Pat. No. 4,032,222. This application Feb. 23, 1979, Ser. No. 14,584
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.³ G02B *27/00*
U.S. Cl. 350—276 R **3 Claims**



1. A traffic signal indicator having a glare and reflection control for ambient light comprising:

(a) a casement housing containing said indicator having a view opening therein to permit viewing of the indicator inside said casement along a viewing light of sight,

(b) a traffic signal indicator device presenting a visual display positioned in said casement along said viewing line of sight,

(c) an interposer surface positioned on said casement in a direction substantially parallel to said line of sight thereby to exclude the interposer surface from the field of view of said visual display, so that the field viewing angle is restricted to less than 90° relative to the front plane of said casement,

(d) a transparent specular surface disposed at a depth within the casement in the field of view to the visual display and disposed at an angle of the order of 25° to 80° relative to the front plane of said casement directing the specular surface reflections of ambient light entering the casement from the viewing sector in a direction away from the viewing sector and into the interposer surface, said display being disposed at the same angle as said specular surface, and

(e) a lamp positioned behind the visual display along said line of sight to visibly actuate said display.

4,235,524

REFLECTING APPARATUS

George Lechter, Brookline, and David S. Eckel, Revere, both of Mass., assignors to Rorrim Incorporated, Cambridge, Mass.

Filed Jun. 29, 1979, Ser. No. 53,314
Int. Cl.³ G02B *5/08, 5/10*
U.S. Cl. 350—299 **5 Claims**

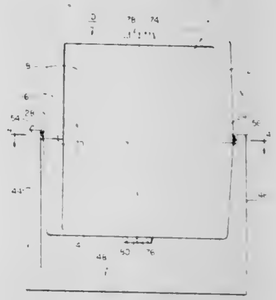
1. A reflecting apparatus comprising:

a case having a grooved lip adapted to receive a glass pane, and first and second coaxial journals extending ourwardly from opposite side panels of said case along an axis passing through the center of mass of said reflecting apparatus;

flexible tubing disposed within said grooved lip to press said glass pane against said lip to form a dust seal;

an angle brace having a predetermined linear coefficient of thermal expansion;

a first plane mirror having a linear coefficient of thermal expansion within 30% of said predetermined linear coefficient of thermal expansion being attached to said angle brace;



a second plane mirror having a linear coefficient of thermal expansion within 30% of said predetermined linear coefficient of thermal expansion being attached to said angle brace substantially orthogonal to said first plane mirror to form a system for presenting a positive reflective image; said system being assembled in said case for viewing; and

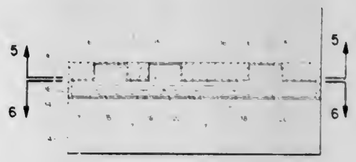
a base having journal bearing and clampling means for receiving and gripping said journals with adjustable tension to enable said reflecting apparatus to be pivotally moved about its center of mass.

4,235,525

LIQUID CRYSTAL DISPLAY CELL HAVING A LIGHT FIELD BACKGROUND

Arthur L. Berman, Brea, and Gordon Kramer, Huntington Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 7, 1979, Ser. No. 36,619
Int. Cl.³ G02F *1/137*
U.S. Cl. 350—339 R **7 Claims**



1. A light field dark character liquid crystal display cell comprising:

first and second substrates formed of a transparent material, each of the substrates having inwardly facing surfaces arranged in coplanar relationship and spaced apart to provide a uniform space therebetween;

at least one transparent electrode formed on the inward facing surface of the second substrate;

a plurality of transparent electrode segments formed on the inward facing surface of the first substrate and facing the electrode on the second substrate;

a transparent clear seal and pattern layer formed of an electrically nonconducting material disposed in the space between the substrates, the pattern layer forming a seal substantially around the periphery of the space leaving only a fill channel therethrough, the pattern layer forming open regions across the space between the electrode seg-

ment areas and forming thin background regions between the layer and the inwardly facing surface of one of the substrates, the thickness of the thin background regions being substantially less than the thickness of the open regions across the space between the electrode segment areas;

a molecular director alignment layer deposited on at least the portions of the electrodes not sealed by the pattern layer;

a liquid crystal material and pleochroic dye mixture confined by the pattern layer between the two substrates, the molecular orientation of the liquid crystal material and pleochroic dye being substantially ordered by the director alignment layer in the unenergized states so that the molecules of liquid crystal and dye material in the open regions between unenergized electrodes absorb light, thereby presenting a dark colored appearance in such open regions, and the molecules of liquid crystal and dye material in the thin background regions partially absorb light thereby presenting a lighter background color in these regions of the cell; and

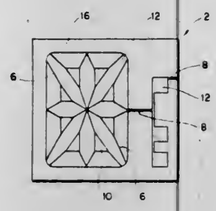
means for electrically energizing the electrode on the second substrate and for selectively energizing certain of the segment electrodes on the first substrate causing the liquid crystal and dye molecules to be oriented in a manner to substantially transmit light through energized electrode segments, thereby producing a light color substantially the same as that of the thin background regions containing only a thin layer of unenergized liquid crystal and pleochroic dye molecules.

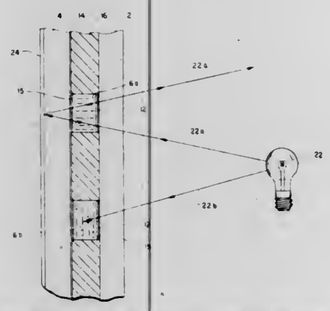
4,235,526

LIQUID CRYSTAL DISPLAY CELL HAVING A LIGHT FIELD BACKGROUND

Arthur L. Berman, Brea, and Gordon Kramer, Huntington Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 7, 1979, Ser. No. 36,620
Int. Cl.³ G02F *1/137*
U.S. Cl. 350—344 **15 Claims**





1. A light field dark character liquid crystal display cell comprising:

first and second substrates formed of a transparent material, each of the substrates having inwardly facing surfaces arranged in coplanar relationship and spaced to provide a uniform space therebetween;

at least one transparent electrode formed on the inward facing surface of the second substrate;

a plurality of transparent electrode segments formed on the inward facing surface of the first substrate and facing the electrode on the second substrate;

a transparent colored seal and pattern layer formed of electrically nonconducting material disposed in the space between the substrates, the seal and pattern layer sealing the space between the inward facing surfaces except substantially in the regions between the electrode segments;

a molecular director alignment layer deposited on at least the portion of the electrodes not sealed by the seal and pattern layer;

a liquid crystal material and pleochroic dye mixture filling the region between the electrodes, the molecular orientation of the liquid crystal material and pleochroic dye being substantially ordered by the alignment layer in the unenergized state so that the liquid crystal and pleochroic dye mixture absorb light through the region between the electrodes, presenting a dark colored appearance for each unenergized region; and

means for electrically energizing the electrode on the second substrate and for selectively energizing certain of the electrode segments on the first substrate, causing the liquid crystal and dye molecules to be oriented in a manner to substantially transmit light through the region between the energized electrodes, the pleochroic dye absorbing only light sufficient to create a color substantially the same as the color of the pattern layer.

4,235,527

DISPLAY DEVICE COMPRISING A LIGHT VALVE UNIT IN CONJUNCTION WITH THE FLUORESCENT PLATE

Waldemar Greubel, and Hans Krüger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,537
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808268
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—345 **8 Claims**



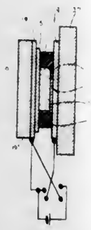
1. A display device comprising a light valve unit having a medium which has at least one zone that can be switched between different optical states; a plate-like body being of a material having an index of refraction which is greater than 1 and containing fluorescent particles, said plate-like body possessing at least one light exit window and having narrow side edges; and frame means for positioning the plate-like body and light valve unit with the exit windows of the plate-like body in alignment with the switchable zones of the light valve unit, said frame means including a one-piece member of a material which allows excitation light for the fluorescent particles to pass therethrough, but blocks the fluorescent light emitted by said particles, said member having surfaces engaging the narrow side edges of the plate-like body and being provided with a layer of material producing a diffused reflection layer for the engaged edges of the plate-like body.

4,235,528

CERAMICS FOR ELECTROCHROMIC DISPLAY

Kohzo Yano, Tenri; Hiroshi Kuwagaki, Kyoto; Hiroshi Hamada, Tenri, and Sadatoshi Takechi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 760,521, Jan. 19, 1977, abandoned. This application Apr. 23, 1979, Ser. No. 32,493
Claims priority, application Japan, Jan. 20, 1976, 51-6436
Int. Cl.³ G02F *1/17*
U.S. Cl. 350—357 **21 Claims**



1. An electrochromic display cell comprising:

a pair of electrodes,

a layer of electrochromic material disposed between the pair of electrodes, and

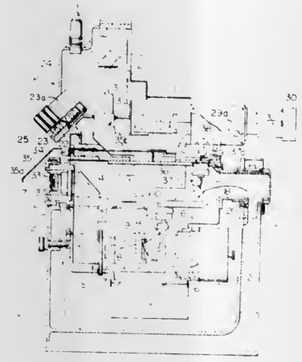
a sintered porous ceramic material impregnated with an electrolyte and disposed between the pair of electrodes and located in the background of a visual display on the layer of the electrochomic material, said sintered porous ceramic material having a color effective as a display background material in the display cell.

4,235,529

APPARATUS FOR RECORDING IMAGES OF CRYSTALLINE LENS SECTIONS

Suminosuke Kawase, Ohmiya, and Yukinori Karasawa, Yokohama, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,952
Claims priority, application Japan, Feb. 21, 1977, 52-18511
Int. Cl.³ A61B *3/10, 3/14*; G03B *29/00*
U.S. Cl. 351—14 **7 Claims**



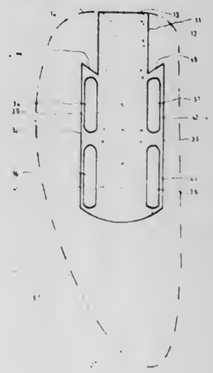
1. Apparatus for recording images of sections of crystalline lenses which comprises a slit illumination system for illuminating a crystalline lens along a slit illumination path including a slit plane having a slit axis, a recording optical system having an optical axis inclined with respect to the slit plane, light interrupting means in the illumination path between the objective lens means of the slit illumination system and the crystalline lens at a side of the slit axis adjacent to the recording optical system so as to selectively block a portion of light projected by the slit illumination system.

4,235,530

NOSEPAD FOR SPECTACLES

Kurt Stohrer, Lerchenweg 18, 7030 Boblingen, Fed. Rep. of Germany

Filed Apr. 25, 1979, Ser. No. 33,309
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819141
Int. Cl.³ G01N *21/41*; G01C *1/06*
U.S. Cl. 351—136 **8 Claims**



1. A pad to be fastened to the end areas of metallic pad levers affixed to eyeglass frames and placed on the area of the root of the nose of persons wearing said eyeglass frames, which pad is made of the silicon resin SYLGARD, comprising:

a sleeve in the pad which is thin relative to the pad and has a flexibility lying between the pad and the pad lever, and which is composed of an injection-molded polyamide material of natural-color and has approximately the length of the end area of the pad lever and a blind hole with its opening at the upper edge of the pad and which has a shape allowing the flush insertion therein of the end area of the pad lever;

said sleeve having a substantially smaller volume than the pad;

said sleeve extending approximately in the center line of the pad; and

said sleeve being provided with pad retaining elements on the outside thereof

said retaining elements comprising thin vanes on either side of said sleeve having means on said vanes for securing the pad to said vanes.

4,235,531

COLOR MOVIE FILM NOISE REDUCTION SYSTEM

Thomas J. McCormick, 19639 Vission Dr., Topanga, Calif. 90290

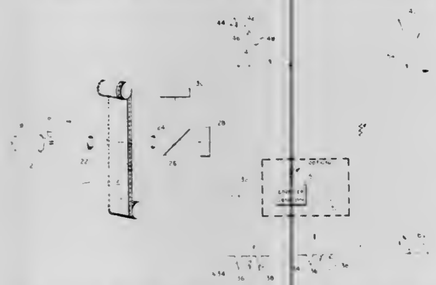
Filed Feb. 5, 1979, Ser. No. 9,309
Int. Cl.³ G03B *31/02*; G11B *7/00*
U.S. Cl. 352—27 **5 Claims**

1. A system for reducing the effect of undesired information in the form of noise on the sound track of motion picture film having desired recorded information printed on the film in a given color sound track comprising:

means for generating light signals including infrared signals adapted to be modulated by undesired information on the movie film sound track,

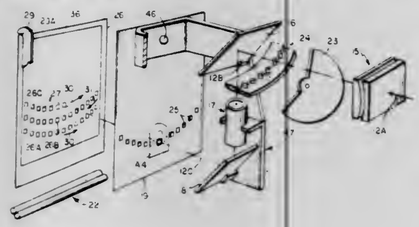
said light signals including color responsive signals adapted

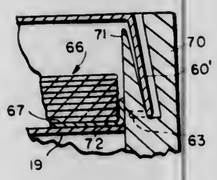
to be modulated by said undesired signals on said sound track,
means for focusing said light signals on said sound track of said movie film,
means for separating said modulated infrared light signals from said color modulated light signals and directing each of said light signals to a first light detecting means and to a second light detecting means respectively,
said first detector means generating a noise signal indicative of undesired information on said movie film sound track,



said second detector means generating a noise plus desired signal indicative of said modulated desired sound track information and said undesired information,
means for algebraically combining said noise signal with said noise plus desired signal for canceling the effects of said noise signal whereby the output signal is substantially all desired signal, and
the noise signal output from said first detector is amplitude corrected by the output of said second detector for changing the amplitude of the noise output signal as a function of the variations in apparent density of said sound track.

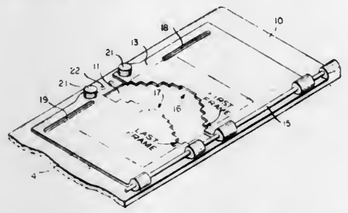
4,235,532
CARD MOTION PICTURE CAMERA
Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jun. 11, 1979, Ser. No. 47,115
Int. Cl.[3] G03B *41/00, 17/26*
U.S. Cl. 352—82 **17 Claims**





1. Photographic apparatus for use with a photographic film unit for recording images thereon, said apparatus comprising:
means for supporting said film unit for movement in a given direction at an exposure location in a given film plane;
optical means for directing light from a photographic scene along a given path to said film plane, said optical means including means for initially directing light rays from said scene along a first axis, then along a second axis at an angle to said first axis, and subsequently along a third axis offset from and substantially parallel to said first axis;
means for mounting said optical means for rotation of at least a portion thereof partly around said first axis to produce imaging of scene light in an arcuate path generally laterally of said first direction; and
drive means for alternately moving said film unit in its said given direction and said portion of said optical means along its said arcuate path to sequentially produce a plurality of rows of scene images at said film plane.

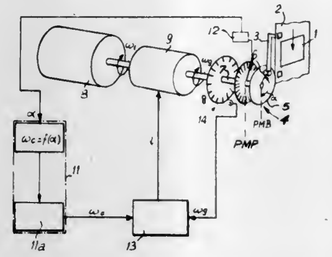
4,235,533
CARD MOTION PICTURE EDITING SYSTEM
Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jun. 11, 1979, Ser. No. 47,022
Int. Cl.[3] G03B *41/00*
U.S. Cl. 352—129 **8 Claims**



1. A device for editing a film unit having a plurality of images thereon so that a selected number of said images are capable of being viewed when said film unit is used in a viewing system, said images being arranged in a plurality of arcuate rows on said film unit, said editing device comprising:
a frame having means for positioning said film unit;
a template arrangement for identifying a selected number of image rows for subsequent viewing and the remaining image rows for editing, said template arrangement comprising a pair of template members arranged to overlay said film unit so that opposing edges of said members define row delineating edges so as to form an effective frame about said selected image rows and means for exposing selected portions of said film unit corresponding to either said selected or said remaining images to permit altering of the characteristics of said exposed portions so that, when said film unit is used in a viewing system, only said selected image rows will be viewed, said exposing means comprising a slot in each said template in spaced relation to the row delineating edge thereof for providing access to the borders of said film unit for permitting the alteration thereof.

4,235,534
DEVICE FOR DRIVING THE CLAW SHAFT OF A MOTION PICTURE CAMERA
Jean-Pierre Beauviala, Grenoble, France, assignor to Aaton S.A., Grenoble, France
Filed Feb. 23, 1979, Ser. No. 14,278
Int. Cl.[3] G03B *1/22*
U.S. Cl. 352—191 **12 Claims**

1. A device for driving the claw shaft of a motion picture camera, said device comprising:
a reciprocating claw engageable with a film perforation;
a rotatable claw shaft;
means connected between said claw shaft and said claw for converting the rotary motion of said claw shaft into reciprocating motion of said claw;
an electric motor connected to said claw shaft;
control means for said motor, said control means modulating the speed of rotation of the claw shaft as a function of the angle of rotation of said claw shaft with respect to a reference position, said control means including means for delivering a periodic reference signal whose frequency is modulated as a function of the angle of said claw shaft, said means for delivering including means for storing and selecting at least two types of reference signals, each of said at least two types of reference signals corresponding to an angle of obturation of the camera shutter.



4,235,535
APPARATUS FOR PROJECTION ON A CYLINDRICAL SCREEN
Benjamin Prinz, Bremen, and Wolfgang Schmidt, Dortmund-Hombruch, both of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany
Filed Dec. 13, 1978, Ser. No. 969,242
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755693
Int. Cl.[3] G09B *9/06*; G03B *21/28*
U.S. Cl. 353—11 **7 Claims**



1. A projector for use in a computer-controlled ship-simulating system, which system includes a cylindrical projection screen for the display of images representing localized visual environment of a ship, the projector comprising:
optical projections means directing a projection beam into a vertical axis and including image-rotating means;
a mirror;
means for mounting the mirror on the axis for the turning-movement about said axis, and for providing a tilt-movement upon the mirror about a horizontal axis which turns upon said turning-movement but intersects in any position the vertical axis, respectively, for directing said projection beam in various directions towards said screen, corresponding to the turning movement, and at different elevations of display, corresponding to the tilt movement;
a pair of motors; a pair of transmission means, including coaxial means for coupling the motors of the pair to said means for mounting in order to obtain, respectively, said turning movement and said tilt movement as independent adjustment movement, the motors being controlled by said computer; said image-rotating means being drivingly connected to the motor of the pair providing the turning movement, to cause the image-rotating means to maintain a particular orientation of the projection beam as reflected by the mirror; and
differential gear means, cross-coupling the transmission means of the pair in order to obtain rotational decoupling and independant turning and tilt movements.

4,235,536
MICROFILM READER
Wilfried Hofmann; Herbert Lusch, both of Taufkirchen, and Walter Rauffer, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Munich, Fed. Rep. of Germany
Filed May 7, 1979, Ser. No. 36,494
Claims priority, application Fed. Rep. of Germany, May 11, 1978, 2820537
Int. Cl.[3] G03B *23/12, 21/22*
U.S. Cl. 353—27 R **12 Claims**



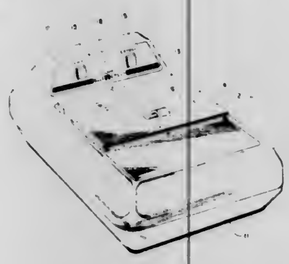
1. A microfilm reader, comprising in combination,
a first casing comprising
selection means for selecting a micropicture from a plurality of micropictures on a micropicture carrier;
positioning means for positioning said micropicture;
projection beam means providing a projection beam for imaging said micropicture;
said first casing having at least a side surface and a top surface and at least two orifices, each capable of permitting the passage therethrough of the projection beam carrying the micropicture information which emanates from said projection beam means; and at least one deflection mirror for deflecting the projection beam carrying the micropicture information through a selected orifice; said orifaces being positioned in two different surfaces of said first casing, said first casing having an orientation during use wherein one of said surfaces is the top surface and the other said surface is one of the side surfaces;
a second casing comprising at least one orifice for receiving the projection beam; and
a screen displaying the received micropicture information; and
means for attaching the second casing to the first casing in at least two different orientations with one orifice of the first casing matching one orifice of the second casing in each orientation in order to transfer the projection beam carrying the micropicture information from the first casing to the second casing and wherein in the first orientation the second casing is placed adjacent the first casing aligned along a horizontal axis and in the second orientation the second casing is placed on top of the first casing such that the two casings are aligned along a vertical axis.

4,235,537

METHOD OF TESTING PHOTOGRAPHIC FILM USING MULTICOLOR SENSITOMETER

Darrell T. Thompson, 4356 Blackfoot Dr., Grandville, Mich. 49418

Filed Jan. 26, 1978, Ser. No. 872,686
Int. Cl.³ G03B *41/00*
U.S. Cl. 354—20 **2 Claims**
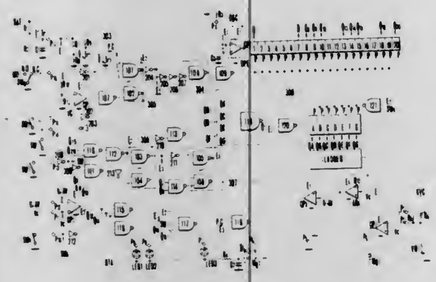


1. A method of test-exposing photographic material having known color-response characteristics, comprising:
applying an alternating current excitation voltage to an electroluminescent plate;
establishing the frequency of said voltage from at least two distinct frequencies each corresponding to a particular color-response characteristic of said plate to excite the entire area of said plate within a color range related to the color-response characteristics of said material; and
exposing said material to a pulse of a predetermined quantity of light from said plate.

4,235,538

DIGITAL CONTROL CAMERA

Masanori Uchidoi, Yokohama; Tomonori Iwashita, Fuchu; Tetsuya Taguchi, Kawasaki; Yukio Iura, Yokosuka; Toshikazu Ichiyanagi, Tokyo, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 733,794, Oct. 19, 1976. This application Dec. 22, 1978, Ser. No. 972,322
Claims priority, application Japan, Oct. 21, 1975, 50-126559
Int. Cl.³ G03B *7/08, 17/18, 17/38*
U.S. Cl. 354—23 D **8 Claims**



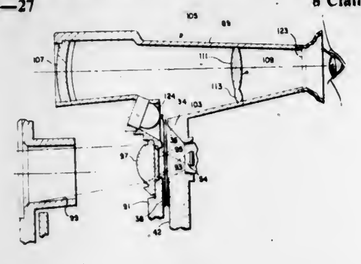
1. A camera comprising:
(a) connection means for connection to a power source;
(b) a warning signal forming circuit coupled to said connection means for detecting the voltage at the connection means and for producing a warning signal when the voltage drops to a value less than a given voltage value;
(c) a photographic operation start signal forming means for producing a signal for starting a photographic operation;
(d) operating means coupled to the start signal forming means and said warning signal forming circuit for performing a photographic operation, said operating means including a releasable shutter and a sequence control circuit for producing control signals in a time sequence for controlling photographic sequence operations and for producing at least a control signal for releasing the shutter; and
(e) an operation circuit in said operating means responsive to the signal from said photographic operation start signal forming means for producing a signal to render said sequence control circuit operative to start control over a sequence of photographing actions, said operation circuit being arranged for inhibiting the signal which renders said sequence control circuit operative when said warning signal is issued.

4,235,539

PHOTOGRAPHIC EXPOSURE CONTROL SYSTEM UTILIZING A SINGLE PHOTOCELL FOR THREE DISTINCT PURPOSES

George D. Whiteside, Lexington; Bruck K. Johnson, Andover, and Arthur G. LaRocque, Belmont, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 960,062, Nov. 13, 1978, Pat. No. 4,192,587, and Ser. No. 487, Jan. 2, 1979, This application Jan. 24, 1979, Ser. No. 6,423
Int. Cl.³ G03B *7/097, 7/099, 15/05, 17/20*
U.S. Cl. 354—27 **8 Claims**



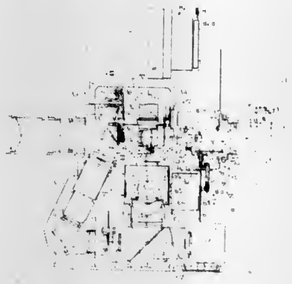
1. A photographic camera apparatus of the type adapted to be energized at least in part by a source of electrical energy and including means for defining a film plane comprises:
a single photoresponsive element stationed to receive light from the scene to be photographed in order to provide an output signal having an electrical characteristic which varies as a function of the intensity of the scene light incident thereon, and
exposure control means for controlling the admission of scene light to the film plane to define an exposure interval and for controlling the admission of scene light to said photoresponsive element prior to the commencement of said exposure interval and during said exposure interval in correspondence with the scene light admitted to the film plane, said exposure control means also including: means for directing artificial light to impinge upon said photoresponsive element at the instant that said exposure interval is commenced, means responsive to the electrical characteristic of said photoresponsive element upon the receipt thereof of said artificial light at the commencement of said exposure interval for subsequently providing an exposure influencing operation, and subsequently responsive to the electrical characteristic of said photoresponsive element upon the receipt thereof of scene light during said exposure interval for controlling the duration of said exposure interval, and means responsive to the electrical characteristic of said photoresponsive element upon the receipt thereof of scene light prior to the commencement of said exposure interval for controlling the manner in which said exposure influencing operation is provided.

4,235,540

EYE FUNDUS CAMERA HAVING VARIABLE POWER PHOTOGRAPHING OPTICAL SYSTEM

Yoshihiko Hanamura, and Schinichi Nishimura, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1979, Ser. No. 35,804
Claims priority, application Japan, May 10, 1978, 53-55189; May 10, 1978, 53-55190; May 10, 1978, 53-55191
Int. Cl.³ A61B *3/14*
U.S. Cl. 354—62 **4 Claims**



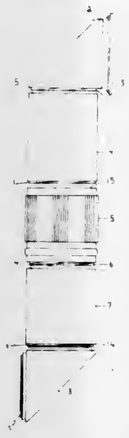
1. Eye fundus camera having a photographing optical system having a photographing optical axis and comprised of objective lens means, imaging lens means and magnification power changing lens means positioned between the objective lens means and the imaging lens means, said magnification power changing lens means being movable along the optical axis of the photographing optical system for focusing, said magnification power changing lens means comprising a plurality of lenses having different focal distances, said lenses being mounted on a member which is rotatable about an axis parallel with the photographing optical axis so that desired one of the lenses can be placed in the photographing optical path through rotation of the rotatable member.

4,235,541

PERISCOPE FINDER

Billwayne Jamel, 28 Valley View Rd., Elmsford, N.Y. 10523

Filed Mar. 29, 1979, Ser. No. 25,037
Int. Cl.³ G03B *17/48, 19/12*
U.S. Cl. 354—79 **2 Claims**



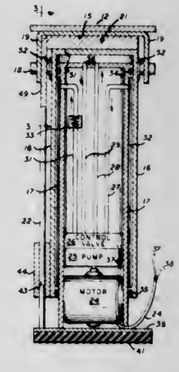
1. A periscope finder for use with a film containing camera of the interchangeable lens mount type to facilitate taking of pictures in a crowd, said periscope finder being of the knock-down type to facilitate carrying of same in a compact condition and comprising a pair of tubular extensions and a pair of light deflecting members each having means thereon to enable the extensions to be removably secured to the camera lens with the said lens therebetween to form an elongated light transmitting tube of considerable length with the light deflecting members secured to the free ends of the said light transmitting tube to form the assembled periscope finder and to enable the thus assembled periscope finder to be detachably secured to the camera lens mount, said camera lens being adapted to be employed to focus the light transmitted through the periscope finder to the camera film.

4,235,542

SELF STOWING VEHICLE LEVELING HYDRAULIC JACK

Frank J. Paterik, Jr., 1485 Floyd Ave., Sunnyvale, Calif. 94087

Filed Jan. 29, 1979, Ser. No. 7,166
Int. Cl.³ B66F *3/24*
U.S. Cl. 254—86 H **2 Claims**



1. In an extendable and retractable motorized hydraulic jack for leveling of a vehicle to which the jack is to be pivotably affixed:
ram housing means for pivotable attachment to the vehicle to be leveled;
ram means for telescopic mounting relative to said ram housing means for telescopically axially extending and retracting relative to said ram housing means;
an electrical motor housed within one of said ram means and said ram housing means;
a hydraulic pump for being driven by said electrical motor and for containment within one of said ram and ram housing means for pumping hydraulic fluid into a ram extension chamber means formed between said ram housing means and said ram means to cause said ram to move axially of said ram housing means;
means for pivotably affixing said ram housing means to a vehicle to be leveled;
self stowing means operatively associated with said ram means and mechanically operatively responsive to telescopic retractive movement of said ram means relative to said ram housing means for pivoting said ram means and said ram housing means, into a stowed position, about the pivoting axis of said pivotable affixing means, said self stowing means including cam means for providing a cam track, cam follower means being arranged for following said cam track, means for producing relative movement of said cam follower means and said cam track, one along the other, with terminal retractive movement of said ram means for causing said ram housing means to be pivoted about said pivotable affixing means into said stowed position;

retraction chamber means defined by an annular region of space between said ram means and said ram housing means for pressurization with hydraulic fluid for telescopically retracting said ram means relative to said ram housing means, hydraulic conduits interconnecting said hydraulic pump and said ram extension and ram retraction chamber means so that each of said chambers serves as the hydraulic reservoir for the other, and wherein said hydraulic pump means serves to transfer hydraulic fluid between said ram extension chamber means and said ram retraction chamber means via said hydraulic conduits.

4,235,543

MICROFICHE CAMERA WITH LENS AND FILM TRANSPORT SYSTEM

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 4, 1979, Ser. No. 72,051
Int. Cl.³ G03B *17/52, 27/32*
U.S. Cl. 354—86 **12 Claims**



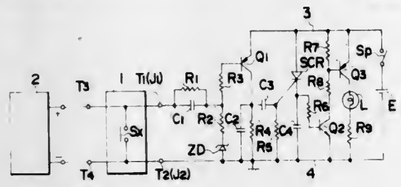
1. A camera for exposing a plurality of image frame areas on a single card-like film unit, said camera comprising:
- a housing defining a chamber for receiving at least one film unit;
- a guide plate fixed in said housing, said guide plate having a back surface for defining a film plane and a laterally extending row of a plurality of framing gate apertures opening to said film plane;
- an image forming lens;
- a carriage supporting said lens for incremental movement in linear passes along said row during which said lens is successively located in imaging relation with each of said framing gate apertures;
- exposure means operable for passing light from a subject through said lens and a framing gate aperture having said lens in imaging relation therewith to expose an image frame area on the film unit;
- film advancing means for incrementally moving the film unit along said back surface to present longitudinally spaced lateral areas thereof in alignment with said framing gate apertures;
- drive means for driving said carriage and said film advancing means alternately such that after each linear pass of said carriage and the exposure of the image frame area aligned with the last framing gate aperture in said row said film advancing means moves the film unit one increment to advance the next lateral area of the film unit into alignment with said framing gate apertures; and
- manually controlled common actuating means including an actuating button movable from a first position to a second position for actuating said drive means to effect operation of said carriage and said film advancing means and then for actuating said exposure means to effect exposure of an image frame area in response to return movement of said actuating button from said second to said first position.

4,235,544

DATA IMPRINTING LAMP CONTROL CIRCUIT

Seiji Yamada, Sakai, and Norio Beppu, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1978, Ser. No. 972,128
Claims priority, application Japan, Dec. 27, 1977, 52-178664[U]
Int. Cl.³ G03B *17/24, 17/18*
U.S. Cl. 354—106 **11 Claims**



1. A lamp control circuit for controlling energization of a lamp which is adapted to illuminate images to imprint them on a film in a camera having a flash syncho switch, said control circuit comprising:
- a high input impedance trigger circuit means for generating a single pulse in response to a closure of said flash synchro switch and having an input terminal connectable with said synchro switch;
- semiconductor means coupled to said trigger circuit and having an output transferable to a conductive state in response to said single pulse and maintaining said conductive state following the termination of said single pulse and while the current therethrough exceeds a predetermined level and transferable to a non-conductive state when said current decreases below said predetermined level;
- a capacitor connected in series with said semiconductor means output element to be charged therethrough;
- a discharge circuit means for discharging said capacitor when said capacitor is charged above a given voltage through said semiconductor means output; and
- a semiconductor switching circuit for energizing said lamp while the terminal voltage of said capacitor is above a given level.

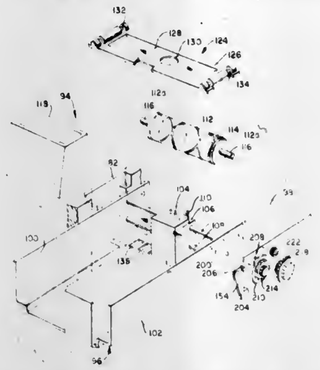
4,235,545

MICROFICHE CAMERA WITH COOPERATING SHUTTER AND LIGHT SHIELD

Philip R. Norris, North Reading, Mass.

Filed Sep. 4, 1979, Ser. No. 71,940
Int. Cl.³ G03B *1/00*
U.S. Cl. 354—123 **10 Claims**

1. A camera for exposing a plurality of image frame areas on a single card-like film unit, said camera comprising:
- means for locating the film unit at a film plane in position for exposure;
- an imaging lens;
- a lens carriage mounting said lens for incremental movement to bring said lens into imaging relation with successive image frame areas disposed in a row on the film unit;
- a shutter for defining a reclosable elongated shutter aperture extending along the length of said row to permit transmission of scene light for exposure of each of said image frame areas during an exposure interval; and
- a light shield having an aperture therein and being movable in increments with said lens carriage for maintaining said shield aperture in operative relation with said lens to thereby restrict scene light transmitted through said shutter aperture to one of said image frame areas having said lens in imaging relation therewith and block the transmission of such scene light to the other image frame areas during said exposure interval.



4,235,546

PHOTOGRAPHIC CAMERA SYSTEM AND A FOCAL PLANE PHOTOGRAPHIC CAMERA SHUTTER SYSTEM

Clive F. Woodfine, 39, Shawfield Park, Bromley, Kent BR1 2NQ, England

Filed Apr. 2, 1979, Ser. No. 26,319
Claims priority, application United Kingdom, Mar. 31, 1978, 12751/78
Int. Cl.³ G03B *9/34*
U.S. Cl. 354—244 **2 Claims**



1. A photographic camera system adapted to make a series of exposures at a variable frequency, including a film transport system adapted to transport film at an average speed which is variable with the frequency of the exposures and a focal plane shutter system for making the exposures, said shutter system including a revolvable shutter with an aperture and means for connecting the revolvable shutter with the film transport system so as to revolve continuously in use at a speed which is held proportional to the frequency of the exposures, characterised by:
- means for varying the shutter aperture with the shutter speed at least for a given set of light conditions;
- wherein said revolvable shutter includes two revolvable members defining the aperture therebetween and said means for varying the shutter aperture is adapted to vary the aperture by varying the relative positions of the two revolvable members;
- wherein one of the two revolvable members is arranged to be driven via a respective pair of inter-meshing helical gears of which the relative axial positions are variable for the purpose of advancing or retracting said one of the two revolvable members relative to the other of the two revolvable members so as to vary the shutter aperture, said relative axial positions being controlled by said means for varying the shutter aperture;
- wherein the other of the two revolvable members is arranged to be driven via a respective pair of inter-meshing helical gears of which the relative axial positions are variable for the purpose of advancing or retracting said one of the two revolvable members relative to the other of the two revolvable members so as to vary the shutter aperture, said relative axial positions being controlled by said means for varying the shutter aperture; and
- wherein the driven gears of the two pairs of inter-meshing helical gears are co-axial and of opposite hand and spaced a fixed distance apart and wherein the driving gears of the two pairs of inter-meshing helical gears are co-axial and of opposite hand and spaced a fixed distance apart

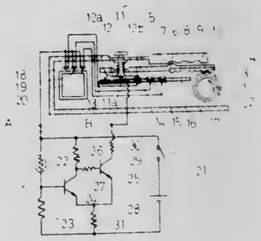
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4,235,547

PHOTOGRAPHIC CAMERA

Hiroshi Iwata, Nara, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Jul. 5, 1979, Ser. No. 55,033
Claims priority, application Japan, Jul. 12, 1978, 53-085591
Int. Cl.³ G03B *3/00, 17/20*
U.S. Cl. 354—60 L **3 Claims**



1. A distance and brightness indicator for a photographic camera comprising:
- a plurality of contact points corresponding to a distance of a photographic object,
- an indication means comprising several light emitting devices connected to said contact points,
- a brightness check circuit comprising a power supply source for said light emitting devices, a photo detector for detection of brightness of said photographic object, and a switching circuit for a control of voltage supplying of said power supply source with respect to said brightness of said photographic object, whereby
- said light emitting devices are connected to said power supply source through said brightness check circuit and corresponding one of said contact points.

4,235,548

ELECTROSTATIC LATENT IMAGE TRANSFER TYPE COPYING APPARATUS

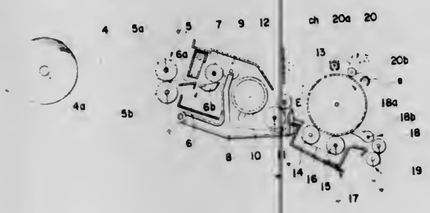
Osamu Miyamoto, Toyokawa; Isao Iizaka, Shinshiro; Toshio Yamamoto, Toyokawa; Takashi Hikosaka, Aichi, and Shigemitsu Shimizu, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 967,876, Dec. 8, 1978, abandoned, which is a continuation of Ser. No. 818,932, Jul. 25, 1977, abandoned, which is a division of Ser. No. 643,957, Dec. 23, 1975, Pat. No. 4,057,339. This application Jan. 31, 1979, Ser. No. 8,336

Claims priority, application Japan, Jan. 7, 1975, 52-4717; Jan. 10, 1975, 52-6620[U]; Jan. 13, 1975, 52-6835

Int. Cl.[1] G03G *15/00*

U.S. Cl. 355—3 R **15 Claims**



1. An electrostatic latent image transfer type copying apparatus which comprises:

a photoconductive member;

means for forming an electrostatic latent image on said photoconductive member;

image transferring means for transferring said latent image onto a transfer material having an insulating dielectric layer coated over an electrically conductive layer;

means for transporting the transfer material along a predetermined path to said image transferring means;

at least one member provided along said path which tends to cause electrostatic contamination by contact with the surface of transfer material having the insulating dielectric layer; and

an insulating member provided in the vicinity of said at least one member and separate therefrom for preventing the transfer material from contacting said at least one member as the transfer material is transported and spacing said one member from the surface of the transfer material for substantially preventing charging on the transfer material due to said one member.

4,235,549

DEVELOPING STATION FOR AN ELECTROSTATIC COPIER

Jürgen Eisbein, and Kurt Moser, both of Gerlingen, Fed. Rep. of Germany, assignors to Develop Dr. Eisbein GmbH and Co., Fed. Rep. of Germany

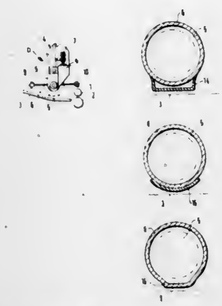
Filed Mar. 12, 1979, Ser. No. 19,565

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817464

Int. Cl.[1] G03G *15/00*

U.S. Cl. 355—3 DD **11 Claims**

1. A developing station for an electrostatic copier, the developing station including a rotably driven magnetic roller disposed within a stationary sleeve formed of a non-magnetizable material, said magnetic roller being adapted to receive a powdered toner on an outer circumference thereof, said stationary sleeve being disposed so that an area of an outer circumference thereof is located opposited an image carrier or an intermediate image carrier transported through the developing station past the magnetic roller, characterized in that in the region of said sleeve that is opposite said image carrier or said intermediate image carrier, means are provided for deflection of the toner that is transported in the peripheral direction of said sleeve,



whereby said toner in this region will have an increased radial distance with respect to the magnetic roll.

4,235,550

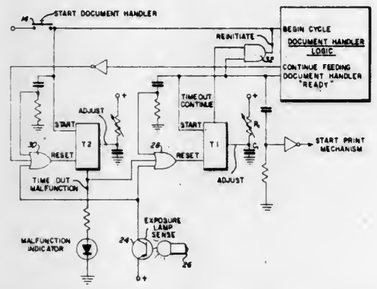
AUTOMATIC DOCUMENT HANDLER CONTROL

Raymond D. Case, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 18, 1979, Ser. No. 40,334

Int. Cl.[1] G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**



1. An automatic document handler control system for use on a reproduction machine having an exposure station whereat the documents to be copied are exposed by a suitable light source comprising;

exposure sensing means adapted to provide a control signal in response to each exposure illumination, and

means, responsive to said signal, for controlling the operation of the automatic document handler.

4,235,551

PHOTOGRAPHIC PRINTER WITH PRESET CORRECTION BUTTONS

Ronald B. Harvey, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 27, 1978, Ser. No. 881,423

Int. Cl.[1] G03B *27/73*

U.S. Cl. 355—38 **9 Claims**

1. For use in a photographic printing system, the improvement comprising:

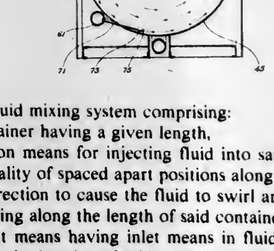
a plurality of incremental correction keys each for requesting, when actuated, an incremental color or density correction;

alterable storage means for storing a plurality of combinations of incremental corrections, each combination comprising more than one incremental color or density correction required to correct a recognizable cause of off-balance photographic prints;

a plurality of preset correction keys each for requesting, when actuated, one of the plurality of combinations of incremental corrections stored by the alterable storage means;

operator control switch means for selecting a first or a second operating mode; and

digital processor means for receiving signals from the actuated incremental correction keys, the actuated preset correction keys, and the operator control switch means,



the digital processor means storing in the alterable storage means the combination of incremental corrections requested by the actuated incremental correction keys in a memory location associated with the actuated preset correction key when the operator control switch means selects the first operating mode, and totalling the corrections requested by the actuated incremental correction keys and actuated preset correction keys and providing exposure correction signals as a function of the totals of corrections when the operator control switch means selects the second operating mode.

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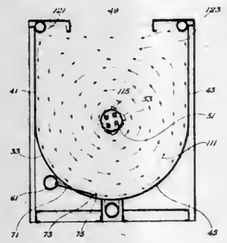
FLUID MIXING SYSTEM

Gene E. Underwood, Casper, Wyo., assignor to 3U Partners, Casper, Wyo.

Continuation-in-part of Ser. No. 810,590, Jun. 27, 1977, Pat. No. 4,170,420, which is a continuation-in-part of Ser. No. 722,668, Sep. 13, 1976, abandoned. This application Apr. 16, 1979, Ser. No. 30,367

Int. Cl.[1] B01F *15/02, 5/10*

U.S. Cl. 366—137 **2 Claims**



1. A fluid mixing system comprising:

a container having a given length,

injection means for injecting fluid into said container at a plurality of spaced apart positions along its length and in a direction to cause the fluid to swirl around an axis extending along the length of said container,

conduit means having inlet means in fluid communication with the interior of said container near said axis for the flow of fluid from said container into said conduit means,

air bleed means having inlet means in fluid communication with the interior of said container near said axis for removing air from said container near said axis, and

means for withdrawing fluid from said conduit means and for flowing said withdrawn fluid into said injection means for injection back into said container.

4,235,553

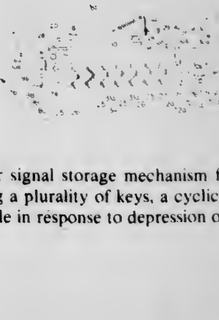
MATERIAL MIXER

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Continuation-in-part of Ser. No. 945,544, Sep. 25, 1978, abandoned. This application Jul. 16, 1979, Ser. No. 58,034

Int. Cl.[1] B01F *9/00*

U.S. Cl. 366—208 **10 Claims**



1. Apparatus for mixing flowable material within a container comprising:

A. first supporting means for supporting the container for rotation in one direction about a first axis;

B. second supporting means for supporting the container for rotation in said one direction about a second axis which is non-perpendicular to the first axis;

C. first drive means connected to said second supporting means for rotating the container in said one direction about said second axis; and

D. second drive means connected to said first supporting means for rotating the container in said one direction about said first axis while the container rotates about said second axis.

4,235,554

KEYBOARD SIGNAL STORAGE MECHANISM

Michihiro Yamada, Kodaira, Japan, assignor to Silver Seiko Limited, Kodaira, Japan

Filed Nov. 16, 1978, Ser. No. 961,210

Claims priority, application Japan, Dec. 2, 1977, 52-144038

Int. Cl.[1] B41J *23/02*

U.S. Cl. 400—52 **4 Claims**



1. Keylever signal storage mechanism for a typewriter or printer having a plurality of keys, a cyclically operable drive means operable in response to depression of a key, and typing

means actuated by said drive means to type a character, wherein the improvement comprises interposer latch means;

a plurality of interposers each having a normal position latched by said interposer latch means and spring urged to an operative position, each interposer being released from said normal position by depression of a key to move to said operative position thereby initiating a cycle of operations of said drive means and said typing means for printing a character in accordance with the depressed key;

interlock means for permitting only one interposer at a time to be moved out of said normal position;

restoring means operable during an initial part of a print cycle initiated by movement of an interposer to said operative position to restore said interposer to said normal position thereby permitting another interposer to be moved out of said normal position; and

arresting means operable during the remaining part of the print cycle to arrest another subsequently released interposer to an intermediate stored position whereby a second print cycle may be initiated at the end of the print cycle, said arresting means including a cam actuated by said cyclically operable drive means, a universal bar disposed for engagement with any of said interposers, and a cam follower linkage means interconnecting said cam with said universal bar for imparting a cam controlled motion to said universal bar.

4,235,555

NON IMPACT DOT MATRIX PRINTER

Armando Aprato, Lugnacco, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Apr. 27, 1978, Ser. No. 900,487
Claims priority, application Italy, May 4, 1977, 67990 A/77
Int. Cl.³ B41J *3/10, 3/20*
U.S. Cl. 400—120 **5 Claims**



1. Non impact matrix printer for printing dot-composed graphic information on a recording medium comprising:

a printer frame,

a platen mounted on said frame, for supporting the recording medium along a printing line direction,

a base member extending along and movable parallel to said printing line direction,

a plurality of printing heads, each including a row of regularly spaced dot size printing elements supported on a planar surface of the head and mounted on said base member, adjacent each other with the rows aligned to form a single long row of equally spaced printing elements parallel to the printing line direction,

mounting means fixed to said base member, for independently supporting each of said heads and,

a reciprocating mechanism including a cam with a profile divided into a first and a second symmetrical part,

wherein each of said parts extends through 180° and includes a staircase like portion connected to a constant portion.

4,235,556

PLATEN VARIABLE

Chris A. Dewey, Homer, and John L. Nelson, Ithaca, both of N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,915
Int. Cl.³ B41J *19/96*
U.S. Cl. 400—567 **3 Claims**



1. Apparatus in a typewriter or the like providing operator selection of rotation of a platen about its axis either in step increments controlled by a detent means or in angular amounts less than the step increments, the platen having an axial extension for support of the apparatus, the apparatus comprising:

a coarse adjusting knob rigidly coupled to the axial extension for rotating the platen in step increments;

a hub member rotatably mounted on the axial extension, said hub member independent of said coarse adjusting knob and having circular spline teeth;

a sprocket rigidly secured to said hub member for rotational movement therewith and cooperatively engageable with the detent means;

a flexspline rigidly secured to the axial extension and having internal spline teeth overlying and being greater in number than said circular spline teeth on said hub member; and

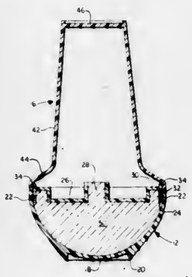
a fine adjusting wheel mounted on said flexspline between said coarse adjusting knob and the platen for rotational movement relative thereto and having an internal wave generator surface for cooperation with said flexspline to mesh said internal spline teeth of said flexspline with said circular spline teeth on said hub member at circumferentially spaced localities whereby rotation of said fine adjusting wheel rotates the platen in angular amounts less than the step increments.

4,235,557

DISPENSER

Thomas H. Hayes, Baton Rouge, LA, assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1978, Ser. No. 972,689
Int. Cl.³ B43K *19/00*
U.S. Cl. 401—49 **12 Claims**



1. A device for packaging and dispensing a hot-fill solid product, said device comprising:

a. an open-ended, hollow cover, said cover having cover coupling means adjacent its open end and having stand-up means on the outside of said cover for supporting said device in an upright position;

b. product holding means for securing said product to said device, said product holding means having,

i. a hot-fill port,

ii. a first coupling means for forming selective attachment with said cover coupling means whereby said cover and said product holding means form a cavity into which said product is hot filled, and

iii. a circular channel for aiding in the securement of said product to said device, said channel being formed by an outside annular side wall and a co-axial inside annular side wall connected one to the other adjacent their upper ends by an annular top wall; and,

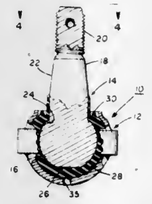
c. a handle connected to said product holding means substantially opposite said cavity.

4,235,558

BALL JOINT DESIGN

Daniel S. Snyder, Norwalk, and Harold L. Kaufman, Port Clinton, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 23, 1978, Ser. No. 918,623
Int. Cl.³ F16C *11/00*; F16D *11/12*
U.S. Cl. 403—130 **8 Claims**



1. An elastomer ball joint comprising:

a ball-stud member having a ball portion at one end and a shank portion at the other end,

said ball portion having an underside portion adjacent said shank portion,

an open-ended socket member surrounding said ball portion in spaced relationship thereto, said open end of the socket forming a window in the socket through which said shank portion projects, the window and ball stud defining a clearance therebetween the ball stud and the socket without allowing the ball to pass through the window, and

an elastomer coating layer, resiliently interconnecting the ball stud member and the socket member, said layer surrounding said ball and a portion of said shank portion adjacent said ball and, chemically bonded firmly thereto, thereby providing increased bond strength and resistance to bond line attack,

and having a rib of additional elastomer in the high stress window area.

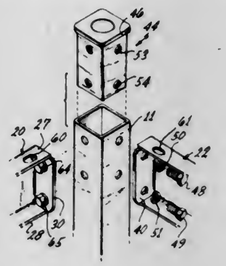
4,235,559

CONSTRUCTION OF METAL ARTICLES

Jack Rooklyn, Burbank, Calif., assignor to Industrial Management Company, Calif.

Filed Jun. 14, 1979, Ser. No. 48,347
Int. Cl.³ F16B *12/46*
U.S. Cl. 403—262 **7 Claims**

1. In the construction of metal articles having upright members and transverse members, in combination, an upright hollow member having an end part having flat side portions lying in planes, transverse channel members constructed to be secured to the end portion of the said upright member by way of joints, each transverse member terminating in joining means including at least one transverse portion closing the end of the channel and configurated to fit against a side of the end portions of the upright member, a fitting in the form of a plug positioned within the end of said upright member having tapped holes to receive securing means, a securing means



securing the said joining means to said upright member and fitting said flat side portions of said member having flat inner surfaces, said plug having flat sides, each of said flat inner surfaces having flush engagement against a flat side of said plug.

4,235,560

TRANSITION BOLT FOR CLAMPING TOGETHER THE SIDE RAILS OF CONCRETE WALL FORM PANELS OR THE LIKE

Vernon R. Schimmel, Arlington Heights, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 705,086, Jul. 14, 1976, Pat. No. 4,030,694.
This application Jan. 21, 1977, Ser. No. 761,245
Int. Cl.³ E04G *17/04*; F16B *35/04*
U.S. Cl. 403—388 **2 Claims**

1. A one-piece transition bolt adapted to clamp together the abutting side rails of a pair of edge-to-edge concrete wall form panels or the like and further adapted to extend through a rectangular transversely extending slot in one of the rails and a registering longitudinally extending slot in the other side rail, said bolt comprising an enlarged head at one end thereof, a reduced intermediate shoulder portion, and a further reduced shank portion at its other end, said enlarged head portion being adapted when the bolt is in its proper operative position to have its inner face abut flatly against the outer surface of the portion of the one side rail which defines said rectangular transversely extending slot, said shoulder and shank portions being flatsided, having their sides coplanar, and being adapted respectively to extend through the first and second mentioned slots in the two rails, the shoulder portion being shaped correspondingly to and of substantially the same depth as the rectangular transversely extending slot in said one rail to the end that when the bolt is in its operative position the shoulder portion fits snugly in the last mentioned slot and thus positively holds the bolt against rotation or angular displacement with respect to said rails, said shank portion being of greater length than the depth of the longitudinally extending slot in the other rail, having interrupted screw threads on its edges throughout its

entire length and being adapted to receive on its outer projecting end an internally-threaded nut which when tightened abuts against the outer surface of the adjacent portion of said other side rail and causes said inner surface of the head of the bolt to be clamped against the aforesaid portion of the outer surface of said one side rail.

4,235,561

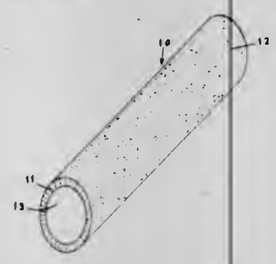
SUBTERRANEAN IRRIGATION MEANS AND SYSTEM

Glen Peterson, 540 S. 83rd E. Ave., Tulsa, Okla. 74112

Continuation-in-part of Ser. No. 687,891, May 19, 1976, abandoned. This application Feb. 12, 1979, Ser. No. 11,686

Int. Cl.[1] **E02B** *13/00*

U.S. Cl. 405—45 **5 Claims**



1. A water dispenser for the irrigation of plants comprising a porous body having at least:
   a. Two connected surfaces; with
   b. access to the roots of said plants at a first surface;
   c. a conduit connecting a second surface to a controlled water supply and providing a flow of water to said porous body;
   d. said first and second surfaces connected by the pores of said porous body; and wherein
   e. said pores of said porous body are relatively much larger in cross-section than the cross-section of a water molecule and relatively much smaller than the cross-section of the smallest plant feeder root; and wherein
   f. the total water flow cross-section through said porous body, which connects said first and second surfaces, is relatively much smaller than the water flow cross-section of said conduit which connects said second surface to said controlled water supply, and wherein
   g. the largest cross-sectional dimension of any pore in said porous body is larger than one thousandth of a micron and smaller than 50 microns.

4,235,562

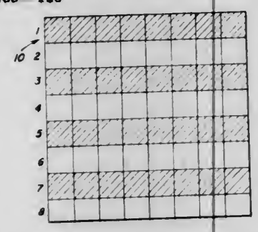
LAND RECLAMATION SYSTEM

Alberto L. Ribas, 9115 SW. 25th St., Miami, Fla. 33165

Filed Dec. 8, 1978, Ser. No. 967,784

Int. Cl.[2] **E02D** *3/00*

U.S. Cl. 405—128 **20 Claims**



1. A method of reclamation of a tract of land in the surface mining of an ore-bearing stratum and an overburden stratum overlying the ore-bearing stratum comprising the steps of:
   (a) dividing said tract into a plurality of parallel strips, numbered consecutively from an edge of said area as the first strip, second strip, and the like;
   (b) excavating and storing the overburden stratum from said first strip;
   (c) forming a first strip mined-out pit by excavating and transporting to a processing plant the ore-bearing stratum from said first strip, said processing plant being adapted to separate said ore-bearing stratum into an ore and a waste product of said first strip and treat said waste product to produce a dewatered waste product;
   (d) initiating excavation of said overburden from said third strip;
   (e) mixing said overburden from said third strip with said dewatered waste product of said first strip to form a backfill;
   (f) transporting said backfill to said first strip mined-out pit while said third strip is being excavated;
   (g) repeating sequentially steps (c) through (f) for all odd-numbered strips; and
   (h) repeating sequentially steps (c) through (f) for all even-numbered strips.

4,235,563

METHOD AND APPARATUS FOR FEEDING POWDER

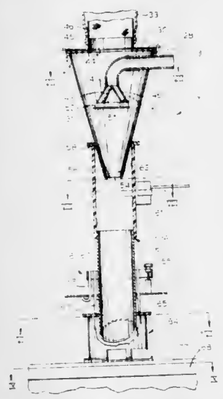
Charles R. Hine, Portage, and Craig B. Peot, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 814,540, Jul. 11, 1977, Pat. No. 4,156,546. This application Mar. 19, 1979, Ser. No. 21,630

The portion of the term of this patent subsequent to May 29, 1996, has been disclaimed.

Int. Cl.[1] **B65G** *53/40, 53/60, 53/66*

U.S. Cl. 406—23 **6 Claims**



1. In a method for feeding small solid particles to the intake of a tableting machine, the steps comprising:
   introducing said particles into a flow path;
   intermittently introducing into said flow path for a period of short duration a stream of gas under pressure to cause an intermittent flow of gas and particles along said path;
   discharging said stream into a first chamber against a deflector positioned therein for causing sideward deflection and diffusion of the stream;
   then separating the particles and gas within said first chamber by permitting the particles to fall downwardly of said first chamber due to the urging of gravity while venting most of the gas from the upper portion of said first chamber so that the first chamber is only slightly pressurized;
   causing said separated particles to be discharged from said first chamber through an opening adjacent the lower end thereof into a second chamber below said first chamber and to accumulate within said opening so as to momentarily isolate said particles in said second chamber from the pressure in said first chamber; and
   conducting said particles from said second chamber to the intake of said tableting machine.

4,235,564

CUTTING TOOL

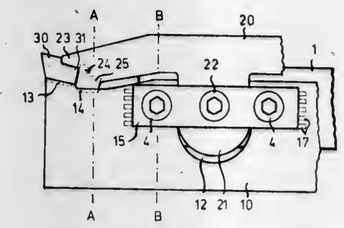
Jean P. Huser, Meggen, Switzerland, assignor to Utilis Müllheim AG, Switzerland

Filed Dec. 29, 1978, Ser. No. 974,492

Claims priority, application Switzerland, Dec. 31, 1977, 16288/77

Int. Cl.[3] **B26D** *1/12*

U.S. Cl. 407—101 **14 Claims**



1. In a cutting assembly of the type comprising: a cutting tool means, a tool holder means, a support means for supporting said cutting tool means, clamping means for clamping said cutting tool means on said support means, said support means and said clamping means being provided with two opposed longitudinally extending surfaces, means provided on the opposed surfaces of said support means and said clamping means for receiving and accurately guiding said cutting tool means, guide means projecting outwardly from one of the opposed surfaces of said clamping means relative to said support means, groove means provided on the other of the opposed surfaces of said clamping means and said support means for laterally aligning said clamping means relative to said support means, groove means provided on the other of the opposed surfaces of said clamping means and said support means for receiving said guide means, means provided on one of the opposed surfaces of said support means and said clamping means for vertically aligning said clamping means relative to said support means, said guide means, said groove means and said means for vertically aligning said clamping means being arranged on said opposed surfaces substantially along a vertically extending center plane of said clamping means and said support means, and means for mounting said support means and said clamping means on said tool holder means, the improvement wherein said cutting tool means is provided with a substantially vertically oriented slot in a rear face thereof and wherein said clamping means has a substantially vertically oriented serrated edge which engages in a shape-mating connection within said slot for vertically securing said cutting tool means in a precise manner.

4,235,565

PRECISE DOWEL JOINT WOODWORKING DEVICE

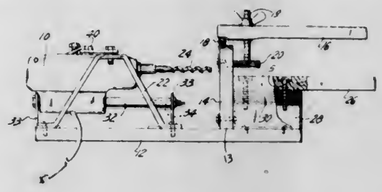
Mathew R. Albano, 59 Marshall Hill Rd., West Milford, N.J. 07480

Filed Apr. 23, 1979, Ser. No. 32,087

Int. Cl.[3] **B23B** *41/00*

U.S. Cl. 408—99 **1 Claim**

1. A precise dowel joint, woodworking device, comprising:
   (a) a base;
   (b) a slidable power drill with a drill housing mounted horizontally on said base;
   (c) a V-shaped lever support securely attached with the power drill housing and the base;
   (d) a pair of sliding bars firmly supported upon the base by bolting a sliding bar support on opposite sides of the drill housing which is slidably horizontally secured between said bars;
   (e) a handle lever pivotably attached to the power drill housing and fixedly attached to the base so that by moving the handle lever in a direction of a work piece, said drill moves horizontally in same direction;
   (f) a hold-down lever hinged to a hold-down support mounted on the base to support the workpiece vertically;



   (g) a vertically adjustable worktable upon which the workpiece can be adjusted for drilling a hole thereinto; and
   (h) a depth stop bolt attached to the sliding bar support for adjusting the depth of the hole to be cut into the workpiece,
   whereby the drill is guided to drill a perfect hole at a predetermined mark on said workpiece.

4,235,566

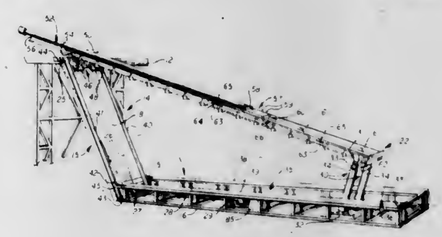
PIPE-CONVEYING CATWALK

Archie W. Beeman, and Harold D. Beeman, both of 501 Hillcrest, Odessa, Tex. 79761

Filed Dec. 4, 1978, Ser. No. 965,895

Int. Cl.[1] **E21B** *19/00*

U.S. Cl. 414—22 **10 Claims**



7. A pipe-conveying apparatus for moving pipe between a rig floor and a pipe rack which is spaced vertically below and horizontally away from the rig floor;
   said apparatus includes a ground-supported main structure, a boom, a swing arm assembly, an elevator; and a pipe-receiving stinger;
   said boom and said main structure having a near end adapted to be placed near a drilling rig and a far end remote from said near end, means by which one end of said elevator can be attached to the near end of said main structure and the other end of said elevator can be attached to a rig floor of a drilling rig;
   said elevator includes a boom guide attached to said near end of said boom so that the near end of the boom can be moved vertically upwardly and at the same time horizontally away from said far end of said main structure, whereupon the near end of the boom can be elevated into proximity of a rig floor; means for moving said boom guide respective to the main structure;
   said swing arm assembly has a swing end and a pivoted end, said swing end being journaled to the far end of said boom, said pivoted end being journaled to the marginal, far end of said main structure so that when the elevator lifts the

near end of the boom, the far end thereof is lifted vertically up and horizontally towards the near end of the main structure;

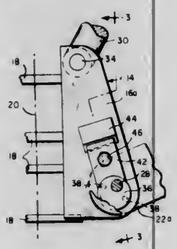
means by which said stinger is supported for reciprocal movement respective to said boom, so that a pipe which is supported by the stinger can be telescopingly moved in a direction towards and away from said far end of said boom, whereupon the boom is elevated and the stinger extended over a rig floor; thereby enabling a pipe to be transported between a pipe rack and a rig floor.

4,235,567

MATERIAL HANDLING MACHINE WITH ADJUSTABLE SPEED-POWER RELATIONSHIP FOR BOOM MOVEMENT

John S. Pilch, Ware, Mass., assignor to Ware Machine Service, Inc., Ware, Mass.

Filed Apr. 11, 1979, Ser. No. 28,970
Int. Cl.³ E02F 3/00
U.S. Cl. 414—694 **9 Claims**



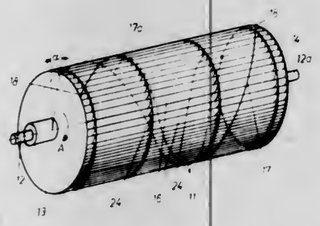
1. In a material handling machine having a turret, a boom supported by said turret for movement about a first pivot, and power means for pivoting said boom about said first pivot, said power means being connected to said boom and being supported by said turret for pivotal movement about a second pivot parallel to said first pivot, the improvement comprising: at least one of said pivots being journalled for rotation in the bore of an eccentric sleeve member, said sleeve member in turn being journalled for adjustment rotation in said turret, whereupon rotation of said sleeve member produces a change in the distance between said pivots, with an accompanying variation in the speed-power relationship of boom movement.

4,235,568

FAN ROTOR WITH TENSIONING MEANS

Kurt Zenkner, Ettlingen, Fed. Rep. of Germany, assignor to Voith Getriebe KG, Heidenheim, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,615
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744743
Int. Cl.³ F04D 29/66
U.S. Cl. 416—187 **15 Claims**



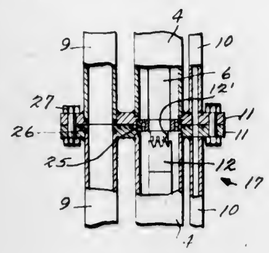
1. A rotor, particularly a rotor for radial fans, comprising two spaced-apart coaxial substantially disk-shaped end walls; a plurality of elongated blades secured to the peripheries of said end walls; and a tensioning device including end portions affixed to said end walls and a substantially helical median portion surrounding said blades and having a length exceeding the length of said blades.

4,235,569

SUBMERSIBLE PUMP FOR RADIOACTIVE LIQUIDS

Klaus Wegner, Pfarrer-Hufnagel-Strasse 10, 6450 Hanau 1, and Alois Schillinger, Höhenweg 19, 4630 Bochum, both of Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,056
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 7710103
Int. Cl.² F04D 29/60
U.S. Cl. 415—122 R **9 Claims**



1. A submersible pump for radioactive fluids comprising a housing, fluid displacement means rotatably mounted in said housing, a plurality of shaft sections, each shaft section including at least a conduit surrounding a drive shaft member and a separate conduit only for the fluid to be pumped, each conduit of each said shaft section being secured at each end thereof in fluidtight engagement to a coupling means so that, where said coupling means of adjacent shaft sections are coupled together, said drive shaft member conduit and fluid conduit of one shaft section will be in alignment with said respective drive shaft member conduit and fluid conduit of an adjacent shaft section, said respective coupling means of said shaft section including fluid sealing means, said coupling means having bearing means for receiving and rotatably supporting one end of a said drive shaft member, each said drive shaft member having at its end adjacent said bearing means, guide insertion drive transmitting means and, at its opposite end, guide and drive receiving means complementary to said guide insertion drive transmitting means so that, where said respective coupling means of adjacent shaft sections are coupled together, said respective drive shaft members of said adjacent shaft sections will be coupled in drive transmitting relation, motor means for driving said drive shaft members, said housing having magnetic coupling means for transmitting power from a said drive shaft member in engagement therewith to said fluid displacement means.

4,235,570

ELASTOMERIC HELICOPTER ROTOR LOAD REACTION SYSTEM

Donald L. Ferris, Newtown; Edward S. Hibyan, Trumbull, and Robert L. Faiz, Newtown, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 26, 1978, Ser. No. 919,357
Int. Cl.² B64C 11/06, 27/38
U.S. Cl. 416—134 A **2 Claims**

1. A helicopter rotor comprising:

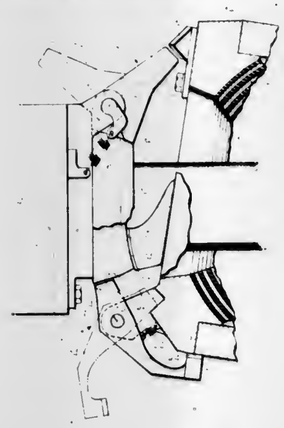
(A) a hub mounted for rotation about an axis of rotation,

(B) at least one blade projecting radially from said hub,

(C) a spherical elastomeric bearing having a focal point and supporting said blade from said hub for universal motion about said focal point to thereby accommodate both blade lead-lag motion and blade flapping motion with respect to said hub and so that rotation of the blade with said hub generates centrifugal force which causes a radially outward motion of the blade to thereby exert a compressive load on the elastomeric bearing,

(D) a lead-lag damper comprising a cylinder-piston mechanism extending substantially parallel to said blade and connected at its opposite ends to said blade and said hub to resist lead-lag motion of said blade and including first restraint means to limit piston motion within the cylinder to thereby limit blade lead motion with respect to said hub,

(E) brake means operatively associated with said hub to reduce the speed thereof and hence cause said blade to move in lead motion until said first restraint means comes into operation to limit blade lead motion and thereby impose a force on the blade tending to cause a radial inward motion of the blade to thereby exert a tension load on said bearing in opposition to said compressive load, and



(F) normally inoperative means to limit the inward motion of said blade as a result of actuation of said brake means to thereby prevent or limit tension loading of said bearing comprising second restraint means brought into operation by said radially inward motion of said blade resulting from the operation of said brake means and including a collar rotatably mounted on the inboard end of said blade and having a spherical contact surface coincident with the focal point of the spherical elastomeric bearing, and a contact pad having a spherical contact surface coincident with the focal point of the spherical elastomeric bearing and fixedly attached in a selected position to the hub so that said radial inward motion of said blade resulting from the actuation of said brake means and the operation of the first restraint means will bring said spherical contact surfaces into contact to limit said radial inward motion of the blade and hence the tension loading of said bearing.

4,235,571

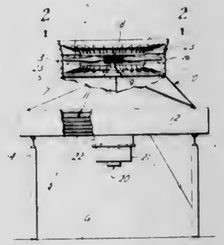
COOLING EQUIPMENT

Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Oct. 25, 1977, Ser. No. 844,574
Int. Cl.³ F04B 49/00
U.S. Cl. 417—1 **19 Claims**

1. Cooling equipment including an axial flow fan having a ring, a hub rotatable about the axis of the ring, means for so rotating the hub, blades mounted on and extending from the hub for rotation within the ring, the ring fitting closely about the tips of the blades and overlapping opposite sides of the lateral projection of the blades, and a substantially circular rail having a continuous, planar surface mounted on the ring on one side of the blades and generally concentrically of the ring in order to engage and thus restrain bending of the blades in an axial direction.

3. Cooling equipment of the character defined in claim 1,



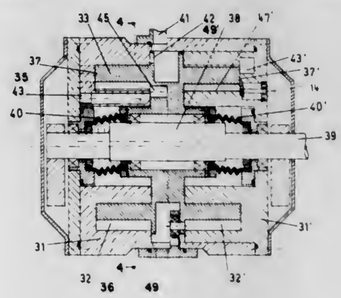
including means for sensing bending of the blades toward but prior to engagement with said rail, and means responsive to the sensing of said bending for only momentarily deenergizing said rotating means.

4,235,572

ROTARY DISPLACEMENT PUMP WITH INTAKE THROUGH A FIRST SEALING SLIDE

Otto Winkler, Balzers, and Eberhard Moll, Triesen, both of Liechtenstein, assignors to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dünne Schichten, Liechtenstein

Filed Nov. 30, 1978, Ser. No. 964,874
Claims priority, application Switzerland, Dec. 1, 1977, 14692/77
Int. Cl.³ F04C 18/02, 23/00, 29/08
U.S. Cl. 418—6 **10 Claims**



1. A displacement pump requiring no gas-yielding lubricant in a delivery space thereof comprising:

a stator housing having a cylindrical chamber therein;

a cylindrical displacement body mounted for non-rotating eccentric movement in and about an axis of said cylindrical chamber through gas tight spring bodies connected to the stator housing, defining with said cylindrical chamber the delivery space, said body moved into close association with said housing in said chamber during the eccentric movement thereof to divide said delivery space into an intake space and a discharge space;

said housing having an air intake port communicating with said intake space and a discharge port communicating with said discharge space;

a first sealing slide connected to said body and in sliding contact with a surface of said housing to close communication between said intake port and said intake space and shaped to open communication between said intake port and said intake space only during an intake range of movement of said body; and

a second sliding seal mounted for radial movement between said body and said housing for dividing said intake space from said discharge space throughout the entire eccentric movement of said body.

4,235,573

DOUBLE ACTING HUB-TO-SHAFT CLAMP CONNECTION

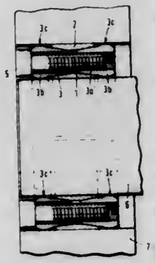
Oskar E. Peter, 7129 Schloss-Str. 9/1, Brackenheim, Fed. Rep. of Germany, and Lothar Peter, Güglingen, Fed. Rep. of Germany, assignors to Oskar E. Peter, Brackenheim, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 116,309

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939261

Int. Cl.³ F16D *1/06*

U.S. Cl. 403—13 **10 Claims**



1. Double acting hub-to-shaft clamp connection having
an inner, sleevelike element (1) adapted to fit around a shaft (6) and having outer conical surfaces tapering from an enlarged central portion to thinner outer end portions;
an outer tubular element (2) adapted to fit within the hub (7) and having inner conical surfaces tapering from an enlarged central portion to thinner outer end portions,
the relative dimension of the outer element and the inner element being so selected as to leave a gap therebetween;
oppositely facing compression rings (3,3*a*) inserted in the gap between the conical surfaces of the inner and the outer elements (1, 2), said compression rings being formed with conical surfaces at least approximately matching the conical surfaces of said inner and outer elements,
said compression rings being formed with centering ring portions (3*b*) at the outer regions thereof remote from said conical surfaces;
and means (5) to draw said compression rings towards each and engage the conical surfaces thereof with the conical surfaces of said inner and outer elements (1,2),
wherein,
the centering portions (3*b*) of the compression rings comprises inner and outer engagement surfaces (3*c*) dimensioned to engage the inner surface of the hub (7) and the outer surface of the shaft (6), said engagement surfaces being curved in axial cross-section to provide floating self-seating tangential engagement thereof with the shaft, and the hub, respectively.

4,235,574

SPINNERET ORIFICE CROSS-SECTION

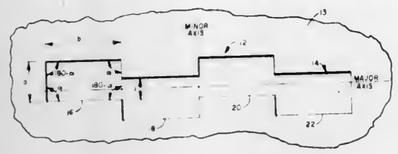
Bobby M. Phillips, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 818,692, Jul. 25, 1977, abandoned. This application Jan. 17, 1979, Ser. No. 4,242

Int. Cl.³ B29C *25/00*

U.S. Cl. 425—72 S **5 Claims**

1. A spinneret having formed within and extending through the plane of its face at least one spinneret orifice through which a fiber having an undulating cross-section may be spun, said spinneret orifice defining in said spinneret face plane an elongated slot formed by a series of repeating parallelograms connected in end-to-end relation together and alternating in offset relation along the major axis of said elongated slot, each parallelogram having a pair of opposite side walls "a" substantially parallel to the minor axis of said elongated slot and a pair of



opposite side walls "b" substantially parallel to said major axis of said elongated slot, and wherein a side wall "a" of one parallelogram and the side wall "a" of the adjacent off-set parallelogram lie on a common line and define the angle of the minor axis relative to the major axis of said elongated slot.

4,235,575

DEVICE FOR LUBRICATING THE TIE RODS OF AN INJECTION MOLDING MACHINE

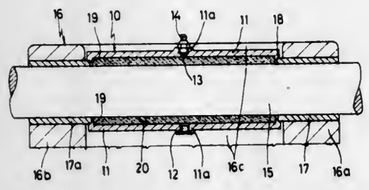
Karl Hehl, Arthur-Hihl Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,346

Claims priority, application Fed. Rep. of Germany, May 22, 1978, 2822248

Int. Cl.³ B29C *1/00*

U.S. Cl. 425—107 **16 Claims**



1. A device for lubricating a straight-line guide assembly of which one member is a guide rod and another member embraces the guide rod so as to provide a longitudinal guiding action, as one member executes a reciprocating motion relative to the other, the lubricating device comprising in combination:
a tubular shell enveloping a length portion of the guide rod with a radial gap so as to form an annular chamber therewith, the tubular shell being assembled from a plurality of longitudinally parted shell sectors which are insertable over and removable from the guide rod in a radial direction;
a lubricant supply body occupying the annular chamber formed by the tubular shell, said supply body being absorbant and holding a quantity of lubricant while frictionally engaging the surface of the guide rod, thereby transferring lubricant to the latter during the reciprocating motion; and
means for axially restraining the tubular shell in relation to the rod-embracing member of the guide assembly, so as to force the shell and the lubricant supply body to execute the same relative axial movements as the rod-embracing member.

4,235,576

PRESSES

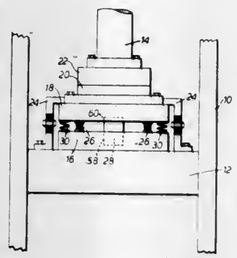
William D. Robinson, Ipswich, England, assignor to Delta Materials Research Limited, England

Filed Oct. 3, 1978, Ser. No. 948,257

Claims priority, application United Kingdom, Oct. 3, 1977, 41034/77

Int. Cl.³ B29C *3/00*; **B30B** *15/16*

U.S. Cl. 425—138 **4 Claims**



1. A press including
(a) a reciprocable ram reciprocal with a determined stroke,
(b) a platen towards and away from which, said ram reciprocates,
(c) a workpiece carrier supported by said platen between said platen and said ram, and
(d) a self-adjusting device operatively between said platen and said carrier for adjusting the position of said carrier in relation to the stroke of said ram, said device comprising,
(e) a fluid-containing cylinder operatively connected to one of said carrier and said platen,
(f) a cooperating piston movable in said cylinder and operatively connected to the other of said carrier and said platen,
(g) a normally closed valve in said cylinder for permanent discharge of some of said fluid when opened, and
(h) means for opening said valve when the pressure of said fluid exceeds a given value and for closing said valve after said pressure has fallen, whereby, if during a stroke of said ram towards said platen the liquid pressure exceeds said given value, liquid is discharged through said valve until the pressure drops, and whereby said carrier is brought closer to said platen for subsequent press strokes.

4,235,577

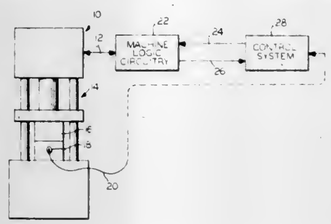
AUTOMATIC CURING CYCLE CONTROL SYSTEM

Rodney J. Groleau, Williamsburg, Mich., assignor to Control Process, Incorporated, Plantsville, Conn.

Filed Jun. 18, 1979, Ser. No. 49,284

Int. Cl.² B29C *3/06*; **B29G** *3/00*; **B30B** *15/26*, *15/34*

U.S. Cl. 425—144 **6 Claims**



1. A control system for controlling the opening of the mold at the end of the curing cycle of a molding machine comprising:
a. at least one means in said mold for sensing the temperature of resin in the mold cavity and for producing a temperature signal representative of the sensed temperature;
b. rate means connected to each temperature-sensing means to receive the temperature signal therefrom and generate a rate signal representative of the rate of change of the temperature signal as a function of time;
c. circuit means connected to each rate means to receive the rate signal therefrom and adapted to be connected for transmission of signals to means for opening the mold in response to reception of a command signal, said circuit means including means for establishing first and second reference rates, detecting when each sensed rate exceeds the first reference rate and thereafter when it falls below the second reference rate, generating a command signal at a time determined by the time at which the last sensed rate falls below the second reference rate after it has exceeded the first reference rate, and transmitting the command signal to the means for opening the mold when connected thereto, the mold thereby opening in response to the termination of curing as determined by the falling of the last sensed rate below the second reference rate after having exceeded the first reference rate.

4,235,578

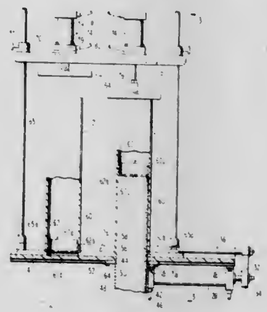
PROVOLONE CHEESE MOLDING APPARATUS AND MOLD ASSEMBLY THEREFOR

Vincent Cosmi, Hagerstown, Md., assignor to Dari-Desserts, Inc., Richmond, Vt.

Filed Sep. 1, 1978, Ser. No. 939,041

Int. Cl.³ B29J *1/00*

U.S. Cl. 425—173 **10 Claims**



1. In combination, an improved provolone cheese molding apparatus and mold assemblies therefor, said apparatus comprising:
a fixed, horizontal table;
a circular hole within said table;
a chute depending from said table aligned with said opening;
means for pressing warm cheese upwardly within said chute for discharge vertically upwards from said opening;
a slide mounted on said table for horizontal reciprocating movement over the top of the table;
a longitudinally spaced row of circular holes within said slide for selective alignment with the hole of said table as said slide is shifted transversely relative to said table; and
cheese loaf forming tubes vertically mounted on said slide coaxial with said holes and extending upwardly therefrom for receiving said cheese through said table opening to form cylindrical loaves conforming to the tube interior, the improvement wherein:
said table is provided with a single circular hole;
said tubes are formed of a lightweight light transmitting material, each tube including a disc-like plunger of light contrasting color to that of said tube, having a diameter on

the order of the inner diameter of said tube and slidably positioned therein, and said apparatus further comprises:

means for releasably clamping the tubes downwardly against the slide and in vertical alignment with the holes within said slide during tube filling and lateral shifting of said slide, whereby said tubes are sequentially filled with hot cheese through the open bottoms of said tubes, forcing the plungers to rise within the tube to visually indicate to the operator the level of the cheese within the tube and wherein, by release of the releasable clamping means, a filled tube may be removed from the apparatus subsequent to shifting of the slide position where the table cuts off the bottom of a filled tube from the cheese supply.

4,235,579

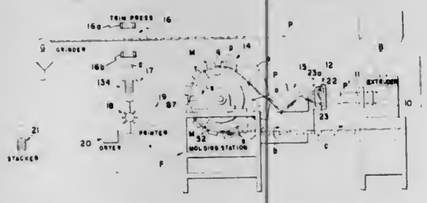
SYNTHETIC PLASTICS ARTICLE MANUFACTURING SYSTEM

John H. Kurz, Scottsdale, and Edward E. Batson, Glendale, both of Ariz., assignors to Leesona Corporation, Beaverton, Mich.

Filed May 11, 1978, Ser. No. 904,734

Int. Cl.³ B29C *17/04, 17/10*; B41F *7/02*

U.S. Cl. 425—174.4 **31 Claims**



1. In a continuous plastics forming system having an extruder for continuously issuing a heated plastic in the form of an elongated web; a downstream forming station with means for deforming selected portions of the continuously moving web, while still warm and deformable, to the shape of articles supported and interconnected by undeformed intervals of web; mechanism for separating the articles from the web; and mechanism for moving the web in a path to the forming station and separating mechanism; said deforming means including an endless member about which said web is trained, having a plurality of generally radially extending plug assist passages therein open to the periphery thereof and said web, and a closable cover for each passage comprised of a female mold cavity; means synchronized with said web moving mechanism for moving said endless member continuously at the rate of speed of the web moving to the endless member; and means for moving said covers consecutively to closed position to clamp the web to the endless member and after a predetermined forming interval to then move the covers to open position to release the deformed web:

the improvement wherein: a piston driven plug assist assembly is mounted in each of said passages to deform the web initially into the mold cavity in each cover when the cover is in closed position; said assemblies each including a cylinder with a piston to which a plug assist mechanism having a tubular support rod is fixed; there being air emission ports in said plug assist mechanisms to create a differential pressure to move the web into intimate engagement with the mold cavities as a final deforming step; a common compressed air supply system for supplying air to each plug assist cylinder at air inlet passage means radially inward of each piston; and an air flow inlet port in the inner end of each tubular support rod located radially inward of said air inlet passage when the piston is in radially inner position, positioned axially to communicate with the air inlet passage means only after each piston has been moved to radially outward position, to control the time of air emission through said air emission ports.

4,235,580

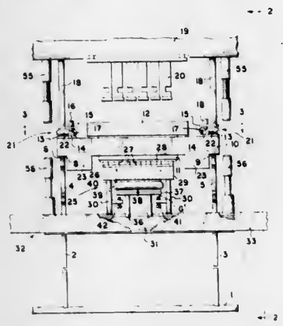
NOISE SUPPRESSION STRUCTURE FOR BLOCK MAKING MACHINERY

Thomas W. Springs, Alpena, and William F. Wallis, Atlanta, both of Mich., assignors to Besser Company, Alpena, Mich.

Continuation of Ser. No. 713,920, Aug. 12, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,527

Int. Cl.³ B28B *1/08*

U.S. Cl. 425—211 **4 Claims**



1. In a concrete block making machinery of the kind having a frame, a vibratable, open bottom mold supported on and in contact with said frame, a pallet support beneath said mold, a pallet carried thereon, motion transmission means coupled to said pallet support for raising the latter toward said mold a distance sufficient to seat a pallet against the bottom of said mold and to raise said mold to a position spaced from said frame, and vibration causing means coupled to said mold, the improvement comprising:

first elastic yieldable means incorporated between said pallet and motion transmission means to isolate the vibration causing means, mold and pallet therefrom when the mold is vibrated;

second elastic yieldable means interacting between said mold and frame to yieldingly oppose raising movement of said mold and to isolate the mold and vibration causing means from the frame when the mold is in raised position, but enabling movement of said mold to its raised position off the frame; and

drive means operable to control said motion transmission means to raise the mold and permit the second elastic yieldable means to aid in returning said mold to engagement with said frame.

4,235,581

SCREW EXTRUSION PRESS HAVING TEMPERATURE-CONTROL MEANS

Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

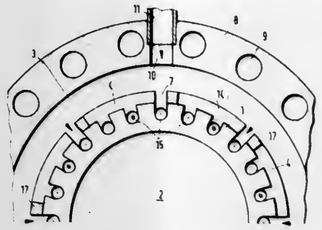
Filed Mar. 20, 1979, Ser. No. 22,249

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812065

Int. Cl.³ B29F *3/08*

U.S. Cl. 425—378 R **3 Claims**

1. A screw extrusion press for processing plastics materials and having a cylinder which encloses a screw, the wall of said cylinder being formed with a plurality of longitudinally extending bores which are arranged in sets of three, with the bores in each set being disposed adjacent one another and serially connected to pass through said bores of each set a temperature control medium; means for supplying said temperature control medium to said longitudinal bores and means for discharging said medium after passage through each set of bores, said supply means comprising an annular supply manifold, first radially extending bores communicating every third longitudinal bore with said annular supply manifold, and second radially extending bores serially connecting adjacent longitudinal bores of each set of bores through spaced annular passage means, whereby in each set of bores, said temperature



control medium is caused to flow in a first direction through a first longitudinal bore, a second opposite direction through an adjacent second bore of said set, and then in said first direction through the third bore of said set, before discharge; the consequent meandering path of said medium providing for optimum temperature control.

4,235,582

METHOD AND APPARATUS FOR MOLDING HOLDERS FOR DISC-LIKE OBJECTS

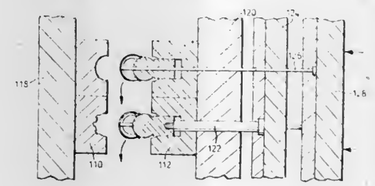
Gordon W. Holmes, Mississauga, Canada, assignor to Professional Packaging Limited, Mississauga, Canada

Division of Ser. No. 935,762, Aug. 22, 1976, Pat. No. 4,198,371, which is a continuation-in-part of Ser. No. 879,467, Feb. 21, 1978, abandoned, which is a division of Ser. No. 733,916, Oct. 19, 1976, Pat. No. 4,095,608. This application Oct. 2, 1979, Ser. No. 81,140

Claims priority, application United Kingdom, Oct. 22, 1975, 43455/75; Canada, Oct. 12, 1976, 263146; Fed. Rep. of Germany, Jan. 26, 1977, 7702199[U]; New Zealand, Sep. 5, 1977, 185103

Int. Cl.³ B29F *1/14*

U.S. Cl. 425—438 **6 Claims**



1. A mold for molding an elongate resiliently flexible article having a generally C-shaped cross-section and an end wall integral with the body at each end thereof, the ends walls defining a generally C-shaped opening in the ends of the body of smaller radius of curvature than the radius of curvature of the body, said mold comprising:

a mold cavity corresponding in shape to the shape of said elongate article,

molten polymeric material feed means communicating with said cavity for feed molten polymeric material thereto,

an inner part cylindrical elongate mold core,

an outer mold member cooperating with said inner mold core to define said cavity,

said outer mold member consisting of two parts separable about a part line which intersects the axis of said core,

said cavity being shaped to provide the curvilinear extremities of the article lying on a straight line parallel to said mold part line,

a pair of movable push rods extending in parallel through said inner mold core perpendicular to the axis thereof, and means selectively establishing spacing between said core and the adjacent outer mold part when said mold is opened about said part line which is greater than the dimension of the mold cavity.

4,235,583

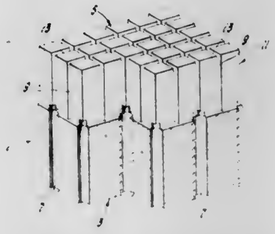
EXTRUSION DIE AND METHOD FOR MAKING SAME

James R. Reed, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 23, 1978, Ser. No. 889,358

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—464 **6 Claims**



1. In a method for forming an extrusion die of the type used to form a ceramic monolith having thin walls defining a multiplicity of parallel tubular passageways with at least about 100 passageways per square inch, said die having a feed face and a discharge face, said feed face having a plurality of feed holes extending partially through said die and interconnecting with a network of grid slots in the discharge portion of said die formed by a plurality of grid pins which define the said slot width and the wall thickness, shape and size of said passageways, the invention comprising the steps of forming the width of said slots larger than the desired wall thickness of said monolith passageways, and metal plating the slot defining surfaces of said grid pins to obtain the slot width corresponding to said desired wall thickness, said plating being accomplished by electroless plating of a metal selected from the group consisting of nickel, chromium, cobalt and cobalt-nickel, to form a substantially uniform coating having good wear resistance and being strippable for replating and continued die use.

4,235,584

HAND-OPERATED INJECTION MOLDING MACHINE

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Chiyoda, Japan

Division of Ser. No. 850,902, Nov. 14, 1977, Pat. No. 4,172,700. This application Mar. 26, 1979, Ser. No. 23,752

Claims priority, application Japan, Nov. 17, 1976, 51-154781; Nov. 17, 1976, 51-154782; Nov. 17, 1976, 51-154783

The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.

Int. Cl.³ B29F *1/08*

U.S. Cl. 425—545 **2 Claims**

1. A hand-operated injection molding machine comprising:

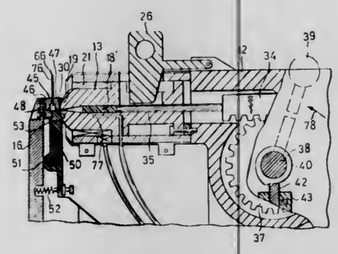
(a) a base;

(b) a heating cylinder mounted on said base and having a chamber therein, said heating cylinder having at one end a discharge nozzle with an orifice therein and a plunger movable into said chamber toward said discharge nozzle;

(c) a mold holder pivotally supported on said base and having a mold at one end thereof, said mold including first and second mold members jointly providing a mold cavity therebetween, said first mold member being fixed to said mold holder, said mold holder supporting an arm pivotally mounted thereon and having at one end said second mold member, bias means for biasing said arm to cause said first and second mold members to be pressed against

each other for providing said mold cavity, said second mold member being located between said first mold member and said discharge nozzle, and having a sprue communicating with said mold cavity,

(d) means on said base for acting on the other end of said mold holder to pivotally move the mold holder into a position in which said second mold meber is pressed against said first mold member and is in contact with said



discharge nozzle with said sprue in communication with said orifice, said means including locking means for locking said mold holder in said position; and

(e) said mold having a clearance space communicating with said mold cavity and a slot communicating with said clearance space and with said mold cavity, said clearance space and slot being provided jointed by said first and second mold members and opening to the exterior of said mold.

4,235,585

PROCESS AND COMPOSITION FOR NEUTRALIZATION OF ACIDIC COMBUSTION PRODUCTS AND FOR BOILER CLEANING

Hans Christian M. Anderson, 13 Nylandsalle, Horsens, Denmark (8700)

Filed Mar. 5, 1979, Ser. No. 17,273

Claims priority, application Denmark, Mar. 3, 1978, 3637/78

Int. Cl.³ F23J *7/00*

U.S. Cl. 431—3 **7 Claims**

1. A process for the total or partial neutralization of the acidic combustion products formed by combustion of sulphur-containing fuel by continuously injecting basic substances in the combustion zone, characterized by performing a continuous injection of following compounds:

(a) sodium or potassium nitrate

(b) ammonium nitrate

(c) magnesium carbonate and/or calcium hydroxide

(d) carbon

(e) ammonium carbonate.

4,235,586

GAS IGNITION CONTROL

James A. Hirsch, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jun. 20, 1978, Ser. No. 917,235

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—71 **7 Claims**

1. An apparatus for automatic fuel ignition consisting essentially of:

(a) A resistance type electrically operated fuel ignition means which reaches a temperature above the ignition temperature of the fuel when a first range of electrical current from an electrical source passes through the ignition means;

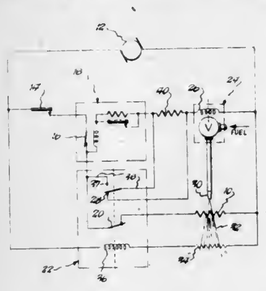
(b) A valve means which allows passage of fuel to the ignition means, when the valve means is opened;

(c) A first valve control means connected to the valve means which will open said valve upon application of a second range of electrical current from said electrical source;

(d) A second valve control means connected to the valve means which will retain said valve in an open position upon the application of said second range of electrical current from said electrical source but will not initially open said valve upon application of said second range of electrical current;

(e) An activating switch electrically connected between said first and second valve control means and said electrical source and between said ignition means and said electrical source so that neither said valve means nor said ignition means will operate unless said activating switch is closed, said activating switch initially connecting said first valve control means to said second range of electrical current;

(f) A time delay switch means electrically connected between said electrical source and said first and second valve control means and electrically connected to an ignition sensing switch means, said time delay switch means stopping the flow of electrical current to said first and second valve control means after a time delay if said ignition sensing switch means does not sense that fuel ignition is taking place within said time delay;



(g) An ignition sensor which senses that fuel ignition is taking place;

(h) Said ignition sensing switch means being responsive to the ignition sensor which ignition sensing switch means is electrically connected between said first and second valve control means and said electrical source and between said ignition means and said electrical source, which ignition sensing switch means, when said activating switch is closed, switches said electrical source from said first valve control means to said second valve control means after the ignition sensor senses that fuel ignition is taking place; which disconnects said ignition means from said electrical source after the ignition sensor senses that fuel ignition is taking place; which disconnects said time delay switch means from said electrical souce after the ignition sensor senses that fuel ignition is taking place; which re-connects said ignition means after the igniter sensor ceases to sense that fuel ignition is taking place; which re-connects said time delay switch means after the ignition sensor ceases to sense that fuel ignition is taking place; and which re-connects said first valve control means to said electrical source and said second range of electrical current through said time delay switch means after the ignition sensor ceases to sense that fuel ignition is taking place.

4,235,587

FLAME RESPONSIVE CONTROL CIRCUIT

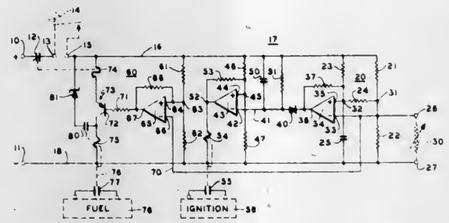
Gregory M. Miles, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 9, 1979, Ser. No. 27,964

Int. Cl.³ F23N *5/08*

U.S. Cl. 431—73 **14 Claims**

1. A flame responsive control circuit means adapted to be connected to flame responsive cell means to provide an improved, rapid response to the loss of a flame in burner means and to initiate ignition means upon said flame loss, including: rate of change sensing means having input means adapted to be connected to said cell means to respond to a change in the impedance of said cell means; said rate of change sensing means including amplifier means having output means connected to ignition control switch means; said rate of change sensing means being responsive to the application of an energizing potential to said control circuit means to cause said



control circuit means and said ignition control switch means to initiate the operation of said ignition means; said rate of change sensing means further responsive to a rate of change in the impedance of said flame responsive cell means to also initiate said ignition means upon said cell means being first exposed to a flame and subsequently changing impedance rapidly due to the loss of said flame; and fuel control means connected to initiate a supply of fuel to said burner means in response to an absolute potential at said cell means.

4,235,588

CIGARETTE LIGHTER UTILIZING CATALYST

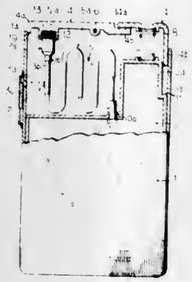
Noboru Tanaka, Tokyo, Japan, assignor to Tokyo Pipe Co., Ltd., Tokyo, Japan

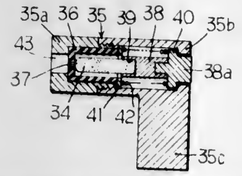
Filed Dec. 5, 1977, Ser. No. 857,087

Claims priority, application Japan, Jan. 13, 1977, 52/2743; Feb. 4, 1977, 52/11252

Int. Cl.³ F23Q *25/00*

U.S. Cl. 431—147 **11 Claims**





1. A fuel gas lighter of the type using a catalyst to elevate the temperature of at least a portion of the gas flow to ignition temperature comprising:

(a) fuel storage means in said lighter;

(b) a nozzle;

(c) control means for controlling the flow of fuel to said nozzle;

(d) conduit means for delivering the fuel from said control means to said nozzle;

(e) means in said conduit means for gasifying the fuel;

(f) said means for gasifying comprising at least one restricting and expanding means;

(g) suction means in said conduit means actuated by the flow of fuel therein for drawing in air and mixing said air and fuel together; and

(h) a catalyst mounted within said lighter

(i) means for passing at least part of said fuel and air mixture in contact with said catalyst whereby the temperature of the fuel and air mixture is raised to ignition temperature.

9. A fuel gas lighter of the type using a catalyst to elevate the temperature of at least a portion of the gas flow to ignition temperature comprising:

(a) fuel storage means in said lighter;

(b) a nozzle;

(c) control means for controlling the flow of fuel to said nozzle;

(d) conduit means for delivering the fuel from said control means to said nozzle;

(e) means in said conduit means for gasifying the fuel;

(f) suction means in said conduit means actuated by the flow of fuel therein for drawing in air and mixing said air and fuel together;

(g) a catalyst mounted within said lighter;

(h) means for passing at least part of said fuel and air mixture into contact with said catalyst whereby the temperature of the fuel and air mixture is raised to ignition temperature;

(i) a catalyst holder adjacent the end of said nozzle;

(j) resilient means for urging said catalyst into said catalyst holder and for retaining it enclosed therein, and

(k) means actuated by said control means for urging said catalyst at least partly out of said catalyst holder and into contact with the fuel and air mixture from said nozzle.

4,235,589

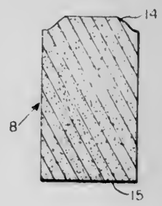
FLAME-LIMITING DEVICE FOR A GAS LIGHTER

Joseph J. Vallera, Melrose, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 27, 1979, Ser. No. 15,848

Int. Cl.³ F23D *13/04*

U.S. Cl. 431—344 **6 Claims**



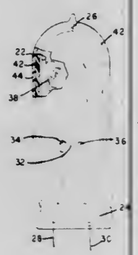
1. In a flame height limitation device for liquefied gas lighters including a noncompressible permeable plug through which the gas passes, said plug encased in fluid-tight relationship within a sleeve which is in contact solely with materials of low thermal conductivity, said plug and said sleeve having high thermal conductivity, the improvement which comprises: said permeable plug having a permeability which increases in the downstream direction.

4,235,590

TINTED UV CURED COATINGS FOR PHOTOFLASH LAMPS

John E. Tozier; John W. Shaffer, both of Williamsport, and William M. Williams, Montoursville, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 22, 1978, Ser. No. 972,196
Int. Cl.[3] F21K 5/00, 5/02
U.S. Cl. 431—360 9 Claims



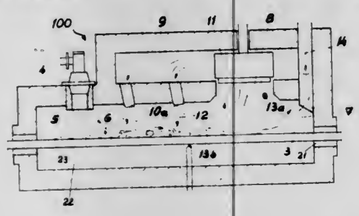
1. A color-corrected photoflash unit comprising, in combination, a flashlamp having a clear glass envelope and a transparent coating on the exterior surface of said envelope, said coating comprising a UV curable photopolymer tinted with a first colorant, and transparent means disposed between said tinted flashlamp coating and the exterior of said unit, said transparent means being tinted with a second colorant whereby said tinted transparent means has a substantially different absorption maxima than said tinted coating and complements the light-filtering capability of said tinted coating to provide the total color correction capability of said unit.

4,235,591

CONTINUOUS FLOW OVEN

Heinrich Aebli, Kreuzlingen, Switzerland, assignor to Gautschi Electro-Fours SA., Täegerwilen, Switzerland

Filed May 22, 1978, Ser. No. 908,244
Claims priority, application Switzerland, May 24, 1977, 6416/77
Int. Cl.[3] F27B 9/28
U.S. Cl. 432—8 8 Claims



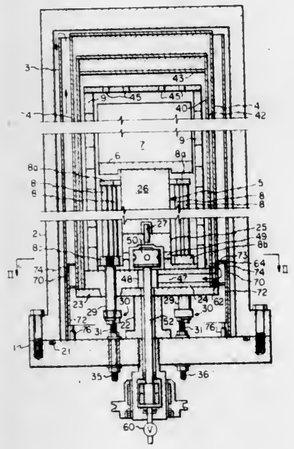
1. A continuous flow oven for heating materials comprising:
a. a heating chamber having a heating means disposed therein, an input opening, an exit opening and an exhaust port, said input opening being adapted to receive said materials which exit via said exit opening;
b. means for directly heating said material with the convection air currents from said heating means directed thereon;
c. blower means having intake and exhaust openings within said heating chamber, said blower intake sucking said convection air currents from said chamber and exhausting them under pressure; and
d. a pressure chamber cooperating with said blower exhaust opening and receiving said pressurized air currents, said pressure chamber being provided with a plurality of exhaust jets directed towards said material to be heated, said pressurized air currents mixing and interspersing with said convection air currents as it impinges upon said material.

4,235,592

AUTOCLAVE FURNACE WITH MECHANICAL CIRCULATION

Charles W. Smith, Jr., Fairview, and Franz X. Zimmerman, Erie, both of Pa., assignors to Autoclave Engineers, Inc., Erie, Pa.

Filed Aug. 29, 1979, Ser. No. 70,674
Int. Cl.[3] F27B 5/04
U.S. Cl. 432—205 4 Claims



1. An apparatus for gas pressure bonding, hot isostatic pressing or the like in which a workpiece may be treated at elevated temperatures and pressures, said apparatus comprising an elongate cylindrical pressure vessel for enclosing a furnace, a furnace bottom and an insulating hood resting upon the furnace bottom for enclosing the workpiece and a hearth upon which the workpiece rests, a cylindrical baffle positioned between the interior wall of the pressure vessel and the insulating hood, an elongate cylindrical refractory pedestal extending upward from the furnace bottom, said hearth set upon said refractory pedestal, a cylindrical heating element disposed about and substantially along the entire length of said pedestal below said hearth, a cylindrical shield disposed about the pedestal and heating element, said heat sheild extending up from the furnace bottom and above the hearth, said pedestal having an impeller chamber adjacent the base thereof with radial exhaust ports extending therefrom and an impeller positioned in said chamber having a downwardly extending drive shaft, and remotely actuatable damper means for directing the flow of the furnace atmosphere moving in response to the action of the impeller such that in a first position of the damper means flow is directed entirely within the furnace hood and in a second position flow is directed from the furnace interior to flow between the baffle and interior of the vessel wall prior to returning to the impeller.

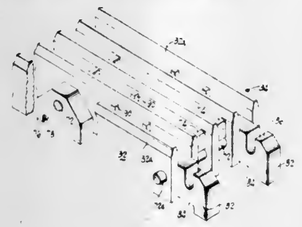
4,235,593

BLAST STOVE

William H. Malone, Northfield, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 27, 1979, Ser. No. 24,388
Int. Cl.[3] F27D 1/16
U.S. Cl. 432—217 29 Claims

25. In a blast furnace stove checker chamber having support girders and a grid bar structure comprising a plurality of grid bar assemblies located on said girders, each of said assemblies comprising:
(a) a plurality of grid bars extending transverse to said girders;
(b) transverse members fixed to said grid bars to maintain said bars in assembled spaced relation; and



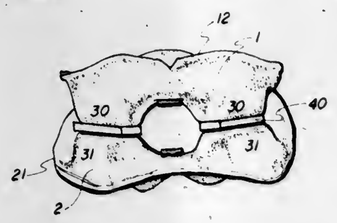
(c) co-engagement means for interlocking said assemblies to each other and to said girders, said means allowing controlled lateral movement within predetermined limits, between said assemblies and said girders.

4,235,594

PREFABRICATED BITE BLOCK STRUCTURE

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J. 07065

Filed Apr. 2, 1979, Ser. No. 25,856
Int. Cl.[3] A61C 19/04
U.S. Cl. 433—68 5 Claims



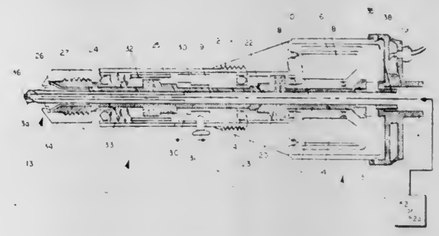
1. A prefabricated bite block structure comprising:
(a) a maxillary tray and a mandibular tray each having an inner and outer surface terminating at a flange portion, said trays formed from a heat-deformable material; the inner surface of the maxillary tray corresponding to the maxillary alveolar ridge and palate and adapted to be positioned on the maxillary alveolar ridge; the inner surface of the mandibular tray corresponding to the mandibular ridge, retromolar pad areas, mucobuccal fold area and mucolingual fold area and adapted to be positioned on the mandibular alveolar ridge; the outer surface of the maxillary and mandibular trays having protrusions terminating as flat, planar occlusal surfaces that correspond at least to the area occupied by the canines, premolar and first molars; the planar occlusal surface of the maxillary tray, when said tray is positioned on the maxillary alveolar ridge, being substantially parallel to the plane defined by the hammular notches and the center of the palatine papilla; and the planar occlusal surface of the mandibular tray when positioned on the mandibular alveolar ridge, being substantially parallel to the plane defined by the centers of the retromolar pads and point about 5 to 20 millimeters above the intersection of the mandible midline with the mucobuccal fold; and
(b) shim members adapted to be removably located on said occlusal surface of the maxillary and/or mandibular trays.

4,235,595

HANDPIECE WITH CONTINUOUS SHAFT AND BELL ROTOR

Richard E. Arnegger, Im Schooren, 8713 Uerikon ZH, Switzerland

Filed May 3, 1978, Ser. No. 902,375
Claims priority, application Switzerland, May 31, 1977, 6674/77
Int. Cl.[3] A61C 1/08; A61F 17/32, 5/04; B23B 5/22
U.S. Cl. 433—131 11 Claims



1. A surgical bone operation instrument with a straight shaft arranged coaxially in relation to the longitudinal axis of the instrument, which instrument is provided at the one end of a hand piece with a working unit and at the other end of the hand piece with a driving assembly, the driving assembly and the hand piece each having a tube-shaped shaft piece forming a part of said shaft, which shaft pieces are arranged coaxially with respect to the longitudinal axis of the tool and behind one another, and with their neighboring ends are coupled together, forming over their entire length including their ends a continuous channel which serves for the guidance of a means utilized in the operation of the instrument, said driving assembly being a bell-type electrical motor with the stator enclosed within the bell-shaped rotor, the latter comprising windings of lacquered wire embedded in a plastic material, said windings further being wound to form a hollow cylinder of relatively thin wall thickness to form a part of the bell-shaped rotor, the mechanical structure thereof being furthermore reinforced by glass fibers.

4,235,596

PROCESS FOR THE PAD-DYEING AND PRINTING OF TEXTILE MATERIAL MADE FROM MIXED FIBRES OF CELLULOSE AND POLYESTER

Andres Schaub, Biel; Paul Dussy; Peter Aeschlimann, both of Basel, and Stefan Koller, Ramlinsburg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 752,591, Dec. 20, 1976, abandoned. This application Nov. 24, 1978, Ser. No. 963,498

Claims priority, application Switzerland, Dec. 23, 1975, 16698/75

Int. Cl.[1] **D06P** *1/382, 3/85, 5/02;* **C09B** *65/00*

U.S. Cl. 8—456 **16 Claims**

1. A process for pad-dyeing or printing textile material comprised of cellulose and polyester fibers, comprising the steps of applying to the textile material a dispersion of a disperse dyestuff having an alkylatable hetero atom of oxygen, sulfur or nitrogen; applying to the textile material a compound having at least two epoxide groups or groups convertible to epoxide groups; and finally heating the textile material sufficiently to bring about alkylation of the dyestuff oxygen, sulfur or nitrogen atom by the epoxide compound; wherein the process is carried out in the absence of alkali, urea, thiourea, whereby both the cellulose fibers and the polyester fibers of the textile material are dyed in a level, tone-in-tone shade.

4,235,597

GRANULES OF TEXTILE PROCESSING AGENTS FOR USE IN ORGANIC SOLVENT LIQUORS

Gerhard Reinert, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,708

Claims priority, application Switzerland, Nov. 27, 1975, 15393/75

Int. Cl.[1] **C09B** *67/02, 67/10;* **C09K** *11/02;* **C08L** *91/06*

U.S. Cl. 8—526 **9 Claims**

1. Non-dusty, free-flowing granules of optical brightener for solvent application, said granules containing an optical brightener, alone or together with a dispersing agent or auxiliary, dissolved in a melt of an organic carrier which is solid at room temperature, soluble in halogenated hydrocarbon and immiscible in water, selected from the group consisting of montan waxes, fatty acids and fatty acid amides, fatty alcohols of at least 12 carbon atoms and its ether derivatives thereof, paraffins, phthalic acid dicyclohexylester, phthalic acid monobenzyl ester, terephthalic acid dimethylester, polyacrylates, polymethacrylates and polyethylene waxes, said granules produced by

(1) dissolving said optical brightener of finishing agent, alone or together with said dispersing agent or auxiliary, in said melt of organic carrier.

(2) emulsifying said melt in water which is at a temperature of at least 90° C. with the aid of an emulsifier.

(3) cooling the resulting emulsion with stirring, to produce a dispersion of said non-dusty, free flowing granules, in the aqueous emulsifying liquid, and

(4) separating said non-dusty, free flowing granules from said aqueous emulsifying liquid.

4,235,598

AZO DYESTUFFS CONTAINING A NAPHTHALIC IMIDE COUPLER AND POLYETHER GROUPS

Henning Reel, Cologne; Winfried Kruckenberg, and Karl H. Schüadehütte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

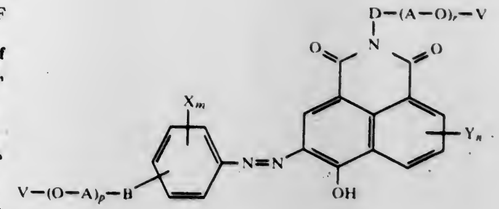
Filed Oct. 27, 1978, Ser. No. 955,360

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748720

Int. Cl.[3] **C09B** *29/36;* **D06P** *1/04, 1/18, 3/54*

U.S. Cl. 8—584 **4 Claims**

1. An azo dyestuff having a melting point below 160° and of the formula



wherein

A is $-(CH_2)_2-$, $-(CH_2)_3-$ or $-C(CH_3)H-CH_2-$,

B is —OOC— or NQCO,

D is a direct bond, $-CH_2-$ or —O—,

V and Q each independently is hydrogen or C_{1-4}-alkyl,

X and Y each independently is $-CH_3$, —Cl, —Br, $-OCH_3$, —CN or $-NO_2$,

m is 0 or 1,

n is an integer from 0 to 3

p is 0 or a positive integer,

r is 2, 3 ,4, and

p+r is from 4 to 9.

4. A dyestuff formulation comprising a dyestuff according to claim 1 and an emulsifying polar/non-polar compound of the formula

G—L

wherein

G is an aliphatic hydrocarbon radical with at least 10 carbon atoms, and

L is $-SO_3H$, $-O-SO_3H$, $-OPO_3H_2$ or a salt thereof.

4,235,599

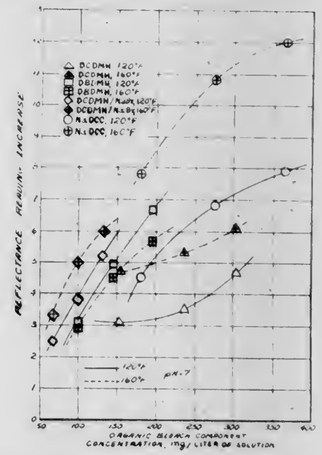
BLEACHING COMPOSITION

Thomas B. Davis, Cos Cob, and Theodore A. Girard, Bridgeport, both of Conn., assignors to Glyco Chemicals, Inc., Greenwich, Conn.

Filed May 30, 1978, Ser. No. 911,190

Int. Cl.[2] **D06L** *3/06*

U.S. Cl. 8—108 R **6 Claims**



1. A method for the effective bleaching of textile goods at temperatures in the range of 100° to 140° F. which consists essentially in exposing the same to an aqueous solution, at said temperatures, containing a mixture consisting essentially of 25 to 75 parts by weight of N,N-dichloro-5,5-dilower alkyl hy-

dantoin and from 75 to 25 parts by weight of an alkali metal, alkaline earth metal or ammonium bromide salt, said dilower alkyl containing up to 8 carbons.

4,235,600

METHOD OF AND APPARATUS FOR DECONTAMINATING RADIOACTIVE GARMENTS

Joseph A. Capella, Gainesville, Fla., and Dennis R. Morrison, Kemah, Tex., assignors to Health Physics Systems, Inc., Gainsville, Fla.

Filed Nov. 9, 1978, Ser. No. 959,009
Int. Cl.[2] B08B *3/00*
U.S. Cl. 8—137 **14 Claims**

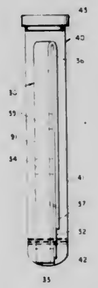
1. A method of decontaminating radioactive garments, comprising the steps of:
depositing contaminated garments in a cleaning drum;
agitating the drum during a wash cycle to separate radioactive particulate material from the garments;
continuously removing a dry cleaning solvent from the drum during the wash cycle for storage in a sump;
continuously pumping solvent from the sump to the drum during the wash cycle for flushing the separated radioactive particulate material into the sump; and
filtering the pumped solvent to remove the radioactive particulate material suspended in the solvent prior to addition to the drum.

4,235,601

TEST DEVICE AND METHOD FOR ITS USE

Marshall E. Deutsch, Sudbury, and Louis W. Mead, Lexington, both of Mass., assignors to Thyroid Diagnostics, Inc., Bedford, Mass.

Continuation of Ser. No. 887,886, Mar. 20, 1978, abandoned, which is a division of Ser. No. 701,762, Jul. 2, 1976, Pat. No. 4,094,647. This application Jan. 12, 1979, Ser. No. 3,076
The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.
Int. Cl.[2] G01N *31/06, 31/22, 33/16*
U.S. Cl. 23—230 R **3 Claims**



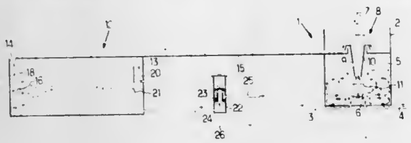
1. A method of determining a characteristic of a sample comprising the steps of:
(a) providing a strip element composed of a material capable of transporting a developing liquid therealong by capillarity having a beginning end portion and a terminal end portion and having a plurality of zones positioned between said beginning and terminal end portions, a first zone for receiving said sample, a portion of said sample capable of being moved along said strip by said developing liquid, a second zone having a first reagent incorporated therein, and capable of being moved along said strip by said developing liquid, a third zone having a second reagent incorporated therein, said second reagent capable of interacting with said first reagent to form a product and a measuring location at or downstream of said third zone, said measuring location being spaced upstream of said terminal end portion a distance preselected to assure that, when transport of said developing liquid along the strip element is terminated by the leading front thereof reaching said terminal end portion, substantial separation of said product and said first reagent has occurred at said measuring location, the amount of said product and of said separated first reagent being related to the amount of said sample characteristic;
(b) depositing the sample on said first zone;
(c) immersing the beginning end portion of the strip element in the developing liquid; and
(d) measuring the characteristic to be determined, when liquid transport is terminated, by detecting the presence of said product or said separated first reagent at said measuring location.

4,235,602

INSTALLATION FOR MIXING AND SEPARATING TWO NON-MISCIBLE LIQUIDS, INTER ALIA FOR LIQUID-LIQUID EXTRACTION

Maurice Meyer, Chaville, and Heinrich Stucki, Neuilly-sur-Seine, both of France, assignors to Krebs & Cie, Paris, France

Continuation of Ser. No. 777,290, Mar. 11, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,578
Claims priority, application France, Mar. 11, 1976, 76 07002; Mar. 12, 1976, 76 07076
Int. Cl.[1] B01D *11/04*
U.S. Cl. 23—293 R **13 Claims**



10 A method of mixing and separating two non-miscible liquids, comprising the steps of:
(a) separately supplying a tank with the two liquids to fill said tank to a first, lower level;
(b) mixing said liquids in the tank to provide a dispersed mixture thereof;
(c) pumping the liquid mixture with low turbulence from said first, lower level to a second, upper level, said pumping step including the step of restraining the turbulence of the mixture at the inlet to the pump by constraining the mixture to flow into the pump in a generally horizontal direction;
(d) conveying the liquid mixture from said upper level along a generally horizontal, elongated path to the inlet of a decanting tank, said inlet being located at the end of said decanting tank remote from said mixing tank;
(e) decanting said liquid mixture in the decanting tank, while the mixture flows towards said mixing tank at a free level intermediate in height to said first and second levels; and
(f) separating said two liquids by separately withdrawing said liquids from the decanting tank at the end thereof adjacent said mixing tank.

4,235,603

SOLVENT PRETREATMENT OF FEED COAL FOR BRIQUETTING

Michael R. Miller, and David M. Martin, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Anr. 26, 1979, Ser. No. 33,473
Int. Cl.[3] C10L *5/08*
U.S. Cl. 44—10 R **13 Claims**

1. A method of preparing briquettes which contain no added binder material but which have weatherability superior to added binder containing briquettes, when compared at conventional binder addition levels, the method comprising,
pretreating coal fines with an organic solvent for a period of time sufficient to allow interaction between said coal fines and said solvent, and
removing substantially all of said solvent from said solvent treated coal fines, and
briquetting said coal fines to provide coal briquettes which contained no added binder material.

10. The process of claim 1 wherein said organic solvent is a lower ketone.

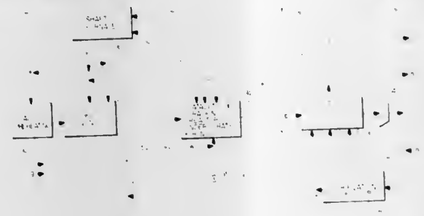
11. The process of claim 10 wherein said solvent is acetone.

4,235,604

METHOD FOR PROCESSING COKE OVEN GAS

Dietrich Wagener; Claus Flockenhaus, both of Essen, and Joachim F. Meckel, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,725
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659782
Int. Cl.[1] C10K *1/34*; C01B *3/38*
U.S. Cl. 48—197 R **12 Claims**



1. A method for producing a cracked gas suitable for use as a reduction gas, said method comprising:
introducing coal into a coal preheating installation and therein preheating said coal to a temperature of approximately 200° C.;
introducing the thus preheated coal into coke ovens and therein producing coke and generating coke oven gas;
discharging said coke oven gas from said coke ovens; and
subjecting said coke oven gas, immediately after the discharge thereof from said coke ovens, and without any preliminary cooling operation or any purification operation other than desulfurization, to a catalytic cracking operation at a reaction temperature of from 600° to 1200° C. and at a pressure of from 0 to 30 bar in the presence of steam and/or CO_2-containing gas, by passing said coke oven gas into a catalytic reactor containing a steam reforming catalyst, and thereby forming a hot cracked gas rich in hydrogen and carbon monoxide and suitable for use as a reduction gas in a reducing operation.

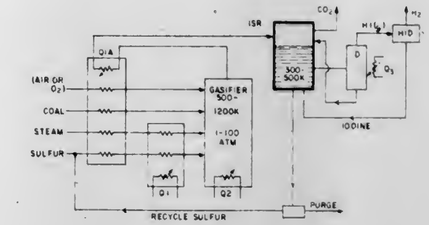
4,235,605

SYNTHESIZING GAS FROM COAL VIA SYNERGETIC REACTIONS WITH STEAM AND SULFUR

Chi S. Kim, Cambridge, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed Jan. 29, 1979, Ser. No. 7,344
Int. Cl.[1] C10J *3/00*
U.S. Cl. 48—202 **6 Claims**

1. Coal gasification process comprising the reaction of feedstocks consisting essentially of steam, coal and elemental sulfur to produce carbon monoxide and hydrogen sulfide, the reaction being carried out at 500°-1500° K. and under relative concentration and supply rates of feedstocks such that the mole ratio of $C:H_2O:S$ shall be in the range of 1:1:0.5 to 0.5:1:1 to produce carbon monoxide and hydrogen sulfide.

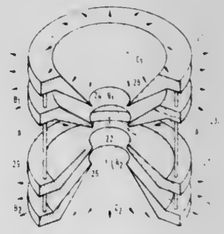


4,235,606

SEPARATION OF GASEOUS OR VAPOROUS SUBSTANCES ACCORDING TO THE SEPARATING NOZZLE PRINCIPLE

Erwin-Willy Becker, Karlsruhe; Peter Bley, Eggenstein-Leopoldshafen; Wolfgang Ehrfeld; Ursula Ehrfeld, both of Ettlingen, and Gunther Krieg, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,217
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1978, 2801923
Int. Cl.[2] B01D *59/18*
U.S. Cl. 55—17 **12 Claims**



1. In a method for separating a gaseous or vaporous mixture into components having different molecular weights and/or different gas kinetically effective cross sections by conducting the mixture through a nozzle into a separating chamber and deflecting the mixture in the chamber by mutual jet deflection, dividing the deflected mixture into partial streams having respectively different densities by means of at least one separating baffle which protrudes into the mixture flow path, and separately removing the partial streams, the improvement wherein said step of conducting is carried out by distributing the mixture substantially uniformly around the axis of the separating chamber and feeding the mixture into the chamber from all sides thereof in radial directions along a plane and said step of removing includes causing at least the lightest partial stream to flow radially out of the separating chamber substantially uniformly around the axis of the separating chamber and in a plane approximately parallel with the plane along which the mixture is fed into the separating chamber.

8. In apparatus for separating a gaseous or vaporous mixture into components having different molecular weights and/or different gas kinetically effective cross sections and including at least one nozzle element including a nozzle through which a stream of the mixture is conducted, a separating chamber which the mixture enters after passing through the nozzle and in which the mixture stream is deflected by mutual jet deflec-

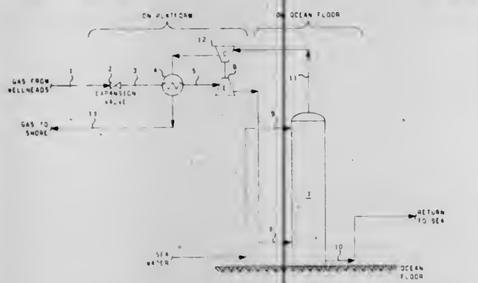
tion, and at least one separating baffle which protrudes into the mixture flow path in the chamber for dividing the deflected mixture into partial streams having respectively different densities, and means for separately removing the partial streams, the improvement wherein said nozzle element comprises four aligned discs spaced from one another and each provided with a bore for passage of the mixture stream, the bores in said discs being in mutual alignment and delimiting said separating chamber, and means for distributing the mixture substantially uniformly around the axis of said separating chamber for enabling the mixture to be fed into said chamber from all sides thereof in radial directions along a plane, and said discs are arranged for causing at least the lightest partial stream to flow radially out of said separating chamber substantially uniformly around the axis of said separating chamber and in a plane approximately parallel with the plane along which the mixture is fed into said separating chamber.

4,235,607

METHOD AND APPARATUS FOR THE SELECTIVE ABSORPTION OF GASES

Richard A. Kinder, and Fred T. Sherk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 19, 1979, Ser. No. 4,796
Int. Cl.[3] B01D *19/00*
U.S. Cl. 55—68 **13 Claims**



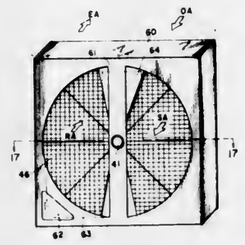
1. A method for removing CO_2 from a gas comprising natural gas and CO_2, said method comprising the steps of:
- obtaining said gas from a wellhead,
- introducing sea water from near the ocean floor into the upper portion of a contacting zone located on the ocean floor wherein said contacting zone contains a plurality of compartments known as absorber stages,
- introducing said gas from said expansion valve into the lower portion of said contacting zone,
- contacting said sea water with the gas in each adsorber stage wherein the gas and sea water flow cocurrently upward through the stage,
- accumulating the gas in the top of the stage and passing it to a dispersing means in the lower portion of the compartment above whereby the gas is dispersed therein,
- allowing the sea water, which has flowed cocurrently upward to the top of the stage, to flow downwardly via a passage means and enter the lower stage at a point below the dispersing means of said compartment,
- withdrawing the CO_2-enriched sea water from a point near the lower end of said contacting zone, and
- recovering natural gas from the upper portion of said contacting zone.

4,235,608

ROTARY-TYPE COUNTER-CURRENT HEAT EXCHANGER

Hiroshi Watanabe, Fujiyoshida; Ryushi Aoyama, Urawa; Yasuhira Hironaka, Funabashi, and Hanji Oana, Iruma, all of Japan, assignors to ABC Trading Co., Ltd., Japan

Filed Sep. 5, 1978, Ser. No. 939,280
Claims priority, application Japan, Sep. 9, 1977, 52-108591; Sep. 9, 1977, 52-108592; Sep. 21, 1977, 52-127121
Int. Cl.[3] B01D *53/14*
U.S. Cl. 55—181 **8 Claims**



1. A heat exchanger element for use in a rotary-type counter-current heat exchanger comprising: a gathering member, said gathering member being composed of coconut fiber having a diameter equal to between about 0.1 and 0.4 millimeter.

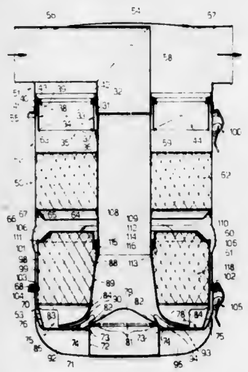
3. A rotary-type counter-current heat exchanger comprising: a casing; a rotary frame rotatably supported by said casing, said rotary frame including a shaft, a pair of rotor rims maintaining a predetermined distance in an axial direction of said shaft and a plurality or rotor spokes, one end of each rotor spoke being fixed to said shaft and the other end thereof being fixed to said pair of rotor rims, and a heat-exchanging element accommodated in said rotary frame, said heat exchanging element consisting of a gathering member, said gathering member being composed of coconut fiber having a diameter equal to between about 0.1 and 0.4 millimeter.

4,235,609

OIL BATH AIR CLEANER

Alberto Garigioli, Pisa, Italy, assignor to Whitehead Motofides S.p.A., Livorno, Italy

Filed Nov. 9, 1978, Ser. No. 959,205
Claims priority, application Italy, Nov. 10, 1977, 69520 A/77
Int. Cl.[3] B01D *47/02, 47/10*
U.S. Cl. 55—226 **18 Claims**



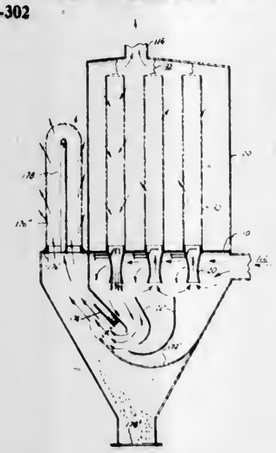
1. An air cleaner for internal combustion engines said air cleaner being of the type having a casing having an air inlet and an air outlet, said casing having an outer wall which defines an inner housing chamber, a pool of liquid in the bottom of the casing, fluid passageway means connected at one end to said inlet and open at its other end to said pool; and a first filter cartridge constructed of wool or metal mesh positioned between said pool of liquid and said outlet so that air flow from said inlet and through said fluid passageway means passes into contact with said pool of liquid and then through said first filter cartridge, said cleaner further comprising:
- a second filter cartridge of relatively small height disposed between said first filter cartridge and said outlet, said second filter cartridge being constructed of paper;
- said fluid passageway means further comprising first means to provide a substantially constant ratio between the quantity of air passing through said fluid passageway means and the quantity of liquid associated with the air during its passage, said first means comprising a tubular member having a plurality of spaces, said spaces being at least partially immersed in said liquid;
- means for exerting a centrifugal action on the air leaving said first filter cartridge;
- means for creating a relatively calm region adjacent the outer wall of the casing, said last mentioned means being disposed in said housing chamber between said centrifugal means and said outlet and comprising an annular baffle fixed to the outer wall of the casing and further comprising an enlarged portion of the outer wall of the casing of said cleaner, said enlarged portion of the wall extending from said centrifugal means and toward said outlet;
- passage means for fluidly connecting said calm region with said pool of liquid; and
- wherein increases and decreases in air pressure within said tubular member effects a lowering and raising, respectively, of the level of liquid in which said spaces are immersed.

4,235,610

APPARATUS IN THE FABRIC FILTER CONTROL OF AIR POLLUTION

Kenneth L. Richard, Lake Toxaway, N.C., assignor to York-Shipley, Inc., York, Pa.

Continuation-in-part of Ser. No. 826,824, Aug. 22, 1977, abandoned. This application May 22, 1978, Ser. No. 908,443
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 **7 Claims**



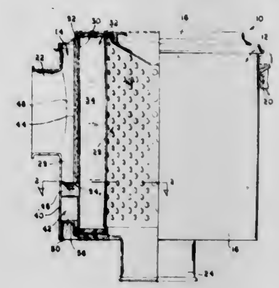
1. A filter apparatus for separating solid particulate matter from gases and permitting selective cleaning of groups of the filter elements while others remain on stream comprising:
- a housing having a horizontal partition therein to define upper and lower compartments for clean and dirty gases respectively;
- a plurality of venturis mounted through and supported by said partition communicating said upper and lower compartments therethrough;
- an equal number of porous filter bags vertically supported within said upper compartment, the lower open end of each bag being closed around the upper end of one of said venturis respectively;
- inlet means opening into said lower compartment for admission of particulate laden gases to be cleaned;
- outlet means at the upper end of said upper compartment for release of cleaned gases;
- particulate removal means at the lower end of said lower compartment;
- a plurality of jet nozzles one downwardly directed in each of said venturis respectively;
- means for selectively supplying groups of said nozzles with bursts of high pressure gas to induce a high velocity reverse flow of clean gas from said clean compartment inwardly through the associated bags to thereby remove the filtrate from the interior surfaces thereof and convey it toward the bottom of said dirty compartment while the other venturis remain on stream; and
- plural fixed vane means in said lower compartment positioned below the level of said inlet means to direct filtrate cleaned from said bags away from the lower end of all of said venturis and inlet gas flow stream and toward said particulate removal means in order to prevent reentrainment of filtrate into those venturis which remain on stream during the cleaning process.

4,235,611

AIR FILTER

Peter Brownell, Exeter, R.I., assignor to Fram Corporation, East Providence, R.I.

Filed Apr. 23, 1979, Ser. No. 32,084
Int. Cl.[3] B01D *50/00*
U.S. Cl. 55—309 **6 Claims**



1. In an air filter, a housing defining a chamber therewithin, an annular filter cartridge in said chamber having a circumferentially extending permeable outer wall cooperating with the wall of the housing to define an annular inlet compartment therebetween within said chamber, inlet means for communicating air into said inlet compartment, said annular filter cartridge defining an outlet compartment, outlet means for communicating air from said outlet compartment after the air has passed through said filter cartridge, means in said inlet compartment circumscribing said permeable outer wall of said cartridge and extending transversely across said inlet chamber between the wall of the housing and said permeable outer wall for inducing a spiral flow component to at least a portion of the air communicated through said inlet and dividing said inlet compartment into one section upstream from said spiral flow inducing means and another section downstream from said spiral flow inducing means, said inlet communicating with said upstream section, said filter cartridge including a first filtering medium for filtering larger particles from the air communicated to said housing and a second filtering medium separate

from said filtering medium for filtering finer particles from the air communicated to said housing, said second filtering medium being carried on said permeable outer wall of said filter cartridge, said upstream section and said first and second filtering media defining a first flow path between said inlet and outlet, said upstream section, said spiral flow inducing means, said downstream section, and at least one of said filtering media defining a second flow path between said inlet and outlet in parallel with said first flow path.

4,235,612

DEVICE FOR SEPARATING GASEOUS MIXTURES

Hans O. E. Gazda, Anton Kriegergasse 155, A-1238 Wien, Austria

Filed Mar. 16, 1978, Ser. No. 887,360
Int. Cl.[2] B01D 59/20
U.S. Cl. 55—403 **4 Claims**



1. A centrifugal apparatus for the separation of a gaseous mixture into a light component and a heavy component, comprising:

a plurality of disks connected to a common hollow shaft which is in communication with the centrifugal separator's gaseous mixture inlet and rotatable at high speed about a common axis, each of said disks having a central supply region at said axis, a radial passage extending outwardly from said supply region and including a first nozzle orifice having a constriction, a chamber radially outwardly of said first nozzle orifice and communicating therewith while being of larger cross section than said nozzle orifice, another radial passage in flow communication with said chamber opposite said nozzle orifice and including a second nozzle orifice having a constriction whereby a heavy fraction from a gas mixture is led through said second nozzle orifice, a heavy-fraction delivery passage communicating with said second chamber substantially centrally thereof, and respective light-fraction delivery passages communicating with each of the chambers of the respective disks to opposite sides of said nozzle orifices and said heavy-fraction delivery passage;

first conduit means connected to the heavy-fraction delivery passage of one of said disks; and

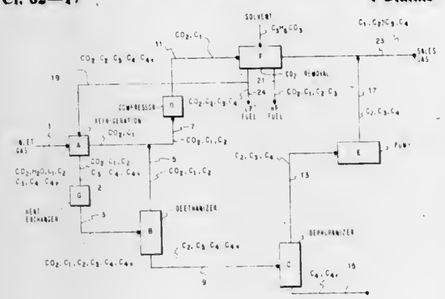
second conduit means connected to the light-fraction delivery passages of said one of said disks, one of said first and second conduit means being positioned and arranged so as to discharge the respective fraction into the supply region of another of said disks.

4,235,613

PREPARATION OF SALES GAS

Alonzo R. Castoe, Irving, Tex., and Jan W. Bass, Monrovia, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 918,183, Jun. 22, 1978, abandoned. This application May 29, 1979, Ser. No. 43,578
Int. Cl.[3] F25J 3/02
U.S. Cl. 62—17 **4 Claims**



1. A method for preparing a wet gas stream of high carbon dioxide, methane, ethane and propane content containing heavier hydrocarbons to meet specifications, which comprises in combination the steps of:

(a) cooling said gas stream to split same into a liquid portion of predominantly ethane, propane, butane and heavier hydrocarbons and a gaseous portion of predominantly methane and carbon dioxide;

(b) fractionating said liquid portion from (a) to yield a gaseous portion of predominantly methane and carbon dioxide and a liquid portion of predominantly ethane, propane, butane and heavier hydrocarbons;

(c) fractionating said liquid portion from (b) to yield a gaseous portion of predominantly ethane, propane, and butane and a liquid portion of predominantly heavier hydrocarbons;

(d) combining the gaseous portion of (a) and (b) and contacting same with at least one physical solvent which has greater absorbing affinity for carbon dioxide and heavier hydrocarbons than methane, ethane, propane, and butane;

(e) recovering the gaseous hydrocarbons not sorbed by the physical solvent in (d);

(f) combining the gaseous portion of (c) with the recovered gaseous hydrocarbons of (e) to provide a sales gas which meets specifications; and

(g) recovering said sorbed hydrocarbons in (d) from said physical solvent and recycling a portion of same to step (a).

4,235,614

METHOD AND DEVICE FOR THE MANUFACTURE OF GLASS FILAMENTS

Fredo E. L. Schlachter, Johannesberg, Fed. Rep. of Germany, assignor to Glaswerk Schuller GmbH, Wertheim Main, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,067
Int. Cl.[3] C03B 37/02
U.S. Cl. 65—2 **17 Claims**

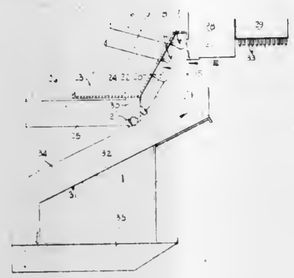
1. A method of making continuous glass filaments, comprising:

(a) drawing filaments from a bushing into a fiberization zone,

(b) introducing a pressurized gas and a liquid into tubes proximate an area exposed to heat radiating from said bushing and fiberization zone in order to form a gas/liquid mixture which promotes the drawing and/or treatment of said filaments,

(c) conducting said mixture at increasing distances from the proximity of the most intensely heated area exposed to radiant heat emanating from said bushing and said fiberization zone,

(d) conducting said mixture from said tubes to a fluid distributor, and



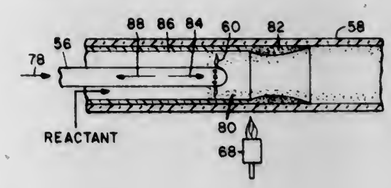
(e) blowing said mixure from said distributor into said fiberization zone.

providing a hollow cylindrical substrate,

disposing within said hollow cylindrical substrate, and substantially along the longitudinal axis thereof, a burner having a substantially radial flame,

flowing a vapor mixture including at least one compound, glass-forming precursor, together with an oxidizing medium through said hollow cylindrical substrate surrounding said burner,

heating said substrate and said vapor mixture by means of said burner flame, whereby a hot zone is established within the interior of said hollow substrate such that said



vapor mixture and oxidizing medium is reacted to produce a suspension of particulate material, and

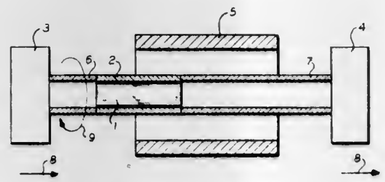
traversing said burner with respect to said substrate along the longitudinal axis of said substrate, whereby said hot zone is caused to move along the length of said substrate, at least a portion of said particulate material travels downstream where at least a portion thereof comes to rest on the inner surface of said substrate to subsequently form a continuous glassy deposit on the inner surface thereof, the remainder of said particulate material being exhausted from the other end of said substrate.

4,235,615

METHOD FOR THE PRODUCTION OF SEMIPRODUCT FOR THE PRODUCTION OF LIGHT CONDUCTING FIBERS

Karlheinz Rau, Hanau; Albert Mühlich, Frankfurt; Fritz Simmat, Gelnhausen, and Norbert Treber, Kriftel, all of Fed. Rep. of Germany, assignors to Heraeus Quartzschmelze GmbH, Hanau, Fed. Rep. of Germany

Division of Ser. No. 713,479, Aug. 11, 1976, Pat. No. 4,165,915. This application Feb. 9, 1979, Ser. No. 11,267
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536456
Int. Cl.[3] C03C 25/02
U.S. Cl. 65—3 C **10 Claims**



1. A process for preparing a semiproduct for use in the manufacture of light conducting fibers which process comprises disposing within the hollow of a synthetic quartz glass cylinder having less than 10 ppm of hydroxyl ions and more than 4,000 ppm of fluorine ions whose inside and outside surfaces have been ground, a core of an exteriorly ground solid cylinder of synthetic quartz glass containing less than 10 ppm of hydroxyl ions and having an optical loss total, in the near infrared spectral range, of less than 4 dB/km, measured in the mass, fusing said cylinder to said core and drawing the fusion product into a semiproduct having a diameter of more than 8 mm but less than 60 mm.

4,235,616

OPTICAL WAVEGUIDE MANUFACTURING PROCESS AND ARTICLE

Robert W. Siegfried, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 14, 1979, Ser. No. 38,775
Int. Cl.[3] C03D 25/02
U.S. Cl. 65—3 A **17 Claims**

1. A method of manufacturing an optical device comprising the steps of

4,235,617

FABRICATION OF ROTARY HEAT EXCHANGERS MADE OF MAGNESIUM ALUMINUM SILICATE GLASS-CERAMIC

V. Durga N. Rao, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 5, 1979, Ser. No. 17,292
Int. Cl.[3] C03B 19/06, 32/00
U.S. Cl. 65—18 **5 Claims**



1. A method for preparing a glass ceramic heat exchanger core comprising the steps of producing a glass frit and combining the glass frit with a thermoplastic block polymer binder; the formation of the glass frit comprising the steps of melting a cordierite base glass composition, drawing the glass for a holding period between one-half hour and two hours duration in a temperature range between 2,100° F. and 1,500° F. during which time a substantial portion of the glass is transformed to the crystalline state, and quenching the pre-crystallized glass thereby producing stresses in the glass particles that are severe

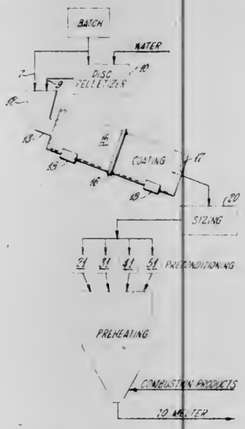
enough to shatter the glass into tiny fragments and to produce numerous cracks in the crystalline phase; grinding the frit with a high energy ball mill to produce a powder, firing the polymer and glass crystal powder structure, rolling the mixture into a ribbed tape and winding the ribbed tape to form a cylindrical structure; the firing cycle comprising heating the binder-powder structure at a temperature of about 1,000° F. to 1,100° F. to achieve binder burn-off, heating the structure after binder burn-off to a temperature range of 1,400° F. to 1,700° F. at which time nucleation and crystal growth takes place and sintering the structure at a higher temperature range between 2,000° F. and 2,500° F. whereby high energy crystal-crystal interface surfaces of the ground crystal particles become bonded by the nucleation of fresh crystals that grow into the interface.

4,235,618

GLASS MANUFACTURING PROCESS EMPLOYING GLASS BATCH PELLETS

Richard K. Henry, Newark; Stephen Seng, Frazeysburg; Charles M. Hohman, Granville, and Mark A. Propster, Gahanna, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 19, 1979, Ser. No. 31,290
Int. Cl.³ C03B 1/00
U.S. Cl. 65—21 **7 Claims**



1. In a process for drying and preheating free water-containing, hydrologically unstable glass batch pellets comprising combining glass batch ingredients and water on a rotary disc pelletizer so as to form pellets, heating said pellets in a bed so as to form heated dry pellets and melting said pellets, the improvement comprising coating the surface of said pellets, prior to heating, by combining said pellets and dry glass batch ingredients having substantially the same glass composition as the batch ingredients used to form said pellets with a tumbling motion in a rotary drum so as to form a substantially uniform surface coating on said pellets.

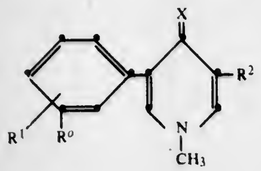
4,235,619

METHOD OF CONTROLLING AQUATIC WEEDS AND ALGAE

Harold M. Taylor, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

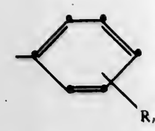
Continuation-in-part of Ser. No. 810,219, Jun. 27, 1977, Pat. No. 4,152,136, which is a continuation-in-part of Ser. No. 591,661, Jul. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 501,424, Aug. 28, 1974, abandoned. This application Mar. 19, 1979, Ser. No. 21,670
Int. Cl.³ A01N 43/40
U.S. Cl. 71—66 **44 Claims**

1. A method of reducing the vigor of aquatic weeds or algae which comprises applying to water infested with or likely to be infested with such weeds or algae an herbicidally or algicidally effective amount of a compond of the formula



wherein
X represents oxygen or sulfur;
R^o represents halo,
C_1-C_4 alkyl,
C_1-C_4 alkyl substituted with halo,
C_1-C_4 alkyl monosubstituted with phenyl, cyano or C_1-C_3 alkoxy,
C_2-C_4 alkenyl,
C_3-C_6 cycloalkyl,
C_4-C_8 cycloalkylalkyl,
C_1-C_3 alkanoyloxy,
phenyl,
nitro,
hydroxy,
C_1-C_3 alkoxycarbonyl,
—O—R^3,
—S—R^3, or
—SO—R^3;
R^3 represents C_1-C_4 alkyl,
C_1-C_4 alkyl substituted with halo,
C_1-C_4 alkyl monosubstituted with phenyl, cyano or C_1-C_3 alkoxy,
phenyl,
phenyl monosubstituted with halo, C_1-C_3 alkyl, C_1-C_3 alkoxy or nitro,
C_3-C_6 cycloalkyl,
C_4-C_8 cycloalkylalkyl, or
C_2-C_4 alkenyl;
R^1 represents halo,
hydrogen,
C_1-C_4 alkyl,
C_1-C_4 alkyl substituted with halo,
C_1-C_4 alkyl monosubstituted with phenyl, cyano or C_1-C_3 alkoxy,
methoxy, or
C_2-C_4 alkenyl;
R^2 represents hydrogen,
C_1-C_3 alkoxycarbonyl,
C_1-C_6 alkyl,
C_1-C_6 alkyl substituted with halo or C_1-C_3 alkoxy,
C_2-C_6 alkenyl,
C_2-C_6 alkenyl substituted with halo or C_1-C_3 alkoxy,
C_3-C_6 cycloalkyl,
C_3-C_6 cycloalkyl substituted with halo, C_1-C_3 alkyl or C_1-C_3 alkoxy,
C_4-C_6 cycloalkenyl,
C_4-C_8 cycloalkylalkyl,

phenyl-C_1-C_3 alkyl,
—O—R^4,
—S—R^4,
—SO—R^4; or



R^4 represents C_1-C_3 alkyl,
C_1-C_3 alkyl substituted with halo,
C_2-C_3 alkenyl,
C_2-C_3 alkenyl substituted with halo,
benzyl,
phenyl or
phenyl substituted with halo, C_1-C_3 alkyl or C_1-C_3 alkoxy;
the R^5 groups independently represent halo,
C_1-C_4 alkyl,
C_1-C_4 alkyl substituted with halo,
C_1-C_4 alkyl monosubstituted with phenyl, cyano or C_1-C_3 alkoxy,
C_2-C_4 alkenyl,
C_3-C_6 cycloalkyl,
C_4-C_8 cycloalkylalkyl,
C_1-C_3 alkanoyloxy,
hydroxy,
C_1-C_3 alkoxycarbonyl,
—O—R^6,
—S—R^6, or
—SO—R^6;
R^6 represents C_1-C_4 alkyl,
C_1-C_4 alkyl substituted with halo, or
C_1-C_4 alkyl monosubstituted with phenyl, cyano or C_1-C_3 alkoxy;
n represents 0–2;
and the acid addition salts thereof.

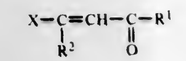
4,235,620

AZOLYL-SUBSTITUTED UNSATURATED KETONES AND HERBICIDAL USE THEREOF

Terence Lewis, Bracknell, and Sugavanam Balasubramanyan, Wokingham, both of England, assignors to Imperial Chemical Industries Limited, London, England

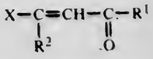
Filed Aug. 18, 1977, Ser. No. 825,784
Claims priority, application United Kingdom, Aug. 27, 1976, 35736/76
Int. Cl.² A01N 9/22; C07D 249/08
U.S. Cl. 71—92 **8 Claims**

1. A herbicidal compound of the formula:



wherein X is a 1-(1,2,4-triazolyl) radical or a 1-imidazolyl radical; R^2 is an alkyl or cycloalkyl radical of 2 to 10 carbon atoms or a phenyl or naphthyl radical optionally bearing one or more substituents selected from the group consisting of fluorine, chlorine, bromine, iodine, cyano, nitro, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms optionally substituted by one or more phenyl radicals or alkoxy radicals of 1 to 6 carbon atoms; alkylthio of 1 to 6 carbon atoms; haloalkyl of 1 to 6 carbon atoms; haloalkoxy of 1 to 6 carbon atoms; carboxyalkoxy in which the alkoxy group has from 1 to 6 carbon atoms; alkoxycarbonylalkoxy in which each alkoxy group has from 1 to 6 carbon atoms; N,N-dialkylcarbamoylalkoxy in which the alkoxy group and each alkyl group each has from 1 to 6 carbon atoms; phenyl; or 1-(1,2,4-triazolyl)-vinyl; and R^1 is an alkyl or cycloalkyl radical of 2 to 10 carbon atoms, or a phenyl or naphthyl radical optionally bearing one or more of the substituents listed for R^2 above; or an acid addition salt or metal complex thereof.

6. A herbicidal composition comprising as an active ingredient a herbicidally effective amount of a compound of the formula:



or an acid addition salt or metal complex thereof, wherein X, R^1, and R^2 are as defined in claim 1, in admixture with a carrier comprising a solid or liquid diluent.

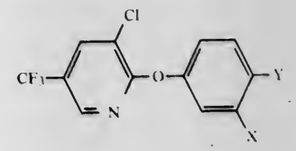
4,235,621

2-SUBSTITUTED PHENOXY-3-CHLORO-5-TRIFLUOROMETHYL PYRIDINE USEFUL AS A HERBICIDE

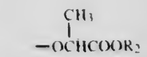
Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Moriyama; Takahiro Haga, Kusatsu; Tadaaki Toki, Moriyama; Terumasa Komyoji; Nobuyuki Sakashita, both of Kusatsu, and Kazuyuki Maeda, Hikone, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed May 30, 1979, Ser. No. 43,611
Claims priority, application Japan, Jun. 9, 1978, 53/68848
Int. Cl.³ C07D 213/64
U.S. Cl. 71—94 **20 Claims**

1. A compound having the formula (1):

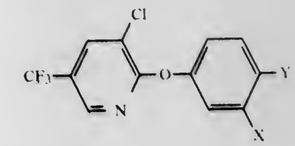


wherein X is hydrogen; (C_1-C_4) alkyl; (C_1-C_4) alkoxy; -$COOR_1$ wherein R_1 is hydrogen, a cation or (C_1-C_4) alkyl; or

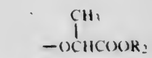


wherein R_2 is hydrogen, cation, (C_1-C_4) alkyl or benzyl; and Y is halogen, nitro or cyano.

11. A herbicidal composition comprising from 1 to 90 weight percent of at least one compound having the formula (1)



wherein X is hydrogen; (C_1-C_4) alkyl; (C_1-C_4) alkoxy; -$COOR_1$ wherein R_1 is hydrogen, a cation or (C_1-C_4) alkyl; or



wherein R_2 is hydrogen, a cation, (C_1-C_4) alkyl or benzyl; and Y is halogen, nitro or cyano, as an active ingredient, and agriculturally acceptable adjuvants.

4,235,622

REDUCTION OF ACID LEVEL IN POMEGRANATES

Sidney R. Siemer, Columbia, Md., and Richard S. Gordon, St. Louis, Mo., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,883

Int. Cl.³ A01N *37/02, 35/02*

U.S. Cl. 71—113 **9 Claims**

1. A method for decreasing the acidity in pomegranates having an acidity in excess of 18½ percent, comprising applying to the leaves of the pomegranate plant, a compound selected from the group consisting of vanillin and carboxylic acid salts containing from 3 to 5 carbon atoms.

4,235,623

CONTINUOUS SMELTING METHOD FOR FERROCHROME

Gero Rath, Mülheim, Fed. Rep. of Germany, assignor to DE-MAG, Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 856,657, Dec. 2, 1977, abandoned. This application May 2, 1979, Ser. No. 35,289

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656725

Int. Cl.³ C22C *39/14*

U.S. Cl. 75—11 **3 Claims**

1. A method for the continuous smelting of ferrochrome to obtain a product having a carbon content of less than 6.5 percent by weight, comprising the steps of

(a) establishing and continuously maintaining an electric reduction furnace at smelting temperature;

(b) continuously introducing into the top of said furnace a burden for the production of ferrochrome comprised of fine chrome ore and coke;

(c) continuously reducing in a first reducing step said burden into a ferrochrome product having a carbon content higher than 6.5 percent;

(d) simultaneously with said introducing and said reducing steps, continuously supplying to said furnace directly into the molten slag layer thereof additional quantities of lumpy or agglomerated fine chrome ore and coke, said additional quantities separate from those of said introducing step;

(e) simultaneously with said introducing and supplying steps, continuously maintaining the temperature of the melt in said furnace at a level which insures heat transfer between the oxide-rich chrome ore and the reactants in said furnace at the same degree as the which occurs when smelting ferrochrome having a carbon content by weight of between the range of about 6.5 and 8 percent;

(f) simultaneously with said first reducing step, rapidly reducing in a second reducing step continuously said ores from said supplying step in said molten slag layer;

(g) continuously combining in said furnace said ferrochrome obtained from said first and second reducing steps to obtain a combined ferrochrome product with a carbon content of less than 6.5 percent by weight; and

(h) continuously withdrawing said ferrochrome product from said furnace.

4,235,624

METHOD FOR PROCESSING COKE OVEN GAS

Dietrich Wagener; Claus Flockenhaus, both of Essen, and Joachim F. Meckel, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,468

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733785

Int. Cl.³ C22B *5/12*

U.S. Cl. 75—91 **13 Claims**

1. A method for the formation and utilization of reduction gas, said method comprising:

forming hot coke oven gas in a coke oven and withdrawing said hot coke oven gas from said coke oven;

subjecting said hot coke oven gas, immediately after the withdrawal thereof from said coke oven, and without any preliminary cooling operation, to partial oxidation and cracking with an oxygen-containing gas, and thereby forming a hot cracked gas rich in carbon monoxide and hydrogen;

subjecting said hot coke oven gas before said partial oxidation and cracking or said hot cracked gas after said partial oxidation and cracking, while still hot and without any preliminary cooling operation, to a hot desulfurization operation;

supplying the thus desulfurized hot cracked gas as a reduction gas directly to a shaft furnace for performing a direct reduction operation therein, without any preliminary



cooling of said hot cracked gas, other than resulting from heat lost during transfer to said shaft furnace; and

regulating said partial oxidation and cracking such that the temperature of said hot cracked gas, upon entry thereof into said shaft furnace, will be sufficient to achieve said direct reduction operation.

7. A method as claimed in claim 1, wherein said coke oven is part of an overall metallurgical installation which includes said shaft furnace and an air separation and dissociation plant for obtaining substantially pure oxygen used in said metallurgical installation, and said oxygen-containing gas comprises oxygen enriched gas of a purity less than said substantially pure oxygen and taken from an intermediate stage of said air separation and dissociation plant.

4,235,625

METHOD OF PRODUCING HYDROGEN AND CARBON-OXIDE-CONTAINING PROCESS GASES FOR USE FOR REDUCING ORES

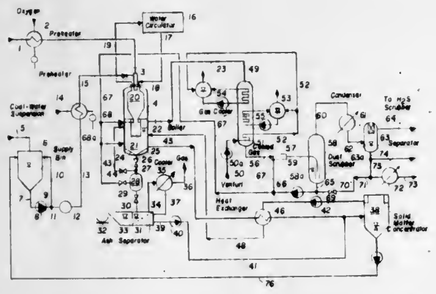
Kurt Tippmer, Recklinghausen, Fed. Rep. of Germany, assignor to Firma Carl Still, Recklinghausen, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,256

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735090

Int. Cl.³ C22B *5/12*

U.S. Cl. 75—91 **3 Claims**



1. A method of producing hydrogen and carbon-oxide containing process gases, to be used for reducing ores and synthesizing hydrocarbons and oxygen containing organic substances, comprising the steps of fine grinding coal, suspending the coal in water, supplying the suspension and oxygen through a burner into a pressure gasification reactor, partly burning the aqueous solution in the reactor under excess pressure to produce gases in a temperature range of 1300° C. to 1500° C., ash and non-converted coal, separating the gases from the ash and non-converted coal, directing the separated gases into a quenching water within said reactor to form steam and to precool the gases to a temperature range of 200° C. to 350° C., depending on the gasification pressure, cooling the ash free steam and the gases in a waste-heat boiler having an indirect cooling water circuit to a temperature range of 100° C. to 200° C. to generate a steam pressure of 50 to 60 bar and a steam-to-gas ratio of about 2, condensing the steam to form a condensate and to further cool the gases to a temperature of from 40° C. to 80° C. at a pressure of from 20 to 60 bar, separating the condensate from the gases and recycling it into the quenching water, and directing the further cooled gases to the synthetic or ore-reducing process.

4,235,626

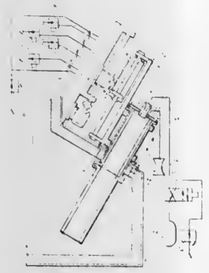
METHOD AND APPARATUS FOR STIRRING MOLTEN METAL

Sergei S. Semin, ulitsa Svobody, 184, kv. 63; Viktor I. Plokhov, ulitsa Stroitelei, 20, kv. 75; Igor A. Partin, ulitsa Svobody, 230, kv. 164; Boris S. Dolzhenkov, ulitsa Aerodromnaya, 87, kv. 2, and Jury N. Lanin, ulitsa Fizkulturnaya, 13, kv. 66, all of Kuibyshev, U.S.S.R.

Filed Dec. 19, 1978, Ser. No. 971,902

Int. Cl.³ C22B *9/00*; C21C *7/00*

U.S. Cl. 75—93 R **7 Claims**



1. A method for stirring molten metal, comprising alternately withdrawing molten metal upwardly from a body of molten metal in a confined space to a level above the body and expelling the withdrawn metal into the body under a pulse of compressed gas; said molten metal being withdrawn from upper layers of the melt in a metal holding means, disposed immediately beneath the surface of the melt; the withdrawn molten metal being expelled into lower layers of the melt body, adjacent to the bottom of the metal holding means; said alternate metal-withdrawing and metal-expelling steps being effected so that regardless of the level of melt bath, rising in the process of melting, portions of molten metal are invariably withdrawn directly from beneath the surface of the melt body and are discharged into the bottom region of the metal holding means.

4,235,627

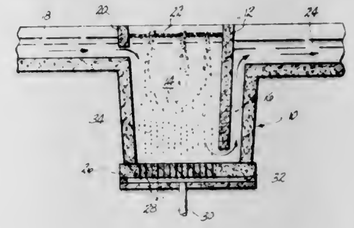
METHOD AND APPARATUS FOR THE DEGASSING OF MOLTEN METAL

Jonathan A. Dantzig, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 865,895, Dec. 30, 1977, abandoned. This application May 23, 1979, Ser. No. 41,787

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—93 E **11 Claims**



1. An apparatus for degassing molten metal by purging said molten metal with a fluxing gas which comprises a fluxing box having a floor, inlet means for delivering said molten metal to said fluxing box, outlet means for removing said molten metal from said fluxing box, the improvement which comprises means located within said fluxing box for purging said molten metal with said fluxing gas while said molten metal is within said fluxing box, said means comprising a sparger plate means being provided with a plurality of orifices of controlled size and spacing so as to minimize fluxing gas bubble size maximizing fluxing gas bubble dispersion thereby optimizing the degassing of said molten metal wherein said spacing of said orifices is no smaller than twice d_b so as to prevent bubble coalescence where d_b is the bubble diameter defined by the equation

$$d_b = 0.015\,\theta \left(\frac{2\sigma}{g(\rho_{liq} - \rho_{gas})} \right)^{\frac{1}{2}}$$

where

θ = contact angle of the bubble on the sparger plate

σ = surface tension

g = gravity

ρ_{liq} = density of liquid

ρ_{gas} = density of fluxing gas

4,235,628

AL-MN ALLOY AND PROCESS OF MANUFACTURING SEMIFINISHED PRODUCTS HAVING IMPROVED STRENGTH PROPERTIES

Heinz J. Althoff, Oberursel, and Heinz Lommel, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 965,227

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754673

Int. Cl.³ C22C *21/02*; C22F *1/04*

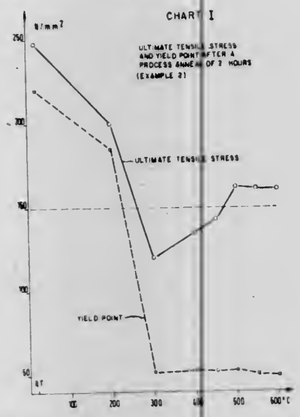
U.S. Cl. 75—148 **19 Claims**

1. An Al-Mn alloy which can be brazed and enamelled, has a high resistance to corrosion and in a completely recrystallized state has an ultimate tensile stress of at least 150 N/mm², said alloy consisting essentially of:

0.8 to 2 weight percent manganese

1.40 to 3 weight percent silicon

0.2 to 1 weight percent iron
0 to 0.2 weight percent copper
0 to 0.2 weight percent magnesium,



the balance being aluminum with up to 0.2 weight percent impurities.

4,235,629

METHOD FOR PRODUCING AN EMBRITTLEMENT-RESISTANT TANTALUM WIRE

Harold G. Marsh, Libertyville, Ill., and James A. Pierret, Muskogee, Okla., assignors to Fansteel Inc., North Chicago, Ill.

Division of Ser. No. 345,956, Mar. 29, 1973, Pat. No. 4,062,697. This application Oct. 17, 1977, Ser. No. 842,588
Int. Cl.[3] B22F 1/04, 33/02
U.S. Cl. 75—211 **4 Claims**

1. The method of producing a tantalum metal resistant to embrittlement which comprises preparing a master blend of finely divided silicon and a finely divided metal of the group consisting of tantalum and tantalum-rich alloys containing at least about 80 weight percent of tantalum; blending said master blend with additional finely divided metal of said group in an amount to prepare a composition containing from about 100 to about 2000 parts per million of silicon; and thereafter pressing and sintering said composition to produce a compact shaped article having a silicon content of about 50 to about 700 parts per million.

4,235,630

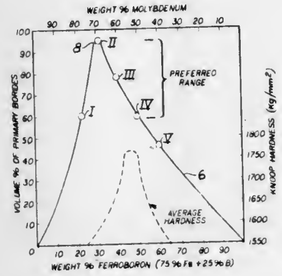
WEAR-RESISTANT MOLYBDENUM-IRON BORIDE ALLOY AND METHOD OF MAKING SAME

B. Naga P. Babu, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 5, 1978, Ser. No. 939,524
Int. Cl.[3] B22F 3/00
U.S. Cl. 75—244 **31 Claims**

1. A wear-resistant, molybdenum-iron boride alloy (**10**), comprising:
a microstructure of a primary boride phase (**12**) and a matrix phase (**14**);
said primary boride phase (**12**) comprising molybdenum alloyed with iron and boron; and
said matrix phase (**14**) comprising one of iron-boron in iron and iron-molybdenum in iron, said matrix phase (**14**) having a hardness less than that of said primary boride phase (**12**).

23. A wear-resistant, molybdenum-iron boride alloy (**10**), comprising:
molybdenum in a range of about 50 to 77 Wt.%;
iron in a range of about 17 to 38 Wt.%;
boron in a range of about 5 to 13 Wt.%;
chromium in a range of about 0 to 4.9 Wt.%;
titanium in a range of about 0 to 4.9 Wt.%;
vanadium in a range of about 0 to 4.9 Wt.%;
columbium in a range of about 0 to 4.9 Wt.%;
zirconium in a range of about 0 to 4.9 Wt.%;



hafnium in a range of about 0 to 4.9 Wt.%;
tantalum in a range of about 0 to 4.9 Wt.%;
tungsten in a range of about 0 to 4.9 Wt.%; and
wherein the alloy includes a primary boride phase (**12**) and a matrix phase (**14**), said primary boride phase being between about 70 to 90 Vol.% of the total alloy.

4,235,631

CORROSION-RESISTANT DENTAL ALLOY HAVING IMPROVED HANDLING CHARACTERISTICS

Joseph Allotta, Newton, Mass., and Louis F. Alcuri, Jr., Matawan, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 760,181, Jan. 17, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,667
Int. Cl.[3] B22F 1/00, 9/00
U.S. Cl. 75—251 **13 Claims**



1. A corrosion-resistant dental alloy in particulate form for use as a filling for dental cavities after amalgamation with mercury, comprising a mixture of silver, tin and copper, said alloy consisting essentially of randomly shaped particles having a mean particle size of between about 20 and 26.5 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said particles having a surface area which, exclusive of both spherical particles and flake-like particles as defined below, ranges from 0.22 m^2/gm to about 0.31 m^2/gm, so that said alloy, after amalgamation, retains a corrosion resistance comparable to that of spherical particles having substantially the same composition and having a surface area of about 0.21 m^2/gm, but in any event, less than 0.22 m^2/gm, while retaining handling characteristics comparable to those of flake-like particles also having substantially the same composition and having a surface area of at least about 0.33 m^2/gm and approximately the same particle size and distribution as said randomly shaped particles.

7. A corrosion-resistant dental alloy in particulate form for use as a filling for dental cavities after amalgamation with mercury comprising a mixture of silver, tin and copper, said alloy consisting essentially of randomly shaped particles which, exclusive of both spherical particles and flake-like particles as defined below, have a surface area at least about 20 percent greater than the surface area of spherical particles but less than about 0.33 m^2/gm, whereby said alloy, after amalgamation, retains a corrosion resistance comparable to that of spherical particles having substantially the same composition and having a surface area of about 0.21 m^2/gm, but in any event, less than 0.22 m^2/gm, while retaining handling characteristics comparable to those of flake-like particles also having substantially the same composition and having a surface area of at least about 0.33 m^2/gm and approximately the same particle size and distribution as said randomly shaped particles.

4,235,632

PARTICULATE SLAGGING COMPOSITION FOR THE EXTENDED OPTIMUM CONTINUOUS CASTING OF STEEL

Joseph F. Uher, Timonium, and Charles M. Loane, Jr., Bel Air, both of Md., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 14,649, Feb. 23, 1979. This application Apr. 4, 1979, Ser. No. 26,925
Int. Cl.[2] C22B 9/10
U.S. Cl. 75—257 **14 Claims**

1. Particulate slagging composition for the continuous casting of steel, said steel tending to evolve alumina into said composition when said composition is in molten condition during its use in the continuous casting operation, said slagging composition being characterized by flowidity of about 4 to 16 inches, fusion range not substantially above 2300° F., a Start-up ADK value not exceeding 500 seconds, said composition further characterized by having theoretical net oxide analysis values within the following ranges wherein the percentages are weight percentages and are selected to total 100%:

Fluxing Ingredients	Wt. %
CaO*	0–42
MgO*	0–20
BaO*	0–20
SrO*	0–20
MnO*	0–20
FeO*	0–18
F* (elemental component of the fluorine-providing materials)	4–16
B_2O_3*	0–15
Na_2O	1–25
K_2O	0–5
Li_2O	0–5
V_2O_5	0–1
NiO	0–2
CuO	0–2
ZnO	0–1
TiO_2	0–5
ZrO_2	0–3
CoO	0–2
Cr_2O_3	0–2
MoO_3	0–1
Glass Network Formers	
SiO_2	20–40
Al_2O_3	0–12
P_2O_5	0–10
B_2O_3	included above;

the ratio of the sum of the theoretical net oxide analysis values of the starred (*) fluxing ingredients to the theoretical net oxide analysis value of SiO_2 (this ratio being termed the R′ ratio) being preselected between 1.5:1 and 3:1 for obtaining an Operational ADK value not substantially in excess of 750 seconds.

4,235,633

DENTAL COMPOSITIONS

Kentaro Tomioka, Chofu, and Shunichi Futami, Nagareyama, both of Japan, assignors to G-C Dental Industrial Corporation, Tokyo, Japan

Filed Jan. 16, 1979, Ser. No. 3,792
Claims priority, application Japan, Jan. 27, 1978, 53-7380
Int. Cl.[1] C08L 93/04; C09K 3/00
U.S. Cl. 106—35 **6 Claims**

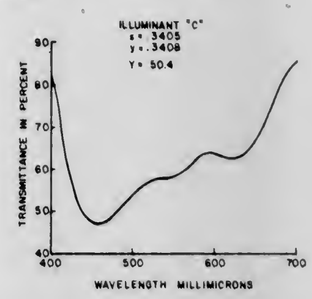
1. A dental composition comprising a combination of 8 to 92% by weight of liquid acid phosphates obtained by replacing one or two hydrogen atoms of orthophosphoric acid with alcohols having 3 to 13 carbon atoms and being essentially insoluble in water, 92 to 8% by weight of at least one of reactive multivalent metallic salts selected from the group consisting of oxides, hydroxides, basic salts and silicates of alkaline earth metals, aluminium of heavy metals, and 50 to 5% by weight of at least one of sparing soluble fluorides, silicofluorides, titanium fluorides and zirconium fluorides serving as a reaction accelerator based on the weight of said acid phosphates, said compounds being permitted to react with each other such that they are cured at room temperature.

4,235,634

COLORED SODA-LIME GLASSWARE

David C. Boyd, Corning; Paul S. Danielson, Big Flats, and Joseph Ference, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 27, 1979, Ser. No. 79,276
Int. Cl.[1] C03C 3/12
U.S. Cl. 106—52 **1 Claim**



1. A transparent glass exhibiting an amber-with-rose-highlights hue and demonstrating a spectral transmittance curve approximating that depicted in the appended drawing consisting essentially, expressed in weight percent on the oxide basis is calculated from the batch, of about:

Na_2O	13.45 ± 0.15
CaO	9.6 ± 0.15
Al_2O_3	1.65 ± 0.1
As_2O_3	0.3 ± 0.02
NiO	0.04 ± 0.002
MnO_2	0.48 ± 0.08
SiO_2	Remainder

4,235,635

HIGH DIELECTRIC CONSTANT TYPE CERAMIC COMPOSITION

Osamu Iizawa, Honjo; Shinobu Fujiwara, Akita; Hisayoshi Ueoka, Yachiyo; Kiyoshi Furukawa, Akita; Nobuaki Kikuchi, Akita, and Hitoshi Tanaka, Akita, all of Japan, assignors to TDK Electronics Co., Inc., Tokyo, Japan

Filed Jul. 26, 1979, Ser. No. 61,015

Claims priority, application Japan, Aug. 1, 1978, 53-94725; Aug. 2, 1978, 53-94934; Aug. 3, 1978, 53-95114; Aug. 4, 1978, 53-95743; Aug. 4, 1978, 53-95744; Aug. 7, 1978, 53-96381; Aug. 7, 1978, 53-96382

Int. Cl.³ C04B *35/26*

U.S. Cl. 106—39.5 **19 Claims**

1. A high dielectric constant type, ceramic composition, referred to as the basic ceramic composition, which consists essentially of from 63.17 to 63.89% of PbO, from 6.09 to 14.31% of Fe_2O_3, from 8.85 to 20.78% of WO_3 and from 1.74 to 21.17% of ZrO_2, all percentages being by weight based on the basic composition.

4,235,636

PLASTIC REFRACTORIES WITH FUSED ALUMINA-CHROME GROG

James R. Friedrichs, Lansdale; Edward A. Snajdr, Exton, both of Pa., and Bela Klaudinyi, deceased, late of King of Prussia, Pa. (by Lenke G. Klaudinyi, executrix), assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 4, 1979, Ser. No. 36,202

Int. Cl.³ C04B *35/42*

U.S. Cl. 106—66 **5 Claims**

1. A plastic refractory composition comprising:
(a) from 30 to 70 percent of crushed fused alumina-chrome grog;
(b) from 10 to 30 percent glass industry grade chromite;
(c) from 3 to 12 percent alumina selected from the group consisting of calcined, tabular and fused alumina;
(d) from 2 to 6 percent bond clay;
(e) from 3 to 18 percent of an acid phosphate binder; and
(f) from 0 to 6 percent water.

4,235,637

ANTI-FOGGANT COMPOSITION

Rudolph Singleton, 4920 Roja Dr., Oceanside, Calif. 92054

Filed May 29, 1979, Ser. No. 43,152

Int. Cl.³ C08L *3/00*

U.S. Cl. 106—213 **8 Claims**

1. An anti-foggant composition comprising in combination an intimate mixture of the association products of 100 parts by volume of starch granules, from about 50 to about 120 parts by volume of a surfactant, from about 15 to about 35 parts by volume of a lower polyhydric alcohol and an amount of a volatile lower alcohol to provide a freely flowable mixture.

4,235,638

SULFONATO-ORGANOSILANOL COMPOUNDS AND AQUEOUS SOLUTIONS

Boyd R. Beck, Spring City, Utah; Frank T. Sher, and George V. D. Tiers, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 11, 1978, Ser. No. 895,528

Int. Cl.³ C09K *3/00*; **C07F** *7/08*

U.S. Cl. 106—287.12 **38 Claims**

1. An aqueous solution comprising a sulfonato-organosilanol compound having at least one sulfonato-organic substituent, wherein the weight percentage of oxygen in said compound is at least about 30%, and the weight percentage of silicon in said compound is not greater than about 15%, said percentages being taken with reference to the water-free acid form of said compound.

4,235,639

CHROME PIGMENT

Philip Wilson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 25, 1979, Ser. No. 42,338

Claims priority, application United Kingdom, Jun. 13, 1978, 26788/78

Int. Cl.³ C09C *1/14, 1/20, 3/06*

U.S. Cl. 106—298 **8 Claims**

1. A process for the preparation of a treated chrome pigment comprising precipitating antimony trioxide onto the surface of the pigment in the presence of a solution of metaphosphate ions, wherein the quantity of metaphosphate ions in the solution is from 0.5% to 10% by weight, based on the total weight of the pigment.

8. A treated lead chrome pigment carrying a superficial coating of antimony oxide precipitated from a slurry containing metaphosphate ions.

4,235,640

LIGHTWEIGHT CONCRETE AGGREGATE AND METHOD

Bruce P. Cox, Sunland, Calif., and David P. DeVries, 4861 Ocean View, LaCanada, Calif. 91011, assignors to David P. DeVries, LaCanada, Calif.

Filed Jun. 12, 1979, Ser. No. 47,880

Int. Cl.³ C04B *31/42*

U.S. Cl. 106—308 Q **9 Claims**

1. A method of treating scoria aggregate to reduce its absorption rate to make the scoria aggregate more suited as an aggregate for lightweight concrete, said method comprising:
providing a slow or medium-setting asphalt emulsion;
diluting the slow or medium-setting asphalt emulsion with water to provide a dilute asphalt emulsion;
mixing aggregate consisting essentially of scoria aggregate with the dilute asphalt emulsion to impregnate the individual particles of the scoria aggregate with the dilute asphalt emulsion; and
drying the scoria aggregate.

4,235,641

DYEING AGENT COMPOSITIONS BASED ON POLYPROPYLENE WAX

Manfred Engelmann; Karl Maier, both of Augsburg; Arno Spange, Eschborn; Bernd Dewald, Idstein; Hans-Joachim Lenz, Hofheim am Taunus, and Wolfgang Teige, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 852,538, Nov. 17, 1977. This application Jun. 28, 1979, Ser. No. 53,032

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652628

Int. Cl.³ C08L *23/12*

U.S. Cl. 106—308 M **11 Claims**

1. A preparation of an insoluble colorant consisting essentially of an insoluble colorant distributed in an effective amount of a polypropylene wax having at 170° C. a viscosity of 0.5 to 5 Pa.s and an isotactic proportion of 40 to 90% by weight.

4,235,642

DISHWASHER USING STEAM TO HEAT COLD WASH AND RINSE WATERS AND SPRAY THEM AGAINST DISHES DURING THE WASH AND RINSE CYCLES

George J. Federighi, and George B. Federighi, both of 70 Thirteenth St., San Francisco, Calif. 94105

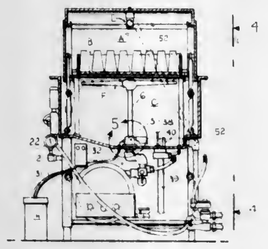
Filed Dec. 28, 1978, Ser. No. 973,898

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—58 D **2 Claims**

1. In a dishwashing machine having a wash/rinse compartment for receiving a dish-carrying basket;
a tank disposed beneath said compartment;

a water containing boiler positioned beneath said tank with heating means in said boiler for generating steam;
a source of unheated water connected to said tank;
an aspirating nozzle connected to said boiler for receiving steam therefrom and extending into said tank with a water inlet communicating with said tank, a wash/rinse arm mounted on said nozzle;
time controlled means for actuating said boiler heating means for generating steam and delivering same through said aspirating nozzle for withdrawing water from said



tank and entraining same with said steam and propelling said steam and water through said spray arm over the dish-carrying basket for a predetermined period of time during a washing cycle;
a detergent supply positioned beneath said tank; and
a conduit having time controlled valving means therein connecting said detergent supply with said aspirating nozzle for withdrawing a supply of detergent and entraining same with said steam and water for delivery to said wash/rinse arm.

4,235,643

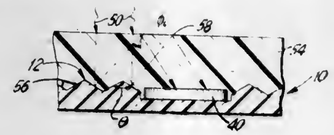
SOLAR CELL MODULE

James A. Amick, Princeton, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 30, 1978, Ser. No. 920,691

Int. Cl.³ H01L *31/04*

U.S. Cl. 136—246 **19 Claims**



1. A solar cell module comprising:
a support structure having at least one planar surface adapted to support an array of solar cells;
a plurality of circular solar cells arrayed on said at least one planar surface of said support structure, said cells having top and bottom surfaces;
a light transparent optical medium coupled to said array and support structure;
land areas between said arrayed circular solar cells, said land areas having a plurality of facets with light relfective surfaces, each facet having a predetermined angular relationship with respect to said planar surface of the support and each other so that light impinging on said light relective surfaces is relected upwardly through said optical medium and forms an angle at the opposite top surface of said module which is greater than the critical angle whereby said reflected light is internally reflected downwardly toward said solar cells.

4,235,644

THICK FILM SILVER METALLIZATIONS FOR SILICON SOLAR CELLS

Christopher R. S. Needes, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1979, Ser. No. 71,683

Int. Cl.³ H01L *31/04*

U.S. Cl. 136—256 **3 Claims**

1. A solar cell comprising a body of silicon semiconductor material and at least one contact adhered thereto for accepting and directing a flow of electricity away from said body, said contact comprising an n-type region of said semiconductor body on which there has been screen printed a paste composition consisting essentially of a mixture of silver powder and lead bismuthate glass frit powder in a vehicle and solvent mixture, said composition having been heated to drive off the vehicle and solvent and thereafter fired at 550° to 750° C.

4,235,645

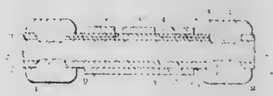
PROCESS FOR FORMING GLASS-SEALED MULTICHIP SEMICONDUCTOR DEVICES

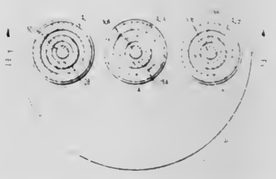
Joseph E. Johnson, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 15, 1978, Ser. No. 970,045

Int. Cl.³ H01L *21/56, 23/08*

U.S. Cl. 148—1.5 **6 Claims**





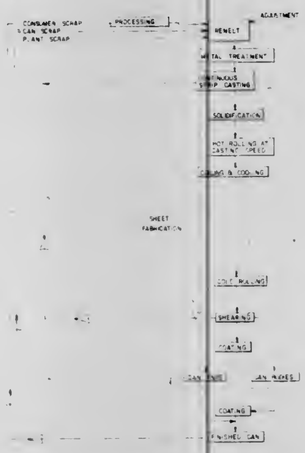
1. A method for constructing a semiconductor device comprising the steps of:
(a) forming at least two regions of opposite conductivity in a body of semiconductor material, said body of semiconductor material including first and second substantially flat opposed surfaces and an edge portion extending therebetween;
(b) etching a first groove in said first opposed surface such that a PN junction formed at the interface of said two regions of opposite conductivity type extends to an inner edge of said first groove;
(c) etching a second groove in said second substantially flat opposed surface of said body of semiconductor material;
(d) disposing first and second preformed ring shaped glass members in said first and second grooves;
(e) disposing said body of semiconductor material and said preformed ring-shaped glass members, as assembled, in a furnace and fusing said preformed ring shaped glass members to said body of semiconductor material to form a seal protecting said portion of said PN junction which extends to said inner edge of said first groove.

4,235,646

CONTINUOUS STRIP CASTING OF ALUMINUM ALLOY FROM SCRAP ALUMINUM FOR CONTAINER COMPONENTS

Kurt Neufeld, Zurich; Kurt Buxmann, Sierre; Heinz Bichsel, Neuhausen am Rheinfall, and Ivan Gyöngyös, Männedorf, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 4, 1978, Ser. No. 931,039
Int. Cl.³ C22F 1/04
U.S. Cl. 148—2 **13 Claims**



1. A process for fabricating aluminum sheet suitable for manufacturing drawn-and-ironed can bodies and can ends comprising:

(a) forming an aluminum alloy melt composition comprising manganese 0.4–1.0% and magnesium 1.3–2.5% said manganese and magnesium being present in a total concentration of 2.0–3.3% and in a ratio of magnesium to manganese of between 1.4:1 and 4.4:1;

(b) continuously casting the melt composition to produce a moving strip;

(c) hot rolling the moving strip at casting speed at a starting temperature between 300° C. and the non-equilibrium solidus temperature and a finish temperature of at least 280° C. to produce a hot rolled strip reduced by at least 70%;

(d) coiling and allowing the hot rolled strip to cool in still air at ambient temperature;

(e) cold rolling the hot rolled strip to a strip of intermediate gauge in a first series of passes;

(f) annealing said strip of intermediate gauge at 350° C. to 500° C. for a maximum duration of 90 seconds; and

(g) cold rolling the strip of intermediate gauge to final gauge.

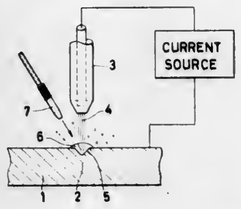
4,235,647

METHOD FOR MACHINING BY THERMAL SHOCK

Toshio Sano, Tokorozawa; Masaharu Takahashi, Tokyo, and Masayuki Yokai, Higashi-Yamato, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Feb. 28, 1979, Ser. No. 15,770
Claims priority, application Japan, Mar. 27, 1978, 53/35051
Int. Cl.³ B23K 7/00
U.S. Cl. 148—9 R **2 Claims**

1. A method of machining a work blank, which comprises the steps of locally heating and fusing a portion of the work blank, injecting into the fused portion of the work blank a liquefied gas of extremely low temperature, small heat capacity and low latent heat to subject the fused portion of the work blank to thermal shock as soon as it is formed and to scatter said fused portion away to remove said portion and expose an underlying portion of the work blank, and repeating the fusing



of successive ones of the underlying portions and injecting of the liquefied gas into each one of the underlying portions until a desired depth in the work blank has been removed.

4,235,648

METHOD FOR IMMERSION PLATING VERY THIN FILMS OF ALUMINUM

Lavoie Richardson, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1979, Ser. No. 27,213
Int. Cl.³ C23C 3/00
U.S. Cl. 148—6.27 **2 Claims**

1. A method for eliminating an aluminum oxide surface film on a substantially aluminum thin film layer comprising in order: immersing said layer in a fluoride-based solution; immersing said layer in water at about 50° C. to form a fresh surface aluminum oxide film; and immersing said layer in an immersion solution comprising the fluoride ion and a metal selected from the group consisting of zinc, tin, nickel, silver and copper.

4,235,649

FLUX FOR BRAZING

Minoru Inamura; Noboru Takeuchi, and Kazuhiro Inukai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 57,071
Int. Cl.³ B23K 35/34
U.S. Cl. 148—24 **5 Claims**

1. A flux for brazing which consists essentially of a main component selected from the group consisting of boric acid, borax, alkali metal fluorides, alkali metal borofluorides and alkali metal chlorides; and 0.5 to 10 wt. % of a metal having an average particle diameter of 0.1 to 500μ, and water in an amount sufficient to form a paste.

4,235,650

OPEN TUBE ALUMINUM DIFFUSION

Mike F. Chang, Liverpool, and Alfred Roesch, Auburn, both of N.Y., assignors to General Electric Company, Auburn, N.Y.

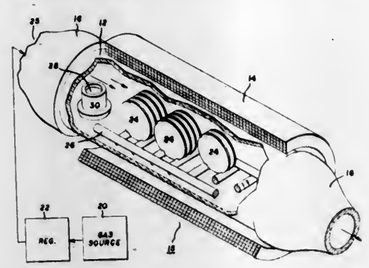
Filed Sep. 5, 1978, Ser. No. 939,669
Int. Cl.³ H01L 21/223
U.S. Cl. 148—189 **25 Claims**

1. A method for diffusing aluminum into a silicon semiconductor wafer comprising the steps of:

disposing said wafer within an open diffusion tube;

disposing a source of aluminum in said tube, said source being spaced apart from said wafer;

providing a flow of non-oxidizing inert gas through said tube at a rate in excess of about 1 liter/min.;



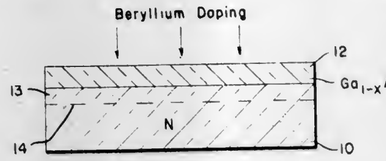
heating said tube to a temperature sufficient to create an aluminum vapor in said tube and to cause aluminum atoms to diffuse into said semiconductor wafer.

4,235,651

FABRICATION OF GAAS-GAALAS SOLAR CELLS

G. Sanjiv Kamath, Malibu, and Carl L. Anderson, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 792,839, May 2, 1977, Pat. No. 4,163,987. This application Mar. 19, 1979, Ser. No. 21,732
Int. Cl.³ H01L 21/208
U.S. Cl. 148—171 **7 Claims**



1. A process for fabricating a III–V compound solar cell having an improved power conversion efficiency, comprising:

(a) providing a saturated epitaxial growth solution of gallium aluminum arsenide in gallium and aluminum at a predetermined solution growth temperature,

(b) introducing beryllium atoms into said solution in a preselected amount sufficient to establish a desired P-type doping level in said solution, and

(c) exposing an N-type gallium arsenide substrate to said solution for a predetermined time and under conditions of controlled liquid epitaxial growth temperature to form a P-type epitaxial layer of gallium aluminum arsenide on said gallium arsenide substrate and to convert a region of said substrate to P-type gallium arsenide, thereby defining a PN junction of said solar cell bounded by relatively low resistivity material which resistivity is substantially invariant with changes in the aluminum concentration in said solar cell.

4,235,652

METHOD OF USING A LOW PROFILE HEAT SEALING IRON

Ray G. Brooks, Irving, Tex., and Harvell M. Smith, Conifer, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 765,140, Feb. 3, 1977, Pat. No. 4,160,688. This application Mar. 12, 1979, Ser. No. 19,969
Int. Cl.² C09J 5/10, 7/00
U.S. Cl. 156—71 **2 Claims**

1. A method of applying a heat activatable sealing strip to a generally planar surface in an area having a clearance of no more than a few inches comprising inserting a strip of heat activatable material into the guide means of a low profile sealing iron having a longitudinal axis comprising a cap member having generally planar first and second faces, heating plate means attached to said second face and having a head end and a foot end, guide means comprising a rectangular slot passing through said cap member from said first face to said second face adjacent the head end of said heating plate means,



and handle means connected to said low profile head, moving the leading end of said strip through said guide means and beneath the head end of said heating plate, placing said heating plate onto said generally planar surface at a first terminal end of an area to be sealed and sliding said iron over the generally planar surface of the area to be sealed to an opposite terminal end of said area.

4,235,653

METHOD FOR MAKING RECLOSABLE BAGS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 813,450, Jul. 7, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 919,823
Int. Cl.² A65D 33/24; B32B 7/06
U.S. Cl. 156—91 **17 Claims**



1. A method of making an integral extruded plastic bag, comprising:

forming a thin wall extruded flexible plastic web;

providing integrally on the plastic web longitudinally extending and laterally spaced complementary resiliently flexible interlocking fastener profiles having an imperforate gusset-forming web area therebetween;

collapsibly folding the gusset-forming web area into a gusset extending in one direction away from said profiles;

folding portions of the plastic web into free terminal digi-

tally manipulatable bag mouth pull flanges projecting to a suitable length in the opposite direction from said profiles;

collapsing the remainder of the plastic web into bag side wall panels toward said gusset and to extend to a substantially greater length than the gusset for providing a substantial bag pouch into which the gusset projects only a limited distance;

and securing the fastener profiles together into interlocking but releasable fastener relation;

whereby the gusset provides a security closure for the bag which closure is adapted to be broken for discharging contents from the bag and the separable fastener profiles being than adapted for reclosing the bag.

4,235,654

METHOD FOR PRODUCING COMPOSITE OPTICAL ELEMENTS OF GLASS AND POLYMER MATERIAL

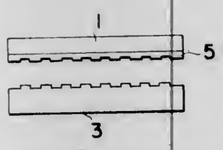
Toshihide Dohi, Osaka, and Sigeo Kitaguchi, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1978, Ser. No. 912,744

Claims priority, application Japan, Jun. 16, 1977, 52-71906

Int. Cl.³ B32B *17/10;* **C03C** *17/30;* **G02C** *7/02*

U.S. Cl. 156—99 **16 Claims**



1. A method for mass producing a composite optical element by molding laminated optical elements comprised of a glass substrate and a thin outer layer of an organic polymer material in a mold having a cavity of a preselected configuration, the outer layer of the organic polymer material presenting a surface of a high tolerance replication of the mold cavity whereby the composite optical element is suitable for use in lens systems of photographic equipment and the like, the method comprising steps of:

providing a mold cavity with a predetermined surface configuration of an optical element exterior surface;

treating a glass substrate with a silinating agent to activate the substrate relative to a clear organic polymerizable material, the silanating agent having at least one functional group capable of forming covalent bonds with the glass substrate and also having at least one functional group capable of reacting with the organic polymerizable material, the organic polymerizable material being selected from a group consisting of prepolymers of metacrylic acid ester, acrylic acid ester, styrene and diethylene glycol bis (allylcarbonate);

juxtaposing the activated substrate within the mold cavity having the desired configuration;

disposing the organic polymerizable material between the activated substrate and the mold cavity surface thereby forming a laminate;

curing the laminate with an application of an energy to the organic polymerizable material to further polymerize and, thereto to form the thin layer of the organic polymer material on the glass substrate, the thin layer of the organic polymer material being strongly attached to the glass substrate by covalent bonds; and

releasing the thin layer of the organic polymer material on the glass substrate from the mold by application of force between the glass substrate and the mold to provide the composite optical element with a high tolerance optical quality surface.

4,235,655

CONTINUOUS COATING OF WEBS HAVING SPLICED JOINTS

Joseph I. DeRoeck, St. Katelijne-Waver, and Frans Van Steenwinkel, Mortsel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 21, 1978, Ser. No. 934,722

Claims priority, application United Kingdom, Aug. 23, 1977, 35319/77

Int. Cl.³ B31F *5/00*

U.S. Cl. 156—157 **3 Claims**



1. In a method of continuously coating a moving web with a layer of a coating composition wherein the web is advanced along a path adjacent a coating station for the application of the coating layer to the front web surface and from time to time the leading end of a fresh web is spliced to the trailing end of the exhausting web, the improvement of splicing said web ends while separated from each other by a distance of at least ten times the web thickness by means of a splicing tape that forms a flexible connection therebetween, said tape having its leading margins ahered to the front surface of the trailing end of the old web and its trailing margin adhered to the reverse surface of the leading end of the new web whereby the only discontinuities at the front face of the spliced web joint presented to the coating station are "step-up" discontinuities.

4,235,656

METHOD OF AND APPARATUS FOR FORMING A CORELESS ARMATURE WINDING FOR AN ELECTRIC MACHINE

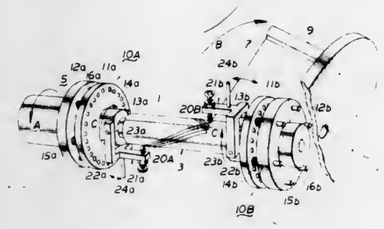
Sachio Shimada, Yokohama; Akio Tsunaki; Tatsuo Furuichi, both of Tokyo, and Tsuneyuki Hayashi, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 26, 1979, Ser. No. 15,107

Claims priority, application Japan, Feb. 28, 1978, 53-22200; Feb. 28, 1978, 53-25057

Int. Cl.³ H02K *15/04*

U.S. Cl. 156—175 **23 Claims**



1. A method of forming a coreless armature winding for an electric machine, comprising the steps of revolving a source of wire in a fixed orbit about a cylinder, the axis of said orbit being inclined with respect to the longitudinal axis of said cylinder; guiding said wire about first and second guide members positioned at opposite spaced apart locations on the surface of said cylinder and defining the opposite ends of the coreless armature winding so as to form one complete turn of said wire about said surface of said cylinder; rotating said cylinder about the longitudinal axis thereof in synchronism with the revolution of said wire, said cylinder being rotated by a predetermined angle corresponding to a pitch of the winding so that as said wire continues to revolve, successive skewed turns of said wire are formed on said surface of said cylinder; rotating said first and second guide member with the rotation of said cylinder; rotating said guide members relative to said cylinder for returning said first and second guide members to initial positions thereof after a predetermined number of turns have been formed repeating the aforementioned steps until the complete armature winding is formed; and removing said armature winding from said cylinder.

9. Apparatus for forming a coreless armature winding for an electric machine, comprising:

a revolvable source of wire;

a rotatable cylinder, said source of wire being revolvable in an orbit about said cylinder, said orbit having an axis of revolution that is inclined with respect to the longitudinal axis of said cylinder;

means for rotating said cylinder about the longitudinal axis thereof in synchronism with the revolution of said source of wire;

first and second guide means disposed at spaced apart locations on the surface of said cylinder to define the opposite ends of said armature winding, said first and second guide means being rotatable with said cylinder, and said first and second guide means intercepting said wire as said source of wire revolves about said cylinder so as to establish respective double back points for each turn of wire; and

means for rotating said first and second guide means relative to said cylinder in a direction opposite to the direction of rotation of said cylinder and through a predetermined angle, after a predetermined number of turns of said wire has been formed on said cylinder, to return said first and second guide means to respective initial positions to intercept said wire again.

4,235,657

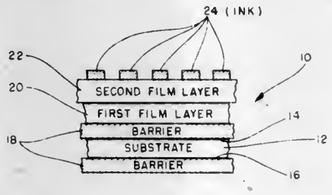
MELT TRANSFER WEB

Edwin G. Greenman, and Gary L. Nilo, both of Neenah, Wis., assignors to Kimberly Clark Corporation, Neenah, Wis.

Filed Feb. 12, 1979, Ser. No. 11,439

Int. Cl.³ B32B *3/18;* **B41M** *3/12;* **B44C** *1/16;* **B32B** *7/06*

U.S. Cl. 156—234 **12 Claims**



1. An improved melt transfer web for decorating or printing selected patterns of inked graphics upon a surface of a porous, semi-porous or non-porous material workpiece, said web comprising:

(a) a flexible substrate of a heat-stable material having top and bottom surfaces;

(b) a first polymeric film layer disposed over said top surface of said substrate and comprised of a vinyl resin copolymer admixed with an emulsifiable polyethylene wax, said first film layer forming a heat softenable separable layer; and

(c) a second polymeric film layer superposed over said first layer and comprised of an ionomer or a copolymer of ethylene acrylic acid, said second film layer having a top surface that is ink-receptive, said second layer being characterized by having a potentially adhesive property for permanently bonding the inked pattern to the surface of the workpiece, the adherent property being activated when said first and second film layers are heated and placed in pressure contact with the workpiece; said second layer forming a mechanical bond with said first layer, the mechanical bond between the layers having more internal strength when heat softened than the bond between said first layer and said substrate.

4,235,658

PROCESS FOR MAKING TRANSLUCENT PLATES WITH LIGHT-SCATTERING SURFACES

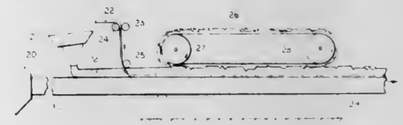
Hans Klingel, Leonberg, Fed. Rep. of Germany, and Wolfgang Klingel, Dieselstr. 20, D-7250 Leonberg, Fed. Rep. of Germany, assignors to Wolfgang Klingel, Leonberg, Fed. Rep. of Germany

Filed Aug. 7, 1979, Ser. No. 64,585

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834849

Int. Cl.³ B05D *3/12, 5/02;* **B32B** *31/08, 33/00*

U.S. Cl. 156—244.12 **5 Claims**



1. A process of making translucent plates with light-scattering surfaces, comprising the steps of:

extruding a hollow profile of light-transmissive thermoplastic material with two flat major sides;

depositing an adhering film of cold-hardening, light-stabilized and transparent liquid resin on at least one of said major sides;

deforming the deposited film by contact with an embossed pattern carrier; and

allowing the deformed film to harden on said profile.

4,235,659

APPARATUS FOR MAKING AND STACKING PLASTICS BAGS

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 24, 1979, Ser. No. 60,237

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833236

Int. Cl.³ B32B *31/00;* **B30B** *15/34*

U.S. Cl. 156—510 **8 Claims**



1. Apparatus for making plastics bags from an intermittently fed flattened web of tubular film and for stacking same, comprising air jet pipes which stretch the leading fed end of the web of tubular film and are disposed at both sides thereof, cyclically operating transverse welding and transverse severing means which provide the bags with base weld seams and cut them from the web of tubular film, a row of needles behind the transverse severing means in the feeding direction of the tubular web of film, a raisable and lowerable depressor which is disposed above the row of needles and pushes the bag that has last been severed from the web of tubular film onto the needles in the vicinity of its mouth, means for pushing the bags off the needles after forming a stack of predetermined number, and a conveyor belt supporting the bags during stacking and intermittently taking the finished stacks away, characterised in that two rows of needles (**28, 29**) interspersed in comb-like

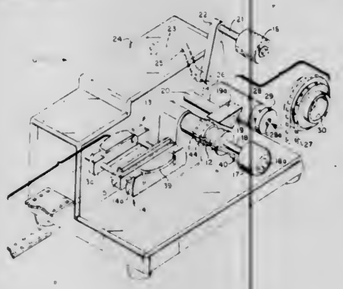
manner are provided that engage through elongate holes (17) in a supporting plate (16) bridging the gap between the severing means (8, 9) and the conveyor belt (20) and are secured to carriers (30) which are disposed beneath the supporting plate, are provided with drives (36, 39) and alternately move one row from its spiking position projecting beyond the supporting plate (16) to a position advanced towards the conveyor belt (20) and, prior to or upon commencement of the advancing motion, retract the other row, which is in the advanced position, out of the stack under the supporting plate (16) and, during the advancing cycle, move it to the spiking position, and that the belt drive is switched on during the advancing motion of the respective row of needles.

4,235,660

APPARATUS FOR REPAIRING SPROCKET HOLES ON STRIP MATERIAL

Daniel E. Rodriguez, Altadena, Calif., assignor to James S. Stanfield, Los Angeles, Calif.

Filed Mar. 5, 1979, Ser. No. 17,394
Int. Cl.³ B32B *31/00*; B31F *5/00*; B65N *23/32, 27/00*
U.S. Cl. 156—516 **19 Claims**



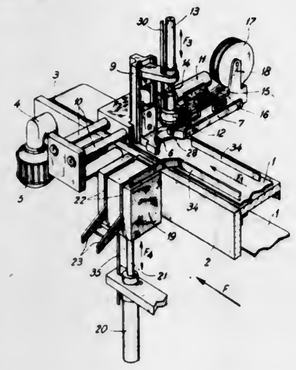
1. An apparatus for repairing sprocket holes on a selected section of film by bonding a pressure adhesive repair tape along the length of the film over the sprocket holes, said tape having matching sprocket holes, and said apparatus having a repair station comprised of a wheel on a shaft extending from a support wall, said wheel having sprockets spaced for the sprocket holes of said film, and a pressure roller for pressing film onto the adhesive side of said repair tape for bonding on said film as said sprocket wheel is rotated, an improvement comprising a knob on said sprocket wheel shaft, a spring biasing said knob away from said sprocket wheel, a pin connected to said knob off center, said pin extending parallel to said shaft through a hole in said sprocket wheel to engage said sprocket wheel for turning with said knob, said pin extending from said knob to a point very near said support wall, a knife blade having a cutting edge secured to said knob, the cutting edge of said blade being disposed from a point at the free end thereof on one side of the circumference of said sprocket wheel to a point at the butt end thereof on the other side of the circumference of said sprocket wheel when the knob is in its extended position on said shaft, a slot in said sprocket wheel in line with said knife blade to permit said cutting edge to cut repair tape wrapped on said sprocket wheel when said knob is pushed in, and an opening in said support wall to receive said pin when said knob is in a position for the knob to be pushed in against said spring to cut repair tape without cutting film.

4,235,661

ARTICLE LABELLING MACHINE

Jacques E. M. Evrard, 20 avenue Jean Aicard, Paris, France

Filed Dec. 15, 1978, Ser. No. 969,716
Claims priority, application France, Dec. 16, 1977, 77 37974
Int. Cl.² B65C *9/06, 9/18, 9/36*
U.S. Cl. 156—542 **9 Claims**



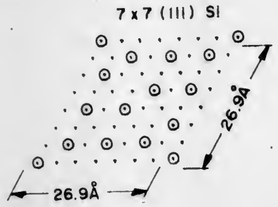
1. An article labelling machine comprising means for conveying the articles to be labelled and labelling means for the articles including a label distributor, characterised in that the articles are fed one-by-one by said conveying means into a stirrup the internal shape of which corresponds to part of the external shape of the articles in order to achieve an automatic centering of an article in relation to a label-applying head mounted above said stirrup, the assembly of the stirrup and the label-applying head being mounted on lateral guiding means in order to permit disengagement of said assembly from the label distributor and the bringing of a labelled article into position for discharge from the machine.

4,235,662

LAYER OF CRYSTALLINE SILICON HAVING (111) ORIENTATION ON (111) SURFACE OF LITHIUM ALUMINUM

Norman E. Reitz, Redwood City, Calif., assignor to Sotec Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 872,625, Jan. 26, 1978. This application Jun. 28, 1978, Ser. No. 920,093
Int. Cl.³ C30B *23/06, 25/10, 25/18*
U.S. Cl. 156—612 **9 Claims**



1. A method for producing a layer of crystalline silicon having a (111) orientation comprising:
providing a substrate of crystalline lithium aluminum, said substrate having essentially a (111) orientation and having an exposed aluminum surface;
gradually applying silicon atoms thereto from the vapor state at a rate which allows said silicon atoms to arrange themselves for oriented overgrowth on said substrate; and
recovering a product comprising a layer of crystalline silicon having a (111) orientation upon a (111) lithium aluminum substrate, said layer of crystalline silicon having a reconstructed 7×7 surface configuration at the silicon-aluminum interface which has epitaxial relationship with a 6×6 aluminum surface structure on the (111) lithium aluminum.

4,235,663

METHOD OF PRODUCING A DIELECTRIC OF TWO-LAYER CONSTRUCTION

Tsutomu Okamoto, and Hidemasa Tamura, both of, Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 1, 1977, Ser. No. 856,269
Claims priority, application Japan, Dec. 3, 1976, 51/145866
Int. Cl.³ C30B *19/04*
U.S. Cl. 156—624 **15 Claims**

1. A method of producing a dielectric layer on a substrate comprising:
(a) providing a liquid melt composed of a pseudo-three-component system defined by the formula:

$$(Bi_2O_3)\text{-}(GeO_2)\text{-}(Y+xGeO_3)$$

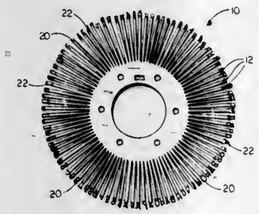
wherein Y is a material selected from the group consisting of BaO, CaO, MgO, SrO and mixtures thereof and x is a numeral ranging from 0.5 to 5.0 so that such liquid melt has a mol ratio of such components within a ternary diagram of said three components which is surrounded by a range connecting points A, B and C on such diagram wherein point A is 0.760:0.002:0.238; point B is 0.994:0.002:0.004; and point C is 0.760:0.236:0.004;
(b) selectively supercooling such melt to a temperature about 0.2° to 50° C. below the solidification temperature of said melt and substantially simultaneously contacting said melt with a select surface of a monocrystalline substrate compound of $Bi_{12}GeO_{20}$ and maintaining such supercooling temperature while a desired thickness of an epitaxial layer grows at a select rate from said melt onto said surface; and
(c) pulling said substrate away from said melt.

4,235,664

UNITARY TYPE-CARRIER ELEMENTS AND METHOD OF MAKING SAME

Jon F. Menke, Cokato, Minn., assignor to Hutchinson Industrial Corporation, Hutchinson, Minn.

Filed Jun. 29, 1979, Ser. No. 53,408
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—645 **14 Claims**



1. The method of forming from flat metal stock a one-piece type-carrier element of the kind having a center portion and a plurality of arms extending therefrom, each arm having a printing surface including integrally formed type characters, comprising the steps:
coating both front and back surfaces of the metal stock with photoresist material;
forming an image defining the overall shape of the carrier element in the photoresist material on the back surface of the metal stock;
forming an array of images defining selected type characters in the photoresist on the front surface area of the metal stock, each of said images being arranged to register with one of the arms, respectively;
removing photoresist to expose metal stock around the images of the characters on the front side surface of the stock and to expose metal stock around the image shape of the carrier element of the back surface and optionally allowing photoresist to remain on any other areas of the surfaces to facilitate handling during fabrication; and
etching the exposed metal stock on both surfaces whereby all of the metal stock surrounding the carrier element is completely removed except for any portions selected to facilitate handling and the type characters are formed in relief on the arms thereof.

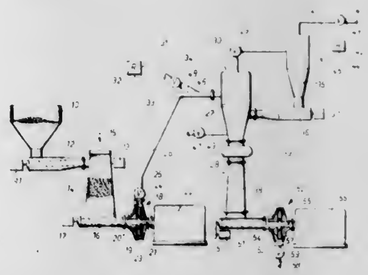
14. The method of forming from metal stock a one-piece type-carrier element of the kind having a center portion and a plurality of arms extending therefrom, each arm having a printing surface including integrally formed type characters, comprising the steps:
coating both opposing surfaces, hereinafter termed front and back surfaces, of the metal stock with photoresist material;
forming an image defining the overall shape of the carrier element in the photoresist material on the back surface of the metal stock;
forming an array of images defining selected type characters in the photoresist on the front surface area of the metal stock, each of said images being arranged to register with one of the arms on the back surface, respectively;
removing photoresist to expose metal stock around the images of the characters on the front side surface of the stock and to expose metal stock around the image shape of the carrier element of the back surface and optionally allowing photoresist to remain on any other areas of the surfaces to facilitate handling during fabrication; and
etching the exposed metal stock on both surfaces whereby all of the metal stock surrounding the carrier element is completely removed except for any portions selected to facilitate handling and the type characters are formed in relief on the arms thereof.

4,235,665

METHOD AND APPARATUS FOR PRODUCING FIBER PULP IN A STEAM PRESSURIZED GRINDING SYSTEM

Rolf Reinhall, Bellevue, Wash.; Inge Johansson; Ake Sandstron, both of Täby, Sweden; Anders Mukvist, Bellevue, Wash., and Lars Elander, Täby, Sweden, assignors to American Defibrator, Inc., Minneapolis, Minn.

Continuation of Ser. No. 808,713, Jun. 21, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,572
Claims priority, application Sweden, Jun. 30, 1976, 7607484
Int. Cl.³ D21B *1/14*; B27L *11/08*; B23C *23/14*
U.S. Cl. 162—23 **6 Claims**



1. The method for producing pulp from lignocellulose-containing fibrous material comprising:
(a) grinding the material in a steam pressurized defibrating apparatus (18);
(b) propelling the ground pulp material by the accompany-

ing steam via a blow valve (**24**) through duct means (**26**) into a vapor-tight receiving cyclone (**27**);
(c) separating the pulp material from the accompanying steam in said receiver cyclone;
(d) discharging the separated pulp material from said receiver cyclone and passing it in a vapor-tight manner to a further pulp preparation station;
(e) discharging the separated steam and entrained fibers via valve means (**30**) to create a pressure drop in said receiving cyclone sufficient only to maintain the propellant force of the steam;
(f) passing the separated steam and entrained pulp fibers in a vapor-tight manner to a vapor-tight steam cleaning cyclone (**35**), where the entrained fibers are separated and recycled to the receiving cyclone; and
(g) recycling the separated steam via valve means for further use in the pulp producing process.

3. Apparatus for producing pulp from lignocellolose fibrous material comprising:
(a) a defibrator (**18**) in which the fibrous material is ground in an atmosphere of pressurized steam;
(b) a vapor-tight receiving cyclone (**27**) for separating pulp and steam discharged from said defibrator;
(c) a blow valve (**25**) controlling the discharge of ground pulp material and steam from said defibrator;
(d) vapor-tight duct means (**26**) through which the discharged pulp material is propelled by the accompanying steam into said receiving cyclone;
(e) secondary pulp preparation means (**32**);
(f) discharge means (**28**) for passing separated pulp material from said receiving cyclone in a vapor-tight manner to said secondary pulp preparation means;
(g) a vapor-tight steam cleaning cyclone (**35**) for secondary separation of steam and entrained fibrous material;
(h) valve-controlled means (**29, 30**) for discharging separated steam and entrained fibers from said receiving cyclone to said steam cleaning cyclone to create a pressure drop sufficient only to maintain the propellant force of the steam between said defibrator and the receiving cyclone;
(i) vapor-tight means for recycling the fiber material separated in said steam cleaning cyclone to said receiving cyclone; and
(j) valve-controlled means for discharging surplus steam from said steam cleaning cyclone for further use in the pulp producing process.

4,235,666

1,2,3,4,4a,9a-HEXAHYDRO-9,10-ANTHRACENE-DIONE, ITS PREPARATION AND ITS APPLICATION TO THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIALS

Lucien E. Bourson, Bois Colombes; Serge Y. Delavarenne, Francheville le Haut, and Pierre Tellier, Sainte-Foy-les-Lyon, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jun. 27, 1979, Ser. No. 52,658
Claims priority, application France, Jun. 29, 1978, 78 19466
Int. Cl.³ D21C *3/20, 9/10*; C07C *49/68*
U.S. Cl. 162—72 **13 Claims**

1. As a new industrial product 1,2,3,4,4a,9a-hexahydro-9,10-anthracene-dione.

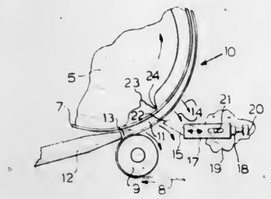
10. A process for the delignification of lignocellulose materials which comprises utilizing 1,2,3,4,4a,9a-hexahydro-9,10-anthracene-dione in said delignification.

4,235,667

METHOD OF AND MEANS FOR ATTAINING UNIFORMITY IN PAPER WEBS PRODUCED ON A ROLL FORMER

Jan I. Bergstrom, Beloit, Wis., and Richard E. Hergert, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 9, 1979, Ser. No. 28,227
Int. Cl.³ D21F *1/00*
U.S. Cl. 162—203 **14 Claims**



1. A method of attaining uniformity in forming a paper web on a roll former, comprising:
directing a jet of paper making fiber stock slurry into a primary drainage area of a forming zone defined between convergently related cotravelling inner and outer forming belts, wherein said inner belt wraps the perimeter of a rotary forming roll throughout a substantial circumferential area and provides a form retaining backing for said inner belt throughout the extent of said primary drainage area, at least said outer belt being porous for drainage therethrough and beyond the primary drainage area also wrapping said forming roll with the paper web squeezed between the belts;
effecting primary drainage in said primary drainage area;
and locating a narrow pulse generating surface at an adjustable stationary position along said primary drainage area in adjacently spaced relation to, and across the width of, said outer belt and thereby momentarily interrupting freedom of drainage through said outer belt from the travelling paper stock slurry, but permitting free drainage from said drainage area through said outer belt both upstream and downstream from said surface, and thus generating and imposing a pressure pulse on mobile fibers in suspension in said stock slurry as the stock travels through said pulse in said primary drainage area, resulting in substantially uniform distribution of said fibers before the fibers become locked in the paper web.

4,235,668

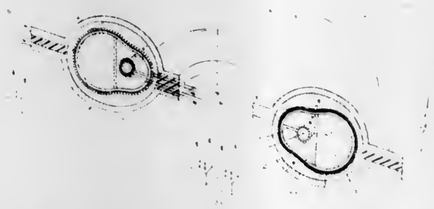
CONFINEMENT OF HIGH TEMPERATURE PLASMAS

Robert W. Bass, Provo; Helaman R. P. Ferguson, Orem, both of Utah; Harvey J. Fletcher, Coltsneck, N.J.; John H. Gardner, Provo, Utah; B. Kent Harrison, Provo, Utah, and Kenneth M. Larsen, Provo, Utah, assignors to Brigham Young University, Provo, Utah

Continuation-in-part of Ser. No. 300,781, Oct. 25, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 515,858
Int. Cl.² G21B *1/00*
U.S. Cl. 176—3 **10 Claims**

1. The method of producing in a topologically toroidal vacuum volume a high temperature topologically toroidal plasma volume externally dynamically stabilizable comprising the steps of
generating a topologically toroidal plasma of selected beta value, and
confining said plasma by a magnetic field so that the interface of said vacuum and said plasma is a smooth magnetic surface without cusps tangent to the surface of said plasma and characterized by
static structural stability,
a rational rotation number, and

at least but not more than a selected finite even non-zero number of axially non-symmetric topologically closed magnetic field lines,
wherein said step of confining said plasma by a magnetic field includes the further steps of
generating a first current to effect a poloidal flow of current transversely around and exteriorly of said plasma, in order to tend to displace said magnetic surface inwardly toward the longitudinal axis of said plasma and thereby compress said plasma about its longitudinal axis, as well as to curve said magnetic surface about the toroidal axis of said plasma,
generating a second current to effect a first toroidal flow of current longitudinally of said plasma and exteriorly thereof adjacent the side of the plasma having a relatively small radius in comparison to the diametrically opposite



large radius side of said plasma, thereby to curve said magnetic surface in a direction away from said toroidal axis and toward the longitudinal axis of said plasma so that the poloidal cross-section of said plasma is non-convex, and
generating a third current exteriorly of both said plasma and said second current to effect a second toroidal flow of current longitudinally of said plasma and in a direction opposite to the direction of said first toroidal flow of current, thereby to prevent movement of said plasma in a direction toward the large radius side of said plasma, and where the values of said first, second and third currents are selected so that said plasma is bounded by only a single such smooth magnetic surface, said smooth magnetic surface being the product of the interaction of two separate and distinct families of magnetic surfaces produced by said first, second and third currents.

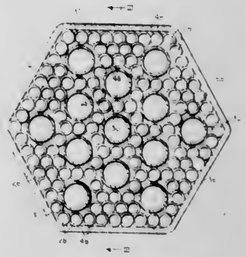
4,235,669

NUCLEAR REACTOR COMPOSITE FUEL ASSEMBLY

Donn M. Burgess, Richland; Duane R. Marr, West Richland; Michael W. Cappiello, and Ronald P. Omberg, both of Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1978, Ser. No. 891,673
Int. Cl.² G21C *3/04*
U.S. Cl. 176—18 **1 Claim**

1. In a liquid metal cooled breeder nuclear reactor, an improved core comprising a plurality of vertical coextending fuel assemblies arranged in a predetermined lateral array so as to approach the configuration of a right circular cylinder, each said assembly including a thin-walled metallic polygonal duct and a plurality of parallel coextending elongated fuel elements closely arranged within said duct in a bundle of substantially the same cross-sectional shape as said duct, said fuel elements including a plurality of breeder elements and a plurality of enriched fissile fueled driver elements, each said driver element having a peripherally wound wire spacer, said breeder elements being of larger transverse cross section than said driver elements and each laterally bounded and radially supported by said spacers of a subplurality of said driver elements, said spacers of said subplurality being contiguous with said breeder element, said peripherally wound wire spacers being only on said driver elements, said breeder elements being radially supported solely by said spacers of said driver elements each said driver element of said core being of the same



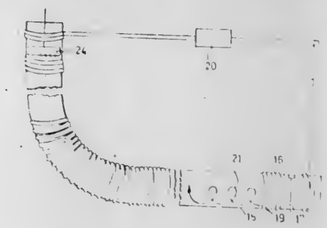
fissile enrichment, the number of said breeder elements in each of said assemblies of said core varying in a predetermined decreasing amount from the assemblies in a radial central region of said core to a radial peripheral region of said core, the number of said driver elements in each of said assemblies varying in a predetermined increasing amount from the assemblies in a radial central region of said core to a radial peripheral region of said core.

4,235,670

METHOD AND APPARATUS FOR MEASURING NEUTRON FLUX

Samir A. Alzaldi, 64/22 Raghiba-Khatoon, Baghdad, Iraq

Filed Oct. 17, 1977, Ser. No. 842,462
Int. Cl.² G21C *17/00*
U.S. Cl. 176—19 R **13 Claims**



1. A method of measuring the neutron flux in a nuclear reactor which includes inserting a neutron sensitive material in the reactor, generating an axial magnetic field along the length of an evacuated tube, guiding electrons emitted by the neutron sensitive material through the evacuated tube to the exterior of the reactor with the aid of the axial magnetic field, and detecting electrons reaching the exterior of the reactor.

4,235,671

NUCLEAR ENERGY INSTALLATION HAVING A GAS-COOLED REACTOR CORE

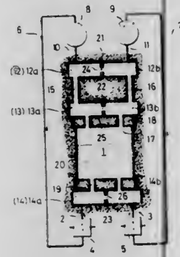
Heiko Barnert, and Manfred Schäfer, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,954

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713463

Int. Cl.[3] G21C 9/00

U.S. Cl. 176—38 **2 Claims**



1. In a nuclear energy installation having a gas-cooled reactor core, and at least two parallel conveyed cooling gas circuits connected to said reactor core and including components for withdrawing the energy of the cooling gas: and at least one gas collecting chamber for said cooling gas circuits, gas conduits and gas distributors of said cooling gas circuits discharging into said gas collecting chamber preceding entry of the cooling gas cooled in said cooling gas circuit into said reactor core, the so-called cold gas, and subsequent to exit of the cooling gas heated in said reactor core from said reactor core, the so-called hot gas, the improvement comprising: separator walls subdividing at least one said gas collecting chamber so that the gas conduits and gas distributors of each cooling gas circuit discharge into a separate gas chamber: at least one pressure-compensating aperture with a high flow resistance compared to the collective flow resistance of all said gas conduits and said gas distributors other than said at least one pressure-compensating aperture, connecting said gas chamber with at least one further gas chamber of the same at least one gas collecting chamber, said separator walls having an inherent stiffness to withstand the pressure differentials generated between said gas chambers responsive to the rupture of a pressure-carrying wall structure or gas conduit.

4,235,672

NUCLEAR REACTOR PLANT WITH PRESSURIZED WATER REACTOR SECURED AGAINST BURSTING OR RUPTURE

Elmar Harand, Höchstadt, and Eberhard Michel, Nuremberg, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

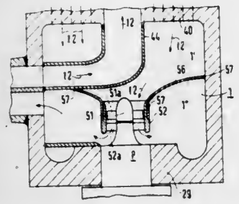
Filed Feb. 14, 1978, Ser. No. 877,742

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706216

Int. Cl.[2] G21C 15/16

U.S. Cl. 176—65 **6 Claims**

1. In a nuclear reactor installation secured against rupture and having a pressurized water reactor, at least one steam generator, at least one main coolant pump and lines connecting them in a primary circulatory loop, the main coolant pump being installed in a primary chamber of the steam generator and forming with the latter a structural unit, the primary circulatory loop having a string of hot and cold lines between a pressure vessel enclosing the reactor and the primary side of the steam generator, at least part of the hot and cold lines being structurally united along the direction of their fluidic flow paths, the structural unit formed of the pump and the steam generator having an upright disposition with relatively short, straight and substantially horizontal primary circulatory loop lines, and sheathing protective against rupture enclosing the pump and the steam generator as well as the lines of the primary circulatory loop, the steam generator being a straight-tube steam generator having a central ascending pipe, a tube bundle having a central passageway through which said ascending pipe extends, an inlet chamber communicating with said tube bundle at an upper end thereof, an outlet chamber communicating with said tube bundle at a lower end thereof, tube support plates holding said tube bundle at said upper and said lower ends thereof, said central ascending pipe communicating with said inlet chamber for feeding primary medium thereto from which the primary medium is returned through said tube bundle to said outlet chamber, and a guidance member in the form of a pipe elbow having a substantially 90° -bend



extending through said outlet chamber, said guidance member connecting said ascending pipe and said hot line string, said cold line string communicating with said outlet chamber, said outlet chamber of the steam generator forming a pump suction chamber of the main coolant pump, the latter comprising an impeller projecting axially from below into said outlet chamber, a flow guidance device surrounding said impeller and having a guide vane ring disposed above said impeller, flow guidance walls for diverting the primary medium axially-radially, said flow guidance walls connecting said flow guidance device to said cold line string of said double line, said outlet chamber having a base spaced from said flow guidance device and defining therewith an annular intake passageway thereat for the pump whereby the primary medium initially flowing downwardly in said outlet chamber is diverted, after flowing laterally toward said annular intake passageway, so as to flow axially upwardly into the pump.

4,235,673

CHIP SLEEVE FOR NUCLEAR FUEL ELEMENTS

Walter J. Mordarski, Wallingford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 12, 1978, Ser. No. 868,868

Int. Cl.[2] G21C 3/20

U.S. Cl. 176—82 **10 Claims**

1. An improved nuclear reactor core element of the type having a column of axially stacked cylindrical pellets surrounded and enclosed by a cylindrical metal cladding tube, the improvement comprising:

a circumferentially uninterrupted cylindrical web confining said column of pellets and spaced at all points from said cladding to provide an annular gap between said web and said cladding, said web being formed of a plurality of discrete, overlapping, continuous filaments at least some of which are helically wound about and extend over the entire axial length of said column, said overlapping filaments forming radial openings therebetween whereby portions of the outer surface of the pellets are in fluid communication with the environment external to the web; and

fastening means at each end of said column to which are attached the filaments that extend over the entire length of said column, the attached filaments thereby being maintained in an axially tensioned condition whereby the web



exerts an inward girdling force over the outer surface of said column.

4,235,675

PROCESS FOR PURIFYING PYROLYSIS GASES

Horst Bechthold, Erftstadt-Friesheim, Fed. Rep. of Germany, assignor to Ealther & Cie Aktiengesellschaft, Köln-Dellbrück, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,287

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722767

Int. Cl.[2] C10B 51/00; B01D 53/02, 53/14

U.S. Cl. 201—2.5 **13 Claims**



4,235,674

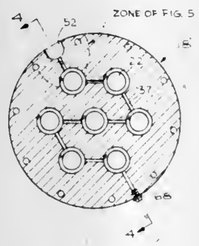
PRESSURIZER SYSTEM FOR ELECTRIC PENETRATION ASSEMBLIES

David D. Yue, Huntington Beach, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 1, 1977, Ser. No. 856,240

Int. Cl.[2] G21C 17/10

U.S. Cl. 176—87 **4 Claims**



1. A nuclear reactor penetration installation comprising:

a penetration nozzle having a header plate with ports for passing electrical conductors therethrough;

sealing means supported adjacent to said ports;

means for holding a quantity of dielectric liquid in contact with said sealing means;

an accumulator including a quantity of dielectric liquid therein;

means for communicating said dielectric liquid in said accumulator with said dielectric liquid in said holding means; and

means in said accumulator for maintaining pressure to the dielectric liquid therein.

1. A process for operating a pyrolysis reactor for waste products, the said process comprising

(a) passing the waste products into a pyrolysis reactor provided with a separate heating means;

(b) after completion of the pyrolysis passing the gaseous and vaporous products including suspended solids resulting from said pyrolysis into a partial oxidation zone wherein preheated air is added to the gaseous and vaporous products in an amount insufficient for complete combustion and sufficient to cause the formed gas to have a temperature of at least 1000° when leaving the oxidation zone, thereby causing decomposition of substantially all hydrocarbons present to CO, H_2, CO_2 and H_2O;

(c) then passing the formed gas through separate heat exchange means in contact, successively, with (1) the purified gas (below (d)), (2) the air to be fed into the external heating unit of the reactor and (3) in contact with the air for said partial oxidation, at least part of the sensible heat of said partial oxidation gas thus being utilized to preheat the oxidation air, heating air and heating gas;

(d) then subjecting the gas to a purification by adsorption or absorption of contaminants present in it;

(e) introducing air in separate conduits to said oxidation zone and said heating means of the reactor; and

(f) passing the purified gas having a temperature of at least 200° C. together with part of said added air into said heating means of the reactor, the said purified gas and added air being preheated in said heat exchangers (above c)) prior to introduction or reintroduction as fuel gas into the process.

4,235,676

APPARATUS FOR OBTAINING HYDROCARBONS FROM RUBBER TIRES AND FROM INDUSTRIAL AND RESIDENTIAL WASTE

R. William Chambers, Tustin, Calif., assignor to Deco Industries, Inc., Santa Ana, Calif.

Continuation of Ser. No. 725,189, Sep. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 558,599, Mar. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 548,498, Feb. 10, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 833,904

Int. Cl.[1] C09B *3/00;* **C10B** *7/10, 31/04, 47/18*

U.S. Cl. 202—118 **12 Claims**



1. Apparatus for obtaining hydrocarbon products from organic feed material, comprising:

an insulated heating chamber;

at least one stationary elongated tubular member having an inlet and an outlet, positioned in said chamber;

means for heating the tubular member to at least about 800° F.;

means including a screw conveyor having a hollow shaft, which rotates relative to the tubular member for continuously moving feed material through the tubular member from the inlet to the outlet thereof at a substantially constant rate of speed;

means for heating the interior of the hollow shaft;

means for preventing the introduction of air into the tubular member during the movement of feed material therethrough; and

means for producing a vacuum within said tubular member and for continuously removing vapors and gases therefrom.

4,235,677

DISTILLATION FLASK AND APPARATUS FOR PRODUCING HIGH-PURITY WATER HAVING OVERFLOW LIQUID TRAP MEANS

Narbik A. Karamian, Bethesda, Md., assignor to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

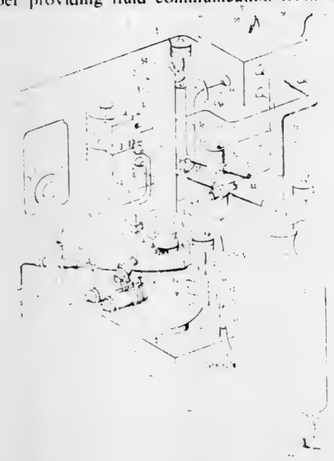
Continuation-in-part of Ser. No. 671,713, Mar. 29, 1976, Pat. No. 4,089,749. This application Feb. 23, 1978, Ser. No. 880,425

Int. Cl.[1] C02B *1/04*

U.S. Cl. 202—176 **21 Claims**

1. An apparatus for the production of high-purity liquid, the apparatus comprising distillation flask means; a condenser unit; carboy means for receiving and storing the high-purity liquid, communication means for effecting fluid communication from said flask means to said condenser unit and thence to said carboy means, said flask means, said condenser unit, said carboy means and said communication means defining interior of the apparatus; and filter means coupled to said interior of the apparatus for filtering air entering said interior while allowing air to enter and to leave said interior of the apparatus, said flask means including an overflow liquid trap means for allowing liquid above a given level within said flask means to flow outward while preventing air from passing into said flask means via said trap means, and wherein said flask means includes a fluid holding member and wherein said liquid trap means comprises:

a fluid trap, said fluid trap including a first hollow member and a second hollow member interconnected by a first tubular member which opens into said second hollow member providing fluid communication from said first



hollow member to said second hollow member, an overflow drain being coupled to said second hollow member above that height at which said first tubular member opens thereinto, and a second tubular member connected between said fluid holding member and said first hollow member, said second tubular member being connected to said first hollow member beneath that height at which said first tubular member is connected thereto.

4,235,678

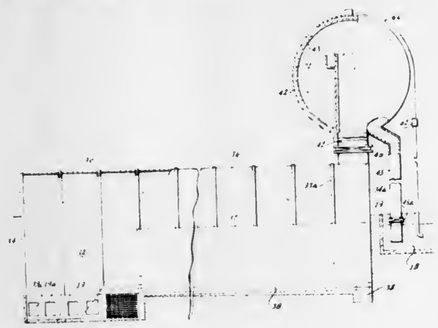
SOLAR POWERED WATER DESALINATION SYSTEM WITH A REGENERATIVE FIXTURE

Joseph E. McKeen, Box 1306, Long Beach, Calif. 90801

Filed Mar. 17, 1978, Ser. No. 887,750

Int. Cl.[1] C02B *1/06;* **F24B** *3/02*

U.S. Cl. 202—185 R **3 Claims**



1. A water desalination system comprising:

a vacuum tight tank having a semi-cylindrical top made of a material that is transparent to the suns rays and more transparent to the violet and ultraviolet parts of the spectrum than the red and infrared parts of the spectrum;

a condensation sphere disposed at a higher elevation than said tank;

a tube connecting said tank to said sphere so that any vapor within said tank rises into said sphere to be condensed therein;

a barometric leg coupled to said sphere so that any condensed water therein flows into said leg;

first means for storing fresh water disposed at a lower elevation than said sphere and with the lower end of said leg submerged below the surface of said fresh water;

second means for forming a vacuum within said tank;

third means exposed to the atmosphere for storing sea water so that said sea water absorbs solar energy;

fourth means for coupling sea water from said third means into said tank;

fifth means disposed within said sphere to absorb heat therein;

sixth means disposed within said tank and submersed within said sea water to supply heat to said sea water;

seventh means for transporting energy from said fifth means to said sixth means.

4,235,679

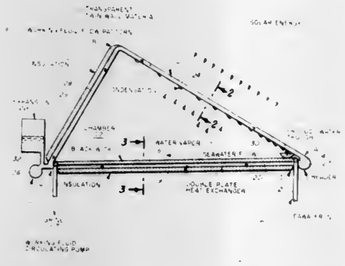
HIGH PERFORMANCE SOLAR STILL

Brian E. Swaidan, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 15, 1979, Ser. No. 3,181

Int. Cl.[1] B01D *3/00*

U.S. Cl. 202—234 **25 Claims**



1. A high performance solar distillation apparatus for vaporization and condensation of pure water from saline and brackish waters, comprising:

a. a generally flat double plate heat-exchanger base means having passage means therethrough for the flow of a heat transfer working fluid from one end of the apparatus base to the other;

b. a twinwall cover means having passage means between the twin walls and being transparent to solar energy; said cover means mounted above said heat-exchanger base means so as to form a chamber between said transparent cover means and said base means; said chamber being completely enclosed by walls on all remaining sides thereof; and said twinwall transparent cover means being positioned at an incline to the horizontal when the apparatus is in operating position;

c. said passage means in said heat-exchanger base means and in said transparent cover means being filled with a heat-exchanger working fluid;

d. a first conduit means connecting one end of the passage means of said double plate heat-exchanger base means to one end of the passage means in said twinwall transparent cover means, and a second conduit means connecting the other end of said passage means in the twinwall transparent cover means to the other end of the passage means in said double plate heat-exchanger base means to allow complete flow of the working fluid through said heat-exchanger base means through said transparent cover means and return to the heat-exchanger base means;

e. a pump means operable to continuously circulate said working fluid as desired through said heat-exchanger base means, said twinwall transparent cover means and said first and second conduit means;

f. an inlet means at one end of said apparatus for introducing saline waters to flow into said chamber and across the upper surface of said heat-exchanger base means; an outlet means at the opposite end of said apparatus for withdrawing concentrated saline waters following evaporation and condensation as pure water on the inner surface of said transparent cover means of at least a portion of the introduced saline waters;

g. means for activating said pump means when solar energy entering said apparatus chamber through said twinwall transparent cover means impinges upon and heats to a predetermined temperature the upper surface of said double plate heat-exchanger means and the saline waters flowing across the upper surface of the surface thereof causing certain vaporation of the water;

h. said working fluid as it flows through said twinwall transparent cover operating to recapture the heat of condensation as water vapor condenses on the inner surface of said twinwall transparent cover means;

i. means for collecting said pure water condensation and removing same from said chamber;

j. said working fluid from said twinwall transparent cover means flowing though said double plate heat-exchanger base means in turn giving up its recaptured heat of condensation to enhance the vaporization of additional saline water flowing across the upper surface of said heat-exchanger base means.

4,235,680

METHOD FOR DESALINATING WATER BY PREHEATING AND DISTILLATION WITH SOLAR ENERGY

Richard E. Diggs, 12A Rd., Carthage, Mo. 64836

Division of Ser. No. 625,850, Oct. 28, 1975, Pat. No. 4,118,283. This application Jan. 12, 1978, Ser. No. 869,015

Int. Cl.[2] B01D *3/10;* **C02B** *1/04;* **F24J** *3/02*

U.S. Cl. 203—2 **1 Claim**



1. A process for distilling water and separating the water from solids dissolved therein, comprising the steps of

withdrawing contaminated water from a body of water having solid contaminants dissolved therein;

flowing contaminated water from said body of water into a header which is fluidly connected to an outer peripheral edge of a grid;

flowing contaminated water from said header onto said grid via said header;

transferring solar energy to said water flowing across said grid;
flowing contaminated water into a trough which is located on said grid inner peripheral edge which is fluidly attached to said grid, from said grid;
flowing contaminated water from said grid via said trough into a water storage means having a side wall attached to said grid trough and having a heat exchange structure connected thereto;
removing contaminated water from said storage means;
transferring water from said trough to said water storage means;
monitoring temperature of water in said water storage means;
transferring only water having a temperature which equals or exceeds a predetermined temperature to said water storage means;
recirculating said water from said trough back to said header prior to transferring water from said trough into said water storage means when the temperature of said water in said trough falls below a predetermined temperature;
flowing water from said heat exchange structure into a vaporizer means connected to said heat exchange structure, and for separating said water from said solid contaminants dissolved therein;
concentrating solar energy on the contaminated water flowing from said heat exchange structure into said vaporizer means;
using solar energy, raising to a second predetermined temperature said contaminated water flowing from said heat exchange structure into said vaporizer;
vaporizing said contaminated water in said vaporizer under vacuum conditions to form water vapor;
separating said water from solid contaminants in said vaporizer means;
removing said solid contaminants from said vaporizer means;
removing water vapor from said vaporizer means;
transferring said water vapor to a condensing means;
exposing said contaminated water in the vaporizing means to said water vapor and transferring heat from said water vapor to such contaminated water to preheat same;
circulating such preheated contaminated water in a circuitous path;
condensing water vapor and forming distilled water which is free of solid contaminants; and
withdrawing condensed water from the proximity of said water vapor.

4,235,681

ANODES FOR CATHODIC PROTECTION AND OTHER ELECTROLYTIC PROCESSES

Lionel L. Shreir, 18A Elmwood Ave., Kenton, Harrow, Middlesex HA3 8AH, England

Filed Oct. 15, 1979, Ser. No. 84,773
Int. Cl.³ C25B *11/04*; C25D *15/00, 15/48, 3/34*
U.S. Cl. 204—16 **9 Claims**

8. A process for making a composite anode, which comprises electrodepositing lead from a lead plating solution containing particles of magnetite in suspension onto a cathode.

4,235,682

SEALING SOLUTION AND PROCESS TO PREVENT DEPOSITS FORMING DURING THE SEALING OF ANODIZED ALUMINUM SURFACES

Fritz Schneeberger; Walter Zweifel, both of Schaffhausen, and Hermann Weber, Neuhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 20, 1979, Ser. No. 67,437
Claims priority, application Switzerland, Sep. 7, 1978, 9400/78
Int. Cl.³ C25D *11/18*
U.S. Cl. 204—35 N **6 Claims**

1. Process to prevent deposits forming during the sealing of anodized aluminum or aluminum alloys with an aqueous sealing solution, in which process the sealing takes place at a temperature between 90° C. and the boiling point of the solution, and this sealing bath contains an addition of 0.1 to 2.5 g/l comprising:
(a) at least 10% Agar-Agar
(b) 0 to at most 90% gelatine
with the pH of the solution lying between 5 and 7.

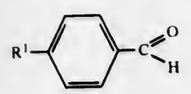
4,235,683

ELECTROLYTIC PREPARATION OF BENZALDEHYDES

Dieter Degner, Dannstadt-Schauernheim, and Hardo Siegel, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

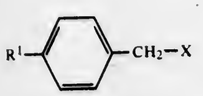
Filed Dec. 5, 1979, Ser. No. 100,654
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855508
Int. Cl.³ C25B *3/00*
U.S. Cl. 204—78 **6 Claims**

1. A process for the preparation of a benzaldehyde of the general formula



I

where R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, wherein a compound of the formula



II

where X is hydrogen, hydroxyl or R^2—COO—, and R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, is oxidized electrochemically in the presence of water, of an alkanoic acid of the formula

R^3COOH III

where R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, and of a fluoride, tetrafluoborate, perchlorate or sulfate as a conductive salt.

4,235,684

PROCESS FOR PRODUCING GLYOXALIC ACID BY ELECTROLYTIC OXIDATION

Hiroyuki Harada, Yokohama; Kazuhiro Hirao, Ichihara; Tadayuki Mitani, and Masaaki Ichino, both of Arai, all of Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo and Daicel Chemical Industries Ltd., Sakai, both of, Japan

Filed Nov. 29, 1979, Ser. No. 98,444
Claims priority, application Japan, Dec. 7, 1978, 53-150570
Int. Cl.³ C25B *3/00*
U.S. Cl. 204—79 **10 Claims**

1. A process for producing glyoxalic acid, which comprises electrolytically oxidizing glyoxal in an electrolytic cell comprising at least one anode, at least one cathode and at least one cation exchange membrane therebetween to define an anode compartment(s) and a cathode compartment(s) therein, using an aqueous solution containing glyoxal and halogen ions as an anolyte solution and an aqueous solution containing an inorganic or organic electrolyte as a catholyte solution.

4,235,685

PREPARATION OF 3-THENYL BROMIDE

Dennis P. Bauer, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 4, 1979, Ser. No. 71,993
Int. Cl.³ B01J *1/10*
U.S. Cl. 204—158 HA **17 Claims**

1. A process for the selective bromination on an alkyl sidechain of an alkyl heterocyclic compound with a brominating agent selected from N-bromosuccinimide, 1,3-dibromo-5,5-dimethyl hydantoin and N-bromoacetamide in a solvent comprising carrying out said bromination in the presence of infrared light as an initiator for the free radical bromination reaction.

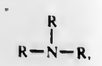
4,235,686

PHOTOPOLYMERIZABLE COMPOSITION COMPRISING α,αDIKETONE CATALYST

Edward C. Dart; Roger C. Roberts; Antony R. Perry; Jozef Nemcek, and Neil B. Graham, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 4, 1977, Ser. No. 848,524
Claims priority, application United Kingdom, Dec. 29, 1971, 60396/71
Int. Cl.³ C08G *18/00*; C08F *2/46*; G03C *1/68*
U.S. Cl. 204—159.19 **13 Claims**

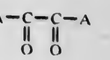
1. A polymeric composition capable of being shaped and which is formed by partially reacting a mixture comprising:
(a) 5% to 95% by weight of the precursors of a polyurethane comprising at least one polyisocyanate and at least one polyol free of ethylenic unsaturation and having isocyanate-reactive groups;
(b) 95% to 5% by weight of the precursors of a cured polyester resin comprising at least one ethylenically unsaturated polyester reactive with said polyisocyanate and at least one ethylenically unsaturated monomer copolymerisable therewith, wherein the mixture is reacted to an extent such as to produce a handleable composition which is capable of being shaped; and
(c) at least one photosensitive catalyst capable of initiating copolymerisation of the ethylenically unsaturated polyester and the ethylenically unsaturated monomer upon exposure of the composition to visible radiation said photosensitive catalyst comprising at least one photosensitiser and at least one compound having the structure



where the units R, which may be the same or different, are hydrogen atoms, hydrocarbyl groups, substituted hydrocarbyl groups or groups in which two units R together with N form a cyclic ring system, no more than two of the units R being hydrogen atoms, and where N is attached directly to a hydrocarbyl group R, at least one of the groups R has a



group attached to N, said photosensitiser having the structure



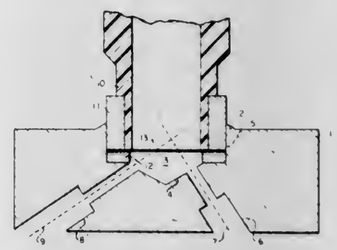
wherein the groups A, which may be the same or different, are hydrocarbyl or substituted hydrocarbyl groups, and wherein the groups A may be further linked together by a direct link or by a divalent hydrocarbyl group or wherein the groups A together form a fused aromatic ring.

4,235,687

MEASURING CELL FOR MICRO-ASSAYS, COMPRISING MEMBRANE ELECTRODES

Jean-Louis Romette, Orrouy; Gerard Gellf, Compiegne, and Daniel Thomas, Thourotte, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine (Anvar), France

Filed May 16, 1978, Ser. No. 906,891
Claims priority, application France, May 20, 1977, 77 15615
Int. Cl.³ G01N *27/30*; C12Q *1/00*
U.S. Cl. 204—195 M **14 Claims**



1. Measuring cell for assays utilizing membranes, said cell being essentially composed of at least one cavity hollowed out in a block of material, so as to define a first cylindrical space whose bottom is, over a reduced part of its diameter, extended by a second space defining the measuring chamber proper, of conical, frustoconical or substantially hemispherical shape, a measuring electrode terminated by a magnetic torus within said first cylindrical space, means holding the torus in position, a non-magnetic membrane of circular shape cut out to the desired size within said cavity adjacent the magnetic torus and between the end of said torus and the mating surface of the cavity, and ducts respectively for the inlet and outlet of the liquids to be assayed and/or the passage of other fluids connecting the periphery and/or the bottom of the cell with the measuring chamber, and open into the latter.

4,235,688

SALT BRIDGE REFERENCE ELECTRODE

Leon P. Sudrabin, Berkeley Heights; Stephen F. Billets, Cedar Grove; Van Dyke J. Pollitt, Fanwood, and Lubomyr Liszczynsky, Cedar Grove, all of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 769,380, Feb. 17, 1977, abandoned.
This application Jun. 27, 1978, Ser. No. 919,600
Int. Cl.[1] G01N *27/30*
U.S. Cl. 204—195 F 9 Claims



1. A position-insensitive long-term fixed potential internally wet salt bridge reference electrode assembly immersible in wet and dry corroding electrolytes, comprising:

(a) an electrolytically non-conductive generally axially elongated vessel impervious to water, having an open end;

(b) a metallic electrode contained within said vessel, remote from said vessel open end;

(c) insulated wire means, physically connected to said metallic electrode and extending from the exterior of said vessel, for electrically connecting said metallic electrode to a voltage potential measuring device;

(d) a hydrophylic porous electrolytically conductive plug circumscribed by an inner surface of a generally cylindrical wall of said vessel, including electrolytically active metallic salt crystals suspended therein with the salt crystals dispersed throughout the plug, said plug separating said metallic electrode from said vessel open end, an extremity of said plug most proximate said metallic electrode being spaced from said metallic electrode to form a closed compartment bounded by said plug, said metallic electrode and the wall of said vessel, said plug including:

(i) a rod-like portion extending into said compartment towards said metallic electrode, for contacting salt crystal-saturated water in said compartment and maintaining simultaneous water-plug and water-electrode contact even when water volume is substantially less than compartment volume and said electrode is oriented with said axially elongated tube substantially skew to vertical;

(e) said water, being saturated with crystals of said metallic salt, and being within said compartment for unrestricted flow therethroughout;

(f) hydrophylic electrolytically semipermeable barrier means, disposed across said vessel open end, one surface thereof contacting said plug and a second surface thereof forming an external surface of said assembly to contact said electrolyte when said assembly is immersed therein, for resisting escape of ions of said salt for said vessel;

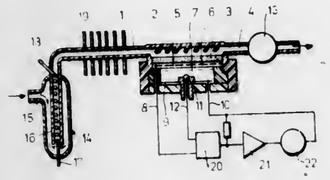
wherein said water contacts both said electrode and said plug.

4,235,689

APPARATUS FOR DETECTING TRACES OF A GAS

Otto Petersen, and Hans-Dieter Schmidt, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,120
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812613
Int. Cl.[1] G01N *27/54*
U.S. Cl. 204—195 R 6 Claims



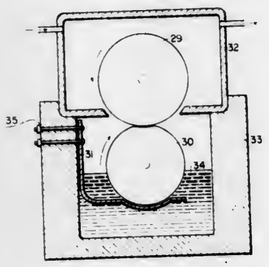
1. An apparatus for detecting traces of gas in a gaseous mixture, comprising: an electro-chemical cell having a polarizable ion selective working electrode composed of silver coated with silver iodide, a reference electrode and auxiliary electrode composed of silver in an organic electrolyte; means for maintaining a constant voltage between the working electrode and the reference electrode to cathodically polarize the working electrode; a current measuring instrument for measuring the current to the auxiliary electrode; a reactor having a catalyst filling and connected upstream of the electro-chemical cell; cooling means between the reactor and the cell; and means for guiding the gaseous stream to be measured such that the gas is heated in the reactor and catalytically oxidised and is thereafter cooled in the cooling means before it impinges upon the working electrode.

4,235,690

TRACE GAS SENSOR

Fred Lichtgarn, 314 Evonshire St., Santa Barbara, Calif. 93111

Filed May 11, 1979, Ser. No. 38,337
Int. Cl.[1] G01N *27/46*
U.S. Cl. 204—195 R 2 Claims



1. A gas sensing instrument operative to detect, measure and monitor trace amounts of foreign gases in the air, in the parts per million range, comprising: a rotatable cylindrical electrically conductive gas adsorbing first electrode, a chamber containing an electrolyte and a felt-like electrolyte absorbing material which is positioned as to contact the first said electrode, with a second electrode in said chamber contacting the said electrolyte and the said felt-like electrolyte absorbing material.

4,235,691

APPARATUS FOR ELECTROPLATING AN OUTER SURFACE OF A WORKPIECE

Kaj-Ragner Loqvist, Fagersta, Sweden, assignor to Wave Energy Development I Vastmanland Aktiebolag, Fagersta, Sweden

Filed Jun. 20, 1979, Ser. No. 50,456
Claims priority, application Sweden, Jun. 30, 1978, 7807399
Int. Cl.[1] C25D *17/00, 17/12*
U.S. Cl. 204—212 4 Claims



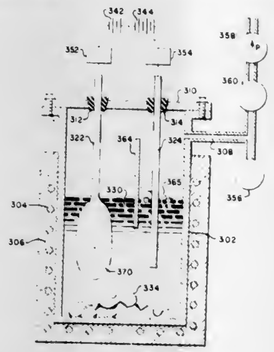
1. An apparatus for providing a surface coating of metal or metal alloy upon the surface of a workpiece through electrolytic plating, the workpiece being used as a cathode, characterized by a tubular anode which is displaceable and rotatable in relation to the workpiece and which carries fastened in slots in its inner surface at least one resilient and electrically insulating strip of material which projects into the tube and makes contact with the workpiece during use dividing the space between workpiece and anode into separate cavities.

4,235,692

ELECTROLYTIC APPARATUS

Douglas W. Townsend, 35 Front St., S, Apt. 410, Mississauga, Ontario, Canada (L5H 2C6)

Division of Ser. No. 360,467, May 15, 1973, Pat. No. 3,979,267, which is a continuation-in-part of Ser. No. 220,245, Jan. 1, 1972, abandoned. This application Feb. 10, 1976, Ser. No. 656,871
Int. Cl.[1] C25D *21/12*; C25C *3/08, 3/22*
U.S. Cl. 204—228 2 Claims



1. Electroplating apparatus comprising:

(a) a crucible for maintaining a melt consisting essentially of at least one fluoride selected from the group consisting of alkali metal fluorides and alkaline earth metals fluorides above its melting temperature;

(b) said crucible being enclosed and adapted to sustain a vacuum over said melt;

(c) an anode comprised essentially of carbon disposed within said crucible in contact with said melt;

(d) a cathode consisting essentially of metal to be deposited within said crucible in contact with said melt;

(e) first electrical means for maintaining a positive electrical potential of about 1 to 3 volts on said anode relative to said cathode;

(f) control means providing a substantially constant potential difference between said anode and said cathode keeping said potential between 1 and 3 volts;

(g) second electrical means for maintaining a negative electrical potential on said cathode relative to said anode, whereby said metal to be deposited is plated on said cathode; and

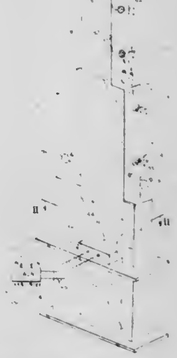
(h) second control means to control said negative potential and to control the rate at which said metal is deposited.

4,235,693

SUBMERSIBLE ENERGY STORAGE APPARATUS

Raymond A. Rowe, Encinitas, and Joseph F. McCartney, Solana Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 9, 1979, Ser. No. 92,819
Int. Cl.[1] C25B *15/08, 1/02, 9/00*
U.S. Cl. 204—229 17 Claims



1. An electrolysis unit feed water gas collection assembly for a water submersible energy storage apparatus wherein the energy storage apparatus includes the collection assembly as well as a fuel cell, comprising:

a hydrogen container and an oxygen container, each container having a gas outlet and being capable of containing feed water as well as hydrogen and oxygen gases respectively;

an electrolysis unit having a hydrogen outlet, an oxygen outlet, and a feed water inlet, the hydrogen outlet being located in the hydrogen container, the oxygen outlet being located in the oxygen container, and the feed water inlet being located in one of the containers;

each of said containers having an opening to the submersible ambient environment so as to be pressure responsive thereto; and

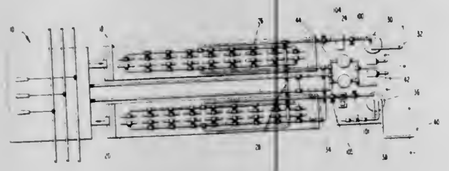
barrier means operatively associated with the opening in each container for isolating the feed water in the containers from water in the submersible environment.

4,235,694

ELECTROLYTIC CELLS FOR HYDROGEN GAS PRODUCTION

Frederick F. Hall, 2452 Villanueva, Mountain View, Calif. 94040

Continuation of Ser. No. 767,122, Feb. 9, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,075
Int. Cl.[3] C25B 9/00
U.S. Cl. 204—266 13 Claims



1. A bank of electrolytic cell for electrolytically converting water into its constituent gases of hydrogen and oxygen upon the application of a voltage source comprising:

two end plate electrodes,

a plurality of intermediate electrodes spaced between said end plate electrodes,

a plurality of dielectric separators individually spacing and electrically separating adjacent electrodes from one another and together with the said electrodes forming impervious electrolytic cell chambers between adjacent electrodes, pressure developing in said chamber during the converting of water into hydrogen and oxygen,

a plurality of gas separator diaphragms individually spaced between adjacent electrodes to divide each said electrolytic cell chamber into two sections to prevent the remixing of hydrogen and oxygen,

alkaline electrolyte contained in each cell chamber,

means for connecting a voltage source to said electrodes,

means for introducing water to each of said electrolytic cell chambers,

first manifold means connected with like sections of each of said electrolytic cell chambers for allowing off-gas withdrawal of hydrogen,

first automatic valve means for closing said first manifold whenever the pressure within said electrolytic cell chambers is equal to or less than a preselected pressure,

second manifold means connected with the other like sections of each electrolytic cell chambers for allowing off-gas withdrawal of oxygen,

second automatic valve means for closing said second manifold means whenever pressure within said electrolytic cell chambers is equal to or less than preselected pressure,

means for back-pressuring the exterior walls of each end plate electrode to counter-balance any pressure developed within the adjacent electrolytic cell chambers and exerted against the inside wall of the end plate electrodes.

4,235,695

NOVEL ELECTRODES AND THEIR USE

Vittorio De Nora, Nassau, The Bahamas; Antonio Nidola, and Placido M. Spaziante, both of Lugano, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Dec. 9, 1977, Ser. No. 858,968
Int. Cl.[3] C25B 11/10, 11/06, 1/34
U.S. Cl. 204—268 15 Claims

1. In an electrolysis cell comprising a cell provided with at least one set of an anode and a cathode and means for impressing an electrolysis current on the cell, the improvement comprising as the anode a dimensionally stable, rigid, recticulated, porous electrode made of an vitreous or glassy carbon strands, or reticulated structures which are crack-free and thermally stable up to 2500° C.

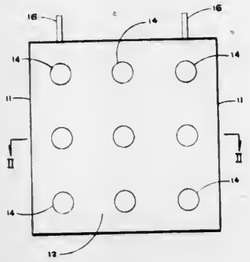
6. A dimensionally stable bipolar electrode comprising a rigid, reticulated porous body made of a vitreous or glassy carbon strands or reticulated structure which are crack-free and thermally stable up to 2500° C. bonded in an electrically conductive relationship to a sheet of cathodic material.

4,235,696

MANDREL FOR NICKEL ROUNDS WITH A MONOLITHIC SURFACE

Philip Bernstein, Glen Ridge; William C. Probst, Ramsey, both of N.J.; James P. Coffey, Warwick, and Charles J. Knipple, Cornwall, both of N.Y., assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,519
Int. Cl.[3] C25C 1/08, 7/02
U.S. Cl. 204—281 6 Claims



1. A mandrel for use in an electrolyte for electroforming items having a major dimension no greater than about 50 mm comprising a sheet-form base of high electroconductivity laminated to a polymeric sheet having integral therein polymeric electroconductive areas of major dimension no greater than about 50 mm isolated one from the other by a co-planar matrix of compatible non-conductive polymer said polymeric sheet and said matrix of compatible non-conductive polymer together isolating said sheet form base of high electrical conductivity from said electrolyte.

4,235,697

OXYGEN SELECTIVE ANODE

John E. Bennett, and Joseph E. Elliott, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 890,374, Mar. 27, 1978, Pat. No. 4,180,445. This application Oct. 29, 1979, Ser. No. 88,891
Int. Cl.[3] C25D 11/04, 11/10, 11/16
U.S. Cl. 204—290 F 2 Claims

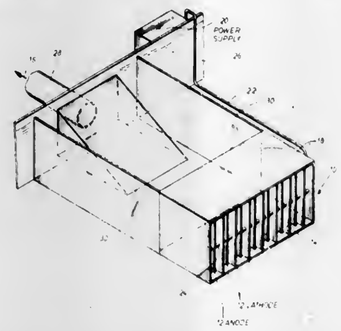
1. An anode comprising an electrically conductive base having at least a portion of the surface of said base having a coating of delta manganese dioxide thereon.

4,235,698

ELECTRONIC WATER TREATMENT APPARATUS

Johnny Arnaud, Houston, Tex., assignor to Hydrotreat, Inc., Houston, Tex.

Filed Oct. 10, 1978, Ser. No. 949,957
Int. Cl.[3] C10G 33/02; B03C 5/00
U.S. Cl. 204—302 34 Claims



1. An electronic fluid treatment apparatus for scale control for use in freely circulating fluid reservoirs comprising:

an open ended support having at least one planar surface;

means for supporting an electric field having a potential voltage greater than 0.7 volts including:

a first plurality of planar electrodes having a positive electrical charge, vertically disposed on said surface in spaced parallel relationship to one another, and,

a second plurality of planar electrodes having a negative electrical charge, vertically disposed on said surface in alternating spaced parallel relationship with said first plurality of planar electrodes and electrically insulated therefrom,

said first and second plurality of planar electrodes being in direct electrical contact with said fluid; and,

a power supply electronically connected to said first and second plurality of electrodes for generating said electric field between each of said alternating first and second planar electrodes.

4,235,699

SOLUBILIZATION OF COAL WITH HYDROGEN SULFIDE AND CARBON MONOXIDE

Charles T. Ratcliffe, Morristown, and Mahmoud B. Abdel-Baset, New Providence, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 5, 1979, Ser. No. 17,514
Int. Cl.[3] C10G 1/00; 45/00, 47/00
U.S. Cl. 208—8 LE 7 Claims

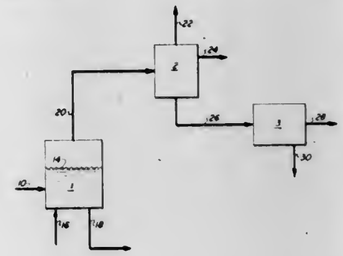
1. In a process for conversion, in liquid or fused reaction medium using a hydrogenating reactant, of a substrate of the group consisting of coal and coal tar and mixtures thereof to products of lower molecular weight than the starting material and soluble in ethyl acetate: the improvement which comprises employing as the sole hydrogenating reactant, such reactant consisting essentially of hydrogen sulfide and carbon monoxide.

4,235,700

TWO-STAGE COKING FOR THE PRODUCTION OF LOW METALS COKE

William J. Metrailer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 12, 1979, Ser. No. 84,511
Int. Cl.[3] C10G 51/02
U.S. Cl. 208—54 8 Claims



1. A process for producing a low metal-containing coke, which comprises the steps of:

(a) contacting a heavy hydrocarbonaceous oil feed containing metal contaminants and having a Conradson carbon content of at least 5 weight percent with hot coke particles in a fluidized bed coking zone maintained at a temperature ranging from about 850 to about 1200° F. to produce coke having a high metals content and a vapor phase effluent, including a heavy hydrocarbonaceous oil having a reduced metals content relative to said oil feed;

(b) treating at least a portion of said heavy hydrocarbon oil having the reduced metals content in a delayed coking zone maintained at a temperature below about 950° F. to produce coke having a low content of metal; and

(c) recovering said low metals content coke.

4,235,701

AROMATICS FROM DRIPOLENE

Fred W. Kopf, Ocean City, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 30, 1979, Ser. No. 25,628
Int. Cl.[3] C10G 45/32; C07C 15/04
U.S. Cl. 208—57 2 Claims

1. In a process in which a hydrocarbon stream is subjected to steam cracking to prepare unsaturated streams of C_2, C_3, and C_4 hydrocarbons, and to prepare a dripolene containing benzene and toluene, and in which said dripolene is employed to prepare a C_6-C_7 hydrogenated hydrocarbon stream containing at least 35% by weight benzene and at least 2% by weight toluene the unit weight ratio of benzene to toluene being less than 25, said C_6-C_7 hydrogenated hydrocarbon stream being substantially free from olefins and cycloolefins, said C_6-C_7 hydrogenated stream consisting predominantly of C_6-C_7 hydrocarbons, the improvement which consists of:

subjecting a liquid hydrocarbon stream consisting only of said hydrogenated C_6-C_7 hydrocarbon stream to an aromatizing zone containing a catalyst consisting predominantly of an activated alumina matrix, said catalyst containing at least 0.2 weight % platinum but not more than 2 weight % platinum, said catalyst having about 1 weight % chloride, at a liquid hourly space velocity within a range from 0.5 to 5 at a pressure within the range from 75 psig to 250 psig at a temperature within the range from 850° F. to 1000° F. in the presence of a hydrogen rich recycle stream providing from 2 to 10 mols of hydrogen per mol of hydrocarbon in said liquid hydrocarbon stream to produce an effluent; and,

subjecting the liquid portion of said effluent to aromatics extraction to recover significantly more benzene and

toluene than was present in said hydrogenated C_6-C_7 hydrocarbon stream.

4,235,702

HYDROCARBON PROCESSING

Robert D. Smith, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 15, 1978, Ser. No. 969,829
Claims priority, application United Kingdom, Dec. 20, 1977, 52972/77
Int. Cl.[1] C07C *4/04*; C10G *55/04*
U.S. Cl. 208—87 9 Claims

1. A process for thermally cracking a fuel value residual hydrocarbon feedstock containing a substantial proportion of saturated hydrocarbons in the absence of a catalyst which comprises solvent extracting the hydrocarbon feedstock with a paraffinic hydrocarbon solvent which is selective for the saturated hydrocarbon material present in the feedstock, separating the paraffinic hydrocarbon solvent from the extracted hydrocarbon material and thermally cracking the extracted hydrocarbon material in a pyrolysis furnace in the presence of a process stream diluent to produce lower molecular weight olefinic hydrocarbons, the process stream diluent comprising steam and the thermal cracking stage of the process being effected at a cracking temperature of at least 750° C.

4,235,703

METHOD FOR PRODUCING PREMIUM COKE FROM RESIDUAL OIL

William H. Kegler, and James R. McConaghy, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Mar. 27, 1979, Ser. No. 24,345
Int. Cl.[1] C10G *9/14*, *55/04*
U.S. Cl. 208—89 6 Claims



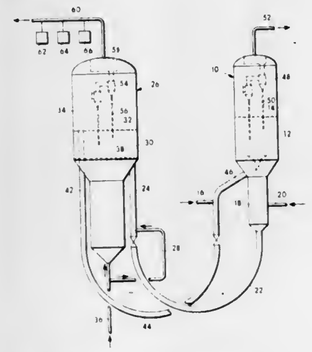
1. A method of making premium delayed petroleum coke comprising:
(a) subjecting a petroleum residual oil having a 5 percent boiling point between 470° and 580° C. and being derived from distillation of a naphthenic crude oil having a K factor of 11.4 or lower to a catalytic demetalation step at a temperature of at least 400° C., a pressure of at least 75 kg/cm^2 and a liquid hourly space velocity of less than 0.25;
(b) subjecting the demetalized residual oil to catalytic desulfurization at a temperature of at least 370° C. and a pressure of at least 50 kg/cm^2 and a liquid hourly space velocity of from 0.2 to 1.0;
(c) subjecting the demetalized and desulfurized residual oil to delayed coking under premium coking conditions; and
(d) recovering premium delayed coke capable of producing graphite electrodes having a longitudinal coefficient of thermal expansion of less than 8.0×10^{-7}/°C.

4,235,704

METHOD OF REDUCING OXIDES OF NITROGEN CONCENTRATION IN REGENERATION ZONE FLUE GAS

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 20, 1979, Ser. No. 67,995
Int. Cl.[1] C10G *11/02*, *11/18*
U.S. Cl. 208—113 12 Claims



1. In a catalytic cracking process wherein:
(a) hydrocarbon feedstock is contacted with a cracking catalyst under cracking conditions to produce cracked hydrocarbon vapors and coke contaminated catalyst; and
(b) the coke contaminated catalyst subsequently is contacted in a regeneration zone under regeneration conditions in the presence of a carbon monoxide combustion promoter with an oxygen and nitrogen-containing regeneration gas to thereby at least partially combust the coke and form oxides of nitrogen which thereafter become part of the exit flue gas, the improvement which comprises:
(i) monitoring the oxides of nitrogen concentration in the exit flue gas from the regeneration zone; and
(ii) adjusting the concentration of combustion promoter in the regeneration zone in relation to the concentration of nitrogen oxides monitored in the flue gas to maintain the concentration of nitrogen oxides in the flue gas below a predetermined level.

4,235,705

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Dec. 15, 1978, Ser. No. 970,049
The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.
Int. Cl.[3] C10G *35/08*
U.S. Cl. 208—139 24 Claims

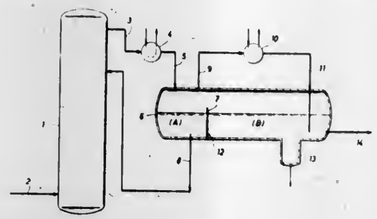
1. A process for converting a hydrocarbon which comprises contacting said hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation of the rhenium carbonyl component, and of a bismuth component.

4,235,706

MULTISTAGE CONDENSATION PROCESS

Robert P. Bannon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1979, Ser. No. 30,962
Int. Cl.[3] B01D *3/14*; C10G *7/00*
U.S. Cl. 208—347 3 Claims



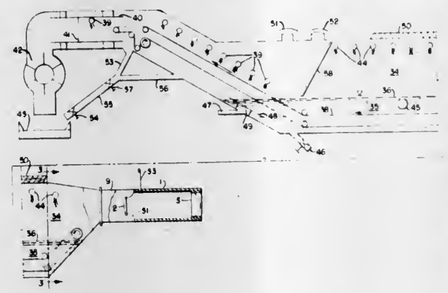
1. A process comprising:
(a) distilling a multi-component liquid in a distillation column under conditions effective to provide an overhead fraction having a temperature differential of at least 20° F. between its dew point and its bubble point;
(b) condensing a first portion of the overhead fraction in a first condensation zone;
(c) passing vapor and liquid from the first condensation zone and separating said vapor and said liquid, and accumulating said liquid in a first accumulation section of an accumulating zone, said accumulating zone also comprising a second accumulation section having vapor communication with the first accumulation section but being separated from said first accumulation section by a barrier which provides limited flow of liquids between the first accumulation section and the second accumulation section near or at the bottom of said barrier, the first accumulation section and the second accumulation section being at different liquid temperatures;
(d) passing said vapor to a second condensation zone and condensing the bulk of the vapor in said zone at a lower temperature than in the first condensation zone to form a liquid and passing the condensed liquid to the second accumulation section of the accumulating zone.

4,235,707

METHOD AND APPARATUS FOR TREATING SOLID MUNICIPAL REFUSE AND OTHER CELLULOSE CONTAINING MATERIAL

Jerry A. Burke, Jr., Richmond, Va., assignor to Burke, Davoud & Associates, Richmond, Va.

Filed Apr. 9, 1979, Ser. No. 28,605
Int. Cl.[3] B03B *1/06*
U.S. Cl. 209—3 25 Claims



1. A method of treating solid municipal waste and other solid materials containing organic and inorganic substances comprising the steps:
(a) loading the solid materials into an elongated pressure vessel;
(b) pressurizing the loaded pressure vessel with compressed gas;
(c) causing the pressurized contents to rapidly discharge from the pressure vessel through a restricted orifice to thereby promote a powerful turbulence and shock wave;
(d) collecting the discharged material in a container having a volume substantially larger than the volume of the pressure vessel;
(e) maintaining the pressure in the container not substantially above ambient pressure;
(f) causing the discharged material in the container to separate into heavy and light fractions in either a wet or a dry condition; and
(g) separately removing the heavy and light fractions from the container;
said method further characterized in that the vessel is discharged horizontally over the surface of water in a tank and where the contents fall into the tank.

4,235,708

METHOD OF SEPARATING A MIXTURE OF ORE PARTICLES

Brij M. Moudgil, Ontario; Booker W. Morey, Pasadena, and David F. Messenger, Pomona, all of Calif., assignors to Occidental Research Corporation, LaVerne, Calif.

Filed Apr. 19, 1978, Ser. No. 897,947
Int. Cl.[2] B07C *5/02*
U.S. Cl. 209—3.3 14 Claims

1. A method of separating a mixture of ore particles consisting of particles containing different ore components comprising the steps of:
(a) conditioning the mixture of ore particles by contacting the mixture with at least one selective surface-active agent capable of selectively coating those particles containing a component receptive to the surface active agent to the substantial exclusion of coating those particles containing a component non-receptive to the surface active agent and combining said surface active agent, with a solid coloring agent having an affinity toward such surface active agent in a quantity sufficient to provide upon combining a color distinguishable from the color of the non-coated particles; and
(b) separating the color distinguishable coated ore particles from the non-coated ore particles.

4,235,709

SELECTIVE FLOCCULATION PROCESS FOR TREATING FINES OF PHOSPHATE ORES

Gerard Baudet; Michel Morlo, both of Orleans, and Christian Vautrelle, Clery-St-Andre, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Aug. 2, 1978, Ser. No. 930,227
Claims priority, application France, Aug. 5, 1977, 77 24301
Int. Cl.[3] B03B *1/04*
U.S. Cl. 209—5 25 Claims

1. Selective flocculation process for the recovery treatment of phosphate ore fractions having fine granulometry, said fractions being formed essentially of apatite and a mixture of silicate materials, particularly of the fractions whose particle size is less than about 40 μm, said process comprising the following sequence of three steps:
(a) a first step of conditioning said fractions by contacting the particles of the ore pulp with a conditioning agent to form a dispersion;
(b) a second step of flocculation with the selective formation of apatite agglomerates, by diluting the pulp resulting from the first step with water and by adding thereto a flocculation agent constituted by a watersoluble anionic

polymer capable of being fixed only on the apatite particles, said flocculation agent being selected from the group consisting of derivatives of cellulose, starches, and polysaccharides containing carboxyl groups; and

(c) a third step of separation by sedimentation and precipitation operations of the dispersed minerals and of the flocculated material, which flocculated material is constituted essentially of apatite, the latter then being recovered directly, the separation being carried out to recover flocculated material having a particle size equal to or greater than a cut-off size comprised between 30 and 100 μm.

4,235,710

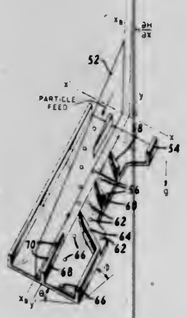
METHODS AND APPARATUS FOR SEPARATING PARTICLES USING A MAGNETIC BARRIER

Jack J. Sun, Trenton, N.J., assignor to S. G. Frantz Company, Inc., Trenton, N.J.

Continuation of Ser. No. 668,080, Mar. 18, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,232

Int. Cl.³ B03C *1/02*

U.S. Cl. 209—213 **42 Claims**



1. A method for separating a flowable mixture of particles in accordance with the magnetic susceptibilities of the particles, comprising:

establishing a nonuniform magnetic field having in a direction transverse to the direction of the field, in contiguous sequence, a katadynamic field region, an isodynamic field region, and an anadynamic field region, whereby the magnetic energy gradient $H(\partial H/\partial X)$ in said transverse direction is at a maximum at the locus of said isodynamic field region and decreases therefrom on either side thereof;

feeding a mixture of particles into the magnetic field on one side of the locus of maximum transverse gradient in a manner such that the particles are urged by non-magnetic force in said transverse direction towards the locus of maximum transverse gradient, the magnitude of the maximum transverse gradient being such that particles having a magnetic susceptibility to the field equal to or greater than a selected susceptibility at which a separation is to be effected are prevented by the transverse magnetic force acting thereon from passing from said one side of the locus of maximum transverse gradient to the other side while particles having a magnetic susceptibility to the field less than said selected susceptibility are urged across the locus of maximum transverse gradient by the non-magnetic force; and

collecting the particles which do not cross said locus of maximum transverse gradient separately from the particles which cross said locus.

4,235,711

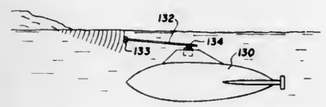
MEANS AND METHOD FOR SWEEPING MATERIAL FLOATING ON WATER USING VIBRATIONAL ENERGY

John N. Koblanski, North Vancouver, Canada, assignor to Ocean Ecology Ltd., Edmonton, Canada

Continuation of Ser. No. 832,980, Sep. 14, 1977, abandoned. This application May 11, 1979, Ser. No. 38,320

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—748 **9 Claims**



1. A sweeping method for moving floating material across a water surface, said method comprising the steps of:

submerging transducer means operative to generate high frequency acoustical waves in a shaped, intensified ray;

directing said ray upwardly and forwardly for intersection with said surface at an acute, relatively shallow angle within a zone of incidence adjacent said material;

energizing said transducer means at an energy level sufficient to develop forces against said material characterized by a horizontal vector tending to move said material horizontally in a forward direction; and

moving said transducer means in a controlled manner to change the position of said zone along a path and thereby sweep said material along said path.

4,235,712

REMOVAL OF ANIONIC SURFACTANTS FROM WATER

Gifford G. McClaflin, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Apr. 5, 1979, Ser. No. 27,211

Int. Cl.³ C02F *1/26*

U.S. Cl. 210—708 **16 Claims**

1. A method for removing a water-soluble anionic surfactant from water, wherein the method comprises:

(A) forming an emulsion of the following:

(1) water containing the anionic surfactant,

(2) an effective amount of a nonionic surfactant, said nonionic surfactant being selected from the group consisting of

(a) alkoxylated alcohols wherein the alcohol moiety contains about 10 to about 20 carbon atoms, the alkoxy group contains about 2 to about 4 carbon atoms, and the number of alkoxy groups is in the range of about 10 to about 100, and

(b) alkoxylated mono- or di-alkyl phenols wherein the alkyl group contains from about 8 to about 12 carbon atoms, the alkoxy groups contain about 2 to about 4 carbon atoms, and wherein there are about 20 to about 100 alkoxy groups, and

(3) a hydrocarbon which is liquid at ambient temperature,

(B) breaking the emulsion of step (A) thereby forming an aqueous layer and a hydrocarbon layer which contains the nonionic surfactant and substantially all of the anionic surfactant, and

(C) separating the aqueous layer and the hydrocarbon layer, said method being characterized further in that

(a) the anionic surfactant is selected from the group consisting of (i) alkali metal salts of alkaryl sulfonates, said sulfonates having equivalent weights in the range of about 250 to about 500 and (ii) alkali metal salts of fatty acids containing from 12 to 18 carbon atoms,

(b) the amount of anionic surfactant in the water is in the range of about 0.001 to about 10 weight percent,

(c) the amount of nonionic surfactant to anionic surfactant is in the range of about 0.1 to about 10 parts by weight, and

(d) the amount of hydrocarbon to aqueous solution of anionic surfactant is in the range of about 0.1 to about 10 parts by volume.

4,235,713

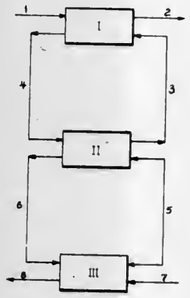
PROCESS FOR THE ELIMINATION OF ACCUMULATED IRON IN ORGANIC PHASES OF FLUID-FLUID EXTRACTION THAT CONTAIN DI-2-ETHYL-HEXYL PHOSPHORIC ACID

Eduardo Diaz Nogueira, Avda. Mediterraneo 47; Angel L. Redondo Abad, Gabriel Ruiz 7, and Jose M. Regife Vega, San Ernesto 12, all of Madrid, Spain

Continuation of Ser. No. 734,820, Oct. 22, 1976, abandoned. This application Jun. 6, 1978, Ser. No. 913,092

Int. Cl.² B01D *11/04*

U.S. Cl. 210—638 **9 Claims**



1. A process for the removal of accumulated iron from organic solutions of liquid-liquid solvent extraction systems that contain di-2-ethyl-hexyl phosphoric acid which comprises contacting a first organic solution containing the di-2-ethyl-hexyl phosphoric acid and the accumulated iron with an aqueous acid solution containing chloride irons to effect the removal of iron from the first organic solution and to obtain an aqueous acid solution containing the iron removed from the first organic solution, contacting the iron containing aqueous acid solution with a second organic solution containing a liquid aminated anionic ion exchanger to extract and effect the removal of the iron from the aqueous acid solution, recovering the iron free aqueous acid solution for reuse in the removal of iron from the first organic solution and then contacting the second organic solution with water to extract iron therefrom and to effect the removal of the iron as an aqueous solution of ferric chloride.

4,235,714

HYDROPHILIC POLYAMIDE FILM FOR SEMIPERMEABLE MEMBRANES

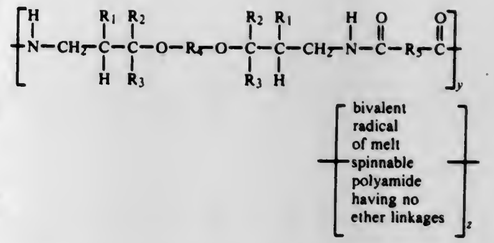
Robert M. Thompson, Wilmington, Del., and David C. White, Concordville, Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Dec. 18, 1978, Ser. No. 970,409

Int. Cl.³ B31D *13/00*; C02F *1/44*; C08L *77/00*

U.S. Cl. 210—654 **5 Claims**

1. In a separation process in which a liquid containing a material desired to be removed is caused to diffuse through a semipermeable membrane effective to diffuse the liquid component and said material at different rates, thereby forming a liquid having a reduced amount of said material, the improvement which comprises using as said membrane a block copolymer of a nylon and a poly(dioxa-amide) having a molecular weight of about 5000–100,000 and the following repeating structural formula:



wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1-C_{10} alkyls and C_3-C_{10} isoalkyls;

R_4 is selected from the group consisting of C_1-C_{10} alkylenes and C_3-C_{10} isoalkylenes;

R_5 is selected from the group consisting of C_0-C_{10} alkylenes and C_3-C_{10} isoalkylenes; and $y = 4$–200, $z = 4$–200.

4,235,715

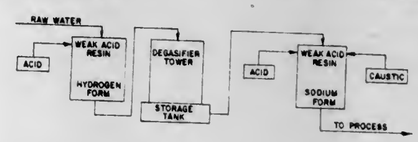
PROCESS FOR REMOVING ALKALINITY AND HARDNESS FROM WATERS

Robert E. Wiegert, Middletown, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed Feb. 16, 1979, Ser. No. 12,589

Int. Cl.³ B01D *15/04, 19/00*; B01J *49/00*

U.S. Cl. 210—670 **9 Claims**



1. A method of treating water to reduce its alkalinity and hardness content comprising the steps of:

a. passing untreated water through a first ion exchange column containing a weak acid cation exchange resin in hydrogen form to convert the alkalinity causing ions therein to carbonic acid and to remove hardness causing ions to the extent of alkalinity;

b. then directly passing the effluent from the first ion exchange column through a decarbonation unit to remove dissolved carbon dioxide from the effluent; and

c. finally directly passing the effluent from the decarbonation unit through a second ion exchange column containing a weak acid cation exchange resin in sodium form to replace all residual hardness causing ions therein with sodium ions and to neutralize any acidity in said effluent.

4,235,716

FLUORESCENT INDICATORS FOR CHROMATOGRAPHY AND SORPTION AGENTS CONTAINING THEM

Herbert Halpaap, Seeheim-Jugenheim; Manfred Eckle, Püttlingen, and Hubert Rössler, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 17, 1978, Ser. No. 961,824

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816574

Int. Cl.³ B01D *15/08*; B01J *23/02, 23/06, 23/30*

U.S. Cl. 210—31 C **8 Claims**

1. A sorption agent for chromatography comprising a sorbent and a tungstate of magnesium, calcium, strontium, barium, zinc or cadmium, or calcium molybdate as a fluorescent indica-

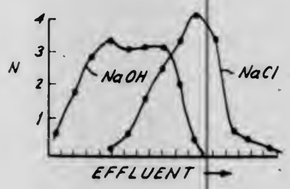
tor, the amount of indicator being 0.5–10% of the amount of sorbent.

4,235,717

PROCESS FOR DESALTING AN AQUEOUS CAUSTIC SOLUTION

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 22, 1978, Ser. No. 944,688
Int. Cl.³ C02F 1/42
U.S. Cl. 210—685 6 Claims



1. In a process for desalting an aqueous caustic solution, said process comprising contacting the aqueous solution with an ion exchange resin,

said resin being characterized as a bead form of polystyrene containing about 8% crosslinking with divinylbenzene and having nuclear substituted quaternary trialkyl ammonium groups, wherein said quaternary ammonium groups are neutralized by carboxylic acid groups which are pendant on chains of polyacrylic acid entrapped within the resin beads,

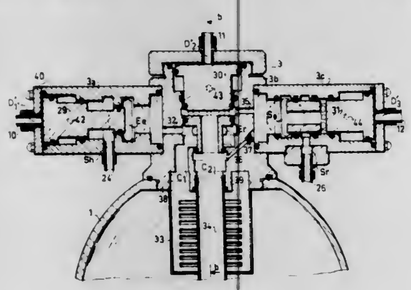
the improvement which comprises the use of such an ion exchange resin wherein there is a sufficient amount of acrylic acid groups on the polyacrylic acid to not only neutralize the quaternary ammonium groups to give an exchange capacity of $\Delta C^{+}=0$, but also enough carboxylic groups to give an exchange capacity of $\Delta C^{-}=X$, where X is from about 0.4 to about 1.0 meq./ml. of resin.

4,235,718

CONTROL DEVICE FOR THE FEEDING AND FOR THE DRAINAGE OF A COLUMN, COLUMN AND DEMINERALIZATION STATION EQUIPPED WITH SUCH A DEVICE

Fernand Lopez, 27, rue Emile Barriere, 31200 Toulouse, France

Filed Jul. 3, 1978, Ser. No. 921,574
Int. Cl.³ B01D 23/24, 29/42
U.S. Cl. 210—191 13 Claims



1. A device adapted to feed, drain and regenerate a treatment column used to treat fluids such as water, said device comprising: a compact centralized distribution valve joined to the top of said column, control means for controlling said distribution valve, and a hydro-injector adapted to be fed with said fluid which serves to aspirate a regeneration agent into said hydro-injector and further adapted to eject said fluid from said hydro-injector, said distribution valve comprising:

(a) a distribution chamber comprising a distribution inlet port for the intake of said fluid to be treated and a distribution outlet adapted to feed said fluid to said hydro-injector;

(b) a direction reversal chamber comprising a chamber inlet in fluid communication with said hydro-injector and adapted to receive said regeneration agent ejected by said hydro-injector, and first and second chamber passages, each of said first and second chamber passages being in fluid communication with said regeneration column and adapted to communicate the flow of said fluid and said regeneration agent between said distribution valve and said regeneration column; and

(c) an exit chamber comprising first and second exit outlets; said distribution chamber being adapted to be connected in fluid communication with said direction reversal chamber and further comprising a piston adapted to move between first and second positions PE1 and PE2 respectively, said piston being arranged such that when said piston is in said first position PE1 and fluid is free to flow into said distribution chamber and towards said direction reversal chamber, and such that when said piston is in said second position PE2 said fluid is diverted to said hydro-injector; said direction reversal chamber being in fluid communication with said exit chamber, said direction reversal chamber comprising a reversal piston adapted to be moved between first and second reversal positions PI1 and PI2 respectively such that when said reversal piston is in said first reversal position PI1, said fluid is free to flow from either said distribution chamber or from said chamber inlet into said first chamber passage, then into said regeneration column, then through said second chamber passage, and then into said exit chamber, and when said reversal piston is in said second reversal position PI2, either said fluid is free to flow from said water distribution chamber or said regeneration agent is free to flow from said chamber inlet through said second chamber passage then into the regeneration column, then through said first chamber passage and then into said exit chamber; said exit chamber comprising an exit piston adapted to be moved between first and second positions, PS1 and PS2 respectively, such that when said exit piston is in said first position PS1 said fluid is free to flow from said direction reversal chamber to said first exit outlet and when said exit piston is in said second position PS2 fluid is free to flow from said direction reversal chamber to said second exit outlet.

4,235,719

PRESSURIZED OXYGENATION SYSTEM AND METHOD

Chris C. Pearson, Woodside, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 27, 1978, Ser. No. 890,725
Int. Cl.³ C02F 11/02
U.S. Cl. 210—195.1 7 Claims

1. A system for dissolving oxygen from a pressurized oxygen supply into a body of liquid to be oxygenated, comprising

an absorber in communication with the oxygen supply operating to oxygenate liquid therein at super-atmospheric pressure,

a storage vessel lock-chamber oriented substantially vertically to define an elevated top end and a bottom end disposed therebelow and configured to be filled by a predetermined volume of liquid

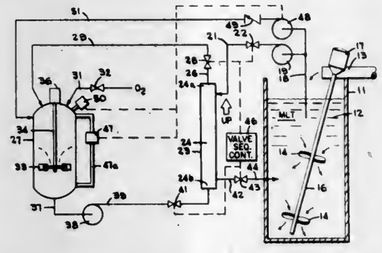
first means for selectively transferring liquid to enter the top end of said lock-chamber at atmospheric pressure,

second means for selectively communicating the bottom end of said lock-chamber with the body of liquid, so that when liquid is transferred into said top end thereof, a like amount of liquid is displaced from said lock-chamber and gently transferred at atmospheric pressure from said bottom end to the body of liquid,

third means for selectively communicating said top end of said lock-chamber with said absorber and for transferring the contents of said lock chamber including free oxygen gas rising therefrom to said absorber, and,

fourth means for selectively transferring oxygenated liquid from said absorber to said bottom end of said lockchamber,

said oxygen absorber and said storage vessel lock-chamber together with said third means and said fourth means together defining a closed system for transferring liquid to



be oxygenated and gaseous oxygen from said lock-chamber to said absorber and thence back to said lock-chamber without gaseous oxygen loss therefrom when said first and second means are selectively noncommunicating,

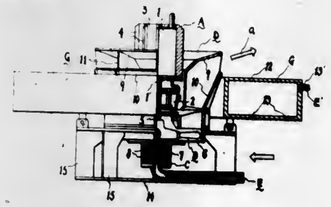
so that when oxygenated liquid is transferred to the bottom end of said lock-chamber at said superatmospheric pressure, the predetermined volume of liquid therein is displaced together with trapped gas and transferred to said absorber through said third means for selectively communicating said top end of said lock-chamber with said absorber, whereby oxygen escaping from solution in said lock chamber is returned to said absorber and a supersaturated predetermined volume of liquid is thereafter mixed with the body of liquid to thereby raise the dissolved oxygen content therein.

4,235,720

UNDERWATER AERATOR

Risuke Nakajima, Kamakura; Yoshio Takei, Kadoma; Shoroku Kawauchi, Itami, and Tetsuo Fujita, Chigasaki, all of Japan, assignors to Hanshin Engineering Co., Ltd., Osaka, Japan

Filed Mar. 20, 1979, Ser. No. 22,356
Claims priority, application Japan, Jul. 10, 1978, 53/84447
Int. Cl.² C02C 1/02
U.S. Cl. 210—220 2 Claims



1. An underwater aerator comprising:

a base adapted to be located at the bottom of a waste water purification tank;

a plurality of water guide ducts mounted above said base and arranged in the form of an annular assembly arranged concentrically about a vertically extending axis and defining a central chamber, each said water guide duct having a lower inlet opening and an upper outlet opening, said outlet openings of all of said water guide ducts being arranged upwardly and radially outwardly of said lower inlet openings, with respect to said axis;

a driving unit having extending downwardly therefrom and into said central chamber a rotatable outlet shaft, said outlet shaft being aligned concentrically with said axis;

a cylindrical air diffuser rotor mounted on an extension of said outlet shaft for rotation therewith, said rotor being arranged at a position below said lower inlet openings of said water guide ducts and concentrically of said axis, said rotor having a cylindrical peripheral wall with a plurality of small perforations therein;

air supply conduit means, extending through a bottom wall of said rotor, for supplying air into the interior of said rotor and for, upon rotation of said rotor by said driving unit, causing air bubbles to exit from said rotor through said plurality of small perforations and to rise upwardly toward said lower inlet openings of said water guide ducts; and

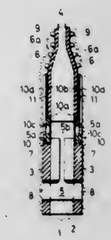
propeller means, mounted on said extension of said outlet shaft and rotatable therewith at a speed sufficiently low to avoid breaking up of sludge and solids within the waste water, said propeller means being arranged at a position above said rotor and immediately below said lower inlet openings of said water guide ducts and concentrically of said axis, for finely dividing said air bubbles rising upwardly from said rotor and for imparting a continuous recirculation of waste water, entraining therein the thus finely divided air bubbles, throughout the waste water purification tank in paths vertically upwardly and radially outwardly through said water guide ducts.

4,235,721

REINFORCING PATCH PLATE APPLIED TO LIQUID PASSAGE HOLE IN FILTER-SURFACED EXPRESSING SHEET ON EXPRESSING FILTER PLATE

Masayuki Nakamura, and Hisayoshi Yokoyama, both of Osaka, Japan, assignors to Kurita Machinery Manufacturing Company Limited, Japan

Filed Feb. 28, 1979, Ser. No. 16,152
Claims priority, application Japan, Mar. 16, 1978, 53-30856; Mar. 20, 1978, 53-31894
Int. Cl.² B01D 25/00
U.S. Cl. 210—227 9 Claims



1. In a liquid passage reinforcing patch plate for use with an expressing sheet of flexible fluid-tight material, such as rubber, which separates the prefilt chamber and the expressing fluid chamber from each other and which is formed with an irregular filter surface opposed to the prefilt chamber and is adapted to bulge toward the prefilt chamber upon completion of filtration so as to press the cake, said patch plate being mounted in a liquid passage hole, such as a filtrate outlet hole or wash liquor introducing hole, which is open to said filter surface, said patch plate having a boss portion adapted to be fitted in said liquid passage hole and a liquid guiding flange portion integrally formed at one end of said boss portion to cover the portion of the expressing sheet around said liquid passage hole in the sheet, said boss and flange portions being made of a

material whose hardness is equal to or somewhat greater than the expressing sheet, said liquid guiding flange portion being formed on its surface with liquid buiding grooves establishing communication between the liquid guiding grooves of the expressing sheet surface and said boss portion, the improvement comprising said boss and flange portions being of laminated construction wherein a core serving as a reinforcing intermediate layer is interposed between a front layer and a back layer which are integrated with the core.

4,235,722

LIQUID TREATING UNIT

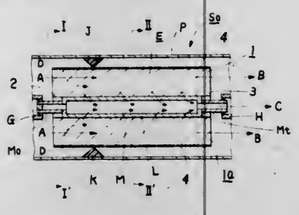
Yasuhiro Sakaguchi, Yokohama, Japan, assignor to Daicel Ltd., Sakai, Japan

Filed May 15, 1978, Ser. No. 906,076

Claims priority, application Japan, Jun. 13, 1977, 52/77449[U]; Jul. 11, 1977, 52/82686; Sep. 28, 1977, 52/130859[U]; Dec. 20, 1977, 52/172560

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—247 **14 Claims**



1. A liquid treating unit to separate an entering liquid into a product liquid and a non-diffused liquid comprising a pressure resistant hollow cylinder, a semipermeable membrane module housed in the cylinder and seal means closing the space defined by the module and the cylinder to force the entering liquid to flow substantially horizontally across said module, the semipermeable membrane module comprising:

(a) means defining a liquid collector channel for collecting the product liquid for recovery, said channel positioned concentrically within said cylinder such that the product liquid flows in the same direction as the entering liquid,

(b) at least one semipermeable membrane member connected to the channel defining means and made from a semipermeable membrane strip of synthetic resin, the membrane being alternately folded longitudinally thereof to provide a plurality of feed liquid passages on its front side and a plurality of product liquid passages on its rear side and to direct the non-diffused liquid in the same direction as the entering liquid,

(c) an adhesive layer adhering each pair of product liquid passage defining leaf portions of the membrane at each end of the passage to liquid-tightly close the product liquid passage only, the adhesive layer further liquid-tightly adhering the semipermeable membrane member at least to the periphery of the channel defining means,

(d) spacers inserted into the feed liquid passages, in operative bridging engagement with adjacent feed liquid passage defining leaf portions of the membrane,

(e) an openable covering member surrounding the outer periphery of the semipermeable membrane member,

(f) a backing fabric attached to the entire surface of said semipermeable membrane defining the product liquid passages;

whereby the product liquid flows through said cylinder in substantially the same direction as the entering liquid and the non-diffused liquid.

4,235,723

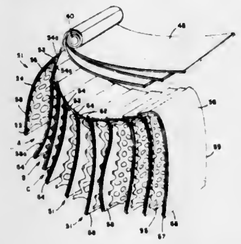
REVERSE OSMOSIS MEMBRANE MODULE

James L. Bartlett, Jr., Santa Barbara, Calif., assignor to Hydranautics, Goleta, Calif.

Filed May 15, 1979, Ser. No. 39,209

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321 R **7 Claims**



1. A spirally wrapped reverse osmosis module membrane for separating a selected fluid component from a feed stock, comprising:

a mandrel having an axial passageway forming a flow path for said selected fluid component through said mandrel;

a flow guide member for forming a channel for said selected fluid component to said mandrel, said flow guide member spirally wrapped around said mandrel and in fluid communication with said axial passageway;

a plurality of generally rectangular membrane envelopes formed from (i) elongated permeate collector sheets, each said collector sheet forming a flow path for said selected fluid component from the outer periphery of each said envelope to said flow guide member, and (ii) folded support sheets placed between and joined to adjacent collector sheets, each said support sheet having membrane areas where reverse osmosis with said feed stock takes place, each said support sheet further being folded in an area where reverse osmosis does not take place, thereby eliminating folded lines on said membrane areas where reverse osmosis of said feed stock does take place;

said flow guide member and said envelopes being spirally wrapped around said mandrel such that the distance from the folded edge of each support sheet to the mandrel radially increases along a generally spiral path; and

a flow spacer disposed between each adjacent envelope such that one end of said flow spacer is located adjacent the area where said support sheet is folded and where reverse osmosis does not take place, said flow spacer for separating each envelope thereby forming a passageway for the feed stock to flow across the membrane areas on each said envelope.

4,235,724

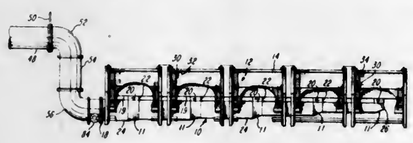
HIGH CAPACITY WASTE WATER TREATMENT SYSTEM

Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Sep. 21, 1978, Ser. No. 944,545

Int. Cl.³ B01D *23/02*

U.S. Cl. 210—323 R **18 Claims**



1. A waste water treatment system comprising a plurality of screens presenting descending flow surfaces, means defining a flow conduit commonly feeding said screens and arranged below the upper limits of said flow surfaces, said flow conduit being adapted to receive waste water and having openings therein in constantly open communication with means constructed and arranged to direct waste water from said conduit to flow to the upper ends of said screens for separation of its contents in a movement thereof down said descending flow surfaces, the flow passage defined by said flow conduit being reduced as to its cross sectional area in the vicinity of each of said openings from the cross sectional area of that portion of the flow passage immediately preceding the opening to induce waste water at the locations of said openings to exit from each of said openings to said means for directing the waste water to the upper ends of said screens in substantially equal amounts.

18. A waste water treatment system, particularly as used in treating variable volume flows of sewage and storm water, including an in-line arrangement of screens over which waste water flows from upper toward lower limits thereof, a flow conduit through which waste water is brought to said screens, said conduit extending longitudinally of said line of screens and receiving waste water at one end for flow toward the opposite end, said conduit having longitudinally spaced apart exit openings for an escape of waste water to related respective screens, and the flow passage defined by said conduit being reduced as to its cross-sectional area in the vicinity of each said exit opening to provide a volume of flow to all said screens by way of overflow means which is substantially equal as applied to each said screen irrespective of changes in volumetric flow through said conduit.

4,235,725

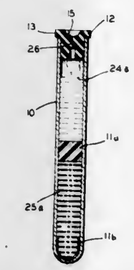
STERILE BLOOD-COLLECTING AND SEPARATING DEVICE

Frank E. Semersky, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 16, 1978, Ser. No. 934,240

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—516 **16 Claims**



1. In a substantially sterile, irradiated, blood collecting and separating device comprising an enclosed container adapted to receive a blood sample and having therein a thixotropic gel adapted to form a separating barrier between separated phases of said blood having differing densities, said gel having at rest a density intermediate said differing densities; the improvement wherein said gel comprises a sterilizing irradiated liquid polybutadiene still retaining carbon-to-carbon unsaturation and an inorganic inert filler dispersed therein, said gel having been subjected to sterilizing radiation without substantial loss of said carbon-to-carbon unsaturation in said butadiene, whereby said container and gel are sterilized to provide said sterile blood collecting and separating device without destruction of physical properties of said gel.

4,235,726

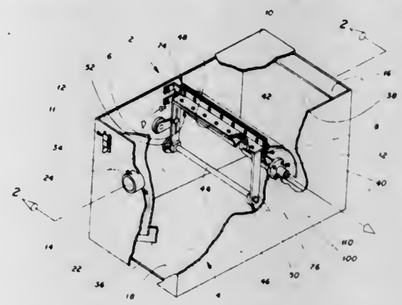
AUTOMATIC GREASE SEPARATING APPARATUS

Dalton L. Shimko, Hewitt, N.J., assignor to Baker-Waldeck Associates, Montville, N.J.

Filed Mar. 12, 1979, Ser. No. 19,400

Int. Cl.² B01D *21/24*

U.S. Cl. 210—523 **16 Claims**



1. A device for the separation of grease from a grease-containing liquid which comprises:

a settling container,

a pivotable non-cylindrical grease collector assembly mounted within said container adapted to pivot into and out of contact with said grease-containing liquid, and

a grease removal assembly mounted within said container cooperating with said grease collector assembly to transport said grease away from said collector assembly and out of said settling container.

4,235,727

HUMATE THINNERS FOR DRILLING FLUIDS

William C. Firth, Jr., Robbinsville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Apr. 6, 1978, Ser. No. 894,026

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 C **5 Claims**

1. A method of reducing the viscosity of a water-based drilling mud, which comprises;

providing a quantity of humate, said humate having been associated with rutile sand deposits and having a compositional make-up of carbon and hydrogen with a ratio (weight to weight) of 9.5-17.5:1.0; oxygen with carbon to oxygen (weight to weight) ratio of 1.0-2.0:1.0; an aluminum content of 2.8-8.4 percent by weight; a titanium content of 0.5-1.5 percent by weight and a calcium content of less than 0.5 percent by weight; and

dispersing a viscosity reducing proportion of the humate in the water-based drilling mud;

said mud comprising an aqueous suspension of clay.

4,235,728

DRILLING FLUIDS CONTAINING NOVEL COMPOSITIONS OF MATTER

Johann G. D. Schulz, Pittsburgh, and Jaroslav Zajac, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 29, 1979, Ser. No. 25,109

Int. Cl.³ C09K *7/02*; C07C *51/41*

U.S. Cl. 252—8.5 C **22 Claims**

1. An aqueous clay-free drilling fluid containing water and from about one to about 25 weight percent of a new composition of matter resulting from the reaction of (1) substantially water-insoluble polycyclic, polycarboxylic acids obtained as a result of the nitric acid oxidation of coal, said oxidation comprising subjecting a slurry containing coal to reaction with aqueous nitric acid having a concentration of about one to

about 90 percent at a temperature of about 15° to about 200° C. for about five minutes to about 15 hours, with (2) a base, said base being a hydroxide of an element of Group IA of the Periodic Table or a hydroxide of an element of Group IIA of the Periodic Table, a basic salt of an element of Group IA or IIA of the Periodic Table whose aqueous solutions exhibit a pH in the basic region, or ammonium hydroxide, the amount of said base, said basic salt or ammonium hydroxide, being at last an amount stoichiometrically required to react with at least about 50 percent of the carboxyl groups in said acids, the reaction between said acids and said base, said basic salt or ammonium hydroxide being in the range of about 5° to about 150° C.

4,235,729

2-OXABICYCLOOCTANE DERIVATIVES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

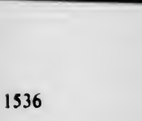
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Division of Ser. No. 8,924, Feb. 2, 1979, Pat. No. 4,197,328, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Jun. 27, 1979, Ser. No. 52,335

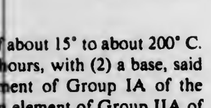
Int. Cl.³ A61K 7/46; C11D 3/20

U.S. Cl. 252—8.9 **5 Claims**

1. A process for augmenting or enhancing the aroma of a perfumed article selected from the group consisting of fabric softener compositions, and fabric softener articles comprising the step of intimately admixing with a fabric softener article coating, or a fabric softener composition, an aroma augmenting or enhancing quantity of at least one cyclic chemical compound having a structure selected from the group consisting of:


;

;

; and


4,235,730

POLYURETHANES AND USE THEREOF IN LUBRICANTS AND FUELS

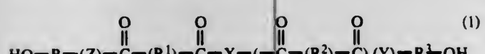
Raymond C. Schlicht, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 28, 1978, Ser. No. 973,837

Int. Cl.³ C10M 1/36; C08K 5/01; C08G 18/68

U.S. Cl. 252—51.5 A **46 Claims**

1. A polyurethane which is the reaction product of an isocyanate and a diol of the formula


(1)

wherein

each of R, R^1, R^2 and R^3 is independently a divalent aliphatic or aromatic moiety;

u, v, x, y, and z are each independently 0 or 1 and x+y=1 or 2;

X is a radical derived from removal of terminal hydrogen atoms from a compound of the formula H—X—H wherein said H—X—H compound is:

a. a diamine or polyamine bearing at least two secondary amino groups, optionally containing any number of tertiary amine or other functional groups inert to anhydrides, hydroxyalkylating agents and isocyanates;

b. a monohydroxyalkyl secondary amine optionally bearing tertiary amine or other functions inert to anhydrides, hydroxyalkylating agents and isocyanates; or

c. a bis-hydroxyalkyl substituted mono di-, or poly-tertiary amine; or

X is a -O-R^4-O moiety where R^4 is a C_2 to C_{30} divalent hydrocarbyl group or an oxa-alkylene group of 1 to 15 oxygen atoms, and

Y and Z are each O or NR^5 where R^5 is a C_1 to C_{30} alkyl group which can be substituted by aryloxy, cyano, C_1 to C_{32} carbalkoxy, C_1 to C_{32} carboxamido or other substituent inert to anhydrides, hydroxyalkylating agents and isocyanates.

35. A lubricating oil composition comprising a lubricating oil and the polyurethane of claim 1.

45. A fuel composition comprising a fuel and the polyurethane of claim 1.

4,235,731

MODIFIED TERPOLYMER DISPERSANT - VI IMPROVER

Thomas E. Klovsky, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1976, Ser. No. 733,575

Int. Cl.³ C10M 1/32

U.S. Cl. 252—51.5 A **9 Claims**

1. The oil-soluble product prepared by the process comprising:

(a) reacting a terpolymer with maleic anhydride in the presence of a solvent and at a temperature of between about 180° C. and 250° C. wherein the terpolymer has a molecular weight of between about 200,000 and 1,000,000 and comprises about 30 to 85 mole percent ethylene, about 15 to 70 mole percent of a C_3 to C_8 alpha monoolefin and about 1 to about 20 mole percent of a C_5 to C_{14} non-conjugated diene;

(b) reacting the product of step (c) with an amine having the formula:

$$N_2(CH_2)_n[NH(CH_2)_n]_mNH_2$$

where n is 2 to 4 and m is 0 to 6; and

(c) subjecting the product of step (d) to a repeated shearing action so as to reduce the molecular weight of the oil-soluble product to between about 70,000 and 150,000, and the ratio of Mw/Mn to between 1 and 4.

6. A lubricating composition comprising a major amount of a lubricating oil and from about 0.1 to about 15.0 weight percent of the oil-soluble product of claim 1.

4,235,732

LIQUID BLEACHING COMPOSITIONS

Harold H. Beyer, Glashuetten, Fed. Rep. of Germany, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 8, 1978, Ser. No. 875,954

Int. Cl.² C11D 7/56, 7/34

U.S. Cl. 252—103 **10 Claims**

1. An aqueous false-body hard-surface scouring cleanser consisting essentially of;

A. from about 0.2% to 5% by weight of a bleaching agent which yields hypochlorite ion in aqueous solution.

B. from about 1% to 30% by weight of an inorganic colloid-forming clay selected from the group consisting of smectites, attapulgites and mixtures of smectite and attapulgites;

C. from about 0.1% to 5% by weight of a paraffin sulfonate surfactant of the formula RSO_3M wherein R is a primary or secondary alkyl group containing from about 8 to about 22 carbon atoms and M is an alkali metal;

D. from about 5% to 60% by weight of insoluble particulate abrasive material which has particle diameters ranging from one micron to about 250 microns and a specific gravity of from about 0.2 to about 5.0;

E. from about 2% to 15% by weight of an inorganic alkaline buffer salt capable of maintaining composition pH within the range of from about 10.0 to 14; and

F. from about 10% to 90% by weight of water.

4,235,733

ANTIBACTERIAL SOAP CONTAINING TRICHLOROHYDROXY DIPHENYL ETHER BACTERICIDE AND AN ORGANIC PHOSPHORIC ESTER AS A STABILIZER THEREFOR

Hiroshi Watanabe, Funabashi, and Masatoshi Arisawa, Koganei, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

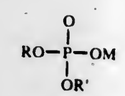
Filed Jul. 11, 1979, Ser. No. 56,559

Claims priority, application Japan, Jul. 13, 1980, 53-85379

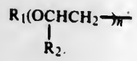
Int. Cl.³ C11D 9/34, 9/50

U.S. Cl. 252—107 **3 Claims**

1. An antibacterial soap comprising 2,4,4'-trichloro-2'-hydroxy-diphenylether in a range of 0.05 to 5% by wt. and at least one organic phosphoric ester represented by the formula:



wherein R represents an alkyl group having 8 to 20 carbon atoms, or a group of



in which R_1 is an alkyl group having 8 to 20 carbon atoms, R_2 is a hydrogen atom or a methyl group, and n is an integer of 1 to 10; R^1 represents the same group as R, or an hydrogen atom or an alkali metal; and M represents a hydrogen atom or an alkali metal; and wherein said organic phosphoric ester is added in a range of 0.1 to 20% by weight.

4,235,734

FOAMED ACIDS STABILIZED WITH ALKANOLS

Gary A. Scherubel, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 30, 1978, Ser. No. 964,868

Int. Cl.² C11D 7/08, 7/32, 7/26

U.S. Cl. 252—142 **14 Claims**

1. A foam derived from a foamable acid composition comprising (a) a foam-generating amount of at least one soluble cationic surfactant, (b) a foam-stabilizing amount of at least one alkanol or inertly-substituted alkanol, dissolved in (c) an aqueous acid.

4,235,735

LAUNDRY DETERGENT CONTAINING CELLULOSE ACETATE ANTI-REDEPOSITION AGENT

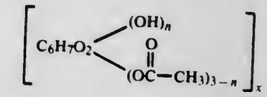
Francis W. Marco, Pauline, and Philip G. Harris, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 30, 1979, Ser. No. 61,632

Int. Cl.² C11D 3/22, 3/02

U.S. Cl. 252—174.18 **7 Claims**

1. A laundry detergent composition comprising: an organic synthetic detergent component in an amount sufficient to remove soil and other unwanted matter from laundry, and a cellulose acetate polymeric anti-redeposition agent being characterized as having a degree of substitution of the acetyl moiety of from about 0.5 to about 2.3 and represented by the formula



wherein x is an integer of at least about 25, n is about 2.5 to about .7, and the expression 3—n is the degree of substitution of the acetyl moiety, said anti-redeposition agent being provided in said detergent composition in an amount sufficient to provide anti-redeposition properties in the detergent composition.

4,235,736

DIPHENYLIC ESTERS EXHIBITING MESOMORPHIC PHASES

Alain Beguin; Jean-Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

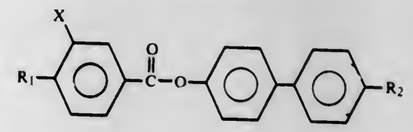
Continuation-in-part of Ser. No. 875,931, Feb. 7, 1978, abandoned. This application Apr. 12, 1979, Ser. No. 29,536

Claims priority, application France, Feb. 11, 1977, 77 03916; Jan. 24, 1978, 78 01880

Int. Cl.³ C09K 3/34; G02F 1/13; C07C 121/60, 69/62

U.S. Cl. 252—299 **12 Claims**

1. A liquid crystal corresponding to the formula:



wherein

R_1 is $C_nH_{2n+1}O$ or C_nH_{2n+1},

where

n is an integer of from 1 to 10;

R_2 is C_mH_{2m+1},

where

m is an integer of from 1 to 10; and

X is Br or CN.

4,235,737

METHOD FOR TREATING RADIOACTIVE LIQUIDS

James F. Pritchard, 1101 Greenleaf Rd., and Robert R. Komrow, Rte. 2, Box 52, Botany Woods, both of Hartsville, S.C. 29550

Continuation-in-part of Ser. No. 718,876, Aug. 30, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,689

Int. Cl.² C09K 3/00

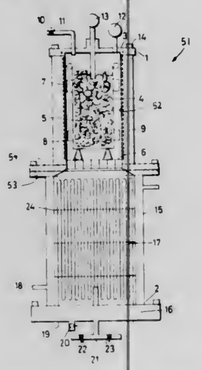
U.S. Cl. 252—301.1 W **5 Claims**

1. A reversible process for treating radioactive liquid composed of radioactive solids dissolved or suspended in a liquid vehicle selected from the group consisting of water and an organic liquid, which process comprises: adding to the radioactive liquid having a pH greater than 5.5, a sufficient amount of an absorbent consisting of a water-insoluble alkali salt of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymer to form a product comprising a gel containing said radioactive solids by the absorption of the said liquid vehicle by said polymer, acidifying said product sufficiently to reliquify said product and separating and recovering said polymer from the reliquified gel.

4,235,738
TECHNIQUE FOR CONVERTING SPENT RADIOACTIVE ION EXCHANGE RESINS INTO A STABLE AND SAFELY STORABLE FORM

Karl Knotik, Eisenstadt; Peter Leichter, Vienna, and Heinz Jakusch, Ternitz, all of Austria, assignors to Vereinigte Edlsthalwerke Aktiengesellschaft (VEW) and Oesterreichische Studiengegesellschaft fuer Atomenergie GmbH, both of Vienna, Austria

Filed Jun. 22, 1976, Ser. No. 698,714
Claims priority, application Austria, Jun. 26, 1975, 4943/75
Int. Cl.[2] G21F 9/28
U.S. Cl. 252—301.1 W **2 Claims**

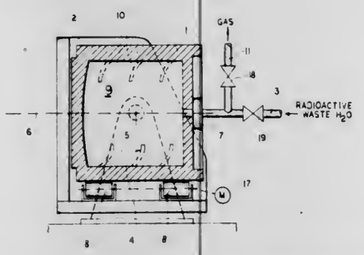


1. In a method of converting ion exchange resins containing radioactive inorganic compounds into a stable and safely storable form, the method comprising the step of thermally treating the spent resin, the improvement wherein the thermal treating step comprises surrounding the spent resin with a high-temperature boiling point oil that does not support combustion, and then heating the oil-surrounded spent resin to a temperature sufficient to effect a decomposition of the resin by carbonization but below the temperature at which the radioactive compounds in the resin evaporate or sublimate, as the case may be.

4,235,739
CANISTER METHOD OF DISPOSING OF RADIOACTIVE WASTE

Henning Baatz, Essen, and Dieter Rittscher, Heiligenhaus, both of Fed. Rep. of Germany, assignors to Steag Kernenergie GmbH, Essen, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,093
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720342
Int. Cl.[2] G21F 9/16
U.S. Cl. 252—301.1 W **1 Claim**



1. A method of packaging radioactive waste, said method comprising the steps of:

supporting a canister having a substantially central fill hole lying on a canister axis with said hole directed upwardly and said axis upright;

introducing dry cement granules into said canister;

thereafter tipping said canister about a horizontal axis into a tipped position with said canister axis horizontal and said fill hole directed horizontally;

aspirating gas from the interior of said canister through said fill hole to create a subatmospheric pressure in said interior;

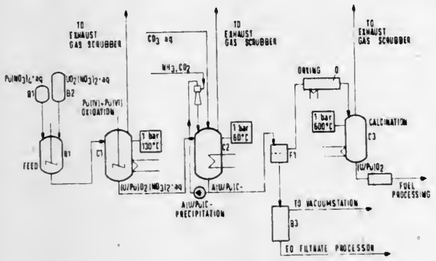
rotating said canister about said canister axis while maintaining said canister in said tipped position; and

thereafter sucking fluent radioactive waste into said canister through said fill hole with said subatmospheric pressure while rotating said canister about said canister axis in said tipped position and thereby mixing said waste with said cement.

4,235,740
METHOD FOR THE MANUFACTURE OF $(U,PU)O_2$ MIXED CRYSTALS

Wolf-Günther Druckenbrodt, Aachen; Siegfried Baumann, Karlstein; Roland Krause, Alzenau, and Wolfgang Stoll, Hanau, all of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,012
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811959
Int. Cl.[2] C01G 56/00; G21C 3/62
U.S. Cl. 252—301.1 R **17 Claims**



1. Method for the manufacture of uranium/plutonium oxide mixed crystals soluble in 10 molar nitric acid as a preliminary stage for the fabrication of sintered nuclear fuel bodies with uranium-and plutonium-containing materials, which comprises

(a) oxidizing a mixture of uranyl nitrate and plutonium nitrate in aqueous solution to cause the plutonium to reach a stage of oxidation with a valence VI,

(b) admixing the oxidized solution with an aqueous solution of a salt selected from the group consisting of ammonium carbonate, ammonium oxalate and ammonium carbamate and adjusting the pH of the admixture to 8.1–8.5 by adding NH_3 as well as CO_2 while maintaining a temperature of about 45° to 60° C. to precipitate an ammonium uranyl plutonyl carbonate, oxalate or carbamate depending on the use the particular salt selected from the group consisting of ammonium carbonate, ammonium oxalate and ammonium carbamate,

(c) calcining the precipitate in a reducing atmosphere at about 300°–700° C. to produce a uranium-plutonium oxide, and

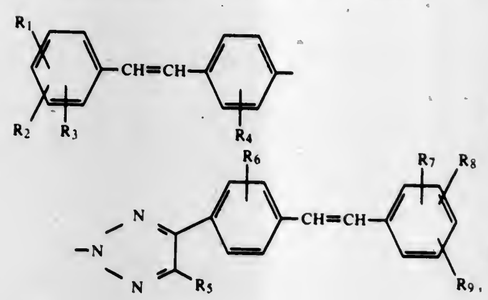
(d) adjusting the uranium-plutonium oxide to a desired oxygen/metal ratio.

4,235,741
V-TRIAZOLES

Kurt Weber, Basel, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 799,058, May 20, 1977, abandoned. This application Jun. 15, 1979, Ser. No. 48,965
Claims priority, application Switzerland, Jun. 2, 1976, 6933/76; Jan. 28, 1977, 1071/77
Int. Cl.[3] C07D 249/06
U.S. Cl. 252—301.22 **15 Claims**

1. 2,4-Bis-(stilben-4'-yl)-v-triazoles of the formula



wherein

each of

R_1 and R_7 independently represents a hydrogen atom, a sulphonic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, sulphonamido, a carboxylic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, carbalkoxy of 2 to 5 carbon atoms or carbonamido, a cyano group, a halogen atom, an unsubstituted or substituted alkylsulphonyl substituted by phenyl, hydroxy, alkanoyloxy of 2 to 15 carbon atoms or halogen, unsubstituted or substituted arylsulphonyl substituted by halogen or alkyl of 1 to 8 carbon atoms, unsubstituted or substituted alkyl substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyano, halogen, carboxy, sulfonic acid group, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, phenyl or phenoxy, unsubstituted or substituted alkoxy substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyano, halogen, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, phenyl or phenoxy, unsubstituted or substituted aralkyl substituted by halogen, cyano, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, sulpho, alkyl or alkoxy each of 1 to 4 carbon atoms, unsubstituted or substituted aryl substituted by halogen, cyano, carboxy carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, sulpho, alkyl or alkoxy each of 1 to 4 carbon atoms, unsubstituted or substituted aryloxy substituted by halogen, cyano, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, sulpho, alkyl or alkoxy each of 1 to 4 carbon atoms, aralkoxy or unsubstituted or substituted cycloalkyl radical substituted by alkyl of 1 to 4 carbon atoms, an unsubstituted or substituted 5-membered heterocyclic ring selected from the group consisting of v-triazole, oxazole or 1,3,4-oxdiazole, said substituted heterocycles are substituted by alkyl of 1 to 4 carbon atoms, halogen, phenyl, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, cyano, benzyl, alkoxy of 1 to 4 carbon atoms, phenoxy or sulpho, with two adjacent substituents of the triazole and oxazole together are able to form a fused benzene ring or together with R_2 and R_8 they represent a methylenedioxy, ethylenedioxy, methylenoxymethylenoxy, trimethylene, tetramethylene, propenylene, butenylene or butadienylene radical,

each of

R_2 and R_8 independently represents a hydrogen atom, a sulphonic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, sulphonamido, a carboxylic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, carbalkoxy of 2 to 5 carbon atoms or carbonamido, a cyano group, a halogen atom, an unsubstituted or substituted alkyl substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyano, halogen, carboxy, sulphonic acid group, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, phenyl or phenoxy, or unsubstituted or substituted alkoxy substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyano, halogen, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, phenyl or phenoxy, or together with R_1 and R_7 represent a methylenedioxy, ethylenedioxy, methylenoxymethylenoxy, trimethylene, tetramethylene, propenylene, butenylene or butadienylene radical,

each of

R_3 and R_9 independently represents a hydrogen atom, a halogen atom or an unsubstituted or substituted alkyl radical substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyano, halogen, carboxy, sulphonic acid group, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety phenyl or phenoxy,

each of

R_4 and R_6 independently represents a hydrogen atom, a halogen atom, a cyano group, a sulphonic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, sulphonamido, or a carboxylic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, carbalkoxy of 2 to 5 carbon atoms or carbonamido, and

R_5 represents a hydrogen atom, a halogen atom, a cyano group, a sulphonic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, sulphonamido, a carboxylic acid group or its salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium or amine, carbalkoxy of 2 to 5 carbon atoms or carbonamido, an unsubstituted or substituted alkyl substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyano, halogen, carboxy, sulphonic acid group, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, phenyl or phenoxy, unsubstituted or substituted aryl substituted by halogen, cyano, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, sulpho, alkyl or alkoxy each of 1 to 4 carbon atoms, unsubstituted or substituted aralkyl substituted by halogen, cyano, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, sulpho, alkyl or alkoxy each of 1 to 4 carbon atoms, or unsubstituted or substituted styryl substituted by halogen, cyano, carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, sulpho, alkyl or alkoxy each of 1 to 4 carbon atoms, or the $-CH_2OZ$ group, in which Z represents a hydrogen atom or an unsubstituted or substituted bezoyl or alkanoyl of 2 to 19 carbon atoms.

4,235,742
BASE FOR DEFOAMING COMPOSITIONS

Roy S. Anderson, Broomall, and Oscar J. Pladek, Downingtown, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 863,276, Dec. 22, 1977, abandoned. This application Mar. 9, 1979, Ser. No. 18,966
Int. Cl.[3] B01D 19/04; B32B 5/16, 17/02
U.S. Cl. 252—358 **23 Claims**

1. A hydrophobic defoamer base suitable to disperse in a water insoluble organic liquid to form a defoamer effective in aqueous systems, said base consisting of: hydrophobic platelike fragments of crushed microspheres, said microspheres consisting of sodium silicate and a polysalt, and said fragments being rendered hydrophobic by coating with 2 to 30% of a halo-silane or a siloxane and cured by heating at 230° to 320° C. for 4 to 24 hours, wherein said polysalt is an alkali metal

polyborate, an ammonium polyborate, an alkali metal polyphosphate or an ammonium polyphosphate.

12. A hydrophobic defoamer base suitable to disperse in a water insoluble organic liquid to form a defoamer effective in aqueous systems, said base consisting of: hydrophobic plate-like fragments of crushed microspheres, said microspheres consisting of synthetic, fused, water insoluble alkali metal silicate-based glass, and said fragments being rendered hydrophobic by coating with 2 to 30% of a halo-silane or a siloxane and cured by heating at 230° to 320° C. for 4 to 24 hours.

4,235,743

COMPOSITION AND METHOD FOR SUPPRESSING VAPOR LOSS OF VOLATILE HYDROCARBONS

Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 702,692, Jul. 6, 1976. This application Sep. 30, 1977, Ser. No. 838,246

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—382 **12 Claims**

6. A hydrocarbon evaporation retarding composition comprising:

from about 5 wt. % to about 20 wt. % fluorosurfactant which is insoluble in the liquid hydrocarbon body and which has a linear fluorocarbon moiety containing from about 7 to about 16 carbon atoms;

from about 5 wt. % to about 10 wt. % silicone surfactant, said silicone surfactant being selected from the group consisting of alkyl, aryl and alkaryl polysiloxanes and copolymers of alkyl, aryl and alkaryl polysiloxanes with polyethers having linear aliphatic groups of from 4 to 6 carbon atoms;

from about 5 wt. % to about 35 wt. % polyglycol, said polyglycol being selected from dihydroxy derivatives of linear aliphatic hydrocarbons having a molecular weight of from about 100 to about 1200; and

from about 5 wt. % to about 35 wt. % polyether, said polyether being selected from alkoxy alkanes having from 6 to 10 carbon atoms.

4,235,744

CARBONYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

Frederick A. Pesa, Aurora, and Thomas A. Haase, Twinsburg, both of Ohio, assignors to Standard Oil Company (Ohio), Cleveland, Ohio

Filed Oct. 30, 1978, Ser. No. 955,861

Int. Cl.[3] B01J *31/20, 31/28, 31/06;* **C07C** *121/38*

U.S. Cl. 252—428 **16 Claims**

1. A catalyst composition comprising a polyamine promoter ligand and at least one of cobalt and ruthenium carbonyl, wherein said promoter ligand is polyvinyl pyrollidone.

9. A catalyst composition comprising a polyamine promoter ligand and at least one of cobalt and ruthenium carbonyl, wherein said polyamine promoter ligand is diazobicyclo (2.2.2) octane.

4,235,745

TITANIUM TRICHLORIDE CATALYTIC COMPONENT AND METHOD FOR HOMO-OR CO-POLYMERIZATION OF α-OLEFIN

Yoshikazu Takahashi, Hikari; Yoichi Sunada, and Masaru Takitani, both of Shinnanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1978, Ser. No. 971,505

Claims priority, application Japan, Dec. 28, 1977, 52-159997

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **5 Claims**

1. A titanium trichloride catalytic component for polymerization of α-olefin obtained in the following manner: in having a titanium trichloride catalytic component separate out of a solution of saturated aliphatic hydrocarbon and/or alicyclic hydrocarbon in which titanium tetrachloride, an organic ether compound of the formula ROR', wherein one of R and R' is alkyl of 1-8 carbons and the other is alkyl of 1-5 carbons, and an organo-aluminum compound of the formula AlR_nX_{3-n}, wherein R is alkyl of 1-10 carbons, X is halogen or hydrogen and n is an integer of $0<n\leqq 3$, are dissolved, said organo-aluminum compound is added at a solvent temperature not exceeding 55° C. in the presence of 20 to 70% by volume of an aromatic hydrocarbon halide in the mixed solvent formed thereby; and, after addition of said organo-aluminum compound, the solvent temperature is raised to a value between 45° and 150° C. over a period of time between 10 minutes and 24 hours to allow a titanium trichloride catalytic component having highly uniform particle diameter, the average value of which is adjustable as desired between 10 and 1000μ to separate out of said solvent.

4,235,746

POLYMERIZATION OF OLEFINS

Richard E. Dietz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1979, Ser. No. 4,122

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 C **19 Claims**

1. A catalyst component obtained by mixing a magnesium dihydrocarbyloxide compound with a tetravalent, halogenated titanium compound having the formula $TiX_a(OR)_{4-a}$ in which R represents an identical or different hydrocarbon group, a is an integer from 1 to 4 and X is selected from the group consisting of bromine, chlorine and iodine with X being the same halogen or different halogens when a is greater than 1 and contacting the resultant product after removal of unreacted titanium compound with a dihydrocarbylmagnesium compound.

4,235,747

PROCESS FOR IMPROVING POLYMERIZATION PERFORMANCE OF BROWN SOLID TITANIUM TRICHLORIDE CATALYST COMPONENT

Linus K. Leung, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 19, 1979, Ser. No. 31,378

Int. Cl.[3] C08F *4/64*

U.S. Cl. 252—429 B **26 Claims**

1. In a process for preparing a brown solid catalyst component comprising beta titanium trichloride and an amount, ranging up to about 10 mole %, of at least one organic electron pair donor compound selected from the group consisting of hydrocarbyl ethers, thioethers, thiols, ketones, esters, amides, amines, phosphines and stibines, said brown solid having a surface area of at least about 50 square meters per gram and a pore volume of at least about 0.10 cc per gram and produced by a process comprising:

(a) reacting titanium tetrachloride and at least one organo-aluminum component of the formula AlR_nX_{3-n} wherein R is a hydrocarbyl radical, X is chlorine or bromine, and $1<n\leqq 3$ in amounts such that the molar ratio of said organoaluminum component to titanium tetrachloride ranges from about 0.5:1 to about 3:1 and at a temperature below about 0° C. in the presence of an inert liquid solvent for said titanium tetrachloride to form a brown solid;

(b) increasing the temperature of the brown solid of (a) to less than about 100° C.;

(c) contacting the brown solid of (b) with at least one electron pair donor compound selected from the group consisting of hydrocarbyl ethers, thioethers, thiols, ketones, esters, amides, amines, phosphines and stibines in the presence of an inert liquid solvent for said donor compound, the molar ratio of said donor compound to titanium in the brown solid of (b) ranging from about 0.5:1 to about 5:1, and heating at about ambient to about 80° C.;

(d) treating the brown solid of (c) with a solution of at least one electron pair acceptor selected from the group consisting of titanium tetrahalides, titanium alkoxyhalides, aluminum bromide, germanium tetrachloride, silicon tetrachloride, and other Group IVA, IVB, and VB halides in an inert liquid at conditions of temperature, time, concentration of said acceptor in said liquid, and molar ratio of said acceptor to titanium contained in said brown solid of (c) which convert said brown solid of (c) into a brown solid having a surface area of above about 50 square meters per gram and a pore volume of above about 0.10 cc per gram; and

(e) recovering the solid of (d); the improvement wherein

(f) the brown solid from (e) is contacted in the presence of an inert liquid diluent and at a temperature ranging from about 0° to about 40° C. with at least a catalytically effective amount of at least one aluminum alkyl component of the formula AlR'_mX_{3-m} wherein R' is an alkyl radical of 1 to about 20 carbon atoms, X is halogen, and m ranges from 1 to 3, and at least one alpha-olefin at a rate of about 0.05 to about 10 grams alpha-olefin per gram of said brown solid from (e) per hour for a time sufficient to form about 0.005 to about 100 grams solid polyalpha-olefin per gram of said brown solid from (e).

4,235,748

METHOD OF MAKING IMPROVED HYDROGENATION CATALYST

Aldo S. Berchielli, Westerly, R.I., and Roland F. Chireau, Quaker Hills, Conn., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Feb. 28, 1979, Ser. No. 16,219

Int. Cl.[3] B01J *21/18, 31/06, 37/04;* **H01M** *4/88*

U.S. Cl. 252—430 **9 Claims**

1. A method of making an improved catalyst for hydrogenation reactions and the like, said method comprising:

a. mixing a porous particulate refractory support material comprising activated carbon with a hydrophobic polymeric binder comprising polytetrafluoroethylene to form an essentially homogeneous porous mixture, said polytetrafluoroethylene and carbon particles being sheared and blended during said mixing until said polytetrafluoroethylene forms a filament-like, fibrous structure and said mixture is uniform and spongy and without free particles of carbon or tetrafluoroethylene in substantial concentration; and,

b. catalyzing said mixture by:

i. introducing into the pores of said support material a salt of a metal of the eighth group of the Periodic Table in a non-polar solvent in which said salt is ionizable, the concentration of said salt being sufficient to provide a metal catalyst concentration of at least about 0.1 mg/cm^2, and,

ii. reducing said salt to said catalytic metal within the pores of said support material by contacting said salt in said pores with a selected reducing agent for said salt.

4,235,749

AMMONIA SYNTHESIS CATALYSTS AND PROCESS OF MAKING AND USING THEM

Theodore A. Gens, Lake Zurich, Ill., assignor to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Continuation-in-part of Ser. No. 960,941, Nov. 15, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,288

Int. Cl.[1] B01J *23/78, 27/20*

U.S. Cl. 252—443 **34 Claims**

1. An improved ammonia synthesis catalyst, consisting of a preformed porous substrate of reduced iron-base catalyst, having large surface area, the surface of which is coated with a vapor-deposited coating of an inorganic alkali metal compound or compounds in an amount measured by weight of the alkali metal, of less than one weight percent of the catalyst weight.

4,235,750

CONTAINER FOR PREVENTION OF POSTHARVEST DECAY, MATURATION AND SENESCENSE OF HARVESTED CROPS

Michael F. Cazalet, 11603 Vanderford, Houston, Tex. 77099

Filed Mar. 7, 1979, Ser. No. 18,117

Int. Cl.[3] B01J *21/08, 21/18, 23/34, 21/04*

U.S. Cl. 252—446 **8 Claims**

1. A container for retarding decay, maturation and senescense of perishables, including fruits, vegetables and florals, in postharvest circumstances which comprises:

(a) an air-exposed first granulated adsorbent material having at least 350.0 square meters surface area per gram of material and having deposited thereon a permanganate salt for oxidation of airborne evolutionary gases from postharvest perishables;

(b) an air-exposed second, adsorbent, granulated material having a surface area of not less than 1450.0 square meters per gram of material;

(c) an air-exposed third adsorbent material in granulated form having a surface area of not less than 850.0 square meters per gram of material which material is a water-holding silica gel;

(d) an air-exposed fourth adsorbent having a surface area of not less than 350.0 square meters per gram of material for removal of carbon dioxide from the evolutionary gases of fruit;

(e) means for holding said first, second, third and fourth adsorbent, said means permitting air exposure of each of said adsorbents so that each of said air adsorbents is exposed to the near atmosphere;

(f) wherein said first granulated adsorbent incorporates a granulated substrate in particulate form;

(g) wherein said second adsorbent includes activated carbon in particulate form; and

(h) wherein said fourth adsorbent includes a molecular sieve.

4,235,751

MODIFIED MONTMORILLONITE CLAY CATALYST

Thomas W. Del Pesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1979, Ser. No. 34,604

Int. Cl.[1] B01J *20/12, 37/00*

U.S. Cl. 252—450 **4 Claims**

1. A catalyst material prepared by

(a) holding a raw granular Wyoming bentonite at a temperature of about 300°-600° C. for about 1-20 hours, in air;

(b) impregnating the product of (a) with an organic liquid capable of being intercalated into said product;

(c) optionally, removing residual organic liquid from the product of (b);

(d) activating the product of (b) or (c) with a strong acid;

(e) removing residual acid from the product of (d);

(f) washing the product of (e) with water until it is substantially free of acid anions;

and then

(g) optionally, drying the product of (f) at a temperature below about 150° C.

3. The catalyst material of claim 1 in whose preparation the organic liquid in step (b) is tetrahydrofuran.

4,235,752

DETERGENT COMPOSITIONS CONTAINING ALKYL SULFATE ISOMERS

Brian Rossall, and Jeffrey D. Hampson, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 9, 1979, Ser. No. 10,666

Claims priority, application United Kingdom, Feb. 14, 1978, 5837/78

Int. Cl.[2] C11D 1/14, 1/22

U.S. Cl. 252—551 8 Claims

1. A detergent composition comprising as active detergent component a C_{10}-C_{18} secondary alkyl sulfate, said secondary alkyl sulfate containing up to 50% of 2- and 3-sulfate isomers and consisting of at least 40% of effective isomers selected from the group consisting of $C_{14}{}^{-2}$, $C_{15}{}^{-2/3/4/5/6}$, $C_{16}{}^{-3/4/5/6/7}$ and $C_{17}{}^{-7/8/9}$ sulfate isomers and mixtures thereof.

4,235,753

ZEOLITIZED COMPOSITE BODIES AND MANUFACTURE THEREOF

Stanley M. Brown, Scotch Plains, and Gerald M. Woltermann, Middletown, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Menlo Park, N.J.

Filed Mar. 16, 1979, Ser. No. 21,214

Int. Cl.[1] B01J 29/06

U.S. Cl. 252—455 Z 14 Claims

1. In a process for synthesizing coherent composite zeolitic shaped bodies comprising a mixture of crystalline zeolitic aluminosilicate disseminated throughout the bodies in an essentially amorphous alumina-silica porous residue of anhydrous calcined clay, said process comprising: mixing (a) coherent precursor bodies of essentially the same size and shape as said composite zeolitic bodies and containing kaolin clay calcined under conditions of time and temperature to undergo the characteristic kaolin exotherm with (b) a basic aqueous solution containing a predetermined amount of one or more bases, sufficient of said aqueous solution (b) being present to at least cover said shaped precursor particles (a); heating said mixture of (a) and (b) unit calcined kaolin clay in said precursor bodies (a) is converted by reaction with said basic aqueous solution (b) into shaped bodies containing said mixture of crystalline aluminosilicate and silica-alumina, and a mother liquor containing silica and/or alumina originally in (a) is formed; and recovering the resulting crystallized bodies; the improvement, wherehy the rate of growth of said crystalline aluminosilicate in said bodies of calcined clay (a) is desensitized to variations in the source of clay used to produce said bodies (a) and to variations in the calcination conditions used to produce said bodies (a), which comprises: optionally aging, and then heating said mixture of (a) and (b) in the presence of amorphous aluminosilicate nucleation centers.

4,235,754

CRACKING CATALYST

Arthur W. Chester, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 928,036, Jul. 25, 1978, Pat. No. 4,181,600. This application Aug. 10, 1979, Ser. No. 66,215

Int. Cl.[3] B01J 29/12, 29/16

U.S. Cl. 252—455 Z 10 Claims

1. A catalyst mixture adapted for addition to a plant for continuous catalytic cracking of hydrocarbons and continuous oxidation regeneration of spent catalyst from said catalytic cracking with combustion of CO during said regeneration which mixture comprises an intimate and substantially uniform blend of a minor portion of particles containing from 20 to 80 ppm of platinum, iridium, osmium, palladium, rhodium, ruthenium or rhenium and a major portion of active cracking catalyst, the proportions of said minor and major portions being such that said blend contains no more than 10 ppm of said metal.

5. A mixture according to claim 1 wherein the particles of said minor portion are constituted by calcined spray dried kaolin clay impregnated with said metal.

9. A mixture according to claim 5 wherein said major portion of active cracking catalyst is a rare earth zeolite Y type cracking catalyst.

10. A mixture according to claim 1 wherein both said major and minor portions are constituted by rare earth zeolite Y type cracking catalyst.

4,235,755

HYDROCARBON DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 894,958, Apr. 10, 1978, Pat. No. 4,148,833, which is a continuation-in-part of Ser. No. 758,616, Jan. 12, 1977, Pat. No. 4,087,381, which is a division of Ser. No. 633,890, Nov. 20, 1975, Pat. No. 4,024,052. This application Feb. 21, 1979, Ser. No. 13,489

The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.

Int. Cl.[3] B01J 23/10

U.S. Cl. 252—462 14 Claims

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.01 to about 5 wt. % lantanide series metal; wherein the platinum group metal, catalytically available cobalt, lanthanide series metal and alkali metal or alkaline earth metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the lanthanide series metal is present in an oxidation state above that of the elemental metal; wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrogenation conditions or in a mixture of these states; and wherein substantially all of the alkali metal or alkaline earth metal is present in an oxidation state above that of the elemental metal.

4,235,756

MODIFIED GAMMA ALUMINA COMPOSITION

Lynn H. Slaugh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 27, 1979, Ser. No. 61,221

Int. Cl.[3] B01J 21/04; C01F 7/02; C07C 2/04

U.S. Cl. 252—463 12 Claims

1. A process for preparing an aluminous composition which comprises impregnating a substantially dehydrated gamma alumina with aluminum hydride dissolved in an anhydrous, non-hydroxyl containing organic solvent, drying the impregnated alumina to remove the solvent and subsequently heating the impregnated alumina at a temperature of about 300° to about 900° C. in a nonoxidizing atmosphere.

4,235,757

ETHYLENE EPOXIDATION CATALYST

James C. Cannon, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 27, 1979, Ser. No. 79,298

Int. Cl.[3] B01J 23/50, 21/04, 23/04; C07D 301/04

U.S. Cl. 252—476 3 Claims

1. A silver containing catalyst suitable for use in preparing ethylene oxide by the oxidation of ethylene with oxygen said catalyst prepared by impregnating a support material with a solution of catalytic actives followed by heating the support material in the presence of a reducing agent to deposit metallic silver on the support material, the improvement wherein the reducing agent is a compound represented by the formula:

$$NH_2—R—NH—R_1—OH$$

wherein R and R_1 are the same or different and selected from alkylidene radicals containing from 2 to 4 carbon atoms.

4,235,758

CLEAR LIQUID DETERGENT COMPOSITION CONTAINING MGABS AND ALKYL POLYETHER SULPHATES

Peter L. Dawson, Upton-by-Chester, and Edwin Willis, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,155

Claims priority, application United Kingdom, Dec. 22, 1977, 53475/77

Int. Cl.[3] C11D 1/24, 1/29, 1/37, 1/831

U.S. Cl. 252—544 1 Claim

1. A clear, stable liquid detergent composition having a clear point below 20° C. consisting of:

a. 35 to 55 percent by weight of said composition of a detergent mixture consisting of:

(i) a magnesium alkylbenzene sulphonate derived from a linear C_{10}-C_{13} alkylbenzene having an average molecular weight of from 225 to 245 and containing at least 4 percent by weight of said sulphonate of dialkyl tetraline, and

(ii) an alkali metal, ammonium or amine alkyl polyethersulphate having the general formula

$$R—(C_2H_4O)_n—OSO_3M$$

where R is an alkyl group of 10 to 18 carbon, n is an integer from 1 to 8, and M is an alkali metal, ammonium or amine cation wherein said magnesium alkylbenzene sulphonate and said alkyl polyethersulphate are present in a ratio of 1:1 to 5:1,

b. 0 to 12 percent by weight of said composition of a hydrotrope selected from the group consisting of lower alcohols having 2 to 4 carbon atoms, urea, and mixtures thereof; and

c. water.

4,235,759

LIQUID DETERGENT COMPOSITIONS

Kazuo Ohbu, Tokyo; Nobuo Johna, Funabashi, and Ichiro Kashiwa, Kunitachi, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1979, Ser. No. 45,134

Claims priority, application Japan, Jun. 7, 1978, 53/68534

Int. Cl.[3] C11D 1/65

U.S. Cl. 252—545 5 Claims

1. A liquid detergent composition in which the synthetic organic surfactant component consists essentially of a mixture of

A. anionic surfactant having the formula

$$R'O(CHCH_2O)_mSO_3M$$

(R'' above R)

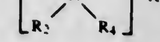
wherein R' is alkyl having 8 to 16 carbon atoms, R'' is H or CH_3, m is the average number of mols of added

$$—CHCH_2O—$$

(R'' above R)

units and is in the range of from 1 to 6 and M is an alkali metal, ammonium or alkanolamine

B. cationic surfactant having the formula



wherein R_1 is alkyl having 8 to 14 carbon atoms, R_2 and R_3 are CH_3, C_2H_4OH or $(C_2H_4O)_2H$, R_4 is CH_3, C_2H_4OH, $(C_2H_4O)_2H$ or benzyl, and X is halogen, CH_3SO_4 or $C_2H_5SO_4$,

the molar ratio of A:B being in the range of from 8:1 to 1:1, and the total weight of A plus B being from 1 to 40% by weight, based on the weight of said composition.

4,235,760

ANTIPLASTICIZER FOR HIGH IMPACT POLYSTYRENE

Christopher W. Uzelmeier, and Paul M. Coffman, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

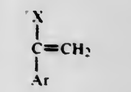
Filed May 24, 1979, Ser. No. 42,386

Int. Cl.[3] C08L 91/06

U.S. Cl. 260—28.5 B 9 Claims

1. A polymeric polyblend having high melt flow and high heat resistance comprising, based on the total weight of the polyblend:

(a) about 80 to 98.5 percent by weight of a monoalkenyl aromatic polymer comprising at least one monoalkenyl aromatic monomer of the formula:



where Ar is selected from the group consisting of phenyl, halophenyl alkylphenyl, alkylhalophenyl, and mixtures thereof, and X is selected from the group consisting of hydrogen, halogen, and an alkyl radical of less than three carbon atoms and mixtures thereof,

(b) about 1 to 15 percent by weight of a diene rubber moiety dispersed as grafted diene rubber particles, said rubber particles being grafted with and having occluded said monoalkenyl aromatic polymer, and

(c) about 0.5 to 10 percent by weight of an oxidized polyethylene having a molecular weight of from about 500 to about 5,000 and an acid number of between about 5 and 50.

4,235,761

WATER-INSOLUBLE THERMOPLASTIC COMPOSITIONS FOR RIGIDLY HOLDING OR SUPPORTING ARTICLES DURING MACHINING

Myron Koenig, Mamaroneck, N.Y., assignor to M. Argueso & Co., Inc., Mamaroneck, N.Y.

Filed Jun. 22, 1979, Ser. No. 51,434

Int. Cl.[3] C08L 91/00

U.S. Cl. 260—28.5 AV 12 Claims

1. A water-insoluble, thermoplastic composition comprising about 4 to about 10% by weight of natural wax, about 2 to about 10% by weight ethylene vinyl acetate copolymer, about 3 to about 8% by weight hydrogenated glyceride, and about 25 about 80% by weight of a water-insoluble, thermoplastic hydrocarbon resin having a ring and ball softening point in the range of about 85° to 130° C.

4,235,762

STABILIZED PHENOLIC RESINS

C. Eugene Jinkins, Freeport, and Bobby Legler, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1979, Ser. No. 5,738
Int. Cl.³ C08L 61/10, 61/08
U.S. Cl. 260—29.3 16 Claims

1. A stabilized phenolic resole resin composition comprising a phenolic resole resin and an amount of a finely divided, water absorbent powder having a number average particle size of less than about 5000 A sufficient to reduce the amount of a distinct, water rich phase formed in the phenolic resole resin.

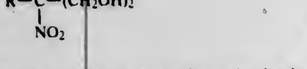
4,235,763

MELAMINE POLYMERIC COMPOSITION

Jerry H. Hunsucker, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Mar. 30, 1979, Ser. No. 25,640
Int. Cl.³ C08G 12/32; C08J 3/00; C08L 61/28
U.S. Cl. 260—29.4 R 9 Claims

1. A polymeric composition comprising the condensation product obtained by the process of reacting in aqueous solution a nitroalkanol of the formula



where R is hydroxymethyl, methyl or ethyl, with melamine in a mole ratio of about 3-4:1 respectively at a temperature of 50° to 95° C. at a pH of about 8 to 11 for a period of time sufficient to form the polymer without precipitating same.

5. The composition of claim 1 wherein the nitroalkanol is formed in situ by substituting an equimolar amount of a nitroalkane of 1-3 carbon atoms and 2 moles of formaldehyde per mole of nitroalkane of 2-3 carbon atoms or 3 moles of formaldehyde per mole of nitroalkane of one carbon atom.

4,235,764

SIZE COMPOSITION

Ernst H. Dereser, and Jean-Marie Meulders, both of Battice, Belgium, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 30, 1977, Ser. No. 866,141
Int. Cl.³ C08L 77/00
U.S. Cl. 260—29.6 NR 5 Claims

1. A size composition for glass fibers, said composition consisting essentially of an aqueous dispersion of a polyvinyl alcohol, 85 percent to 90 percent hydrolysis, and a molecular weight such that a 4 percent aqueous solution thereof has a viscosity of from 4 to 6 centipoises, a water dispersible cationic epichlorohydrin polyamide copolymer where the polyamide is based upon a polyalkylene polyamide and a flocculent polymer that is a medium-high to high cationic polymer or copolymer having a quaternized amine function, said polymer or copolymer being of at least 40 percent of a monomer having an acrylic function and an amine function where the acrylic function is acrylate or methacrylate, and any co-monomer being an acrylamide, said quaternized copolymer having a molecular weight sufficiently high that a 1 percent solution thereof in water has a Brookfield viscosity from 1200 to 1600 centipoises.

4,235,765

URETHANE ELASTOMERS HAVING REDUCED THIXOTROPY AND VISCOSITY

James A. Gallagher, Grosse Ile, and Bernard A. Merkl, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 4, 1979, Ser. No. 1,025
Int. Cl.³ C08K 5/41
U.S. Cl. 260—30.8 R 14 Claims

1. In an essentially solvent-free pigmented polyurethane elastomer composition of the type comprising on organic polyisocyanate, an active hydrogen-containing compound, a pigment and a catalyst, the improvement which comprises:

a minor amount of a sodium alkyl sulfate, the sulfate reducing the thixotropy and viscosity of the elastomer composition.

4,235,766

COATING COMPOSITION HAVING AN IMPROVED POT LIFE

Cornelis J. Kuijper, Katwijk, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Filed Sep. 15, 1978, Ser. No. 942,595
Claims priority, application Netherlands, Sep. 15, 1977, 7710099
Int. Cl.³ C08K 5/05; C08G 18/32
U.S. Cl. 260—33.4 UR 7 Claims

1. A coating composition having a prolonged pot life comprising (a) an organic polyhydroxy compound, (b) an organic polyisocyanate, and (c) 2 to 25% by weight of a 2-methyl-2-alkanol selected from the group consisting of 2-methyl-2-propanol, 2-methyl-2-butanol, and a mixture of 2-methyl-2-propanol and 2-methyl-2-butanol, with the proviso that at least 0.8 equivalents of said 2-methyl-2-alkanol are present per equivalent of said organic polyisocyanate.

4,235,767

PROCESS FOR THE PRODUCTION OF HALOHYDRIN-AMINE-SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 938,450, Aug. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 732,013, Oct. 13, 1976. This application Jul. 12, 1979, Ser. No. 56,907
Int. Cl.³ C08L 79/02
U.S. Cl. 260—37 EP 13 Claims

1. The process for the production of silica containing copolymer compositions by the following steps:

(a) mixing 10 to 50 parts by weight of a hydrated silica compound and 5 to 150 parts by weight of a polyfunctional amine;

(b) adding slowly 50 parts by weight of a polyfunctional halohydrin compound to said mixture while agitating and keeping the temperature between 20° C. and 70° C.;

(c) adding 50 to 500 parts by weight of water to the mixture while agitating and keeping the temperature between 20° C. and 70° C. for 30 to 120 minutes, thereby

(d) producing a silica containing prepolymer;

(e) adding an alkylene oxide, selected from the group consisting of ethylene oxide, propylene oxide and mixtures thereof, to the prepolymer in an aqueous solution containing about 25% aolids, at a temperature of 45° C. to 70° C., at a pH of 6 to 7, and with the proportion of alkylene oxide being from about 0.5 to 1.5 mols per mol of amino nitrogen atom in the halohydrin-amine-silicate prepolymer, while agitating, and

(f) maintaining the temperature until the alkylene oxide has reacted.

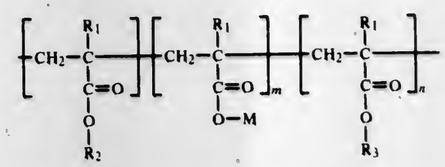
4,235,768

PRODUCTION OF READILY DISPERSIBLE TITANIUM DIOXIDE PIGMENTS

Helmut Ritter; Heinz-Peter Hemmerich, and Hans J. Rosenkranz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 28, 1979, Ser. No. 70,477
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1978, 2840637
Int. Cl.² C09C 1/36, 3/10
U.S. Cl. 260—40 R 4 Claims

1. In the homogeneous coating of a titanium dioxide pigment with an organic polymer in which an aqueous solution of a polymer containing carboxyl groups is added to a dispersion of titanium dioxide in water, the polymer is applied to the pigment, the coated pigment is separated off from the aqueous medium, washed, dried and, optionally, ground, the improvement which comprises employing as the polymer a polymer of the formula



in which

R_1 each independently is hydrogen or methyl,

R_2 is hydrogen, or alkyl or cycloalkyl containing from 1 to 8 carbon atoms,

M is sodium or potassium,

R_3 is hydrogen, alkyl or cycloalkyl containing from 1 to 12 carbon atoms, or hydroxyalkyl containing from 2 to 6 carbon atoms,

m=0.2 to 1.5, and

n=0 to 0.5,

the polymer being added to the titanium dioxide dispersion in the form of a weakly alkaline aqueous solution in about 0.05 to 2.5% by weight based on the titanium dioxide.

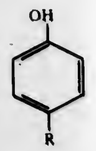
4,235,769

COLOR-DEVELOPING PHENOLIC-ALDEHYDE COMPOSITION FOR PRESSURE-SENSITIVE RECORDING SHEET MATERIAL AND PROCESS FOR THE PREPARATION THEREOF

Makoto Asano; Saburo Kawashima; Kenichi Sugimoto, and Tadashi Kobayashi, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jan. 19, 1979, Ser. No. 4,770
Claims priority, application Japan, Jan. 26, 1978, 53-6734
Int. Cl.³ C08G 8/12, 8/24, 8/28; C08K 5/13
U.S. Cl. 260—45.8 NT 14 Claims

1. A color-developing composition for pressure-sensitive recording sheet material of the self-contained type comprising (A) a copolymer obtained by reacting at least one p-alkylphenol selected from the group consisting of compounds having the general formula:



(I)

where R is an alkyl radical containing from 1 to 12 carbon atoms, and phenol with formaldehyde and (B) from 1 to 20 parts by weight, based on 100 parts by weight of (A), of a hindered phenolic compound selected from the group consisting of 6-(4-hydroxy-3,5-di-tert-butylanilino)-2,4-bis(alkylthio)-1,3,5-triazines, the copolymer and the hindered phenolic compound being homogeneously dissolved in mutual solution.

4,235,770

AMMELINIUM BETA-OCTAMOLYBDATE AND COMPOSITION CONTAINING SAME

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 18, 1979, Ser. No. 49,256
Int. Cl.³ C08K 5/34; C07D 251/52
U.S. Cl. 260—45.75 R 4 Claims

1. Ammelinium beta-octamolybdate characterized by major x-ray diffraction peaks at "d" spacings of 9.90 A, 9.15 A, 5.96 A, 3.62 A, 3.47 A, 3.30 A and 3.16 A.

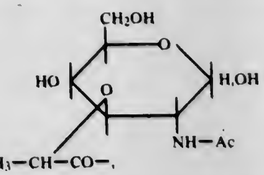
4,235,771

WATER SOLUBLE AGENTS EFFECTIVE AS IMMUNOLOGICAL ADJUVANTS FOR STIMULATING IN THE HOST THE IMMUNE RESPONSE TO VARIOUS ANTIGENS AND COMPOSITIONS, NOTABLY VACCINES CONTAINING SAID WATER SOLUBLE AGENTS

Arlette Adam, Palaiseau; Francoise Audibert, Neuilly; Louis Chedid; Jean Choay, both of Paris; Rita Ciorbaru, Montrouge; Fabrielle Ellouz, Bagneux; Dominique Juy, Paris; Pierre Lefrancier, Bures sur Yvette; Claude Merser, Olivet; Jean-Francois Petit, Paris; Pierre Sinay, Orleans, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Division of Ser. No. 516,991, Oct. 22, 1974, Pat. No. 4,186,194. This application May 15, 1978, Ser. No. 906,002
Claims priority, application France, Oct. 23, 1973, 73 37806; Jul. 1, 1974, 74 22909
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 R 28 Claims

1. A peptidoglycan, N-Acmuramyl of the formula



to which carboxyl group there is linked a peptide chain which comprises two to eight aminoacid residues, the first aminoacid residues comprising alanyl, seryl, or glycyl, and the second aminoacid residues comprising glutamic or aspartic acid residues, the carboxyls of this second aminoacid residue being either free or substituted, or when there are more than two aminoacid residues, the carboxyls of the second aminoacid being either free, substituted or linked to another aminoacid residue, with the proviso that both carboxyls of the second aminoacid are not free and Ac methyl, concurrently.

4,235,772

NOVEL PEPTIDES HAVING GROWTH PROMOTING ACTIVITY

Ronny-Hugo L. Lundin, Johanneshov; Gertrud E. Westin-Sjödahl, Södertälje; Karin H. L. Bergendal, Danderyd, and Linda M. Fryklund, Kungsängen, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed Jun. 20, 1979, Ser. No. 50,962

Claims priority, application Sweden, Jun. 21, 1978, 7807114

Int. Cl.³ C07C *103/52;* **C12N** *5/00, 5/02*

U.S. Cl. 260—112.5 R **9 Claims**

1. A growth promoting polypeptide having the general formula

Cys-Q-Cys
P- -R,

and the corresponding linear form thereof, wherein

P is hydrogen, or Phe-Asn-Val-Asp-Lys-Lys-;

Q is selected from -Gin, or -Ser-Tyr-Tyr-Gln-Ser-Asn-, or -Tyr-Thr-Ala-Glu-; and

R is selected from -Thr, or -Lys-Pro -Gln-Val-Thr-, or -Asp-Glu-Leu-;

and the corresponding peptide in which its reactive groups are projected in any of Asp, Cys, Glu, Lys, Ser, Thr, Tyr, Which are included; as well as the corresponding pharmaceutically acceptable acid addition salts of each said peptide.

4,235,773

TRISAZO DYESTUFFS CONTAINING A NAPHTHOLAMINO SULFONIC ACID COMPONENT AND A PHENYLCARBONYLAMINO-PHENYL COMPONENT

Volker Hühne; Carl Taube, both of Leverkusen, and Reiner Ditzer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

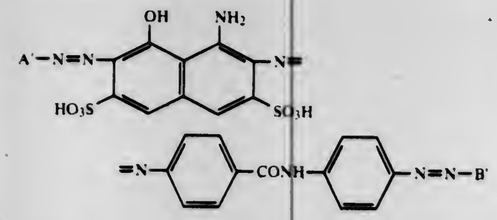
Continuation of Ser. No. 232,295, Mar. 6, 1972, abandoned. This application Dec. 21, 1976, Ser. No. 752,737

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1971, 2110772

Int. Cl.³ C09B *35/32;* **D06P** *3/04, 3/24, 3/60*

U.S. Cl. 260—173 **4 Claims**

1. Triasazo dyestuff of the formula



wherein

A' is phenyl, chlorophenyl, nitrophenyl or sulphophenyl,

B' is 4-hydroxy-phenyl, 2,4-diaminophenyl, 2,4-diamino-5-methyl-phenyl, 2,4-diamino-5-nitrophenyl, 1-amino-3-hydroxy-phenyl, 2-hydroxy-(2'-methylphenylamino)-phenyl or 2-acylamino-4-dialkylaminophenyl.

4,235,774

PENICILLIN DERIVATIVES

Michael Preiss; Hans-Bodo König; Karl G. Metzger, and Gunter Schmidt, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

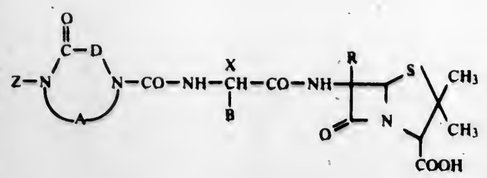
Filed Feb. 12, 1979, Ser. No. 11,347

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2810083

Int. Cl.³ C07D *499/70*

U.S. Cl. 260—239.1 **11 Claims**

1. A penicillin derivative of the formula



an ester or salt thereof, or a derivative thereof in which the carboxyl group is protected by a protective group, in which

R denotes a hydrogen atom or a C_1-C_6-alkoxy group,

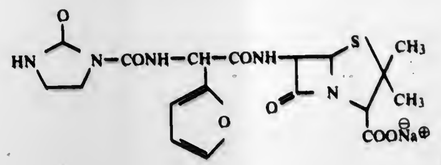
B denotes furyl, pyrrolyl, pyrazolyl, imidazoly, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, oxdiazolyl, thiazolyl, 2-imino-Δ^4-thiazolin-4-yl, isothiazolyl, thiadiazolyl, oxtriazolyl, thiatriazolyl, sydnonyl, pyridyl, pyrazinyl, pyridazinyl, pyrimidinyl, triazinyl, tetrazinyl or pyronyl said heterocyclic groups being unsubstituted or substituted by halogen, C_1-C_6-alkyl, cyano, nitro, hydroxyl, amino, sulpho or methylsulfonyl,

A denotes an ethylene, trimethylene or o-phenylene radical,

D denotes a carbonyl group or a direct bond and

Z denotes hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_3-C_{10}-cycloalkyl, C_3-C_{10}-cycloalkenyl or C_3-C_{10}-cycloalkadienyl, aralkyl with 6 or 10 carbon atoms in the aryl radical and 1 to 4 carbon atoms in the alkyl part, C_6-C_{10}-aryl, said alkyl, alkenyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aralkyl and alkyl being unsubstituted or substituted by R_3; thienyl, furyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, pyrrolyl, imidazolyl, pyrazolyl, oxadiazolyl, thiadiazolyl, triazolyl, oxtriazolyl, thiatriazolyl, tetrazolyl, pyridyl, pyrazinyl, pyrimidinyl, tetrahydrofuranyl, dioxanyl, pyrrolidinyl, piperidinyl, morpholinyl, pyron-2-yl or pyron-4-yl, said heterocyclic groups being unsubstituted or substituted by C_1 to C_4 alkyl, trifluoromethyl, halogen, amino, C_1 to C_4 alkylamino, di-(C_1 to C_4 alkyl)-amino, formylamino, acetylamino, methoxycarbonylamino, ethoxycarbonylamino, methylsulphonylamino, hydroxy, methoxy, ethoxy, methylmercapto, ethylmercapto, methylsulphonyl, methylsulphinyl, carboxy, sulpho, formyl, (C_1 to C_4 alkyl)-carbonyl, (C_1 to C_4 alkoxy)-carbonyl or cyano, if the substituent is bonded to a carbon atom or substituted by C_1 to C_4 alkyl, cyano, formyl, (C_1 to C_4 alkoxy)-carbonyl, aminocarbonyl, (C_1 to C_4 alkylamino)-carbonyl, and C_1 to C_4 alkyl)-carbonyl, if the substituent is bonded to a nitrogen; (C_1 to C_4 alkyl)-carbonyl, phenylcarbonyl unsubstituted or substituted by R_3 C_1 to C_4 alkylsulphonyl, phenylsulphonyl, unsubstituted or substituted by R_3, (C_1 to C_4 alkoxy)-carbonyl, aminocarbonyl and aminosulphonyl, unsubstituted or substituted by C_1 to C_4 alkyl, and R_3 is halogen, amino, C_1 to C_4-alkylamino, di-(C_1 to C_4 alkyl)-amino, pyrrolidyl, piperidyl, formylamino, (C_1 to C_4 alkyl)-carbonylamino, N-(C_1 to C_4-alkyl)-formylamino, N-(C_1 to C_4 alkyl)-(C_1 to C_4 alkyl)-carbonylamino, di-(C_1 to C_4 alkyl)-methylimino, C_1 to C_4 alkylsulphonylamino, N-C_1 to C_4 alkyl-C_1 to C_4 alkylsulphonylamino, hydroxysulphonylamino, N-C_1 to C_4 alkyl-hydroxysulphonylamino, amidino, di-(C_1 to C_4 alkyl)-amino-methylimino, pyrrolidinylmethylimino, guanido, nitro, azido, hydroxy, C_1 to C_4 alkoxy, formyloxy, (C_1 to C_4 alkyl)-carbonyloxy, (C_1 to C_4 alkoxy)-carbonyloxy, aminocarbonyloxy, (C_1 to C_4 alkylamino)-carbonyloxy, di-(C_1 to C_4 alkyl)-aminocarbonyloxy, piperidinylcarbonyloxy, aminosulphonyloxy, C_1 to C_4 alkylaminosulphonyloxy, di-(C_1 to C_4 alkyl)-aminosulphonyloxy,carboxy, aminocarbonyl, di-(C_1 to C_4 alkyl)-aminocarbonyl, formyl, hydroxysulphonyloxy, mercapto, C_1 to C_4 alkylmercapto, C_1 to C_4 alkylsulphinyl, sulpho, C_1 to C_4 alkylsulphonyl, aminosulphonyl, C_1 to C_4 alkylaminosulphonyl, di-(C_1 to C_4 alkyl)-aminosulphonyl, piperidinylsulphonyl, thiosulphate, phenoxy and—in the case of the cyclic radicals—alkyl with 1 to 6 carbon atoms.

5. A compound according to claim 1, wherein such compound is sodium 6-{α-[(2-oxo-imidazolidin-1-yl)-carbonylamino]-furyl-2-acetamido}-pencillinate of the formula



4,235,775

TRIAZOLOBENZODIAZEPINE DERIVATIVES

Kanji Meguro, Takarazuka, and Yutaka Kuwada, Ashiya, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

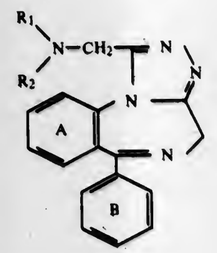
Continuation of Ser. No. 201,960, Nov. 24, 1971, abandoned. This application Jun. 15, 1979, Ser. No. 49,055

Claims priority, application Japan, Dec. 11, 1970, 45/110716

Int. Cl.² A61K *31/55;* **C07D** *487/04*

U.S. Cl. 260—243.3 **15 Claims**

1. A compound selected from the group consisting of a compound of the formula



wherein R_1 represents hydrogen, alkyl of 1-6 carbon atoms, hydroxyalkyl of 1-6 carbon atoms, cycloalkyl of 3-6 carbon atoms or hydroxycycloalkyl of 3-6 carbon atoms, R_2 represents hydroxyalkyl of 1-6 carbon atoms, cycloalkyl of 3-6 carbon atoms or hydroxycycloalkyl of 3-6 carbon atoms, or R_1 and R_2, together with the adjacent nitrogen atom, form ethyleneimino, pyrrolidino, piperidino, morpholino, piperazino, N-(2-hydroxyethyl)piperazino, N-(3-hydroxypropyl)-piperazino, N-methylpiperazino or N-ethylpiperazino, the rings A and B are unsubstituted or substituted by one or more members selected from the group consisting of halogen, nitro, trifluoromethyl, alkyl of 1-3 carbon atoms and alkoxy of 1-3 carbon atoms, and the nitrogen atom at the 5-position is unsubstituted or substituted by oxygen, and a pharmaceutically acceptable salt thereof.

4,235,776

TETRAHYDRO-2H-BENZO[C]PYRROLES

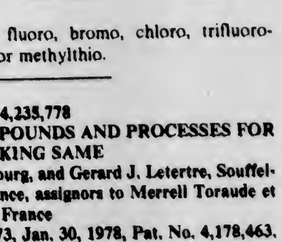
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 3,063, Jan. 22, 1979, abandoned. This application Mar. 15, 1979, Ser. No. 20,560

Int. Cl.³ C07D *209/44;* **A61K** *31/40*

U.S. Cl. 260—326.1 **9 Claims**

1. A compound of the formula



wherein

R^1 is H, R^2 or



Am is NH_2 or $N(R^2)_2$;

R^3 is methyl, ethyl or n-propyl; and each R^2 is independently R^3 or allyl; except that R^1 is not

when Am is NH_2 and acid addition salts thereof.

4,235,777

BENZYLPYRROLYLMETHYL ESTERS OF 3-(1,2-DIBROMO-2,2-DICHLOROETHYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLIC ACID

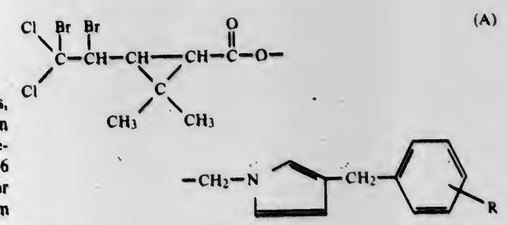
Clive A. Hearick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 19, 1979, Ser. No. 95,283

Int. Cl.³ C07D *207/33, 207/325, 207/333;* **A01N** *43/36*

U.S. Cl. 260—326.43 **8 Claims**

1. A compound of the formula (A):



(A)

wherein R is hydrogen, fluoro, bromo, chloro, trifluoromethyl, methyl, methoxy or methylthio.

4,235,778

2-PYRROLIDONE COMPOUNDS AND PROCESSES FOR MAKING SAME

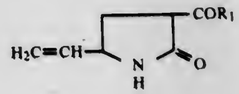
Maurice W. Gittos, Strasbourg, and Gerard J. Letertre, Souffelweyersheim, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 873,273, Jan. 30, 1978, Pat. No. 4,178,463. This application Jun. 4, 1979, Ser. No. 45,005

Int. Cl.³ C07D *207/08*

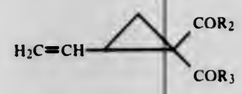
U.S. Cl. 260—326.43 **4 Claims**

1. A compound of the formula

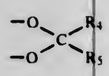


wherein R_1 is hydroxy, amino, or tertiary-butoxy, and the alkali metal, alkaline earth metal and organic amine salts thereof when R_1 is hydroxy.

4. A process for the preparation of a compound of claim 1 which comprises reacting a 2-vinylcyclopropane-1,1-dicarboxylic acid derivative of the formula



with ammonia gas in an appropriate inert polar solvent at a temperature of about 25° to 150° C. for about 4 to 24 hours wherein each of R_2 and R_3 are different and represent a straight or branched alkoxy group of from 1 to 4 carbon atoms, or R_2 and R_3 are the same and represent a straight or branched alkoxy group having from 1 to 6 carbon atoms or a straight or branched alkenyloxy group having from 2 to 4 carbon atoms or R_2 and R_3 taken together form a lower alkylenedioxo group of the structure



wherein each of R_4 and R_5 may be the same or different and represents a straight chain alkyl group having from 1 to 4 carbon atoms.

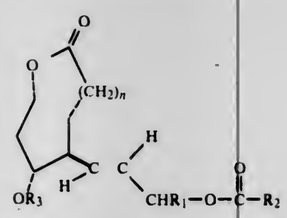
4,235,779

BICYCLIC LACTONES

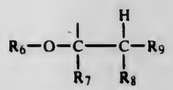
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 654,109, Feb. 2, 1976, abandoned. This application Nov. 23, 1979, Ser. No. 96,806
Int. Cl.³ C07D *307/77*
U.S. Cl. 260—343.3 P 2 Claims

1. A compound of the formula



wherein n is one or 2; R_1 is hydrogen, methyl, or ethyl; R_2 is alkyl of one to 19 carbon atoms, inclusive, or aralkyl of 7 to 12 carbon atoms, inclusive, substituted with zero to 3 halo atoms; and R_3 is a blocking group which is tetrahydropyranyl, tetrahydrofuranyl, or a group of the formula



wherein R_6 is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_7 and R_8 are the same or different, being hydrogen, alkyl of one to 4 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or, when R_7 and R_8 are taken together, $-(CH_2)a-$ or $-(CH_2)b-O-(CH_2)c-$ wherein a is 3, 4, or 5, b is one, 2, or 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, and wherein R_9 is hydrogen or phenyl.

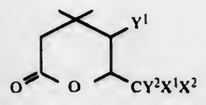
4,235,780

DERIVATIVES OF 2H-PYRAN-2-ONE

Kiyoshi Kondo; Toshiyuki Takashima, and Minoru Suda, all of Kanagawa, Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 1, 1979, Ser. No. 90,223
Int. Cl.³ C07D *309/30*
U.S. Cl. 260—343.5 3 Claims

1. A compound of the formula



wherein X^1 and X^2 are the same or different and each is an independently selected halogen atom, a trichloromethyl group, or a trifluoromethyl group, and Y^1 and Y^2 are independently bromine or chlorine atoms with the proviso that Y^1 is a bromine atom when at least one of X^1, X^2, and Y^2 is a bromine atom.

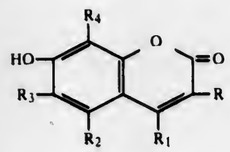
4,235,781

6 OR 8 HALOALLYL SUBSTITUTED 7-HYDROXYCOUMARINS

Kurt D. Kaufman, Kalamazoo, Mich., assignor to Thomas C. Elder, Inc., Hamilton, Ind.

Division of Ser. No. 20,935, Mar. 15, 1979. This application Sep. 20, 1979, Ser. No. 77,484
Int. Cl.³ C07D *311/16*
U.S. Cl. 260—343.44 12 Claims

1. A compound of the formula



in which R, R_1, and R_2 are selected from the group consisting of hydrogen, lower-alkyl, and lower-alkoxy; R_4 is lower-alkyl or lower-alkoxy, and R_3 is R_5-CH=CX-CHR_6-, in which R_5 and R_6 are hydrogen or lower-alkyl and X is bromine or chlorine.

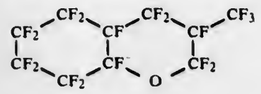
4,235,782

PERFLUORO(4-METHYL-2-OXABICYCLO[4.4.0]DECANE) AND METHOD FOR MANUFACTURE THEREOF

Takashi Abe, and Shunji Nagase, both of Nagoya, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,628
Claims priority, application Japan, Jul. 21, 1978, 53-89846
Int. Cl.³ C07D *311/00*
U.S. Cl. 260—345.2 1 Claim

1. Perfluoro(4-methyl-2-oxabicyclo[4.4.0]decane) represented by the structural formula:



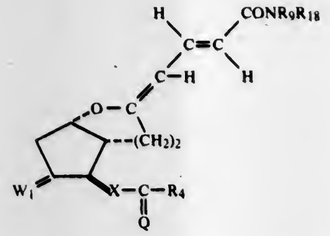
4,235,783

TRANS-2,3,4,5-TETRADEHYDRO-9-DEOXY-5,9A-EPOXY-PGF$_1$ AMIDES

Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 936,295, Aug. 23, 1978, which is a division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Sep. 7, 1979, Ser. No. 73,463
Int. Cl.³ C07D *311/02*
U.S. Cl. 260—345.2 8 Claims

1. A 4Z compound of the formula



wherein W_1 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, α—CH_2OH:β—H;
wherein Q is oxo, α-H:β-H; α-OH:β-R_8 or α—R_8:β—OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and
wherein R_4 is
(1) $-CR_5R_6-C_gH_{2g}=CH_3$ or
(2) $-CR_5R_6-Z-(Ph)$
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6- and the (Ph); wherein (Ph) is phenyl or phenyl substituted by one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that not more than two such substituents are other than alkyl, such substituents being either the same or different;
wherein R_9 is hydrogen, methyl, or ethyl, and wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

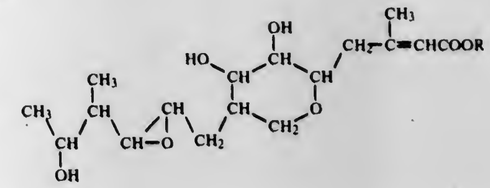
4,235,784

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John P. Clayton, Horsham, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

Division of Ser. No. 803,466, Jun. 6, 1977, Pat. No. 4,102,901. This application Jan. 27, 1978, Ser. No. 872,806
Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77
Int. Cl.³ C07D *309/22*
U.S. Cl. 260—345.8 R 4 Claims

1. A compound of the formula:



wherein R is
(a) alkyl of 1 to 20 carbon atoms substituted with halo, hydroxy, alkanoyloxy of 1 to 6 carbon atoms, amino, alkylamino or dialkylamino wherein each alkyl group contains 1 to 6 carbon atoms;
(b) alkenyl of 2 to 8 carbon atoms substituted with halo, carboxy, alkoxycarbonyl wherein alkoxy contains 1 to 6 carbon atoms, carbamoyl, hydroxy, alkanoyloxy of 1 to 6 carbon atoms, amino, alkylamino or dialkylamino wherein each alkyl group contains 1 to 6 carbon atoms; or
(c) alkynyl of 2 to 8 carbon atoms substituted with halo, carboxy, alkoxycarbonyl wherein alkoxy contains 1 to 6 carbon atoms, carbamoyl, hydroxy, alkanoyloxy of 1 to 6 carbon atoms, amino, alkylamino or dialkylamino wherein each alkyl group contains 1 to 6 carbon atoms.

4,235,785

4-ACETYL-2-ALKOXY-7,7-DIMETHYL-3-OXABICYCLO[4.1.0]HEPTANE

Roger A. Sheldon, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 9, 1979, Ser. No. 55,856
Claims priority, application United Kingdom, Jul. 19, 1978, 30370/78
Int. Cl.³ C07D *309/06*
U.S. Cl. 260—345.9 R 3 Claims

1. A cis 4-Acetyl-2-alkoxy-7,7-dimethyl-3-oxabicyclo[4.1.0.-]heptane wherein the alkoxy group contains from 1 to 5 carbon atoms.

4,235,786

PROCESS FOR PRODUCING OIL-SOLUBLE DERIVATIVES OF UNSATURATED C_4-C_{10} DICARBOXYLIC ACID MATERIALS

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 967,276, Dec. 7, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,939
Int. Cl.³ C07D *307/60*
U.S. Cl. 260—346.74 12 Claims

1. An improved process for preparing oil-soluble derivatives of a monoethylenically unsaturated C_4-C_{10} dicarboxylic acid, anhydride or ester comprising the Ene reaction of said unsaturated C_4-C_{10} dicarboxylic acid, anhydride or ester and an olefin containing from 30 to 700 carbons characterized in that said Ene reaction is carried out in the presence of at least a sediment-reducing amount of an oil-soluble, strong organic acid, having a pk less than about 4, and said acid is of the class consisting of hydrocarbyl substituted phosphorous containing

acids, hydrocarbyl substituted maleic acids, hydrocarbyl substituted malonic acids, hydrocarbyl substituted sulfuric acids, hydrocarbyl substituted sulfonic acids and hydrocarbyl alpha-substituted carboxylic acids wherein the alpha substituent or substituents is selected from the group consisting of nitrilo or nitro, said hydrocarbyl substituents having at least 15 carbons.

4,235,787

BENZOPHENONE PENTACARBOXYLIC ACIDS AND THEIR DIANHYDRIDES

Johann G. D. Schulz, Pittsburgh, and Anatoli Onopchenko, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 10, 1979, Ser. No. 101,919
Int. Cl.³ C07D 307/89
U.S. Cl. 260—346.3 **9 Claims**

1. An isomeric mixture of benzophenone pentacarboxylic acids containing the following compounds:
(1) 3,4,5,3',4'=benzophenone pentacarboxylic acid,
(2) 2,4,5,3',4'-benzophenone pentacarboxylic acid and
(3) 2,3,4,3',4'-benzophenone pentacarboxylic acid.

2. An isomeric mixture of benzophenone pentacarboxylic dianhydrides containing the following compounds:
(1) 5-carboxy-3,4,3',4'-benzophenone tetracarboxylic dianhydride,
(2) 2-carboxy-4,5,3',4'-benzophenone tetracarboxylic dianhydride,
(3) 4-carboxy-2,3,3',4'-benzophenone tetracarboxylic dianhydride and
(4) 2-carboxy-3,4,3',4'-benzophenone tetracarboxylic dianhydride.

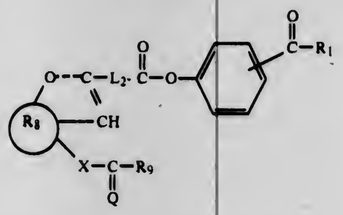
4,235,788

6,7-DIDEHYDRO- OR 7,8-DIDEHYDRO-PGI$_1$ ACYL-SUBSTITUTED PHENYL ESTERS

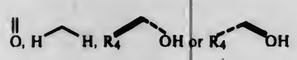
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 933,329, Aug. 14, 1978, Pat. No. 4,180,657. This application Jun. 14, 1979, Ser. No. 48,495
Int. Cl.³ C07D 307/935
U.S. Cl. 260—346.22 **4 Claims**

1. An acid ester of a prostacyclin analog of the formula



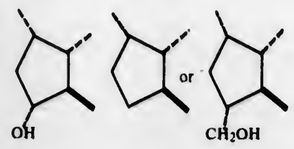
wherein L_2 is
(1) $-(CH_2)_n-$ wherein n is one to 5 inclusive, or
(2) $-(CH_2)_p-CF_2-$ wherein p is 2, 3, or 4, wherein Q is



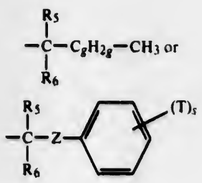
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the



group is in the 4-position, wherein R_8 is

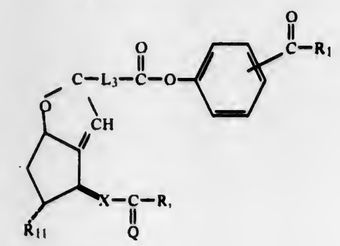


wherein R_9 is



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein Z represents an oxa atom (—O—) or C_jH_{2j} where C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6- and the phenyl ring;
wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$- wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different, and
wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C—or
(4) $-CH_2CH_2-$.

3. An acid of a prostacyclin analog of the formula

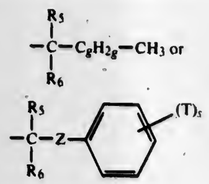


wherein L_3 is $-(CH_2)_n-$
wherein n is one to 5 and
wherein Q is



wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the

group is in the 4-position, wherein R_9 is



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6$-and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different,
wherein R_{11} is hydrogen, hydroxy, or hydroxymethyl, and
wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) $-CH_2CH_2-$

4,235,789

PROCESS FOR THE PREPARATION OF 1-AMINO-2-BROMO-4-HYDROXYANTHRAQUINONE

James R. Stout, Hanahan, S.C., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 19, 1979, Ser. No. 21,673
Int. Cl.³ C07C 97/25
U.S. Cl. 260—380 **14 Claims**

1. Process for the preparation of 1-amino-2-bromo-4-hydroxyanthraquinone which comprises the steps of
(a) brominating 1-aminoanthraquinone in 70–95% sulfuric acid at elevated temperatures to obtain 1-amino-2,4-dibromoanthraquinone;
(b) without mixing the product of step (a) with sulfur trioxide and boric acid and hydroxylating;
(c) adjusting the sulfuric acid content in the mixture obtained in step (b) to 50–80% and
(d) isolating 1-amino-2-bromo-4-hydroxyanthraquinone.

4,235,790

PROCESS FOR SEPARATING P-BENZOQUINONE FROM THE REACTION PRODUCTS OF PHENOL OXIDATION AS QUINHYDRONE

Werner H. Müller, Eppstein, and Dieter Freudenberger, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,570
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802863
Int. Cl.³ C07C 46/10, 50/04
U.S. Cl. 260—396 R **5 Claims**

1. A process for separating p-benzoquinone as quinhydrone from a reaction solution obtained in the oxidation of phenol with oxygen in the presence of a copper salt and a nitrile as solvent, which comprises suspending and/or dissolving solid hydroquinone in said reaction solution, precipitating the p-benzoquinone contained in the reaction solution as quinhydrone and separating the quinhydrone from the reaction solution.

4,235,791

PROCESS FOR DEHYDROGENATION OF STEROLS TO PRODUCE DELTA 4-3-KETOSTEROIDS

Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1979, Ser. No. 81,956
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.2 **16 Claims**

1. A process which comprises dehydrogenating a 3-β-hydroxy steroid or mixture of soy sterols to form the corresponding Δ^4-3-keto derivatives, the improvement which comprises dehydrogenating said steroid or mixture of sterols using an activated non-pyrophoric nickel catalyst and in the presence of a diaryl ketone solvent.

4,235,792

IMMUNOLOGICAL MATERIALS

Jen C. Hsia, and Chou-Tok Tan, both of Toronto, Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

Filed Apr. 14, 1977, Ser. No. 787,524
Int. Cl.³ C07F 9/09; C07J 9/00
U.S. Cl. 260—403 **5 Claims**

1. A synthetic sensitizer for use in forming sensitized liposomes and characterized by a molecular structure comprising an antigenic radical selected from the group consisting of thyroxine-N-group, and 3,5,3'-triiodo-thyronine-N-group linking to the 5-position of a 2,4-dinitro-phenylene group and said phenylene group being linked at the 1-position to an amphiphilic radical selected from the group consisting of phosphatidyl esters of hydroxyamines, amino-acylated phosphatidyl esters of hydroxy amines, cholesterols, sphingosins and dihydrosphingosins.

4. A sensitizer comprising the compound 2,4-dinitro-5-(thyroxine-N-) phenylated dipalmitoyl phosphatidylethanolamine.

4,235,793

PROCESS TO OBTAIN OILY, HIGHLY PURIFIED PHOSPHATIDYLCHOLINES

Hans Betzing, Horrem, Fed. Rep. of Germany, assignor to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,525
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 27187979
Int. Cl.³ A23J 7/00; C07F 9/02; C11C 3/00
U.S. Cl. 260—403 **5 Claims**

1. A process for obtaining oily, highly purified phosphatidylcholines from oily raw phosphatides comprising extracting an oily phosphatide extract from the oily raw phosphatide with a solvent selected from the group consisting of lower alcohols

and aqueous solutions thereof containing from about 85 to 96 percent alcohol, directly contacting the said oily phosphatide extract with an aluminum oxide adsorbent and recovering the adsorbed phosphatidylcholine therefrom.

4,235,794

METHOD FOR THE MANUFACTURE OF METAL SOAP GRANULATES

Gernot Rieber, Munich, and Thomas H. Miller, Gauting, both of Fed. Rep. of Germany, assignors to Chemische Werke Munchen Otto Barlocher GmbH, Munich, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 38,797

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823002

Int. Cl.[1] **C11C** *1/00;* **C09K** *15/32*

U.S. Cl. 260—413 **23 Claims**

1. A process for the preparation of metal soap granulates or mixtures thereof which comprises:

(a) reacting an aqueous solution or suspension of a metal compound selected from metal oxide, metal hydroxide, metal carbonate, basic metal carbonate or mixtures thereof with a water insoluble C_8 to C_{32} fatty acid or mixtures thereof having a melting point above 0° C. and below 100° C., said reaction conducted at a temperature below the melting point of said fatty acid or mixtures thereof, in the absence of catalysts or wetting agents, and under constant agitation until a structurally stable metal soap crust forms on the surface of the fatty acid

(b) continuing the reaction to completion at a temperature above the melting point of said fatty acid or mixtures thereof whereby metal soap granulates are formed as a product.

4,235,795

METHOD FOR EXTRACTING FATTY ACIDS FROM SHORTENING

Marvin D. Cohen, 10719 Sandpiper, Houston, Tex. 77096

Filed Oct. 20, 1978, Ser. No. 953,173

Int. Cl.[1] **C09F** *5/10;* **C11B** *3/00;* **A23C** *12/02*

U.S. Cl. 260—428 **6 Claims**

1. In the method for extending the life of shortening used in deep frying cooking processes comprising the steps of:

introducing directly to the vat of shortening a filter aid material comprising heat-expanded pumicite particulates allowing the particulates to disperse in the shortening

circulating the shortening and particulates therein

and conducting a singular pass of shortening carrying the particulates onto and through a filter structure.

4,235,796

PROCESS FOR FRACTIONAL CRYSTALLIZATION OF LIPIDS

Fred R. Paulicka, Berea, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Sep. 26, 1978, Ser. No. 946,090

Int. Cl.[3] **C09F** *5/10;* **C11B** *3/00*

U.S. Cl. 260—428.5 **10 Claims**

1. A process for the fractional crystallization of crystallizable lipid from a fugitive solvent therefore, said solvent being appreciably more or less dense than the crystals of said lipid, which comprises:

introducing said lipid in liquid state into a crystallization zone having an outlet for dilute liquor and an outlet for washed crystal-containing slurry, said lipid introduced at an inlet intermediate between said outlets, said outlets being remote from each other;

introducing said solvent as wash into said zone near said washed slurry outlet, said solvent as wash being at a temperature not exceeding the temperature of said zone, and in a liquid phase throughout said zone, at least a portion of said solvent as wash flowing towards said dilute liquor outlet;

removing heat from said zone to generate a crystal-containing slurry of lipid crystals, solvent, and dissolved lipid, said lipid crystals representing a fraction of said crystallizable lipid introduced into said zone;

transporting said crystals in a net direction towards said washed slurry outlet;

establishing and maintaining about said washed slurry outlet a washed crystal-containing slurry substantially depleted of dissolved lipid;

withdrawing said washed slurry from said washed slurry outlet;

withdrawing dilute liquor containing lipid dissolved in solvent from said dilute liquor outlet; and

recovering washed crystals from said withdrawn washed slurry.

4,235,797

SILYL VINYL ESTERS

Allan Wissner, Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

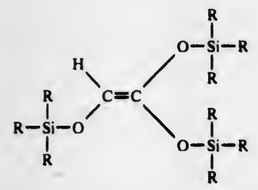
Division of Ser. No. 858,504, Dec. 8, 1977, Pat. No. 4,172,839.

This application Apr. 17, 1979, Ser. No. 30,863

Int. Cl.[3] **C07F** *7/18*

U.S. Cl. 556—443 **2 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of C_1-C_5 alkyl.

4,235,798

PROCESS FOR PRODUCING TWO-CARBON ATOM OXYGENATED COMPOUNDS FROM SYNTHESIS GAS WITH MINIMAL PRODUCTION OF METHANE

William J. Bartley; Thomas P. Wilson, both of Charleston, and Paul C. Ellgen, St. Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,841

Int. Cl.[3] **C07C** *27/06*

U.S. Cl. 260—449 R **6 Claims**

1. In a process for the reaction of a synthesis gas containing carbon monoxide and hydrogen in the presence of a hydrogenation catalyst, the improvement for selectively producing two-carbon atom oxygenated hydrocarbon products while minimizing the production of methane comprises continuously contacting said synthesis gas with a heterogeneous catalyst comprising rhodium in combination with at least one alkali metal selected from the group consisting of lithium, potassium, cesium and rubidium at reaction conditions such that product efficiencies based on carbon consumption in excess of 10 percent are achieved and ethanol, acetic acid and acetaldehyde are formed in an amount which is at least about 50 weight percent of the two or more carbon atom compounds produced by the reaction whereby the production of methane is reduced such that the carbon efficiency to methane is lower than the corresponding carbon efficiency when lithium, potassium, cesium and/or rubidium are absent from said heterogeneous catalyst, which reaction conditions include a temperature within the range from about 150°–450° C., a pressure within the range of from about 15–10,000 psig, and a mole ratio of hydrogen to carbon monoxide within the range of from about 20:1 to 1:200.

4,235,799

PRODUCTION OF METHANOL

Theodore O. Wentworth, and Alvin B. Stiles, both c/o Wentworth Brothers Incorporated, 644 Linn St., Cincinnati, Ohio 45203

Filed Apr. 16, 1979, Ser. No. 30,028

Int. Cl.[2] **C07C** *31/06*

U.S. Cl. 260—449.5 **14 Claims**

1. In the process for the synthesis of methanol wherein a gaseous mixture containing hydrogen and carbon monoxide, carbon dioxide or a mixture of carbon monoxide and carbon dioxide is passed under elevated conditions of temperature and pressure into contact with a catalyst wherein the improvement comprises the steps of

(a) passing said mixture through two or more beds of catalyst arranged in series, the catalyst in each of said beds being of such composition as to function in a lower temperature range than the catalyst in each succeeding bed, said mixture being introduced into the first bed at a temperature within the range from 400° F. to 500° F. and exiting the last bed at a temperature within the range from 700° F. to 750° F.,

(b) cooling the mixture to a temperature within the range from 400° F. to 500° F. by indirect heat-exchange, and

(c) passing the mixture through one or more beds of catalyst whereby the temperature of mixture is raised to from 550° F. to 650° F.

4,235,800

SYNTHESIS GAS

Alwyn Pinto, Norton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 18, 1979, Ser. No. 40,311

Claims priority, application United Kingdom, May 31, 1978, 25657/78

Int. Cl.[3] **C07C** *29/15*

U.S. Cl. 260—449.5 **9 Claims**

1. A process for producing methanol from a carbon monoxide stream which comprises the steps of

(a) forming a gaseous mixture comprising carbon monoxide and steam;

(b) reacting the mixture over a shift catalyst to produce a shifted gas comprising carbon monoxide, carbon dioxide and hydrogen;

(c) removing any excess steam and at least part of the carbon dioxide from the shifted gas;

(d) reacting the resulting gas over a copper-containing methanol synthesis catalyst at an outlet temperature under 300° C.; and

(e) cooling the reacted synthesis gas and separating methanol from it: wherein said process further comprises the steps of

(i) in step (e) transferring exothermic heat of synthesis into water under pressure; and

(ii) in step (a) bringing the resulting hot water under pressure into direct heat exchange with the carbon monoxide stream, whereby to supply at least part of the steam of the gaseous mixture.

4,235,801

PROCESS FOR PRODUCING ETHANOL FROM SYNTHESIS GAS

Madan M. Bhasin, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 541,660, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 437,141, Jan. 28, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,129

Int. Cl.[3] **C07C** *27/06*

U.S. Cl. 260—449.6 R **6 Claims**

1. In a process for the reaction of a synthesis gas containing carbon monoxide and hydrogen in the presence of a hydrogenation catalyst, the improvement whereby oxygenated hydrocarbon products of two-carbon atoms are selectively produced, which comprises continuously contacting said synthesis gas with a heterogeneous catalyst consisting essentially of a combination of rhodium and iron and at reaction conditions correlated to achieve product efficiencies based on cabon consumption in excess of 10 percent and obtain the formation of ethanol, and optionally acetic acid and/or acetaldehyde as well, in an amount which is at least about 50 weight percent of the two or more carbon atom compounds obtained by the reaction and there is obtained an increased amount of ethanol relative to that produced when the catalyst is rhodium only, which reaction conditions include a temperature within the range of about 150°–450° C., a pressure within the range of about 15–10,000 psig, and a mole ratio of hydrogen to carbon monoxide within the range of 20:1 to 1:20.

4,235,802

PROPENIMIDATES

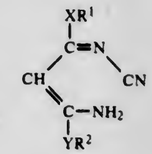
Julius J. Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 14, 1979, Ser. No. 67,354

Int. Cl.[3] **C07C** *125/08, 119/18*

U.S. Cl. 260—453 RW **4 Claims**

1. A compound of the formula:



wherein

X and Y are independently O or S; and

R^1 and R^2 are independently C_1-C_4 alkyl, $(CH_2)_nOR_3$ where R^3 is C_1-C_4 alkyl and n is 1 or 2, CH_2CH_2Cl or CH_2CF_3, provided that when R^1 or R^2 is CH_2CH_2Cl or CH_2CF_3, then the respective X or Y is O.

4,235,803

1,6-DIMESYL-3,4-DIMETHYL-D-MANNITOL AND A PROCESS FOR THE PREPARATION THEREOF

Janos Kuszmann; Pal Sohar; Endre Csanyi, and Emilia Kiraly nee Vida, all of Budapest, Hungary, assignors to Gyogyszerkutato Intezet, Budapest, Hungary

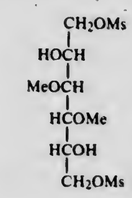
Filed Apr. 26, 1979, Ser. No. 33,492

Claims priority, application Hungary, May 3, 1978, GO-1402

Int. Cl.[3] **C07C** *143/68*

U.S. Cl. 260—456 R **1 Claim**

1. 1,6-Dimesyl-3,4-dimethyl-D-mannitol of the formula (I),



(I)

wherein Ms is mesyl and Me is methyl.

4,235,804

PREPARATION OF PERFLUOROALLYL FLUOROSULFATE

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 931,904, Aug. 8, 1978, abandoned. This application Aug. 20, 1979, Ser. No. 68,080

Int. Cl.³ C07C *141/10*

U.S. Cl. 260—458 F **11 Claims**

1. Method of preparing perfluoroallyl fluorosulfate which comprises reacting hexafluoropropene with sulfur trioxide in a mole ratio of 100:1 to 1:2 under anhydrous conditions in the presence of 0.1 to 5% by weight, based on the sulfur trioxide, of a trivalent boron compound selected from the group consisting of boric oxide, boron trichloride, boron trifluoride, tri(lower alkyl) borates where the alkyl groups contain 1 to 6 carbon atoms, boron oxychloride and boron oxyfluoride at a temperature of 0° to 100° C. for a time sufficient to produce perfluoroallyl fluorosulfate, and recovering perfluoroallyl fluorosulfate from the reaction mixture.

4,235,805

NOVEL NITRILES AND USE AS PERFUME CHEMICALS

Willem Lenselink, Voorthuizen, Netherlands, assignor to Polak's Frutal Works B.V., Amersfoort, Netherlands

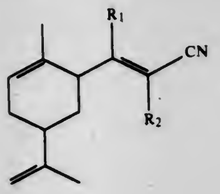
Filed Mar. 14, 1979, Ser. No. 20,308

Claims priority, application United Kingdom, Mar. 20, 1978, 10938/78

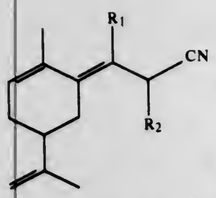
Int. Cl.³ C07C *121/48*

U.S. Cl. 260—464 **2 Claims**

1. A mixture of the chemical compounds having the general formulae:



and



wherein R_1 and R_2 are hydrogen or alkyl radicals of 1 to 6 carbon atoms and having between them a carbon number of 6 or less and where the same substituents are present on each compound.

4,235,806

CATIONIC α-CYANO-P-(N-BENZYL-N-ETHYLAMINO)CINNAMOYL DYES

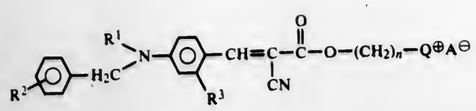
Kishor A. Desai, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Apr. 5, 1979, Ser. No. 27,458

Int. Cl.³ C07C *121/78*; C07D *295/14, 213/02, 233/56*

U.S. Cl. 260—465 D **3 Claims**

1. A dye represented by the structure:



where

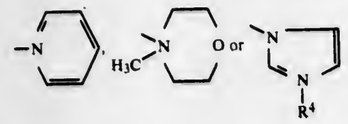
R^1 is alkyl or cyanoalkyl, said alkyl being of 1-4 carbons;

R^2 is H, Cl, Br or NO_2;

R^3 is H or CH_3;

n is 2 or 3;

Q is $N(CH_3)_3$,



where R^4 is alkyl of 1-4 carbons, benzyl, monochlorobenzyl or monobromobenzyl; and

A is an anion.

4,235,807

SYNTHESIS OF 2,6-DISUBSTITUTED BENZONITRILES

Donald W. Fuhlhage, Tonganoxie, Kans., assignor to Thompson-Hayward Chemical Company, Kansas City, Kans.

Filed Jul. 2, 1979, Ser. No. 54,208

Int. Cl.³ C07C *120/00, 121/52*

U.S. Cl. 260—465 G **9 Claims**

1. A method of producing 2,6-disubstituted benzonitriles from the corresponding 2,6-disubstituted benzaldehydes wherein the substituents on the 2 and 6 positions are selected from the group consisting of chlorine, bromine, iodine, alkyl of 1-6 carbon atoms, alkoxy of 1-6 carbon atoms and halogenated alkyls of 1-6 carbon atoms, comprising heating said 2,6-disubstituted benzaldehydes together with a hydroxylamine and a dehydrating agent in an organic acid solvent therefore and then separating out the resultant 2,6-disubstituted benzonitrile.

4,235,808

PURIFICATION OF UNSATURATED DINITRILES BY CONTACTING WITH CHI-ALUMINA PRIOR TO HYDROGENATION

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1978, Ser. No. 939,168

Int. Cl.³ C07C *120/00, 121/28, 121/46, 121/66*

U.S. Cl. 260—465.8 R **19 Claims**

1. A process for the catalytic hydrogenation of an olefinically unsaturated dinitrile feedstock consisting essentially of the dinitrile reaction product obtained by contacting at least one olefinic hydrocarbon reactant, at least one olefinically unsaturated mononitrile reactant and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound, each said olefinically unsaturated mononitrile reactant and each said olefinically unsaturated mononitrile compound containing a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atom which is attached to at least one hydrogen atom, each said olefinic hydrocarbon reactant and each said olefinic hydrocarbon compound having at least one olefinic linkage and having joined to one of the doubly bonded carbon atom another carbon atom having at least one hydrogen atom attached thereto, wherein said dinitrile reaction product comprises a mixture of 5-methyl-4-nonenedinitrile, 2,4-dimethyl-4-octenedinitrile, 2,4-dimethyl-3-octenedinitrile, 2,4,6-trimethyl-3-heptenedinitrile, 5-methylenenonanedinitrile, 2-methyl-4-methyleneoctanedinitrile, and 2,6-dimethyl-4-methyleneheptanedinitrile, which process comprises:

contacting said olefinically unsaturated dinitrile feedstock with chi-alumina so as to produce a treated feedstock; and

subjecting said treated feedstock to suitable hydrogenation conditions in the presence of hydrogen and a suitable hydrogenation catalyst so as to effect hydrogenation of the olefinically unsaturated dinitrile compounds in said feedstock to the corresponding saturated dinitrile compounds and saturated diamine compounds.

4,235,809

α-AMINO PHOSPHONIC ACIDS

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

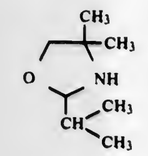
Filed Aug. 12, 1976, Ser. No. 713,705

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 **4 Claims**

1. A process of preparing α-amino phosphonic acids which consists essentially of reacting an oxazolidine with phosphorous acid, in substantially stoichiometric ratios at temperatures below the decomposition point of the reactants and products.

3. The process of claim 1 where the oxazolidine reacted has the formula



4,235,810

ALKYLATES AND SULPHONIC ACIDS AND SULPHONATES PRODUCED THEREFROM

Andre Osselet, and Robert Tirtiaux, both of Mont-Saint-Aignan, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 873,631, Jan. 30, 1978, abandoned. This application Aug. 3, 1978, Ser. No. 930,808

Int. Cl.³ C07C *143/24*; C10M *1/40*

U.S. Cl. 260—505 A **8 Claims**

1. An overbased alkaline earth metal sulfonate lubricant additive of a sulfonic acid prepared by sulfonating an aromatic alkylated with a mixture consisting essentially of about 5 to 30 wt. % linear olefin containing 16 to 30 carbon atoms and up to about 95% of branched chain olefin containing from 15 to 40 carbon atoms, the molar ratio of said aromatic compound to the olefin mixture being from 10:1 to 1:1.

4,235,811

COMPOUNDS FROM AMINATED ALKOXYLATED ALIPHATIC ALCOHOL

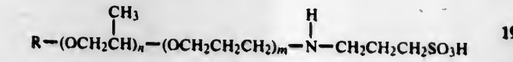
Heinz Schulze; Robert L. Zimmerman, and Carter G. Naylor, all of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Apr. 2, 1979, Ser. No. 26,270

Int. Cl.³ C07C *143/02*; C11D *3/065*

U.S. Cl. 260—513 N **4 Claims**

1. Compounds of the formula



where R is an alkyl group having from 6 to about 18 carbon atoms and n has an average value of from 0 to about 20 and m is 0 or 1 provided that m is 1 when n is 0.

4,235,812

PROCESS FOR PREPARING THIOUREA DIOXIDE

Osamu Fujimoto; Jiro Watanabe, and Kazuyoshi Kushibe, all of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,789

Claims priority, application Japan, Jul. 25, 1978, 53-89986

Int. Cl.³ C07C *145/00*

U.S. Cl. 260—513.7 **5 Claims**

1. A process for preparing thiourea dioxide characterized in that in the production of thiourea dioxide by the reaction of thiourea and hydrogen peroxide in an aqueous solvent, sufficient ammonium bicarbonate is added continuously to the reaction solution so that the ratio of ammonium bicarbonate per mole of thiourea dioxide in the reaction solution is in the range of from 0.01 to 0.2 mole.

4,235,813

AROMATIC SULFONAMIDE SULFONYL CHLORIDE COMPOUNDS

Hideo Ueda, and Hiroshi Sawaguchi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

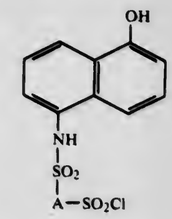
Division of Ser. No. 868,164, Jan. 9, 1978, Pat. No. 4,176,134. This application Mar. 23, 1979, Ser. No. 23,502

Claims priority, application Japan, Jan. 11, 1977, 52/1797

Int. Cl.³ C07C *143/70*

U.S. Cl. 260—543 R **3 Claims**

1. An aromatic sulfonamide sulfonyl chloride compound represented by the following general formula (I)



(I)

wherein A represents a divalent naphthalene nucleus, in which in each nucleus the bonding thereto is symmetrical.

4,235,814

MANUFACTURE OF α-HALOALKYLCARBAMYL HALIDES

Karl-Heinz Koenig, Frankenthal; Christian Reitel, Heidelberg, and Dietrich Mangold, Neckargemuend, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,312

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741980

Int. Cl.³ C07C *125/03*

U.S. Cl. 260—544 C **7 Claims**

1. A process for the manufacture of an α-haloalkylcarbamyl halide, wherein a N-tert.-alkyl-N-(1-alkenyl)-carbamyl halide is reacted with a hydrogen halide at from −78° C. to +80° C.

4,235,815

N-FLUOROMETHYL-CARBAMIC ACID FLUORIDES AND THEIR MANUFACTURE

Sabine Thym, Heidelberg-Dossenheim; Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

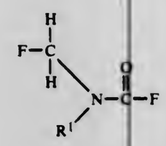
Division of Ser. No. 869,383, Jan. 13, 1978, Pat. No. 4,179,465. This application Jul. 31, 1978, Ser. No. 931,718

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706683

Int. Cl.³ C07C *125/00*

U.S. Cl. 260—544 C **8 Claims**

1. An N-fluoromethyl-carbamic acid fluoride of the formula



I

where R^1 is a cycloalkyl of 5 to 8 carbon atoms or is



where R^2, R^3 and R^4 may be identical or different and each is hydrogen or an alkyl of 1 to 20 carbon atoms or an alkenyl of 2 to 20 carbon atoms, and in addition R^2 may be fluorine if R^3 and R^4 are each hydrogen.

4,235,816

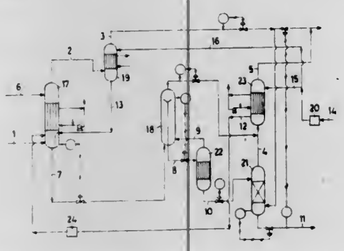
INTEGRATED AMMONIA-UREA PROCESS

Vincenzo Lagana, Milan, and Francesco Saviano, Segrate, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Mar. 8, 1979, Ser. No. 18,729

Int. Cl.³ C07C *126/00*

U.S. Cl. 564—72 **3 Claims**



1. An integrated ammonia-urea process comprising the steps of:

(a) Sending the gaseous stream obtained from steam reforming or partial oxidation of liquid or gaseous hydrocarbons, containing H_2, N_2 and CO_2, to a CO_2-absorption system in which CO_2 is absorbed by a concentrated aqueous solution of ammonia,

(b) discharging from the CO_2-absorption system a gaseous stream composed essentially by H_2 and N_2 and a liquid stream essentially composed by an aqueous solution of ammonium carbamate,

(c) feeding with the aqueous solution of ammonium carbamate a urea synthesis reactor wherein the carbamate is partially converted into urea,

(d) discharging from the urea synthesis reactor an aqueous solution of urea containing the unconverted ammonium carbamate and the excess of ammonia relative to the stoichiometric amount,

(e) feeding the aqueous solution of urea which contains the uncoverted carbamate to a decomposer and thermally decomposing therein about the 50% of said carbamate, discharging a solution of urea containing carbamate and the decomposition products, the latter being recycled in the vapor phase to the urea synthesis reactor,

(f) decomposing the carbamate contained in the solution of urea exiting the decomposer of the carbamate of stage (e) in an adiabatic stripper in which the gaseous stream of stage (b) is used as the stripping agent, a urea solution substantially devoid of carbamate being obtained at the bottom, whereas the decomposition products, the stripping agent and the evaporated water are obtained at the stripper head,

(g) condensing the decomposition products and the evaporated water in the presence of an ammoniated solution of ammonium carbonate by indirect heat exchange with a cold fluid, the inert gases (H_2+N_2) to be used for the ammonia synthesis upon methanization being discharged through the condenser head,

(h) sending the condensate as produced in stage (g) to the CO_2-absorption stage,

(i) sending the solution of urea exiting the bottom of the adiabatic stripper to a concentration stage and discharging melted urea from the latter, wherein, in the urea reactor the ratio of H_2O to CO_2 being in the range of from 0.9 and 1.3 to 1 and the ratio of NH_3 to CO_2 being in the range of from 4.5 and 6.5 to 1.

4,235,817

2-AMINO-5-CHLORO-N-(2,2-DIMETHOXYETHYL)BENZAMIDE

Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Sep. 17, 1979, Ser. No. 75,996

Int. Cl.³ C07C *103/78*; A61K *31/165*

U.S. Cl. 564—163 **1 Claim**

1. The compound 2-amino-5-chloro-N-(2,2-dimethoxyethyl)benzamide.

4,235,818

PROCESS FOR PRODUCING ALPHA-MONOCHLOROACETOACETIC ACID MONOMETHYLAMIDE

Roland Dousse, and Ernst Kägi, both of Monthey, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 811,662, Jun. 30, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 963,057

Int. Cl.² C07C *103/34*, *97/02*

U.S. Cl. 564—199 **11 Claims**

1. In a process for producing α-monochloroacetoacetic acid monomethylamide by reaction of chlorine with an aqueous solution of acetoacetic acid monomethylamide in the presence of urea at a low temperature, the improvement which comprises performing the chlorination of acetoacetic acid monomethylamide in the presence of a water-soluble alkali metal salt or ammonium salt at a temperature of between −20 and +10° C. with 80–95% of the equivalent amount of chlorine; neutralising the reaction mixture; separating the precipitated α-monochloroacetoacetic acid monomethylamide; and partially recycling the mother liquor back into the chlorination process.

4,235,819

PROCESS FOR ISOLATING 1-(ALKOXYPHENYL)-5-(PHENYL)BIGUANIDE COMPOUNDS FROM A CRUDE, ACID REACTION MIXTURE THEREOF

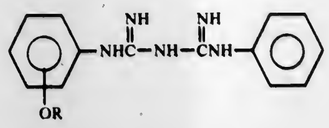
Louis Schneider, Elizabeth, and Bruce M. Resnick, W. Paterson, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 10, 1979, Ser. No. 37,926

Int. Cl.³ C07C *129/16*

U.S. Cl. 260—565 **9 Claims**

1. An improved process of isolating purified free 1-(alkoxyphenyl)-5-(phenyl)biguanide compounds having the formula:



where R is alkyl, linear or branched, having from 1–14 carbon atoms, from a crude acid reaction mixture thereof containing the impure compound, prepared by alkylation of a nitrophenol, reduction to the alkoxyaniline, and condensation in acid with phenyldicyandiamide, which comprises neutralizing said acid mixture with aqueous base to the crude, free biguanide, filtering, slurrying the precipitate with an aliphatic hydrocarbon purification solvent, straight chain or branched, having from 5–10 carbon atoms, or mixtures thereof to remove impurities, filtering the slurry, and, drying the solid.

4,235,820

PROCESS FOR DIBENZOCYCLOHEPTENE COMPOUNDS

Ben E. Evans, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 10, 1976, Ser. No. 713,306

Int. Cl.³ C07C *5/327*, *5/333*, *87/28*

U.S. Cl. 564—427 **13 Claims**

1. A process for the reductive dehydroxylation of 5-(aminoalkyl or alkoxyalkyl)-5-hydroxy-5H-dibenzo[a,d]cycloheptene compound having one or more substituents or centers of unsaturation susceptible to catalytic hydrogenation which comprises contacting said 5H-dibenzo[a,d]cycloheptene compound with an alkali metal or ammonium borohydride in trifluoroacetic acid to produce the corresponding 5-(aminoalkyl or alkoxyalkyl)-5H-dibenzo[a,d]cycloheptene compound.

4,235,821

HYDROGENATION OF ALIPHATIC NITRILES TO PRIMARY AMINES

Walter A. Butte, Jr., West Chester; William J. Murtaugh, Eddystone, and Richard E. Mitchell, Glenmills, all of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Feb. 1, 1979, Ser. No. 8,315

Int. Cl.² C07C *87/14*, *85/12*

U.S. Cl. 564—491 **10 Claims**

4. A process for hydrogenating aliphatic nitriles of formula $R_1—(CN)_n$, $A—(R_2—O—R_2)—_mCN$, or $A—(R_2NR_3—R_2)—_mCN$ where R_1 and R_2 are hydrocarbon groups of from one to about eighteen carbon atoms, R_3 is hydrogen or lower alkyl, A is hydrogen or nitrile, n is an integer of 1 or 2, and m is an integer of 1, 2, or 3 which comprises reacting said nitrile with hydrogen in the presence of a cobalt or ruthenium catalyst at a temperature of from about 50° C. to about 200° C. at a hydrogen pressure of from about 500 to about 3000 psig in a cyclic ether solvent containing (a) from about 5% to about 25% by weight of nitrile on the weight of said solvent, (b) from about 10% to about 30% by volume of said solvent of ammonia, and (c) from about 5% to about 15% by weight of said solvent of water, whereby high selectivity to primary amine products is obtained at a significantly high reaction rate.

4,235,822

2-DECARBOXY-2-HYDROXYMETHYL-6-KETO-PG COMPOUNDS

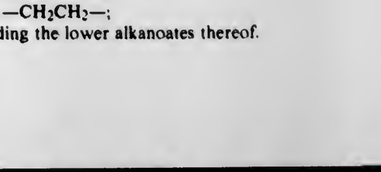
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 959,400, Nov. 9, 1978, which is a division of Ser. No. 819,857, Jul. 28, 1977, Pat. No. 4,158,667, which is a continuation-in-part of Ser. No. 725,548, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,972, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 655,110, Feb. 4, 1976, abandoned. This application Oct. 17, 1979, Ser. No. 85,832

Int. Cl.³ C07C *177/00*

U.S. Cl. 568—330 **143 Claims**

1. A prostacyclin intermediate of formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene; α-H:β-H, α-CH_2OH:β-H;

wherein L is

(1) $—(CH_2)_d—C(R_2)_2—$,

(2) $—CH_2—O—CH_2—Y—$, or

(3) $—CH_2CH=CH—$,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and wherein Y is a valence bond, $—CH_2—$ or $—(CH_2)_2$,

wherein Q is keto, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j}, wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6 and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7—$, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $—CH_2CH_2—$;

including the lower alkanoates thereof.

4,235,823

PREPARATION OF DIKETONES

Christian Dudeck, Limburgerhof; Gunter Lehmann, Ludwigshafen; Karl-Heinz Ross, Mutterstadt; Werner Fliege, Otterstadt; Norbert Petri, Frankenthal; Hans Diem, Mannheim; Bernd Meissner, Heidelberg, and Wolfgang Sauer, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

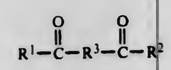
Filed Jun. 26, 1979, Ser. No. 52,103

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831229

Int. Cl.³ C07C *45/39*

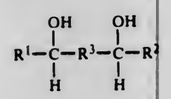
U.S. Cl. 568—402 12 Claims

1. A process for the preparation of a diketone of the formula I



(I)

where R^1 and R^2 are identical or different and each is hydrogen or an aliphatic radical, R^3 is an aliphatic radical which may or may not be interrupted by —O— radicals and, if R^1 and/or R^2 is an aliphatic radical, may also be a single bond, by oxidizing a glycol with oxygen in the presence of a metal catalyst, wherein a glycol of the formula II



(II)

where R^1, R^2 and R^3 have the above meanings, is oxidized at from 450° to 750° C. in the presence of a catalyst bed consisting essentially of at least 2 layers of different particle size of silver crystals and/or copper crystals, at least one lower or rear layer, accounting for from 70 to 95 percent by weight of the catalyst, containing particles of size from 0.75 to 2.5 mm, whilst the remainder of the upper or front layers, accounting for from 5 to 30 percent by weight of the catalyst, contain particles of size from 0.1 to 0.75 mm.

4,235,824

METHOD FOR THE PREPARATION OF FRAGRANCES, AND METHOD FOR THE PREPARATION OF PERFUME COMPOSITIONS

Petrus C. Traas, Naarden; Harmannus Boelens, Huizen, and Hans J. Wille, Bussum, all of Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Division of Ser. No. 817,914, Jul. 22, 1977. This application Nov. 9, 1978, Ser. No. 959,233

Claims priority, application Netherlands, Jul. 27, 1976, 7608333

Int. Cl.³ C07C *47/222*

U.S. Cl. 568—486 4 Claims

1. A process for the preparation of the compound 4-heptynal-acetal comprising the following steps:

(a) reacting butyn-1 with an alkalimetal-amide in a polar solvent at a temperature of between about −80° C. and +80° C. to form a solution of alkalimetal butynilide;

(b) reacting acrolein with a hydrogen halide and a lower aliphatic or araliphatic alcohol having no more than eight (8) carbon atoms, or an aliphatic diol, at a temperature of between about −80° C. and +80° C. to form α-halopropionaldehyde acetal; and

(c) reacting the α-halopropionaldehyde acetal formed in step (b) with the alkalimetal butynilide formed in step (a) to form the compound 4-heptynal-acetal.

4,235,825

PRODUCTION OF DICHLOROBENZENE

Joseph E. Milam, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1979, Ser. No. 90,841

Int. Cl.³ C07C *25/04*

U.S. Cl. 370—210 4 Claims

1. In a process for producing isomeric mixtures of dichlorobenzene by chlorinating benzene or monochlorobenzene in the liquid phase in the presence of a metal halide catalyst, the improvement wherein the reaction is conducted in the presence of diethylether as co-catalyst to produce dichlorobenzene having a higher ratio of para isomer to ortho isomer than that produced were the reaction conducted in the presence of only metal halide as catalyst.

4,235,826

ESTERS OF ISOCAMPHYL-GUAIACOL, PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE PREPARATION OF 3-[ISOCAMPH-5-YL]-CYCLOHEXANOL

Kurt Bauer, and Gerd-Karl Lange, both of Holzminden, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 30, 1979, Ser. No. 71,430

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917360

Int. Cl.³ C07F *9/11, 9/12;* C07C *143/02*

U.S. Cl. 260—951 2 Claims

1. [Isocamph-5-yl]-guaiacyl esters of the formula

wherein

R is an isocamph-5-yl radical in the 2-position or 4-position relative to the OAc group and Ac is a C_1-C_4-alkylsulphonyl or di-(C_1-C_4-alkyl)-phosphoryl radical.

2. O,O-Diethyl O-4-[isocamph-5-yl]-guaiacyl phosphate.

4,235,827

FLOAT-TYPE CARBURETOR

Theo Göpel, Frauenstädtstr. 13, D-8000 München 40, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,010

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808126

Int. Cl.³ F02M *5/14*

U.S. Cl. 261—67 6 Claims

1. In a carburetor of the type including a float, a float housing, a gasoline conduit leading and connected to the float housing, a mixing chamber having an air funnel, a fuel passage connecting the float housing and the mixing chamber, a main nozzle disposed in the fuel passage, and a spray nozzle disposed in the region of the air funnel in the mixing chamber, the improvement which comprises

idling valve means and operational valve means disposed in the cover of the float housing,

spring means connected to said operational valve means for biasing the same in the direction of closure thereof, and

means for positivley moving said operational valve means open against the bias of said spring means, after a predetermined downward movement of the float,

said idling and operational valve means closing at different levels of fuel in the float housing.

4,235,828

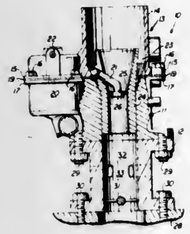
FUEL ECONOMIZER EMPLOYING IMPROVED TURBULENT MIXING OF FUEL AND AIR

Leslie D. Howes, 202 Queen Mary Way, Queen Valley, Apache Junction, Ariz. 85220

Filed Jun. 20, 1979, Ser. No. 50,183

Int. Cl.³ F02M *23/00*

U.S. Cl. 261—78 R 3 Claims



1. A carburetor for mounting on an internal combustion engine comprising:

a housing,

a hollow mixing chamber provided within said housing and having an air inlet at one end and a fuel outlet at the other end of said housing,

a fuel reservoir mounted adjacent said housing,

a sleeve having a funnel shaped configuration for mounting in the interior of said chamber forming a venturi shaped opening positioned longitudinally of said housing tapering from a given diameter at said one end to a smaller diameter opening at said other end of said chamber,

a fuel injection means interconnecting said reservoir with the interior of said venturi at a point adjacent its smaller diameter and substantially axially aligned with the longitudinal axis of the venturi whereby the lower pressure of air flowing through said venturi causes fuel to flow out of said fuel injection means into said venturi,

the smaller diameter of said venturi being of a predetermined size large enough to cause a predetermined lower pressure therein sufficient to draw fuel out of said fuel injection means, and

a hollow extension connected to said other end of said housing for receiving at one end the fuel and air mixture from said venturi and discharging it from its other end,

said extension being provided with at least two spacedly arranged air inlet port means extending into the hollow interior of said extension substantially at right angles to the longitudinal axis of said extension for injection at all engine speeds through its fully opened ports atmospheric air into the fuel air mixture from said venturi passing therethrough,

the injected air passing through said air inlet port means turbulently actuating said fuel air mixture and additionally adding the remaining necessary air needed for complete fuel combustion in the associated internal combustion engine.

4,235,829

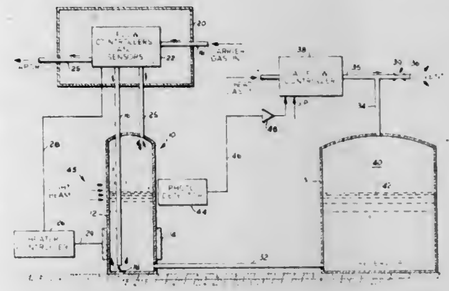
VAPOR DELIVERY SYSTEM AND METHOD OF MAINTAINING A CONSTANT LEVEL OF LIQUID THEREIN

Fred P. Partus, Cobb County, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 7, 1979, Ser. No. 36,714

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—121 R 10 Claims



1. A vapor delivery system comprising a reservoir; a bubbler adapted to generate and deliver vapors from a vaporizable liquid contained therein; conduit means providing bidirectional flow of liquid between said reservoir and bubbler; means for sensing the level of vaporizable liquid contained within said bubbler; and means for providing a gaseous head pressure in said reservoir of variable magnitudes dependent upon the level of vaporizable liquid sensed by said sensing means to maintain the level of liquid in the bubbler substantially constant.

4,235,830

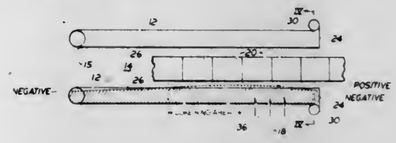
FLUE PRESSURE CONTROL FOR TUNNEL KILNS

Robert F. Bennett, Newburgh, Ind.; Warren D. Brown, Pittsburgh, Pa.; Clarence L. Patterson, Newburgh, and John C. Sorensen, Rockport, both of Ind., assignors to Aluminum Company of America and Pullman Incorporated, both of Pittsburgh, Pa.

Filed Sep. 5, 1978, Ser. No. 939,397

Int. Cl.³ B29C *25/00;* C01B *31/00*

U.S. Cl. 264—29.7 2 Claims



1. A method of operating a tunnel kiln in which green carbon articles are baked in the ware space of a baking zone by heat produced by the combustion of fuel in chambers adjacent the baking zone, and having walls that separate the chambers from the ware space, the combustion chambers being connected in fluid communication with flues extending lengthwise of the kiln and adapted to remove products of combustion from the chambers, the flues having a pressure gradient that extends lengthwise of the flues and combustion chambers, the method comprising the steps:

baking carbon articles in the baking zone such that hydrocarbon gases are produced from an organic binder in the articles, which gases contact the surfaces of the walls of the combustion chambers facing the carbon articles, the

temperature of said surfaces being such that the hydrocarbon gases tend to crack on the surfaces and leave deposits of coke on the surfaces; and

controlling the pressure gradient within the flues and the pressure in the ware space such that a pressure differential between the combustion chambers and the ware space is effected that causes products of combustion to flow into the ware space from the combustion chambers in amounts sufficient to burn and consume coke deposits without burning the carbon articles;

the step of controlling the pressure gradient in the flues including the placing of exhaust stacks in fluid communication with the flues at locations in the combustion chambers of the flues.

4,235,831

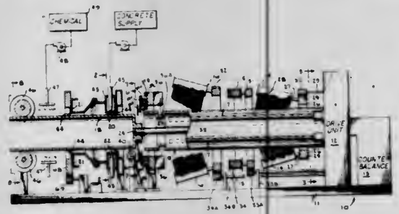
CONDUIT MAKING METHOD

David Larive, 7707 Bryonwood, Houston, Tex. 77055

Continuation-in-part of Ser. No. 660,606, Oct. 18, 1976, abandoned. This application May 16, 1978, Ser. No. 906,423

Int. Cl.³ B28B *1/08*; B29C *23/00*; B29D *3/02*; B28B *1/28*

U.S. Cl. 264—129 **9 Claims**



1. A method for making concrete conduit comprising:

(a) forming a conduit mat in a mat forming zone by feeding material on the bias and under tension onto a form in said mat forming zone,

(b) advancing the said fc med conduit mat from said form and forming zone,

(c) applying concrete on said conduit mat as said conduit mat is placed over a trowel thereby forming a concrete conduct,

(d) moving said conduit axially only,

(e) rotating a trowel circumferentially about said inside surface of said concreted conduit relative to the direction of advance of said concreted conduit for smoothing said concrete applied on said mat, and

(f) curing the concreted mat to form the concrete conduit.

4,235,832

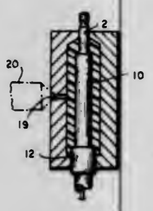
MOLDING METHOD

Robert D. Leighton, Brockton, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Jul. 31, 1978, Ser. No. 929,404

Int. Cl.³ B29C *27/00*

U.S. Cl. 264—230 **6 Claims**



1. A method of molding a thermoplastic material about a compressible plastic in which at least one portion of the compressible material extends from the thermoplastic material, the steps which comprise:

disposing a heat shrinkable sleeve about said compressible material;

heating said heat shrinkable sleeve to tightly fit about said compressible material and impart rigidity thereto;

disposing said compressible material in a mold having an opening adapted to receive said compressible material, at least a portion of said sleeve being disposed within said opening so as to form a plug;

injecting a thermoplastic material into said mold about said compressible material at a pressure in excess of atmosphere and curing to form a solid body, said body being disposed about said compressible material with said heat shrunk sleeve being disposed between said thermoplastic material and said compressible material and forming a mechanical seal which is substantially impervious to the permeation of moisture.

4,235,833

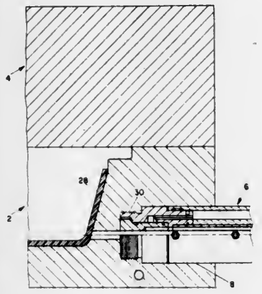
IN-THE-MOLD COATING APPARATUS AND METHOD

Sigurdur I. Arnason, and Edward J. Kleese, both of Ionia, Mich., assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 944,093, Sep. 20, 1978, which is a continuation-in-part of Ser. No. 897,980, Apr. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 814,502, Jul. 11, 1978, abandoned. This application Dec. 29, 1978, Ser. No. 974,583

Int. Cl.³ B29D *9/00*; B32B *27/08*

U.S. Cl. 264—255 **1 Claim**



1. In a method of forming a thermoset in-the-mold coating on a hot, cured glass fiber reinforced thermoset resin substrate by,

(a) placing an uncured resin containing glass fiber into a hot mold cavity, the mold cavity formed by two dies having a shear edge;

(b) closing the mold to form and cure the resin containing the glass fibers;

(c) separating one of the dies from the cured resin containing the glass fibers while still maintaining the mold in a sealed condition at the shear edge;

(d) injecting a thermosetting in-the-mold resin coating into the space between one mold die and the cured resin containing glass fibers;

(e) bringing the dies together to spread the coating over the cured resin containing the glass fibers and to cure the in-the-mold resin coating,

wherein the improvement comprises:

(f) injecting the thermosetting in-the-mold resin in a single stream which flows parallel from the injector directly onto the surface of the substrate from a cooled injector permanently attached to the mold;

(g) controlling the relative positioning of the dies solely by the ram of the mold; and,

(h) controlling the molding sequence including the injection step and the die parting step.

4,235,834

METHOD FOR MAKING BIAXIALLY STRETCHED ARTICLES OF THERMOPLASTIC RESIN

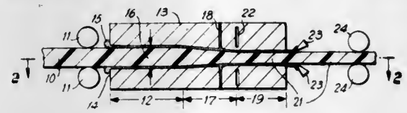
Heinz Vetter, Rossdorf; Ernst Friederich, Darmstadt; Karl-Heinz Schanz, Traisa, Darmstadt, and Hartmut Schikowsky, Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,283

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706688

Int. Cl.³ B29C *17/02*; B29D *7/24*

U.S. Cl. 264—290.2 **7 Claims**



1. A method for biaxially stretching a band of thermoplastic resin by 30 percent to 120 percent in each axial direction which comprises attenuating a lubricated band of unstretched resin, in a forming zone while the resin is in the thermoelastic condition, by passing the lubricated band between two surfaces spaced at a distance less than the thickness of said band of unstretched resin while permitting said band to expand in width, and then cooling said band to a temperature below the softening point of the resin while maintaining the dimensions of the attenuated and expanded band.

4,235,835

THERMOSETTING COMPOSITIONS FOR INJECTION MOLDING

Gary L. Stutzman, Flemington, and Carlo F. Martino, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 740,412, Nov. 10, 1976, abandoned. This application Nov. 29, 1979, Ser. No. 98,533

Int. Cl.³ C08K *9/06*

U.S. Cl. 264—328.2 **12 Claims**

1. A process for preparing a thermoset injection molded product having a hot tensile strength of at least 250 pounds per square inch when measured according to ASTM D412-64T at the mold temperature employed in said process, which process comprises the steps of:

injecting a vulcanizable composition into a preheated mold, said mold having been preheated to a temperature sufficient to crosslink said vulcanizable composition within five minutes, said composition consisting essentially of about 35 to about 75 parts by weight of (A) an ethylene-vinyl acetate copolymer containing about 7 to about 55 weight percent of vinyl acetate based on the total weight of said copolymer; about 65 to about 25 parts by weight of (B) a clay filler selected from the class consisting of an organosilane treated clay and an organopolyester treated clay wherein said organopolyester is reaction product of polyfunctional organic carboxylic acid and/or polyfunctional organic carboxylic acid anhydride with polyhydric alcohol; the sum of (A)+(B) being about 100 parts by weight in the composition; about 1 to about 5 parts by weight based on the sum of (A)+(B) of (C) an organic peroxide crosslinking agent having a half-life at its stock temperature of greater than one hour; and 0 to about 5 parts by weight based on the sum of (A)+(B) of (D) of an organic crosslinking booster; wherein said components (A), (B), (C) and (D) are such that a crosslinked product obtained upon crosslinking an admixture containing only said components (A), (B), (C) and (D) in the same proportions as (A), (B), (C) and (D) are present in said vulcanizable composition, has a hot tensile strength of at least 250 pounds per square inch when measured according to ASTM D412-64T at the same temperature employed to crosslink said admixture;

crosslinking said composition in said mold, and

recovering the thermoset injected molded product by removing it from said mold.

4,235,836

METHOD FOR MAKING THERMAL INSULATING, FIRE RESISTANT MATERIAL

Leonard L. Wassell, Didcot; Gerald B. Cole, Hungerford; Alan Briggs, Didcot, and James F. Pollock, Hook, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 19, 1979, Ser. No. 4,863

Claims priority, application United Kingdom, Jan. 31, 1978, 3928/78

Int. Cl.³ C04B *43/00*

U.S. Cl. 264—333 **3 Claims**

1. A method of making a thermally insulating, fire resistant material which comprises the steps of

(i) pressing into a shape a mix consisting of hollow spherical particles of pulverised fuel ash and sodium silicate; and

(ii) curing the pressed mix to give the thermally insulating, fire resistant material;

in which method the proportions of particles and sodium silicate in the mix are such that the thermally insulating, fire resistant material consists essentially of from 90% to 95% by weight of the particles and from 5% to 10% by weight of the sodium silicate.

4,235,837

METHOD OF MAKING ORIENTED CONTAINERS

Robert P. Noonan, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 519,639, Oct. 31, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,695

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—520 **4 Claims**

1. The method of forming an oriented polyethylene terephthalate container which comprises the steps of:

1. injecting a polyethylene terephthalate composition into a first mold chamber defining a parison having an axis substantially defined by a core rod and perimeter defined by the wall of the mold;
2. cooling the exterior wall of the polyethylene terephthalate parison to render the outer wall of the parison dimensionally stable;
3. after the outer wall of the parison is dimensionally stable, transferring the parison, while disposed on the core rod, to a second mold chamber having on an average a tolerance of between 2.5 and 150% between the body of the parison and the wall of the second mold chamber, wherein the wall of the second chamber is at a higher temperature than the wall of the first chamber in contact with the parison tip;
4. when the core rod is at no more than 265° F., injecting a gaseous fluid into the parison at a pressure of at least 10 psig to separate the body of the parison from the core rod and force the exterior wall of the body of the parison to assume the shape of the wall of the second chamber;
5. transferring the parison, while the neck of the parison is disposed on the core rod, to a third chamber having on an average a tolerance of at least 50% between the body of the parison and the wall of the third chamber; and
6. at the orientation temperature of the polyethylene terephthalate parison, injecting a gaseous fluid into the parison to force the exterior walls of the body of the parison to assume the shape of the wall of the third chamber and to orient the walls of the body of parison.

4,235,838

USE OF BENZAZOLES AS CORROSION INHIBITORS

Derek Redmore, Ballwin, and Benjamin T. Outlaw, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 9, 1978, Ser. No. 932,260
Int. Cl.³ C23F *11/04, 11/14, 11/16*
U.S. Cl. 422—7 **14 Claims**

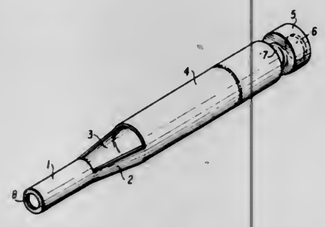
1. A process of inhibiting or preventing the corrosion of a metal selected from the group consisting of iron and ferrous alloys in a corrosive system which consists essentially of treating said system with a corrosion inhibiting amount of a benzazole as the sole corrosion inhibitor, said benzazole having an alkylene amino group side chain on the number 2 position on the heterocyclic moiety.

4,235,839

DEVICE FOR ANALYSIS

Olof Vesterberg, Patrons vag 1B, 130 11 Saltsjo-Duvnas, Sweden

Filed Dec. 11, 1978, Ser. No. 968,517
Int. Cl.³ G01N *1/10, 31/22*
U.S. Cl. 422—58 **17 Claims**



1. A substantially tube-shaped analysis device for the determination of at least one substance in a liquid sample, said device comprising:

means defining a measuring compartment at one end of the device for the collection of a predetermined volume of the liquid sample;

means defining a reaction compartment, spaced from said one end of the device, containing a reagent for the substance, said reaction compartment being closed at the end thereof most remote from the measuring compartment; and

means interconnecting the reaction compartment and measuring compartment through which the liquid sample can flow from the measuring compartment to the reaction compartment when the measuring compartment is positioned above the reaction compartment, and said interconnecting means comprising a tubularly shaped canal having an opening in the wall thereof and adjacent to said measuring compartment, said opening communicating the interior of said device to the atmosphere through which liquid sample can enter and excess sample beyond the predetermined volume of said measuring compartment can exit when the reaction compartment is above the measuring compartment.

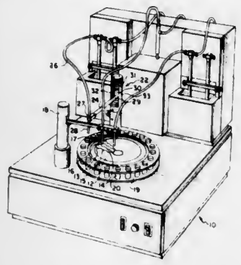
4,235,840

SAMPLE TRANSFER ARM ASSEMBLY

Daniel F. Mendoza, and Charles E. Hodgson, both of Silver Spring, Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 10, 1979, Ser. No. 37,679
Int. Cl.³ G01N *1/14*
U.S. Cl. 422—64 **9 Claims**

1. An improved sample transfer arm assembly for use in a device for transferring liquid sample from a first receptacle to a second receptacle, said assembly including a sample transfer arm, support means for supporting said transfer arm with said arm extending normal to and from the axis of said support means, locating means for locating and limiting arcuate movement of said arm about said axis of said support means, drive means including a drive shaft for rotating said arm support means a predetermined arcuate extent between a first position where the outer end of said arm is located over the first receptacle and at least one other position where said outer end of



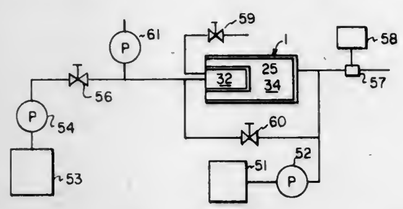
said transfer arm is located over the second receptacle, and said drive means including lost motion clutch means between said drive shaft and said arm support means for permitting overrotation of said drive shaft beyond predetermined arcuate extent without damage to said sample transfer arm when arcuate movement of said sample transfer arm is limited by engagement thereof with said locating means.

4,235,841

DOUBLE CHAMBERED HIGH PRESSURE FURNACE

Franz X. Zimmerman, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Continuation-in-part of Ser. No. 829,883, Sep. 1, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,436
Int. Cl.² B01J *3/04*; F01B *5/04, 5/16*
U.S. Cl. 422—112 **4 Claims**



1. A double chambered high pressure furnace for treating specimens and workpieces with process gases at elevated pressures and temperatures comprising

A. a cylindrical pressure vessel,

B. an axially removable rear end closure device for sealing one end of the cylindrical pressure vessel,

C. an electrical heating element supported within the interior of the cylindrical pressure vessel near the inner wall thereof,

D. an axially removable apertured front end closure device for partially sealing the other end of the cylindrical pressure vessel,

E. a relatively thin-walled inner container supported from the front closure device and opening only to the aperture in the front closure device, the said inner container interior defining a process chamber, and the volume defined by the inner container exterior along with the pressure vessel and end closure devices being a furnace chamber, both chambers being sealed from the atmosphere,

F. an axially removable small closure device for sealing the aperture in the front closure such that the inner container and small closure define a process chamber isolated from the furnace chamber,

G. means comprising a reaction frame for securing the front closure, small closure and rear closure devices from axial outward movement,

H. means for introducing blanket gases from a source of pressurized blanket gas to the furnace chamber and process gases from a source of pressurized process gas to the process chamber under high pressures, said means for introducing process gas comprising passages in the front end closure device, said passages opening to the exterior of the vessel clear of the exterior axial faces of said end closure devices, and

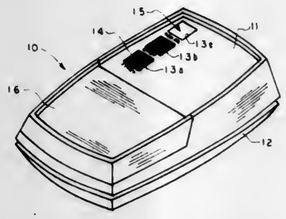
I. means for minimizing the pressure difference between the gases on each side of the inner container to enable it to maintain its original shape, said minimizing means comprising means for sensing the pressure difference, if any, and in response to that difference, controlling the relative application of the sources of blanket and process gases to the furnace chamber and process chamber respectively.

4,235,842

TEMPERATURE CYCLE INDICATING MEANS FOR A STERILIZER UNIT

Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.

Filed Oct. 27, 1978, Ser. No. 955,392
Int. Cl.³ A61L *2/04*; H05B *1/00*
U.S. Cl. 422—116 **19 Claims**



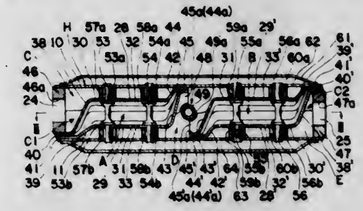
1. A contact lens disinfector unit for sterilizing contact lenses contained within a contact lens case, wherein the contact lenses are of the type which preferably should be cleaned periodically after a predetermined number of sterilizing cycles, said disinfector unit comprising: a heating block arranged to contact the contact lens case; circuit means coupled to said heating block and adapted to be coupled to a source of electric potential for applying electric current to said heating block for a sufficient time period for causing said heating block to heat the lens case and the contact lenses contained therein to a sterilizing temperature and for terminating the application of said electric current to said heating block thereafter to allow the lens case and the contact lenses to cool for completing a contact lens sterilizing cycle; and sterilizing cycle indicating means including indicia bearing indexing means responsive to the temperature changes of said heating block for providing a first indication responsive to said heating block reaching said sterilizing temperature and a second indication responsive to said heating block returning to a reduced temperature below said sterilizing temperature, thereby providing a positive indication that the sterilizing cycle has taken place and is completed.

4,235,843

CATALYTIC CONVERTER

Tomoo Tadokoro; Haruo Okimoto, and Shinichi Yoshii, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 10, 1979, Ser. No. 65,744
Claims priority, application Japan, Aug. 14, 1978, 53-99399; Aug. 25, 1978, 53-104108; Aug. 29, 1978, 53-105804; Sep. 12, 1978, 53-112691
Int. Cl.³ F01N *3/28*
U.S. Cl. 422—119 **8 Claims**



1. A catalytic converter which comprises, in combination: a generally elongated housing structure including a generally upwardly dished top housing shell having a top peripheral flange protruding outwards therefrom, and a generally downwardly dished bottom housing shell having a bottom peripheral flange protruding outwards therefrom, said top and bottom housing shells being positioned one above the other, with the top and bottom peripheral flanges connected to each other, to define a gas flow compartment therein, said top housing shell also having first and second semicylindrical recesses opposed to each other and respectively defined at the opposed portions of the top peripheral flange, said bottom housing shell also having first and second semicylindrical recesses opposed to each other and respectively defined at the opposed portions of the bottom peripheral flange, said first and second semicylindrical recesses in the top peripheral flange and said first and second semicylindrical recesses in the bottom peripheral flange being so recessed upwardly and downwardly, respectively, as to define inlet and outlet openings at the opposed ends of the housing structure when the top and bottom housing shells are assembled together to define the gas flow compartment, first and second catalyst containers housed within the gas flow compartment adjacent the inlet and outlet openings, respectively, and spaced a distance from each other in a direction longitudinally of the housing structure, each of said first and second catalyst containers being adapted to hold a bed of catalyst material therein for removal of noxious pollutants from exhaust gases which may be introduced into the converter through the inlet opening and discharged therefrom through the outlet opening, said first and second catalyst containers so housed within the gas flow compartment dividing said gas flow compartment into an upstream chamber positioned between the inlet opening and the first catalyst container, a substantially intermediate chamber positioned between the first and second catalyst containers and a downstream chamber positioned between the second catalyst container and the outlet opening, each of said first and second catalyst containers being constituted by an upper retainer plate and a lower retainer plate, said upper retainer plate including a perforated top wall having a plurality of apertures defined therein, first and second side walls opposed to each other and having respective flanges remote from the perforated top wall of the upper retainer plate, and first and second end walls opposed to each other and having respective flanges remote from the perforated top wall of the upper retainer plate, said lower retainer plate including a perforated top wall having a plurality of apertures defined therein, first and second side walls opposed to each other and having respective flanges remote from the perforated top wall of the lower retainer plate, and first and second end walls opposed to each other and having respective flanges remote from the perforated top wall

of the lower retainer plate, said upper and lower retainer plates for each of the first and second catalyst containers being positioned one above the other with the flanges of said side and end walls of the respective upper and lower retainer plates, thereby defining a catalyst retainer space for the accommodation of the corresponding catalyst bed, said upstream chamber being communicated to the intermediate chamber through the catalyst bed within the first catalyst container and said downstream chamber being also communicated to the intermediate chamber through the catalyst bed within the second catalyst container, the overlapped opposed side walls of the respective upper and lower retainer plates for each of the first and second catalyst containers being sandwiched between other respective portions of the top and bottom peripheral flanges than said opposed portions where the semicylindrical recesses are defined, respectively, inlet and outlet tubular members respectively inserted in the inlet and outlet openings, the first end walls of the upper and lower retainer plates of the first catalyst container being sandwiched in position between the outer peripheral surface of the inlet tubular member and that portion of the flange of the bottom housing shell where the first semicylindrical recess is defined whereas the second end walls of the upper and lower retainer plates of the second catalyst container are sandwiched in position between the outer peripheral surface of the outlet tubular member and that portion of the flange of the top housing shell where the second semicylindrical recess is defined, the second end walls of the upper and lower retainer plates of the first catalyst container being secured to the top housing shell whereas the first end walls of the upper and lower retainer plates of the second catalyst container are secured to the bottom housing shell, and a substantially elongated nozzle means protruding through the joint between the flanges of the top and bottom housing shells into the intermediate chamber in a direction generally perpendicular to the longitudinal axis of the housing structure, said nozzle means being utilized to inject a secondary air therethrough into the intermediate chamber to mix with the exhaust gases flowing therein.

4,235,844

PROCESS AND APPARATUS FOR THE MANUFACTURE OF LINEAR HIGH MOLECULAR WEIGHT POLYESTERS

Hans-Josef Sterzel, Dannstadt-Schauernheim; Kasimir Von Dziembowski, and Hans Pirzer, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 932,632, Aug. 10, 1978. This application Mar. 27, 1979, Ser. No. 24,298

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738093; Jan. 27, 1978, 2803530

Int. Cl.³ B01D *1/22*; **F28F** *13/08*; **C08G** *63/00*

U.S. Cl. 422—138 **3 Claims**

1. Apparatus for the manufacture of high molecular weight linear polyesters, comprising:

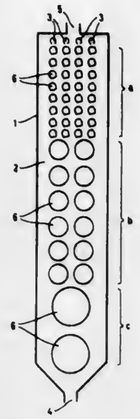
(a) means defining a substantially vertical tunnel, the bore of which defines a common vapor space;

(b) a plurality of groups of horizontal, parallel heated tubes within the bore of said tunnel and spaced from another, wherein each group is comprised of a plurality of layers of tubes with the tubes of each group all having the same diameter, wherein at least one of said groups has a plurality of tubes in each layer;

(c) feed means disposed above said tubes for introducing polyester precondensate into the bore of the tunnel;

(d) means defining an orifice for the discharge of formed polyester melt from the apparatus; and

(e) a vapor outlet; wherein said common vapor space is substantially free from obstructions other than the tubes and wherein the tubes are so arranged below one another that the melt flows under gravity from one tube to the



next tube below it, the diameters of the tubes increasing in the downward direction of the tunnel.

4,235,845

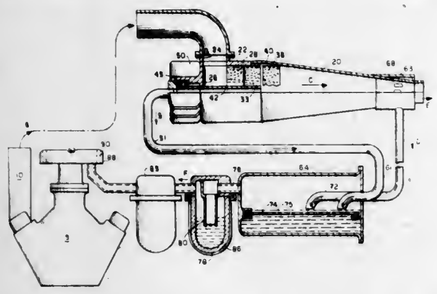
ANTI-AIR POLLUTION SYSTEM FOR EXHAUST GAS

Ranendra K. Bose, 1554 N. Danville St., Arlington, Va. 22201

Filed Jan. 2, 1979, Ser. No. 173

Int. Cl.³ B01D *50/00*

U.S. Cl. 422—171 **12 Claims**



1. In an anti-air pollution system for exhaust gas of the kind having a turbine impeller and a gas separation vortex tube for a first stage separation between combustible heavier and combustible lighter components of pollutant gases and a second gas separation stage for separating the non-combustible lighter constituent of the heavier combustible component gases for ultimate exhaust; wherein the lighter component moves in direction out of said vortex tube opposite to the direction of entry; and said system having means providing mixing of the lighter combustible component with the heavier combustible remaining component; the improvement which comprises: a stator wheel disposed downstream of the impeller for effecting downstream gas rotation in the vortex tube of said components in the same direction of rotation as said impeller whereby in said first separation stage lighter gases have reduced resistance to flow outwardly of said vortex tube.

4,235,846

CONVERTER FOR EXHAUST GAS WITH REMOVABLE INSERT HOUSINGS HAVING MONOLITHIC CATALYST THEREIN

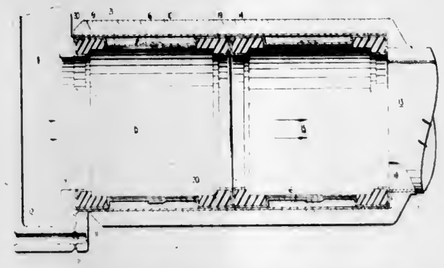
Jörg Abthoff, Plüderhausen; Hans-Dieter Schuster, Schornbach, and Hans-Joachim Langer, Fellbach-Schmiden, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 610,423, Sep. 4, 1975, abandoned. This application Feb. 23, 1979, Ser. No. 14,854

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1974, 2442488

Int. Cl.³ F01N *3/28, 7/08, 7/14, 7/18*

U.S. Cl. 422—171 **26 Claims**



1. An installation for the catalytic decontamination of exhaust gases of internal combustion engines comprising an outer housing means, at least one insert housing means disposed therein, said insert housing means including a catalyst-monolith means supported therein by the interposition of radially elastic means, said outer housing means being detachably connected at least at one open side with an adjoining structural part and said insert housing means being insertable into said outer housing means from said side, said insert housing means being axially confined by said adjoining structural part, said installation being characterized in that said part is a tubular member of an exhaust system and in that the insert housing means is an essentially drum-shaped assembly, said assembly comprising two outer collar portions and a wall portion extending therebetween and said assembly fixedly engaging and surrounding the catalyst-monolith means at the periphery of both outer ends thereof, and in that said elastic means comprises axially and radially elastic annular elements arranged in said collar portions for the support of the catalyst-monolith means, and wherein the wall portion of said insert housing means is radially drawn-in between th collar portions and in that said elastic means includes a radially elastic layer disposed between said wall portion and said catalyst-monolith means.

4,235,847

VAPOR/LIQUID DISTRIBUTOR FOR FIXED-BED CATALYTIC REACTION CHAMBERS

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 848,700, Nov. 4, 1977, Pat. No. 4,138,327. This application Jun. 21, 1978, Ser. No. 917,606

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

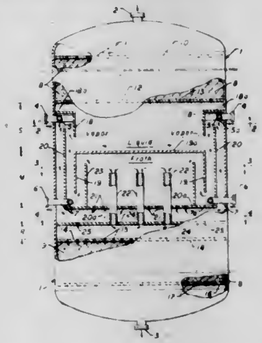
Int. Cl.³ B01J *8/02*

U.S. Cl. 422—220 **7 Claims**

1. A vapor/liquid distributor for effecting uniform distribution of a mixed-phase reactant stream to the upper surface of a fixed-bed of catalyst particles disposed within a catalytic reaction chamber, said distributor having three pairs of chordal-form, catalyst-free volumes defined by the interior surface of said chamber and three pairs of spaced-apart chordal baffles, said chordal baffles of each pair forming said catalyst free volumes being disposed on opposite sides of the plane containing the central axis of said reaction chamber, said plane situated perpendicular to said fixed-bed of catalyst particles and said chordal baffles situated parallel to said plane of said central axis, which distributor comprises, in cooperative relationship:

(a) an outer, first pair of chordal baffles having (i) a greater height than the second and third pairs of chordal baffles and, (ii) a perforated first horizontal plate attached to the entire lower periphery thereof and contacting the interior surface of said reaction chamber, said first pair of chordal baffles defining first areas of catalyst-free volume with the interior surface of said reaction chamber;

(b) a middle, second pair of chordal baffles (i) having an imperforate second horizontal plate attached to the entire upper periphery thereof and contacting the interior surface of said reaction chamber, and (ii) being disposed intermediate the upper and lower periphery of said first pair of chordal baffles and defining intermediate, second areas of catalyst-free volume therewith;



(c) an inner, third pair of chordal baffles disposed a finite distance below said second horizontal plate, and having its entire lower periphery attached to said perforated first horizontal plate, said third pair of chordal baffles defining third areas of catalyst-free volume with said second pair of chordal baffles; and

(d) a third horizontal plate, attached at its outer periphery to the interior surface of said chamber, and having a plurality of vertical tubular conduits attached to its upper surface, said tubular conduits (i) extending upwardly through said perforated first horizontal plate and within said third pair of chordal baffles, and terminating a finite distance below said imperforate second horizontal plate, and, (ii) having a nominal diameter greater than the remaining apertures in said perforated first horizontal plate.

4,235,848

APPARATUS FOR PULLING SINGLE CRYSTAL FROM MELT ON A SEED

Anatoly M. Sokolov, Novye Cheremushki, 32a, korpus 3b, kv. 259; Oleg V. Pelevin, ulitsa Tretei linii, 13, kv. 120, both of Moscow; Anatoly I. Kirichenko, ulitsa Lenina, 45, kv. 1a, Svetlovodsk Kirovogradskoi oblasti; Grigory G. Makarenko, ulitsa Alexandra Nevskogo, 245, Zaporozhie; Lev G. Eidelman, ulitsa Otokara Yarosha, 17, kv. 53, Kharkov; Oleg S. Mjulendorf, ulitsa Geroev Truda, 47b, kv. 242, Kharkov; Valentin I. Goriletsky, ulitsa Otokara Yarosha, 17, kv. 53, Kharkov; Vitaly Y. Apilat, ulitsa 23 Avgusta, 55b, kv. 53, Kharkov, and Alexei V. Radkevich, ulitsa Zernovaya, 53, kv. 56, Kharkov, all of U.S.S.R.

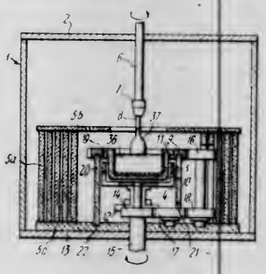
Filed Jun. 15, 1978, Ser. No. 915,754

Int. Cl.³ C30B *15/10, 15/14, 15/30*

U.S. Cl. 422—249 **11 Claims**

1. An apparatus for pulling single crystal from a melt on a seed, comprising: a sealed chamber; a seed holder; a crucible assembly adapted to contain the melt therein, accommodated in said sealed chamber; a heater accommodated in said sealed

chamber and enclosing said crucible assembly; thermal insulation means accommodated in said sealed chamber and encompassing said heater and said crucible assembly; a rod carrying said seed holder, arranged coaxially with said crucible assembly; drive means for effecting rotation and vertical reciproca-



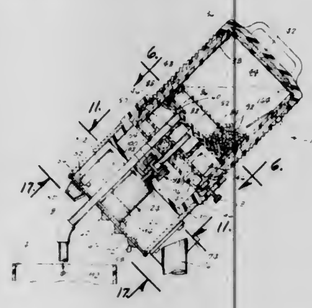
tion of said rod; a rotatable support ring located within said chamber, said crucible assembly being suspended at an upper region thereof from said support ring; means for supporting said support ring in said sealed chamber and rotational drive means for rotating said support ring whereby said crucible assembly suspended therefrom is simultaneously rotated.

4,235,849

CHEMICAL TABLET DISPENSING DEVICE FOR WELLS

George A. Handeland, Ringsted, Iowa 50578

Filed May 10, 1978, Ser. No. 904,465
Int. Cl.[3] B01D *11/02*
U.S. Cl. 422—263 20 Claims



1. A pellet storage and dispensing apparatus comprising,
a housing having a sidewall and bottom wall defining a pellet chamber,
means for supporting said housing at an incline whereby said bottom wall has upper and lower portions,
a pellet dispensing tube having one end operatively connected to said bottom wall so as to open through said upper portion,
means for maintaining the level of pellets within said chamber below said one end of the pellet dispensing tube,
a pellet conveying member movably supported within said pellet chamber adjacent the bottom wall, said member having at least one opening which partially defines a pellet receiving pocket,
said pellet conveying member being movable between a first position wherein said opening is disposed below said one end of the pellet dispensing tube for receiving a pellet from said chamber and a second position wherein said opening is registered with said one end of the pellet dispensing tube for delivering a pellet into said tube,
a power source,
drive means interconnecting said power source and said pellet conveying member for movement of said member in response to actuation of said power source, and
control means for actuating said power source.

4,235,850

PROCESS FOR THE RECOVERY OF URANIUM FROM A SALINE LIXIVIANT

John B. Otto, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,714
Int. Cl.[2] C01G *43/00*; C02B *1/60*
U.S. Cl. 423—7 11 Claims

1. In a method for the recovery of uranium from a saline alkaline lixiviant wherein an anionic ion exchange resin is contacted with said lixiviant to adsorb uranium, the improvement comprising reducing the pH of said lixiviant to a value less than 7 prior to contacting said ion exchange resin with said lixiviant.

4,235,851

PROCESS FOR REDUCING THE NITROGEN OXIDE CONTENT OF COKE OVEN GASES

Claus Flockenhaus, Essen, Fed. Rep. of Germany, assignor to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,254
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832397
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—235 5 Claims

1. A process for reducing the nitrogen oxide content of the waste gases of a coking oven comprising the step of admixing ammonia or ammonia-containing water with the waste gases in the regenerator or recuperator cells of the coke oven at a heat zone containing the waste gases at a temperature between 700° and 1100° C.

4,235,852

PROCESS FOR TREATING AN EXHAUST GAS CONTAINING NITROGEN OXIDES AND SULFUR OXIDES

Kohki Nomoto, and Yoshihiko Kudo, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo KabushikiKaisha, Tokyo, Japan

Filed Jun. 19, 1979, Ser. No. 49,891
Claims priority, application Japan, Jun. 28, 1978, 53-78340
Int. Cl.[3] C01B *17/04*; C01C *1/10*
U.S. Cl. 423—238 3 Claims

1. A process for converting NO_x and SO_x contained in exhaust gas of combustion to ammonia and sulfur comprising:
a first step of cooling said exhaust gas to a temperature lower than 100° C.,
a second step of absorbing said NO_x and SO_x in an aqueous solution at least containing an iron chelate, potassium salt and potassium sulfite,
a third step of cooling said solution used in the second step and containing potassium imidodisulfonate and potassium dithionate formed by the absorbed SO_x and NO_x, of
separating the thus formed potassium salts by filtration as crystals and of recycling the filtrate to said second step,
a fourth step of heating the thus formed and separated potassium salts to a temperature of 250° to 300° C. in the presence of steam to hydrolyze potassium imidodisulfonate to ammonium hydrogen sulfate and potassium sulfate and to thermally decompose simultaneously potassium dithionate into potassium sulfate and sulfur dioxide,
a fifth step of admixing potassium hydrogen carbonate to the reaction residue of said fourth step at a temperature of 200° to 300° C. thereby neutralizing said reaction residue to evolve ammonia and of recovering said ammonia,
a sixth step of reducing the remaining potassium sulfate by the addition of carbonaceous substance at a temperature of 900° to 1,000° C. into potassium sulfide,

a seventh step of dissolving said potassium sulfide in an aqueous solution containing potassium carbonate followed by incorporating carbon dioxide thereby converting said dissolved potassium sulfide into potassium hydrogen sulfide,
an eighth step of admixing an aqueous solution containing potassium hydrogen carbonate to the solution containing the thus formed potassium hydrogen sulfide thereby converting said potassium hydrogen sulfide into hydrogen sulfide and potassium carbonate,
a ninth step of recovering said hydrogen sulfide, then of recycling a part of the residual solution containing said potassium carbonate into said seventh step and of incorporating carbon dioxide further into the other part of said residual solution containing potassium carbonate thereby converting said potassium carbonate into potassium hydrogen carbonate,
a tenth step of recycling the resultant solution containing potassium hydrogen carbonate after separating the precipitated potassium hydrogen carbonate into said eighth step thereby converting said potassium hydrogen sulfide into hydrogen sulfide, and
an eleventh step of producing sulfur by utilizing hydrogen sulfide obtained in said eighth step and sulfur dioxide obtained in said fourth step in the Claus process.

4,235,853

METHOD FOR SULFUR DIOXIDE CONTROL II

William L. Nikolai, Rte. 4 - Box 80, Platteville, Wis. 53818

Continuation-in-part of Ser. No. 651,239, Jan. 22, 1976, Pat. No. 4,076,793. This application Feb. 16, 1978, Ser. No. 878,248
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—242 16 Claims

1. A method for removing sulfur dioxide from a gas stream containing sulfur dioxide, comprising the steps of
conducting the gas stream into contact with an aqueous absorbant comprising an aqueous slurry comprising from about 1 to about 30 weight percent of a solid manganous absorbant selected from the group consisting of manganous hydroxide, manganous carbonate and mixtures thereof,
absorbing sulfur dioxide from the gas stream in said slurry and oxidizing said sulfur dioxide in said slurry to convert the manganous absorbant in said slurry into manganous sulfate, and
regenerating manganous hydroxide, manganous carbonate or mixtures thereof by chemical precipitation of said manganous sulfate for reuse in an aqueous sulfur dioxide absorbant slurry.

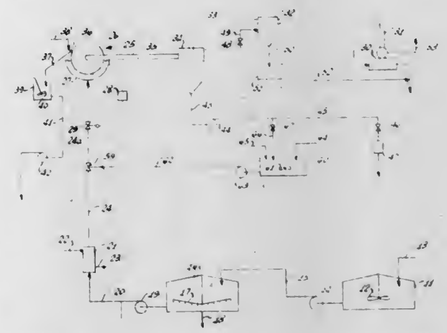
4,235,854

METHOD FOR PURIFYING WET PROCESS PHOSPHORIC ACID

Hudson C. Smith; Wesley W. Atwood, and John S. Myrick, all of Lake City, Fla., assignors to Occidental Petroleum Corp., Los Angeles, Calif.

Continuation of Ser. No. 744,229, Nov. 23, 1976, abandoned, which is a continuation of Ser. No. 571,855, Apr. 25, 1975, abandoned. This application Aug. 25, 1977, Ser. No. 827,741
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 13 Claims

12. A method for removing impurities from wet-process produced phosphoric acid and recovering values retained by the impurities comprising the steps of:
maintaining wet-process produced phosphoric acid containing particulate impurities at a temperature of from about 57° C. to about 77° C.;
filtering such phosphoric acid for removing particulate impurities from such phosphoric acid, said removed particulate impurities retaining phosphate values;
forming an aqueous slurry of removed particulate impurities; and



filtering said slurry to recover a filtrate containing a major portion of the phosphate values retained by the particulate impurities for reprocessing.

4,235,855

METHOD FOR PRODUCING HIGH STRENGTH LOW EXPANSION CORDIERITE BODIES

Joseph J. Cleveland, Dushore, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 6, 1978, Ser. No. 966,932
Int. Cl.[3] C01B *33/22*; C04B *35/04*
U.S. Cl. 423—327 10 Claims

1. A method for producing a polycrystalline cordierite ceramic body of magnesium aluminum silicate having the composition in weight percent within the range of about 13 to 16 weight percent MgO, 30 to 36 weight percent Al_2O_3 and 49 to 54 percent SiO_2, the method comprising: (a) pelletizing a mixture of talc, clay and alpha alumina which upon sintering will yield a composition within the above weight percent range, (b) firing the pellets to form a substantial amount of cordierite therein; (c) reducing the fired pellets to an average particle size within the range of about 1 to 10 microns; (d) consolidating the particles into a green body; and (e) sintering the compact to form a substantially cordierite polycrystalline ceramic body.

4,235,856

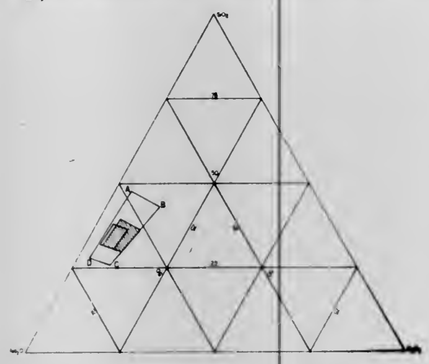
METHOD OF PRODUCING A ZEOLITE OF CONTROLLED PARTICLE SIZE

John A. Kostiako, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Dec. 20, 1978, Ser. No. 971,584
Int. Cl.[3] C01B *33/28*
U.S. Cl. 423—329 5 Claims

1. A method of producing zeolite A comprising the steps of:
(a) forming a sodium aluminate solution;
(b) forming a sodium silicate solution by:
(i) dissolving sand in a sodium hydroxide solution at a pressure of at least 200 psig heated to a temperature of at least 130° C. to produce a sodium silicate solution having a silica to sodium oxide molar ratio of between 2.4:1 and 2.8:1;
(ii) activating said sodium silicate solution with from 50 to 2000 ppm alumina at a temperature of between 15° and 100° C. for at least 10 minutes; and
(iii) heating said sodium silicate solution to between 80° and 120° C.;
(c) adding said sodium aluminate solution to said sodium silicate solution to produce a reaction mixture comprising a sodium silicate mother liquor and an amorphous sodium alumino silicate pigment, in total having a sodium oxide to silica molar ratio of between 1:1 and 2.5:1, a silica to

alumina molar ratio of between 3:1 and 10:1; and a water to sodium oxide molar ratio of between 10:1 and 35:1;
(d) heating said mixture to a temperature of from 80° to 120° C.;



(e) reacting said mixture at a temperature of from 80° to 120° C. until zeolite A is formed; and
(f) recovering said zeolite A.

4,235,857

METHOD OF NITRIDING SILICON

John A. Mangels, Flat Rock, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 2, 1979, Ser. No. 54,214
Int. Cl.³ C01B *21/06*
U.S. Cl. 423—344 **6 Claims**

1. A method of nitriding silicon particles which comprises the steps of:
- placing the silicon particles to be nitrided in an enclosed furnace;
- filling said enclosed furnace with an initial gaseous mixture of nitrogen and hydrogen, said mixture containing not more than about 6% by volume hydrogen;
- heating said enclosed furnace with said gaseous mixture therein to a temperature in a range from about 900° C. to about 1000° C.;
- demand filling said enclosed furnace after it has been heated to said temperature in the range from about 900° C. to about 1000° C. with a nitriding gas mixture consisting essentially of about 1 to 10% by volume helium and about 99 to 90% by volume nitrogen;
- continue heating said enclosed furnace to a reaction temperature below the melting temperature of silicon;
- continue demand filling of said enclosed furnace with said helium/nitrogen gas combination until the nitriding operation is terminated;
- cooling the enclosed furnace to room temperature; and
- recovering the nitrided silicon material from the enclosed furnace said nitrided silicon material exhibiting a greater strength than a nitrided silicon material prepared according to said method wherein argon is used in place of helium.

4,235,858

PROCESSES FOR PRODUCING NITRIC ACID BY UTILIZATION OF COLD OXYGEN

Philip G. Blakey, Riddings; Bryan K. Smith, Woking, and Richard W. Watson, Allestree, all of England, assignors to BOC Limited, London, England

Filed Apr. 6, 1979, Ser. No. 27,694
Claims priority, application United Kingdom, Apr. 7, 1978, 13818/78
Int. Cl.³ C01B *21/40*
U.S. Cl. 423—393 **12 Claims**

1. A gas-liquid contact process for making nitric acid comprising the steps of conducting a first reaction between nitric oxide and oxygen in a gas mixture to form nitrogen dioxide/dinitrogen tetroxide and a second reaction between the so-formed nitrogen dioxide/dinitrogen tetroxide and water to form nitric acid, the improvement comprising supplying oxygen separately from oxygen in said gas mixture to one or more chosen reaction regions wherein one or both of the aforesaid reactions takes place, with said supplied oxygen being at a temperature of below about −20° C. as said supplied oxygen comes into contact with reactants in the or each said reaction region thereby promoting said first and second reactions.

4,235,859

GRAPHITE MOLDING POWDER AND METHOD OF PREPARATION

John W. Borkowski, Ridgway; La Vern J. Lenze, Jr., St. Marys; Alan F. Campbell, St. Marys, and William A. Nystrom, St. Marys, all of Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.

Filed Apr. 4, 1979, Ser. No. 27,034
Int. Cl.³ C01B *31/04*
U.S. Cl. 423—448 **5 Claims**

1. The method of making a binder-free graphite molding compound having a mold fill-ratio between about 7 and 10 to 1 suitable for making molded graphite parts having a density of at least 1.1 g/cc, comprising compressing vermiform graphite to produce a preform with a density of about 0.03 to 0.8 g/cc, and then comminuting said preform to produce a powdered molding compound in which substantially all of the particles are smaller than 48 mesh and at least 40% of the particles are greater in size than 100 mesh.

4,235,860

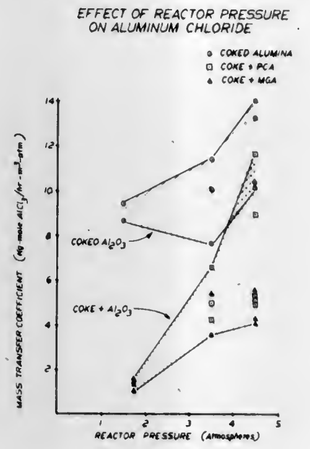
CHLORINATION OF ALUMINOUS MATERIAL AT SUPERATMOSPHERIC PRESSURE

David A. Wohleber, Lower Burrell; Jon F. Edd, Monroeville, Ronald L. Hennrich, Pittsburgh, all of Pa. and Franciscus A. Plantenberg, Zolterneer, Netherlands, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 7, 1979, Ser. No. 46,460
Int. Cl.³ C01F *5/32*
U.S. Cl. 423—495 **19 Claims**

1. A method for chlorinating an aluminous material containing oxygen comprising chlorinating the aluminous material in

the presence of a reducing agent at a pressure of greater than three atmospheres, with the aluminum chloride production



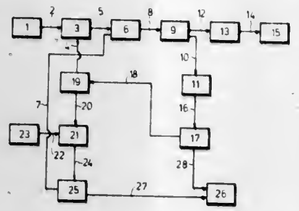
rate coefficient being increased compared with what it is at pressures below three atmospheres.

4,235,861

PRODUCTION OF IRON OXIDE PIGMENTS AND SODIUM SULPHATE

Jakob Rademachers, Krefeld, and Ingo Pflugmacher, Meerbusch, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,345
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1978, 2808674
Int. Cl.³ C01D *5/00*; C01G *49/02*
U.S. Cl. 423—551 **3 Claims**



1. A process for producing iron oxide suitable for pigment production and sodium sulphate, comprising dissolving iron sulphate in a solution of sodium sulphate, alkalizing and aerating said solution to convert the iron therein into a solid iron oxide suitable for pigment production and forming sodium sulphate solution, separating the iron oxide, crystallizing a part of the sodium sulfate out of the sodium sulphate solution to leave a mother liquor, subdividing the mother liquor into first and second portions, utilizing the first portion to dissolve the iron sulphate feed, treating the second portion with sodium hydroxide to crystallize out additional sodium sulphate and to form a sodium hydroxide- and sodium sulphate-containing solution which is used for alkalizing the initial iron sulphate solution.

4,235,862

PRODUCTION OF LOW SULPHUR CHROMIUM (III) OXIDE

Wolfgang Rambold; Heinrich Heine; Bruno Raederscheidt, and Gerhard Trenczek, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 817,080, Jul. 18, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,588
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2635086
Int. Cl.³ C01G *37/033*
U.S. Cl. 423—607 **4 Claims**

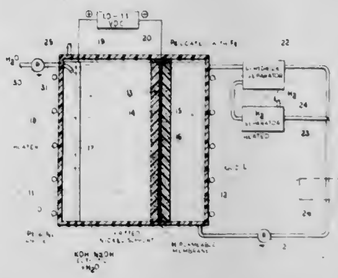
1. A process for the production of low sulphur chromium-(III) oxide comprising adding solid alkali metal dichromate to a concentrated ammonium sulfate solution at a temperature of about 15° to 45° C., the ammonium sulfate being present in about 0.7 to 0.96 times the molar amount of the chromate, adjusting the mixture to a water concentration of less than about 15% by weight of water, and calcining at a temperature of about 800° to 1100° C.

4,235,863

METHOD OF AND CELL FOR GENERATING HYDROGEN

Rudolf Schulten, Aachen-Richterich; Friedrich Behr, Herzogenrath-Kohlscheid, and Helmut Wenzl, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 16, 1979, Ser. No. 12,746
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2806984
Int. Cl.² C01B *1/03, 6/04, 15/00*; C25B *1/14*
U.S. Cl. 423—648 R **12 Claims**



1. A method of generating hydrogen and oxygen or an oxidized compound which comprises the steps of:
- electrolyzing an electrolyte decomposable to produce hydrogen and disposed in an anode compartment of an electrolyte cell between an anode in said compartment and a cathode of a cathode compartment;
- continuously introducing in a liquid state a metal capable of forming a hydride into said cathode compartment while separating said cathode compartment from said anode compartment by a membrane permeable to hydrogen, thereby forming the hydride of said metal in said cathode compartment;
- removing said hydride of said metal from said cathode compartment while replenishing the same with said metal in the liquid state; and
- heating said hydride of said metal externally of said cathode compartment to a temperature above the melting point of the metal hydride to decompose the metal hydride and produce hydrogen.

4,235,864

SIMULTANEOUS RADIO IMMUNOASSAY OF MULTIPLE ANTIGENS AND ASSAY FOR COCAINE METABOLITES

Balkrishena Kaul, West Caldwell, N.J., Bernard Davidow, Flushing, N.Y., and Stephen J. Millian, East Brunswick, N.J., assignors to Research Corporation, N.Y.

Division of Ser. No. 761,078, Jan. 21, 1977. This application Apr. 10, 1978, Ser. No. 895,020

Int. Cl.[2] G01N *33/16*; A61K *43/00, 39/00*

U.S. Cl. 424—1 9 Claims

1. In an immunoassay method for the detection of a cocaine metabolite in a biological tissue or fluid wherein an anti-serum is combined with said biological tissue or fluid to form a complex with said cocaine metabolite, said complex being detectable in an assay, the improvement comprising employing an anti-benzoylecgonine serum produced by immunizing an animal by injecting into said animal an antigenic conjugate of ecgonine or the acetate thereof and a peptide, protein or polysaccharide and eliciting serum from said animal.

4,235,865

METHOD FOR THE DETERMINATION OF UNBOUND HORMONES AND PHARMACEUTICALS

Hans A. Thoma, Munich, Fed. Rep. of Germany, assignor to Chandon Investment Planning Ltd., Grand Cayman, Cayman Islands

Filed Apr. 24, 1978, Ser. No. 899,706

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2731028

Int. Cl.[2] B01N *33/16*; G21H *5/02*

U.S. Cl. 424—1 12 Claims

1. A method for the determination of unbound hormones and pharmaceuticals comprising placing a solution containing unbound hormones, hormones bound to bonding proteins and bonding proteins into contact with a dry gel containing immobilized antibody; swelling the gel and reacting the unbound hormone with the antibody; eluting the hormones bound to bonding proteins and the bonding hormones; adding a solution containing a marked hormone; reacting the marked hormone with the antibody, and determining the marked hormone by radioimmunological evaluation.

4,235,866

PROCESS FOR THE TOTAL DETERMINATION OF HORMONES AND PHARMACEUTICALS

Hans A. Thoma, Munich, Fed. Rep. of Germany, assignor to Chandon Investment Planning Ltd., Grand Cayman, Cayman Islands

Filed Apr. 24, 1978, Ser. No. 899,742

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718700

Int. Cl.[2] G01N *33/16*; A61K *43/00*

U.S. Cl. 424—1 3 Claims

1. A process for the total determination of hormones and pharmaceuticals bonded partially to specific or non-specific bonding proteins comprising treatment of said bonded hormones and/or pharmaceuticals with an active enzyme to hydrolyze the bonding proteins, reaction of the hormones or pharmaceuticals in the presence of active enzyme with an immobilized antibody and radioimmunological determination of the hormones or pharmaceuticals.

4,235,867

ACRYLAMIDE COPOLYMER MATRIX FOR RADIOIMMUNE ASSAY TECHNIQUES

Hans A. Thoma, Munich, Fed. Rep. of Germany, assignor to Chandon Investment Planning Ltd., Grand Cayman, Cayman Island

Filed Apr. 24, 1978, Ser. No. 899,744

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721267

Int. Cl.[2] G01N *33/16*; A61K *43/00*

U.S. Cl. 424—1 3 Claims

1. In the method of immunologically determining hormones and pharmaceuticals wherein a polymer matrix is employed for immobilizing anitbodies, the improvement comprising, the improvement comprising a polymer matrix consisting of a copolymer of acrylamide and a compound selected from the group consisting of acrylic acid, methacrylic acid, methacrylamide, their derivatives, salts of acrylic acid or methacrylic acid and mixtures thereof.

4,235,868

STAINING WITH NITRIDO-BRIDGED OSMIUM OR RUTHENIUM COMPOUNDS

Michael J. Cleare, and Paul C. Hydes, both of Reading, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Feb. 12, 1979, Ser. No. 11,666

Claims priority, application United Kingdom, Feb. 13, 1978, 5624/78; May 23, 1978, 21358/78

Int. Cl.[3] G01N *1/30*

U.S. Cl. 424—3 4 Claims

1. A method for staining cells of a prepared biological specimen which comprises submitting said specimen firstly to mild acid hydrolysis and secondly to reaction with a staining reagent comprising an aqueous solution of a nitrido-bridged complex of osmium or ruthenium having the general formula

$$[M_2^{V}N(NH_3)_{8-2x}X_{5-y}(H_2O)_x]Y_y$$

where M represents either Os or Ru, X and Y are the same or different anions selected from the group consisting of nitrate, halide and psuedohalide, x is 0 or 1 and y is 2 or 3.

4,235,869

ASSAY EMPLOYING A LABELED FAB-FRAGMENT LIGAND COMPLEX

Moshe Schwarzberg, Sunnyvale, Calif., assignor to Syva Company, Palo Alto, Calif.

Filed May 16, 1978, Ser. No. 906,388

Int. Cl.[2] G01N *21/00, 31/00, 31/14, 33/16*

U.S. Cl. 424—8 10 Claims

1. A method for performing a protein binding assay employing a labeled ligand complex reagent, where the ligand is a protein and a member of a specific binding pair consisting of ligand and antiligand and is polyepitopic and of at least about 15,000 molecular weight; and said label is of from about 100 to 2,000 molecular weight and provides a detectible signal affected by the proximity of antiligand due to the steric bulk of said antiligand or a group conjugated to said antiligand which interacts with said label;

said labeled ligand complex reagent prepared by the method comprising:

(a) combining said ligand with a γ-globulin composition containing Fab fragments derived from antiligand, said R-globulin composition having been conjugated with said label, wherein said ligand and labeled fab fragments form complexes having at least one free ligand epitopic site; and

(b) separating said complexes from other labeled protein;

said protein binding assay comprising;

combining said complexes with a sample suspected of containing said ligand in an assay medium for determination of said ligand.

5. A method for performing a protein binding assay for immunoglobulin employing a labeled immunoglobulin complex reagent wherein said label is of from about 100 to 2,000 molecular weight and provides a detectible signal affected by the proximity of antiimunoglobulin due to the steric bulk of said antiimmunoglobulin or a group conjugated to said antiimmunoglobulin which interacts with said label;

said labeled immunoglobulin complex reagent prepared by the method comprising:

(a) combining said immunoglobulin with a γ-globulin composition containing Fab fragments derived from a serum protein composition having antiimunoglobulin and other protein conjugated with said label, wherein said Fab fragments derived from antiimunoglobulin and said immunoglobulin form complexes having at least one free ligand epitopic site; and

(b) separating said complexes from the other labeled protein;

said protein binding assay comprising:

combining said complexes with a sample suspected of containing said immunoglobulin in an assay medium for determination of said immunoglobulin.

4,235,870

SLOW RELEASE PHARMACEUTICAL COMPOSITIONS

Stewart T. Leslie, Aberdeen, Scotland, assignor to Syngergistics, New York, N.Y.

Division of Ser. No. 476,351, Jun. 5, 1974, Pat. No. 3,965,265, which is a continuation-in-part of Ser. No. 253,746, May 16, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 641,069

Claims priority, application United Kingdom, Jun. 3, 1971, 18839/71

Int. Cl.[3] A61K *9/22, 9/26, 9/48*

U.S. Cl. 424—19 15 Claims

1. A composition for use in admixture with pharmacologically active compounds to sustain release thereof over a prolonged period after oral ingestion, the composition comprising a higher aliphatic alcohol selected from the group consisting of aliphatic alcohols with the formula ROH, wherein R is an alkyl group having from 8 to 18 carbon atoms in chain length, cetostearyl alcohol and mixtures thereof, admixed with a hydrated hydroxy alkyl cellulose compound selected from the group consisting of hydroxymethyl cellulose, hydroxyethyl cellulose, hydropropyl cellulose and mixtures thereof, the cellulose compound having been hydrated with from 2 to 4 parts by weight water per part of dry hydroxyalkyl cellulose compound prior to admixture, the weight ratio of said aliphatic alcohol to said cellulose compound being within the range of from 2:1 to 4:1.

4,235,871

METHOD OF ENCAPSULATING BIOLOGICALLY ACTIVE MATERIALS IN LIPID VESICLES

Demetrios P. Papahadjopoulos, 78 Heathwood, Williamsville, N.Y. 14221, and Francis C. Szoka, Jr., 375 Leroy Ave., Buffalo, N.Y. 14214

Filed Feb. 24, 1978, Ser. No. 881,116

Int. Cl.[3] A61K *9/10, 9/66, 39/02, 37/48*

U.S. Cl. 424—19 26 Claims

1. A method of encapsulating biologically active materials in synthetic, oligolamellar, lipid vesicles, which comprises:

providing a mixture of a vesicle wall forming compound in organic solvent and an aqueous mixture of the biologically active material to be encapsulated, the ratio of organic phase to aqueous phase being that which will produce an emulsion of the water-in-oil type;

forming a homogeneous water-in-oil type of emulsion of said mixture;

evaporating organic solvent from the emulsion, until a mixture is obtained having a gel-like character; and

converting the gel-like mixture to a suspension of synthetic, oligolamellar vesicles encapsulating the biologically active material by one of the steps of (a) agitating said gel-like mixture and (b) dispersing said gel-like mixture in an aqueous media.

4,235,872

MICROENCAPSULATED METHOMYL INSECTICIDE

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 4, 1979, Ser. No. 45,412

Int. Cl.[3] A61K *9/50*

U.S. Cl. 424—19 4 Claims

1. An insecticide microcapsule consisting essentially of a core of methomyl surrounded by a cover of non-crosslinked, all aromatic polyurea formed by dispersing a solution of methylene chloride, methomyl and toluene-2,4-diisocyanate of at least 95% purity in aqueous medium creating a dispersion of liquid microspheres wherein the ratio of toluene-2,4-diisocyanate to methomyl is 1:4 to 3:1 by weight and the ratio of methylene chloride to methomyl is about 2:1 to 3:1 by weight, hardening the liquid microspheres by adding an aqueous alkali to the dispersion, the ratio of aqueous alkali to toluene-2,4-diisocyanate being about 0.25:2 to 2:1 on a molar basis, and removing the methylene chloride.

4,235,873

ANTIPERSPIRANT-DEODORANT COMPOSITIONS

Albert M. Packman, Dresher, Pa., assignor to Dermik Laboratories, Fort Washington, Pa.

Filed Mar. 30, 1979, Ser. No. 25,389

Int. Cl.[3] A61K *7/32, 9/12, 9/70*

U.S. Cl. 424—47 10 Claims

1. In a method for suppressing body odor and perspiration in a warmblooded animal the improvement which comprises topically administering to said warmblooded animal a composition containing an effective amount of an active compound having the formula

$$(C_5H_4NOS)_2MY_t$$

wherein M represents a member selected from the group consisting of zinc, iron, magnesium, tin, cadmium, zirconium, alkali and alkaline earth metals; Y is the anion of an inorganic or organic acid and t is either 1 or 2.

4,235,874

DENTIFRICE

James Norfleet, Plainfield, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,600

Int. Cl.[3] A61K *7/16, 7/18*

U.S. Cl. 424—52 13 Claims

1. A dentifrice composition having improved polishing power comprising (1) about 19 to 85% of a water-insoluble primary polishing agent selected from the group consisting of insoluble sodium metaphosphate, insoluble potassium metaphosphate, dental grade calcium pyrophosphate, magnesium orthophosphate, tricalcium orthophosphate, dicalcium phosphate dihydrate, anhydrous dicalcium phosphate, calcium carbonate, magnesium carbonate, hydrated alumina, colloidal silica and equivalents thereof having a radioactive dentin abrasion value of less than about 300 and (2) about 1 to 10% of normal calcium pyrophosphate having a radioactive dentin abrasion value of about 1170 in about 50% aqueous slurry.

4,235,875

ANTICARIES PIPERIDINO COMPOUNDS

Sven E. H. Hernestam, Malmo; Lars O. Willard, Hollviksnas; Aina L. Abramo, and Hans-Bertil Johansson, both of Malmo, all of Sweden, assignors to A.B. Ferrosan, Malmo, Sweden

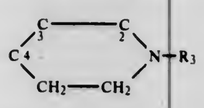
Continuation-in-part of Ser. No. 678,960, Apr. 21, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,598

Claims priority, application United Kingdom, Apr. 22, 1975, 16673/75

Int. Cl.[3] A61K *7/22*; **C07D** *211/14*

U.S. Cl. 424—54 **43 Claims**

1. An oral and dental hygiene composition suitable for use in the inhibition of dental plaque comprising (a) an alkyl 1-hydroxyalkylpiperidine having the Formula I,



I

which is substituted in the 2,3, or 4 position with



wherein R_1 is an alkyl group, straight or branched, having at least seven carbon atoms, R_2 is hydrogen or an alkyl group, R_1 and R_2 together having 7–14 carbon atoms, and wherein R_3 is a hydroxyalkyl group of 2–6 carbon atoms, the sum of the carbon atoms in R_1, R_2, and R_3 being at least ten; "C" representing CH_2 except for the one carbon atom bearing the said R_1 R_2 substitution, or (b) an orally acceptable acid addition salt thereof, in an amount effective for said purpose, in association with an orally-acceptable carrier.

4,235,876

LIVE NEWCASTLE DISEASE VIRUS VACCINE

Jacqueline Gits, La Hulpe, and Nathan Zygraich, Brussels, both of Belgium, assignors to SmithKline-Rit, Belgium

Filed Apr. 24, 1978, Ser. No. 899,424

Claims priority, application Belgium, Apr. 25, 1977, 853923

Int. Cl.[3] A61K *39/12, 9/12*; **C12K** *7/00*

U.S. Cl. 424—89 **5 Claims**

1. An improved vaccine against Newcastle disease and administrable in the form of an aerosol comprising an effective dose of the Newcastle disease virus P/77/8 strain and a pharmaceutical diluent for aerosol administration.

4,235,877

LIPOSOME PARTICLE CONTAINING VIRAL OR BACTERIAL ANTIGENIC SUBUNIT

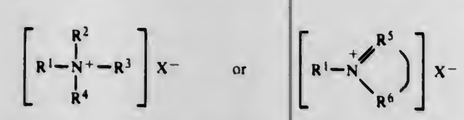
William W. Fullerton, King of Prussia, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 24,144, Mar. 26, 1979. This application Jun. 27, 1979, Ser. No. 52,379

Int. Cl.[3] A61K *39/02, 39/12, 39/18*

U.S. Cl. 424—89 **3 Claims**

1. A particle comprising a liposome, a positively charged quaternary ammonium salt of an amino-containing surfactant of the formulas



wherein R^1 is a straight or branched chain alkyl radical of from 12 to 20 carbon atoms, R^2 and R^3 may be the same or different and are alkyl of from 1 to 3 carbon atoms, and R^4 is benzyl, R^5 and R^6 together are a 5-membered or 6-membered heterocyclic radical, and X is a halide ion, preferably chloride or bromide, and a viral or bacterial subunit antigen reacted therewith to form a complex which complex is.

4,235,878

ANIMAL FEEDS CONTAINING A MIXTURE OF AVOPARCIN OR SPIRAMYCIN AND PROTEOLYTIC ENZYMES

Günter Hiller, Erkrath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 17, 1978, Ser. No. 961,709

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1977, 2751902

Int. Cl.[2] A61K *37/48*

U.S. Cl. 424—94 **13 Claims**

1. A high efficiency animal feed based on carbohydrates, protein and fats and containing from 5 to 100 ppm of an antibiotic selected from the group consisting of avoparcin and spiramycin and a content of proteolytic enzyme selected from the acid proteases of *Aspergillus niger* and *Rhizopus rhizopodiformis*, or a mixture thereof, in such an amount that the enzymatic activity is from 0.05 to 2.5 mTU/gm of said animal feed.

4,235,879

ANIMAL FEEDS CONTAINING A MIXTURE OF VIRGINIAMYCIN, ZINC BACITRACIN OR FLAVOPHOSPHOLIPOL AND PROTEOLYTIC ENZYMES

Günter Hiller, Erkrath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 814,047, Jul. 8, 1977, abandoned, and a continuation-in-part of Ser. No. 814,048, Jul. 8, 1977, abandoned, and a continuation-in-part of Ser. No. 847,793, Nov. 2, 1977, abandoned, and a continuation-in-part of Ser. No. 952,410, Oct. 18, 1978. This application Jan. 22, 1979, Ser. No. 5,482

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633105; Jul. 23, 1976, 2633106; Nov. 2, 1976, 2650277

The portion of the term of this patent subsequent to Aug. 19, 1980, has been disclaimed.

Int. Cl.[3] A23K *1/165, 1/17*

U.S. Cl. 424—94 **5 Claims**

1. A method for efficient rearing of cockerels comprising feeding cockerels a high efficiency animal feed containing carbohydrates, protein and fats and optionally conventional additives, having a content of 5 to 150 ppm of an antibiotic selected from the group consisting of Virginiamycin, zinc Bacitracin and flavophospholipol, and a content of acid proteolytic enzymes in such an amount that an enzymatic activity of 0.05 to 2.5 mTU/gm of said animal feed is produced, wherein said animal feed has a deficiency in essential nutrient components selected from the group consisting of raw protein, essential amino acids, and a mixture thereof, and in convertible energy of from 5 weight percent to 20 weight percent, based on standard animal feed mixtures.

4,235,880

ANIMAL FEEDS CONTAINING A MIXTURE OF TYLOSIN AND PROTEOLYTIC ENZYMES

Guenter Hiller, Erkrath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 917,984, Jun. 22, 1978, abandoned. This application Jul. 30, 1979, Ser. No. 61,628

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728850

Int. Cl.[3] A61K *37/48*

U.S. Cl. 424—94 **2 Claims**

1. A high efficiency animal feed for the feeding of piglets and the fattening of pigs comprising carbohydrates, protein and fats and optionally conventional additives, having a content of 10 to 40 ppm of the antibiotic tylosin and a content of acid proteolytic enzymes derived from Aspergillus niger, from the genus Tramates or from Rhizopus rhizopodiformis, having a wide spectrum of action and a range of 50% of maximum activity between a pH of 2.5 and a pH of 6.5 in such an amount that an enzymatic activity of 0.2 to 0.5 mTU/gm of said animal feed is produced.

4,235,881

METHOD FOR PRODUCING HIGH POTENCY FACTOR VIII

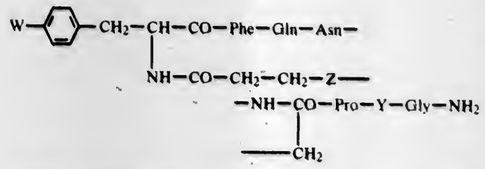
Joseph H. Cort, 300 E. 54 St., New York, N.Y. 10022

Filed Dec. 4, 1978, Ser. No. 966,014

Int. Cl.[3] A61K *35/14, 37/00*

U.S. Cl. 424—101 **6 Claims**

1. In a method for producing a Factor VIII preparation comprising collecting blood from a donor, separating the plasma therefrom, and recovering a Factor VIII-rich fraction from said plasma, the improvement of administering to said donor, in an amount effective to increase the circulating level of Factor VIII in the blood of said donor, a polypeptide represented by the formula:



wherein W is hydrogen, hydroxy or amino; Y is a residue of an alpha-amino acid having a basic aliphatic side chain in the D-configuration containing from 2 to 5 carbon atoms and having on the terminal carbon a basic group; and Z is disulfide or monocarba, with the proviso that when W is hydroxy, and Y is the D-arginine residue, then Z is monocarba, and thereafter recovering blood containing said increased levels of Factor VIII.

4,235,882

ANTIBIOTIC MM 4550A

Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

Continuation-in-part of Ser. No. 691,491, Jun. 1, 1976, abandoned, which is a division of Ser. No. 559,973, Mar. 19, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,948

Claims priority, application United Kingdom, Mar. 28, 1974, 13855/74

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 **20 Claims**

11. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a pharmaceutical composition which comprises an antibacterially effective amount of pharmaceutically acceptable di-basic salt of MM 4550A which is at least 70% pure wherein MM 4550A is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_9N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:

(a) In aqueous solution, it has a characteristic ultraviolet spectrum with absorption maxima at about 238 nm and at about 287 nm;

(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum substantially as shown in FIG. 2 and has absorption maxima inter alia about 3450, 2950, 1765, 1695, 1510, 1390 and 1260 cm^{-1};

(c) it has a characteristic n.m.r. spectrum which when taken in D_2O is substantially as shown in FIG. 3, which spectrum possesses inter alia (i) a pair of low field doublets centered approximately at 2.45τ and 3.65τ with coupling constants of approximately 15 Hz; (ii) a doublet centered at approximately 855τ, and (iii) a sharp singlet at approximately 7.95τ;

(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Acinetobacter anitratus Serratia marcescens* and *Shigella sonnei;*

(e) it synergizes the antibacterial activity of ampicillin against certain β-lactamase producing bacteria including strains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morganii* and *Staphylococcus aureus Russell* and

(f) it is not a polypeptide or protein, in combination with a pharmaceutically acceptable carrier.

4,235,883

NOVEL ANTIBIOTIC BN-213 SUBSTANCE AND ITS PRODUCTION

Jiro Itoh; Shinji Miyadoh, both of Yokohama; Mitsugu Itoh, Machida; Norio Ezaki, Yokohama; Tomizo Niwa, Yokohama, and Yujiro Yamada, Yokohama, all of Japan, assignors to Meiji Seika Kaisha Limited, Tokyo, Japan

Filed Oct. 12, 1978, Ser. No. 950,822

Claims priority, application Japan, Oct. 31, 1977, 52-129700

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—122 **4 Claims**

1. An antibiotic BN-213 substance, which is effective in inhibiting the growth of Gram-positive bacteria and having the following properties:

Elementary analysis: C. 73.93%; H. 10.28%; O. 15.79% (Difference);

Molecular weight: 294 (High resolution mass spectrometry)

Molecular formula: $C_{18}H_{30}O_3$;

Specific rotatory power: $[\alpha]_D^{20}$ 0° (C=0.4, methanol);

Melting point: 84° C.;

Ultraviolet absorption spectrum: Characteristic absorption maximum at 292 mμ in CH_3OH;

Infrared absorption spectrum: Characteristic absorption bands at 2920, 2850, 2650, 1660, 1630, 1570, 1440, 1405, 1300, 1260, 1240, 1170, 1130, 1000, 850, 760, 720 (cm^{-1}).

4,235,884

METHOD FOR THE PREPARATION OF STABLE AQUEOUS SOLUTIONS OF COMPLEXES OF POLYVINYLPYRROLIDONE AND OF HALOGENS AND THE SOLUTIONS OBTAINED THEREBY

Nicolas Salkin, 36 Avenue de Villepreux, Vaucresson - (Hauts-de-Seine), France

Filed Mar. 5, 1979, Ser. No. 17,197

Claims priority, application France, Mar. 17, 1978, 78 07797

Int. Cl.[3] A61K *31/79, 33/18*; **C07D** *207/444*

U.S. Cl. 424—150 **3 Claims**

1. Method for preparation of a stable aqueous solution of a

complex of halogen and polyvinylpyrrolidone (PVP) comprising the following steps:

(a) halogen selected from the group consisting of chlorine, iodine and bromide is put in solution in the presence of PVP in a solvent which solubilizes the two components, the said solvent having a boiling point lower than that of water, being insoluble in water, and forming no azeotrope with the latter;

(b) The solution obtained is heated to react the PVP and the halogen;

(c) The said solvent is displaced by addition of water brought to a temperature higher than the boiling point of the said solvent.

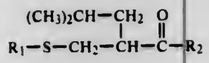
4,235,885

INHIBITORS OF MAMMALIAN COLLAGENASE

Joseph E. Sundeen, Yardley, Pa., and Tamara Dejneka, Skillman, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 25, 1979, Ser. No. 51,915
Int. Cl.³ A61K 37/00; A01N 37/00, 37/30
U.S. Cl. 424—177 **25 Claims**

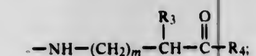
1. A method for reducing the adverse effects of mammalian collagenase in a mammalian host in need thereof, which comprises administering to said mammal an effective amount of a compound having the formula



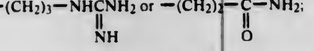
or a salt thereof wherein

R_1 is hydrogen or alkanoyl of 2 to 10 carbon atoms;

R_2 is hydroxy, amino or



R_3 is hydrogen, alkyl of 1 to 4 carbon atoms,



R_4 is hydroxy, amino, arginine, leucine, glutamine, alanine or glycine; and

m is 0 or an integer of 1 to 9.

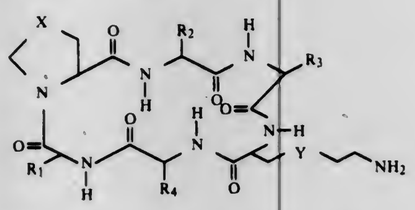
4,235,886

CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

Roger M. Freidinger, Hatfield, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 31, 1979, Ser. No. 89,827
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 424—177 **12 Claims**

1. A compound having the formula:



wherein X is $(CH_2)_n$ wherein n is 0, 1 or 2 or sulfur;

Y is $(CH_2)_m$ wherein m is 0, 1 or 2 or sulfur such that the sulfur may be in any position along the chain;

R_1 and R_2 are independently lower alkyl, benzyl, substituted benzyl wherein the substituent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with a 5- or 6-membered heterocyclic ring;

R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen; and

R_4 is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl or substituted hydroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro.

4,235,887

PROCESS FOR THERAPEUTIC TREATMENT

John J. Voorhees, Ann Arbor, and Wendell Wierenga, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 13, 1977, Ser. No. 787,230
Int. Cl.³ A61K 31/705; C07J 41/00
U.S. Cl. 424—180 **16 Claims**

1. A process for treating a dermatological disease which comprises:

(a) administering to a human or animal afflicted with a dermatological disease a composition comprising a photocleavable pro-drug in combination with a pharmaceutical carrier, and

(b) irradiating the diseased area with radiation having a wave length of from about 2500 to about 3600 angstroms in an amount sufficient to convert said administered prodrug to a pharmacologically active form and in a concentration effective to alleviate the said disease.

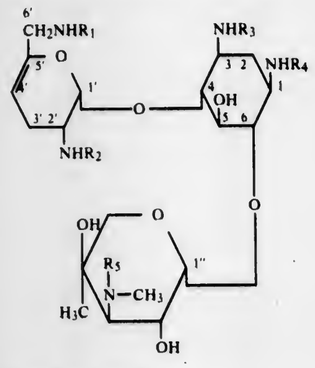
4,235,888

PSEUDOTRISSACCHARIDES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS MEDICAMENTS

Peter Stadler, Haan; Karl-Georg Metzger, Wuppertal; Eckart Voss, Cologne; Uwe Petersen, Leverkusen; Hans-Joachim Zeiler, Velbert, and Hans-Joachim Kabbe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 52,871
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832268
Int. Cl.³ A61K 31/70; C07H 17/08
U.S. Cl. 424—180 **12 Claims**

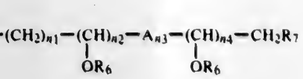
1. A pseudotrisaccharide of the formula



(I)

or a salt thereof in which

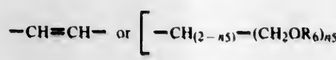
R_1, R_2, R_3, R_4 and R_5 independently of one another denote hydrogen or a group of the formula



(Ia)

in which

A denotes



R_6 denotes hydrogen; triphenylmethyl; triphenylmethyl substituted by C_1-C_4-alkyl or chloro;

C_1-C_4-alkyl; C_2-C_6-alkylcarbonyl; formyl or benzoyl; or

2 R_6 together denote C_1-C_6-alkylidene,

R_7 denotes hydrogen or OR_6, n_1 is 0, 1, 2 or 3,

n_2 is 0, 1, 2, 3, 4 or 5 and n_3, n_4 and n_5 are, independently of one another,

0, 1 or 2, the sum of n_1, n_2, n_3 and n_4 being from 1 to 5 and the total number of the OR_6 groups in at least one of R_1, R_2, R_3, R_4 and R_5 being 2 to 6, and at least one of the R_1, R_2, R_3, R_4 and R_5 being other than hydrogen.

5. An antibacterial pharmaceutical composition containing as an active ingredient an antibacterially effective amount of a compound according to claim 1 in admixture with an inert pharmaceutical carrier.

9. A method of combating bacterial diseases in warm-blooded animals which comprises administering to the animals an antibacterially effective amount of active compound according to claim 1 either alone or in admixture with an inert pharmaceutical carrier.

4,235,889

THERAPEUTIC AGENT FOR THE EXTERNAL TREATMENT OF PSORIASIS, TINEA AND ECZEMAS

Walter Evers, Pinneberg, Fed. Rep. of Germany, assignor to Pharmazeutische Fabrik Evers & Co., Pinneberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 757,620, Jan. 7, 1977, abandoned. This application Apr. 25, 1979, Ser. No. 33,154
Int. Cl.³ A61K 35/78
U.S. Cl. 424—195 **12 Claims**

1. A pharmaceutical composition for the external treatment of psoriasis, tinea and eczemas consisting essentially of thirty to fifty percent by weight of coconut oil, thirty to fifty percent by weight of palm kernel oil, five to fifteen percent by weight of an extract of the leaves and berries of laurel (*Laurus nobilis* (Linn.)) and five to fifteen percent by weight of an emulsifier, the percentages by weight summing up to 100 percent.

4,235,890

STEPHANIA CEPHARANTHA EXTRACT, ITS METHOD OF PREPARATION AND ITS USE AS PHARMACEUTICAL

Jacques Debat, Saint Cloud; Jean Lemoine, Garches, and Françoise Llier nee Gabillault, Plaisir, all of France, assignors to Laboratoire Debat, Paris, France

Filed May 31, 1979, Ser. No. 44,313
Claims priority, application United Kingdom, May 31, 1978, 25618/78
Int. Cl.³ A01N 9/02, 9/08
U.S. Cl. 424—195 **7 Claims**

1. A method of preparation of an extract of *Stephania cepharantha* useful in therapy which comprises extracting ground dried stems of the plant with at least one solvent selected from the group consisting of water, alcohols, ketones, esters, ethers, hydrocarbons, halogenated hydrocarbons and mixtures thereof.

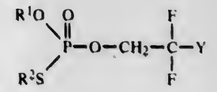
4,235,891

COMBATING PESTS WITH O-ALKYL-S-ALKYL-O-HALOALKYL-PHOSPHATES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, and Shinichi Tsubol, both of Tokyo, all of Japan, assignors to Nihon Tokusho Noyaku Seizo K.K., Tokyo, Japan

Filed Jun. 27, 1979, Ser. No. 52,632
Claims priority, application Japan, Jul. 5, 1978, 53-80934
Int. Cl.³ A01N 57/10; C07F 9/165
U.S. Cl. 424—224 **10 Claims**

1. An O-alkyl-S-alkyl-O-haloalkyl-phosphate of the formula



in which

R^1 and R^2 each independently is alkyl with 1–4 carbon atoms, and

Y is halogenoalkyl with 1–4 carbon atoms.

8. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes or to a habitat thereof, an arthropodicidally or nematocidally effective amount of a compound according to claim 1.

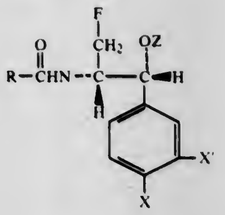
4,235,892

1-ARYL-2-ACYLAMIDO-3-FLUORO-1-PROPANOLS, METHODS FOR THEIR USE AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

Tattanahalli L. Nagabhushan, Parsippany, N.J., assignor to Schering Corporation, Patent Dept., Kenilworth, N.J.

Filed Feb. 5, 1979, Ser. No. 9,207
Int. Cl.³ A61K 31/165, 31/18; C07C 103/40
U.S. Cl. 424—226 **21 Claims**

1. A D-(threo)-1-aryl-2-acylamido-3-fluoro-1-propanol of the following formula:



wherein R is a member selected from the group consisting of methyl or ethyl or a halogenated derivative thereof, dihalogenodeuteriomethyl, 1-halogeno-1-deuterioethyl, 1,2-dihalogeno-1-deuterioethyl, azidomethyl and methylsulfonylmethyl; each of X and X' is a member selected from the group consisting of NO_2, SO_2R_1, SOR_1, SR_1, $SONH_2$, SO_2NH_2, $SONHR_1$, SO_2NHR_1, COR_1, OR_1, R_1, CN, halogen, hydrogen, phenyl and phenyl substituted by halogen, NO_2, SO_2CH_3, R_1 or OR_1, wherein

R_1 is methyl, ethyl, n-propyl or isopropyl; and

Z is hydrogen.

18. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic, antibacterially effective amount of a D-(threo)-1-aryl-2-acylamido-3-fluoro-1-propanol of claim 1.

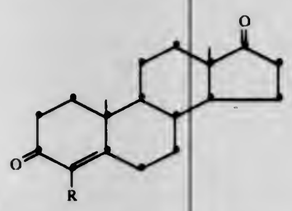
4,235,893

ESTER DERIVATIVES OF 4-HYDROXY-4-ANDROSTENE-3,17-DIONE AND A METHOD FOR INHIBITING ESTROGEN BIOSYNTHESIS

Angela M. H. Brodie; Harry J. Brodie, both of 8373 Reservoir Rd., Fulton, Md. 20759, and David A. Marsh, 13 Edgewater Ave., Shrewsbury, Mass. 01545

Filed May 8, 1978, Ser. No. 903,551
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—243 **6 Claims**

1. A method of inhibiting estrogen biosynthesis using as an inhibitor a compound having the general formula



wherein R is selected from the group consisting of straight-chain, saturated monocarboxylates containing 2–12 carbon atoms; hemisuccinate; and benzoate.

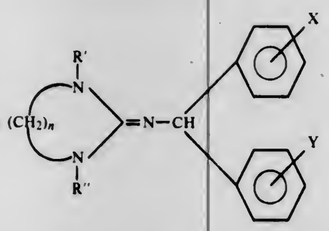
4,235,894

2-BENZHYDRYLIMINO-1,3-DIAZACARBOCYCLIC COMPOUNDS, COMPOSITIONS AND METHODS OF USE

Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

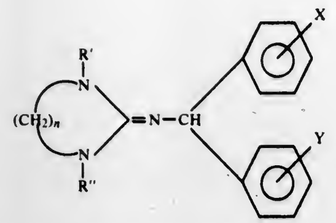
Division of Ser. No. 815,393, Jul. 13, 1977, Pat. No. 4,174,401. This application Jan. 30, 1979, Ser. No. 7,757
Int. Cl.³ A61K *31/33*; C07D *243/04*
U.S. Cl. 424—244 **4 Claims**

1. A compound represented by the formula



wherein R′ and R″ independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo, and n is an integer of 4; and the therapeutically active acid addition salts thereof.

4. A method for inhibiting gastric secretion which comprises administering to a subject with gastric hyperacidity an effective antisecretory amount of a compound of the formula



wherein R′ and R″ independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo, and n is an integer of 4; and the therapeutically active acid addition salts thereof in admixture with a pharmaceutical carrier.

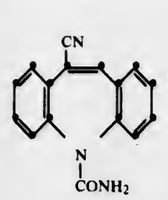
4,235,895

SUBSTITUTED 5H-DIBENZ[b,f]AZEPINE

Hans Blattner, Riehen, and Angelo Storni, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,274
Claims priority, application Switzerland, Nov. 10, 1978, 11588/78
Int. Cl.³ A61K *31/55*; C07D *223/22*
U.S. Cl. 424—244 **3 Claims**

1. 10-Cyano-5H-dibenz[b,f]azepine-5-carboxamide of the formula



3. A method of treating epilepsy in a warm-blooded animal which comprises administering to said animal a therapeutically effective amount of the compound according to claim 1.

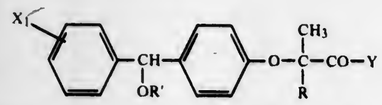
4,235,896

BENZYL-PHENOXY ACID ESTERS AND HYPERLIPAEMIA COMPOSITIONS CONTAINING THE SAME

Andre Mieville, Lausanne, Switzerland, assignor to Orchimed S.A., Fribourg, Switzerland

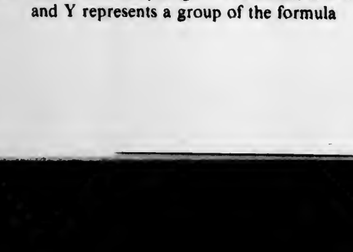
Division of Ser. No. 656,711, Feb. 9, 1977, Pat. No. 4,072,705. This application Oct. 28, 1977, Ser. No. 846,324
Claims priority, application United Kingdom, Feb. 12, 1975, 5979/75; Dec. 10, 1975, 50630/75
Int. Cl.³ A61K *31/445*; C07C *101/72*; C07D *295/14, 223/02*
U.S. Cl. 424—244 **10 Claims**

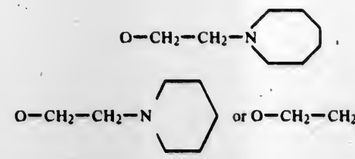
5. A compound of the formula:



(II)

wherein X_1 is hydrogen or chlorine, R is CH_3, R′ is hydrogen and Y represents a group of the formula





10. A pharmaceutical composition for the treatment of hyperlipaemia comprising a therapeutically active amount of a compound as claimed in claim 5 or a non-toxic acid addition salt thereof and a physiologically acceptable pharmaceutical excipient.

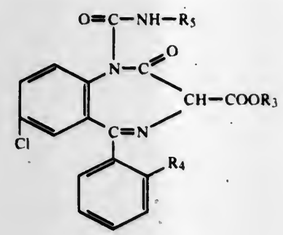
4,235,897

BENZODIAZEPINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Henri Demarne, Montpellier, and André Hallot, St. Gely Du Fesc, both of France, assignors to C. M. Industries, Paris, France

Continuation of Ser. No. 794,013, May 5, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,224
Claims priority, application United Kingdom, May 5, 1976, 18492/76
Int. Cl.³ A61K *31/55*; C07D *243/24*
U.S. Cl. 424—244 **5 Claims**

1. A benzodiazepine compound of the formula:



wherein:
R_5 is C_1—C_4 alkyl;
R_3 is C_1—C_4 alkyl; and
R_4 is selected from Cl and F.

2. A pharmaceutical composition useful for the treatment of neuropsychic disturbances, characterized in that it contains a compound as defined in claim 1 as active ingredient in association with a pharmaceutically acceptable carrier, and is administered in such a manner that the patient receives from 2 to 100 mg per day of the active ingredient.

4,235,898

LIQUID SHAMPOO COMPOSITION

Hiroshi Watanabe, Funabashi, and Tsuruo Mikata, Kashiwa, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1979, Ser. No. 12,066
Claims priority, application Japan, Mar. 6, 1978, 53-25147
Int. Cl.³ A01N *55/02*
U.S. Cl. 424—245 **4 Claims**

1. A liquid shampoo composition having an excellent foaming power and containing a water-insoluble powder dispersed therein in a stable condition, consisting essentially of:
from 5 to 30 wt. % of ammonium salt, monoethanolamine salt, diethanolamine salt, triethanolamine salt or 2-amino-2-methylpropane-1,3-diol salt of anionic, synthetic, organic surfactant effective for shampooing hair;
from 0.1 to 1.0 wt. % of water-soluble carboxy vinyl polymer;
from 1 to 10 wt. % of a fatty acid alkanolamide having from 10 to 14 carbon atoms in the fatty acid moiety;
from 1 to 20 wt. % of a stabilizer selected from the group consisting of alkyl monohydric alcohols having 1 to 3 carbon atoms, glycols having 2 to 6 carbon atoms, monoethanolamine, diethanolamine and triethanolamine;
from 0.001 to 5 wt. % of water-insoluble, finely divided powder selected from the group consisting of water-insoluble pigments for shampoos, water-insoluble pearlescent agents for shampoos, water-insoluble hair or scalp-treating medicaments for shampoos and water-insoluble germicides for shampoos;
said composition containing an amount of ammonia or an alkanolamine sufficient to maintain the composition at a pH of from 6 to 8;
and the balance is essentially water.

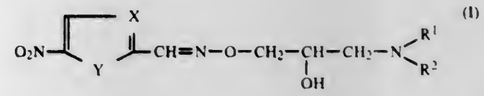
4,235,899

SUBSTITUTED O-(2-HYDROXYPROPYL)-ALDOXIMES

Ulrich Gebert, Kelkheim, and Wolfgang Raether, Dreieichenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,936
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651084
Int. Cl.³ C07D *403/12, 405/12, 407/12, 413/12*
U.S. Cl. 424—246 **6 Claims**

1. Compounds of general formula



(I)

wherein X represents a methine group and Y is an oxygen atom, or X represents a nitrogen atom and Y the group NR^3 in which R^3 represents a radical selected from the group consisting of a hydrogen atom, a methyl, ethyl and hydroxethyl group; and R^1 and R^2 each represent a radical of the group hydrogen atom, an alkyl and hydroxyalkyl group each containing up to 6 carbon atoms, or a phenyl or naphthyl group; and R^1 and R^2, together with the nitrogen atom to which they are attached, form a 5- to 7-membered saturated ring or a piperazine, homopiperazine, morpholine or thiamorpholinyl ring, which rings are unsubstituted or substituted by at least one of the groups an alkyl and hydroxyalkyl group each containing up to 6 carbon atoms and a phenyl group which may be substituted by one or several alkyl groups which together with the phenyl group consist of not more than 10 carbon atoms, and physiologically acceptable acid addition salts thereof.

4,235,900

CEPHRADINE COMPOSITIONS

Anthony L. La Via, East Brunswick, N.J., and Irwin S. Gibbs, Philadelphia, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 15, 1978, Ser. No. 960,792
Int. Cl.³ A61K *31/545*
U.S. Cl. 424—246 **4 Claims**

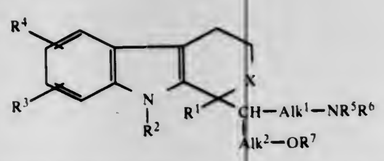
1. A dry solid antibiotic composition suitable for reconstitution as an injectable upon addition of water, which comprises cephradine and arginine, the arginine being present in a weight ratio to the cephradine in an amount ranging from about 1:4 to about 1:1

4,235,901
1-HYDROXYALKANAMINE PYRANO(3,4-b)INDOLE COMPOSITIONS AND USE THEREOF

André Asselin, St. Laurent; Leslie G. Humber, Dollard des Ormeaux; Gervais Dionne, St. Laurent; Clara Revesz, Montreal, and Amedeo Failli, St. Laurent, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 904,081, May 8, 1978, Pat. No. 4,179,503.
This application May 14, 1979, Ser. No. 38,994
Int. Cl.[2] A61K *31/535, 31/40*
U.S. Cl. 424—248.51 20 Claims

1. A method of treating hypertension in a mammal, which comprises administering to the mammal an effective antihypertensive amount of a compound of formula I,



(I)

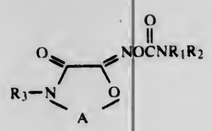
in which R^1 is lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 each independently is hydrogen, lower alkyl, halo, nitro, trifluoromethyl or lower alkoxy; R^5 and R^6 each independently is hydrogen or lower alkyl or R^5 and R^6 together with the nitrogen atom form a pyrrol-1-yl, piperidino or morpholino ring; R^7 is hydrogen or lower alkyl; Alk^1 and Alk^2 each independently is a straight or branched chain lower alkylene having one to six carbon atoms; and X is oxa or thia, or a therapeutically acceptable acid addition salt thereof.

4,235,902
PESTICIDAL CARBAMATE ESTERS OF 5-OXIMINO-1,3-OXAZOLIDIN-4-ONES

John A. Durden, Jr., South Charleston, and Arthur P. Kurtz, Jr., Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,029
Int. Cl.[3] A01N *43/84, 43/86, 43/88;* C07D *265/30*
U.S. Cl. 424—248.53 31 Claims

1. A compound of the formula:



wherein:

R_1 and R_2 are:

(A) individually hydrogen, alkyl, alkenyl or alkynyl; or

(B) when R_1 is alkyl, R_2 may be alkylsulfenyl, trihalomethanesulfenyl, alkylthiosulfenyl, alkanoyl, cycloalkylsulfenyl, cycloalkylthiosulfenyl or either substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more chloro, bromo, fluoro, nitro, cyano, alkoxy or alkyl groups in any combination;

R_3 is hydrogen, alkyl, cycloalkyl, alkoxyalkyl or phenyl;

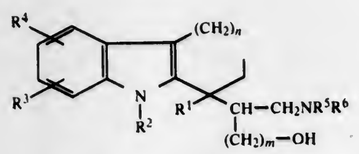
A is ethylene either substituted or unsubstituted with one or more alkyl groups; with the proviso that alkoxyalkyl, alkyl, alkanoyl, cycloalkyl, alkynyl and alkoxy moieties individually may not include more than six carbon atoms.

4,235,903
1-HYDROXYALKANAMINE TETRAHYDROCARBAZOLES AND CYCLOPENT[b]INDOLES, COMPOSITIONS AND METHOD OF USE

Gervais Dionne; Andre A. Asselin, both of St. Laurent, and Leslie G. Humber, Dollard des Ormeaux, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 6, 1979, Ser. No. 64,343
Int. Cl.[3] C07D *209/70, 209/86;* A61K *31/40*
U.S. Cl. 424—248.57 32 Claims

1. A compound of formula I



(I)

in which R^1 and R^2 each is hydrogen or lower alkyl; R^3 and R^4 each is hydrogen, lower alkyl, halo, nitro, trifluoromethyl or lower alkoxy; R^5 and R^6 each is hydrogen or lower alkyl or R^5 and R^6 together with the nitrogen atom to which they are attached form a pyrrol-1-yl, piperidin-1-yl or morpholin-4-yl; m is 2 or 3; and n is 1 or 2; or a therapeutically acceptable acid addition salt thereof.

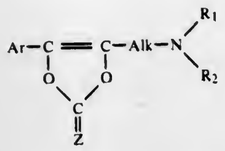
10. A method of increasing the excretion of urine in a mammal without excessive loss of potassium, which comprises administering to said mammal an effective renal mineralocorticoid antagonizing amount of a compound of formula I or a therapeutically acceptable acid addition salt thereof, as claimed in claim 1, in combination with an effective amount of a non-mineralocorticoid antagonizing diuretic agent.

4,235,904
4-ARYL-5-PIPERAZINOALKYL-1,3-DIOXOL-2-ONES, AND COMPOSITIONS

Elso Manghisi; Giuseppe Cascio, both of Monza; Giancarlo Fregnan, Milan, and Roberto Porta, Cernobbio, all of Italy, assignors to Instituto Luso Farmaco d'Italia S.p.A., Milan, Italy

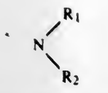
Filed Mar. 1, 1979, Ser. No. 16,135
Claims priority, application Italy, Mar. 3, 1978, 20841 A/78; Feb. 14, 1979, 48004 A/79
Int. Cl.[3] C07D *405/06, 405/14;* A61K *31/505, 31/495*
U.S. Cl. 424—251 25 Claims

1. A 4-aryl-5-aminoalkyl-1,3-dioxol-2-one, having general formula (I)



(I)

wherein: Ar is a residue selected from the group consisting of (a) phenyl, (b) phenyl substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, halogen and lower alkylmercapto, (c) biphenyl, and (d) naphthyl; Alk is a saturated chain of one to three carbon atoms;



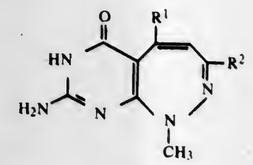
is the residue of piperazine and piperazine substituted in the 4-position with (a) alkyl, (b) phenyl, (c) diphenylalkyl, (d) halophenyl, (e) halodiphenylalkyl, (f) alkoxyphenyl, (g) alkoxydiphenyl, (h) pyridyl, (i) pyrimidinyl, (j) trifluoromethylphenyl and Z is oxygen
and pharmaceutically acceptable salts thereof.

4,235,905
1H-PYRIMIDO[4,5-C]-1,2-DIAZEPINES

Robert W. Morrison, Jr.; William R. Mallory, and Virgil L. Styles, all of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 926,072, Jul. 19, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,280
Claims priority, application United Kingdom, Jul. 20, 1977, 30380/77
Int. Cl.[3] C07D *487/04;* A61K *31/505*
U.S. Cl. 424—251 24 Claims

1. A compound of formula (I) or a tautomer or a pharmaceutically acceptable salt thereof



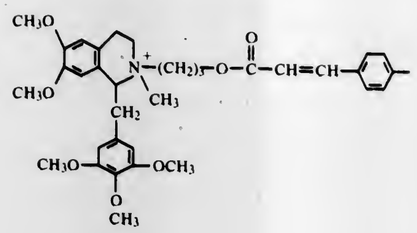
wherein R^1 and R^2 are the same or different and are selected from lower alkyl, phenyl, phenyl substituted by one or more hydroxy or lower alkoxy, pyridyl or $-CO_2R$ in which R is lower alkyl; provided that when R^1 is $-CO_2R$, R^2 is lower alkyl.

4,235,906
BIS-ISOQUINOLINIUM COMPOUNDS, COMPOSITIONS AND METHODS OF USE

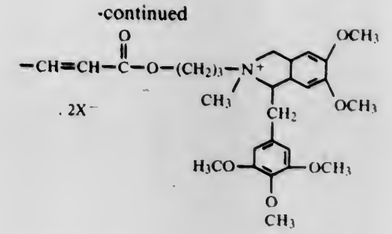
John J. Savarese, Boxford; Richard J. Kitz, Dover, both of Mass., and Sara Ginsburg, New York, N.Y., assignors to Massachusetts General Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 926,794, Jul. 21, 1978, abandoned. This application Jan. 31, 1979, Ser. No. 7,952
Int. Cl.[1] A61K *31/47;* C07D *217/10, 217/20*
U.S. Cl. 424—258 97 Claims

1. A compound of the formula



·continued



. 2X⁻

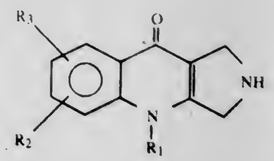
where X is a pharmaceutically acceptable anion.

4,235,907
SUBSTITUTED-9H-PYRROLO[3,4-b]QUINOLIN-9-ONES AND TREATMENT OF ALLERGIC CONDITIONS WITH THEM

Emil Pfenninger, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 842,200, Oct. 14, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,893
Claims priority, application Switzerland, Oct. 15, 1976, 13086/76
Int. Cl.[1] A61K *31/47;* C07D *471/04*
U.S. Cl. 424—258 36 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl or alkynyl, each of 3 to 5 carbon atoms, the multiple bond of which is not adjacent to the nitrogen atom,

R_2 is hydrogen, alkyl or alkoxy, each of 1 to 8 carbon atoms, hydroxyl, fluorine, chlorine, bromine, trifluoromethyl, carboxyl or $-NR_4R_5$,

R_3 is hydrogen, fluorine, chlorine, bromine, hydroxyl, alkyl or alkoxy, each of 1 to 8 carbon atoms,

R_4 is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or $-SO_2R_6$,

R_5 is hydrogen or alkyl of 1 to 4 carbon atoms and

R_6 is alkyl of 1 to 4 carbon atoms, phenyl or phenyl monosubstituted by alkyl or alkoxy, each of 1 to 4 carbon atoms, fluorine, chlorine or bromine,

in the form of the free base or in the form of a pharmaceutically acceptable acid addition salt thereof.

4. A pharmaceutical composition for use in preventing or treating allergic conditions which comprises an anti-allergic effective amount of a compound according to claim 1 in association with a pharmaceutical carrier or diluent.

5. A method of preventing or treating allergic conditions which comprises administering to an animal in need of such treatment an effective amount of a compound of claim 1.

4,235,908

4-AMINOQUINOLINE DERIVATIVES, USEFUL AS ANTI-INFLAMMATORY AGENTS

John T. A. Boyle, Maidenhead, England, assignor to John Wyeth & Brother Limited, Taplow, England

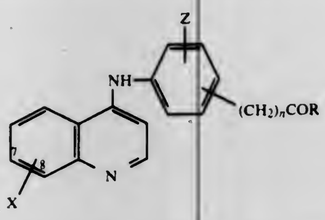
Filed Apr. 9, 1979, Ser. No. 28,617

Claims priority, application United Kingdom, May 24, 1978, 21915/78

Int. Cl.³ C07D *215/44*; A61K *31/47*

U.S. Cl. 424—258 **5 Claims**

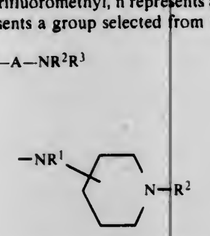
1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein X is at the designated 7- or 8-position and represents a substituent selected from trifluoromethyl and halogen, Z represents a member of the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, nitro, di(lower alkyl-)amino and trifluoromethyl, n represents an integer from 1 to 4 and R represents a group selected from those having the formulae

$$-NR^1-A-NR^2R^3 \quad \text{(II)}$$

and



(III)

wherein R^1 is selected from hydrogen and lower alkyl, R^2 represents lower alkyl, R^3 represents lower alkyl and A represents lower alkylene.

4. A pharmaceutical composition useful as an anti-inflammatory agent, which comprises a compound as defined in claim 1 and a pharmaceutically acceptable, non-toxic carrier.

5. A method of treating inflammation in a mammal which comprises administering to said mammal an effective anti-inflammatory amount of a compound as claimed in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,235,909

OCTAHYDRO-2H-PYRROLO[3,4-G]QUINOLINES

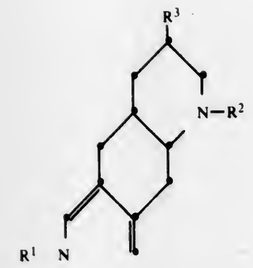
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 5,062, Jan. 22, 1979, abandoned. This application Apr. 19, 1979, Ser. No. 31,642

Int. Cl.³ A61K *31/47*; C07D *471/04*

U.S. Cl. 424—258 **10 Claims**

1. A compound of the formula



wherein R^1 is H, (C_1-C_3)alkyl-CO, or (C_1-C_3)alkyl, R^2 is H, C_1-C_3 alkyl, allyl or benzyl and R^3 is H, or a pharmaceutically-acceptable acid addition salt thereof.

4,235,910

BENZOQUINOLIZINES HAVING BLOOD PRESSURE LOWERING ACTIVITY, AND IN SOME INSTANCES, ANTI-SECRETORY ACTIVITY

John F. White, Wokingham, and Terence J. Ward, Slough, both of England, assignors to John Wyeth & Brother Limited, Taplow, England

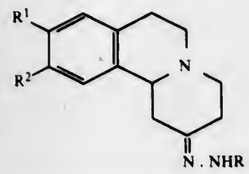
Filed May 10, 1979, Ser. No. 38,029

Claims priority, application United Kingdom, May 26, 1978, 23327/78

Int. Cl.³ A61K *31/47*; C07D *455/06*

U.S. Cl. 424—258 **12 Claims**

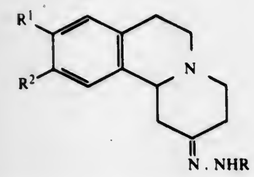
1. A compound selected from the group consisting of a benzoquinolizine of the formula (I)



(I)

and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2, which may be the same or different, each represent hydrogen, lower alkyl, lower alkoxy or halogen and R represents $-CXNHR^3$ (where X is O, S or $=NH$ and R^3 is hydrogen or lower alkyl) or $-(CH_2)_nR^4$ (where n is 0 or 1 and R^4 is a phenyl group or a phenyl group substituted by one or more substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, alkylenedioxy, amino, lower alkylamino di-loweralkylamino and trifluoromethyl) with the proviso that when R is phenyl R^1 and R^2 are not both lower alkoxy.

11. A method of lowering and blood pressure in a warm blooded mammal which comprises administering to said mammal a hypotensively or antihypertensively effective amount of a compound selected from the group consisting of a benzoquinolizine of the formula (I)



(I)

and a pharmaceutically acceptable acid addition salt thereof,

where R^1 and R^2, which may be the same or different, each represent hydrogen, lower alkyl, lower alkoxy or halogen and R represents $-CXNHR^3$ (where X is O, X, or $=NH$ and R^3 is hydrogen or lower alkyl) or $-(CH_2)_nR^4$, where n is 0 or 1 and R^4 is a phenyl group or a phenyl group substituted by one or more substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, alkylenedioxy, amino, lower alkylamino, di-loweralkylamino and trifluoromethyl.

12. A method of treating ulcers in a warm blooded mammal which comprises administering to said mammal an anti-secretory effective amount of a compound selected from the group consisting of 2-(1,3,4,6,7,11bα-hexahydro-2H-benzo[a]-quinolizin-2-ylidene)-hydrazinecarbothioamide and 2-(1,3,4,6,7,11bα-hexahydro-H-benzo[a]quinolizin-2-ylidene)-hydrazinecarboxamide and their pharmaceutically acceptable said addition salts.

4,235,911

HYDANTOIN DERIVATIVES

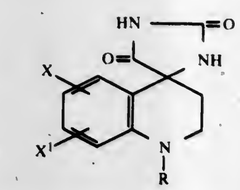
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 13, 1979, Ser. No. 48,004

Int. Cl.³ C07D *471/10*; A61K *31/47*

U.S. Cl. 424—258 **8 Claims**

1. A compound selected from the group consisting of tetrahydroquinoline-derived spiro-hydantoin bases of the formula



I

and the pharmaceutically acceptable acid addition salts thereof, wherein

X is hydrogen and X^1 is lower alkoxy, fluorine, chlorine, bromine or phenyl; or

X and X^1, when taken separately, are each lower alkoxy, chlorine or phenyl, and when taken together are $-OCH_2(CH_2)_nO-$ wherein n is zero or one; and

R is hydrogen or lower alkyl.

7. A method for treating a diabetic host to prevent or alleviate ocular or neuritic diabetes-associated chronic complications, which comprises administering to said diabetic host an alleviating or prophylactically effective amount of a compound as claimed in claim 1.

4,235,912

BIOLOGICALLY ACTIVE NEW 8β-HYDRAZINOMETHYL-ERGOLINE DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

Tivadar Rettegi; Erzsebet Mago nee Karacsony; Lajos Toldy; Jozsef Borsi, and Laszlo Tardos, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

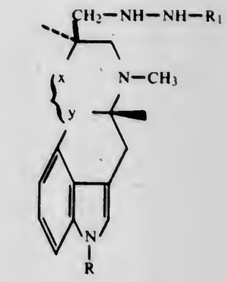
Filed Mar. 19, 1979, Ser. No. 21,947

Claims priority, application Hungary, Mar. 20, 1978, GO 1394

Int. Cl.³ C07D *457/02*; A61K *31/48*

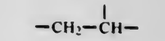
U.S. Cl. 424—261 **8 Claims**

1. An 8β-hydrazinomethyl-ergoline compound of the formula (I),

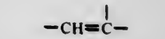


wherein

$\overline{x\,y}$ is

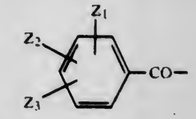


or



R is hydrogen or methyl, and

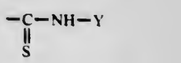
R_1 is hydrogen, lower alkylcarbonyl, a di-(lower)-alkylaminocarbonyl, a group of the formula (VI),



wherein

Z_1, Z_2 and Z_3 each represent hydrogen, halogen or trifluoromethyl,

or a group of the formula (VII),



(VII)

wherein

Y is lower alkyl, allyl or phenyl,

or an acid-addition salt thereof.

5. An antiserotonine antidepressant or hypotensive composition containing as active ingredient a compound as defined in claim 1, or a pharmaceutically acceptable acid addition salt thereof, together with a conventional pharmaceutical carrier and/or auxiliary agent.

4,235,913

9-HYDROXYHEXAHYDRODIBENO[B,D]PYRANS, 1-SUBSTITUTED-9-HYDROXYHEXAHYDRODIBENZO]B,D]PYRANS

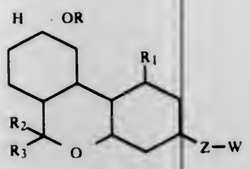
Michael R. Johnson, and Lawrence S. Melvin, Jr., both of Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 904,192, May 9, 1978, Pat. No. 4,165,323, which is a division of Ser. No. 804,306, Jun. 7, 1977, Pat. No. 4,118,559. This application Feb. 14, 1979, Ser. No. 11,785

Int. Cl.³ A61K *31/35*, *31/44*; C07D *213/30*, *311/04*

U.S. Cl. 424—263 **46 Claims**

1. A compound having the formula



wherein OR is selected from the group consisting of hydroxy and alkanoyloxy having from one to five carbon atoms;

R_1 is selected from the group consisting of hydrogen, methyl, hydroxymethyl, alkanoyloxymethyl having from one to five carbon atoms in the alkanoyl moiety, formyl, carboxy, carbamyl, alkylsulfonamido having from one to six carbon atoms, phenalkylsulfonamido having from one to four carbon atoms in the alkyl moiety, and NR_4R_5 wherein R_4 is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; and R_5 is selected from the group consisting of R_4 and alkanoyl having from one to four carbon atoms, with the proviso that when R_5 is alkanoyl, R_4 is hydrogen;

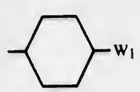
each of R_2 and R_3 is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

(a) alkylene having from one to ten carbon atoms;

(b) $-(alk_1)_m\text{-}O\text{-}(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to ten carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than ten; each of m and n is 0 or 1; and

W is selected from the group consisting of hydrogen, pyridyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro;

and the pharmaceutically acceptable acid addition salts of those compounds wherein R_1 is NR_4R_5 and/or W is pyridyl.

4,235,914

PSYCHOTROPIC γ-(HETEROCYCLIC SUBSTITUTED) BUTYROPHENONES

Kikuo Sasajima, Toyonaka; Keiichi Ono, Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 663,763, Mar. 4, 1976, abandoned. This application Oct. 17, 1978, Ser. No. 952,104

Claims priority, application Japan, Mar. 5, 1975, 50/27489; Nov. 18, 1975, 50/138836

Int. Cl.³ A61K *31/445*; C07D *211/52, 235/26, 471/10*

U.S. Cl. 424—267 **6 Claims**

1. γ-[4-(3-Trifluoromethylphenyl)-4-hydroxypiperidino]-2-hydroxy-4-fluorobutyrophenone, or a pharmaceutically acceptable acid addition salt thereof.

2. γ-[4-(2-Keto-1-benzimidazolinyl)piperidin-1-yl]-2-hydroxy-4-fluorobutyrophenone, or a pharmaceutically acceptable acid addition salt thereof.

3. γ-[4-Oxo-1-phenyl-1,3,8-triazaspiro[4,5]-decan-8-yl]-2-hydroxy-4-fluorobutyrophenone, or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating a patient suffering from mental disease which comprises administering to said patient an effective psychotropic amount of a compound according to any one of claims 1, 2 or 3.

4,235,915

βADRENERGIC BLOCKING PIPERIDINO UREAS AND THIOUREAS

John L. Archibald, Windsor, and Terence J. Ward, Slough, both of England, assignors to John Wyeth & Brother Limited, Taplow, England

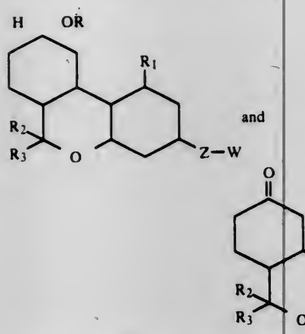
Filed Dec. 5, 1977, Ser. No. 857,334

Claims priority, application United Kingdom, Dec. 11, 1976, 51781/76

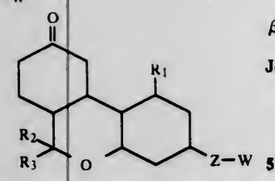
Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **1 Claim**

1. A method of treating or preventing coronary artery disorders in a warm blooded animal afflicted with a disorder requiring β-blocking therapy, which comprises administering to said animal a therapeutically effective amount therefor of a compound having the formula

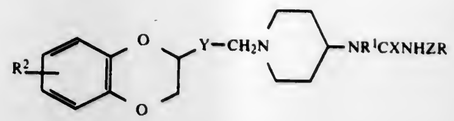


and



wherein OR is selected from the group consisting of hydroxy and alkanoyloxy having from one to five carbon atoms;

R_1 is selected from the group consisting of hydrogen, methyl, hydroxymethyl, alkanoyloxymethyl having from one to five carbon atoms in the alkanoyl moiety, formyl, carboxy, carbamyl, alkylsulfonamido having from one to



in which:

X represents oxygen or sulphur;

Y represents —CHOH—;

Z represents



or a direct bond;

R represents cycloaklyl group having 5 to 7 carbon atoms; phenyl; phenyl substituted by at least one member selected from the group consisting of halogen, lower alkyl, lower alkoxy, methylenedioxy, perhalo lower alkyl, nitro, amino and hydroxy; thienyl, furyl or pyridyl; or when Z is a direct bond R also represents hydrogen;

R^1 represents hydrogen or lower alkyl;

and

R^4 represents hydrogen, halogen, lower alkyl or lower alkoxy;

or

a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof, together with a pharmaceutically acceptable carrier.

4,235,916

2-METHYLTHIO-6-FLUORO-9-(1-METHYL-4-PIPERIDYLIDENE)-THIOXANTHENE AND SALTS THEREOF, NEUROLEPTIC COMPOSITIONS AND METHOD OF USE

Klaus P. Bogeso, Kgs. Lyngby, Denmark, assignor to Kefalas A/S, Copenhagen-Valby, Denmark

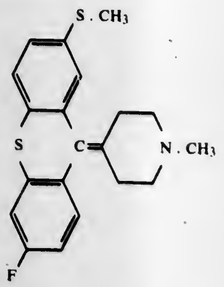
Filed Dec. 20, 1978, Ser. No. 971,509

Claims priority, application United Kingdom, Dec. 29, 1977, 54175/77

Int. Cl.³ A61K *31/445*; C07D *417/04*; A61K *31/38*

U.S. Cl. 424—267 **9 Claims**

1. A compound selected from the group consisting of (1) 2-methylthio-6-fluoro-9-(1-methyl-4-piperidylidene)-thioxanthene of the formula:



and (2) a non-toxic acid addition salt thereof.

8. The method of producing a neuroleptic effect in a warm-blooded animal, comprising the step of administering to the said warm-blooded animal an effective neuroleptic amount of a compound of claim 1.

4,235,917

N-ALKYL-N-ACYL DERIVATIVES OF THIENAMYCIN

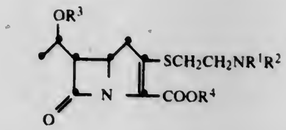
Burton G. Christensen, Metuchen, and William J. Leanza, Berkeley Heights, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 5, 1977, Ser. No. 793,974

Int. Cl.³ A61K *31/40*; C07D *487/04*

U.S. Cl. 424—274 **6 Claims**

1. A compound having the structural formula:



and the pharmaceutically acceptable salts thereof wherein:

R^1 is selected from the group consisting of loweralkyl; loweralkenyl and benzyl;

R^4 is selected from the group consisting of hydrogen, methyl, t-butyl, phenacyl, p-bromophenacyl; pivaloyloxymethyl, 2,2,2-trichloroethyl, allyl, 3-methyl-2-butenyl, 2-methyl-2-propenyl, benzyl, benzylhydryl, p-t-butylbenzyl, phthalidyl, phenyl, 5-indanyl, acetylthiomethyl, acetoxymethyl, propionyloxymethyl, methallyl, 3-butenyl, 4-pentenyl, 2-butenyl, acetoxyacetylmethyl, pivaloylacetylmethyl, diethylaminoethyl, dimethylaminoethyl, methoxymethyl, p-acetoxybenzyl, p-pivaloylbenzyl, p-isopropoxybenzyl, 5-indanylmethyl, benzyloxymethyl, methylthioethyl, dimethylaminoacetoxymethyl, crotonolacton-3-yl, acetamidomethyl, acetylthioethyl, pivaloylthiomethyl and methylthiomethyl;

R^3 is selected from the group consisting of hydrogen, loweralkyl and loweralkanoyl; and

R^2 is selected from the group consisting of formyl, loweralkoxycarbonyl, benzyloxycarbonyl, loweralkenylcarbonyl, loweralkynylcarbonyl and loweralkanoyl which may be substituted by halo, amino, mono- or diloweralkylamino, guanidino or carbamoyl.

6. An antibiotic pharmaceutical composition consisting essentially of, in unitary dosage form, a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,235,918

BENZENESULFONAMIDE DERIVATIVES AND PROCESSES FOR THEIR MANUFACTURE

Hans-Jochen Lang, Hofheim; Roman Muschaweck, and Max Hropot, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

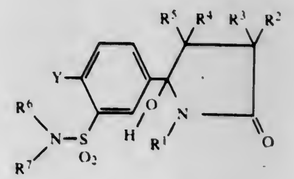
Filed Aug. 16, 1978, Ser. No. 934,063

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737195

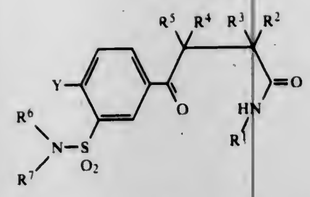
Int. Cl.³ C07D *207/26*; C07C *143/78*; A61K *31/40, 31/18*

U.S. Cl. 424—274 **14 Claims**

1. A benzenesulfonamide derivative of the formula I



and in its tautomeric form of the formula



Ia

in which R^1 denotes hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkyl of 1 to 4 C atoms substituted with a methoxy group, cycloalkyl of 3 to 5 ring members or benzyl; R^2 to R^6 denote hydrogen, or an alkyl radical of 1 to 4 C atoms; R^7 denotes hydrogen, alkyl of 1 to 10 C atoms, alkyl radical of 1 to 10 C atoms substituted with one to two methoxy groups, an ethylenedioxy, or propylenedioxy group, alkenyl of 3 to 5 C atoms, cycloalkyl of 3 to 12 ring members, or cycloalkyl of 3 to 12 ring members substituted with a methyl group, cycloalkylalkyl of 5 or 6 ring members of 1 or 2 C atoms in the alkyl moiety thereof, phenylalkyl of 1 to 2 C atoms in the alkyl moiety thereof, monosubstituted or disubstituted phenylalkyl of 1 to 2 C atoms in the alkyl moiety thereof wherein the substituent is methyl, methoxy or chlorine; or R^6 and R^7, joined together with the N atom denote a saturated 5-membered to 6-membered heterocyclic ring and Y denotes hydrogen, methyl, halogen, or trifluoromethyl.

13. A pharmaceutical formulation in a therapeutic unit dosage from 0.5 to 500 mg and an adjuvant and/or a pharmaceutically acceptable carrier therefor which comprises as an essential component a compound as defined in claim 1.

4,235,919

1-(INDOL-4-YLOXY)-3-(2-SUBSTITUTED AMINO)-2-PROPANOLS AND PHARMACEUTICAL USE THEREOF

Richard Berthold, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

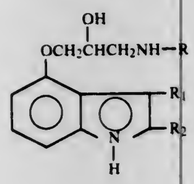
Filed Jul. 17, 1978, Ser. No. 925,196

Claims priority, application Switzerland, Jul. 21, 1977, 9065/77; Jul. 21, 1977, 9069/77; Jul. 21, 1977, 9070/77; Jul. 21, 1977, 9072/77; Jul. 21, 1977, 9073/77; Jul. 21, 1977, 9077/77

Int. Cl.[1] **A61K** *31/40;* **C07D** *209/18, 209/00*

U.S. Cl. 424—274 **38 Claims**

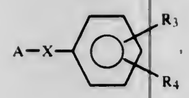
1. A compound of formula I



I

wherein

R is a group



wherein

A is alkylene of 2 to 5 carbon atoms,

X is a bond, oxygen or sulfur,

R_3 is hydrogen, hydroxy, alkoxy of 1 to 4 carbon atoms, halogen of atomic member of from 9 to 35, cyano, carbamoyl or a group $NHCOR_d$, wherein R_d is alkyl of 1 to 4 carbon atoms, and

R_4 is hydrogen and, when R_3 is alkoxy of 1 to 4 carbon atoms, R_4 additionally may be alkoxy of 1 to 4 carbon atoms or, when R_3 is halogen of atomic number of from 9 to 35, R_4 additionally may be halogen of atomic number of from 9 to 35

either

(i) R_1 is hydrogen or methyl and

R_2 is cyano, $CONR_aR_b$, $COOR_c$ or CH_2OR_e, wherein R_a,R_b,R_c and R_e independently are hydrogen or alkyl of 1 to 4 carbon atoms,

or

(ii) either R_1 is methyl and R_2 is halogen of atomic number of from 17 to 35

or

R_1 is halogen of atomic number of from 17 to 35 and R_2 is hydrogen or methyl,

with the provisos that

(a) X is separated from the nitrogen atom of the 3-amino-2-hydroxypropoxy chain by at least 2 carbon atoms,

(b) when X is a bond, R_3 is other than hydrogen and

(c) when R_2 is cyano, R additionally may be alkyl of 3 to 7 carbon atoms,

in free form or in pharmaceutically acceptable salt form.

3. A method of treating diseases related to an adrenergic vasoconstriction, or coronary diseases, or diseases related to an inhibition of bowel motility, or arrhythmies, or hypertension, or lipolysis in the blood, hyperglycemia, appetite or myocardial infarction induced by emotional stress, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,235,920

N-ALKYLATED DERIVATIVES OF THIENAMYCIN

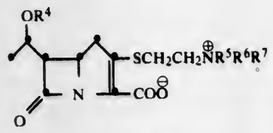
Burton G. Christensen, Metuchen; Raymond A. Firestone, Fanwood, and William J. Leanza, Berkeley Heights, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 733,611, Oct. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 634,297, Nov. 21, 1975, abandoned. This application Dec. 16, 1977, Ser. No. 861,235

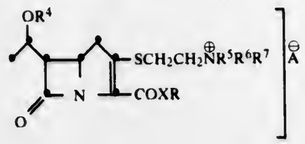
Int. Cl.[3] **C07D** *407/04;* **A61K** *31/40*

U.S. Cl. 424—274 **8 Claims**

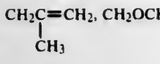
1. A compound having the structural formulae:



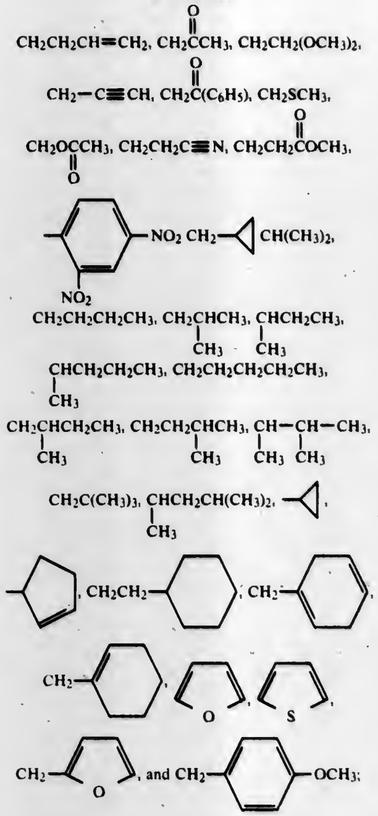
or



wherein R^4 is a member selected from the group consisting of hydrogen, loweralkyl, sulfo, loweralkoxyloweralkyl, loweralkoxycarbonyl, loweralkanoyl and aminoloweralkanoyl; R^5, R^6, and R^7 are independently selected from the group consisting of hydrogen (not all of R^5, R^6 and R^7 are hydrogen at the same time), CH_3, CH_2CH_3, $CH_2CH{=}CH_2$, $CH_2CH_2CH_3$, $CH_2(C_6H_5)_2$, $CH(C_6H_5)$, $C(C_6H_5)_3$,



-continued



X of the group, —COXR is O or S; R is selected from the group consisting of hydrogen, methyl, t-butyl, phenacyl, p-bromophenacyl; pivaloyloxymethyl, 2,2,2-trichloroethyl, allyl, 3-methyl-2-butenyl, 2-methyl-2-propenyl, benzyl, benzylhydryl, p-t-butylbenzyl, phthalidyl, phenyl, 5-indanyl, acetylthiomethyl, acetoxymethyl, propionyloxymethyl, methallyl, 3-butenyl, 4-pentenyl, 2-butenylacetoxyacetylmethyl, pivaloylacetylmethyl, diethylamino, dimethylaminoethyl, methoxymethyl, p-acetoxybenzyl, p-pivaloylbenzyl, p-isopropoxybenzyl, 5-indanylmethyl, benzyloxymethyl, methylthioethyl, dimethylaminoacetoxymethyl, crotonolacton-3-yl, acetamidomethyl, acetylthioethyl, pivaloylthiomethyl, methylthiomethyl; and A is a pharmaceutically acceptable anion.

8. An antibiotic pharmaceutical composition consisting essentially of a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,235,921

TREATING MUSCULAR SPASMS AND CONVULSIONS WITH 3-AZABICYCLO[3.1.0]HEXANES

Roland Achini, Therwil; Wolfgang Oppolzer, Thonex, and Beat Gähwiler, Münchenstein, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

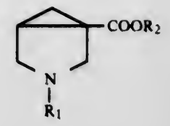
Continuation of Ser. No. 746,605, Dec. 1, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,512

Claims priority, application Switzerland, Dec. 2, 1975, 15643/75

Int. Cl.[3] **A61K** *31/40;* **C07D** *209/52*

U.S. Cl. 424—274 **21 Claims**

1. A compound of formula I,



I

wherein

R_1 is hydrogen; alkyl of 1 to 5 carbon atoms; cycloalkyl of 5 to 7 carbon atoms; alkyl of 1 to 4 carbon atoms mono-substituted by cycloalkyl of 3 to 7 carbon atoms; phenylalkyl of 7 to 11 carbon atoms in the aggregate thereof, wherein the phenyl ring is unsubstituted or mono-substituted by halogen of atomic number from 9 to 35, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms; alkenyl of 3 to 5 carbon atoms wherein the multiple bond is other than in the α,β position; or 2-hydroxyethyl, and

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms,

in free form, in pharmaceutically acceptable acid addition salt form or, when R_2 is hydrogen, in pharmaceutically acceptable salt form.

3. A method of treating muscular spasms or convulsions, in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,235,922

3-(2-AMINOETHYLTHIO)-6-ETHYL-7-OXO-1-AZABICYCLO [3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID

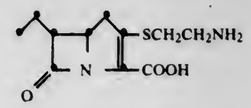
Ronald W. Ratcliffe, Matawan, and Linda J. Ruswinkle, Rahway, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 861,230, Dec. 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 785,811, Apr. 8, 1977, abandoned. This application Jun. 15, 1979, Ser. No. 48,944.

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/40*

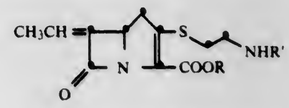
U.S. Cl. 424—274 **8 Claims**

1. A compound having the structural formula:

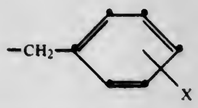


and its pharmaceutically acceptable salts

2. A compound having the structural formula:



wherein R is a member selected from the group consisting of hydrogen, benzyl and



wherein X is a member selected from the group consisting of nitro and lower alkoxy; and R' is a member selected from the group consisting of hydrogen, bromo-t-butoxy-carbonyl, chloro-t-butoxycarbonyl, bromoethoxycarbonyl, benzyloxycarbonyl and p-nitrobenzyloxycarbonyl.

6. An antibiotic pharmaceutical composition consisting essentially of a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,235,923

ESTERS OF 3-SUBSTITUTED-2-(AMINOCARBONYL)OXIRANECARBOXYLIC ACIDS AS LIPOGENESIS INHIBITORS

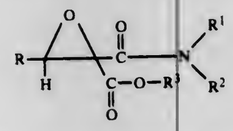
Harry G. Durham, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 926,368, Jul. 20, 1978, abandoned, which is a continuation of Ser. No. 784,097, Apr. 4, 1977, abandoned. This application May 4, 1979, Ser. No. 36,116

Int. Cl.[2] **A61K** *31/335*

U.S. Cl. 424—278 **1 Claim**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally an effective amount of a compound of the formula:



wherein R is alkyl, cycloalkyl, alkenyl, alkynyl, or cycloalkylalkyl, or is phenyl, or phenyl substituted by one or two of nitro, lower alkyl or alkoxy, or halogen, or is benzoyl, R^3 is alkyl, alkenyl, alkynyl or cycloalkyl, and R^1 and R^2 each is hydrogen, one of the moieties represented by R^3.

4,235,924

PROSTACYCLIN ANALOGS OF THE 1 SERIES AND RELATED ANALOGS WHEREIN THE CARBOXYLIC ACID FUNCTION HAS BEEN REPLACED

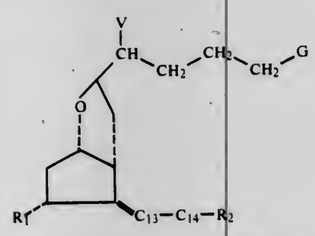
Charles V. Grudzinskas, Nyack; Allan Wissner, Ardsley, both of N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1979, Ser. No. 46,511

Int. Cl.[3] **A61K** *31/557*; **C07D** *307/935*

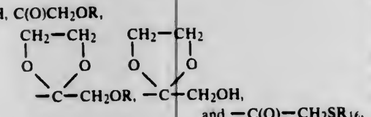
U.S. Cl. 424—278 **54 Claims**

1. A compound of the formula:

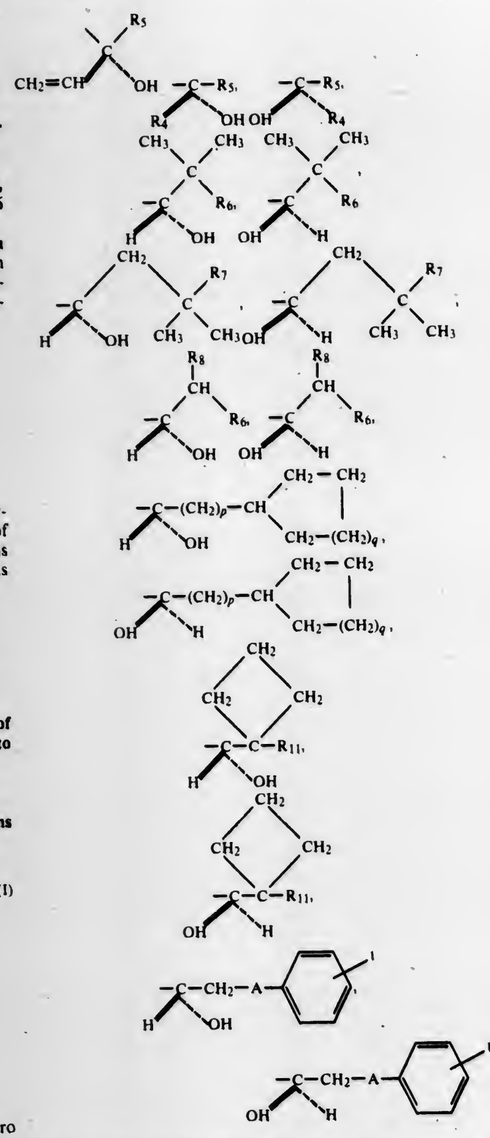


(I)

wherein V is selected from the group hydrogen, bromo, chloro and iodo, G is selected from the group

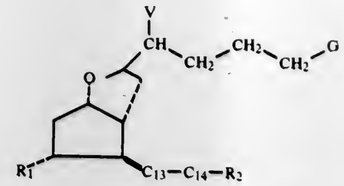


wherein R is C_1 to C_6 alkyl, or optionally substituted phenyl, the substituents selected from the group C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo and trifluoromethyl, R_1 is hydrogen or hydroxy and R_{16} is C_1 to C_6 alkyl; C_{13} to C_{14} is selected from the group —CH=CH—(trans) and $-CH_2CH_2-$, R_2 is selected from the group



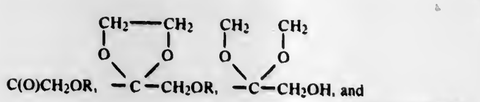
A is a divalent radical selected from $-CH_2-$ and —O—, R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4-C_7 alkyl; R_6 is selected from the group consisting of C_3-C_6 alkyl; R_7 is selected from the group consisting of C_2-C_4 alkyl; R_8 is selected from the group consisting of C_1-C_2 alkyl; R_{11} is selected from the group consisting of C_3-C_7 alkyl; p is an integer from 0 to 3; q is 1 or 2 and t is selected from the group hydrogen, chloro, fluoro, dichloro, trifluoro-methyl and methoxy, the racemic mixtures thereof; the mirror images thereof, and the pharmaceutically acceptable, non-toxic salts thereof.

54. A composition effective in causing bronchodilation in mammals which comprises a bronchodilatory effective amount of compounds of the formula:

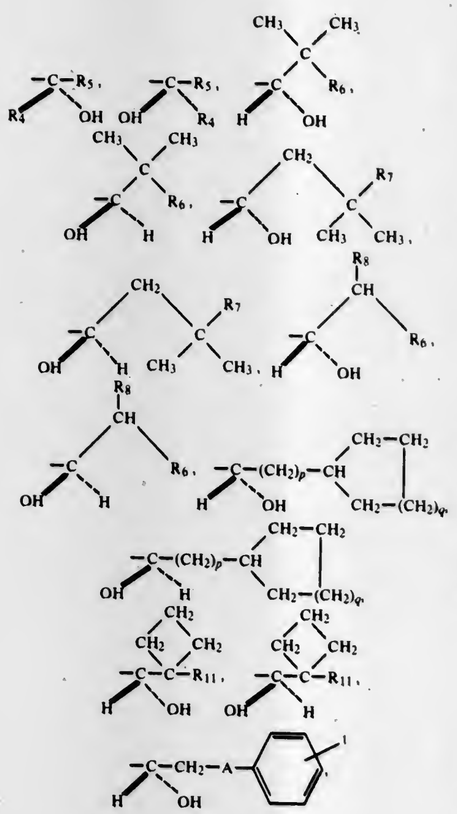


(I)

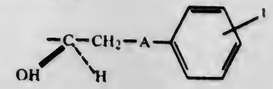
wherein V is selected from the group hydrogen, bromo, chloro and iodo, G is selected from the group



wherein R is C_1 to C_6 alkyl, or optionally substituted phenyl, the substituents selected from the group C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo and trifluoromethyl, R_1 is hydrogen or hydroxy and R_{16} is C_1 to C_6 alkyl; C_{13} to C_{14} is selected from the group —CH=CH—(trans) and $-CH_2CH_2-$, R_2 is selected from the group



-continued



A is a divalent radical selected from $-CH_2-$ and —O—, R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4-C_7 alkyl; R_6 is selected from the group consisting of C_3-C_6 alkyl; R_7 is selected from the group consisting of C_2-C_4 alkyl; R_8 is selected from the group consisting of C_1-C_2 alkyl; R_{11} is selected from the group consisting of C_3-C_7 alkyl; p is an integer from 0 to 3; q is 1 or 2 and t is selected from the group hydrogen, chloro, fluoro, dichloro, trifluoro, methyl and methoxy, the racemic mixtures thereof; the mirror images thereof, and the pharmaceutically acceptable, non-toxic salts thereof in a pharmacologically suitable carrier.

♦

4,235,925

N-BENZOYLANTHRANILATE DERIVATIVES AS PHYTOPATHOGENIC FUNGICIDAL AGENTS

Osamu Kirino, Ashiya; Toshiro Kato, Ibaraki, and Shigeo Yamamoto, Ikeda, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

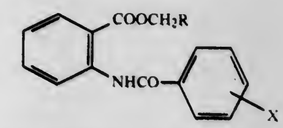
Filed Dec. 20, 1977, Ser. No. 862,527

Claims priority, application Japan, Jan. 6, 1977, 52-693; Feb. 8, 1977, 52-13447; Mar. 10, 1977, 52-26727; Jun. 3, 1977, 52-65973

Int. Cl.[3] **A01N** *43/16, 37/10*

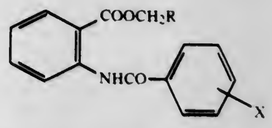
U.S. Cl. 424—282 **18 Claims**

1. A method of killing phytopathogenic fungi which comprises contacting said fungi with a fungicidally effective amount of a N-benzoylanthranilate of the formula,



wherein X is a hydrogen or 3-halogen atom or a 3-methoxy, 4-methoxy, 2,4-dimethoxy, 3,4-dimethoxy, 3-halo-4-methoxy, 3,4-methylenedioxy or 3,5-dimethoxy group and R is a hydrogen atom or a C_1-C_7 alkyl, C_3-C_6 cycloalkyl, C_2-C_4 alkenyl, halo-C_1-C_3 alkyl, C_1-C_4 alkoxy C_1-C_4 alkyl or N,N-di-C_1-C_2 alkylamino C_1-C_4 alkyl group, and an inert carrier.

15. A method of killing phytopathogenic fungi which comprises contacting said fungi with a fungicidally effective amount of a N-benzoylanthranilate of the formula,



wherein X is a 3,4-methylenedioxy group and R is a hydrogen atom or a methyl, ethyl, n-propyl or methoxymethyl group.

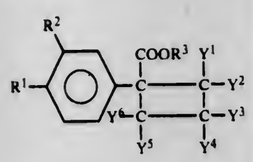
4,235,926

INSECTICIDAL ESTERS

George Holan, Brighton, and David F. O'Keefe, Mount Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Dec. 15, 1978, Ser. No. 969,862
Claims priority, application Australia, Dec. 19, 1977, PD2818
Int. Cl.³ A01N *43/16*; C07D *317/44, 121/66*
U.S. Cl. 424—282 11 Claims

1. The (+), (−) and (±) forms of the compounds of the general formula I

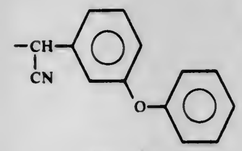


I

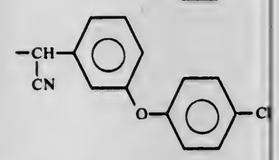
whereon R^1 is hdrogen or a methoxy, ethoxy, propoxy, butoxy, tetrafluoroethoxy, methylthio, ethylthio, propylthio, fluoro, chloro, bromo, methyl, ethyl, or nitro group, and R^2 is hydrogen or a methyl group, or R^1 and R^2 together form a methylenedioxy group;

R^3 is hydrogen, or a lower alkyl group, or one of the following groups (c) or (f):

(c)



(f)



and Y^1, Y^2, Y^3, Y^4, Y^5 and Y^6 are the same or different groups and each is hyrogen or a fluoro, bromo or chloro group, with the proviso that one of Y^1 to Y^6 is other than hydrogen.

7. Insecticidal compositions comprising an insecticidal effective amount of one or more of the compounds of formula I, as stated in claim 1, where R^3 is one of the groups (c) or (f), incorporated in a suitable inert liquid or solid carrier.

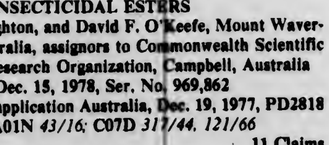
4,235,927

INSECTICIDAL BENZYLFURYLMETHYL PERHALOALKYLVINYLCYCLOPROPANECARBOXYLATES

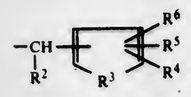
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 12,266, Feb. 15, 1979, abandoned, Ser. No. 927,198, Jul. 24, 1978, abandoned, and Ser. No. 870,973, Jan. 20, 1978, abandoned. This application Jul. 6, 1979, Ser. No. 55,212
Int. Cl.³ A01N *9/28*; C07D *307/54*
U.S. Cl. 424—285 9 Claims

1. An insecticidal compound of the formula



wherein one of Y and Z is a perhaloalkyl group having 1 to 4 carbon atoms and the other is hydrogen, halogen, or lower alkyl; R is $—OR^1$ wherein R^1 is represented by the formula



in which R^2 is hydrogen, lower alkyl, ethynyl, cyano, or trihalomethyl; R^3 is a divalent oxygen; R^4 is benzyl which may be substituted with one to three substituents selected from halogen or lower alkyl; R^5 and R^6 are independently hydrogen, lower alkyl, or halogen.

6. 5-Benzyl-3-furylmethyl 3-[2-chloro-3,3,3-trifluoropropenyl]-2,2-dimethylcyclopropanecarboxylate.

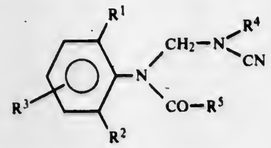
4,235,928

SUBSTITUTED CYANAMIDES AND THEIR USE AS FUNGICIDES

Karl Eicken, Wachenheim; Peter Plath, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,017
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854600
Int. Cl.³ A01N *47/12*; C07C *125/08, 121/78*
U.S. Cl. 424—300 3 Claims

1. A substituted cyanamide of the formula



where R^1 denotes C_1–C_4-alkyl or C_1–C_4-alkoxy, R^2 denotes hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, R^3 denotes hydrogen, C_1–C_4-alkyl or halogen, R^4 denotes C_1–C_6-alkoxycarbonyl, C_3–C_4-alkenoxycarbonyl, C_1–C_6-alkylthiocarbonyl, or cyano, and R^5 denotes C_1–C_6-alkyl which is unsubstituted or substituted by lower alkoxy, alkylthio, cyano or by halogen; unsubstituted or halogen-substituted C_2–C_5-alkenyl; C_2–C_4-alkynyl; C_3–C_7-cycloalkyl; or R^5 denotes unsubstituted phenyl or phenyl substituted by from one to three identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, trifluoromethyl, cyano, nitro, C_1–C_4-alkyl, and C_1–C_4-alkoxy.

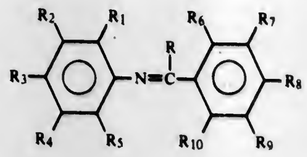
4,235,929

METHOD OF TREATMENT

George W. Nuss, Jr., Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 839,960, Oct. 6, 1977. This application Mar. 2, 1979, Ser. No. 16,826
Int. Cl.² A61K *31/135, 31/255, 31/267, 31/275*
U.S. Cl. 424—301 1 Claim

1. A method of treating inflammation in warmblooded animals comprising topically administering to an animal in need of treatment an effective amount of a compound of the formula:



(I)

where:

R is hydrogen or alkyl;

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} may be the same or different and are hydrogen, alkyl, cyano, nitro, amino, haloloweralkoxy, haloloweralkyl, halo, loweralkoxy, acyl, acyloxy, thio, acylthio, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl and hydroxy,

with the proviso that at least one of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} is thio, acylthio, loweralkylthio, loweralkylsulfinyl or loweralkylsulfonyl,

R_3 and R_8 may also be cycloalkyl, cycloalkenyl, and aryl.

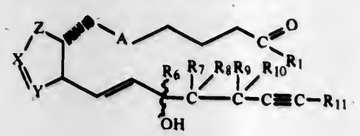
4,235,930

NOVEL ACETYLENIC PROSTAGLANDINS AND PROCESSES FOR THE PREPARATION THEREOF

Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Walter Elger; Olaf Loge, and Ekkehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering, A.G., Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,523
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729960
Int. Cl.³ C07C *177/00*; A61K *31/557*
U.S. Cl. 424—305 29 Claims

1. A prostane derivative of the formula



wherein

R_1 is the residue OR_2 and R_2 is hydrogen, C_{1-10} alkyl, C_{4-10} cycloalkyl, phenyl, naphthyl or a 5- or 6-membered hetero monocycle containing one hetero atom of O, N or S;

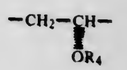
A is cis-CH=CH—

Z is carbonyl or

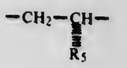


wherein the OR_4 group can be in the α- or β-position and R_4 is H or an acyl group derived from a hydrocarbon carboxylic or sulfonic acid of up to 15 carbon atoms, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl or tri-o-benzylsilyl

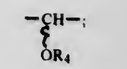
X—Y is



wherein R_4 is as defined above, $—CH_2—CH_2—$ or



wherein R_5 is alkyl of 1–5 carbon atoms, if Z is carbonyl or



X—Y represents —CH=CH— if Z is carbonyl;

R_6, R_7, R_8, R_9 and R_{10} each independently is hydrogen or an alkyl group of 1–5 carbon atoms; and

R_{11} is alkyl of 1–5 carbon atoms;

and if R_2 is hydrogen, the salts thereof with physiologically compatible bases.

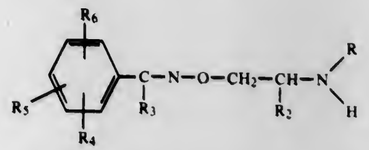
4,235,931

COMPOUNDS HAVING PHARMACOLOGICAL PROPERTIES

Jan van Dijk, and Jenkin E. Davies, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Division of Ser. No. 639,571, Dec. 10, 1975, Pat. No. 4,192,848, which is a division of Ser. No. 517,519, Oct. 24, 1979, Pat. No. 3,937,841, which is a division of Ser. No. 279,971, Aug. 11, 1972, abandoned, which is a division of Ser. No. 715,571, Mar. 25, 1968, Pat. No. 3,692,835. This application Feb. 6, 1978, Ser. No. 875,433
Claims priority, application Netherlands, Apr. 5, 1967, 6704810; Dec. 14, 1967, 6717001
Int. Cl.² A61K *31/15*
U.S. Cl. 424—327 4 Claims

1. The method of combatting depression in a mammal exhibiting depressive symptoms comprising administering to said mammal an antidepressively effective quantity of an antidepressive composition suitable for administration to mammals comprising an antidepressively effective amount of a compound of the formula



or salts thereof with pharmaceutically acceptable acids wherein R_1 is hydrogen or methyl, R_2 is hydrogen or methyl, R_3 is hydrogen, alkyl, alkoxyalkylene, alkylthioalkylene, alkylsulfoxyalkylene, alkylsufonalkylene, each of up to 8 carbon atoms or benzyl, R_4 is alkylthio of up to 6 carbon atoms, R_5 and R_6 are each hydrogen, halogen, alkyl, alkoxy, alkylthio each of up to 6 carbon atoms, benzyloxy, hydroxy, amino, alkylamino of 1 or 2 carbon atoms, dialkylamino wherein each alkyl is of 1 or 2 carbon atoms or trifluoromethyl or meta nitro with the

proviso that at least one of R_1, R_2 and R_3 is other than hydrogen when R_5 and R_6 are orthochloro.

4,235,932

PESTICIDAL 1,4-BIS-[(-PROPYNYLOXY)-METHYL]-BENZENE AND 1,4-BIS-[(2-PROPYNYLOXY)-METHYL] CYCLOHEXANE

Silvia Dorn, Dielsdorf; Albert Pfiffner, and Rene Zurflüh, both of Bülach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 29, 1979, Ser. No. 43,204

Claims priority, application Switzerland, May 31, 1978, 5957/78

Int. Cl.³ A01N *31/00*

U.S. Cl. 424—339 **6 Claims**

1. An insecticical and acaricidal composition which comprises inert carrier material and, as the active ingredient, an amount which is effective as an insecticide and acaricide, of a compound of the formula

$$HC{\equiv}C{-}CH_2{-}O{-}CH_2{-}X{-}CH_2{-}O{-}CH_2{-}C{\equiv}CH$$

wherein X is



4,235,933

PROCESS FOR CONVERTING WHEY PERMEATE TO OIL-CONTAINING YEAST

Nancy J. Moon, Griffin, Ga., and Earl G. Hammond, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 2, 1978, Ser. No. 902,242

Int. Cl.³ A23C *9/12*; A23L *1/28*; C12N *1/16*; C12R *1/72*

U.S. Cl. 426—41 **5 Claims**

1. A process for converting the solids of whey permeate to a triglyceride oil-containing yeast cell mass, said permeate solids having been obtained by ultrafiltration of whey and being composed principally of lactose together with a minor amount of soluble protein, comprising the steps of:

(a) preparing an aqueous fermentation medium from said permeate solids, said medium containing from 2 to 25% by weight of said permeate solids;

(b) inoculating said medium with a fat-producing strain of *Candida curvata*, said strain being capable of producing visible droplets of fat in the yeast cells of a size of at least 1.2 microns; and

(c) subjecting said medium to aerated fermentation until at least 90% of the lactose therein has been consumed and the yeast cells have reached the fattening growth phase with visible droplets of fat therein of a size of at least 1.2 microns, said yeast cells on a dry weight basis on completion of said fermentation containing at least 40% by weight triglyceride oil.

4,235,934

PRODUCTION OF STERILE YOGHURT

Franz Egli, and Franz Egli, both of Lucerne, Switzerland, assignors to Zentralschweizerischer Milchverbrand, Lucerne, Switzerland

Continuation of Ser. No. 858,290, Dec. 7, 1977, abandoned. This application Dec. 12, 1978, Ser. No. 968,838

Int. Cl.³ A23C *9/12*

U.S. Cl. 426—43 **16 Claims**

1. A method for the production of shelf stable and sterile yoghurt comprising the steps of:

(a) admixing a solution comprising pasteurized and homogenized milk and from 0.18 to 0.4% by weight of said milk of a milk modifying additive consisting essentially of red algae, starch, gelatin and sugar, wherein the red algae is present in the highest concentration, with from 1.5 to 4% by weight of said milk of a yoghurt culture;

(b) incubating the mixture at temperatures in the range 35° to 45° C. until the solution reaches a pH in the range 3.8 to 4.6 to form yoghurt;

(c) cooling the yoghurt to 20° to 30° C.;

(d) admixing an effective amount to control viscosity of hydrocolloid-containing stabilizers with the cooled yoghurt;

(e) swelling the stabilizers to enhance the consistency of the yoghurt;

(f) filling the yoghurt into containers and hermetically sealing the filled containers;

(g) heat sterilizing the filled containers at elevated temperatures and pressures for a time sufficient to sterilize; and

(h) cooling the sterilized containers at 4° to 6° C. for at least 24 hours.

4,235,935

PROCESS FOR THE PRODUCTION OF A BACON ANALOGUE

David P. Bone, Palantine, and Robert J. Meachewski, East Dundee, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 23, 1978, Ser. No. 880,449

Int. Cl.³ A23J *3/00*; A23L *1/27*

U.S. Cl. 426—249 **11 Claims**

1. A process for the production of a bacon analogue having self basting characteristics, resembling natural bacon in appearance, cooking characteristics, flavor, eating qualities, and texture, said process comprising:

a. preparing a first emulsion system to simulate the dark red lean portion of natural bacon, by admixing from 2–7 percent by weight heat setting protein, from 0–5 percent by weight of a protein additive selected from the group consisting of soy protein isolates, soy proteinates, peanut protein isolate, peanut proteinate, cottonseed protein isolate, and cottonseed proteinate, from 0.5–4 percent by weight starch, from 0.5–6 percent by weight vegetable gum, vitamins, coloring agents, flavoring agents, from 0.4–1.5 percent by weight surfactant, from 15–30 percent by weight water, and from 4–18 percent by weight oil or fat;

b. preparing a first emulsion system to simulate the light red lean portion of natural bacon by admixing from 2–7 percent by weight heat setting protein, from 0–5 percent by weight of a protein additive, from 0.5–4 percent by weight starch, from 0.5–6 percent by weight vegetable gum, vitamins, coloring agents, flavoring agents, from 0.4–1.5 percent by weight surfactant, from 15–30 percent by weight water, and from 4–18 percent by weight oil or fat;

c. preparing a first emulsion system to simulate the fatty portion of natural bacon, by admixing from 2–7 percent by weight heat setting protein, from 0–5 percent by weight of a protein additive, from 0.5–4 percent by weight starch, from 0.5–6 percent by weight vegetable gum, vitamins, coloring agents, flavoring agents, from 0.4–1.5 percent by weight surfactant, from 15–30 percent by weight water and from 4–18 percent by weight oil or fat;

d. preparing a second emulsion system by admixing from 0.1 to 1.0 percent by weight of a protein additive, flavoring agents, from 0.05–1 percent by weight vegetable gums, from 5–15 percent by weight water, and from 5–15 percent by weight oil or fat;

e. separately admixing the second emulsion system with each of the three differently colored first emulsion systems to produce a separate and distinct first dough, a separate and distinct second dough, and a separate and distinct third dough, said first dough resembling the dark red lean portion of natural bacon, said second dough resembling the light red lean portion of natural bacon, said third dough resembling the fatty portion of natural bacon;

f. admixing from 15–30 percent by weight of protein fibers with each of the first, second, and third doughs, said protein fibers ranging in length from 0.6–5 centimeters;

g. simultaneously and separately extruding each of the first, second, and third doughs through a common die to form a single strip that is marbled like bacon whereby the single strip is composed of alternating substrips of the first, second, and third doughs, such that a first outer border substrip, of the first dough, is adjacent and generally parallel to a next substrip of the second dough which is adjacent and generally parallel to a substrip of the third dough which is adjacent and generally parallel to a second outer border substrip, of the second dough, wherein all four substrips are oriented in parallel fashion to each other and to the longitudinal axis of the extruded single strip;

h. heating the single common strip which resembles marbled bacon; and

i. cutting the single common strip to simulate bacon slices.

4,235,936

SOFT INTERMEDIATE-MOISTURE FROZEN BEVERAGE CONCENTRATES

Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 917,379, Jun. 20, 1978, Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,154,863, and Ser. No. 763,613, Jan. 28, 1977, Pat. No. 4,146,652. This application Mar. 26, 1979, Ser. No. 24,127

Int. Cl.³ A23L *2/02*; A23F *3/00*

U.S. Cl. 426—330.3 **23 Claims**

1. A microbiologically stable beverage concentrate comprising water, sugar, flavoring and at least one of fructose and unsaturated fat, wherein the product is substantially non-crystalline at freezer temperatures and comprises about from 15 to 55% water, sugar in a ratio to water of about from 0.8–2:1 and a minor but effective amount of flavoring, provided that the solutes content is adequate to provide the product with a water activity of about 0.8 to 0.9, and in said sugar the amount of dextrose plus fructose is at least about 50% based upon the total sugar content and at least 10% of said sugar is fructose.

4,235,937

BLAND PROTEIN PRODUCT AND PROCESS

Robert K. Remer, Evanston, Ill., assignor to Hull-Smith Chemicals, Inc., Oak Brook, Ill.

Filed Aug. 14, 1978, Ser. No. 933,173

Int. Cl.³ A23C *21/00*, *21/08*

U.S. Cl. 426—534 **23 Claims**

1. A process for treating whey, comprising:

subjecting whey to blending shear forces while maintaining heat within said whey to conduct said blending step above a predetermined temperature;

incorporating a blandness imparting component into said whey during said blending and heat maintaining steps to give the whey a bland odor and taste, said blandness imparting component being a metal gluconate solution; and

adding a colloid enhancer component to said whey during said blending and heat maintaining steps to impart a colloidal-type condition to said whey.

4,235,938

FLAVORING WITH CRYSTALLINE PURE 2,4,6-TRI-ISOBUTYL DIHYDRO-1,3,5-DITHIAZINE

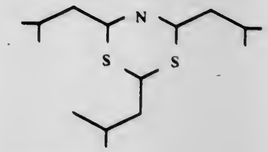
Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 10,887, Feb. 9, 1979, which is a continuation-in-part of Ser. No. 961,684, Nov. 17, 1978. This application Sep. 13, 1979, Ser. No. 75,079

Int. Cl.³ A23L *1/226*, *1/231*

U.S. Cl. 426—535 **3 Claims**

1. A process for augmenting or enhancing the bacon or caramel flavor or aroma of a foodstuff which comprises adding to said foodstuff from about 0.002 up to 100 parts per million by weight of a compound having the structure:



in crystalline, pure form.

4,235,939

BASE MIXES SIMULATING NATURAL AND DUTCH COCOA POWDERS

James R. Kimberly, Sr., Mt. Zion, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jul. 24, 1978, Ser. No. 927,076

Int. Cl.³ A21D *10/00*

U.S. Cl. 426—549 **14 Claims**

1. A dry synthetic base for use in food compositions which said base mix consists essentially of;

(A) from about 25 to about 300 parts by weight granular starch characterized as having (at 95° C.) a swelling power of less than 22 and critical concentration value of at least 5.0; and

(B) 100 parts by weight of a defatted vegetable seed material with said material containing at least 35% by weight vegetable seed protein having an NSI ranging from about 20 to about 80;

with the proportion of said starch component (A) and said seed material (B) being sufficient to provide a base mix which absorbs at least its total granular starch and seed material dry weight in water at 93° C.

4,235,940

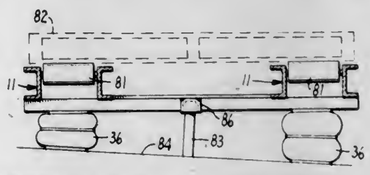
METHOD AND APPARATUS FOR RIDDLING BOTTLED WINES IN CASES

David W. Williams, Forestville; James L. Jordan, Guerneville, and James E. Huntsinger, Windsor, all of Calif., assignors to F. Korbel & Bros., Guerneville, Calif.

Filed Mar. 27, 1978, Ser. No. 890,305

Int. Cl.³ C12G *2/00*

U.S. Cl. 426—592 **55 Claims**



1. The method of riddling bottled wine packed in compartmented cases having individual compartments for each bottle separated by dividers, comprising

inverting said cases and allowing solids to settle into the necks of said bottles,
tilting said cases from side to side to jostle said bottles,
and vibrating said cases and the bottles contained therein so as to cause the solids in the wine to settle into the lower end of the neck of each of said bottles.
17. An apparatus for riddling wine, comprising
a frame formed for supporting a compartmented case containing bottles of wine in an inverted neck down position,
a floating mounting for said frame,
and means for repeatedly tilting said frame and said case and bottles thereon for dislodging solids in the wine from adherence to said bottles whereby such solids settle to the outlets of the bottles.

4,235,941

MEAT PRODUCT

Hector A. Coats, Folcroft, Pa., assignor to Keystone Foods Corporation, Folcroft, Pa.

Filed Nov. 1, 1977, Ser. No. 847,674
Int. Cl.[2] A23L 1/31
U.S. Cl. 426—646 **13 Claims**

1. A method of preparing a consumable meat product resembling a charcoal broiled steak, comprising
providing a slab of compacted meat particles,
forming in at least one surface of the slab a plurality of spaced-apart grooves separated by lands, the grooves extending across the slab from one edge of the slab to the opposite edge, said slab being in the frozen state,
placing the slab in its frozen state upon a continuous heated cooking plate, with the lands resting on the plate, and
subjecting the slab so placed to the heat from the plate until the grooves have substantially flattened out against the plate, and the lands have darkened to a more pronounced degree than the flattened grooves.

4,235,942

DIGESTIBLE POLYAMINO ACIDS

Michael J. Heller, Naperville, Ill., and John A. Ridgway, La-Porte, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 22, 1979, Ser. No. 14,121
Int. Cl.[3] A23J 3/00
U.S. Cl. 426—656 **14 Claims**

6. A method for preparing a digestible poly-L-methionine from L-methionine-N-carboxy anhydride comprising:
(a) preparing a solution of the L-methionine-N-carboxy anhydride in ethanol; and
(b) combining the L-methionine-N-carboxy anhydride/ethanol solution with water while maintaining the pH at 5–8 with aqueous hydroxide ion to effect polymerization for a period of time so as not to exceed a degree of polymerization of about 60.

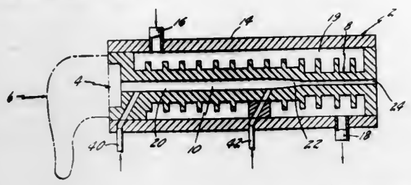
4,235,943

THERMAL SPRAY APPARATUS AND METHOD

Charles C. McComas, Stuart; Larry S. Sokol, and Earl M. Hanna, both of West Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 808,226, Jun. 20, 1977, abandoned, which is a continuation of Ser. No. 654,674, Feb. 2, 1976, abandoned, which is a division of Ser. No. 512,585, Oct. 7, 1974, abandoned. This application Feb. 22, 1979, Ser. No. 13,944
Int. Cl.[2] B05D 1/00, 1/08
U.S. Cl. 427—34 **9 Claims**

1. A plasma powder spray method which comprises:
generating a plasma;
passing the plasma at high velocity through an elongated nozzle;
cooling the plasma, forming a cooled plasma gas stream;
accelerating the cooled plasma;
admitting coating powder to the cooled gas stream in the nozzle, providing sufficient powder residence time in the cooled gas stream to plasticize the powder and impart a high velocity thereto; and



directing the plasticized powder to a surface to be coated and effecting a coating buildup thereon to the desired thickness.

4,235,944

PROCESS FOR PRODUCING GOLD CONDUCTORS

John J. Felten, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 944,895, Sep. 22, 1978. This application Oct. 29, 1979, Ser. No. 88,843
Int. Cl.[3] B05D 5/12
U.S. Cl. 427—125 **8 Claims**

1. A process for preparing a gold conductor metallization comprising applying a film of a gold conductor composition suitable for application in thick film microcircuitry consisting essentially of 80–90% by weight of the composition of gold powder, binder selected from the group consisting of copper oxide, cadmium oxide, bismuth oxide and mixtures of two or more of copper oxide, cadmium oxide and bismuth oxide, organic vehicle and 0.1–4% by weight of silver to a suitable substrate, said film having a wet thickness of approximately 30–80 microns, drying said film at about 80°–150° C. for about 5–15 minutes, and firing said dried film at about 800°–1050° C. for about 5–15 minutes.

4,235,945

HIGH RESISTIVITY ELECTROCONDUCTIVE TIN OXIDE FILMS

William E. Wagner, Verona, and Vern A. Henery, Plum Borough, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1978, Ser. No. 965,664
Int. Cl.[2] B05D 5/12
U.S. Cl. 427—126.3 **4 Claims**

1. In a method for depositing an electroconductive metal oxide film by contacting a substrate at a temperature between about 400° F. (about 204° C.) and a temperature at which the substrate becomes unstable with a coating composition comprising a metal-containing compound which thermally reacts to form an electroconductive metal oxide upon contact with the substrate, the improvement which comprises adding to said coating composition a high boiling point organic compound selected from the group consisting of cresol, benzyl alcohol, catechol, hydroquinone, benzoquinone and resorcinol.

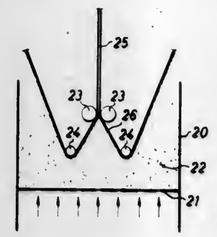
4,235,946

TACK SPUN MATERIALS

Alfred E. Lauchenauer, Horn, Switzerland, assignor to Raduner & Co. A.G., Horn, Switzerland

Filed Feb. 3, 1978, Ser. No. 875,030
Claims priority, application United Kingdom, Feb. 4, 1977, 4779/77; Jan. 23, 1978, 2594/78
Int. Cl.[2] B32B 5/00
U.S. Cl. 427—185 **2 Claims**

1. A method for tack spinning characterized by laminating a pair of backing sheets by interposing a pattern or layer of thermoplastic material therebetween to bond the sheets together, applying heat to the laminate to render the layer of thermoplastic material tacky and progressively separating the backing sheets to draw the thermoplastic material into fibers and directing a stream of coolant onto the fibers during formation to set the same, further characterized by the step of directing a supply of particles of activated carbon into the fibrous filaments formed on said portions of said thermoplastic material layer prior to solidification of the thermoplastic material whereby said activated carbon particles adhere thereto.



4,235,947

METHOD FOR THE MANUFACTURE OF A STEEL SHEET ADAPTED FOR USE IN IRONING PROCESSING HAVING GOOD LUBRICATION PROPERTY

Hidejiro Asano; Shigeyoshi Maeda, and Yashichi Oyagi, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 24, 1975, Ser. No. 616,202
Claims priority, application Japan, Sep. 25, 1974, 49-109475; Sep. 25, 1974, 49-109476
Int. Cl.[3] B05D 3/02
U.S. Cl. 427—226 **7 Claims**

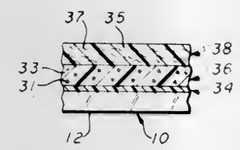
1. A method for applying a lubrication coating to a steel sheet which is to be subjected to an ironing operation, said method comprising
applying an aqueous solution containing ammonium phosphate to the surface of said steel sheet,
heating said sheet in a non-oxidizing atmosphere to thermally decompose said solution and form a surface film therewith on said sheet, and thereafter,
applying to said film a lubrication oil consisting of
(a) at least one member selected from the group consisting of animal oil, vegetable oil, fat, and mineral oil,
(b) a polymeric material, and
(c) a higher fatty acid.

4,235,948

SIMULATED STONE ARTICLE AND METHOD FOR MAKING SAME

Donald F. Holmes, Houston, Tex., assignor to Royal Marble Company, Inc., Houston, Tex.

Filed Apr. 2, 1979, Ser. No. 25,996
Int. Cl.[3] B44F 7/00; B05D 1/36
U.S. Cl. 428—15 **15 Claims**



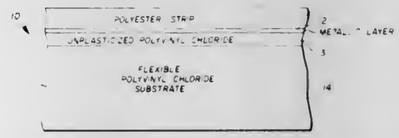
1. The method of forming a simulated stone product having an integral acrylic resin surface, comprising the steps of
applying to the surface of a sheet of the acrylic resin an organic solvent for cleaning said surface and rendering said surface more receptive to bonding,
applying to said surface a coating of liquid urethane,
allowing said urethane to set for a preselected time period,
applying to said urethane coating a composition including a catalyzed polyester bonding resin, a simulated stone aggregate, pigmenting agents, and an exothermic reducing agent, and
curing said polyester bonding resin for bonding said resin to said urethane coating, said exothermic reducing agent causing a slowing of the setting rate and a lowering of the temperature of said resin for permitting greater flexing during shrinkage of said resin while curing.
12. A simulated stone article having an integral acrylic resin surface, comprising
a formed sheet of an acrylic resin in the configuration of the article,
a layer of partially set liquid urethane coating a surface of the acrylic sheet and molecularly bonded thereto,
a cured composition of catalyzed polyester bonding resin and simulated stone aggregate molecularly bonded to the surface of the layer of urethane, said composition further including an exothermic reducing agent causing a slowing of the setting rate and a lowering of the temperature of said resin during curing for permitting greater flexing during shrinkage of said resin while curing to improve the bond between said resin and said urethane.

4,235,949

NON-WRINKLING AUTOMOTIVE TRIM STRIP

Dick T. Van Manen, and Gary S. Klein, both of Canandaigua, N.Y., assignors to Voplex Corporation, Pittsford, N.Y.

Continuation-in-part of Ser. No. 885,541, Mar. 13, 1978, Pat. No. 4,172,745. This application Jul. 27, 1978, Ser. No. 928,536
Int. Cl.[2] B32B 15/08
U.S. Cl. 428—31 **3 Claims**



1. An automotive trim strip that can be thermally bonded to a support material to extend along a curved path, said trim strip being formed as a laminate of a strip of thin polyester material coated with a layer of metallic material that is covered by a thin polyvinyl chloride protective layer the exposed surface of which is then bonded to a supporting substrate of a flexible plasticized polyvinyl chloride material, said trim strip comprising: said thin polyvinyl chloride protective layer being substantially unplasticized to provide said metallic layer coated on said polyester strip with sufficient dimensional stability relative to said polyvinyl chloride substrate to prevent compression wrinkling of said metalized polyester strip at radially inner regions of said curved path in response to stress from thermal variation occurring during thermal bonding of said polyvinyl chloride substrate to a support material.

4,235,950

HIGH TEMPERATURE MINERAL FIBER BINDER

Patrick M. Miedaner, Parkville, Mo., assignor to Certain-Teed Corporation, Valley Forge, Pa.

Division of Ser. No. 830,590, Sep. 6, 1977, Pat. No. 4,176,105. This application Feb. 12, 1979, Ser. No. 11,224
Int. Cl.[3] B05D 3/02; F16L 9/10
U.S. Cl. 428—36 **11 Claims**

1. A mineral fiber thermal insulation product having a density of about 5 to about 10 pounds per cubic foot and having

distributed throughout a cured resin obtained by spraying the mineral fiber with a binder comprising the reaction product of a modified phenol formaldehyde condensate, boric acid, ammonium hydroxide and urea and curing at a temperature in the range of 400° to 500° F.; wherein said modified phenol formaldehyde condensate, consisting essentially of the reaction product of phenol, formaldehyde and a di-functional nitrogenous compound, is initially prepared by reacting one mole of a di-functional compound in which said functional groups are amido or imino groups capable of reacting with the hydroxymethylene groups of the poly-hydroxymethyl phenols formed by the condensation of phenol and formaldehyde, with about 2.5 to 3 moles of phenol and about 6 to 7.5 moles of formaldehyde such that said modified phenol formaldehyde condensate contains less than 2% by weight of free phenol and less than 5% by weight of free formaldehyde and about 12 to 15% by weight of nitrogen with substantially no unreacted nitrogenous compound; and, thereafter reacting said modified phenol formaldehyde condensate with about 12 to 16 parts by wt. of boric acid for each 100 parts by wt. of said condensate, and about 40 to 80 parts by wt. of urea for each 100 parts by weight of said condensate and sufficient ammonium hydroxide so that the final composition has a pH of about 7 to 9.

4,235,951

GLASS MIRROR FILM, AND METHODS FOR ITS PRODUCTION AND USE

Daniel Swarovski, Wattens, Austria, assignor to D. Swarovski & Co., Glasschleiferei, Tirol, Austria

Filed Jun. 7, 1977, Ser. No. 804,317

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626039; Oct. 7, 1976, 2645371

Int. Cl.² B32B 17/06

U.S. Cl. 428—40 **12 Claims**



1. A glass mirror film composite comprising a thin, pliable, glass film, a reflective layer disposed on one side of said pliable glass film for substantially completely reflecting light striking the same and a flexible supporting film releasably adhesively secured to a side of said pliable glass film.

4,235,952

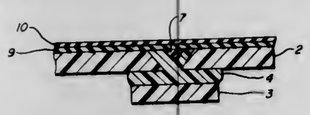
BOND SEAM COATING OF FRP MOLDINGS

Richard G. Holmes, Wadsworth, and David R. Sponseller, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 21, 1979, Ser. No. 22,394

Int. Cl.² B32B 3/00; B05D 5/00; B32B 3/08

U.S. Cl. 428—60 **6 Claims**



1. A method for finishing the cured bond seam of an adhesive selected from the group consisting of polyurethanes and polyesters and joining two thermoset fiberglass reinforced plastic moldings together forming a composite article, said seam exhibiting a valley or depression, which comprises

(a) depositing on and along said seam a built-up layer of a coating composition of an epoxy resin having an epoxide equivalent of from about 100 to 4000 and an average molecular weight of from about 200 to 3800, a polyamide resin having active amino groups and an amine value of from about 83 to 400 and a primary diamine, the amount of said polyamide resin and said diamine being sufficient to react with all of the epoxide groups of said epoxy resin,

(b) heating said seam coating composition for a period of time sufficient to cure the same,

(c) sanding said cured seam coating composition along the bond seam area to restore the original contour of the composite article,

(d) applying a coating of a sealing composition to the surface of said composite article and flash drying the coating and

(e) applying a coating of a top finish paint to the seal coating on the surface of said composite article, flash drying the coating, baking and reflow baking to obtain a finished composite article essentially free of sinks and paint pops and wherein the seam is invisible or nearly invisible.

4,235,953

WATERPROOFING SHEET MATERIAL

Charles A. Kumins, Gates Mills, and Milan L. Warford, Shaker Heights, both of Ohio, assignors to Tremco, Incorporated, Cleveland, Ohio

Continuation-in-part of Ser. No. 798,566, May 19, 1977, abandoned. This application Mar. 16, 1978, Ser. No. 887,292

Int. Cl.² B32B 11/00

U.S. Cl. 428—332 **11 Claims**

1. A self-supporting sheet material suitable for use as a waterproofing membrane in roofing and other structural applications, said sheet material having a thickness within the range of about 20 to about 90 mils and being composed of from about 20 wt.% to about 80 wt.% of a coal tar pitch having a softening point as measured by ASTM D-36 within the range of about 100° F. to about 200° F., and from about 80 wt.% to about 20 wt.% of a plasticized polyvinyl butyral resin.

4,235,954

POLYCARBONATE ARTICLE COATED WITH AN ADHERENT, DURABLE ORGANOPOLYSILOXANE COATING AND PROCESS FOR PRODUCING SAME

James S. Humphrey, Jr., Clemmons, N.C., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 895,665, Apr. 12, 1978, abandoned. This application May 24, 1979, Ser. No. 42,140

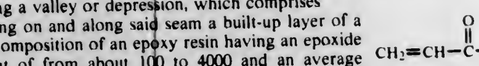
Int. Cl.³ B32B 27/36, 27/30, 27/08; G02B 1/08

U.S. Cl. 428—412 **36 Claims**

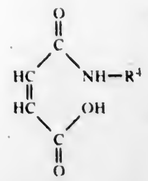
1. A coated article having improved abrasion and chemical solvent resistance comprising a polycarbonate substrate coated with (i) an adhesion promoting primer layer comprised of the photoreaction products of (a) at least one polyfunctional acrylic acid ester monomer, and (b) at least one organic silicon compound represented by the general formula

$$R^3_cSiX_{(4-c)}$$

wherein c is an integer from 1 to 3 inclusive, X is an alkoxy, acyloxy, or aryloxy radical, and R^3 represents a radical selected from



-continued

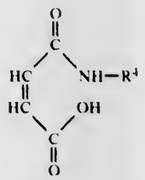


wherein R^4 is a divalent saturated aliphatic hydrocarbon radical; and (ii) a cured thermoset organopolysiloxane containing top coat on said primer layer.

20. An ultraviolet light curable primer composition for improving the adhesion of a thermoset organopolysiloxane containing top coat to a polycarbonate substrate comprising (i) at least one polyfunctional acrylic acid ester monomer; (ii) at least one organic silicon compound represented by the general formula

$$R^3_cSiX_{(4-c)}$$

wherein c is an integer from 1 to 3 inclusive, X is an alkoxy, acyloxy, or aryloxy radical, and R^3 represents a radical selected from

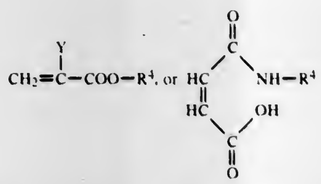


wherein R^4 is a divalent saturated aliphatic hydrocarbon radical; and (iii) a photoinitiator.

27. A process for providing a uniformly and tenaciously adhered abrasion and chemical solvent resistant organopolysiloxane coating onto a polycarbonate substrate which comprises: (i) applying onto said substrate a photocurable primer composition comprised of (a) at least one polyfunctional acrylic acid ester monomer, (b) at least one organic silicon compound represented by the general formula

$$R^3_cSiX_{(4-c)}$$

wherein c is an integer from 1 to 3 inclusive, X is an alkoxy, acyloxy, or aryloxy radical, and R^3 is a radical represented by the formulae



wherein Y is a hydrogen or methyl, and R^4 is a divalent saturated aliphatic hydrocarbon radical, and (c) a photoinitiator; (ii) curing said primer composition by means of ultraviolet radiation; (iii) applying a top coat composition comprised of a further-curable organopolysiloxane onto said cured primer layer; and, (iv) curing said further-curable organopolysiloxane to a thermoset condition.

4,235,955

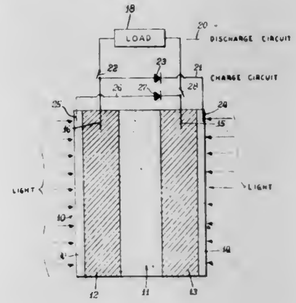
SOLID STATE PHOTOELECTROCHEMICAL CELL

Anthony F. Sammells, and Peter G. P. Ang, both of Naperville, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 23,541, Mar. 26, 1979. This application Oct. 15, 1979, Ser. No. 84,641

Int. Cl.³ H01M 6/30

U.S. Cl. 429—111 **25 Claims**



1. A solid state photoelectrochemical cell comprising:

a homogeneous solid electrolyte matrix having a layer or tunnel crystal lattice tape structure accommodating a high concentration of mobile ionic conductors beyond that required for nominal ionic conductivity forming a central electrolyte sparator portion providing ionic conductance, an oxidant portion having first redox couples in fixed lattice positions on one side of said separator portion and a reductant portion having second redox couples in fixed lattice position on the other side of said separator portion;

a photosensitive n-type or p-type or both n-type and p-type semiconductor photoelectrodes in ionic communication, respectively, with said oxidant and/or reductant portions whereby electron holes or electrons are transmitted to said oxidant or reductant portions, respectively, while said photoelectrode is illuminated, the redox electrolyte portions having an equilibrium potential between the semiconductor decomposition potential and the conduction band edge when an n-type semiconductor is used and an equilibrium potential between the semiconductor decomposition potential and the valence band edge when a p-type semiconductor is used;

external rectified electrical circuit means between said semiconductor and its counterelectrode for charging during illumination; and

external loaded electrical circuit means for withdrawal of electrical energy from said oxidant and reductant portions.

4,235,956

ELECTROCHEMICAL STORAGE BATTERY

Franz Gross, Neckargemünd, and Hermann Birnbreier, Sandhausen, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Däfertal, Fed. Rep. of Germany

Filed Apr. 27, 1979, Ser. No. 33,562

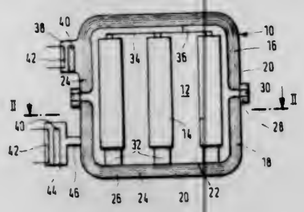
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819026

Int. Cl.³ H01M 10/39

U.S. Cl. 429—112 **19 Claims**

1. An electrochemical storage battery having a normal operating temperature at an elevated temperature above ambient temperature with at least one storage cell and with heat insulation surrounding the storage cell to retard heat flow from the storage cell to the cooler surrounding environment, wherein the heat insulation is an enclosed gastight cavity under subatmospheric pressure surrounding said storage cell to impede

heat flow by convection from the storage cell to the cooler surrounding environment and a radiation shield disposed in the interior of the cavity in the path of heat flow from the storage cell to the cooler surrounding environment to reduce heat losses due to radiation, wherein the heat insulation is composed of at least two insulation sections connected to each other via



interposed electrical insulation, wherein the boundary walls of one insulation section are electrically conducting with one electrical pole of the storage cell electrically connected to said one insulation section, and wherein the boundary walls of another insulation section are electrically conducting with the other electrical pole of the storage cell electrically connected to said another insulation section.

4,235,957

THERMAL SILVER-DYE BLEACH ELEMENT AND PROCESS

Carl F. Kohrt, Pittsford, and Roland G. Willis, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 25, 1979, Ser. No. 6,961
Int. Cl.[2] G03C 1/48, 7/00
U.S. Cl. 430—203 **36 Claims**

16. In a dry activator element for producing a dye image by means of a dry physical development, thermal silver-dye bleach process said element comprising a support having thereon a layer comprising, in a polymeric binder, a silver halide complexing concentration of a silver halide complexing agent, a bleachable dye, and a thermal solvent,

the improvement wherein said element comprises

(a) as said complexing agent, an organic ammonium chloride, bromide or iodide, and

(b), as the polymeric binder, a synthetic, hydrophobic polymeric binder.

21. A dry activator element as in claim **16** wherein said support comprises a polymer that is a dye image receiver for said bleachable dye.

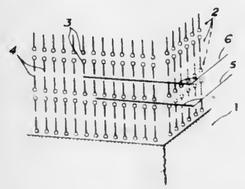
4,235,958

PHOTOSENSITIVE FILM USABLE IN MICROGRAVURE

Andre Barraud, Bures-sur-Yvette; Jean Messier, Gif-sur-Yvette, and Annie Ruaudel, Chatenay-Malabry, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 807,145, Jun. 16, 1977, abandoned. This application May 11, 1979, Ser. No. 38,072
Claims priority, application France, Jun. 23, 1976, 76 19105
Int. Cl.[1] G03C 1/68, 5/00
U.S. Cl. 430—281 **14 Claims**

1. A photosensitive film which can be used in microgravure, said film comprising at least one organic monomolecular layer having amphiphilic molecules which include a hydrophobic extremity and a hydrophilic extremity and with at least one irradiation polymerizable function and one aliphatic chain with at least 12 carbon atoms, said polymerizable function being located at the hydrophobic extremities of said molecules on the final carbon atom of the aliphatic chain, said film being deposited on a substrate with the hydrophobic extremities of said amphiphilic molecules being primarily located at a first surface of the monomolecular layer and the hydrophilic extremities of said amphiphilic molecules being primarily located at a second



surface of the monomolecular layer remote from said first surface thereof.

4,235,959

PHOTOGRAPHIC MATT LAYERS OR SURFACES

Victor J. M. Thijs, deceased, late of Berchem, Belgium; Paul E. Huyghebaert, administrator, Hikstraat 40, B 2410 Herentals, Belgium; Nikolaas C. De Jaeger, Armand Seghersiei 96, B 2510 Mortsel, Belgium, and Bernard H. Tavernier, Prins Boudewijnlaan 357, B 2520 Edegem, Belgium

Filed Feb. 2, 1979, Ser. No. 8,855
Claims priority, application United Kingdom, Feb. 3, 1978, 4479/78
Int. Cl.[1] G03C 5/26, 1/78
U.S. Cl. 430—531 **8 Claims**

1. A photographic light-sensitive silver halide material incorporating a layer formed from a coating composition comprising gelatin and dispersed therein a matting agent, said coating composition having been prepared by mixing in aqueous medium urea, formaldehyde, and an aqueous colloidal dispersion of silica particles, said mixture being buffered to keep the pH of the mixture at 3.2 or lower, polycondensing the urea and formaldehyde while vigorously stirring the mixture until particles comprising urea-formaldehyde resin and silica are formed having an average particle size between 1 and 8 μm, reducing the rate of stirring and raising the pH of the mixture to 5 or higher to prevent afterpolycondensation and agglomeration of the polymer particles and dissolving a gelatin in the reaction mixture.

4,235,960

COMPETITIVE ENZYME-LINKED IMMUNOASSAY

Edward A. Sasse, Brookfield, and Donald E. Yorde, Milwaukee, both of Wis., assignors to The Medical College of Wisconsin, Inc., Milwaukee, Wis.

Filed Jul. 29, 1977, Ser. No. 820,286
Int. Cl.[2] G01N 31/14
U.S. Cl. 435—7 **9 Claims**

1. A competitive enzyme-linked immunoassay for soluble immunogen or hapten analyte in a sample solution including the steps of:

(a) providing an insoluble solid immunosorbent to which analyte has been linked;

(b) carrying out a competitive reaction between analyte in the sample solution and analyte linked to said solid immunosorbent for a selected quantity of a first antibody for the analyte;

(c) coupling a heterologous bridging second antibody to any first antibody linked to analyte on the solid immunosorbent, the bridging second antibody being directed against the first antibody;

(d) coupling a soluble antibody-enzyme immune complex to any bridging second antibody coupled to the first antibody linked to analyte on the immunosorbent, the antibody of the antibody-enzyme immune complex being of the same species as the first antibody or a cross-reactive species; and

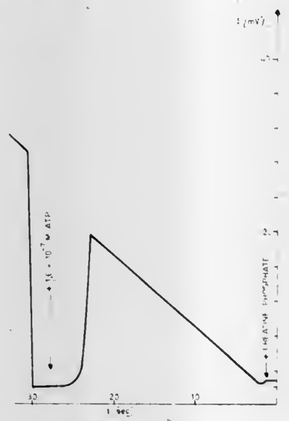
(e) measuring the activity of the enzyme coupled to the immunosorbent to indirectly determine the presence of the analyte in the sample.

4,235,961

METHOD FOR PHOTOMETRIC DETERMINATION OF THE SUBUNIT B OF CREATINE KINASE AND A REAGENT FOR CARRYING OUT THE METHOD

Arne T. Lundin, Stockholm, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Jun. 21, 1979, Ser. No. 50,518
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2888658
Int. Cl.[1] C12Q 1/66
U.S. Cl. 435—8 **9 Claims**



1. Method for photometric determination of the subunit B of creatine kinase (CK-B) in buffered water solution through reaction with creatine phosphate, ADP and the system luciferase/D-luciferin in the presence of a specific antibody inhibiting the subunit M of creatine kinase, characterized in that the determination is made in the presence of a D-luciferin analog having a structure similar to D-luciferin and being a competitive inhibitor of the firefly luciferase reaction.

4,235,962

COMBINATION KIT FOR TRANSAMINASE ASSAY OF A BODY FLUID

James S. Sanderson, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1978, Ser. No. 935,425
Int. Cl.[1] C12Q 1/52, 1/32
U.S. Cl. 435—16 **3 Claims**

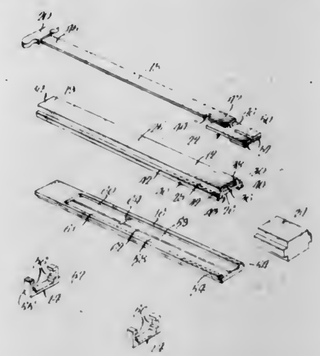
1. A reagent kit for the determination of transaminase present in a body fluid comprising a first reagent containing aspartate, a second reagent containing alanine, and a third reagent containing 2-oxoglutarate, reduced nicotinamide adenine dinucleotide (NADH), malate dehydrogenase (MDH), and lactate dehydrogenase (LDH) wherein the amounts of each reagent used are sufficient to provide, upon direct mixing of said first reagent with said third reagent, a resulting mixture containing at least 35 millimolar concentration of aspartate, from about 0.2 to about 35 millimolar concentration of 2-oxoglutarate, from about 0.5 to about 5 millimolar concentration of reduced NADH, at least 175 units/liter of LDH and at least 140 units/liter of MDH and upon direct mixing of, said second reagent with said third reagent, to provide a resulting mixture containing at least 130 millimolar alanine, from about 0.2 to about 35 millimolar concentration of 2-oxoglutarate, from about 0.5 to about 5 millimolar concentration of reduced NADH, at least 175 units/liter of LDH and at least 140 units/liter of MDH.

4,235,963

SAMPLING AND IDENTIFYING APPARATUS AND METHOD

Joe C. Hansen, Cromwell La., Blackfoot, Id. 83221

Filed May 11, 1979, Ser. No. 38,273
Int. Cl.[1] C12Q 1/24
U.S. Cl. 435—30 **10 Claims**



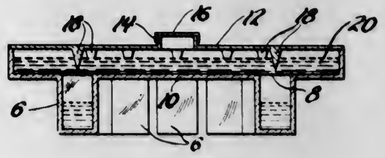
1. In an apparatus for sampling and identifying microorganisms, a housing having an internal elongate cavity; said cavity having an opening through the entire length of one wall of said housing, a streaker strip slidable in said cavity and having an inoculating pad on one end thereof, said inoculating pad projecting beyond one end wall of said housing, an identification bar having at least one open-faced trough formed in one surface thereof, and means for securing said identification bar adjacent the opening through said one lengthwise wall of said housing with said open-faced trough facing said opening, said inoculating pad being drawn over said open-faced trough as said streaker strip is drawn through said housing.

4,235,964

METHOD FOR TESTING AND IDENTIFYING MICROORGANISMS

Barry R. Bochner, 1618 Sherman St., Alameda, Calif. 94501

Continuation-in-part of Ser. No. 773,879, Mar. 3, 1977, Pat. No. 4,129,483. This application Sep. 28, 1978, Ser. No. 946,884
Int. Cl.[2] C12Q 1/04
U.S. Cl. 435—34 **3 Claims**



1. A method for identifying or testing a microorganism comprising preparing a suspension of a culture of the microorganism in a nutrient solution to a culture density of about 2×10^8 cells/ml, and then bringing said suspension into contact with an aqueous solution containing an oxidation-reduction indicator which substantially irreversibly undergoes a change in color upon being reduced and a biodegradable test substrate compound which, when catabolized by a microorganism, will engender reduction of the indicator, the concentration of nutrient in said suspension being insufficient to engender reduction of the indicator when said suspension contacts said solution, said suspension containing a compound which reduces O_2 but which does not reduce the oxidation-reduction indicator and which is present in said suspension in an amount sufficient to

reduce all the O_2 therein, at least one of said suspension and said solution containing a buffer to maintain the pH at from about 4.5 to 8 while said suspension is in contact with said solution.

4,235,965

STARCH HYDROLYSIS AT HIGH DRY SUBSTANCE

Raoul G. P. Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 793,216, May 2, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,538
Claims priority, application Belgium, May 12, 1976, 2155022
Int. Cl.³ C12P *19/22, 19/14*
U.S. Cl. 435—95 **14 Claims**

1. A process for preparing an aqueous slurry of a liquefied and substantially solubilized starch comprising the steps of:
(a) preparing an aqueous slurry of starch hydrolyzate having a D.E. of about 1 to about 25 and a solids concentration of less than 40% by weight;
(b) gradually adding granular starch to said slurry of starch hydrolyzate, held at a temperature below the normal gelatinization temperature of the starch, in the presence of sufficient bacterial alpha-amylase to liquefy the granular starch;
(c) gradually raising the temperature of the mixture from 60° C. to 90° C. during the addition of further increments of starch, maintaining an effective temperature to insure non-gelatinizing conditions for the added starch;
(d) termininating the addition of starch when the total dry substance of the slurry is between 47% and 70% by weight; and
(e) recovering the slurry when the starch is substantially solubilized and has a dextrose equivalent (D.E.) of from about 9.1 to about 17.5.

4,235,966

PROCESS FOR THE PRODUCTION OF POLYSACCHARIDE

Trevor R. Jarman, Reading, England, and John R. W. Govan, Musselburgh, Scotland, assignors to Talres Development (N.A.) N.V., Netherlands Antilles

Filed Jun. 6, 1979, Ser. No. 46,153
Claims priority, application United Kingdom, Jun. 6, 1978, 26413/78; Feb. 7, 1979, 04215/79
Int. Cl.³ C12P *19/04*
U.S. Cl. 435—101 **7 Claims**

1. A process for the production of polysaccharide consisting of a partially acetylated variable block copolymer of D-mannuronic and L-guluronic acid residues, which comprises cultivating in a nutrient medium therefor a strain of *Pseudomonas*, which is non-pathogenic to humans, and which has been obtained by treating a non-mucoid species of *Pseudomonas*, which is non-pathogenic to humans, with a β-lactam or aminoglycoside antibiotic whereby a mucoid strain tolerant to said antibiotic was selected, and isolating from the medium the polysaccharide produced.

4,235,967

PROCESS FOR PRODUCING ANTIBIOTICS BY CULTIVATION OF *STREPTOMYCES FLAVOGRISEUS*

Patrick J. Cassidy, Rahway; Robert T. Goegelman, Linden; Edward O. Stapley, Metuchen, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 827,504, Aug. 25, 1977, Pat. No. 4,162,324, which is a continuation of Ser. No. 634,300, Nov. 21, 1975, abandoned. This application Apr. 6, 1979, Ser. No. 27,642
Int. Cl.³ C12P *17/18*
U.S. Cl. 435—119 **3 Claims**

1. A process for the production of antibiotic 890A_1 which comprises cultivating a strain of *Streptomyces flavogriseus* selected from the group consisting of *Streptomyces flavogriseus* NRRL 8139 and NRRL 8140 in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic conditions and recovering said antibiotic.

4,235,968

SACCHARIFICATION OF CELLULOSE

Mark Pilipski, 89 Mountainside Ter., Clifton, N.J. 07013, assignor to Mark Pilipski, Clifton, N.J.; Martin F. Sturman, Melrose Park, Pa. and Michael Ebert, Mamaroneck, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,646
Int. Cl.² C13K *1/02;* **C12C** *11/00*
U.S. Cl. 435—161 **8 Claims**

1. A method to effect saccharification of raw cellulosic material taken from any available source, comprising the steps of:
A. steeping the raw material in a caustic solution to swell the cellular structure of the material to render it more reactive and to solubilize the lignins and other compounds contained therein;
B. washing away the solubilized lignins and other compounds to provide a prepared cellulosic material;
C. subjecting the prepared material to viscose processing to produce a viscous solution of sodium cellulose xanthate in aqueous sodium hydroxide;
D. removing the aqueous phase of the viscous solution to provide a viscose residue intermediate; and
E. hydrolyzing the viscose intermediate by immersing it in a bath of anhydrous liquid hydrogen chloride to yield a usable glucose and other products.

8. A method as set forth in claim 1, further including the step of fermenting the glucose to produce ethyl alcohol.

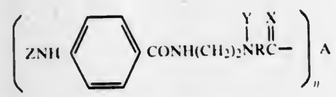
4,235,969

PROCAINAMIDE ANTIGEN CONJUGATES AND ANTIBODIES

Prithipal Singh, Santa Clara, and Marcel R. Pirio, Mountain View, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed May 8, 1978, Ser. No. 903,420
Int. Cl.² C07G *7/00, 7/02*
U.S. Cl. 435—188 **12 Claims**

1. A compound of the formula:



wherein:
Z is hydrogen or acetyl;
Y is alkyl of from 1 to 3 carbon atoms;
X is oxygen or imino (NH);
R is a linking of group of from 1 to 8 carbon atoms having from 0 to 4 heteroatoms, which are oxygen, nitrogen and sulfur, wherein the oxygen is present as oxy or nonoxocarbonyl, nitrogen is present as tertiary amino, amido or imino and sulfur is present as thioether or thiono, and having from 0 to 1 site of ethylenic unsaturation as the only unsaturation;
A is a poly(amino acid) which is antigenic or an enzyme;
n is 1 to the molecular weight of A divided by 1000.

4,235,970

PROTEASE INACTIVATED α-AMYLASE PREPARATIONS

Harry W. Leach, Willowbrook, and Ronald Hebeda, Naperville, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Aug. 5, 1976, Ser. No. 712,103
Int. Cl.³ C12N *9/28*
U.S. Cl. 435—202 **4 Claims**

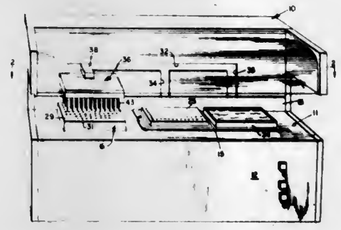
1. A process for the selective inactivation of proteolytic enzyme impurities in a bacterial α-amylase enzyme preparation derived from *Bacillus licheniformis* comprising the steps of:
(a) introducing into the preparation sufficient water soluble calcium salt to yield a total calcium ion concentration of from about 0.5% to about 1.5%, dry basis;
(b) heating the resulting mixture to a temperature in the range of from about 70° C. to about 90° C.; and
(c) maintaining the temperature for a period of time sufficient to substantially completely inactivate the proteolytic enzyme without substantially reducing the α-amylase activity.

4,235,971

INOCULATOR

John F. Howard; Felix P. Tolosa, and Lawrence Boxer, all of Alexandria, Va., assignors to Dynatech Laboratories, Incorporated, Alexandria, Va.

Continuation of Ser. No. 680,450, Apr. 26, 1976, abandoned. This application Jun. 9, 1978, Ser. No. 914,131
Int. Cl.³ C12M *1/32, 1/20, 1/12*
U.S. Cl. 435—293 **13 Claims**



1. An automated inoculator apparatus for the simultaneous transfer of small volumes of material in a predetermined pattern, comprising a support, means providing a stationary reservoir station on said support, means providing a stationary deposit station for mounting a receptacle on said support alongside but in spaced relation to said reservoir, means defining a stationary sterilizing furnace station on said support at the opposite side of the deposit station from said reservoir, an inoculation head having a multiplicity of downwardly projecting material pickup elements arranged in a predetermined pattern movably mounted on said support and initially disposed in a position above said sterilization station, means for displacing said head from said initial position along a substantially horizontal path on said support to dwell positions above said reservoir and deposit stations in sequence and then back to said initial position, means for vertically reciprocating said head when it is in a dwell position above said reservoir to lower said head to cause said pickup elements to pickup small volumes of said material from the reservoir and then raise the head back to said path, means for vertically reciprocating said head when it is in a dwell position above said deposit station to lower said head to cause said pickup elements to deposit material in said pattern in said receptacle at said deposit station and then raise the head back to said path, means effective when said head has returned to said initial position in said path for reciprocating the head vertically to first lower said head to simultaneously dispose all of said pickup elements in the furnace for a sterilization period and then raise said head back to said initial position in said path, and a control system operably connected for cyclically, automatically effecting said head movements in predetermined sequence.

5. Inoculator apparatus comprising support means including a generally horizontal surface, and a portion located above and to one side of said horizontal surface, stationary receptacle holder means mounted on said surface for locating in side by side spaced relation on said surface a first receptacle containing inoculum and a separate second receptacle for deposit of said inoculum in a predetermined area pattern, a stationary furnace mounted on said surface at the side of said second receptacle opposite the first receptacle into which said pickup elements may be thrust for sterilization, an inoculator head movably mounted on said support means portion and initially disposed in a position above said furnace, means on said support means portion for driving said head along a horizontal path from said initial position in timed sequence to a first dwell position above said first receptacle, a second dwell position above said second receptacle and then back to said initial position, means for vertically reciprocating said head down and then up back to said path when it is at each of said dwell positions above the receptacles, said head having a multiplicity of depending inoculum pickup elements arranged in said pattern whereby small quantities of inoculum from said first receptacle may be simultaneously transferred in said pattern from said first receptacle to said second receptacle, and means operable when the head is returned to said initial position in said path for lowering said pickup elements into said furnace for a sterilization period wherein all of said elements are sterilized simultaneously and then returning the head to said initial position.

4,235,972

HIGH CRUSH STRENGTH HETEROGENEOUS ION EXCHANGE RESINS OF CROSSLINKED POLYMERS HAVING VINYL HALIDE MONOMER POLYMERIZED THEREIN

Giffin D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1979, Ser. No. 13,854
Int. Cl.² C08L *27/08*
U.S. Cl. 521—28 **21 Claims**

1. A heterogeneous ion exchange resin of a cross-linked polymer of a monoethylenically unsaturated monomer and a cross-linking agent of a polyethylenically unsaturated monomer having a vinyl halide or vinylidene halide monomer polymerized within the structure thereof in an amount sufficient to increase the density and/or improve the crush strength of the resin, said cross-linked polymer bearing a plurality of pendant ion active exchange groups.

4,235,973

MACROPOROUS POLYMERIC CARRIER FOR COVALENTLY BINDING PROTEINS, ITS PREPARATION AND ITS USE FOR FIXING ACTIVE PROTEINS

Chung-Ji Tschang, Frankenthal; Heinrich Klefenz, Hochdorf-Assenheim, and Axel Sanner, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,010
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834539
Int. Cl.³ C08J *9/00*
U.S. Cl. 521—146 **8 Claims**

1. A process for the preparation of a macroporous polymeric carrier for covalently binding active proteins via isocyanate, thioisocyanate or aldehyde groups, wherein the sulfonic acid chloride groups of a sulfochlorinated macroporous crosslinked styrene resin, containing 1-4.5 milliequivalents/g of sulfonic acid chloride groups and consisting of 50-97% by weight of styrene and 3-50% by weight of divinylbenzene, with or without 1-25% by weight of ethylvinylbenzene and with or without 1-10% by weight, based on the total weight, of a further

comonomer are reacted with an α,ω-diamino compound of the formula

$$H_2N-(CH_2)_n-NH_2$$

where n is a number from 2 to 12, with hydrazine or with an α,ω-diamino-diether of the formula

$$H_2N-(CH_2)_3-O-X-O-(CH_2)_3-NH_2$$

where X is $-(CH_2)_n-$, n being a number from 2 to 6, or where X is a 2,2-dimethyl-1,3-propylene or 3-methyl-1,5-pentylene radical, and any sulfonic acid chloride groups still remaining are hydrolyzed to the free sulfonic acid or saponified to its sodium salt or reacted with a primary or secondary amine to give sulfonamide groups, after which the terminal amino groups from the first process step are reacted with phosgene, thiophosgene, an aliphatic, aromatic or cycloaliphatic diisocyanate or an aliphatic dialdehyde of the formula

$$OCH-(CH_2)_n-CHO$$

where n is a number from 1 to 8, to prepare the binding groups.

4,235,974

PROCESS FOR THE PRODUCTION OF EPOXY CELLULAR SOLID PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 4,039, Jan. 17, 1979, abandoned, which is a continuation of Ser. No. 821,584, Aug. 4, 1977, Pat. No. 4,087,407. This application Dec. 26, 1979, Ser. No. 107,044

Int. Cl.³ C08J 9/02

U.S. Cl. 521—99 **11 Claims**

1. The process for the production of epoxy cellular solid reaction products in a non-aqueous medium without the addition of a blowing agent, by the following steps:

(a) adding about 1 to 3 parts by weight of an organic polyamine compound;

(b) adding slowly 1 to 5 parts by weight of an epoxy compound to the polyamine compound while

(c) agitating the mixture and keeping the temperature between 20° C. to 70° C. until the resulting chemical reaction is completed, thereby

(d) producing an epoxy prepolymer;

(e) admixing 0 to 2 parts by weight of a foam regulator to the epoxy prepolymer;

(f) heating the epoxy prepolymer to a temperature of 80° C. to 100° C. until the mixture expands, thereby

(g) producing an epoxy cellular solid reaction product.

4,235,975

BIS(DIMETHYLBENZYL)DIPHENYLAMINE SCORCH INHIBITOR FOR POLYURETHANE FOAMS CONTAINING HALOGENATED PHOSPHATE ESTERS

Frank J. Preston, Madison; Steven T. Nakos, West Hartford, and Louis Rua, Jr., Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 27, 1979, Ser. No. 61,563

Int. Cl.³ C08G 18/14

U.S. Cl. 521—107 **10 Claims**

1. In a process for preparing polyurethane foam from a reaction mixture comprising a polyether polyol, an organic polyisocyanate, a reaction catalyst, a foaming agent and a halogenated phosphate ester additive having the formula:

$$[(R'O)_2PO]_nRX_a[OPORX_a]_r[OP(OR')_2]$$
$$\qquad\qquad\quad |$$
$$\qquad\qquad\quad OR'$$

wherein R is an aliphatic hydrocarbon radical having 1–8 carbon atoms, or an aromatic hydrocarbon radical having 6–14 carbon atoms, X is a halogen selected from chlorine, bromine and a mixture thereof, a is an integer of 0–4, x is an integer of 0–4, n is an integer of 0–6, and each R' is independently a haloalkyl radical having 1–8 carbon atoms, the halogen in this radical being chlorine, bromine or a mixture thereof,

the improvement which comprises including in said reaction mixture an effective amount of 4,4'-bis(α,α-dimethylbenzyl)diphenylamine to inhibit scorching in the resulting foam.

4,235,976

USE OF PHOSPHONATES AS TRIMERIZATION CATALYSTS FOR THE PRODUCTION OF POLYISOCYANURATE SYNTHETIC RESINS

Peter Haas, Haan, and Rolf Wiedermann, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 27, 1979, Ser. No. 52,524

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830949

Int. Cl.³ C08J 9/10, 9/12, 9/14

U.S. Cl. 521—107 **8 Claims**

1. In a process for the production of synthetic resins containing isocyanurate groups and optionally urethane groups, including foam resins, comprising trimerizing polyisocyanates using isocyanate trimerization catalysts, optionally in the presence of blowing agents, foam stabilizers and other additives, and optionally in the presence of a less than equivalent quantity of polyhydroxyl compounds with molecular weights of from 400 to 10,000 which have at least two hydroxyl groups and optionally chain lengthening agents with a molecular weight of from 32 to 400, the improvement wherein said trimerization catalysts are phosphonates corresponding to the formula:

$$(MO)_2\overset{O}{\overset{\|}{P}}-(CH_2)_n-\underset{R}{\overset{|}{CH}}-CO-OM$$

in which

n represents an integer of from 0 to 3,

R represents H or $-(CH_2)_m-COOM$,

m represents an integer of from 0 to 3,

M represents an alkali metal, or NR'_4 wherein R' represents H or a C_1–C_4 alkyl group.

4,235,977

CROSS-LINKED POLYURETHANE ELASTOMERS AND MICROCELLULAR FOAMS

Kurt C. Frisch, Detroit, Mich.; Daniël M. J. Tummers, and Anne Te Nijenhuis, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Mar. 5, 1979, Ser. No. 17,282

Claims priority, application Netherlands, Mar. 4, 1978, 7802413

Int. Cl.³ C08G 18/14, 18/32

U.S. Cl. 521—166 **19 Claims**

1. In a process for preparing a cross-linked polyurethane elastomer by reacting a polyisocyanate, at least one polyol, and at least one trihydroxy compound, optionally in the presence of a catalyst, the improvement wherein the hydroxyl compounds employed are:

A-1. a polymeric polyol compound having a molecular weight of between about 500 and about 10,000 and an average of 2 to 3 hydroxy groups per molecule; A-2. a dihydroxy compound having a molecular weight of between about 60 and about 200, in a quantity such that the ratio between the hydroxyl groups derived from the low molecular weight diol (A-2) and the hydroxyl groups derived from the polymeric polyol (A-1) is between about 0:1 and about 5:1; and

B. tris-(β-hydroxypropyl)-isocyanurate or ethoxylated tris(β-hydroxypropyl)-isocyanurate such that the ratio between the hydroxyl groups derived from the isocyanurate and the hydroxyl groups derived from the sum of the polyols (A-1) and (A-2) is between about 0.5:1 and about 5:1.

10. In a process for preparing a microcellular polyurethane foam by reacting a polyisocyanate, at least one polyol, and at least one trihydroxy compound, optionally in the presence of a catalyst, the improvement wherein the hydroxyl compounds employed are:

A-1. a polymeric polyol compound having a molecular weight of between about 500 and about 10,000 and an average of 2 to 3 hydroxy groups per molecule;

A-2. a dihydroxy compound having a molecular weight of between 60 and about 200, and present in an amount such that the ratio between the hydroxyl groups derived from the diol (A-2) and the hydroxyl groups derived from the polymeric polyol (A-1) is between about 0.5:1 and about 3:1; and

B. tris-(β-hydroxypropyl)-isocyanurate or ethoxylated tris(β-hydroxypropyl)-isocyanurate such that the ratio between the hydroxyl groups derived from the isocyanurate and the hydroxyl groups derived from the sum of the polyols (A-1 and A-2) is between about 0.5:1 and about 5:1.

4,235,978

FLAME RETARDANT COMPOSITION

John B. Luce, Mt. Vernon, Ind., and Howard A. Vaughn, Jr., Schenectady, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 407,649, Oct. 18, 1973, abandoned. This application Jun. 2, 1975, Ser. No. 582,770

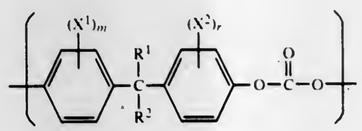
Int. Cl.³ C08L 69/00, 53/06

U.S. Cl. 525—101 **7 Claims**

1. A flame-retardant, non-dripping composition comprising in admixture

(A) an alkenylaromatic polymer;

(B) a flame retardant additive in an amount of from about 10 to about 30 parts by weight per hundred parts resin, said flame retardant additive being either (i) a low molecular weight polymer of a carbonate of a halogenated dihydric phenol, said polymer containing from 2 to 10 repeating units of the formula



wherein R^1 and R^2 are hydrogen, (lower) alkyl or phenyl, X^1 and X^2 are bromo or chloro and m and r are from 1 to 4, said polymer having low volatility when heated above about 200° C., and a softening point of less than about 300° C., or (ii) a combination of said polymer (i) and an inorganic or organic antimony-containing compound; and,

(C) from 0.5 to about 5.0 weight percent based on the weight of the alkenylaromatic polymer of a diorganopolysiloxane polymer gum having a viscosity of from about 10,000,000 to about 100,000,000 centistokes and wherein the organo substituents therein are selected from the group consisting of alkyl, aryl and vinyl radicals and mixtures thereof.

4,235,979

AMINE TERMINATED POLYMERS AND THE FORMATION OF BLOCK COPOLYMERS

William L. Hergenrother; Richard A. Schwarz; Richard J. Ambrose, all of Akron, and Robert A. Hayes, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 848,962, Nov. 7, 1977, Pat. No. 4,151,222, which is a continuation-in-part of Ser. No. 574,676, May 5, 1975, Pat. No. 4,070,344. This application Mar. 5, 1979, Ser. No. 17,674

Int. Cl.³ C08L 75/02

U.S. Cl. 525—128 **20 Claims**

1. A urea block copolymer composition, comprising:

an amine terminated polymer connected to a urea polymer constituent to form the urea block copolymer;

said amine terminated polymer being an end capped polymer formed by the reaction of an anionically prepared polymer and a single polyisocyanate or polyisothiocyanate compound so that at least one unreacted isocyanate or isothiocyanate end portion has been converted to an amine group;

said anionically prepared polymer being a homopolymer or a copolymer, said homopolymer made from monomers selected from the class consisting of conjugated diene, vinyl substituted aromatic, vinyl substituted pyridine, vinyl substituted quinoline, and a compound selected from the class consisting of

1. $CH_2=CACN$ wherein A is CN, CF_3, CH_3 or H;
2. $CH_2=CACO_2R$ wherein A is CO_2R, SO_2R, CH_3 or H;
3. $CH_2=CANO_2$ wherein A is Cl, CH_3 or H;
4. $CH_2=CACON(R)_2$ wherein A is CH_3 or H;

wherein R is a 1 to 15 carbon atom alkyl, a 4 to 15 carbon atom cycloalkyl, an aryl, a 1 to 15 carbon atom alkyl substituted aryl, a 4 to 15 carbon atom cycloalkyl substituted aryl, or hydrogen,

said copolymer made from monomers of conjugated dienes and vinyl substituted aromatics;

said amine terminated polymer having a molecular weight of from about 3,000 to about 100,000;

said polyisocyanate and said polyisothiocyanate having the formula

$$R-N=C=X)_n$$

wherein R is an aliphatic containing from 2 to about 20 carbon atoms, a cycloaliphatic containing from 4 to about 20 carbon atoms, an aromatic containing from 6 to about 20 carbon atoms, and combinations thereof, n is an integer of 2 or 3 and X is selected from the class consisting of oxygen and sulfur; and

said urea polymer constituent being made from urea-forming monomers,

the amount of said urea polymer constituent ranging from about 5 percent to about 95 percent based upon the total weight of said block copolymer composition, and the molecular weight of said urea constituent ranging from about 1,000 to about 40,000.

4,235,980

ELASTOMERIC TERIONOMER BLENDS

Linda R. Bateman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 19, 1979, Ser. No. 87,465

Int. Cl.³ C08L 33/02

U.S. Cl. 525—215 **8 Claims**

1. An elastomeric blend consisting essentially of about:

(1) 20–80 weight percent of a copolymer of chloroprene with an α,β-unsaturated C_3–C_{10} carboxylic acid,

(2) 10–50 weight percent of a copolymer of ethylene with an α,β-unsaturated C_3–C_{10} carboxylic acid, and

(3) 10–50 weight percent of a terpolymer of ethylene with a vinyl ester of a C_1–C_6 saturated aliphatic, monocarboxylic

acid or a C_{1-4} alkyl acrylate or methacrylate and with an α,β-unsaturated C_{3-10} carboxylic acid in respective weight proportions of (20–94.5):(5–65):(0.5–15);

with the provisos that: (a) the sum of all the above percentages of (1), (2), and (3) is 100%; and (b) the pendant carboxylic groups of the polymer blend are neutralized with metal ions to a degree of at least 10%.

4,235,981

COATING COMPOSITIONS

Shozo Tsuchiya, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

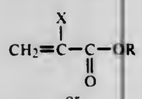
Continuation of Ser. No. 711,049, Aug. 2, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 941,884

Claims priority, application Japan, Aug. 5, 1975, 50/94691; Aug. 5, 1975, 50/94692

Int. Cl.³ C08F 277/00

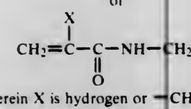
U.S. Cl. 525—244 **18 Claims**

1. A coating composition curable under the action of heat or radiation, consisting essentially of (A) an esterified copolymer resin of (I) a starting copolymer resin of (a) at least one cyclopentadiene type monomer and (b) maleic anhydride and (II) at least one compound selected from the group consisting of those represented by the formulae (1) and (2)



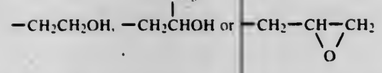
(1)

or



(2)

wherein X is hydrogen or $-CH_3$ and R is

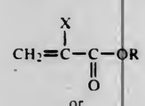


and (B) a reactive solvent for said esterified copolymer resin, the reactive solvent being a monomer capable of reaction therewith under the action of heat or radiation being a (meth)acrylate type monomer selected from the group consisting of pentaerythritol tetra(meth)acrylate, pentaerythritol tri(meth)acrylate, trimethylolproprane tri(meth)acrylate, ethylene glycol di(methyl)acrylate, diethylene glycol di(meth)acrylate, 1,3-butanediol di(meth)acrylate, 1,4-butanediol di(meth)acrylate, 1,6-hexanediol (meth)acrylate, 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, an alkyl (meth)acrylate in which the alkyl has 1 to 18 carbon atoms and a compound in aqueous solution selected from the group consisting of ammonia, methylamine, ethylamine, ethylemethylamine, diethylamine, triethylamine, tert.-butylamine, monoethanolamine, diethanolamine and triethanolamine.

10. A process for preparing a coating composition curable under the action of heat or radiation comprising the steps of:

reacting at least one cyclopentadiene type monomer with maleic anhydride at 150°–350° C. for a time sufficient to produce a starting copolymer resin having a softening point of 50°–250° C.,

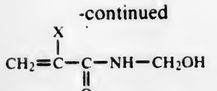
esterifying the thus produced copolymer resin with at least one compound selected from the group consisting of these represented by the formulae (1) and (2)



(1)

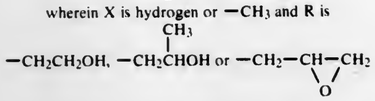
or

-continued



(2)

wherein X is hydrogen or $-CH_3$ and R is



to produce an esterified copolymer resin and

dissolving the thus esterified copolymer resin in a reactive solvent capable of reaction therewith under the action of heat or radiation to produce the coating composition wherein said solvent is a (meth)acrylate type monomer selected from the group consisting of pentaerythritol tetra(meth) acrylate, pentaerythritol tri(meth)acrylate, trimethylolpropane tri(meth)acrylate, ethylene glycol di(meth)acrylate, diethylene glycol di(meth)acrylate, 1,3-butanediol di(meth)acrylate, 1,4-butanediol di(meth)acrylate, 1,6-hexanediol (meth)acrylate, 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, an alkyl (meth)acrylate in which the alkyl has 1 to 18 carbon atoms and a compound in aqueous solution selected from the group consisting of ammonia, methylamine, ethylamine, ethylmethylamine, diethylamine, triethylamine, tert.-butylamine, monoethanolamine, diethanolamine and triethanolamine.

4,235,982

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules, Incorporated, Wilmington, Del.

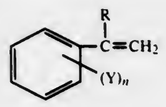
Continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application May 25, 1978, Ser. No. 909,606

Int. Cl.³ C08F 267/10, 269/00

U.S. Cl. 525—284 **18 Claims**

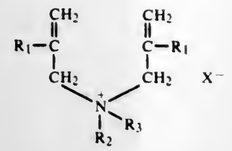
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (1) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alphachloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula

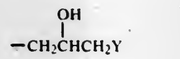


wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, and said prepolymer (2) being the addition polymerization product of

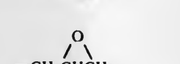
(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



wherein R_1 is hydrogen or a C_1–C_4 alkyl, R_2 is hydrogen, alkyl or substituted alkyl, R_3 is hydrogen, a C_1–C_4 alkyl,



where Y is hydroxyl or halogen,



or $-(CH_2CH_2O)_nH$ where n is an integer 1 or more, and X^- is an anion, and

(ii) from about 95 mole per cent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomer (1) employed.

4,235,983

PURIFICATION OF OLEFIN RECYCLE TO POLYMERIZATION

Edward F. Steigelmann; Robert L. Yahnke, both of Naperville; Alistair S. Couper, Wheaton, and Chand Deepak, Chicago, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 4, 1978, Ser. No. 948,332

Int. Cl.³ C08F 2/06, 2/14; C07C 11/04

U.S. Cl. 526—68 **8 Claims**

1. An improved process for the manufacture of polymer comprising

passing olefinic compound into a reaction zone;

polymerizing a substantial portion of the olefinic compound so as to form a reaction mixture containing polymer and olefinic compound;

passing a stream comprising reaction mixture to a separation zone wherein the stream is separated into a polymer fraction and a fraction comprising a mixture of olefinic compound and saturated material;

recovering polymer;

passing at least a portion of the mixture comprising olefinic compound and saturated material to a membrane separator which substantially separates olefinic compound from saturated material;

removing olefinic compound which has been separated in the membrane separation zone by use of saturated hydrocarbon sweep fluid; and

recycling the recovered olefinic compound and sweep fluid to the reaction zone.

4,235,984

PROCESS FOR PRODUCING HIGHLY STEREOREGULAR α-OLEFIN POLYMERS

Akinobu Shiga; Yoshiharu Fukui, both of Niihama; Katsumi Hanji, Ibaraki; Toshio Sasaki, Niihama; Masahisa Okawa, Niihama; Hideaki Matsuura, Niihama, and Yasuharu Yamada, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 12, 1979, Ser. No. 11,676

Claims priority, application Japan, Feb. 23, 1978, 53-20490; Mar. 9, 1978, 53-27331

Int. Cl.³ C08F 4/02, 10/06

U.S. Cl. 526—127 **9 Claims**

1. A process for producing a highly stereoregular α-olefin polymer which comprises polymerizing an α-olefin with a catalyst system comprising three components A, B and C:

A: a solid catalyst produced as follows:

(1) an organo-magnesium compound represented by the general formula RMgX, wherein R is C_1–C_8 alkyl, aryl or alkenyl group and X is a halogen atom, synthesized in the presence of an ether (I) solvent is reacted in solution is said ether with at least one halogen-containing compound of (a) and (b),

(a) halogeno-silicon compounds of the formula

$R_n^1SiX_{4-n}$

wherein R^1 is a C_1–C_8 alkyl, aryl or alkenyl group, X is a halogen atom and n is a number satisfying $0 \leqq n < 4$,

(b) halogeno-aluminium compounds of the formula

$R_l^2AlX_{3-l}$

wherein R^2 is a C_1–C_8 alkyl, aryl or alkenyl group, X is a halogen atom and l is a number satisfying $0 \leqq l < 3$,

at 0° to 100° C. in the former to the latter molar ratio of 1:10 to 10:1, and the resulting solid product is separated from the reaction system and washed with an inert hydrocarbon solvent, thereby obtaining a solid product containing 20 to 60% by weight of said ether (I),

(2) the solid product is reacted, at −50° to 150° C., with an electron donor of 10^{-5} to 0.1 mole per gram of solid product, selected from the group consisting of amines, amides, ethers, esters, alcohols, phenols, ketones, nitriles, phosphines, phosphites, sulfides, and lactones, and the resulting solid carrier is separated from the reaction system and washed with an inert hydrocarbon solvent, thereby obtaining a solid carrier containing 1 to 30% by weight of the ether (I) and 1 to 20% by weight of the electron donor, and

(3) the solid carrier is reacted with titanium tetrachloride of 0.01 to 10 moles per gram of solid carrier at 0° to 150° C., and the resulting solid catalyst is separated from the reaction system and washed with an inert hydrocarbon solvent, thereby obtaining a solid catalyst containing 0.1 to 15% by weight of the ether (I) and 0.1 to 10% by weight of the electron donor and 0.1 to 20% by weight of titanium,

B: an activating agent of the formula,

$R_m^3AlY_{3-m}$

where R^3 is a C_1–C_8 alkyl, aryl or alkenyl group, Y is a halogen or hydrogen atom and m is a number satisfying $2 \leqq m \leqq 3$ and

C: an electron donor selected from the group consisting of amines, amides, ethers, esters, alcohols, phenols, ketones, nitriles, phosphines, phosphites, sulfides, and lactones, the molar ratio of titanium to activating agent being 10:1 to 1:500 and the molar ratio of titanium to electron donor (c) being 10:1 to 1:500.

4,235,985

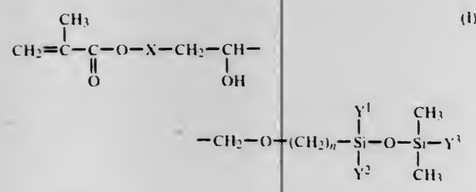
POLYMER FOR CONTACT LENS AND CONTACT LENS MADE THEREOF

Kyoichi Tanaka; Kouzou Takahashi, both of Nagoya; Mitsuhiro Kanada, Aichi; Yasuyuki Kato, Kasugai, and Masuji Ichihara, Aichi, all of Japan, assignors to Toyo Contact Lens Co., Ltd., Aichi, Japan

Filed Sep. 22, 1978, Ser. No. 944,843
Claims priority, application Japan, Jul. 15, 1978, 53-86537
Int. Cl.³ C08F *230/08*; **G02C** *7/04*
U.S. Cl. 526—279 **11 Claims**

1. A polymerization product consisting essentially of:

(a) 30% to 95% of an organosiloxane monomer having the following general formula:



(I)

wherein:

n is an integer of 1 to 3;

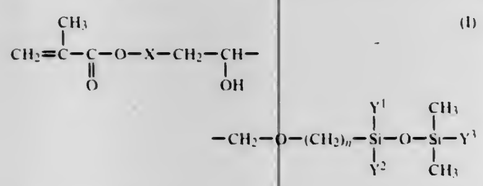
X is $-(CH_2)_p-O]_q$ in which p is an integer of 2 to 4 and q is 0 or an integer of 1 to 3; and

Y^1, Y^2 and Y^3 are methyl or $-O-Si-(CH_3)_3$; and

(b) 70% to 5% of a hydrophobic methacrylic acid alkyl ester monomer, wherein said hydrophobic methacrylic acid alkyl ester monomer is at least one member selected from the group consisting of methyl methacrylate, ethyl methacrylate and cyclohexyl methacrylate, said % of (a) and (b) being % by weight based on the total weight of (a) and (b).

10. A contact lens made of a copolymer consisting essentially of:

(a) 30% to 95% of organosiloxane monomer units having the following general formula (I):



(I)

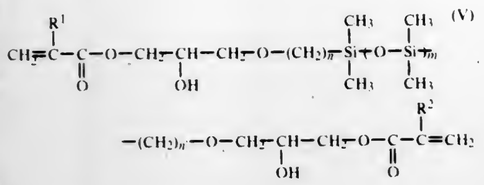
wherein:

n is an integer of 1 to 3;

X is $[(CH_2)_p-O]_q$ in which p is an integer of 2 to 4 and q is 0 or an integer of 1 to 3; and

Y^1, Y^2 and Y^3 are methyl or $-O-Si-(CH_3)_3$; and

(b) 70% to 5% of hydrophobic methacrylic acid alkyl ester monomer units, wherein said hydrophobic methacrylic acid alkyl ester monomer is at least one member selected from the group consisting of methyl methacrylate, ethyl methacrylate and cyclohexyl methacrylate, said % of (a) and (b) being % by weight based on the total weight of (a) and (b), wherein said copolymer further contains units of a cross-linking agent in a weight ratio of 0.5 to 25 against 100 of the components (a) and (b), said cross-linking agent being at least one polyfunctional monomer selected from the group consisting of ethylene glycol diacrylate, ethylene glycol dimethacrylate, diethylene glycol diacrylate, diethylene glycol dimethacrylate, triethylene glycol diacrylate, triethylene glycol dimethacrylate, allyl methacrylate, trimethylolpropane trimethacrylate, divinyl benzene, diallyl phthalate, compounds having the following general formula (V):



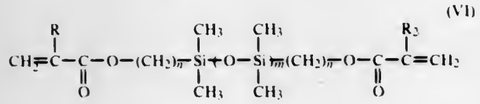
(V)

wherein:

n and n' are an integer of 1 to 3;

m is 1 or 2; and

R^2 and R^2 are hydrogen or methyl, and compounds having the following general formula (VI):



(VI)

wherein:

n and n' are an integer of 1 to 3;

m is 1 or 2; and

R^1 and R^2 are hydrogen or methyl.

4,235,986

ANAEROBIC CURING ADHESIVE COMPOSITION AND PROCESS FOR MAKING SAME

William J. Catena, Montville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 2, 1979, Ser. No. 26,091
Int. Cl.³ C08F *20/20*
U.S. Cl. 526—320 **16 Claims**

1. An improved process for preparing a storage-stable adhesive composition capable of curing in the absence of air which process comprises:

(a) forming a homogeneous mixture consisting essentially of a polymerizable acrylate ester monomer, from 0.0001 to 0.1% by weight, based on monomer, of an inhibitor for free radical polymerization, from 0.0001 to 0.1% by weight, based on total composition, of a soluble chelator having ligand atoms other than nitrogen ligand atoms of the $\leqq C=N$-type, this amount being dependent on the chelator, and at least an effective amount of an accelerator system consisting of an organic cyclic sulfimide and an aromatic tertiary amine; and

(b) heating said mixture at a temperature of about 45°-100° C. for a period of time sufficient to provide said composition with anaerobic curing properties and to provide said composition with at least 25 ppm. active oxygen, said process not requiring the use of any externally added polymerization initiator and said process being conducted without constant passage of gaseous oxygen through the adhesive during preparation thereof.

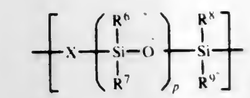
4,235,987

METHOD FOR PRODUCING CARBORANE-SILOXANE POLYMERS DIRECTLY FROM CARBORANE

Edward N. Peters, Piscataway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 865,877, Dec. 30, 1977, abandoned. This application May 4, 1979, Ser. No. 36,229
Int. Cl.³ C08G *77/04*
U.S. Cl. 528—5 **8 Claims**

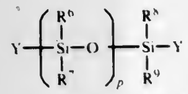
1. A method for preparing carboranesiloxane polymers having the following recurring unit:



by reacting and polymerizing in equivalent molar proportions a dilithio salt of a carborane:

Li—X—Li

with a siloxane of the formula:



wherein X represents a divalent radical derived from a carborane, Y represents a relatively labile moiety which forms a weak nucleophile with lithium; R^6, R^7, R^8 and R^9, which may be the same or different, each represents a hydrogen atom or a group containing up to 14 carbon atoms and selected from the group consisting of alkyl, aryl, alkenyl, alkaryl, aralkyl, haloalkyl and haloaryl; and p is a positive integer of 1 to 4.

4,235,988

DELIVERY MEANS FOR BIOLOGICALLY ACTIVE AGENTS

Francis J. T. Fildes, and Francis G. Hutchinson, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 855,332, Nov. 28, 1977, Pat. No. 4,202,880. This application May 31, 1979, Ser. No. 44,213
Claims priority, application United Kingdom, Dec. 13, 1976, 51917/76; Australia, Nov. 30, 1977, 31065/77; Pakistan, Nov. 30, 1977, 436/77
Int. Cl.³ C08G *18/48*; **A61K** *9/02*, *31/557*, *31/785*
U.S. Cl. 528—79 **10 Claims**

1. The sustained release delivery means comprising:

(a) a functionally effective amount of a biologically active agent; and

(b) a hydrophilic linear block polyoxyalkylene-polyurethane copolymer of the type ABABAB . . . having blocks A linked to blocks B, substantially devoid of cross-linking, wherein A represents a hydrophilic block comprising one or more polyoxyalkylene moieties of molecular weight 600 to 6000, and B represents a hydrophobic block comprising a polyurethane moiety obtainable by reacting an aromatic or aliphatic diisocyanate with a short chain oxyalkylated diphenol.

4,235,989

PRODUCTION OF THERMOSETTING PHENOL-FORMALDEHYDE RESINS

Sim Y. Leong, Vancouver; Pitchaiya Chandramouli, Richmond, and Ramesh C. Vasishth, Delta, all of Canada, assignors to Cor Tech Research Ltd., Richmond, Canada

Continuation of Ser. No. 880,230, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 779,622, Mar. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 567,865, Apr. 14, 1975, abandoned. This application Dec. 22, 1978, Ser. No. 972,353
Int. Cl.³ C08G *8/10*
U.S. Cl. 528—139 **15 Claims**

1. A process for the production of a water-immiscible thermosetting phenol-formaldehyde resin characterized by a large proportion of the linkages between the benzene rings being benzyl ether linkages located ortho to the phenolic hydroxyl groups, which comprises:

forming an essentially aqueous reaction medium containing formaldehyde and phenol at a mole ratio of about 1.5:1 to about 3.0:1, and at least one water-soluble metal carboxylate catalyst which is a water-soluble salt of an organic monocarboxylic acid with a metal of the transition elements of the Periodic Chart of Elements represented by the formula:

$$(C_nH_{2n-1}COO)_xM$$

wherein n is an integer from 0 to 10, x is greater than 1 and M is a metal having an atomic number from 21 to 30,

said reaction medium having an initial total reactants concentration of about 45 to about 58% by weight,

heating said reaction medium to a temperature of at least about 90° C. to initiate reaction between said phenol and formaldehyde in said reaction zone above said temperature,

increasing the temperature of said reaction medium to the reflux temperature of said reaction medium,

maintaining said reaction medium at its reflux temperature until a water-immiscible phenol-formaldehyde resin phase separates from said aqueous reaction medium and a resin phase having a viscosity of at least about 1000 cps at 50° C. is achieved, and

recovering the water-immiscible resin phase from the aqueous phase,

whereby said resin-forming process is effected substantially wholly at a temperature of at least about 90° C. up to the reflux temperature of said reaction medium.

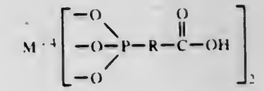
4,235,990

LAYERED CARBOXY END TERMINATED ORGANOPHOSPHORUS INORGANIC POLYMERS

Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Oct. 17, 1978, Ser. No. 952,228
Int. Cl.² C08L *85/02*
U.S. Cl. 528—287 **11 Claims**

1. Solid inorganic phosphorus containing polymers providing pendent carboxy groups, and which include structural units of the formula:



wherein R is an organo group and each oxygen is bonded to phosphorous is structurally linked to a tetravalent metal, M, selected from the group consisting of zirconium, cerium, thorium, uranium, hafnium, lead, titanium and mixtures thereof and wherein the molar ratio of phosphorus to tetravalent metal in said solid inorganic phosphorous containing polyer is about 2 to 1.

4,235,991

LAYERED SULFONATE END TERMINATED ORGANOPHOSPHORUS INORGANIC POLYMERS

Peter M. DiGiacomo, Mission Viego, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Dec. 4, 1978, Ser. No. 966,197
Int. Cl.² C08F *130/02*; **C07F** *7/00*
U.S. Cl. 528—391 **9 Claims**

1. Inorganic phosphorus containing polymers providing pendant sulfonic acid groups, and which include units of the formula:

$$M(O_3P-R-SO_3H)_2$$

wherein R is an organo group and oxygen atoms are bonded to phosphorus and structurally linked to a tetravalent metal selected from the group consisting of zirconium, cerium, thorium, uranium, hafnium, lead, titanium and mixtures thereof and wherein the molar ratio of phosphorus to tetravalent metal in said inorganic phosphorus containing polymer is about 2 to 1.

4,235,992

METHOD FOR PRODUCING HIGH PURITY STEROL GLYCOSIDES

Masakazu Ueno, Joya; Akira Sano, Otsu, and Kyoichi Ideguchi, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Apr. 23, 1979, Ser. No. 32,275
Int. Cl.[3] C07J *17/00*
U.S. Cl. 536—5 **3 Claims**

1. In the method of separating individual sterol glycosides from one another in high purity from a raw material containing said sterol glycosides, the steps which comprise treating an extract of said raw material containing said sterol glycosides with an acetylating agent to produce the corresponding sterol glycoside tetraacetates, subjecting said acetylated extract to liquid chromatography to separate the individual sterol glycoside tetraacetates, and hydrolysing the separated tetraacetate of the desired sterol glycoside under basic conditions to produce the desired individual sterol glycoside.

4,235,993

N-BENZYLIDENEAMPHOTERICIN B, ITS METHYL ESTER AND PROCESS FOR MAKING WATER-SOLUBLE SALTS THEREOF

Frank Sipos, Cranbury, and Adam J. Keseleski, Edison, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 21, 1979, Ser. No. 13,710
Int. Cl.[1] C07H *17/08*
U.S. Cl. 536—17 R **16 Claims**

1. A compound selected from the group consisting of N-benzylideneamphotericin B and the methyl ester of N-benzylideneamphotericin B.

4,235,994

HIGH MOLECULAR WEIGHT MENINGOCOCCAL GROUP C VACCINE AND METHOD FOR PREPARATION THEREOF

Thomas H. Stoudt, Westfield; Dennis J. Carlo, South Amboy, and Arpi Hagopian, Clark, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 820,665, Aug. 1, 1977, Pat. No. 4,123,520. This application Jun. 26, 1978, Ser. No. 919,359
Int. Cl.[1] C08B *37/00*
U.S. Cl. 536—18 **1 Claim**

1. An antigen meningococcal polysaccharide active against Group C meningococci wherein at least 80% of the polysaccharide by weight has a molecular weight in excess of 1,000,000 daltons.

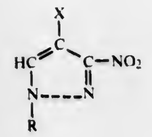
4,235,995

3-NITROPYRAZOLE DERIVATIVES

Reuben G. Jones, Cedar City, Utah, and Norman H. Terando, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 842,006, Oct. 13, 1977, Pat. No. 4,145,554, which is a division of Ser. No. 697,516, Jun. 18, 1976, Pat. No. 4,066,776, which is a continuation-in-part of Ser. No. 561,139, Mar. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 477,118, Jun. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 357,135, May 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,791, Dec. 23, 1971, abandoned, Continuation-in-part of Ser. No. 124,463, Mar. 15, 1971, abandoned. This application Sep. 25, 1978, Ser. No. 945,170
Int. Cl.[3] C07D *231/16*
U.S. Cl. 542—408 **7 Claims**

1. A compound of the formula



wherein

R represents

(A) C_3-C_4 epoxyalkyl,

(B) hydrogen

(C) C_1-C_{10} alkyl, C_2-C_{10} alkenyl, C_3-C_{10} alkynyl, C_3-C_{10} cyanoalkyl, cyclopropylmethyl, C_3-C_{10} cycloalkenyl, C_2-C_{10} alkyl mono- or disubstituted with halo or C_1-C_3 alkoxy, or C_1-C_{10} alkyl monosubstituted with

(1) mercapto,

(2) carboxamido,

(3) keto oxygen,

(4) hydroxy,

(5) phthalimido,

(6) C_1-C_3 alkylthio,

(7) C_1-C_3 alkylsulfonyl

(8) C_1-C_3 alkanoyl,

(9) phenyl,

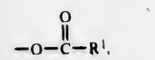
(10) phenyl monosubstituted with

(a) C_1-C_3 alkyl,

(b) C_1-C_3 haloalkyl,

(c) hydroxy, or

(d) halo,



(11)

wherein R^1 represents

(a) C_1-C_3 alkyl,

(b) C_1-C_3 haloalkyl,

(c) C_3-C_6 cycloalkyl,

(d) phenyl, or

(e) phenyl monosubstituted with

(1) C_1-C_3 alkyl,

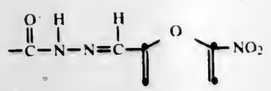
(2) C_1-C_3 haloalkyl,

(3) halo, or

(4) hydroxy, or

(D) phenyl, thiazolyl, or pyridyl, monosubstituted with nitro; and

X represents



provided that a C_1 alkyl R group is substituted only with phenyl or substituted phenyl.

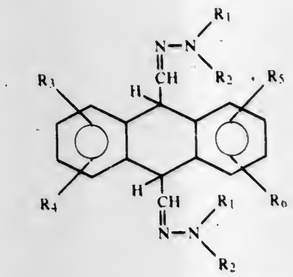
4,235,996

BIS(2-IMIDAZOLIN-2-YLHYDRAZONE)-9,10-DIHYDRO-9,10-ANTHRACENEDICARBOXALDEHYDES

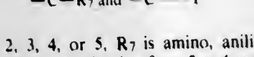
Ralph G. Child, Pearl River; Stanley A. Lang, Jr., Stony Point; Ving J. Lee, Airmont, and Yang-I Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 19, 1978, Ser. No. 943,908
Int. Cl.[1] C07C *143/72, 153/00*; C07D *233/16*
U.S. Cl. 542—415 **19 Claims**

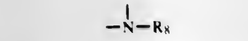
1. A compound selected from the group consisting of those of the formula:



wherein R_1 is selected from the group consisting of hydrogen and alkyl having up to 4 carbon atoms; R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, phenyl and monovalent moieties of the formulae:



wherein n is 2, 3, 4, or 5, R_7 is amino, anilino, hydrazino, monohydroxyalkylamino having from 2 to 4 carbon atoms and wherein the carbon atom alpha to the nitrogen atom may not bear an hydroxy group, alkylamino having up to 4 carbon atoms, dialkylamino wherein each alkyl group has up to 4 carbon atoms, cycloalkylamino having from 3 to 6 carbon atoms, benzylamino, α-phenethylamino, β-phenethylamino, 2-furfurylamino, 3-furfurylamino, α-thenylamino, β-thenylamino, α-pyridylmethylamino, β-pyridylmethylamino, γ-pyridylmethylamino, indanylamino, pyrrolidino, piperidino, morpholino, thiomorpholino, N-methylpiperazino, alkoxy having up to 4 carbon atoms or alkylthio having up to 4 carbon atoms, X is oxo, thioxo, imino or alkylimino having up to 4 carbon atoms, and Y is oxy, thio or a divalent group of the formula:



wherein R_8 is hydrogen, alkyl having up to 4 carbon atoms or monohydroxyalkyl having from 2 to 4 carbon atoms and wherein the carbon atom alpha to the nitrogen atom may not bear an hydroxy group; and R_3, R_4, R_5 and R_6 are each individually selected from the group consisting of hydrogen, halogen, hydroxy, nitro, amino, sulfonamido, alkyl having up to 4 carbon atoms and alkoxy having up to 4 carbon atoms; and the pharmacologically acceptable acid-addition and quaternary ammonium salts thereof.

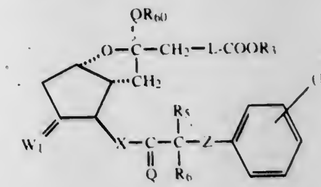
4,235,997

6-ALKOXY-ω-ARYL-PGI$_1$ COMPOUNDS

Frank H. Lincoln, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 892,108, Mar. 31, 1978. This application Aug. 30, 1979, Ser. No. 70,951
Int. Cl.[1] C07D *307/935*
U.S. Cl. 542—426 **13 Claims**

1. A compound of the formula



wherein L is

(1) $-(CH_2)_d-C(R_2)_2-$,

(2) $-CH_2-O-CH_2-Y-$, or

(3) $-CH_2CH=CH-$,

wherein d is zero to 5, R_2 is hydrogen, methyl or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$, or $-(CH_2)_2-$;

wherein Q is oxo, α-H:β-H, α-R_8:β-OH, or α-OH:β-R_8, wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);

wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the (Ph);

wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive; and wherein s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;

wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, or α-CH_2OH:β-H;

wherein R_{60} is straight-chain alkyl of one to 6 carbon atoms, inclusive; and

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$;

wherein R_1 is

(a) alkyl of one to 12 carbon atoms, inclusive,

(b) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(c) aralkyl of 7 to 12 carbon atoms, inclusive,

(d) phenyl,

(e) phenyl substituted with one, 2 or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

(f) p-[(p-acetamido)benzamido]phenyl,

(g) p-(benzamido)phenyl,

(h) p-(acetamido)phenyl,

(i) —(p-Ph)—NH—CO—NH_2, wherein (p-Ph) is para-phenyl,

(j) —(p-Ph)—CH=N—NH—C(=O)—NH_2, wherein (p-Ph) is as defined above,

(k) β-naphthyl,
(l) $-CH(R_{11})-CO-R_{10}$
wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl; wherein R_{11} is hydrogen or benzoyl;
(m) hydrogen; or
(n) a pharmacologically acceptable cation.

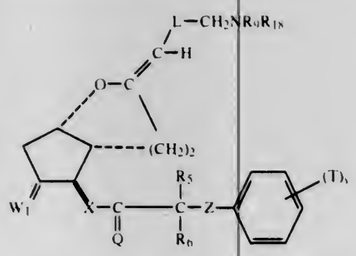
4,235,998

2-DECARBOXY-2-AMINOMETHYL-9-DEOXY-5,9α-EPOXY-4,5-DIDEHYDRO-PGF$_1$ COMPOUNDS

Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 932,899, Aug. 11, 1978, which is a division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Sep. 7, 1979, Ser. No. 73,451
Int. Cl.^{3} C07D *311/02*
U.S. Cl. 542—426 **41 Claims**

1. A compound of the formula



wherein W_1 is α-OH:βH, αH:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;
wherein L is -$(CH_2)_d$-$C(R_2)_2$,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro;
wherein Q is oxo, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein R_9 is hydrogen, methyl, or ethyl, and wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive;
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—), a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6- and the phenyl ring;
wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and
wherein X is
(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

4,235,999

BICHROMOPHORIC BENZOTRIAZOLE-STYRENE ESTER ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

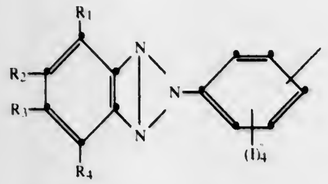
Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 857,731, Dec. 5, 1977, abandoned, which is a division of Ser. No. 715,014, Aug. 16, 1976, Pat. No. 4,070,339. This application May 29, 1979, Ser. No. 43,861
Int. Cl.^{3} C07D *249/20*
U.S. Cl. 542—427 **35 Claims**

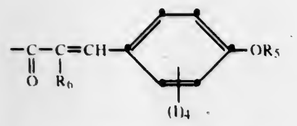
1. A compound having the formula:

A—B—C

wherein A is a group having the structure



wherein
R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;
I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the styrene C group, wherein B is a linking group connecting A and C and can be oxy, oxycarbonylalkyleneoxy, alkyleneoxy, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, N-alkylamino, N-arylamino, N-arylaminoalkyleneoxy, N-alkyleneaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy; and
where C is a group having the formula



where I is the same substituent as listed above and said I substituents can all be one of the substituents listed above or different listed substituents and R_5 is an alkyl group containing 1 to 20 carbon atoms, and R_6 is cyano, alkylsulfonyl, arylsulfonyl, alkylcarbonyl, arylcarbonyl or carbonylalkoxy.

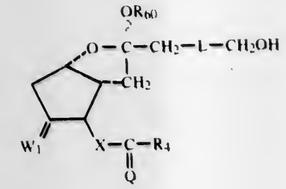
4,236,000

2-DECARBOXY-2-HYDROXYMETHYL-6-ALKOXY-PGI$_1$ COMPOUNDS

Frank H. Lincoln, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 892,108, Mar. 31, 1978, This application Aug. 30, 1979, Ser. No. 70,954
Int. Cl.^{3} C07D *307/935*
U.S. Cl. 542—429 **10 Claims**

1. A compound of the formula



wherein L is
(1) $-(CH_2)_d-C(R_2)_2-$
(2) $-CH_2-O-CH_2-Y-$ or
(3) $-CH_2CH=CH-$
wherein d is zero to 5, R_2 is hydrogen, methyl or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$, or $-(CH_2)_2-$;
wherein Q is oxo, α—H:β—H, α—R_8:β—OH, or α—OH:-β—R_8, wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein R_4 is
(1) $-C(R_5)(R_6)-C_gH_{2g}-CH_3$
(2) $-C(R_5)(R_6)-Z-(Ph)$ or
(3) cis—$CH_2-CH=CH-CH_2CH_3$,
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6- and the (Ph) ring;
wherein (Ph) is phenyl or phenyl substituent by (T)s,
wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;
wherein W_1 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, or α—CH_2OH:β—H;
wherein R_{60} is straight-chain alkyl of one to 60 carbon atoms, inclusive; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —CH≡CH—, or
(4) $-CH_2CH_2-$.

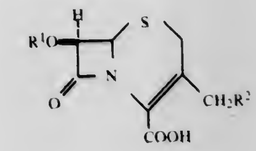
4,236,001

7β-ACYLOXY-3-HETEROCYCLICTHIOMETHYL CEPHALOSPORINS

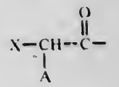
John G. Gleason, Delran, N.J., assignor to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 588,096, Jun. 18, 1975, Pat. No. 4,020,057. This application Dec. 1, 1976, Ser. No. 746,288
Int. Cl.^{3} C07D *501/00*
U.S. Cl. 544—26 **2 Claims**

1. A compound of the formula:



in which:
R^1 is an acyl group of the formula:



where:
X is thienyl; dihydrophenyl; phenyl; phenyl monosubstituted with hydroxy, hydroxymethyl, formamido, ureido, carboxymethylamino; 3-fluoro-4-hydroxyphenyl or 3,4-dihydroxyphenyl;
A is NH_2, OH, COOH or SO_3H; or formyloxy when X is phenyl; and
R^2 is SHet where Het is selected from the group consisting of 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, oxazolyl, thiazolyl, 1,3,4-oxadiazolyl, 1,3,4-thiadiazolyl, 1,2,4-thiadiazolyl, pyridyl, pyrimidyl and pyrazinyl, each such heterocyclic ring being unsubstituted or substituted with from one to two groups selected from lower alkyl, alkoxyalkyl and trifluoromethyl, each alkyl or alkoxy group having from one to four carbon atoms, or a non-toxic pharmaceutically acceptable salt thereof.

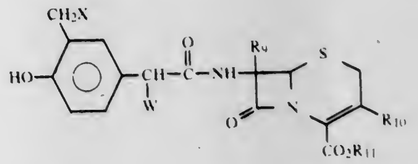
4,236,002

CEPHALOSPORIN DERIVATIVES

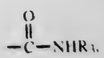
Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziyona, both of Israel, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed Dec. 23, 1977, Ser. No. 863,729
Int. Cl.^{3} C07D *501/22*
U.S. Cl. 544—28 **7 Claims**

1. A compound of the formula



wherein W is hydrogen, $-SO_3H$ or $-NHR_2$, wherein R_2 is hydrogen, tert-butyloxycarbonyl or

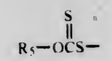


wherein R_3 is hydrogen, a lower alkyl group of from 1 to 4

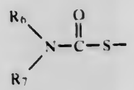
carbon atoms or a phenyl group; X is chloro, bromo, an alkoxy group from 1 to 4 carbon atoms; an R_4—S—;



R_4SO_2— group wherein R_4 is a lower alkyl group of from 1 to 4 carbon atoms; azido; cyano; NCNH—; HSO_3—; —SCN; —OCN; CH_3SO_2NH—; isothiourea; mono-substituted isothiourea wherein the substituents are amino, formylamino, guanylamino, a lower alkyl group of from 1 to 4 carbon atoms and concatenated alkylene groups in the form of a series of from 2 to 6 methylene groups; pyridylthio; 1-methyltetrazol-5-ylthio; 1,3,4-thiadiazol-2-ylthio; 1,3,4-triazol-2-ylthio; —SH; SSO_3H; F_3CS—;



wherein R_5 is lower alkyl of from 1 to 4 carbon atoms;



wherein R_6 and R_7 separately are hydrogen, a lower alkyl group of from 1 to 4 carbon atoms, when taken together R_6 and R_7 may form a concatenated chain of from 4 to 7 methylene groups, a concatenated chain of from 5 to 7 methylene groups wherein one of these methylene groups is replaced by an oxygen atom or an R_8—N group wherein R_8 is a lower alkyl group of from 1 to 4 carbon atoms with the proviso that when X is chlorine or bromine R_2 is other than tert-butyloxycarbonyl; R_9 is hydrogen or methoxy; R_{10} is methyl or acetyloxymethyl; R_{11} is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a straight or branched alkanoyloxymethyl group in which the alkanoyl moiety has from 1 to 4 carbon atoms; and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with a straight or branched lower alkyl group having 1 to 4 carbon atoms; an alkoxycarbonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with a straight or branched lower alkyl group of from 1 to 4 carbon atoms, p-(alkanoyloxy)-benzyl group in which the alkanoyl moiety is straight or branched and has from 1 to 4 carbon atoms; an aminoalkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 15 carbon atoms and the amine nitrogen may be mono- or di-substituted with a straight or branched lower alkyl group having from 1 to 4 carbon atoms; and pharmaceutically acceptable salts thereof.

4,236,003

V-TRIAZOLYL-[4,5-D]-PYRIMIDH.

Ian J. Fletcher, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

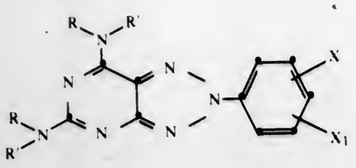
Division of Ser. No. 846,875, Oct. 31, 1977, Pat. No. 4,157,443. This application Mar. 2, 1979, Ser. No. 16,769

Claims priority, application Luxembourg, Nov. 11, 1976, 76169; Switzerland, Jul. 11, 1977, 8523/77

Int. Cl.³ C07D *487/04*

U.S. Cl. 544—254 **5 Claims**

1. A v-triazolyl[4,5-d]-pyrimidine of the formula:



in which R and R' independently of one another are hydrogen or alkyl having 1 to 4 carbon atoms, X is $—SO_3M$, in which M is hydrogen or a salt-forming cation; alkylsulfonyl with 1 to 4 carbon atoms; or $—SO_2NY_1Y_2$, in which Y_1 and Y_2 independently of one another are hydrogen or alkyl having 1 to 4 carbon atoms and X_1 is hydrogen, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms.

4,236,004

2-ALKYLSULPHONYL-7,8-DIHYDRO-5-HYDROXY-7-OXO-PYRIDO[2,3-D]PYRIMIDINE-6-CARBOXYLIC ACID DERIVATIVES

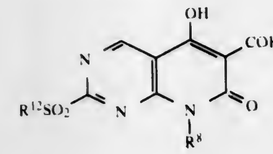
Anthony C. Scotese, King of Prussia; Robert L. Morris, Devon, and Arthur A. Santilli, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 031,256, Apr. 18, 1979. This application Oct. 29, 1979, Ser. No. 89,013

Int. Cl.³ C07D *471/04*; **A61K** *31/505*

U.S. Cl. 544—279 **2 Claims**

1. A compound of the formula:



in which

R^6 is alkoxy of 1 to 6 carbon atoms, 2-hydroxyethylamino, 2-alkoxyethylamino of 3 to 8 carbon atoms or 2-(dialkylamino)ethylamino in which each alkyl group contains from 1 to 6 carbon atoms;

R^8 is hydrogen, alkyl of 1 to 6 carbon atoms, 2-alkoxyethyl of 3 to 6 carbon atoms, allyl, propargyl, phenyl, 4-methoxyphenyl, 4-chlorophenyl, benzyl, 4-methoxybenzyl, 4-chlorobenzyl or piperonyl; and

R^{12} is alkyl of 1 to 6 carbon atoms.

4,236,005

IMIDAZO[1,5-a]PYRIMIDINES

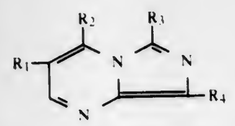
John P. Dusza, and Jay D. Albright, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 970,085, Dec. 15, 1978, Pat. No. 4,178,449, which is a continuation-in-part of Ser. No. 896,826, Apr. 17, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 54,104

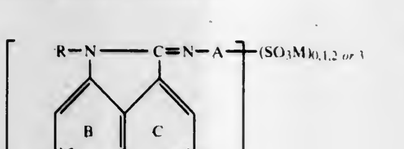
Int. Cl.³ C07D *487/04*; **A61K** *31/415*

U.S. Cl. 544—281 **10 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or alkyl having up to 3 carbon atoms; R_2 is selected from the group consisting of phenyl, o-trifluoromethylphenyl, m-trifluoromethylphenyl and m-methoxyphenyl; R_3 is hydrogen, fluoro, chloro, bromo, cyano, cyanomethyl, carbamoyl or alkyl having up to 3 carbon atoms; and R_4 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, formyl, carboxyl, cyano, hydroxymethyl, N-hydroxyformimidoyl, alkyl having up to 3 carbon atoms and moieties of the formulae:



wherein R is alkyl having up to 3 carbon atoms.

4,236,006

PREPARATION OF QUINAZOLIN-2(1H)-ONES

Guido Gamboni, Allschwil; Walter Schmid, Muttenz, and Alfred Sutter, Birsfelden, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 861,426, Dec. 13, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,328

Claims priority, application Switzerland, Dec. 13, 1976, 15619

Int. Cl.³ C07D *239/82*; **A61K** *31/505*

U.S. Cl. 544—286 **7 Claims**

1. In a process for the production of 4-phenyl-2(1H)-quinazolinones by cyclisation of the corresponding 2-aminobenzophenone with an alkyl carbamate, the improvement characterised in that the cyclisation is effected at a temperature of from 120° C. to 180° C. in the presence of at least one mole per mole of 2-aminobenzophenone of an aromatic acid selected from the group consisting of benzoic acid, o-methylbenzoic acid, p-methylbenzoic acid and mixtures thereof.

4,236,007

NAPHTHOLACTAM DYESTUFFS

Hansrudolf Schwander, Riehen, and Christian Zickendraht, Binningen, both of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Division of Ser. No. 794,485, May 6, 1977, Pat. No. 4,148,805. This application Jan. 11, 1979, Ser. No. 2,512

Claims priority, application Switzerland, Jun. 1, 1976, 6859/76

Int. Cl.³ C07D *401/02*; **C07C** *125/06*; **C07D** *209/04*, *413/02*

U.S. Cl. 544—328 **8 Claims**

1. A dyestuff of the formula (I)

(I)

in which R represents C_1-C_4-alkyl, C_1-C_5-alkenyl, C_4-C_9-cycloalkyl, C_7-C_9-phenyl-alkyl, phenyl or hydrogen, M represents hydrogen or a cation, Y represents —COCl, —COBr, a free carboxyl group or a C_1-C_4-alkyl ester thereof, Z is C_1-C_4-alkoxy, Cl, Br, NO_2, phenylsulphonyl, cyano, $CONH_2$, CONH-C_1-C_4-alkyl, and $CON(C_1$-C_4-alkyl$)_2$, n represents 0, 1 or 2, A represents a heterocyclic radical of the benzimidazole, benzoxazole, benzthiadiazole, thiazole, pyridine, quinoline, phenanthridine, indolenine, thiadiazole, oxadiazle, imidazole, furane, triazole, pyrimidine or isoquinoline series.

4,236,008

FLUORINATION OF PRECURSORS FOR FLUORINE ANALOGS OF HYDROCODONE AND OXYCODONE

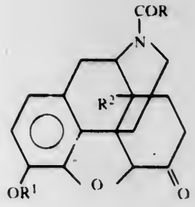
Rosetta M. Henderson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 19, 1978, Ser. No. 944,198

Int. Cl.³ C07D *489/00*

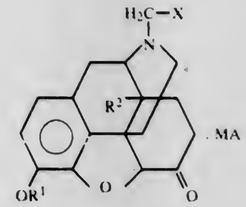
U.S. Cl. 546—46 **8 Claims**

1. Process of reacting under substantially anhydrous conditions the ketone having the formula



II

or



IV

wherein

X is H or R;

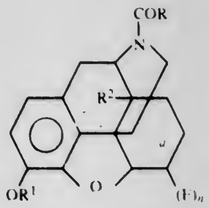
R is selected from the group consisting of alkyl of 1-5 carbon atoms, vinyl, 1-propenyl, isobutenyl, cycloalkyl of 3-6 carbon atoms, furanyl, thienyl, thienylmethyl and phenylmethyl which may be ring substituted with chloro, bromo, fluoro or 1-3 carbon atom alkyl substituents;

R^1 is selected from the group consisting of alkyl of 1-4 carbon atoms, alkanoyl of 1-4 carbon atoms;

R^2 is selected from the group consisting of hydrogen, fluorine, hydroxy and alkanoyloxy of 1-4 carbon atoms; and

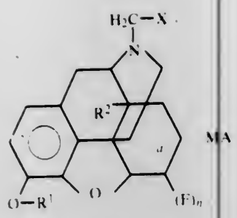
MA is a mineral acid,

with a disubstituted aminosulfur trifluoride fluorinating agent of the formula $R^3R^4NSF_3$ wherein each R^3 and R^4, alike or different, is a primary alkyl group of 1-4 carbon atoms; or R^3 and R^4 when taken together are $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$; at a temperature of about −40° C. to about +80° C.; in the presence of a polar or nonpolar solvent; and recovering the fluorine-containing compound having the formula



I

when the ketone is of formula II, and having the formula



MA

when the ketone is of formula IV,
wherein said formulas I and V
X, R, R^1, R^2 and MA are as defined above;
n is 1 or 2; and
a is a 6,7 double bond when n is 1 and a single bond when n is 2.

8. Compound of the formula



wherein
R is selected from the group consisting of alkyl of 1–5 carbon atoms, vinyl, 1-propenyl, isobutenyl, cycloalkyl of 3–6 carbon atoms, furanyl, thienyl, thienylmethyl and phenylmethyl which may be ring substituted with chloro, bromo, fluoro, or 1–3 carbon atom substituents;
R^1 is selected from the group consisting of alkyl of 1–4 carbon atoms and alkanoyl of 1–4 carbon atoms;
R^2 is selected from the group consisting of hydrogen, fluorine, hydroxy and alkanoyloxy of 1–4 carbon atoms;
n is 1 or 2; and
a is a 6,7 double bond when n=1, and a single bond when n=2.

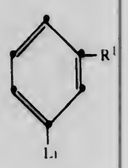
4,236,009

METHOD OF PREPARING 4A-ARYLHEXAHYDRO-1H-2-PYRINDINES AND 4A-ARYLOCTAHYDROISOQUINOLINES

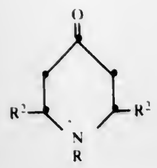
Dennis M. Zimmerman, Mooresville, and Roger L. Robey, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 21, 1979, Ser. No. 50,940
Int. Cl.³ C07D *217/04, 221/04*
U.S. Cl. 546—112 **3 Claims**

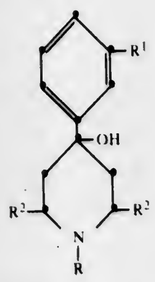
1. The process which comprises essentially the steps of
(a) preparing a lithium derivative of the formula



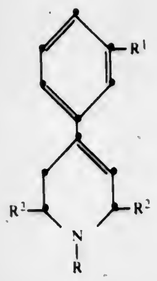
wherein R^1 is H or $(C_1$-$C_3)$alkyloxy and reacting it with a 4-phenyl piperidine of the formula



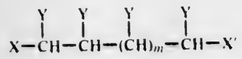
wherein R is $(C_1$-$C_3)$alkyl, $(C_3$-$C_4)$cycloalkylmethyl, benzyl or phenethyl, and each R^2 is independently H, CH_3 or C_2H_5, to form a 4-phenyl-4-hydroxypiperidine of the formula



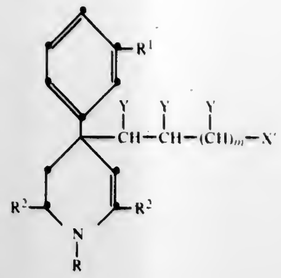
(b) dehydrating said 4-phenyl-4-hydroxypiperidine to yield a 4-phenyl-1,2,5,6,-tetrahydropyridine of the formula



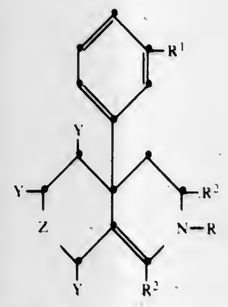
(c) reacting said tetrahydropyridine with n-butyl lithium to form a carbanion and alkylating said carbanion with an α,ω-dihaloalkane of the formula



wherein m is 0 or 1, each Y is independently H, CH_3 or C_2H_5 and X and X′ are the same or different members of the group Cl, Br and I, to yield a 4-substituted 4-phenyl-1,4,5,6-tetrahydropyridine of the formula



(d) internally cyclizing said 4-phenyl-4-(ω-haloalkyl)-1,4,5,6-tetrahydropyridine to yield a bicyclic derivative of the formula



wherein R, R^1, R^2 and Y have the previously assigned significance and Z is



or a direct bond.

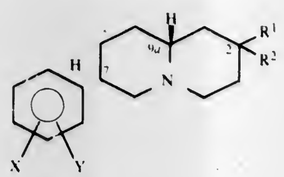
4,236,010

PHENYL-QUINOLIZIDINES

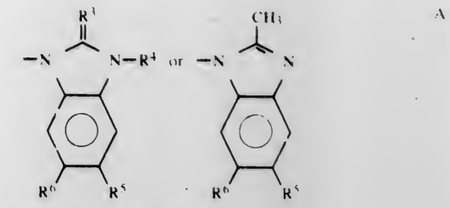
René Imhof, Wittnau, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 15, 1979, Ser. No. 85,096
Claims priority, application Switzerland, Oct. 13, 1978, 10654/78; Aug. 3, 1979, 7156/79
Int. Cl.³ C07D *455/02*
U.S. Cl. 546—138 **17 Claims**

1. A compound of the formula



wherein X, Y, R^1 and R^2 are as follows: X is hydrogen, fluorine, chlorine, lower alkoxy, lower alkyl or trifluoromethyl; Y is hydrogen, fluorine, chlorine, lower alkoxy or lower alkyl; R^1 is hydroxy, lower alkoxy, lower alkanoyloxy, optionally substituted by halogen, or, when R^2 is the group A hereinafter described, hydrogen; R^2 is lower alkyl, phenyl, phenyl substituted by halogen, lower alkoxy or trifluoromethyl, or when R^1 is hydrogen, a group A of the formula



A

wherein R^3, R^4, R^5 and R^6 are as follows: R^3 is oxygen or sulfur; R^4 is hydrogen or lower alkyl; R^5 and R^6, independently, are hydrogen, methyl, fluorine, chlorine, methoxy or trifluoromethyl, or taken together are $-(CH_2)_4-$,
its racemate, an enantiomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

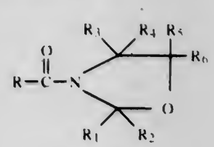
4,236,011

N-ACYL OXAZOLIDINES AND THIAZOLIDINES AS HERBICIDES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 655,938, Feb. 6, 1076, Pat. No. 4,186,130, which is a continuation-in-part of Ser. No. 484,514, Jul. 1, 1974, abandoned, which is a continuation of Ser. No. 356,548, May 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 297,582, Oct. 13, 1972, abandoned. This application Jun. 18, 1979, Ser. No. 49,811
Int. Cl.³ C07D *263/06, 277/04;* **A01N** *43/76, 43/78*
U.S. Cl. 548—215 **1 Claim**

1. The compound having the formula



in which R is dichloromethyl and R_1 is methoxymethyl, R_2, R_3, R_4, R_5 and R_6 are each hydrogen.

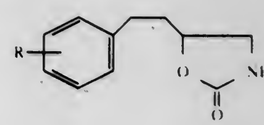
4,236,012

5-PHENETHYL-2-OXAZOLIDONE DERIVATIVES AND A PROCESS FOR PRODUCING THE SAME

Yasuo Fujimoto, and Terumi Tamada, both of Tokyo, Japan, assignors to Nippon Chemiphar Company, Limited, Tokyo, Japan

Filed Jan. 8, 1979, Ser. No. 1,821
Claims priority, application Japan, Jan. 20, 1978, 53-4333
Int. Cl.³ C07D *263/38;* **A61K** *31/42*
U.S. Cl. 548—229 **7 Claims**

1. 5-Phenethyl-2-oxazolidones of the formula (I),



(I)

wherein R represents a hydrogen or halogen atom, or a lower alkoxy group.

4,236,013

BENZOTRIAZOLE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

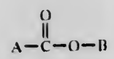
Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 797,667, Dec. 17, 1976, Pat. No. 4,137,235, which is a continuation of Ser. No. 484,846, Jul. 1, 1974, abandoned. This application Oct. 27, 1978, Ser. No. 955,449

Int. Cl.[1] C07D *249/18*

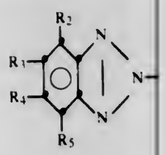
U.S. Cl. 548—261 **8 Claims**

1. A composition of matter having the formula:



wherein

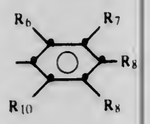
A is a member having the structure



wherein

R_1, R_2, R_3, R_4 and R_5 are hydrogen, chloro, bromo, unsubstituted lower alkyl containing 1 to 12 carbon atoms, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy containing 1 to 20 carbon atoms, dimethyl substituted amino, cyano; and

B is a group having the formula



wherein

at least one R_6 or R_{10} is hydrogen and the other R_6, R_7, R_8, R_9 and R_{10} are hydrogen, unsubstituted lower alkyl having 1 to 12 carbon atoms, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy containing 1 to 20 carbon atoms, dimethyl substituted amino, hydroxy, carboalkoxy, nitrile, chloro, and bromo.

4,236,014

PRODUCTION OF THE AMMONIUM SALT OF 3,5-DINITRO-1,2,4-TRIAZOLE BY SOLVENT EXTRACTION

Kien Y. Lee, and Donald G. Ott, Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1979, Ser. No. 92,155

Int. Cl.[1] C07D *249/14*

U.S. Cl. 548—267 **6 Claims**

1. A method for the production of the ammonium salt of 3,5-dinitro-1,2,4-triazole which comprises:

(a) forming an aqueous phase which comprises an aqueous solution of 3,5-dinitro-1,2,4-triazole;

(b) forming an organic phase which comprises in a desired ratio a water-insoluble secondary or tertiary aliphatic amine capable of acting as an anion exchanger and a desired diluent, said diluent having a good solubility for ammonia gas and little or no solubility for the ammonium salt of 3,5-dinitro-1,2,4-triazole;

(c) contacting said aqueous phase with said organic phase for a time sufficient for partitioning of said 3,5-dinitro-1,2,4-triazole between said aqueous phase and said organic phase to occur;

(d) separating the depleted aqueous phase from said organic phase;

(e) drying said organic phase;

(f) contacting said dried organic phase with ammonia gas; and

(g) separating the precipitate produced by the reaction of said ammonia gas with the amine salt of said 3,5-dinitro-1,2,4-triazole from said organic phase.

4,236,015

1-(2-ACYLAMINOPHENYL)IMIDAZOLES

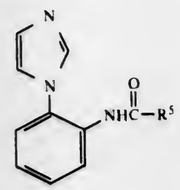
Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Buffalo, both of N.Y., assignors to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Division of Ser. No. 858,514, Dec. 8, 1977, Pat. No. 4,172,947, which is a continuation-in-part of Ser. No. 757,640, Jan. 7, 1977, abandoned. This application May 7, 1979, Ser. No. 36,471

Int. Cl.[1] C07D *233/61*

U.S. Cl. 548—346 **25 Claims**

1. A 1-(2-acylaminophenyl)imidazole of the formula:



wherein:

R^5 is a cycloalkyl group containing 3 to 8 carbon atoms, cycloalkenyl group containing 5 to 6 carbon atoms, phenyl, or substituted phenyl group bonded to the carbonyl carbon through a carbon-to-carbon linkage, said substituted phenyl being a phenyl group substituted by alkyl of from 1 to 6 carbon atoms, alkoxyl of from 1 to 6 carbon atoms, hydroxy, halogen, nitro, amino, acylamino in which the acylamino moiety is derived from an alkanoic acid containing from 1 to 18 carbon atoms and benzamides in which the benzene ring contains from 0 to 3 alkyl groups containing from 1 to 5 carbon atoms or halogen atoms, polyhydroxyalkylamino of from 4 to 8 carbon atoms, cyano, trifluoromethyl, mercapto, lower alkylthio, carboxyl, carboalkoxyl of from 1 to 8 carbon atoms, phenyl, phenoxy, acyloxy and acylthio, wherein the acyl moiety is derived from an alkanoic acid containing from 1 to 18 carbon atoms.

4,236,016

PROCESS FOR THE PREPARATION OF URETHANES

Hans-Joachim Scholl, Cologne, and Armin Zenner, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,637

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808980

Int. Cl.[1] C07C *125/065*

U.S. Cl. 560—24 **17 Claims**

1. A process for the preparation of urethanes by the reaction of aromatic nitro compounds with aliphatic, cycloaliphatic or araliphatic alcohols and carbon monoxide in the presence of catalyst systems containing selenium and/or selenium compounds and aromatic amino compounds and/or aromatic urea compound, characterized in that the catalyst systems used contain (a) tertiary organic amines and/or alkali metal salts of weak acids and (b) oxidizing agents selected from the group consisting of oxygen, oxidizing organic compounds containing chemically bound oxygen and oxidizing inorganic compounds of metals of sub-Groups 1,2 and 5-8 of the Periodic System of Elements containing chemically bound oxygen.

4,236,017

PROCESS FOR SYNTHESIZING 2-SUBSTITUTED SEMICARBAZONES AND CARBALKOXY HYDRAZONES

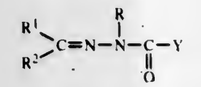
Pier M. Boschi, Piacenza, and Franco Gozzo, San Donato, both of Italy, assignors to Montedison S.p.A.,, Milan, Italy

Filed Jul. 27, 1979, Ser. No. 61,241

Int. Cl.[1] C07C *125/06, 133/04, 133/08*

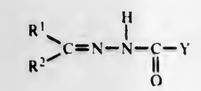
U.S. Cl. 560—24 **10 Claims**

1. Process for the preparation of compounds of general formula:



(VII)

wherein R is alkyl, allyl, propargyl or benzyl radical or a substituted alkyl, allyl, propargyl or benzyl radical; R^1 and R^2, equal to or different from each other are H, or alkyl, aryl or vinyl radicals or substituted alkyl, aryl or vinyl radicals; and Y is NH_2 or O-alkyl, said process comprising reacting a compound of general formula:



(VI)

wherein R^1, R^2 and Y have the same meanings as in formula VII, with a halide or a sulphate of the formula: R-X in which X is Cl, Br, I or SO_4R and R has the same meaning as in formula VII.

4,236,018

PROCESS FOR PREPARING CYCLOPROPANE CARBOXYLIC ACIDS

Alan T. Costello, and Robert J. Lindsay, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

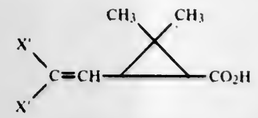
Filed Jul. 10, 1979, Ser. No. 56,305

Claims priority, application United Kingdom, Jul. 18, 1978, 30216/78

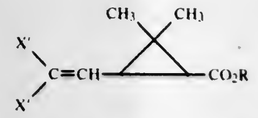
Int. Cl.[1] C07C *69/747, 61/16*

U.S. Cl. 560—124 **5 Claims**

1. A process for the preparation of a cyclopropane carboxylic acid of the general formula:

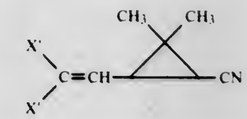


or a cyclopropane carboxylic acid ester of the general formula:

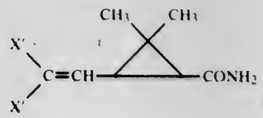


wherein each X′ represents a chlorine or bromine atom or a $-CF_3$ group, or one X′ represents a chlorine or bromine atom and the other represents a $-CF_3$ group, and R represents a lower alkyl group, which comprises the steps of:

(i) reacting a cyclopropane nitrile of the general formula:

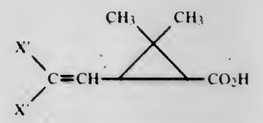


wherein X′ has the meaning stated above, with either (A) a sulphuric acid and water solution containing 98% sulphuric acid in an amount to provide at least 1 mole of water per mole of cyclopropane nitrile, at a reaction temperature not exceeding 50° C. or (B) 4 moles of sulphuric acid and 6 moles of water per mole of cyclopropane nitrile at a reaction temperature of 80° C. for a reaction time of 6 hours to give an amide of the formula:

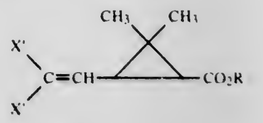


and

(ii) either (a) diluting the cyclopropane amide-containing reaction mixture from step (i) with water to provide 4 to 5 mols of water per mole of sulphuric acid and heating the mixture to give a cyclopropane carboxylic acid of formula:



or (b) diluting the cyclopropane amide-containing reaction mixture from with at least an alcohol R.OH, wherein R has the meaning stated above, to get 1 to 2 moles each of water and the alcohol R.OH per mole of sulphuric acid followed by heating of the mixture to give a cyclopropane carboxylic acid ester of formula:



4,236,019

ESTERS OF PROSTACYCLIN-TYPE COMPOUNDS

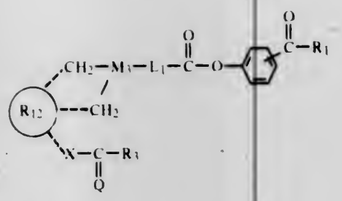
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 933,329, Aug. 14, 1978, Pat. No. 4,180,657. This application Jun. 14, 1979, Ser. No. 48,496

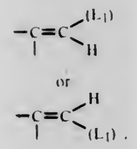
Int. Cl.[1] C07C *177/00*

U.S. Cl. 560—119 **2 Claims**

1. An acid ester of a 6a-carba prostacyclin analog of the formula



wherein L_1 is
(1) $-(CH_2)_n-$ wherein n is one to 5, inclusive,
(2) $-(CH_2)_p-CF_2-$ wherein p is 2, 3, or 4, or
(3) $-(CH_2)_v-CH=CH-$ wherein v is 1, 2, or 3,
wherein M_3 is



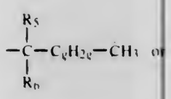
wherein Q is



wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is alkyl of one to 4 carbon atoms with the proviso that when R_1 is tert-butyl the group



is in the 4-position,
wherein R_3 is



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein is

wherein X is
(1) trans-CH=CH—
(2) cis-CH=CH—
(3) $-C\equiv C-$ or
(4) $-CH_2CH_2-$.

4,236,020

CARBAMATE DEPOSIT CONTROL ADDITIVES

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

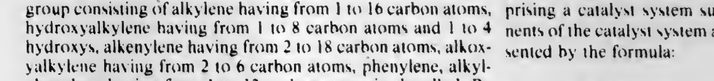
Continuation of Ser. No. 891,879, Mar. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 801,444, May 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application Jun. 18, 1979, Ser. No. 49,519

Int. Cl.[3] C07C *125/04*; C10L *1/22*

U.S. Cl. 560—159 **10 Claims**

1. Compounds suitable for use as deposit control additives in internal combustion engines which comprise poly(oxyalkylene) carbamates having a C_1–C_{30} hydrocarbyloxy-terminated poly(oxyalkylene) chain of at least 5 oxyalkylene units, each unit containing 2 to 5 carbon atoms, said chain being bonded through an oxycarbonyl group to a nitrogen atom of ethylenediamine, and said poly(oxyalkylene) chain containing sufficient oxyalkylene units other than ethyleneoxy to render said compounds soluble in gasoline, and said compounds having molecular weights in the range of 500 to 10,000.

9. Compounds of the formula:



in which g is an integer 2 to 5, j is an integer such that the molecular weight of the compounds are in the range of about 1200 to about 5,000, Z is a hydrocarbyl group of 1 to 30 carbon atoms, and sufficient of the oxyalkylene units in the compounds are other than ethyleneoxy to render the compounds soluble in hydrocarbon fuels boiling in the gasoline range.

4,236,021

PROCESS FOR THE MANUFACTURE OF LEVULINIC ACID AND ESTERS

Chin C. Hsu, Avon Lake, and Dwight W. Chasar, Northfield, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 7, 1979, Ser. No. 36,718

Int. Cl.[3] C07C *67/00*, *69/716*, *51/09*, *59/185*

U.S. Cl. 560—174 **8 Claims**

1. In the process for the manufacture of a levulinic acid ester which comprises the esterification of furfuryl alcohol with a different alcohol selected from the group consisting of unsubstituted primary and secondary carbon-chain aliphatic and carbon-ring cycloaliphatic alcohols of 1-10 carbon atoms in the presence of a strong acid catalyst, the improvement comprising purification of the crude levulinate ester by vacuum distillation of said levulinate in admixture with at least 3 percent by volume of the levulinate of a solvent which (a) has the boiling point of at least 20° C. higher than the boiling point of the levulinate ester, (b) dissolves the by-product polymer tar and (c) is miscible with the levulinate ester.

4,236,022

ESTERS OF 1,2-DIHYDROXYALKANES AS COSMETIC EMULSIFIERS AND COSMETIC EMULSIONS CONTAINING THEM

Ulrich Zeidler, and Fanny Scheuermann, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

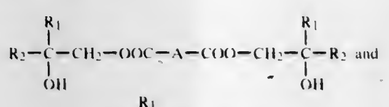
Filed Dec. 21, 1978, Ser. No. 972,014

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757278

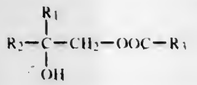
Int. Cl.[3] C07C *69/38*, *69/40*, *69/70*, *69/675*

U.S. Cl. 560—198 **7 Claims**

1. Mono- and Dicarboxylic acid esters of 1,2-dihydroxyalkanes of the formulae



and



wherein A represents a bivalent radical selected from the group consisting of alkylene having from 1 to 16 carbon atoms, hydroxyalkylene having from 1 to 8 carbon atoms and 1 to 4 hydroxys, alkenylene having from 2 to 18 carbon atoms, alkoxyalkylene having from 2 to 6 carbon atoms, phenylene, alkylphenylene having from 1 to 12 carbon atoms in the alkyl; R_1 represents a member selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; R_2 is alkyl having from 10 to 22 carbon atoms; and R_3 represents a member selected from the group consisting of hydroxyalkyl having from 1 to 4 carbon atoms, phenylhydroxyalkyl having from 1 to 4 carbon atoms in the alkyl and haloalkyl having from 1 to 4 carbon atoms.

4,236,023

PREPARATION OF UNSATURATED MONOESTERS BY THE CATALYTIC OXIDATIVE CARBONYLATION OF DIOLEFINS WITH AN ENOL ETHER OR 1-ALKOXYCYCLOALKENE

Haven S. Kesling, Jr., Drexel Hill, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

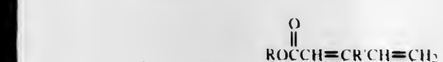
Continuation-in-part of Ser. No. 911,844, Jun. 2, 1978, abandoned. This application Jun. 26, 1979, Ser. No. 52,272

The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.

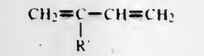
Int. Cl.[3] C07C *67/36*

U.S. Cl. 560—207 **24 Claims**

1. A process for the preparation of a diene monoester having the formula



wherein R is an alkyl group of from 1 to 4 carbon atoms and R' is hydrogen, a halogen, or a methyl group which comprises reacting a diolefin having the formula



wherein R' is as above described, with a mixture of carbon monoxide and oxygen and at least a stoichiometric amount of an enol ether or 1-alkoxycycloalkene based on the diolefin employed, at a pressure of between about 15 psig and 5000 psig and at a temperature in the range of about 25° C. to 200° C. in the presence of an effective amount of a catalytic mixture of a platinum group metal compound selected from the group consisting of palladium, ruthenium, rhodium, and platinum, halides, cyanates, sulfates, nitrates, oxides, oxalates, acetates and trifluoroacetates or mixtures thereof, an organic mono- or poly-dentate ligand or coordination complex compound selected from the group consisting of alkyl, aryl and halogen-substituted phosphines, arsines, stibines and alkali metal salts, and a copper (I), copper (II), iron (II) or iron (III) oxidant salt compound and recovering the desired diene monoester.

4,236,024

PROCESS FOR PRODUCING DIACETOXYBUTENE

Teruo Matsuda, and Kuniyoshi Manabe, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 807,725, Jun. 17, 1977, abandoned. This application Feb. 27, 1979, Ser. No. 15,865

Claims priority, application Japan, Jun. 25, 1976, 51-75874; Dec. 29, 1976, 51-158918

Int. Cl.[3] C07C *67/055*

U.S. Cl. 560—244 **9 Claims**

1. A method for producing diacetoxybutene, which comprises reacting butadiene, acetic acid and an oxygen-containing gas, in a liquid phase, in the presence of a solid catalyst comprising a catalyst system supported on a carrier, the components of the catalyst system and their atomic ratios being represented by the formula:

$$Pd_1Pt_{0\text{-}10}Rh_{0\text{-}10}S_{0.05\text{-}10} \quad (1)$$

or

$$Pd_{0\text{-}10}Pt_1Rh_{0\text{-}10}S_{0.05\text{-}10} \quad (2)$$

or

$$Pd_{0\text{-}10}Pt_{0\text{-}10}Rh_1S_{0.05\text{-}10} \quad (3)$$

4,236,025

2-DECARBOXY-2-AMINOMETHYL-6-KETO-PG COMPOUNDS

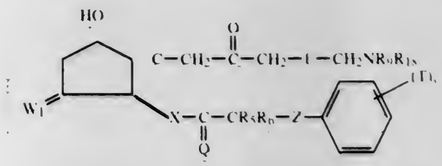
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 959,400, Nov. 9, 1978, which is a division of Ser. No. 819,857, Jul. 28, 1977, Pat. No. 4,158,667, which is a continuation-in-part of Ser. No. 725,548, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,972, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 655,110, Feb. 4, 1976, abandoned. This application Oct. 17, 1979, Ser. No. 85,833

Int. Cl.[3] C07C *177/00*

U.S. Cl. 560—255 **143 Claims**

1. A prostacyclin intermediate of formula



wherein W_1 is α—OH:β—H:β—OH, oxo, methylene, α—H:β—H, α—CH_2OH:β—H;
wherein L is
(1) $-(CH_2)_d-C(R_2)_2-$,
(2) $-CH_2-O-CH_2-Y-$, or
(3) $-CH_2CH=CH-$,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is

not methyl when the other is fluoro, and wherein Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,
wherein Q is keto, α—H:β—H, α—OH:β—R_8 or α—R_8:β—OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein R_9 is hydrogen, methyl, or ethyl, and R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive;
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j}, wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;
wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7-$, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

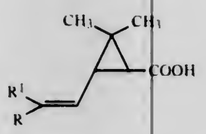
4,236,026

SEPARATION OF STEREOISOMERIC VINYLCYCLOPROPANECARBOXYLIC ACIDS

Klaus Naumann, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 970,099
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1978, 2800922
Int. Cl.[1] C07B *19/00*
U.S. Cl. 562—401 **10 Claims**

1. A process for the separation of cis- and trans-stereoisomers of a substituted vinylcyclopropanecarboxylic acid of the formula



in which
R is alkyl with 1 to 4 carbon atoms, halogen, phenyl or phenyl substituted by at least one of alkyl and halogen, and
R^1 is hydrogen, alkyl with 1 to 4 carbon atoms or halogen, or
R and R^1, together with the adjacent C atom, form a carbocyclic ring,
comprising reacting the free vinylcyclopropanecarboxylic acid in a weakly alkaline aqueous solution with an amount of an amine salt corresponding to the proportion of cis-isomer present thereby to form a salt precipitate enriched in one of the stereosiomers, separating the precipitate from the supernatant, separately reacting the precipitate and supernatant with a strong acid to liberate the isomeric vinylcyclopropanecarboxylic acid, and recrystallizing at least one of the stereoisomers.

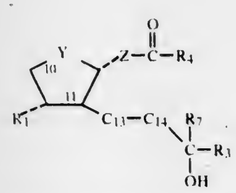
4,236,027

NOVEL 11-ALKOXY-9-KETO (OR HYDROXY)-PROSTENOIC ACID DERIVATIVES AND METHOD FOR PREPARING SAME

Middleton B. Floyd, Jr., Suffern, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 751,302, Dec. 16, 1976, abandoned, which is a continuation of Ser. No. 540,352, Jan. 10, 1975, abandoned, which is a division of Ser. No. 359,391, May 11, 1973, Pat. No. 3,876,690. This application Oct. 17, 1977, Ser. No. 843,020
Int. Cl.[1] C07C *177/00*
U.S. Cl. 562—500 **14 Claims**

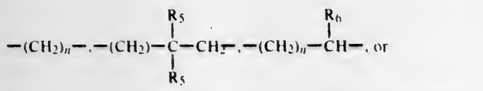
1. A racemic compound of the formula:

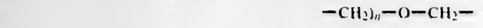


wherein R_1 is W-hydroxy-subsituted C_2–C_4 alkoxy; R_3 is a straight chain alkyl group having from 2 to 10 carbon atoms, a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with one or two lower alkyl groups, a straight chain alkenyl methyl group having from 3 to 10 atoms, a straight chain alkenyl methyl group having from 3 to 10 carbon atoms and substituted with one or two lower alkyl groups, a cycloalkyl group having from 4 to 9 atoms, lower alkyl substituted cycloalkyl group having from 5 to 10 carbon atoms, a cycloalkyl-substituted lower alkyl group having from 6 to 12 carbon atoms and in which the cycoalkyl group is optionally substituted with a lower alkyl group, a cycloalkenyl group having from 5 to 9 carbon atoms, a lower alkyl substituted cycloalkenyl group having 6 to 10 carbon atoms, a cycloalkenyl substituted lower alkyl group having from 6 to 12 carbon atoms and in which the cycoalkenyl group is optionally substituted with a lower alkyl group; R_4 is hydroxy or an alkoxy group having from 1 to 12 carbon atoms; R_7 is hydrogen or a lower alkyl group having up to 3 carbon atoms; Y is



Z is





wherein n is an integer from 3 to 8, inclusive, R_5 is an alkyl group having up to 3 carbon atoms, and R_6 is an alkyl group having up to 3 carbon atoms, a flourine atom or a phenyl group; and the moiety $-C_{13}-C_{14}-$ is trans-vinylene.

4,236,028

PREPARATION OF 6-AMINO-3-OXAHEXANOIC ACID COMPOUNDS

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 913,611, Jul. 8, 1978, abandoned, which is a division of Ser. No. 890,360, Mar. 27, 1978, Pat. No. 4,126,614, which is a continuation-in-part of Ser. No. 826,490, Aug. 22, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,797
The portion of the term of this patent subsequent to Nov. 21, 1994, has been disclaimed.
Int. Cl.[1] C07C *99/10*
U.S. Cl. 562—567 **7 Claims**

1. A process for preparing an amino acid of the formula

$$H_2N-CH_2-C(R^1)H-CH_2-O-C(R^1)_2-C(O)-OR$$

wherein each R^1 is hydrogen or methyl and R is hydrogen which comprises contacting a carboxylic acid anhydride solution of a cyanoalkoxyalkanoate of the formula

$$N\equiv C-C(R^1)H-CH_2-O-C(R^1)_2-C(O)-OR$$

wherein R is hydrogen, lower alkyl, hydroxyethyl or 2-(2-hydroxyethoxy)ethyl and each R^1 is hydrogen or methyl with hydrogen in the presence of a noble metal hydrogenation catalyst to prepare an amide-ester, and heating the amide-ester in excess water at a temperature above about 200° C. to form a mixture comprising oxalactam and amino acid, extracting said mixture with chloroform, and separating the amino acid from the residue of said extraction.

4,236,029

PROCESS FOR THE SYNTHESIS OF 2,4-DINITRO-6-t-BUTYL-3-METHYLANISOLE, REFERRED TO AS MUSK AMBRETTE

Helene M. Pascal, Le Pontet, and Jean-Marie L. Eneury Sorgues, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 18, 1978, Ser. No. 970,139
Claims priority, application France, Dec. 29, 1977, 77 39625
Int. Cl.[1] C07C *79/35*
U.S. Cl. 568—584 **8 Claims**

1. Process for the synthesis of 2,4-dinitro-6-t-butyl-3-methylanisole which consists of reacting 3-methyl-6-t-butylanisole with a ternary nitrating mixture which comprises acetic anhydride, acetic acid and nitric acid at between 5° and 30° C. wherein said nitrating mixture consists of a total of 30 to 50% by weight of acetic acid, 20 to 30% by weight of acetic anhydride and 25 to 45% by weight of nitric acid.

4,236,030

PROCESS FOR RECOVERING PHENOLS FROM A HYDROCARBON MIXTURE CONTAINING THE SAME

Charles M. Selwitz, Monroeville, and John G. McNulty, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 2, 1979, Ser. No. 140
Int. Cl.[1] C07C *37/70*
U.S. Cl. 568—756 **11 Claims**

1. A process for recovering phenols selected from the group consisting of phenol and compounds containing a hydroxyl group and at least one alkyl radical attached to a single aromatic nucleus from a hydrocarbon mixture containing the same having a boiling point range of about 150° to about 250° C. and containing from about five to about 80 weight percent of said phenols which comprises extracting said mixture with an aqueous formaldehyde solution, wherein the weight ratio of aqueous formaldehyde solution to said hydrocarbon charge is in the range of about 10:1 to about 1:10, the weight percent formaldehyde in said aqueous formaldehyde solution is in the range of about 10 to about 70 percent, and said extraction is carried out at a temperature of about 0° to about 100° C. and a pressure of about 0.1 to about 10 atmospheres for about 0.1 to about 20 hours.

4,236,031

PREPARATION OF 5-T-BUTYL ALKYL-SUBSTITUTED PHENOLS

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 5, 1979, Ser. No. 55,088
Int. Cl.[1] C07C *37/14*
U.S. Cl. 568—788 **9 Claims**

1. A process for preparing 5-t-butyl-3-alkylphenol or 5-t-butyl-2,3-dialkylphenol, said process comprising reacting a 3-alkylphenol or a 2,3-dialkylphenol, respectively, with isobutylene in the presence of an effective amount of a catalyst, which is a sulfonated polystyrene crosslinked with at least 2 percent divinylbenzene, said catalyst containing at least 2 milliequivalents of acid per gram of dry resin, at a temperature of at least 100° C., said process being characterized further in that:
(a) the alkyl group is a C_1–C_6 primary alkyl group,
(b) the amount of isobutylene is in the range of about 0.5 to about 2 moles per mole of phenolic compound,
(c) the amount of catalyst, expressed as the reciprocal of the LHSV, wherein LHSV = volume of liquid per hour per volume of catalyst, is in the range of about 0.67 to about 5.0, and
(d) the process results in a product containing at least 75 mole percent 5-t-butyl-3-alkylphenol or 5-t-2,3-dialkylphenol based upon the amount of 3-alkylphenol or 2,3-dialkylphenol initially present.

4,236,032

PREPARATION OF 6-T-BUTYL ALKYL-SUBSTITUTED PHENOLS

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 5, 1979, Ser. No. 55,089
Int. Cl.[1] C07C *37/14*
U.S. Cl. 568—788 **9 Claims**

1. A process for preparing 6-t-butyl-3-alkylphenol or 6-t-butyl-2,3-dialkylphenol, said process comprising reacting a 3-alkylphenol or a 2,3-dialkylphenol, respectively, with isobutylene in the presence of an effective amount of a catalyst, which is a sulfonated polystyrene crosslinked with at least 2 percent divinylbenzene, said catalyst containing at least 2 milliequivalents of acid per gram of dry resin, at a temperature of about 50° to 90° C., said process being characterized further in that:
(a) the alkyl group is a C_1–C_6 primary alkyl group,
(b) the amount of isobutylene is in the range of about 0.5 to about 2 moles per mole of phenolic compound,
(c) the amount of catalyst, expressed as the reciprocal of the LHSV, wherein LHSV = volume of liquid per hour per volume of catalyst, is in the range of about 0.5 to about 2.5, and
(d) the process results in a product containing at least 85 mole percent 6-t-butyl-3-alkylphenol or 6-t-2,3-dialkylphenol based upon the amount of 3-alkylphenol or 2,3-dialkylphenol initially present.

4,236,033

PROCESS FOR THE MANUFACTURE OF P-ALKYLPHENOLS

Helmut Alfs; George Boëhm, and Heinz Steiner, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,609

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2745589

Int. Cl.³ C07C *37/14*

U.S. Cl. 568—793 **10 Claims**

1. A process for the manufacture of a p-alkylphenol comprising alkylating phenol with an olefin of 3 to 4 carbon atoms at an elevated temperature in the liquid phase in two reaction zones in series, in the presence of a strongly acidic ion exchange resin of an exchange capacity of 70 to 120 m. equivalents/100 cm^3, as the catalyst, in the first reaction stage at a temperature of 80°–140° C., and at a gas velocity of 3 to 20 cm/second, based on the free cross-section of the empty reactor and on a molar volume of 25 liters per mole of olefin.

4,236,034

PROCESS FOR PRODUCING TERT-BUTANOL FROM MIXED BUTYLENES

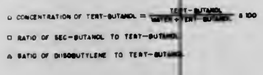
Atsushi Aoshima, Yokohama; Toshiaki Murobushi; Ryoichi Mitsui, both of Fuji, and Nobuhiro Tamura, Chigasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

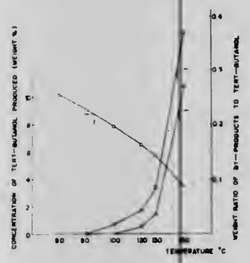
Filed Jun. 7, 1979, Ser. No. 46,315

Claims priority, application Japan, Aug. 6, 1978, 53/683267; Oct. 31, 1978, 53/133237

Int. Cl.³ C07C *29/04*

U.S. Cl. 508—898 **24 Claims**





1. A process for producing tert-butanol by selective hydration of isobutylene which comprises contacting a hydrocarbon mixture comprising isobutylene and n-butene with an aqueous solution containing a heteropoly-acid having at least one condensation coordinate atom selected from the group consisting of Mo, W and V at a temperature of less than 100° C.

4,236,035

1,1,1 TRIS-(4-ISOPROPENYL-PHENYL)ETHANE

Pierre Sigwalt, Saint Michel sur Orge; Patrick Guyot, Paris, and Michel Fontanille, Montmorency, all of France, assignors to Societe Chimique des Charbonnages-CdF CHIMIE, Paris and Agence Nationale de Valorisation de la Recherche (ANVAR), Neully sur Seine, both of, France

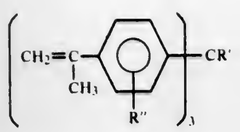
Division of Ser. No. 807,484, Jun. 17, 1977, Pat. No. 4,161,494. This application Apr. 5, 1979, Ser. No. 27,295

Claims priority, application France, Jun. 17, 1976, 76 18453

Int. Cl.³ C07C *15/12*

U.S. Cl. 585—25 **2 Claims**

1. A product of the formula



(A)

in which R' is an alkyl radical of 1 to 4 carbon atoms and R'' is either a hydrogen atom or a methyl radical, its absorption maximum in ultraviolet light being characterised by a wavelength of 252 nm and a molar extinction coefficient of 3.05×10^4 $mols^{-1}$-liter-$cm.^{-1}$.

4,236,036

CATALYTIC ALKYLATION OF HYDROCARBONS

Rolland E. Dixon, and Charles C. Chapman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1979, Ser. No. 27,424

Int. Cl.³ C07C *2/58*

U.S. Cl. 585—331 **25 Claims**



1. A continuous process for alkylating an alkylatable hydrocarbon with a hydrocarbon alkylating agent, comprising:

(a) reacting said alkylatable hydrocarbon with said hydrocarbon alkylating agent, in the presence of an acid-type catalyst and under alkylation reaction conditions, in an alkylation reaction;

(b) separating the thus produced effluent from said alkylation reaction into an alkylate product phase and a catalyst phase containing acid-type catalyst and acid-soluble oil produced in said alkylation reaction, in a separation step;

(c) cooling said catalyst phase, in a cooling step;

(d) recycling said catalyst phase to said alkylation reaction, in a catalyst recycle step;

(e) at least intervally withdrawing a portion of said catalyst phase, during said catalyst recycle step and separating the thus withdrawn catalyst phase to obtain a rerun catalyst phase comprising predominantly acid-type catalyst, in a catalyst recovery step; and

(f) increasing the concentration of acid-soluble oil in said recycle catalyst phase by at least intervally (1) heating a hydrocarbon alkylating agent to a temperature above the temperature of the thus separated recycle catalyst phase, in a heating step, and (2) reacting the thus heated hydrocarbon alkylating agent with the acid-type catalyst contained in said recycle catalyst phase by adding said heated hydrocarbon alkylating agent to said recycle catalyst phase during said catalyst recycle step but prior to said cooling of said recycle catalyst phase, reacting said heated hydrocarbon alkylating agent with at least a portion of said rerun catalyst phase and adding the reaction product of said heated hydrocarbon alkylating agent and said rerun catalyst phase to said recycle catalyst phase during said catalyst recycle step, reacting said heated hydrocarbon alkylating agent with a fresh acid-type catalyst and adding the reaction product of said heated hydrocarbon alkylating agent and said fresh acid-type catalyst to said recycle catalyst phase during said catalyst recycle step, or any combination of reacting said heated hydrocarbon alkylating agent with said acid-type catalyst in said recycle catalyst phase by adding said heated hydrocarbon alkylating agent to said recycle catalyst phase during said catalyst recycle step but prior to said cooling of said recycle catalyst phase, reacting said heated hydrocarbon alkylating agent with at least a portion of said rerun catalyst phase and adding said reaction product of said heated hydrocarbon alkylating agent and said rerun catalyst phase to said recycle catalyst phase during said catalyst recycle step and reacting said heated hydrocarbon alkylating agent with said fresh acid-type catalyst and adding said reaction product of said heated hydrocarbon alkylating agent and said fresh acid-type catalyst to said recycle catalyst phase during said catalyst recycle step, in an acid-soluble oil production step.

4,236,037

PROCESS FOR THE SEPARATION OF OLEFINS

Husain A. Al-Chalabi, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 2, 1979, Ser. No. 53,868

Int. Cl.³ C07C *5/23, 7/00*

U.S. Cl. 585—670 **6 Claims**

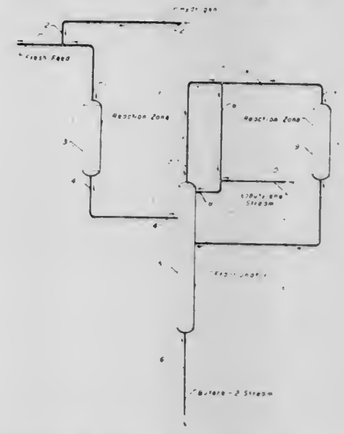
1. A process for the separation of iso-olefin and normal olefin hydrocarbons from a mixture containing the same, which comprises the steps of:

(a) subjecting said mixture to isomerization in a first isomerization zone to convert a portion of the normal olefin hydrocarbon to iso-olefin;

(b) fractionating the resultant isomerization zone effluent in a fractionation zone to separate the same into an iso-olefin-rich stream containing normal olefin and a normal olefin-rich stream of reduced iso-olefin content;

(c) subjecting at least a portion of said iso-olefin-rich stream to isomerization in a second isomerization zone to isomerize normal olefin hydrocarbons contained therein;

(d) refluxing at least a portion of said iso-olefin-rich stream derived from the aforesaid fractionating step (b);



(e) recovering an iso-olefin product derived from the aforesaid fractionating step (b);

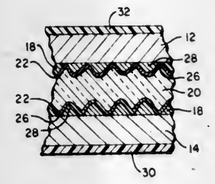
(f) returning essentially the entire effluent from said second isomerization zone derived from the aforesaid step (c) to said fractionation zone at a locus below the reflux locus.

4,236,038

HIGH CAPACITANCE MULTILAYER BUS BAR AND METHOD OF MANUFACTURE THEREOF

Michael J. Taylor, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 19, 1979, Ser. No. 59,068
Int. Cl.³ H01B 5/14
U.S. Cl. 174—72 B **18 Claims**



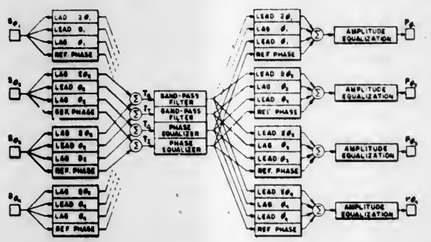
1. A bus bar including:
at least two spaced apart conductive elements having inwardly facing surfaces;
capacitive means positioned between said conductive elements, said capacitive means comprising a dielectric material between conductive outer surfaces;
the conductive outer surfaces of said capacitive means being of different roughness relative to the inwardly facing surfaces of said conductive plates;
at least part of each of said conductive outer surfaces of said capacitive means being in physical and electrical contact with at least part of the adjacent inwardly facing surface of one of said conductive elements; and
nonconductive adhesive bonding said conductive element to said capacitive means.

4,236,039

SIGNAL MATRIXING FOR DIRECTIONAL REPRODUCTION OF SOUND

Duane H. Cooper, Champaign, Ill., assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 578,078, May 16, 1975, Pat. No. 3,970,788, which is a continuation-in-part of Ser. No. 187,065, Oct. 6, 1971. This application Jul. 19, 1976, Ser. No. 706,674
The portion of the term of this patent subsequent to Jul. 20, 1993, has been disclaimed.
Int. Cl.² H04R 5/00
U.S. Cl. 179—1 GQ **4 Claims**



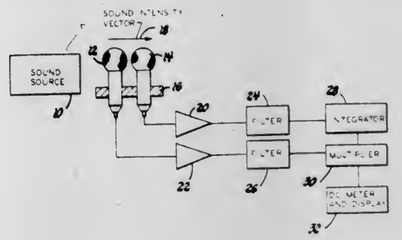
1. In an apparatus for audio reproduction wherein multidirectional source signals are transmitted in two channels suitable for monaural and stereo loudspeaker presentation and having the multidirectional signals encoded in said two channels with predetermined amplitude and phase relations indicative of source directions and adapted to be decoded for formation from the signals in said two channels of more than two loudspeaker presentation signals having source signals corresponding to every source direction appearing in a plurality of such presentation signals but in differing relative amplitude, the improvement comprising
means for transmitting said multidirectional source signals encoded in at least one auxiliary channel with predetermined amplitude and phase relations differently indicative of source directions relative to the amplitude and phase relations of the multidirectional signals encoded in said two monaural and stereo compatible channels,
means for decoding the signals of all of said transmission channels to form multidirectional presentation signals wherein said decoding of all of said transmission channels is carried out by decoding said two monaural and stereo compatible channels to provide a first set of more than two loudspeaker presentation signals for presentation at more than two listening space bearing angles and having source signals corresponding to every source direction appearing in plurality of such presentation signals but in different relative amplitude and decoding said auxiliary channel or channels to provide a second set of a plurality of presentation signals for presentation at listening space bearing angles corresponding to the listening space bearing angle presentation directions of said first set of presentation signals, and
means for adding to each of said first set of presentation signals the signal of said second set of presentation signals for the corresponding listening space bearing angle to provide a plurality of output signals for the presentation directions corresponding to the presentation directions of said first set of presentation signals but with a sharpened directionality pattern with respect to that of said first set of presentation signals.

4,236,040

SOUND INTENSITY METER

Jing-yau Chung, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1978, Ser. No. 934,364
Int. Cl.³ G01H 11/00
U.S. Cl. 179—1 MN **2 Claims**



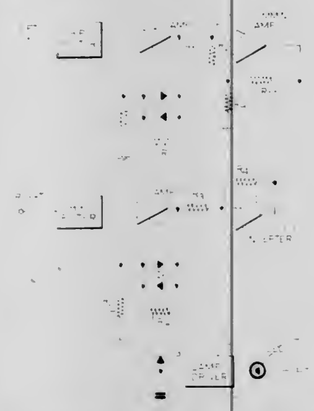
2. An apparatus for measuring the magnitude of sound intensity in a given direction at a given location comprising
a pair of microphones mounted in spaced relationship for placement at the given location and spaced in the given direction for providing respective electrical signals representing acoustic pressures measured at the microphones,
an electronic processing circuit including a multiplier connected by a conductor to one of the microphones for supplying one of said signals representative of acoustic pressures to said multiplier and and integrator having its input connected by another conductor to the other of the microphones for supplying the other of said signals representative of acoustic pressures to said integrator and its output connected to the multiplier for producing a multiplier output proportional to the imaginary part of the cross-spectrum between said electrical signals, the microphones and their associated conductors being selected to minimize phase mismatch, and
means for time averaging the multiplier output whereby the averaged multiplier output is proportional to the absolute value of the second intensity in the given direction.

4,236,041

STEREOPHONIC SIGNAL INDICATING APPARATUS

Richard D. Thomas, Acton, Mass., assignor to H. H. Scott, Inc., Woburn, Mass.

Filed Apr. 13, 1979, Ser. No. 29,729
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GN **5 Claims**



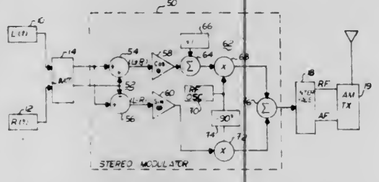
1. In stereophonic signal receiving apparatus and the like provided with means for receiving pairs of signals and a pilot tone signal transmission, apparatus for indicating if said pairs of signals are stereophonic transmissions, said apparatus having, in combination, a pair of similar filter means, one connected to receive each of the said pairs of signals; a pair of similar signal compression means, one connected to each of the filter means, for compressing the respective filtered signals; phase inverter means connected to one of the signal compression means and to a terminal in common with the output of the other signal compression means; summing and detecting means connected with said common terminal for producing a d.c. voltage indicative of the resultant signal at the said common terminal which is significantly different for stereophonic and monophonic signal inputs to the compression means; means connected to said summing and detecting means and responsive to said d.c. voltage for indicating the reception of stereophonic pairs of signals; means for detecting said pilot tone signal transmission; and means for indicating stereophonic signal reception if both the said d.c. voltage and pilot tone detection are present.

4,236,042

COMPATIBLE AM STEREO SYSTEM EMPLOYING A MODIFIED QUADRATURE MODULATION SCHEME

Clifford D. Leitch, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 812,657, Jul. 5, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,837
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GS **22 Claims**



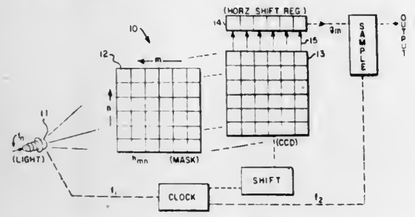
1. A compatible multichannel AM modulator, said modulator comprising a source of a first carrier signal, input means for providing first and second source signals and means for modulating said first carrier signal in accordance with said first and second source signals to provide a composite modulated signal having two phase components, the amplitudes of each of which are modulated in accordance with a corresponding one of said first and second signals, said phase components being phased apart from one another by a selected angle, said input means including limiting means for permitting the amplitude of each of said source signals to extend up to, but not exceed, a predetermined level which is greater than 50% of the level which would provide 100% modulation of said composite modulated signal.

4,236,043

FREQUENCY COMPRESSION AND EXPANSION USING AN ELECTROOPTICAL PROCESSOR

Keith Bromley, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1979, Ser. No. 29,796
Int. Cl.³ G06G 7/19; G10L 1/00
U.S. Cl. 179—1.5 H **18 Claims**



1. A method of compressing or expanding the frequency of signals and keeping the signals' original gross temporal relationship by an electrooptical processor comprising:
- temporally modulating a light source with desired input waveforms;
- projecting temporally modulated optical signals;
- spatially modulating the magnitude of the projected optical signals by an aperture-mask;
- transforming the modulated projected signals to a number of charge packets in a charge coupled device;
- vertically shifting and algebraically adding the transformed charge packets in the charge coupled device; and
- sampling voltage waveforms which are representative of the shifted and added transformed charge packets at a rate different than the signals were projected to effect a change of pitch of the signals within the signals' original gross temporal relationship.

4,236,044

REMOTE PLAYOUT CONTROL MECHANISM FOR A TELEPHONE ANSWERING DEVICE

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Division of Ser. No. 925,370, Jul. 17, 1978, This application Apr. 6, 1979, Ser. No. 27,911
Int. Cl.³ H04M 1/64; G11B 15/44
U.S. Cl. 179—6 E **6 Claims**

1. In a telephone answering device of the type having recording means, operative during automatic answering operation, for recording an incoming message on a tape driven by a tape drive motor, and having playout means for playing out recorded incoming messages over the telephone line in response to detection by a detector circuit of a coded signal received from the telephone line, the improvement comprising:
- a cam mechanism including a cam and a cam drive motor for driving said cam, said tape drive motor being positionable by said cam alternatively to a forward position in which said motor drives said message record tape in a forward direction and to a rewind position in which said tape drive motor rewinds said tape, and
- a cam motor control circuit comprising:
- a single switch having a single control arm and first and second contacts,
- said cam having a first section operative to position said tape drive motor and a second section operative to actuate said switch arm,
- said cam second section having a first portion which causes said switch arm to close a first circuit including said first contact while the position of said tape drive motor is being altered by the driven motion of said cam, having a second portion which causes said switch arm to close a second circuit including said second contact when said cam is oriented with said tape drive motor in the rewind position, and having a third portion which causes said switch arm to assume a neutral position with both said first and second circuits open when said cam is oriented with said tape drive motor in the forward position, and wherein said cam motor control circuit comprises:
- a bistable switching device connecting said cam motor to a source of power,
- a first trigger circuit for providing to said switching device a turn-on pulse upon detection of said coded signal, turn-on of said switching device then providing power to said cam drive motor,



said first circuit being operatively connected to said switching device so that as soon as said switching device is turned on by a pulse from said first trigger circuit said cam drive motor will cause said cam to begin positioning said tape drive motor toward the rewind position, said cam second section then causing said single switch arm to close said first circuit and thereby turn off said switching device but provide power to said cam drive motor via said closed first circuit, said cam drive motor thereafter driving said cam to said orientation in which said tape drive motor is in the rewind position, the resultant opening of said switch first circuit disconnecting power from said cam drive motor so that said tape drive motor will remain in the rewind position so as to rewind said tape,
- an end-of-rewind switch actuated upon completion of rewind of said tape, and
- a second trigger circuit, enabled by closure of said second circuit including said second contact, for providing to said switching device a turn-on pulse in response to actuation of said end-of-rewind switch, the resultant turn-on of said switching device causing said cam drive motor again to drive said cam, the resultant closure of said first circuit turning off said switching device but providing power to said cam drive motor via said first circuit, said cam drive motor thereafter driving said cam so as to reposition said tape drive motor back to the forward position, the resultant opening of said first circuit disconnecting power from said cam drive motor.

4,236,045

ELECTRIC LAMP

Roger J. Q. Van den Plas, and Pieter Hokkeling, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 17, 1979, Ser. No. 75,857
Claims priority, application Netherlands, Sep. 18, 1978, 7809459; Mar. 1, 1979, 7901630
Int. Cl.³ H01K 1/38
U.S. Cl. 174—50.61 **2 Claims**



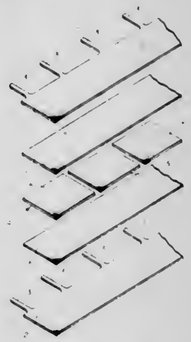
1. An electric lamp having a glass lamp envelope with a pinch through which pinch a current supply wire extends directly from outside the lamp envelope to an electric element accommodated inside the lamp envelope, the said current supply wire being surrounded outside the lamp envelope by a metal plug sealed to the current supply wire, characterized in that the metal plug comprises at least one metal selected from a first group consisting of tin and lead mixed with at least one metal selected from a second group consisting of titanium, zirconium, hafnium, niobium, tantalum, and vanadium, the weight ratio between the metal(s) of the first and second groups being 100:0.5 to 100:1, and in that the metal plug is sealed to the glass of the pinch.

4,236,046

HIGH CAPACITANCE BUS BAR

Donald H. De Vries, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Oct. 10, 1978, Ser. No. 950,265
Int. Cl.³ H01B 5/00
U.S. Cl. 174—72 B **6 Claims**



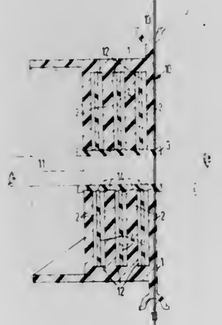
1. A high capacitance bus bar comprising:
- at least a pair of spacially separated elongated conductors;
- a single layer of insulating material disposed between said conductors, said layer of insulating material being comprised of at least a first dielectric element, said dielectric element being comprised of a ceramic material selected for its dielectric constant; and
- conductive adhesive means bonding said conductors to said dielectric element.

4,236,047

SEALING DEVICE FOR SUPPORTING CABLES IN A CABLE FITTING

Wolfgang Haeder, Eichenau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,701
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 7739190[U]
Int. Cl.³ H02G *15/013*
U.S. Cl. 174—77 R **5 Claims**



1. In a sealing device comprising a pair of sealing members each having at least two axially spaced lamella-form sealing elements extending to a separation plane and having a ring-shaped hollow space between adjacent sealing elements, said sealing elements being adapted to be cut adjacent the separation plane to form an aperture for receiving a cable to support the cable in a cable fitting, and means for holding said sealing members with the separating planes in engagement with each other and the sealing elements forming a tight seal with the cable, the improvement comprising semicircular disks of a cuttable material being received in each of said ring-shaped hollow spaces between each pair of adjacent sealing elements of each member, each of said disks having a thickness less than the axial width of the ring-shape hollow space, each of said disks having means disposed on each side for guiding the disk as it is inserted into said ring-shape space, and each disks having transverse ribs extending between said means for guiding.

4,236,048

ELECTRONIC DEVICE FOR SUBTRACTING SIGNALS AND ASSOCIATED SYSTEM EMPLOYING SUCH DEVICE

Richard E. Olney, San Jose, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Jan. 5, 1979, Ser. No. 1,139
Int. Cl.³ H04M *1/58*
U.S. Cl. 179—81 A **17 Claims**

17. A system comprising:

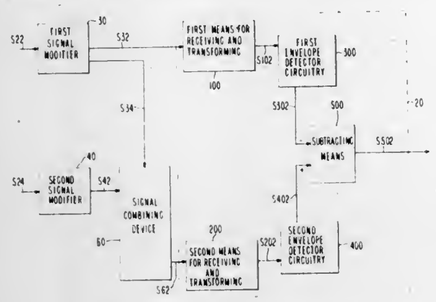
means at a first location for receiving a first acoustic signal from a person at said first location and for transmitting a first signal representative of said first acoustic signal;

means at a second location for receiving a second acoustic signal from a person at said second location and for transmitting a second signal representative of said second acoustic signal to said first location;

means at said first location for receiving said first and second signals and for transmitting a combined signal representative of an additive combination of said first and second signals;

means at said first location for generating an output signal indicative of said second signal in response to said first signal and said combined signal; and

output means activatable in response to receiving said output signal, whereby said output means is responsive to said



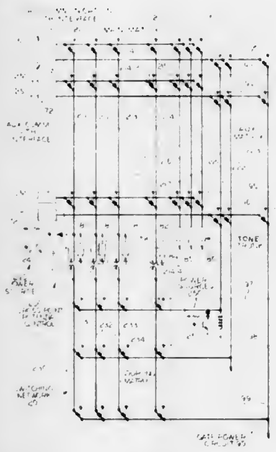
second acoustic signal substantially independent of said first acoustic signal.

4,236,049

ELECTRONIC KEY TELEPHONE SYSTEM

Ryoichi Tanihata; Tsunehiko Shimazawa, and Yoshihisa Shibayama, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 972,789
Claims priority, application Japan, Dec. 27, 1977, 52-158824
Int. Cl.³ H04Q *5/20*
U.S. Cl. 179—99 R **4 Claims**



1. An electronic key telephone system of the type having a plurality of key telephone station sets, at least some of said station sets having a telephone handset, a microphone, a loud speaker and a data circuit means, a plurality of CO/PBX or intercom telephone lines; and a key service unit including central switching means for selectively establishing connections between said station sets and said telephone lines, central control means for controlling said station sets and said central switching means, said key telephone system comprising at least one pair of data lines connecting said data circuit means to said central control means, a pair of main voice communication paths connecting said telephone handset to said central switching means, a pair of auxiliary voice communication paths respectively connecting said microphone and said speaker to said central switching means, and said central switching means comprising: a main switching network including a matrix of switch element means arranged at crosspoints for switching voice paths between said main communication paths and trunk

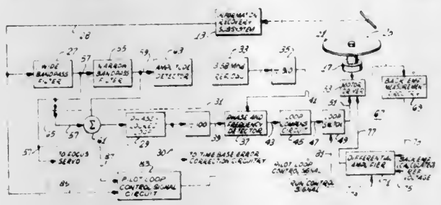
paths associated with said matrix, an auxiliary switch network including switch element means arranged at crosspoints for switching voice paths between said auxiliary communication paths and conductors extending across said auxiliary communication paths, and a coupling switching network including a matrix of switch element means arranged at crosspoints for switching voice paths between conductors which are AC-coupled with said trunk paths and conductors extending across said auxiliary communication paths.

4,236,050

SYSTEM FOR RECOVERING INFORMATION FROM A MOVABLE INFORMATION STORAGE MEDIUM HAVING A PILOT SIGNAL WITH AN ALIGNED PHASE ANGLE IN ADJACENT TRACKS

John S. Winslow, Altadena, and Wayne R. Dakin, Redondo Beach, both of Calif., assignors to MCA Discovision, Inc., Universal City, Calif.

Filed Jun. 30, 1978, Ser. No. 920,701
Int. Cl.³ G11B *19/28. 17/02. 27/30*
U.S. Cl. 179—100.1 G **27 Claims**



1. Apparatus for recovering information from an information recording medium at a prescribed, constant rate, wherein an information signal and a separate pilot signal are recorded on the recording medium in a series of substantially parallel information tracks, said pilot signal having a prescribed, constant frequency, said apparatus comprising:

motor means for moving the information recording medium;

information recovery means for recovering the recorded signals from the recording medium, as the medium is moved with respect thereto;

means for extracting the pilot signal from the recovered signals;

means for producing a reference signal having a frequency representative of the prescribed, constant speed for moving the information recording medium; and

comparison means for comparing the phase angle of the reference signal to the phase angle of the pilot signal extracted from the recovered signals, and for producing a first motor driver signal representative of such comparison to controllably adjust the speed of said motor means,

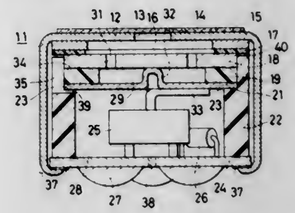
the phase angle of the pilot signal being in substantial alignment with itself on adjacent information tracks, whereby said apparatus is operable to control the relative speed of the recording medium even when said information recovery means is positioned relative to the recording medium such that it is recovering signals from more than a single information track, simultaneously, or is traversing the recording medium from one track to another.

4,236,051

ELECTRET MICROPHONE

Sadayoshi Nakagawa; Mitsuharu Shinohara, both of Fukuoka, and Katsutoshi Hashimoto, Nougata, all of Japan, assignors to Hoshidenki-Seizo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 16, 1979, Ser. No. 12,789
Claims priority, application Japan, Feb. 20, 1978, 53-20575[U]
Int. Cl.³ H04R *19/00*; H01L *29/84*
U.S. Cl. 179—111 E **11 Claims**



1. An electret microphone comprising:

a cylindrical capsule provided with a front plate having a centrally disposed hole;

an electret diaphragm disposed opposite the inside of the front plate;

a back electrode disposed opposite the back of the electret diaphragm;

an isolating metal plate disposed in spaced relation to the back of the back electrode to define therebetween an air compartment and to make electrical contact with the back electrode;

a back electrode holder placed in the capsule coaxially therewith, the inner diameter of the back electrode holder being increased at one end portion thereof on the side of the electret diaphragm to form a stepped portion, the marginal portion of the back of the isolating metal plate resting on the stepped portion to provide an impedance conversion element housing chamber pneumatically isolated from the air compartment; and

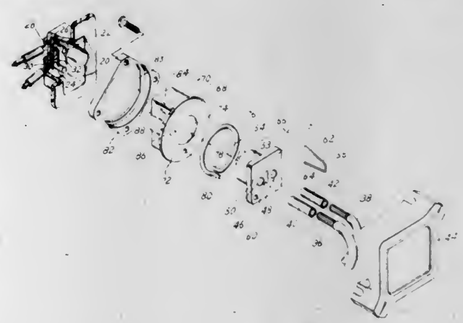
an impedance conversion element housed in the impedance conversion element housing chamber and connected with the isolating metal plate.

4,236,052

DEAD MAN SWITCH FOR A WINCH

Reinhold A. Haase, Hastings, Nebr., assignor to Dutton-Lainson Company, Hastings, Nebr.

Filed Nov. 7, 1978, Ser. No. 958,423
Int. Cl.³ H01R *33/54*
U.S. Cl. 200—51.09 **13 Claims**



1. An improved switch mechanism for the leads to a motor comprising in combination:

a motor lead mounting bracket receptacle having motor leads as parallel projections;

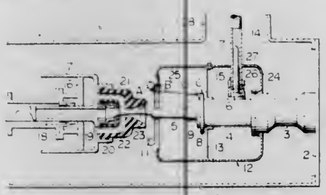
removable bracket engaging means, said bracket engaging means including a plug cooperative with the receptacle and a rotatable power lead handle pivotally attached to the plug, and parallel power leads affixed to the handle for engaging and contacting the motor leads when the plug is engaged to the receptacle and the power lead handle is simultaneously rotated to position the leads in electrical contact said handle being rotatable in either rotational sense to effect switch operation.

4,236,053

PUFFER TYPE GAS CIRCUIT BREAKER

Koji Sasaki, and Yoshihito Asai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 29, 1978, Ser. No. 937,804
Claims priority, application Japan, Sep. 2, 1977, 52-104812
Int. Cl.³ H01H 33/70
U.S. Cl. 200—144 R **22 Claims**



19. A puffer type gas circuit breaker comprising:

a metal vessel filled with an arc extinguishing gas;

a pair of a stationary arcing contact and a movable arcing contact disposed within said metal vessel for making axial parting movement relative to each other;

compressing means disposed within said metal vessel for compressing the arc extinguishing gas in response to the relative parting movement of said stationary and movable arcing contacts;

an insulator nozzle disposed within said metal vessel and having an orifice, for guiding the compressed arc extinguishing gas puffed from said compressing means toward said stationary arcing contact through said orifice which has been disengaged from said stationary arcing contact, during the circuit breaking operation;

envelope means including annular shield means for substantially enveloping at least the free end of said stationary arcing contact, said shield means being maintained at the same potential level as that of said stationary arcing contact;

gas passage means formed in the side portion of said envelope means perpendicular to the axial length of said stationary contact; and

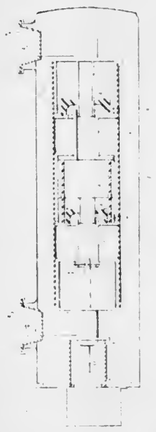
gas-shielding hood means including a generally cylindrical member disposed around said gas passage means and having one end located downstream relative to the root portion of said stationary arcing contact with respect to the flowing direction of the arc extinguishing gas, for shielding the gas stream from flowing directly straight toward the inner surface of said metal vessel after the gas having been puffed from the orifice of said insulator nozzle and passed through said gas passage means.

4,236,054

GAS-BLAST CIRCUIT BREAKER

Herbert Karrenbauer, Niestetal, and Karl Ahrens, Kassel, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,324
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736392
Int. Cl.³ H01H 9/40
U.S. Cl. 200—145 **7 Claims**



1. In a gas-blast circuit breaker having a plurality of serially arranged circuit breaking stations per pole; a tubular through-going stationary casing of electrically insulating material enclosing the circuit breaking stations; each circuit breaking station having a stationary contact affixed to said casing, a movable contact cooperating with the stationary contact, a movable nozzle of insulating material and a gas pressurizing piston-and-cylinder arrangement each having an outer cylindrical wall structure, a piston slidable therein and a stationary component affixed to said casing and forming a radial cylinder base, the improvement wherein each said outer cylindrical wall structure is constituted by a length portion of said casing and further wherein each piston-and-cylinder arrangement has an inner wall structure spaced from said casing; each said inner wall structure constituting a guide for slidably supporting said movable contact for axial displacement with respect to said inner wall structure.

4,236,055

MICROWAVE OVEN INCLUDING A DIGITAL CONTROL SYSTEM AND A HEATER DISPOSED IN AN OVEN CAVITY

Ikuyasu Kaminaka, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 8, 1978, Ser. No. 958,656
Claims priority, application Japan, Nov. 10, 1977, 52-135442
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 B **2 Claims**

1. A microwave oven energized by a power source, having an oven door, and capable of providing microwave cooking and electric heating cooking, comprising:

means for introducing a supply of energy from said power source to said microwave oven; and

circuit means energized by said supply of energy from said power source for controlling the operation of said microwave oven, said circuit means further comprising,

microprocessor means energized by said supply of energy for developing control instructions to control said microwave oven,

magnetron control relay means controlled by said microprocessor means,

first heater control relay means controlled by said microprocessor means,

microwave output control relay means controlled by said microprocessor means,

first switch means controlled by said magnetron control relay means,

second switch means controlled by said magnetron control relay means,

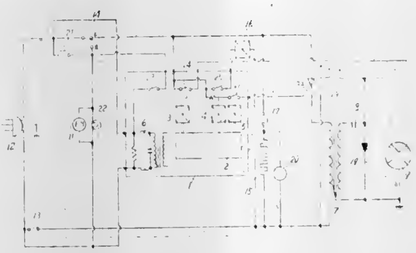
third switch means controlled by said first heater control relay means, and

fourth switch means controlled by said microwave output control relay means;

fan means energized by said supply of energy via said first switch means for cooling said circuit board means when said first switch means is in a first switched position;

magnetron means energized by said supply of energy via said second switch means and said fourth switch means for developing microwave energy when said second switch means and said fourth switch means are in a first switched position thereby providing said microwave cooking for said microwave oven;

wherein said first, second, and fourth switch means switch to a second switched position in response to said control instructions from said microprocessor means via said magnetron control relay means and said microwave output control relay means when said microwave cooking is completed, said third switch means switching to a first



switched position in response to said control instructions from said microprocessor means via said first heater control relay means when said microwave cooking is completed;

second heater control relay means connected to said third switch means for controlling said electric heating cooking;

fifth switch means controlled by said second heater control relay means;

heater means energized by said supply of energy from said power source and controlled by said second heater control relay means via said fifth switch means for developing said electric heating cooking;

wherein said second heater control relay means switches said fifth switch means to a first switched position when said third switch means is switched to said first switched position; and

wherein said heater means develops said electric heating cooking when said fifth switch means switches to said first switched position;

timer means energized by said supply of energy from said power source, and controlled by said second heater control relay means via said fifth switch means for controlling the operation of said fan means for a period of time subsequent to the termination of said electric heating cooking;

wherein said heater control relay means switches said third switch means to a second switched position in response to said control instructions from said microprocessor means, said second heater control relay means switching said fifth switch means to a second switched position in response to the switching of said third switch means to said second switched position, said heater means terminating the development of said electric heating cooking when said fifth switch means switches to said second switched position; and

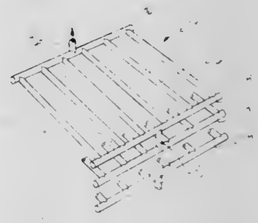
wherein said timer means continues to control the operation of said fan means for said period of time subsequent to the switching of said fifth switch means to said second switched position.

4,236,056

MICROWAVE HEATER

Donald D. Allen, 2206 Cummings, Flint, Mich. 48503, and Earl D. Allen, R.R. #1 Box 133M, Cabot, Ark. 72023

Filed Jan. 29, 1979, Ser. No. 7,164
Int. Cl.³ H05B 6/78
U.S. Cl. 219—10.55 A **6 Claims**



1. A fluid heater comprising,

a housing defining a chamber therein,

fluid passage means disposed within said chamber and having an inlet and an outlet which are in fluid communication with the exterior of the housing, said fluid passage means further comprising a plurality of first conduits, each first conduit having a metal core axially disposed therein to form an annular flow chamber between each core and each conduit; and

means for selectively radiating microwave energy throughout the chamber whereby the fluid in the conduits as well as the metal cores absorb the energy and are heated

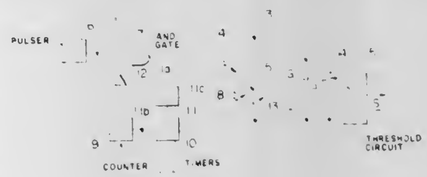
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4,236,057

APPARATUS FOR DETECTING GAP CONDITIONS IN EDM PROCESSES WITH MONITORING PULSES

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Filed Dec. 13, 1977, Ser. No. 860,164
Claims priority, application Japan, Dec. 14, 1976, 51-150052; Jan. 12, 1977, 52-2806; Feb. 8, 1977, 52-13451; Feb. 16, 1977, 52-15889; Feb. 22, 1977, 52-18484; Mar. 8, 1977, 52-25066
Int. Cl. B23P 1/02
U.S. Cl. 219—69 C **2 Claims**



1. An apparatus for detecting gap conditions in EDM processes, which comprises:

(a) means for applying across a machining gap a succession of machining pulses, comprising a first electronic switch

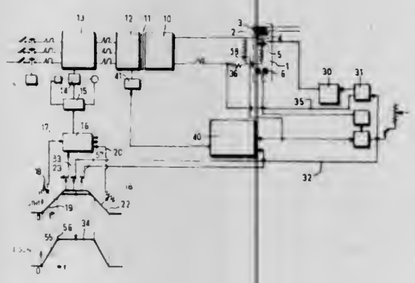
connected in series with a DC source and said gap and a pulser for intermittently energizing said first switch;
(b) means for presetting a pulse duration and peak current of said machining pulses, including first variable resistor means connected in series with said first switch, said DC source and said gap;
(c) means for interposing at least one monitoring pulse into said succession of machining pulses, including a second electronic switch connected in parallel with said first electronic switch in series with said DC source and said gap and energizable by said pulser;
(d) means for presetting a pulse duration and peak current of said monitoring pulses, including second variable resistor means connected in series with said second switch, said DC source and said gap;
(e) means for measuring a characteristic of a gap current pulse resulting from said monitoring pulse to classify it into one of at least two categories;
(f) means responsive to the last-mentioned means for indicating the gap condition;
(g) an AND gate having a first input terminal connected to the output of said pulser and an output connected for energizing said first electronic switch;
(h) a counter for counting a preset number of output pulses from said pulser for resetting thereupon while providing a first timing signal;
(i) a first timer adapted to actuate in response to first timing signal to provide a first signal pulse of a predetermined duration;
(j) a second timer triggerable upon termination of said first duration to provide a second signal pulse of a predetermined second duration, said second timer being connected for energization of said second electronic switch thereby to produce said monitoring pulse; and
(k) gate means connected between said second timer and the second input terminal of said AND gate for disabling the latter in the presence of said second signal pulse.

4,236,058

REGULATION OF ELECTRON-BEAM WELDING GENERATORS

Francois Corcelle, Thoiry; Jean-Pierre Hamon, Cergy, and Philippe Martin, Orsay, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jul. 18, 1978, Ser. No. 925,874
Claims priority, application France, Jul. 22, 1977, 77 22599
Int. Cl.³ B23K *15/00*, G05F *1/10*
U.S. Cl. 219—121 EA **11 Claims**



3. In a method of regulating an electron-beam welding generator having an electron discharge device including a cathode, a Wehnelt electrode and an anode, the steps of:
increasing the power of the generator to an operating level by first increasing the power while maintaining the Wehnelt electrode at the potential of the cathode, and thereafter continuing to increase the power while biasing the Wehnelt electrode progressively negative with respect to the cathode to hold the welding current substantially constant;
maintaining the power within substantially constant limits at the operating level; and
thereafter decreasing the power by decreasing the voltage between the cathode and the anode.

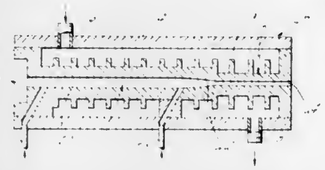
8. In apparatus for regulating an electron-beam welding generator having means for supplying power to the generator and an electron discharge device including a cathode, a Wehnelt electrode and an anode, in combination:
an induction regulator electrically connected to the power supply means;
first control means connected to the induction regulator for controlling the same to increase the power of the generator to an operating level, the first control means including means operable during an initial portion of the increase in power for increasing the welding current and the voltage between the cathode and the anode, while maintaining the Wenhelt electrode at the potential of the cathode, and including means operable during a subsequent portion of the increase in power for continuing to increase the voltage between the cathode and the anode while biasing the Wehnelt electrode progressively negative with respect to the cathode to hold the welding current substantially constant;
servo means connected to the Wehnelt electrode for maintaining the power within substantially constant limits at the operating level; and
second control means connected to the induction regulator for controlling the same to decrease the power of the generator from the operating level.

4,236,059

THERMAL SPRAY APPARATUS

Charles C. McComas, Stuart; Larry S. Sokol, West Palm Beach, and Earl M. Hanna, Greenacres, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 834,087, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 512,585, Oct. 7, 1974, abandoned. This application Nov. 3, 1978, Ser. No. 974,666
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 P **11 Claims**



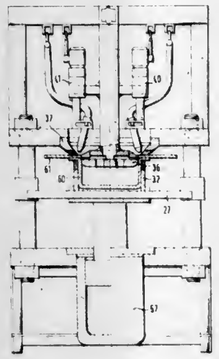
1. A nozzle extension piece for a plasma spray gun, which comprises:
a tubular finned member having a passageway extending therethrough for the passage of plasma generated in the spray gun;
a jacket structure encasing said tubular finned member;
means for flowing a cooling fluid between the jacket structure and the finned member in sufficient quantity to substantially reduce the temperature of the plasma flowing through the passageway of the finned member;
means for accelerating the plasma at a location whereat the temperature of the plasma has been substantially reduced; and
means for injecting powder to be sprayed by the nozzle into said passageway at a location between the upstream end and the downstream end of the nozzle at an injection location providing sufficient powder residence time in the cooled plasma stream to impart a desired level of heating and a high velocity to the powder.

4,236,060

APPARATUS FOR WELDING A BASIN TO A FRAME

Otmar Butz, Sackingen, Fed. Rep. of Germany, assignor to Niro-Plan AG, Schweiz, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 149
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759173
Int. Cl.³ B23K *9/225*
U.S. Cl. 219—125.1 **26 Claims**



1. Apparatus for connecting at least one metal sheet basin to a metal sheet frame by electric arc welding comprising:
(a) a machine frame, said machine frame having vertical guides connected together at upper and lower ends by a respective cross-head;
(b) a presser plate displaceably mounted on said guides and having a basin holder fixed thereon for receiving a basin to be welded thereover;
(c) a yoke located on the upper end cross-head;
(d) a support column extending downwardly from said yoke and positioned centrally with respect to said basin holder, said support column extending through an opening in the upper end cross-head;
(e) a plunger arranged on the lower end of the support column, said plunger having peripheral contours corresponding to the inner cross-section of a basin and a basin opening of a sheet frame to be joined for mutually centering the basin and basin opening;
(f) a presser ring attached to the underside of the upper end cross-head, the lower end of which is flush with an upper edge of the basin holder, set back relative to a lower end face of the plunger and which surrounds the plunger forming an equidistant gap therebetween necessary for effectuating welding of said basin to said sheet frame;
(g) a guide track mounted surrounding said support column above the upper end corss-head; and
(h) at least one welding torch mounted so as to be displaceable along said guide track, said torch having a nozzle directed at a constant setting angle toward said gap between the plunger and the presser ring.

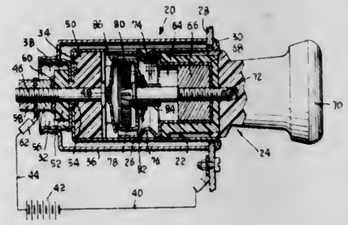
4,236,061

QUICK-ACTING ELECTRIC CIGAR LIGHTER

Lawrence E. Fenn, Anchorage Dr., Bridgeport, Conn. 06605, and Charles R. Sperry, 22 Hillspoint Rd., Westport, Conn. 06680

Filed Feb. 16, 1979, Ser. No. 12,882
Int. Cl.² F23Q *7/02*
U.S. Cl. 219—265 **13 Claims**

1. An instant electric cigar lighter of the type having a heating coil energized from a source of current, comprising in combination:
(a) a holder device presenting a socket,
(b) an igniting unit plug receivable in and removable from the socket of the holder device,
(c) said igniting unit plug having an electrical resistance heating coil adapted to be electrically energized and presenting an exposed face for igniting cigarettes, cigars and the like,
(d) a snap-type bimetallic member of dished configuration, said member having flexing portions and being adapted to be disposed in close heating-receiving relation to the heating coil of the igniting unit plug, said member being disposed in the socket of the holder device and having a laterally offset mounting portion which is surrounded by the flexing portions of the member,



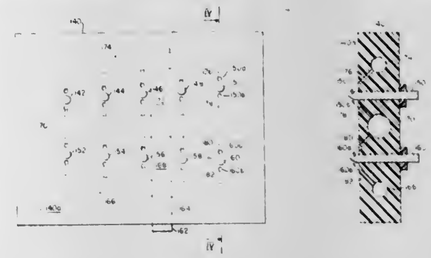
(e) a mounting stud carried by the holder device, having a head portion which is welded against the laterally offset portion of the bimetallic member at locations which are spaced from the bends of the laterally offset portion whereby flexing and snapping of the bimetallic member is characterized by reduced strains and stresses at the weld areas, by virtue of the existence of said bends at the laterally offset portion of the member.

4,236,062

APPARATUS FOR ELECTRICAL PERFORATION OF WEBS

A. Clifton Lilly, Jr., Richmond; Warren E. Claflin, Bon Air; William R. Hardesty, Richmond; George R. Scott, Mechanicsville; Roger L. Hopkins, and Harry V. Lanzillotti, both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 789,367, Apr. 21, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 920,992
Int. Cl.³ H05B *7/18*
U.S. Cl. 219—384 **8 Claims**



1. Apparatus for perforating a planar web comprising
(a) electrode means including first and second electrodes,
(b) first and second plate members supporting said first and second electrodes in spaced opposing relation to define a gap therebetween for passage of said web;
(c) means for issuing plural separate streams of pressurized gas onto the surface of each of said electrodes adjacent said gap, said gas issuing means comprising for each of said electrodes conduits, each of said conduits having a gas issue port adjacent its associated electrode and a conduit portion extending from said gas issue port at an acute

angle with respect to the plane of said web passing within said gap;

(d) means for generating voltage having amplitude excursions with the passage of time and for applying such generated voltage to said electrode means, said applied voltage causing sparks between said electrodes across said gap; and

(e) means for conveying said web linewise through said gap for perforation by said sparks.

4,236,063

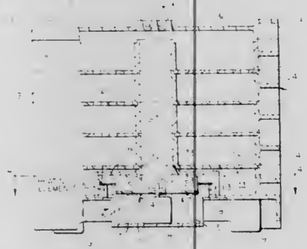
DEHYDRATOR

Dov Z. Glucksman, 43 Norwood Ave., Newton, Mass. 02159

Continuation of Ser. No. 766,771, Feb. 8, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 917,967

Int. Cl.³ F26B *21/06*

U.S. Cl. 219—400 **8 Claims**



1. An electrically operated dehydrator for foodstuff in the shape of a stacked column, said stack comprising a base containing air recirculating and heating means, at least one perforated tray adapted to contain the material to be dried, positioned on top of said base and a top cover positioned on top of the uppermost tray wherein the respective outer covers of said base, said at least one tray and said top cover are tightly but removably connected and form the outer surface of said dehydrator, and wherein

said at least one tray consists of a horizontal plate perforated by a plurality of holes, an outer frame of uniform height integral with, and surrounding said horizontal plate, and a vertical duct of preferably cylindrical shape of substantially the same height as said outer frame, and penetrating through said perforated plate in its central portion,

said air-circulating and heating means comprise a double-inlet centrifugal air impeller mounted on the vertically positioned shaft of an electric motor, said impeller being positioned in a circular casing provided with air outlets distributed over the circumference of said casing and with a central inlet opening in a top portion of said casing communicating with said vertical duct in said tray, and said heating means consisting of at least one circular heating element positioned in said circular casing around the circumference of said air impeller,

said dehydrator base comprising an outer frame of uniform height corresponding in cross section to the outer frame of said tray, a horizontal partition dividing said base into a lower space communicating with the outside for admission of fresh air, and into a upper space containing said circular casing, said impeller and said heating element; said partition being in its central portion provided with air inlet openings connecting said lower space with said circular casing and said impeller;

said top cover is adapted to tightly close the uppermost tray along the upper rim of its frame and providing a free space above said uppermost tray along the upper rim of its frame and providing a free space above the uppermost tray for the air flowing to said central duct in said tray, said top cover being provided with vapor escape openings in its top portion.

4,236,064

HIGH-ACCURACY TEMPERATURE CONTROL WITH HEAT RESISTANCE COMPENSATION

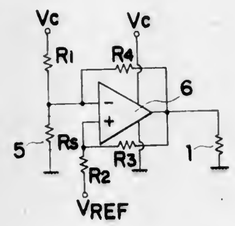
Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1978, Ser. No. 893,790

Claims priority, application Japan, Apr. 7, 1977, 52-40087

Int. Cl.² H05B *1/02*

U.S. Cl. 219—497 **2 Claims**



1. In a system for controlling the temperature of an object which is heated by a heating element separated from said object by a heat transmission medium, said heat transmission medium having a characteristic heat resistance, the improvement comprising:

temperature sensing means for sensing the temperature of said object being heted by said element through said heat transmission medium and providing output signals indicative of the temperature of said object;

comparator means having two input terminals and an output terminal, one of said input terminals being connected to said temperature sensing means and the other input terminal being connected to a voltage indicative of a preselectable reference temperature that said object is desired to reach, the output terminal of said comparator being connected to said heating element; and

positive feedback circuit means connected between the output terminal of said comparator means and said other input terminal thereof, said positive feedback circuit means including resistance means, the value of said resistance means being so selected that the effects of said characteristic heat resistance of said heat transmission medium on the temperature of said object are canceled.

4,236,065

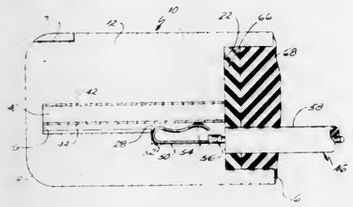
SELF-REGULATING ELECTRIC HEATER

Michael A. Yashin, Foxboro, Mass., and Lucilio A. Rebelo, Pawtucket, R.I., assignors to Texas Instruments Incorporated, Attleboro, Mass.

Filed Dec. 6, 1978, Ser. No. 966,837

Int. Cl.² H05B *3/02*

U.S. Cl. 219—544 **5 Claims**



1. A self regulating electrical heater comprising a rigid body of thermally conductive, electrically insulative material having first and second end portions, the first end portion having an outer surface, a slot having an open end and a closed end formed in the body with the open end in communication with the outer surface of the first end portion and extending toward the second end portion with the closed end of the slot at the

second end portion of the body, the slot defined by first two opposed surfaces joined by second two opposed surfaces, a groove having a bottom wall formed in each of said first two opposed surfaces in communication with the first end portion and extending toward the second end portion, a resistor element composed of a ceramic material with spaced, flat, electrical contact layers provided thereon disposed in the slot, the resistor element configured to slide into the slot and occupy essentially all the available space in the slot, electrically insulative, thermal transfer material disposed between the resistor element and the surfaces defining the slot filling in any remaining space, a terminal received in each groove, the terminals having electrically conductive spring means which are compressed between the bottom wall of each respective groove and a respective flat contact layer on the resistor element to provide good electrical connection with the resistor element and means sealing the slot at the first end portion with the lead attachments received therethrough.

4,236,066

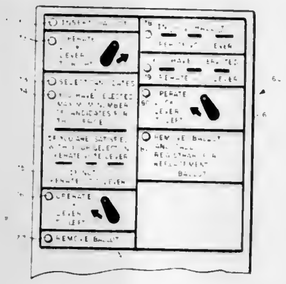
VOTING MACHINE

Charles H. Olmstead, Worcester, Mass., and James V. Simone, High Point, N.C., assignors to Wright Line Inc., Worcester, Mass.

Filed Aug. 25, 1977, Ser. No. 827,589

Int. Cl.³ G07C *13/00*

U.S. Cl. 235—51 **13 Claims**



1. A voting machine comprising first means for receiving a ballot to be voted, second means for locking a ballot in place for voting after the ballot has been received by said first means, third means for determining if a ballot is valid for the machine after it has been locked into place by said second means, means for voting on said ballot made operative by said ballot being locked into place by said second means, said voting means comprising a punch to provide a hole in said ballot in response to each vote by actuation of said punch, said punch being mounted to allow movement along the length of said ballot to allow a series of holes each corresponding to each vote to be punched on said ballot, the position of said punch being such that each hole appears next to a voting option on said ballot, fourth means responsive to said punched holes for indicating to a voter that the maximum number of options have been voted on the ballot, fifth means responsive to said punched holes for indicating to a voter that too many options have been voted on the ballot, sixth means for invalidating the ballot by providing a prescribed mark thereon, buffer storage registers for electrically storing the vote on said ballot in response to the holes produced in said ballot by said voting means, electronic vote accumulating means, and seventh means enabled by said fifth means where too many options have not been voted on the ballot for transferring the stored vote from the buffer storage registers to said vote accumulating means in response to actuation of said seventh means, the actuation of said second means being permitted to release the ballot from the machine only after the ballot vote has been registered in response to said seventh means or the ballot has been invalidated in response to said sixth means.

4,236,067

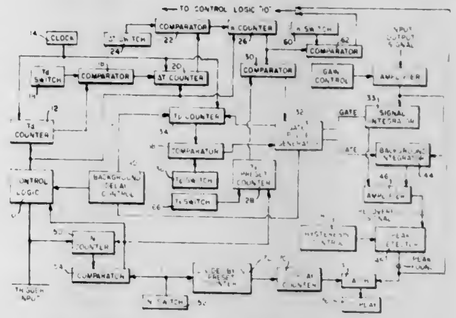
AUTOMATIC SWEEP CIRCUIT

Donald J. Keefe, Lemont, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1978, Ser. No. 961,153

Int. Cl.³ H03K *21/36*

U.S. Cl. 235—92 PB **6 Claims**



1. An automatically sweeping circuit for searching for an evoked response in an output signal in time with respect to a trigger input, comprising:

a clock developing a pulsed output, a ΔT counter coupled to said clock and the input and being responsive to a trigger input to develop a ΔT output signal corresponding to the number of pulses applied to said ΔT counter thereafter,

a ΔT comparator coupled to said ΔT counter and responsive to said ΔT output signal to develop an output of a first state and to reset said ΔT counter with said ΔT output signal equal to a predetermined ΔT value,

a T_p counter coupled to said clock and said ΔT comparator and being responsive to said ΔT comparator's output being at said first state to develop a T_p output corresponding to the number of pulses applied to said T_p counter thereafter,

a T_p comparator coupled to said T_p counter and being responsive to said T_p output signal to develop an output of a first state with said T_p output signal equal to a predetermined value,

detection means coupled to the output signal and said ΔT and T_p comparators and being responsive to said ΔT comparator's being at said first state to begin a search for the response in said output signal and being responsive to said T_p comparator's output being at said first state to cease searching for said response after a time period T_p,

control means coupled to said T_p comparator and said ΔT and T_p counters to allow for a new sweep with the next trigger pulse and T_p counters and being responsive to said T_p comparator's output being at said first state to reset said ΔT,

an N counter coupled to the input and responsive thereto to develop an N output signal corresponding to the number of input triggers,

an N comparator coupled to said control means and said N counter and responsive to said N output signal to develop an output of a first state and to reset said N counter with said N output signal equal to a predetermined value,

an n counter coupled to said ΔT comparator and responsive to said ΔT comparator's output to develop an n output signal corresponding to the number of times said ΔT comparator's output assumes said first state,

a T_γ counter coupled to said N comparator and responsive to said N comparator's output to develop a T_γ output signal corresponding to the number of times said N comparator's output assumes said first state,

and a T_γ comparator coupled to said T_γ, n and T_α counters, and being responsive to the output count of said T_γ

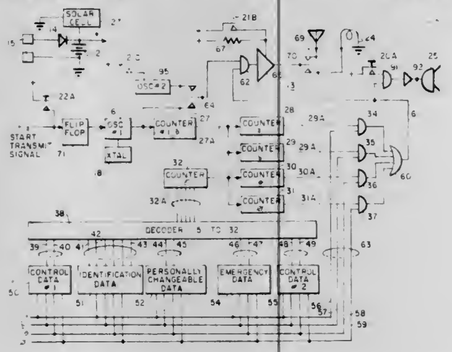
counter being one less than the output count of said n counter to develop an output of first state, said T_p counter being responsive to said T_x comparator's output assuming said first state to develop said T_p output signal thereafter.

4,236,068

PERSONAL IDENTIFICATION AND SIGNALING SYSTEM

Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif. 95030

Filed Mar. 29, 1979, Ser. No. 24,964
Int. Cl.³ G06K 5/00, 19/06; H04Q 9/02; G01S 9/56
U.S. Cl. 235—380 **26 Claims**



1. A portable identification system comprising, in combination:
a housing;
a primary signal generator in said housing, for generating a primary frequency signal;
means to generate a plurality of secondary signals from said primary signal;
first switching means on said housing for transmitting said secondary signals in a predetermined sequence to generate an identification signal; and
means energizeable to alter the sequence said secondary signals are transmitted thereby to change the characteristics of said identification signal.

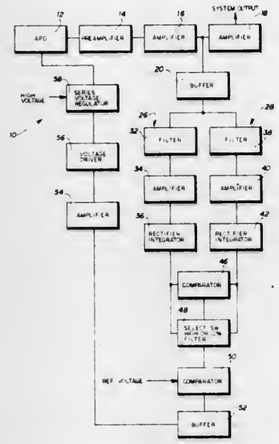
4,236,069

AVALANCHE PHOTODIODE GAIN CONTROL SYSTEM

Richard H. Laughlin, Richardson, Tex., assignor to Varo, Inc., Garland, Tex.

Filed Oct. 16, 1978, Ser. No. 951,791
Int. Cl.³ H01J 40/14
U.S. Cl. 250—214 AG **21 Claims**

1. A system for optimizing the gain of an avalanche photodiode and an associated avalanche photodiode preamplifier comprising:
variable voltage power supply means interconnected to the avalanche photodiode for providing a bias voltage source for the avalanche photodiode;
means for measuring the output noise level of the avalanche photodiode and the preamplifier;
means responsive to said measuring means for generating a control signal; and
said control signal being applied to said variable voltage power supply means for varying said bias voltage applied to the avalanche photodiode by said variable voltage power supply means to control the output noise level of the avalanche photodiode, such that the output noise level of the avalanche photodiode matches the output noise level of the avalanche photodiode preamplifier to thereby



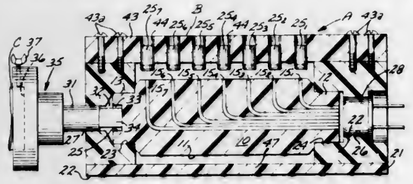
optimize the operation of the avalanche photodiode and the avalanche photodiode preamplifier combination.

4,236,070

SHAFT POSITION ENCODER

Herbert S. Lee, 7041 Mariner Way, Long Beach, Calif. 90803

Filed Feb. 6, 1978, Ser. No. 875,167
Int. Cl.³ G01D 5/34
U.S. Cl. 250—231 SE **5 Claims**



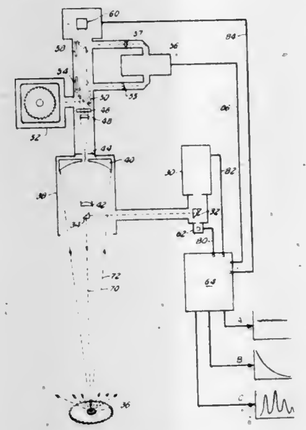
1. An optoelectronic shaft position encoder, comprising:
a support frame including an elongate spine member provided with a plurality of transverse bores attached to a coaxial first and second bearing assembly proximate the ends thereof, said transverse bores being directed towards the central axis of said first and second bearing assembly;
a plurality of phototransducers each received in corresponding one of said transverse bores;
a light source mounted in said first bearing assembly and aligned for directing light towards said second bearing assembly; and
an encoding cylinder mounted for rotation in said first and second bearing assemblies including a light receiving end proximate said light source and a plurality of light emitting apertures at the peripheral surface thereof, said apertures being deployed at selected radial positions of said cylinder in subjacent axial alignment relative said bores.

4,236,071

DETECTION OF URANIUM BY LIGHT INDUCED LUMINESCENCE

Robert J. L. Chimenti, Short Hills, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 832,836, Sep. 13, 1977, abandoned. This application May 21, 1979, Ser. No. 40,900
Int. Cl.³ G01V 5/00
U.S. Cl. 250—253 **16 Claims**



1. Method for detecting the presence of uranium in a substance present in a target area in which the uranium is present in said substance as a hexavalent uranyl ion which comprises:
(a) irradiating said target area with light from a light source, said light having a wavelength in the range of about 2400 to 5000 Å for a period of time equal to or less than about 100 microseconds to induce luminescence in said substance;
(b) waiting for a period of time equal to twice the propagation time for the light to travel from said light source to said target, plus about 50 microseconds; and
(c) measuring the intensity, decay time and spectral distribution of said luminescence.

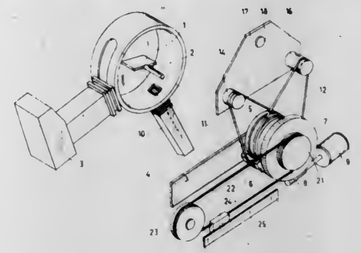
4,236,072

ADJUSTING MECHANISM

Willem Schinkel, and Cornelis Versluijs, both of Almelo, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1979, Ser. No. 18,494
Claims priority, application Netherlands, Mar. 21, 1978, 7803026
Int. Cl.³ G01N 23/20; G21K 1/00, 7/00
U.S. Cl. 250—277 CH **3 Claims**

1. A mechanism for varying distance between a detector and measuring crystal in an X-ray spectrometer comprising:
a crystal mounted on a rotatable shaft,
a detector arranged on an arm moving about said shaft,
a first pulley mounted on said rotatable shaft and having a radius r,
a second pulley rotatably journaled on said rotatable shaft and having a radius 2r,
at least a pair of guide rollers, and
driving means for moving said detector through an angle 2θ when said rotatable shaft is moved through an angle θ, said driving means comprising at least two belts guided respectively over each of said guide rollers and each



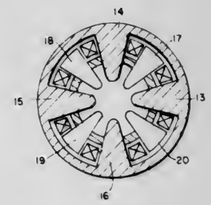
having one end attached to said first pulley and a second end attached to said second pulley.

4,236,073

SCANNING ION MICROSCOPE

Frederick W. Martin, 4323 Van Buren St., Hyattsville, Md. 20782

Continuation of Ser. No. 431,745, Jun. 5, 1974, abandoned. This application May 27, 1977, Ser. No. 801,072
Int. Cl.³ H01J 37/26
U.S. Cl. 250—306 **5 Claims**



1. A scanning ion microscope comprising an accelerator of positive ions; a series of ion optical lenses including an objective lens which both direct the ions to a predetermined position on a specimen and focus the ions onto a microscopically small area of the specimen, thereby forming a directable focused ion beam; a detector sensitive to the occurrence and time of occurrence of individual atomic emissions produced by the interactions of positive ions with the specimen; electronic means for sweeping the focussed ion beam in a pattern across the specimen while recording the number of atomic emissions detected when the ion beam is at each point in the pattern; and wherein said objective lens comprises a plurality of both electric and magnetic quadrupoles arranged with an angular interval of 45 degrees between electric and magnetic poles, said interval being measured azimuthally around the ion beam axis irrespective of the position of such poles along the axis.

4,236,074

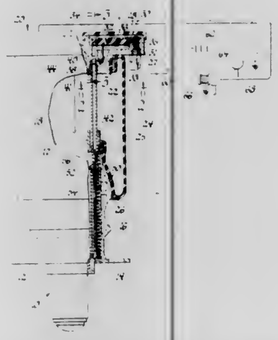
RADIOACTIVE HEIGHT SENSOR FOR AUTOMATIC LEVEL CONTROL

Charles C. Chen, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1979, Ser. No. 32,697
Int. Cl.³ G21K 7/00; B60G 11/28
U.S. Cl. 250—308 **3 Claims**

1. In an automatic vehicle leveling system a sensor for detecting the height relationship between the sprung and unsprung masses of the vehicle with respect to a predetermined height, comprising
beta radiation detector means connected to and movable with one of the masses including photosensor means, a

fluorescent material adjacent the photosensor means for emitting light when irradiated by beta radiation, and the photosensor means exposed to light emitted by the fluorescent material to produce an electrical output in response to the irradiation by beta radiation, and



beta radiation source means connected to and movable with the other of the masses and positioned to irradiate the radiation detector means according to the height relationship between the masses,

whereby the electrical output from the detector is indicative of the height relationship.

4,236,075

APPARATUS FOR MEASURING COMPONENTS OF LIQUID SAMPLES

Sten A. Nexo, Birkerod, and Andreas S. Frandsen, Slangerup, both of Denmark, assignors to A/S N. Foss Electric, Hillerod, Denmark

Filed Aug. 7, 1978, Ser. No. 931,621
Int. Cl.² G01J *1/00*
U.S. Cl. 250—343 **42 Claims**



1. An apparatus for measuring components of a liquid sample, said apparatus comprising

(a) a source of infrared radiation,

(b) transparent sample receiving means,

(c) means for directing a beam of radiation from said source through said sample receiving means,

(d) means for chopping said beam at a predetermined frequency and at a position between said source and said sample receiving means,

(e) a plurality of pairs of optical filters, each of said pairs being associated with a respective one of said components and comprising a component filter for passing infrared radiation at a narrow frequency band at which the radiation absorbing ability of said component is relatively high, and a reference filter for passing infrared radiation at a different narrow frequency band at which the radiation absorbing ability of said component is low,

(f) means for successively positioning said filters of at least one pair in said radiation beam between said source and said sample receiving means and for maintaining each filter in said radiation beam for a period of time exceeding 0.5 second and comprising a plurality of cycles of said chopping means,

(g) a thermopile radiation detector arranged so as to receive radiation having passed said sample receiving means and for providing a signal in each said period of time in response to the radiation received, and

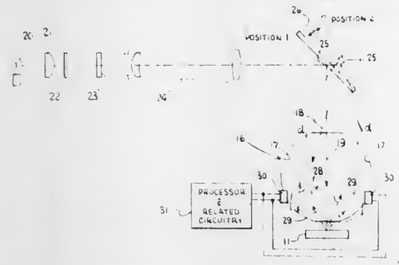
(h) means for calculating values of the component associated with said one pair of filters on the basis of two said signals related to said one pair of filters.

4,236,076

INFRARED ANALYZER

John F. X. Judge, Yorktown Heights, and Victor G. Lipshutz, Tarrytown, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,017
Int. Cl.² G01J *1/00*
U.S. Cl. 250—347 **11 Claims**



1. An analyzer for characterizing a particular constituent in a sample, comprising:

a support for said sample;

a reference against which said sample is compared;

means responsive to light alternately to said sample and said reference;

means responsive to light alternately reflected from said sample and said reference for generating a set of successive sample and reference signals, said set comprising an odd number of at least three signals, the time interval between successive ones of said signals being equal;

means coupled to said generating means for synchronously averaging one of said signals in said set to provide a synchronous output; and

means coupled to said synchronous averaging means for relating said synchronously averaged output to the other of said signals in said set, so as to characterize said constituent in said sample.

4,236,077

IMAGE INTENSIFIER

Tomiya Sonoda, Machida, and Hiroshi Washida, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

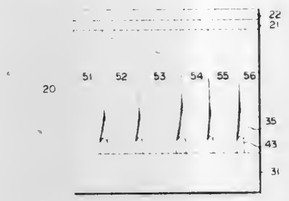
Filed Aug. 24, 1978, Ser. No. 936,392
Claims priority, application Japan, Aug. 29, 1977, 52-102571
Int. Cl.² G01T *1/20*; G01J *1/58*
U.S. Cl. 250—361 R **14 Claims**

1. An image intensifier comprising an input screen converting a radiation image into an electron image;

an electro-optical system accelerating and focusing the electron image and an output screen converting the accelerated and focused electron image into a visible light image, wherein at least one of the input screen and the output screen comprises;

a substrate;

a plurality of electrochemically deposited netty protrusions on at least one surface of the substrate and a phosphor layer formed on the substrate having cracks extending



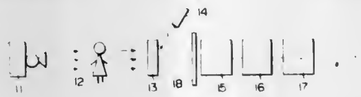
from the tops of the netty protrusions toward the surface of the phosphor layer and a plurality of columnar blocks defined by the cracks.

4,236,078

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A RADIATION IMAGE

Noboru Kotera; Syusaku Eguchi, both of Odawara; Junji Miyahara, Minami-ashigara; Seiji Matsumoto, Minami-ashigara, and Hisatoyo Kato, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 12, 1979, Ser. No. 57,092
Claims priority, application Japan, Jul. 12, 1978, 53-84740; Jul. 12, 1978, 53-84743
Int. Cl.² G01F *1/20*
U.S. Cl. 250—363 R **22 Claims**



1. A method for recording and reproducing a radiation image comprising the steps of (i) causing a visible ray- or infrared ray-stimulable phosphor to absorb a radiation passing through an object, (ii) stimulating said phosphor with stimulation rays selected from visible rays and infrared rays to release the energy of the radiation stored therein as fluorescent light, and (iii) detecting said fluorescent light characterized in that said phosphor is at least one phosphor selected from the group consisting of

(a) a copper and lead activated zinc sulfide phosphor (ZnS:Cu,Pb),

(b) a phosphor included in a group of europium activated barium aluminate phosphors represented by the formula

$$BaO \cdot xAl_2O_3:Eu$$

wherein x is a number satisfying the condition of $0.8 \leqq x \leqq 10$,

(c) a phosphor included in a group of divalent metal silicate phosphors represented by the formula

$$M^{II}O \cdot ySiO_2:A$$

wherein M^{II} is at least one divalent metal selected from the group consisting of Mg, Ca, Sr, Zn and Ba, A is at least one element selected from the group consisting of Ce, Tb, Eu, Tm, Pb, Tl, Bi and Mn, and y is a number satisfying the condition of $0.5 \leqq y \leqq 2.5$, and

(d) a phosphor included in a group of oxyhalide phosphors represented by the formula

$$LnOX:zA'$$

wherein Ln is at least one element selected from the group consisting of La, Y, Gd and Lu, X is Cl and/or Br, A' is Ce and/or Tb, and z is a number satisfying the condition of $0 < z < 0.1$;

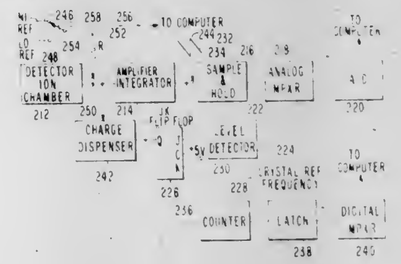
and that the wavelength of said stimulation rays is not less than 500 nm.

4,236,079

TOMOGRAPHIC SCANNING APPARATUS

Paul Sandland, Half Moon Bay, Calif., assignor to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 677,938, Apr. 19, 1976, abandoned.
This application Dec. 2, 1977, Ser. No. 856,946
Int. Cl.² A61B *6/02*; G01T *1/00*
U.S. Cl. 250—445 T **17 Claims**



1. In a computerized tomographic system for examining a subject by means of penetrating radiation to enable reconstruction of a representation of the structure residing in a section taken through said subject; said system comprising:

means for causing penetrating radiation to enter said subject at a plurality of locations around said section, and detector means for detecting radiation passing through said section, and

signal processing means for receiving the output signals from said detector means;

THE IMPROVEMENT COMPRISING:

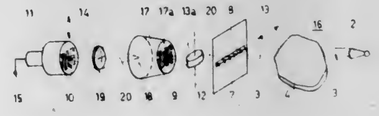
means for applying a reference signal to said signal processing means in the absence of said output signals from said detector means to said processing means, whereby operating characteristics of said processing means may be checked independently of said output from said detector means, and means for adjusting for undesirable operating characteristics of said processing means as determined from application of said reference signal.

4,236,080

X-RAY APPARATUS FOR COMPUTED TOMOGRAPHY

Jürgen Heinzerling, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1979, Ser. No. 5,745
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802746; Feb. 9, 1978, 2805329
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **10 Claims**



1. In X-ray apparatus for computed tomography, in which strip-shaped visible images in an image plane correspond to individual projections of X-ray exposures and are transferred along an optical axis to a light-sensitive input layer of an image pick-up tube by optical means, the improvement wherein

the optical means comprises first lens means which function

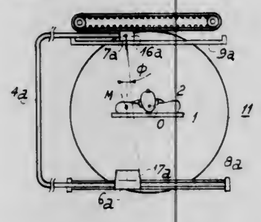
to produce an astigmatic optical path between the image plane and the light-sensitive input layer of the image pick-up tube so that the visible images are focussed in the longitudinal direction of the strip and are defocussed perpendicular to the longitudinal direction of the strip.

4,236,081

RADIOGRAPHIC APPARATUS

Rémy Klausz, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Feb. 1, 1979, Ser. No. 8,410
Claims priority, application France, Feb. 7, 1978, 78 03382
Int. Cl.³ G01N 21/34, 23/04
U.S. Cl. 250—445 T **2 Claims**



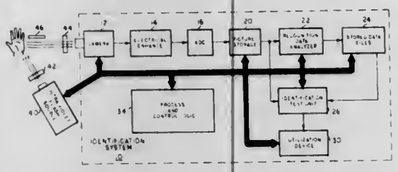
1. In a radiographic apparatus comprising:
a support for receiving a body to be examined,
a device mounted to be movable in rectilinear translation on a frame mounted to be rotatable about the support, said device carrying a source emitting an X-ray beam in the direction of a unit having a plurality of detectors said detectors being fixed on said device, on the opposite side of the source and in a plane substantially perpendicular to the axis of rotation of the frame, the support being disposed between said source and said detectors, said detectors being disposed in a fan arrangement relative to the source which constitutes the apex thereof, the rotatable frame having a plurality of immobilization stations at which the device moves in translation, the angle defined between two neighboring stations being equal to included angle of the fan arrangement,
the improvement consisting in the angle defined between two neighboring stations, which is an odd fraction of a revolution.

4,236,082

METHOD AND APPARATUS FOR RECORDING IMAGE DETAILS OF THE PALM OF A HAND

Marlow D. Butler, Portland, Oreg., assignor to Palmguard, Inc., Beaverton, Oreg.

Filed Jan. 29, 1979, Ser. No. 7,345
Int. Cl.³ G01N 21/38; G06K 9/00
U.S. Cl. 250—461 R **10 Claims**



1. In an identification system, a method of recording image details of the palm of a hand, comprising the steps of:
bombarding the palm with radiant energy so that said palm absorbs the radiant energy and emits visible light from the surface thereof, the levels of visible light varying in accordance with the characteristics of the palm and the surface thereof;
optically raster-scanning the surface of said palm to sense the varying levels of light and to develop an analog electrical signal proportional thereto; and
processing said analog signal to record a complete picture of said image details.

4,236,083

WINDMILL HAVING THERMAL AND ELECTRIC POWER OUTPUT

Clarence E. Kenney, 119 Stuart Rd., Racine, Wis. 53406

Continuation-in-part of Ser. No. 416,939, Nov. 19, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,130
Int. Cl.² F03D 9/00
U.S. Cl. 290—55 **6 Claims**



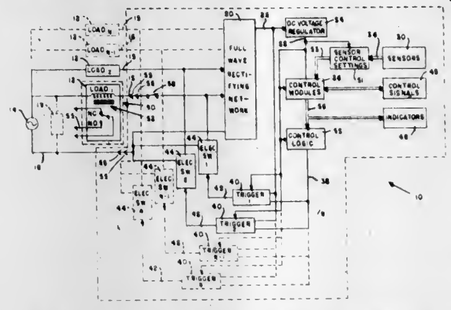
1. A windmill system for recovering energy from the applied wind in proportion to the cube of the wind velocity, comprising a rotationally supported shaft, blades mounted on said shaft, a centrifugal gas-filled machine including a rotatably mounted blade impeller, an enclosed housing surrounding said impeller, said housing having an interior wall structure defining a gas-flow inlet for said impeller, said interior wall structure and said housing being spaced apart and defining a gas-flow passage located radially beyond said impeller blades and in gas-flow communication with said inlet and with said structure and said housing presenting said inlet for circulating the gas to and from said impeller blades and along said passage, a flow restrictor operative adjacent said inlet for controlling the flow of working fluid passing along said passage, a non-clutched rotational drive means operatively connected between said shaft and said machine continuously at rotational speeds in direct proportion to all the rotational speeds of said shaft for uniform increase of the mechanical energy required to rotate said impeller in proportion to the cube of rotational speed of said impeller and for loading said windmill shaft for rotation at speeds directly proportional to the velocity of applied wind and for recovering maximum energy from the wind and for converting the said mechanical energy applied to rotate said impeller to heat energy by fluid friction in the gas in said gas-filled machine, heated gas reception means, and gas-flow conduits connected in gas-flow communication with said machine and said reception means for delivering to said reception means heated gas generated by said machine.

4,236,084

APPARATUS AND METHOD FOR IN-LINE ENERGIZATION AND DE-ENERGIZATION OF EXTERNAL LOADS IN SERIES WITH AN EXTERNAL SOURCE OF ELECTRICITY IN RESPONSE TO EXTERNALLY SENSED PARAMETERS

Richard P. Gingras, 40 North St., Ridgefield, Conn. 06877

Continuation of Ser. No. 712,651, Aug. 9, 1976, which is a continuation-in-part of Ser. No. 575,341, May 7, 1975, Pat. No. 3,974,426. This application Oct. 26, 1978, Ser. No. 955,120
Int. Cl.³ H01H 47/26
U.S. Cl. 307—39 **33 Claims**



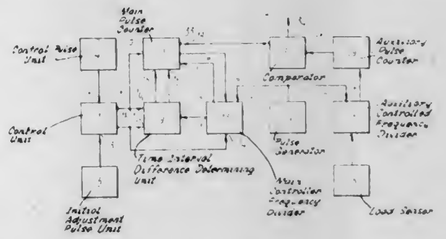
1. A control system for controlling the energization and de-energization of N electrical loads in response to external parameters, each load having a first output line connected in series with a first line of a source of alternating current electricity, and each load having at least a second output line which if connected to a second line of the alternating current electricity would energize the load, and if disconnected from the second AC line would de-energize the load, where N is an integer greater than one, comprising:
(A) a full-wave rectifying network having at least N+1 rectifying legs, each leg having first and second unipolarity current passing elements electrically connected to each other at the cathode of the first element and the anode of the second element forming a junction and the anode of the first unipolarity elements electrically connected to each other and the cathodes of the second unipolarity elements electrically connected to each other, the first rectifying leg having an input terminal at said junction for connection to the second line of the source of alternating current electricity, and each of the remaining rectifying legs having an input terminal at said respective junction for connection to the second line of one of the N loads so that the rectifying network is powered by the alternating current electricity in series with the loads, said rectifying legs generating a unipolarity voltage output across the anodes of the first unipolarity elements and the cathodes of the second unipolarity elements;
(B) means, connected to the output of the rectifying network, for voltage regulating said unipolarity voltage;
(C) means, connected to and powered by the output of voltage regulating means for generating an electrical signal in response to the magnitude of each sensed external parameters;
(D) control module means, each connected to one of the sensing means and powered by the output of the voltage regulating means, for generating electrical control output signals, each control output signal having a first, ON, value if the sensed parameter is greater than a pre-determined value and a second, OFF, value if the sensed parameter is otherwise;
(E) control logic means, powered by the output of the voltage regulating means, having sections for controlling all of the N loads, each section connected to at least one of the outputs of the control module means for generating a control logic output signal that is of a first, ON, value if the output signals of the associated control module means satisfy the Boolean equation representing the section of the control logic means, and is a second, OFF, value if the Boolean equation is not satisfied;
(F) triggering means, powered at least in part by the unipolarity output of the full-wave rectifying network, having inputs each connected to one of the outputs of one of the control logic means, for generating a trigger voltage signal if the corresponding control logic output signal is one, but only for one, of the following values, ON or OFF; and
(G) electronic switching means, having a plurality of inputs, each input connected to one of the trigger voltage signals of the triggering means, and electrically connected across the cathode-anode junction of the corresponding rectifying leg to the cathode-anode junction of the corresponding rectifying leg to the cathode-anode junction of the first rectifying leg, for effectively electrically connecting the corresponding input terminals of the rectifying network if a trigger voltage signal is present and for effectively disconnecting the corresponding input terminals of the rectifying network from each other if the trigger voltage signal is not present;
whereby each load is energized by the alternating current electricity source if the sensed external parameters selected for that load satisfy the Boolean equation represented by the corresponding section of the control logic module, and the load is de-energized if any of the selected sensed external parameters do not satisfy the corresponding Boolean equation, and whereby the control system is powered by the alternating current source in series with the loads.

4,236,085

METHOD FOR PRODUCING TRIGGER PULSES IN RELATION TO PRESET PHASE OF MOTION PROCEEDING WITH CONTINUOUSLY VARIABLE PERIOD AND DEVICE FOR EFFECTING SAME

Viktor B. An, rabochy poselok Krasnoobsk, dom 3, kv. 5; Ivan D. Bukhtiarov, rabochy poselok Krasnoobsk, dom 3, kv. 157; Alexei S. Demin, rabochy poselok Krasnoobsk, dom 6, kv. 198; Veniamin G. Potanin, rabochy poselok Krasnoobsk, dom 3, kv. 12, all of Novosibirskaya oblast, and Valery A. Spelchuk, proezd Dzerzhinskogo, dom 69, kv. 79, Novosibirsk, all of U.S.S.R.

Filed Dec. 7, 1978, Ser. No. 967,271
Claims priority, application U.S.S.R., Dec. 15, 1977, 2555285; Jan. 12, 1978, 2571116
Int. Cl.² F02P 5/04
U.S. Cl. 307—106 **2 Claims**



1. A method for producing trigger pulses in relation to a preset phase of motion proceeding with a continuously variable period, said phase of motion being changed by a preset value, said method comprising the steps of
forming a first control pulse upon reaching the preset phase of motion;
forming a second control pulse as said phase of motion is changed by said preset value;
forming a fundamental time interval having a duration corresponding to the change of said phase of motion by said preset value;
determining a first time interval during said change of said

phase of motion by said preset value within said fundamental time interval;

determining a second time interval during said change of said phase of motion by said preset value within said fundamental time interval, said first and second time intervals being successively determined as said phase of motion changes by such a value that the total change of said phase of motion is equal to the change of said phase of motion by said preset value;

determining the difference between said first and second time intervals;

storing additional control pulses having a repetition frequency at least one order greater than that of said first and second control pulses during said fundamental time interval;

correcting the number of said stored additional control pulses at the end of said fundamental time interval on the basis of the value and sign of said difference between said first and second time intervals;

counting said stored additional control pulses until a preset number is reached; and

forming a trigger pulse at an onset determined by the instant the number of said stored additional control pulses reaches said preset number.

4,236,086

APPARATUS FOR THE DETECTION AND PROCESSING OF ELECTRIC SIGNALS

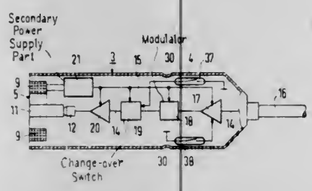
Peter Hoebel, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,189

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752783

Int. Cl.³ H02J *3/00*

U.S. Cl. 307—149 **10 Claims**



1. Apparatus for the detection and processing of electric signals, comprising a signal transmitter part and a signal processing part, primary and secondary coupling members providing signal path interconnection of said signal transmitter part and said signal processing part, and comprising a galvanically separative coupling location in the signal path interconnection between said primary and secondary coupling members, detachably interengageable contact plug means adjoining each other at the galvanically separative coupling location and comprising a contact plug part (**2**, **2'**) on the side of the signal processing part (**1**) and a plug-in contact part (**3**, **3'**) on the side of the signal transmitter part (**16**), each pair of interconnected primary and secondary coupling members (**8**, **9**; **10**, **11**) of the contact plug means having one of the pair of interconnected coupling members (**8**; **10**) disposed in the contact plug part (**2**, **2'**) on the side of the signal processing part (**1**) and having the other of the pair of interconnected coupling members (**9**; **11**) disposed in the corresponding plug-in contact part (**3**, **3'**) of the signal transmitter part (**16**) so that upon establishment of the signal path interconnection between the signal transmitter part (**16**) and the signal processing part (**1**) each pair of coupling members (**8**, **9**; **10**, **11**) join together in spatial proximity as primary and secondary coupling members to form a galvanically separative coupling therebetween at the galvanically separative coupling location, the coupling location of the contact plug means having associated therewith at a common interface (**5**, **40**) primary and secondary coupling members (**10**; **11**) for a use signal transmission and further primary and secondary coupling members (**8**; **9**) providing energy transmission for power supply coupling, characterized in that, as primary and secondary coupling members for the use signal transmission, fiber optic light guide port elements (**11**; **10**) are provided, of which a first port element (**10**) is disposed in the contact plug part (**2**, **2'**) on the side of the signal processing part (**1**) and the other fiber optic light guide port element (**11**) is located in the corresponding plug-in contact part (**3**, **3'**) of the signal transmitter (**16**), so that in the plugged-in state the fiber optic light guide port elements of the one and the other side are positioned relative to one another to provide an essentially continuous (seamless) signal transmission path.

4,236,087

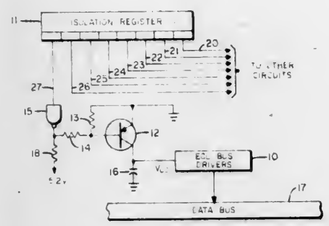
PROGRAMMABLE BUS DRIVER ISOLATION

David G. Kaminski, Eagan, and David F. Grimm, Valley, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 956,017

Int. Cl.³ H03K *13/32*, *19/007*; **H03L** *5/02*

U.S. Cl. 307—200 A **6 Claims**



1. A digital data bus driver circuit comprising:

an ECL tri-state bus driver;

a power transistor having a first electrode coupled to a ground connection of said ECL tri-state bus driver and having a second electrode coupled to ground;

means responsively coupled to said power transistor for biasing said power transistor whereby said power transistor may be biased to conduct between said first electrode and said second electrode; and

means responsively coupled to said biasing means for determining whether said biasing means will bias said power transistor to conduct between said first electrode and said second electrode.

4,236,088

NOISE-FREE SWITCHING CIRCUIT FOR AND METHOD OF ELECTRONICALLY SELECTING AUDIO INPUT SIGNALS IN AUDIO SYSTEMS

Harumi Horiuchi, Yokohama, and Hideo Aoyagi, Otashi, both of Japan, assignors to Soundesign Corp., Jersey City, N.J.

Filed Aug. 14, 1978, Ser. No. 933,624

Claims priority, application Japan, Feb. 8, 1978, 53-13266

Int. Cl.³ H03K *17/56*

U.S. Cl. 307—240 **14 Claims**

1. A noise-free switching circuit for electronically selected between a pair of audio input signals in an audio system, comprising:

(a) first circuit means for establishing electrical communication along a first signal-bearing path between a first input terminal to which one of the audio input signals is applied, and an output terminal;

(b) second circuit means for establishing electrical communication along a second signal-bearing path between a second input terminal to which the other of the audio input signals is applied, and the same output terminal;

(c) switching means including a pair of actuatable switching elements each being in electrical communication with a respective circuit means, and each being actuatable between a pair of switched states in which transmission of the respective audio input signal along the respective path is permitted and prevented, respectively; and

(d) control means for actuating said switching elements to permit transmission of a selected one of the audio input signals to the output terminal while preventing transmission of the other non-selected audio input signal to the output terminal, said control means including

(i) an actuating switch remote from said signal-bearing paths and having two operating conditions,

(ii) means responsive to said actuating switch for generating a first control voltage having an amplitude versus time characteristic which increases in smooth continuous manner in one of said operating conditions and which correspondingly decreases in smooth continuous manner in the other of said operating conditions, and for generating a second control voltage having an amplitude versus time characteristic which decreases in smooth continuous manner in said one operating condition and which correspondingly increases in smooth continuous manner in said other operating condition, said first and said second control voltages being generated substantially simultaneously and in inverse relationship with each other, and

(iii) means for electrically connecting said control voltages to said switching elements so as to gradually begin to actuate one of the switching elements from one to the other of said switched states, and to simultaneously begin to gradually deactuate the other of the switching elements from said other to said one switched state to thereby permit transmission in a gradual noise-free manner of one of the audio input signals along its respective path in one of said operating conditions of said actuating switch, and to thereupon gradually begin to deactuate said one switching element from said other to said one switched state, and to simultaneously begin to gradually actuate said other switching element from said one to said other switched state to thereby permit transmission in a gradual noise-free manner of the other of the audio input signals along its respective path in the other of said operating conditions of said actuating switch.



4,236,089

FLOATING POWER SWITCH

Richard H. Baker, Bedford, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 21, 1978, Ser. No. 944,632

Int. Cl.³ H03K *17/00*

U.S. Cl. 307—254 **20 Claims**



1. A floating transistorized switching circuit comprising

first and second operating voltage terminals for receiving positive and negative polarity logic level voltages,

a power terminal,

an output terminal;

means for electrically isolating a source of control signals from the switching circuit, having an input terminal for receiving control signals, and a control signal output terminal electrically isolated from its input terminal, the control signals being reproduced at this control signal output terminal;

floating DC voltage supply means connected between said first and second terminals for providing said positive and negative polarity logic level voltages thereto, respectively, said floating supply means having a reference terminal connected to said output terminal for referencing said logic level voltages to whatever voltage appears at said output terminal;

an output stage having a main current conduction path connected between said power and output terminals, and a control terminal for receiving a logic signal, said output stage being responsive to said logic signal having a first level for substantially lowering the impedance of its main current path, and to said logic signal having a second level for substantially increasing the impedance of its main current conduction path; and

logic network means connected between said first and second terminals having an input terminal connected to the control signal output terminal of said isolating means, and an output terminal connected to the control terminal of said output stage, said logic network means being responsive to said control signals going "high" and "low" for producing at its output terminal the first and second levels of said logic signal, respectively, for turning on and off said output stage.

4,236,090

SIGNAL GENERATOR AND SIGNAL CONVERTER USING SAME

Jozef Cornu, Stekene; Jean R. J. M. Taeymans, Wilrijk, and Jacques Talbot, Brussels, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 8, 1978, Ser. No. 931,650

Int. Cl.³ H03K *4/02*, *3/35*

U.S. Cl. 307—268 **24 Claims**

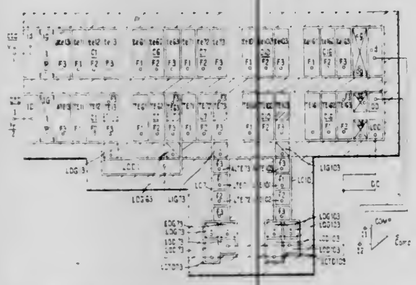
1. A signal generator to generate at its output a first variable output signal comprising:

at least one first charge transfer device having a plurality of stages;

clocking means coupled to given ones of said plurality of

stages to clock a first input signal into said first transfer device and to step the contents thereof through said first transfer device; and

an output circuit coupled to at least one of said plurality of stages to collect portions of said first input signal present in said one of said plurality of stages as a function of said



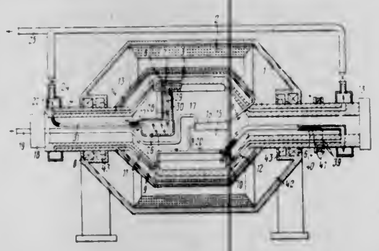
first variable output signal to be generated and to further process said signal portions, said output circuit including first gating means formed as a part of said first transfer device coupled to said one of said plurality of stages to selectively collect and to gate said signal portions to said generator output.

4,236,091

ELECTRICAL MACHINE WITH CRYOGENIC COOLING

Samson S. Kutateladze, ulitsa Zolotodolinskaya 9, kv. 14; Mark O. Lutset, ulitsa Tereshkovoi, 8, kv. 151; Anatoly G. Korolkov, ulitsa Ivanova, 5, kv. 71; Jury S. Popov, ulitsa Barlernaya, 16, kv. 14, Ala.L OF NOVOSIBIRSK; Iosif F. Filippov, ulitsa Pulkovskogo, 17, kv. 39, Leningrad; Garry M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5, Leningrad; Jury N. Vvedensky, Ligovsky prospekt, 275, kv. 11, Leningrad, and Jury V. Skachkov, Nevsky prospekt, 125, kv. 13, Leningrad, all of U.S.S.R.

Filed Sep. 20, 1978, Ser. No. 944,203
Int. Cl.³ H02K 9/00
U.S. Cl. 310—64 **10 Claims**



1. An electrical machine with cryogenic cooling, comprising:

a stator;

a body of said stator;

a winding of said stator disposed within said body;

a hollow rotor disposed in said body of said stator;

a superconducting winging of said rotor;

cooling ducts of said superconducting winding of said rotor;

a heat exchanger disposed in said hollow rotor, provided with an inlet and an outlet on the heat-emitting side and with an inlet and an outlet on the heat-absorbing side, and connected, via said inlet on the heat-absorbing side and via said outlet on the heat-emitting side, with said cooling ducts of said superconducting winding;

a line to feed the coolant to said rotor, connected with said inlet on the hot side of said heat exchanger;

a line to withdraw the coolant from the rotor, connected, with said outlet on said cold side of said heat exchanger;

a thermal electromagnetic shield of said rotor, arranged in a radially spaced relationship from said superconducting winding of said rotor;

two power leads of said rotor, electrically coupled to said superconducting winding of said rotor;

at least one cooling duct of said power leads, connected with said coolant discharge line;

two reducer portions of said rotor, adjacent said superconducting winding, arranged in a serial fashion along the axis of said rotor on either side of said superconducting winding;

at least one cooling duct of each of said reducer portions, provided with a first inlet located in close proximity to said winding and an outlet connected with said outlet of said coolant discharge line;

a Ranque vortex tube disposed in said hollow rotor and having a tangential inlet, a central outlet and a peripheral outlet, said Ranque vortex tube having said tangential inlet connected with said coolant supply line, having said central outlet connected with said first inlet of said cooling ducts of said reducer portions and with said cooling duct of said power leads;

a second inlet of said cooling duct of at least one of said reducer portions of said rotor;

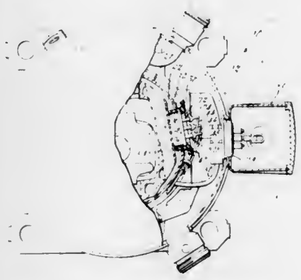
at least one cooling duct of said thermal/electromagnetic shield, connected with said peripheral outlet of said Ranque vortex tube and said second inlet of said cooling duct of at least one of said reducer portions.

4,236,092

COMPRESSOR MOTOR PROTECTION

Michael A. DiFlora, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Jun. 8, 1978, Ser. No. 913,648
Int. Cl.³ H02K 11/00
U.S. Cl. 310—68 C **11 Claims**



1. A hermetic motor compressor comprising:

an outer shell;

compressor means disposed within said shell;

motor means disposed within said shell and drivingly connected to said compressor means, said motor means including a stator having windings projecting outwardly from one end thereof;

a motor cover of a predetermined size substantially enclosing said windings and having an opening provided therein;

motor protection means of a predetermined size extending through said opening into engaging relationship with said windings; and

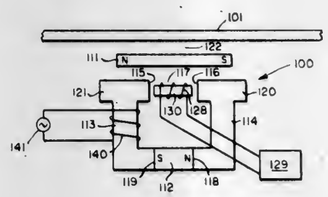
fastening means including a projection provided on and extending outwardly from said motor cover for securing said motor protection means within said opening, a portion of said motor protection means cooperating with said projection to secure said motor protection means in engaging relationship with said windings for different size stators whereby said predetermined size motor cover and said predetermined sized motor protector may be utilized with stators of different sizes.

4,236,093

SPEED INSENSITIVE WHEEL DETECTOR

David Birnbaum, Pittsford, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed May 18, 1978, Ser. No. 907,088
Int. Cl.³ H02K 21/38
U.S. Cl. 310—155 **14 Claims**



1. In a detector of the class wherein the presence of a member having magnetic properties alters a magnetic circuit such that there is a change in the magnetic flux between the faces of opposing pole pieces of the magnetic circuit, the combination with said structure of:

(a) a bi-stable ferromagnetic device situated between the faces of the pole pieces, said device having a core portion and an outer shell portion of relatively low and high coercivity, respectively;

(b) said change of magnetic flux being effective for reversing the polarity of said low coercive core;

(c) a sensing coil in coupling relationship with said bi-stable ferromagnetic device for responding to the flux change resulting from the reversal of the polarity of said core by producing an output signal; and

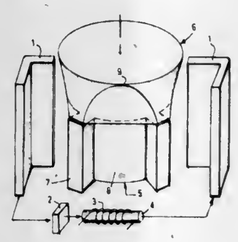
(d) a separate winding coupled to one of said pole pieces and connected to a source of a.c. potential of sufficient magnitude that the magnetic flux between said faces of the opposing pole pieces reverses direction at a rate proportional to the frequency of the a.c. potential for causing said sending coil to produce output signals in response to each flux reversal.

4,236,094

IGNITION TRANSDUCER FOR VEHICLE ENGINES

Bernard R. Raymond, Paris, France, assignor to Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France

Filed Jun. 29, 1978, Ser. No. 920,290
Claims priority, application France, Jul. 1, 1977, 77 20366; Jun. 16, 1978, 78 18078
Int. Cl.³ H02K 19/24
U.S. Cl. 310—168 **25 Claims**



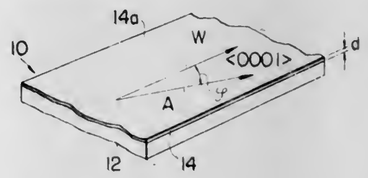
1. A flux change magnetic transducer for producing by induction in at least one winding, a periodic electrical signal, said transducer comprising at least one fixed element and at least one mobile element rotatable in a predetermined direction in relation to the said fixed element, cooperating wall means on said fixed element and said mobile element for generating in said at least one coil, during uniform displacement of said mobile element a periodic electrical signal whose form as a function of time comprises an impulse of a first polarity followed by a progressive change and then an impulse of a second polarity, said cooperating wall means comprising at least one pole tip on said fixed element, at least one pole tooth on said mobile element, and cooperating surfaces on said fixed and mobile elements; said pole tip, pole tooth, and cooperating surfaces defining an air gap volume which changes from one minimum value to a following minimum value by a rapid increase followed by a progressive variation and then by a rapid decrease, during a uniform displacement of said mobile element, said wall means generating said signal during a substantial portion of the interval between said impulses so that said progressive change of the signal occurs during a substantial portion of the interval between impulses.

4,236,095

SURFACE ACOUSTIC WAVE DEVICE COMPRISING PIEZOELECTRIC SUBSTRATE HAVING ZINC OXIDE LAYER ON α-ALUMINA LAYER

Shusuke Ono; Tsuneo Mitsuyu; Osamu Yamazaki, and Kiyotaka Wasa, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Apr. 17, 1979, Ser. No. 30,906
Claims priority, application Japan, Apr. 18, 1978, 53-46291
Int. Cl.³ H01L 41/18
U.S. Cl. 310—313 A **3 Claims**



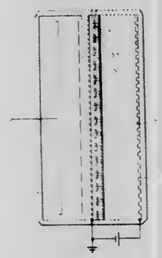
1. A surface acoustic wave device comprising a piezoelectric substrate which comprises a layer of α-alumina as a base region and a layer of crystalline zinc oxide as a surface region formed on and in intimate contact with one side of said α-alumina layer, wherein said α-alumina layer has a thickness greater than the wavelength of a surface acoustic wave to be propagated in the device, and wherein said α-alumina layer is made of a single crystal of α-alumina having a $(00\bar{1}2)$ plane, said single crystal being oriented such that the zinc oxide layer is formed on said $(01\bar{1}2)$ plane, and wherein said zinc oxide layer is made of a single crystal of zinc oxide such that a $(0\bar{1}\bar{2}0)$ plane of the zinc oxide single crystal gives the outer surface of said surface region of said substrate, the $<0001>$ axis of said zinc oxide single crystal being parallel to the $<0\bar{1}11>$ axis of said α-alumina single crystal, the thickness of said zinc oxide layer being in the range of from 0.84/k to 5.01/k, where k is wave number defined by $2\pi/\lambda$ where λ is said wavelength

4,236,096

PLASMA IMAGE DISPLAY DEVICE

Wilhelm Tiemann, Bubenreuth near Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 857,902, Dec. 6, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,720
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656621; Netherlands, Nov. 8, 1977, 7712287; France, Dec. 13, 1977, 77 37570; United Kingdom, Dec. 13, 1977, 51882/77; Japan, Dec. 14, 1977, 52-150396
Int. Cl.³ H01J 1/62, 39/18
U.S. Cl. 313—1 12 Claims



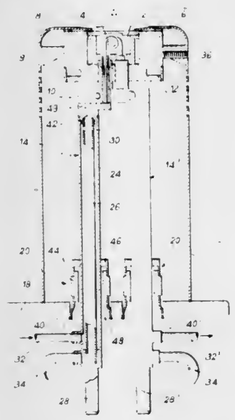
1. A plasma image display device comprising:
(a) a gas-tight envelope;
(b) a light transparent high vacuumtight partition subdividing the interior of said gas-tight envelope into a gas discharge space and an electron acceleration space;
(c) a picture screen with fluorescent phosphors on a surface of said gas-tight envelope opposite said partition in said electron acceleration space;
(d) a thin aluminum film separating said phosphors from said electron acceleration space;
(e) at least one anode disposed in said gas discharge space;
(f) at least one screen electrode disposed in said gas discharge space, said screen electrode forming a cathode;
(g) a gas under pressure filling said gas discharge space whereby a gas discharge will be generated between said anode and cathode;
(h) a photocathode forming an electron source on the side of said partition facing said fluorescent screen, in said electron acceleration space;
(i) means adjacent said fluorescent screen to which a high voltage can be applied to accelerate electrons leaving said photocathode to cause them to penetrate the aluminum film and impinge on the fluorescent phosphors, said electron acceleration space being maintained under a high vacuum;
(j) means for obtaining line scanning and further means for obtaining brightness control arranged perpendicular thereto;
(k) a hole matrix cooperating with said means for obtaining and further means for obtaining to achieve focusing; and
(l) said means for obtaining and further means for obtaining disposed in either the gas discharge space or electron acceleration space whereby, the negative glow of the glow discharge in the gas discharge space will serve as a light source to excite electron emission of the photocathode through said partition, the electrons released from the photocathode then being accelerated by a high voltage applied between said photocathode and said aluminum film to accelerate the electrons leaving the photocathode causing them to penetrate the aluminum film and impinge on the fluorescent phosphors, with said hole matrix achieving focusing, whereby they will generate a focused picture element.

4,236,097

ION SOURCE HAVING FLUID-COOLED SUPPLY CONDUCTORS

Jean Camplan, Paris; Jacques Chaumont, Fontenay Le Fleury, and Robert Meunier, Bonnelles, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 24, 1978, Ser. No. 963,205
Claims priority, application France, Nov. 28, 1977, 77 35760
Int. Cl.³ H01J 61/52, 27/26
U.S. Cl. 313—37 6 Claims



1. An ion source of the type comprising an emissive filament located within a vacuum enclosure and connected to two current supply conductors, wherein said supply conductors are each constituted on the one hand by a leak-tight tube formed of material selected from a group consisting of stainless steel and alloys not substantially heavier than stainless steel and adapted to traverse the enclosure wall through a leaktight bushing and on the other hand by a conductor of heavy metal having good electrical conductivity, each said conductor being connected to said filament through an end-closing plug of said leak-tight tube at the end thereof remote from said bushing and being placed within the interior of the leak-tight tube and being thus completely isolated from the vacuum enclosure.

4,236,098

SOLID-STATE COLOR IMAGING DEVICES

Jerry R. Horak; Harold F. Langworthy; Frederick J. Rauner, and Robert C. Gross, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 867,841, Jan. 9, 1978, which is a continuation-in-part of Ser. No. 730,885, Oct. 8, 1976, abandoned. This application Aug. 20, 1979, Ser. No. 67,961
Int. Cl.³ H01J 29/36, 31/38; G03C 5/00; B03F 5/00
U.S. Cl. 313—371 22 Claims

1. A color imaging device comprising:
A. means for sensing radiation comprising a planar array of charge-handling semiconductive photosensors having sensing areas sensitive to radiant energy and superimposed thereon,
B. filter means for controlling access of radiation to said sensing means, said filter means being in microregistration with said planar array of photosensors and comprising
1. a transparent mordant layer comprising a mordant capable of forming a covalent or ionic bond with a mordantable dye and
2. a plurality of radiation intercepting means defining a planar array of filter elements lying in said mordant layer each filter area of said intercepting means having at least one mordantable dye which absorbs radiation in at least one portion of the spectrum and transmits radiation in at least one other portion of the spectrum,



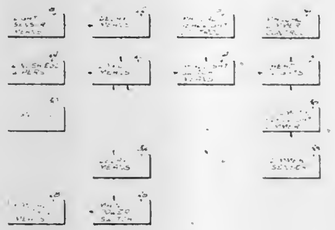
said filter means having at least two sets of intercepting means, one set having a common radiation absorption and transmission characteristic that is different from another set.

4,236,099

AUTOMATIC HEADLIGHT SYSTEM

Irving Rosenblum, 29757 69th St., No., Clearwater, Fla. 33515

Filed Mar. 5, 1979, Ser. No. 17,694
Int. Cl.³ B60Q 1/02
U.S. Cl. 315—83 6 Claims



1. An automatic light system for controlling the light emission of a vehicle headlight, comprising:
light sensor means disposed within the darkened engine compartment of said vehicle to receive ambient light,
control means for automatically turning on or off the headlight in response to detected light level signals from said light sensor means when said light level signals are within predetermined light level ranges,
delay means for preventing the turning on or off of the headlight if the detected light level signals do not stay within the predetermined light level ranges for a predetermined period of time,
polarity switching means connected between said vehicle headlight and the poles of an electric power source, for selectively switching the polarity of the voltage applied by said power source to said headlight,
whereby on and off control of the headlight is accomplished without being affected by momentary, sudden darkness or light and additional battery drain during vehicle starting is prevented.

4,236,100

LIGHTING CIRCUITS

Eric L. H. Nuver, Monterrey, Mexico, assignor to Esquire, Inc., New York, N.Y.

Continuation of Ser. No. 712,937, Aug. 9, 1976, Pat. No. 4,134,043, which is a continuation-in-part of Ser. No. 674,447, Apr. 7, 1976, abandoned. This application Nov. 17, 1978, Ser. No. 961,842
The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.
Int. Cl.³ H05B 41/231, 41/46
U.S. Cl. 315—92 47 Claims



1. In a gaseous-discharge lamp lighting system, said system including
a ballast having line and common leads for receiving an AC input voltage, and a lamp lead, and
a gaseous-discharge lamp which is operatively connected between the lamp and common leads of the ballast,
the improvement comprising an auxiliary lighting circuit which includes:
(a) a first resistive element and a first capacitor operatively connected to form a first series combination which is operatively connected to the ballast to provide a first charging current to the first capacitor;
(b) a second resistive element and a switch operatively connected to form a second series combination which is operatively connected to the ballast, the closing of the switch being determined by the voltage across the first capacitor and the closure of the switch allowing the second resistive element to be energized, and
(c) a sensing circuit, including a reactance, which is operatively connected between the gaseous-discharge lamp and the first capacitor to provide a second charging current to the first capacitor, the vector sum of the first and second charging currents being insufficient to charge the first capacitor to a voltage sufficient to close the switch, as the gaseous-discharge lamp approaches its normal operating condition.

4,236,101

LIGHT CONTROL SYSTEM

David G. Luchaco, Macungie, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 18, 1978, Ser. No. 934,672
Int. Cl.³ H05B 37/02
U.S. Cl. 315—158 13 Claims



1. System for controlling the intensity of artificial illumina-

tion in a predetermined space incidentally also illuminated by natural light, said system comprising in combination:

variable intensity source means for artificial illumination for said space;

means for detecting intensity of said natural light in said space in substantial distinction to the intensity of said artificial illumination and for providing a control signal as a function of the detected intensity of said natural light; and

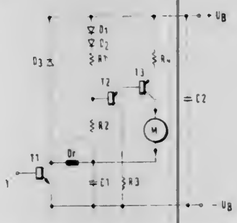
controllable means for varying the intensity of said artificial illumination from said source as a function of (a) said control signal and (b) a gain control function which is independent of any detected light intensity and dependent upon physical characteristics of said predetermined space.

4,236,102

CONTROL SYSTEM FOR SPOOL DRIVE OF MAGNETIC TAPE APPARATUS

Dieter-Ernst Warmbier, Saalburgstr. 85a, 6380 Bad Homburg, and Gerhard Biedenkapp, Saalburgstr. 28, 6382 Friedrichsdorf, both of Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,916
Int. Cl.³ H02P 5/16
U.S. Cl. 318—341 **4 Claims**



1. In a control system for the tape drive in magnetic tape apparatus, in which a d.c. drive motor is provided for each of the two spool carriers and the running speed of the band-shaped record carrier is held at a selected constant value by control of one of the motors, wherein a roller entrained by the record carrier drives a rotary pulse generator which delivers pulses proportional to the tape speed, whose separation in time supplies the necessary actual value for the control, which is compared in a comparison circuit with a desired value, and the output signal of the comparison circuit is supplied to a control circuit, which controls the winding motors in the desired manner, the improvement comprising a comparison circuit which gives a pulse width modulated output signal corresponding to the departures of the actual value from the desired value, a switch amplifier arranged to amplify the output signal from the comparison circuit, a low pass filter following the switch amplifier to convert the amplified output signal into a direct voltage proportional to the difference between the actual and desired values which direct voltage on the one side is serving as supply voltage for the drive motor and which on the other side is controlling a direct voltage amplifier serving as controllable current source to determine the magnitude of the current flowing through the drive motor independent of the instanteous rotor position of the drive motor, the direct voltage amplifier including an input transistor having a base connected through a resistance chain to a terminal of a supply source and through a second resistance to the output of the low pass filter and an output transistor connected after the input transistor in a Darlington circuit, the emitter of the output transistor connected through an emitter resistor to the same terminal of the supply source as the base of the input transistor and the controllable drive motor connected between the collector of the output transistor and the output of the low pass filter.

4,236,103

CONTROL CIRCUIT FOR A DIRECT CURRENT MOTOR

Jacques Matthey, Geneva; Marcel Torre, Meyrin, and André D. Millenet, Geneva, all of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

Filed Nov. 21, 1978, Ser. No. 962,704
Claims priority, application Switzerland, Dec. 1, 1977, 14681/77
Int. Cl.³ H02P 5/16
U.S. Cl. 318—345 D **9 Claims**



1. A control circuit for a direct current electric motor having separate excitation by permanent magnets, comprising a full wave rectifying bridge for supplying the motor with direct current; a resistance network comprising a manually controllable variable resistance for controlling the speed of the motor, a regulating assembly comprising a triac responsive to both positive and negative current directions, a capacitor connected to said rectifying bridge in series with said resistance network, said triac connected to an alternating arm of the rectifying bridge, the triac having an energizing angle determined by said capacitor connected in series with said resistance network; and means for limiting the energy supplied to the motor through said triac as a function of the value of the feed voltage in the alternating arm of the rectifying bridge, including a supplementary resistance connectable in series with the resistance network when the said voltage exceeds a predetermined value, said means comprising a switch in said control circuit responsive to the value of the feed voltage for effectively placing said supplementary resistance in or out of the control circuit.

4,236,104

POSITION SENSING ROTARY SWITCH AND SYSTEM

Daniel G. Spence, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 19, 1978, Ser. No. 970,908
Int. Cl.³ G05B 19/10
U.S. Cl. 318—567 **3 Claims**

1. A position sensing rotary switch comprising, in combination:

a position deck having a pair of electrically isolated rotatable conductors;

means for applying voltage to the conductors;

means for detecting a home position from one of the conductors;

means for detecting each position of the switch relative to said home position from the other of the conductors;

a switching deck having a common rotatable conductor;

means for applying voltage to the common conductor;

means for establishing connections from the common conductor to a plurality of position outlets;

means for spacing the decks apart with the respective rotatable conductors in predetermined orientation;

means for rotating said conductors together;

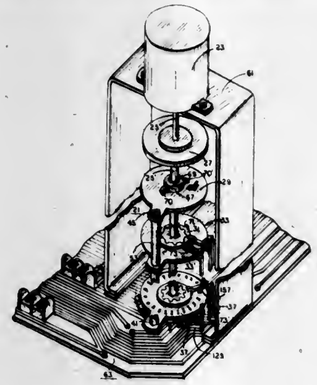
said one conductor of the position deck having a first surface with a single tab;

said means for detecting a home position comprising a contact for engagement with said tab;

said other conductor of the position deck having a plurality of teeth-like tabs corresponding to all switch positions except home position;

said means for detecting each position of the switch comprising a position contact for engaging said teeth-like tabs singly;

said position outlets comprising outlet contacts;



the means for establishing connections from the common conductor comprising an outlet tab on said conductor for engagement with said outlet contacts; and

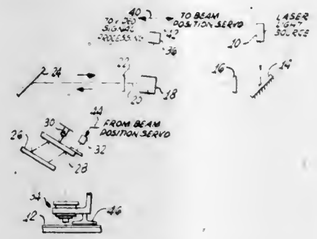
said predetermined orientation locating the outlet tab on an outlet contact as the position contact is just making contact with a corresponding position teeth-like tab to insure good switching outlet contact at the time of determining position by the position deck.

4,236,105

DIGITAL CENTER TRACKING SYSTEM

Richard L. Wilkinson, Torrance, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Filed Jan. 12, 1979, Ser. No. 3,019
Int. Cl.³ G05B 19/33
U.S. Cl. 318—577 **8 Claims**



1. A digital servo control system for controlling the position of detection means with respect to the centerline of an information track without dithering the detection means, said system comprising:

first transducer means for moving the detection means transversely with respect to the information track;

second transducer means for deriving an information signal from the detection means;

means for filtering the information signal to obtain an error signal indicative of the position of the detection means with respect to the track centerline;

signal processing means, for processing the error signal to obtain a timing signal indicative of transitions of the detection means through a switching line parallel with the track; and

control means, responsive to the timing signal, for controlling the polarity and duration of an acceleration signal applied to said first transducer means to accelerate the detection means toward a corrected position;

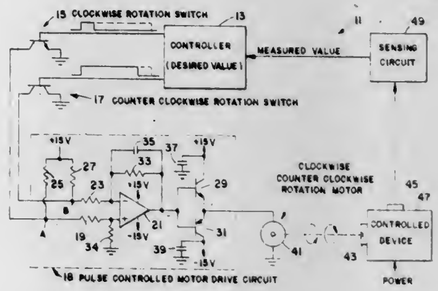
whereby the detection means is accelerated in alternating directions and oscillates about the track centerline, solely under the influence of the acceleration signal applied to accelerate the detection means toward a corrected position.

4,236,106

AUTOMATIC PULSE CONTROLLED SERVO CONTROL SYSTEM

Doxie M. Davis, Bainbridge Island, and John B. Gehman, Poulsbo, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1978, Ser. No. 951,699
Int. Cl.³ G05B 11/28
U.S. Cl. 318—599 **1 Claim**



1. A servo system comprising:

(a) a controller having a desired value reference signal and first and second output control signals;

(b) said first and second output control signals being operably connected to first and second switching elements;

(c) a drive element for operating in either a first direction or in a second direction;

(d) an element drive circuit responsive to said outputs of said first and second switching elements for controlling said drive element whereby said drive element is operated in said first direction when said first switch element is activated and operated in said second direction when said second switch element is activated;

(e) a controlled device having a control element and an output whereby said output indicates a measured value and is responsive to said controlled element;

(f) said drive element operably connected to said control element;

(g) said output being operably connected to the input of said controller;

(h) said first and second output control signals are variable in pulse length and the length of pulse determines the amount of movement of said drive element;

(i) said controller includes correction limit means and percent error means;

(j) means for comparing said percent error means to said corrective limit means; whereby

(k) when said percent error is equal to or greater than said correction limit then said movement is a predetermined amount and when said percent error is less than said correction error than said movement is less than said predetermined movement and said controller provides said first output when said measured value is less than said desired value and said second output when said measured value is greater than said desired value for causing said measured value to about equal said desired value

4,236,107

SECONDARY CELL CHARGING SYSTEM

Jackson R. Templin, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1978, Ser. No. 963,091
Int. Cl.³ H02J 7/10
U.S. Cl. 320—21 **5 Claims**



1. A secondary cell charging system capable of providing a charge potential of the level required to charge a secondary cell load when supplied by a supply potential source of a potential level within a range less than and greater than that of the required charge potential comprising:

an inductor,

an energizing circuit through which said inductor may be electrically connected across said supply potential source;

switching means located in a portion of said energizing circuit through which current is supplied to said inductor for periodically completing and interrupting said energizing circuit at a selected rate; and

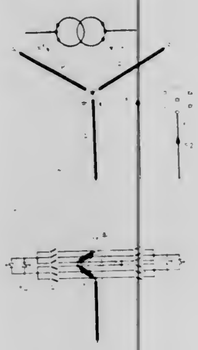
output circuit means coupling said inductor to said secondary cell load including a diode poled to isolate said output circuit means from said energizing circuit and to transmit a charge current to said secondary cell load only upon the interruption of said energizing circuit to induce a potential in said inductor that rises to a value great enough to supply charge current to said secondary cell load.

4,236,108

VARIABLE PHASE-SHIFTING TRANSFORMER NETWORK

Herbert Stemmler, Kirchdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 24, 1979, Ser. No. 6,228
Claims priority, application Switzerland, Apr. 10, 1978, 3807/78
Int. Cl.³ H02J 3/18
U.S. Cl. 323—114 **5 Claims**



1. A variable phase-shifting transformer network wherein the network transformation ratio and phase shift is stepwise adjustable, said network having at least one pair of multiphase transformers with plural primary windings and plural secondary windings interconnected over transmission lines and being star-connected with a grounded star point conductor, comprising:

each secondary winding having plural auxiliary windings located on the core of a preselected secondary winding, each auxiliary winding having plural taps, one of said auxiliary windings connected to a respective secondary winding, the other of said auxiliary windings being connected to said grounded star point and all said auxiliary windings initially not connected to one another;

plural watt-less isolating switches; and,

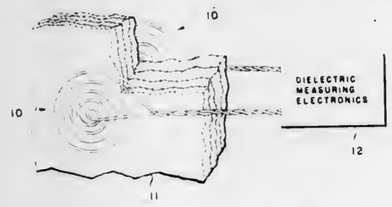
each transformer phase provided with at least one AC semiconductor switch having one terminal connected to a preselected tap of a particular auxiliary winding, and another terminal connected to another tap of an auxiliary winding via said watt-less isolating switches; said at least one AC semiconductor switch being comprised of a pair of thyristors connected in an anti-parallel configuration.

4,236,109

DIELECTRIC MONITORED COMPOSITE ASSEMBLY

Harold R. Ingle, Jr., Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 12, 1977, Ser. No. 859,709
Int. Cl.³ G01R 27/26, 31/12; H01G 7/00
U.S. Cl. 324—61 P **12 Claims**



1. A dielectric monitored cured resin matrix composite assembly comprising in combination:

a multiple-plied, resin matrix composite structure means in a cured state;

and, a dielectric monitoring means including a first and second capacitive plate means each formed of insulation coated wire having a plate portion and at least one end lead,

the plate portion of each said wire assembled to the composite structure means whereby at least a portion of the wire insulation throughout the plate portion is in direct physical contact with the composite structure means such that connection of said wire end lead of each of said plate means to an alternating current source produces a measureable electrical capacitance indicative of the existing dielectric value of the composite structure means portion located between said first and second plate means whereby changes in either as well as both moisture content and physical strength level properties of the composite structure means can be determined by changes in the dielectric properties thereof.

4,236,110

DIGITAL FREQUENCY DEVIATION METER

Harry D. Shearer, and Robert E. Fowler, both of St. Petersburg, Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jun. 29, 1978, Ser. No. 920,533
Int. Cl.³ G01R 23/02
U.S. Cl. 324—78 Z **11 Claims**

1. A digital frequency deviation meter for measuring the frequency deviations of an incoming FM signal from a center frequency, the combination comprising:

timing means for producing a reference signal of center frequency;

counting means responsive to the frequency of the incoming signal by cycling through a series of nonambiguous cyclical sequential states;

storage means actuated at center frequency for storing information about the present and immediately preceding sampled states of said counting means;

detection means actuated at center frequency for detecting changes in magnitude and direction between consecutive sampled states, said means generating a pulse when a state change is detected; and

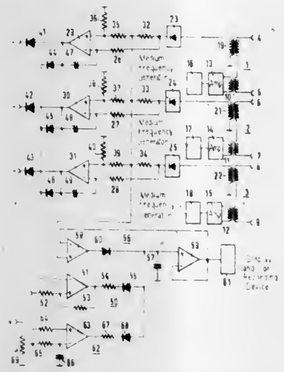
frequency counting means connected to said detection means for counting said pulses.

4,236,111

METHOD AND APPARATUS FOR THE MEASUREMENT OF ELECTRIC CURRENTS AND/OR VOLTAGES IN A PLURALITY OF CURRENT OR VOLTAGE CIRCUITS

Bernd Kusserow, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 11,042
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2810046
Int. Cl.³ G01R 19/00, 19/16
U.S. Cl. 324—103 P **12 Claims**



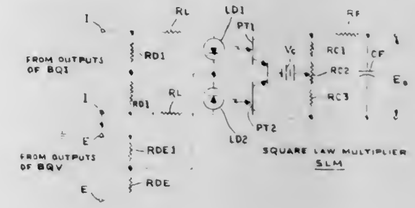
1. A method for the measurement of electric currents and/or voltages in a plurality of current or, respectively, voltage circuits, in particular of middle frequency current circuits in electromedical interference current therapy, whereby the current or voltage of each circuit is compared with a comparative value, characterized in that each separately registered current or voltage value is compared at a comparator (**29, 30, 31**) specifically allocated to it with a mean value which is formed from the current or, respectively, voltage values of all participating current or, respectively, voltage circuits (**1, 2, 3**); and in that the output signals of the comparators upon nonequality of a current or, respectively, voltage value with the mean value within a predeterminable limit are brought to display at a separately allocated display means (**41** through **43**).

4,236,112

POWER MEASURING APPARATUS

Austin G. Boldridge, Jr., Freehold, N.J., assignor to Conversational Systems, Inc., New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,105
Int. Cl.³ G01R 21/06, 29/00
U.S. Cl. 324—142 **6 Claims**



1. Apparatus for measuring the power consumed by a load connected via mains to a source of alternating current having a given fundamental frequency comprising: means for generating a first signal proportional to the instantaneous voltage across the load; means for generating a second signal proportional to the instantaneous current through the load; first amplifier means tuned to the given fundamental frequency for narrow band-amplifying the first signal; second amplifier means tuned to the given fundamental frequency for narrow band-amplifying the second signal; and square law multiplier means connected to said first and second amplifier means for generating an output signal whose amplitude is proportional to the product of the magnitude of the first and second signals and the cosine of the phase angle between said signals, said square law multiplier means comprising a pair of serially connected light emitting diodes, a pair of serially connected phototransistors, each of said phototransistors being optically coupled to one of said light emitting diodes, means for applying a signal proportional to the sum of the first and second signals across one of said light emitting diodes, means for applying a signal proportional to the difference of said first and second signals across another of said light emitting diodes, means for generating a difference signal which is the difference in the voltages across one of said phototransistors and the voltage across the other of said phototransistors, and means for filtering the difference signal.

4,236,113

ELECTRICAL WELL LOGGING TOOL, HAVING AN EXPANDABLE SLEEVE, FOR DETERMINING IF CLAY IS PRESENT IN AN EARTH FORMATION

Bruce F. Wiley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 13, 1978, Ser. No. 896,061
Int. Cl.³ E21B 23/00, G01V 3/24
U.S. Cl. 324—366 **17 Claims**

1. Well logging apparatus comprising:

a well logging tool having a rigid body, said rigid body being enclosed at least in part by an expandable sleeve;

a plurality of electrodes;

means for mounting said plurality of electrodes on said expandable sleeve;

means for expanding said sleeve in such a manner so as to place said plurality of electrodes in close electrical contact with the sidewall surface of the borehole which is being logged;

a control means;

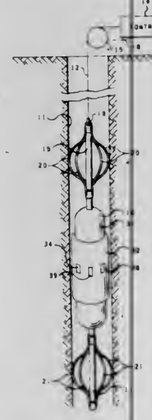
means for establishing a first signal representative of the pressure in said expandable sleeve;

means for transmitting said first signal to said control means, said control means generating a first control signal to activate said means for expanding said sleeve to pump fluid into said expandable sleeve when it is desired to expand said expandable sleeve, said control means generating a second control signal to stop said means for expanding said sleeve when said first signal indicates that the pressure in said expandable sleeve has reached a desired value, said control means generating a third control signal to reverse the pumping action of said means for expanding said sleeve to return said expandable sleeve to a nonexpanded state when it is desired to move said logging tool, and said control means generating a fourth control signal to stop said means for expanding said sleeve when said first signal indicates that said expandable sleeve has returned to a nonexpanded state.

11. In a well logging tool having two current electrodes and four voltage electrodes located therein, apparatus comprising:

means for injecting alternating electrical current through said two current electrodes into the formation surrounding the borehole into which said logging tool is placed;

means for sensing the voltage seen by said four voltage



electrodes, said voltage being induced in said formation surrounding said borehole by said injected alternating electrical current;

phase comparator means;

means for supplying said alternating electrical current to one input of said phase comparator means;

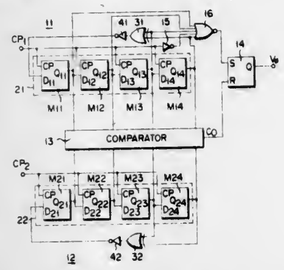
means for supplying said voltage to a second input of said phase comparator means, said phase comparator means determining the phase shift between said alternating electrical current and said voltage to give an indication of the presence of clay minerals in said formation surrounding said borehole, said two current electrodes and said four voltage electrodes being oriented in a plane which is perpendicular to the vertical axis of said well logging tool to thereby substantially reduce the effect of spontaneous potentials on the determination of said phase shift, said two current electrodes being located on opposite sides of said well logging tool, two of said four voltage electrodes being located on opposite sides of and equally spaced from a first one of said two current electrodes, the remaining two of said four voltage electrodes being located on opposite sides of and equally spaced from the second one of said two current electrodes, said four voltage electrodes providing symmetry and an averaging effect to the measurement of said voltage being induced in said formation.

4,236,114

APPARATUS FOR GENERATING PULSE WIDTH MODULATED WAVES

Minoru Sasaki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 25, 1978, Ser. No. 872,118
Claims priority, application Japan, Jan. 28, 1977, 52/8373
Int. Cl.² H03K *3/78, 7/08, 21/10, 21/36*
U.S. Cl. 328—58 **2 Claims**



1. An apparatus for generating a pulse width modulated wave comprising:

a first shift register including a plurality of serially connected binary memory stages for sequentially shifting an input data item in synchronism with a first clock pulse, said first shift register including feedback means for feeding back the outputs of selected ones of said binary memory stages as said input data item to the input of said first binary memory stage through an exclusive OR circuit;

a second shift register including the same number of serially connected binary memory stages as those of said first shift register for sequentially shifting an input data item in synchronism with a second clock pulse which has a frequency lower than said first clock pulse, said second shift register also including feedback means for feeding back the outputs of the same selected binary memory stages of said second shift register as those of said first shift register as said input data item to the input of said first binary memory stage of said second shift register through an another exclusive OR circuit;

a comparator which compares the output of each stage of said first shift register with the output of the corresponding stage of said second shift register for producing a coincidence output when all outputs of the stages of said first shift register coincide with the outputs of the corresponding stages of said second shift register; and

a flip-flop circuit which is set every time the combination of the outputs of respective stages of first shift register comes into a predetermined state and which is reset by said coincidence output, thereby producing a pulse width modulated wave whose pulse width varies gradually with time.

4,236,115

SYNCHRONIZATION DETECTING AND INDICATING SYSTEM

Robert E. Nelson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1978, Ser. No. 959,343
Int. Cl.³ H03D *13/00*
U.S. Cl. 328—133 **4 Claims**

1. A synchronization detecting and indicating system for producing an output signal indication of the substantial equality of the rotational speeds of two rotating members, comprising:

first means for producing a first series of electrical signal pulses of a frequency directly proportional to the rotational speed of one of said two rotating members;

second means for producing a second series of electrical signal pulses of a frequency directly proportional to the rotational speed of the other one of said two rotating members, each of said first and second means producing the same number of electrical signal pulses per revolution of the corresponding said rotating member;

means responsive to said first and second series of electrical signal pulses for producing an output signal upon the occurrence of each signal pulse of the higher frequency one of said first and second series of electrical signal pulses and for terminating said output signal upon the occurrence of each signal pulse of the lower frequency one of said first and second series of electrical signal pulses whereby said means produces a series of square wave output signal pulses that are of increasing width during the periods of time that there is a change of phase displacement of the pulses of said first and second series of electrical signal pulses and that are of constant width when there is no change of phase displacement of the pulses of said first and second series of electrical signal pulses;

means responsive to said series of square wave output signal pulses for producing an output signal that increases substantially linearly in amplitude as a function of the average



of said series of square wave output signal pulses and reduces to a lower amplitude during the period of time that a pulse of the higher frequency one of said first and second series of electrical signal pulses passes through an in-phase relationship with a pulse of the lower frequency one of said first and second series of electrical signal pulses, that repeats at a frequency that is a function of the difference of the rotational speeds of said first and second rotating members and remains at a constant value when the phase displacement of the pulses of said first and second series of electrical signal pulses remains constant;

means for converting said output signals of said last named means into an electrical signal of a potential level that increases and decreases with increasing and decreasing differences of rotational speeds of said rotating members, whereby the potential level of said electrical signal decreases as the rotational speeds of said rotating members approaches equality; and

means responsive to a decrease of potential level of said electrical signal to a preselected potential level for producing an output signal indication of a substantial equality of the rotational speed of said rotating members.

4,236,116

LEVEL CONTROL CIRCUITRY FOR TWO WAY COMMUNICATION SYSTEM

Kermit Beseke, Schaumburg, and Ronald Kopecki, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

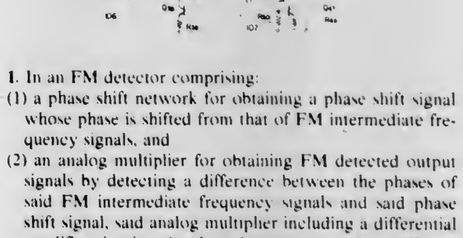
Filed Jun. 26, 1978, Ser. No. 919,015
Int. Cl.³ H03K *5/08;* **H03L** *5/00*
U.S. Cl. 328—169 **3 Claims**

1. An automatic gain control circuit comprising:

controlled attenuator means having an input, output and control terminals, said attenuator means receiving signals at its input terminal, attenuating said signals by a predetermined factor dependent upon a control signal at said control terminal and producing said attenuated signal at said output terminal;

control signal generating means coupled to said output terminal for producing a perdetermined control signal in response to the signal levels thereat;

sample and hold means, coupled between said control signal generating means and the control terminal of said controlled attenuator means, and being operable in a first mode to couple said produced control signal to said con-



trol terminal and being operable in a second mode to store the instantaneous value of said control signal and couple said stored signal to said control terminal; and

zero crossing detector means for detecting the number of zero crossings made by a received signal at said attenuator input terminal and activating said sample and hold means to said first mode upon detecting a number of zero crossings corresponding to an information signal and activating said sample and hold means to said second mode upon detecting a number of zero crossings corresponding to a noise signal.

4,236,117

FM DETECTOR USING A PHASE SHIFT NETWORK AND AN ANALOG MULTIPLIER

Kazuo Watanabe, Kokubunji; Masanori Ienaka, Kodaira; Yasuo Kominami, Kokubunji, and Makoto Homma, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 2, 1979, Ser. No. 8,848
Claims priority, application Japan, Mar. 29, 1978, 53/35510; Mar. 29, 1978, 53/35512; Mar. 29, 1978, 53/35513
Int. Cl.³ H03D *3/14*
U.S. Cl. 329—103 **8 Claims**



1. In an FM detector comprising:

(1) a phase shift network for obtaining a phase shift signal whose phase is shifted from that of FM intermediate frequency signals, and

(2) an analog multiplier for obtaining FM detected output signals by detecting a difference between the phases of said FM intermediate frequency signals and said phase shift signal, said analog multipher including a differential amplifier circuit and a phase detector circuit, said differential amplifier circuit including first and second transistors connected in a differential pair which is driven by said FM

intermediate frequency signals, at least said phase shift signal being applied to said phase detector circuit,

the improvement wherein said detector comprises:

(1) a base of a third transistor connected to a base of one of said first and second transistors,

(2) an emitter of a fourth transistor connected to said bases of said one transistor and said third transistor, and

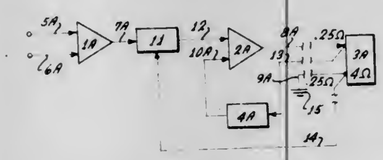
(3) either one of a collector output of said one transistor and a collector output of said third or fourth transistor directly applied to said phase detector circuit, while the other applied to said phase detector circuit through said phase shift network.

4,236,118

STABILIZED REMOTE SENSING HIGH FIDELITY APPARATUS

Wheeler M. Turner, 1030 Mission Ridge Rd., Santa Barbara, Calif. 93103

Filed Dec. 18, 1978, Ser. No. 970,575
Int. Cl.³ H03F 1/26, 1/34
U.S. Cl. 330—105 **11 Claims**



1. An improved amplifier system for driving a remotely located load wherein it is desired that the amplified signal applied to the load be a high-fidelity reproduction of an input signal, said system comprising:

a load remotely located from the amplifier system and having an input terminal and a return terminal;

an amplifier having an input terminal, and having an output terminal connected to the input terminal of the load, and having a return terminal connected to the return terminal of the load;

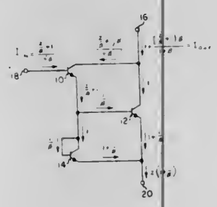
a negative feedback network connected between the input terminal of the load and the input terminal of the amplifier, and applying to the input terminal of the amplifier a negative feedback signal related to the difference between the signal present at the input terminal of the load and a high fidelity reproduction of the input signal.

4,236,119

MONOLITHIC WIDEBAND AMPLIFIER

Carl R. Battjes, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 11, 1978, Ser. No. 941,821
Int. Cl.³ H03F 3/04
U.S. Cl. 330—288 **5 Claims**



1. A wideband amplifier, comprising: first, second, and third transistors forming a three-terminal composite transistor in which the collectors of said first and second transistors are connected in common to a first terminal, the base of said first transistor is connected to a second terminal, the emitter of said first transistor is connected to the base of said second transistor, the collector and base of said third transistor are connected to the base of said second transistor, and the emitters of said second and third transistors are connected in common to a third terminal;

wherein said first, second, and third transistors are matched and have substantially identical operating characteristics so that the DC current gain of said three-terminal composite transistor is equal to $\beta(2\beta+3)/(\beta+2)$.

4,236,120

HIGH SPEED, HIGH EFFICIENCY AMPLIFIER CIRCUIT

Charles M. White, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed May 24, 1978, Ser. No. 908,925
Int. Cl.³ H03F 3/04; H01J 29/70
U.S. Cl. 330—296 **6 Claims**



1. Apparatus comprising an amplifier having an input and an amplifier output, means for coupling said amplifier input to a signal input for receiving a signal to be amplified therefrom, said coupling means including means for decoupling said amplifier input from said signal input whenever a signal is supplied to said signal input which would force said amplifier into saturation, but for said decoupling, wherein said amplifier comprises a current amplifier, and wherein said decoupling means comprises fixed current means for providing a substantially fixed level of current flow through a connection point, means for connecting said connection point to said amplifier input, and unidirectional current shunting means connected between said signal input and said amplifier input, said current shunting means being poled to shunt current away from said amplifier input to an extent which is dependent upon the amplitude of the signal supplied to said signal input.

4,236,121

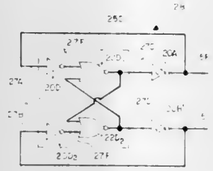
OSCILLATORS INCLUDING CHARGE-FLOW TRANSISTOR LOGIC ELEMENTS

Stephen D. Senturia, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 5, 1978, Ser. No. 893,552
Int. Cl.³ H03K 3/282, 3/353
U.S. Cl. 331—57 **48 Claims**

22. An oscillator that includes, in combination: at least one logic element, said at least one logic element comprising a charge-flow transistor that comprises a semiconductor substrate, a drain region, a source region, a gate insulator, a gapped gate electrode, a gap material having some electrical conductance disposed in the gap of the gapped gate electrode, and an electrical load element connected to one of the source region and the drain region of the charge-flow transistor, said at least one logic element having an input and an output; and electrical circuit means connected to receive as input thereto the output of the logic element, said electrical circuit means having an output fed back as input to the logic element and being operable in response to the input of the electrical circuit means to effect periodic TURN-ON and TURN-OFF of the logic element.

35. A ring oscillator comprising at least one logic element that includes the combination of a load element and a charge-flow transistor comprising a semiconductor substrate, a drain region, a source region, a gate insulator, a gapped gate electrode, and a thin-film material having some electrical conductance disposed in the gap of the gapped gate electrode, said load element being connected to one of the source region and



drain region of the charge-flow transistor, which logic element functions as an inverter, said ring oscillator further including an even number of additional inverters.

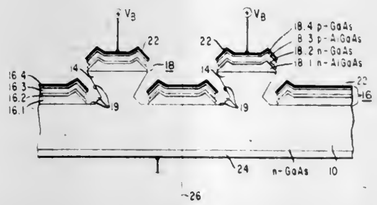
48. An oscillator that comprises, in combination, an inverter logic element comprising the combination of a charge-flow transistor and a load element; and bistable means connected to receive as input the output of the logic element and to provide an output which is fed back as input to the logic element, said bistable means being operable in response to the input thereto from the inverter logic element to effect periodic TURN-ON and TURN-OFF of the logic element.

4,236,122

MESA DEVICES FABRICATED ON CHANNELED SUBSTRATES

Alfred Y. Cho, and Won-Tien Tsang, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 777,400, Mar. 14, 1977, Pat. No. 4,099,305, This application Apr. 26, 1978, Ser. No. 900,123
Int. Cl.³ H01S 3/19
U.S. Cl. 331—94.5 H **4 Claims**



1. In an array of stripe geometry mesa semiconductor junction lasers, a structure comprising:

a semiconductor body,

a plurality of parallel, separate free-standing ridges formed as an integral part of said body and separated by a plurality of parallel, separate channels so that said ridges are trapezoidal in shape, being wider at their topmost surfaces than at their bottoms,

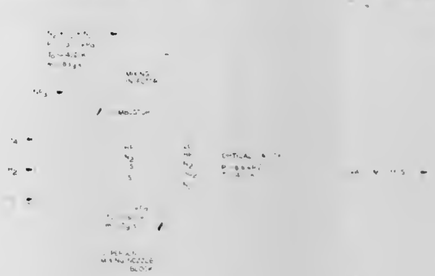
a plurality of epitaxial semiconductor layers deposited on the topmost surface of said ridges so as to form a p-n junction at the interface of at least two contiguous ones of said layers, said layers being formed by directing a plurality of molecular beams substantially perpendicular to said major surface.

4,236,123

HIGH-POWER CO LASER

Ralph J. Richardson, Ballwin; Charles E. Wiswall, Hazelwood, and Richard L. Rasmussen, Florissant, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 1, 1978, Ser. No. 911,333
Int. Cl.³ H01S 3/095
U.S. Cl. 331—94.5 G **8 Claims**



1. A method of producing a chain reaction CO chemical laser comprising the steps of

(a) thermochemically converting CS_2 into CS and S

(b) combining the CS and S with a stream of O_2 oxidizer and diluent to produce vibrationally excited CO resulting in an inverted population of CO,

(c) passing the CO through a resonant optical cavity to obtain continuous stimulated emission of radiation from the CO, and

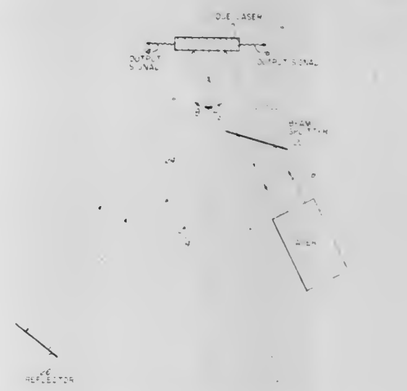
(d) extracting a coherent laser beam from the optical cavity

4,236,124

CO_2 OPTICALLY PUMPED DISTRIBUTED FEEDBACK DIODE LASER

Stephen D. Rockwood, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,631
Int. Cl.³ H01S 3/094
U.S. Cl. 331—94.5 H **3 Claims**



1. An optically pumped distributed feedback diode laser comprising:

a diode laser medium;

CO_2 laser means for generating a first CO_2 laser beam;

means for splitting said first CO_2 laser beam into a second

CO_2 laser beam directed at said diode laser at a first predetermined angle and a third CO_2 laser beam;

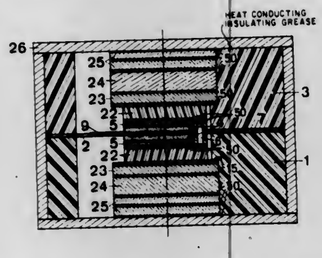
means for reflecting said third CO_2 laser beam to direct said third CO_2 laser beam at said diode laser medium at a second predetermined angle to generate interference fringes within said diode laser medium to periodically alter the reflectivity and optically pump said diode laser medium to initiate lasing action.

4,236,125

WIDE BAND HIGH POWER VERY HIGH OR ULTRA HIGH FREQUENCY CIRCULATORS

Nicolle Bernard, and Gerard Forterre, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Conflans-Sainte-Honorine, France

Filed Jul. 9, 1979, Ser. No. 55,766
Claims priority, application France, Oct. 7, 1978, 78 20475
Int. Cl.³ H01P *1/387*
U.S. Cl. 333—1.1 **4 Claims**



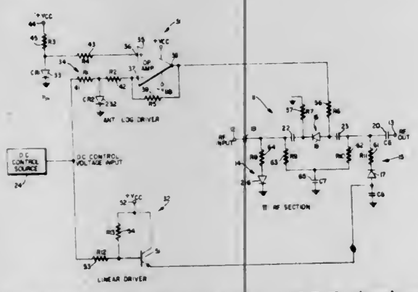
1. A broad band high power temperature stabilized lumped constant strip line circulator with two band broadening circuits comprising a printed circuit on a substrate and a piling up of parts with intermediate layers of heat conductive insulating grease between successive parts, said parts comprising caps surrounding gyromagnetic pellets made from a solid cylindrical piece of metal the inside of which is machined as an hexagon with three curvilinear sides, said piling up being enclosed in a thick ring shaped casing with internal steps the external bases of which are closed by a magnetic yoke.

4,236,126

VARIABLE RF ATTENUATOR

Carroll Weller, and Bruce Lippard, both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Apr. 25, 1979, Ser. No. 33,183
Int. Cl.³ H03H *7/25*
U.S. Cl. 333—81 R **12 Claims**



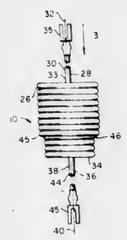
1. A variable attenuator for a source of R.F. signal, said attenuator having an attenuation characteristic that is a function of the level of a source of d.c. control voltage, comprising a pi R.F. attenuator having shunt input and output branches between which is connected a series branch, each of said branches including a voltage controlled variable impedance PIN diode, means responsive to the control voltage for converting the level of the control voltage into a first d.c. current source having a magnitude substantially equal to $K_3+K_2e^{-K_1V}$ where e is the base of natural logarithms, K_1, K_2 and K_3 are constants and V is the level of the control voltage, a first d.c. bias circuit for supplying the current of the first source as a d.c. bias for the diode of the series branch while isolating the d.c. current of the first source from the PIN diodes of the shunt branches, means responsive to the control voltage for converting the level of the control voltage into a second d.c. current source having a magnitude substantially equal to K_4+K_5V, where K_4 and K_5 are constants, a second d.c. bias circuit for supplying the current of the second source as d.c. biases for the diodes of both shunt branches while isolating the d.c. current of the second source from the PIN diode of the series branch.

4,236,127

ELECTRICAL FREQUENCY RESPONSIVE STRUCTURE

Michael B. Scherba, Troy, Mich., assignor to Pyrohm, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 787,011, Apr. 13, 1977, Pat. No. 4,128,818. This application Oct. 6, 1978, Ser. No. 949,045
The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.
Int. Cl.³ H03H *5/00*
U.S. Cl. 333—175 **6 Claims**



1. An electrical frequency responsive circuit comprising a first electrical coil having an axis of generation and a second electrical coil positioned to overlap the first electrical coil both axially and radially so that the frequency responsive circuit is resonant at a predetermined frequency, the second coil having an inner diameter slightly smaller than the outer diameter of the first coil, the coils being screwed together, insulating material extending radially between the first and second coils and means at the opposite ends of the electrical frequency responsive circuit for connecting the electrical frequency responsive circuit in another electrical circuit.

4,236,128

GROUND FAULT RECEPTACLE

David A. Cooper, Loganton; William T. Monoski, and Edward J. Vibert, both of Muncy, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 27, 1979, Ser. No. 33,921
Int. Cl.³ H01H *83/02*
U.S. Cl. 335—18 **12 Claims**

1. In a duplex electrical receptacle providing ground fault protection and formed for mounting in a wall outlet box and for connecting an electrical load to the conductors of a power source, the improvement comprising:

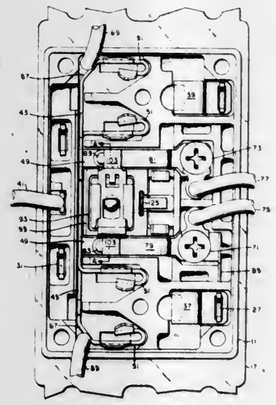
a container of electrical insulating material having an apertured shoulder portion extending to a forward face portion, said forward face portion having a pair of recessed portions formed to receive a test button and a re-set button respectively and a pair of duplex receptacles each formed to receive a ground connection prong and the prongs of a male plug;

a metal support plate formed to telescope over said forward face portion and contact said shoulder portion of said container, said metal support plate having means for attachment thereof to a wall outlet box and a plurality of outstanding tab members formed to extend through said apertured shoulder portion and affix said metal support plate to said container;

a pair of bus-bar conductors disposed within said container, each of said conductors having an electrical contact member affixed thereto and a male prong receiving portion aligned with each of said duplex receptacles;

first and second resilient connectors each attached to an electrical conductor of said power source and having an electrical contact member aligned with the electrical contact member of one of said pair of bus-bar conductors;

a re-set guide assembly disposed within said container and affixed to a re-set button disposed within one of said recessed portions of said face portion, said re-set guide assembly including ground fault circuit interrupting apparatus for effecting and interrupting contact between said



electrical contact members of said bus-bar conductors and said first and second resilient connectors;

a test button assembly including a test button disposed within one of said recessed portions of said face portion and a test button extension within said container and responsive to said test button for simulating a ground fault condition;

a panel member of electrical insulating material disposed within said container and substantially covering said bus-bar conductors and resilient connectors and telescoped over said re-set guide and test button assemblies;

a printed circuit board disposed within said container adjacent said panel member and including ground fault circuitry having a differential transformer telescoped over said electrical conductors of said power source, a solenoid adjacent said re-set guide assembly, and at least a pair of flexible plug-in spring members formed provide electrical connection of said power source conductors to said printed circuit board; and

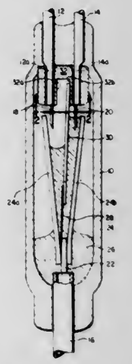
a back cover member of electrical insulating material affixed to said container substantially covering said printed circuit board.

4,236,129

MERCURY CONTACT SWITCH

Laimons Lacis, Bloomfield, and Steven Horvath, Irvington, both of N.J., assignors to Gordos Corporation, Bloomfield, N.J.

Filed Jun. 20, 1979, Ser. No. 50,419
Int. Cl.³ H01H *29/00*
U.S. Cl. 335—55 **10 Claims**



1. A switch comprising:

a rigid non-magnetic, non-conductive enclosure, through which extend at least three electrical conductors;

a pair of spaced apart electrical contacts electrically connected to two of the at least three conductors which extend through the enclosure and supported in fixed position relative to said enclosure,

a reservoir defined by part of said enclosure;

a conductive liquid within said enclosure arranged to circulate into and out of said reservoir,

a non-flexible holder for conductive liquid providing a confined space and an electrical path from the third of the at least three conductors through conductive liquid in the holder to either of the electrical contacts with which conductive liquid alternatively makes contact, the holder being of such shape and position relative to the reservoir to draw conductive liquid from the reservoir into the holder to a position proximate to each of the spaced apart electrical contacts, and

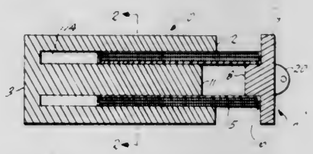
a partition including a magnetic armature element in the holder so positioned as to be movable in the presence of a magnetic field to a magnetic reluctance minimizing position which position also acts upon the conductive liquid in the holder so as to change switch condition of at least one of the spaced-apart contacts.

4,236,130

SOLENOID ACTUATOR HAVING A LONG STROKE

Gustav Hubert, 8427 Leroy St., San Gabriel, Calif. 91775

Filed Sep. 25, 1978, Ser. No. 945,553
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—223 **11 Claims**



1. A solenoid comprising:

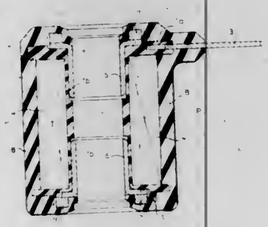
electric coil means for producing a magnetic field, the coil means having windings forming an opening through the coil; and

an armature of permeable material having in fixed relative relationship a core passing through the opening of the windings and a sleeve surrounding the coil means;
the armature being unmagnetized except for magnetization induced by current flow through the coil means;
all the windings of the coil means and the armature being relative movable with respect to each other in an axial direction to vary the extent of overlap therebetween.

4,236,131
ELECTROMAGNET WITH PLUNGER-TYPE ARMATURE AND A METHOD FOR THE PRODUCTION THEREOF

Gerard Grandelement, Cap d'Ail, France, assignor to International Cold Forging Corporation, Monaco

Filed Jan. 10, 1978, Ser. No. 868,456
Claims priority, application Monaco, Jan. 11, 1977, 1225
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—260 **5 Claims**

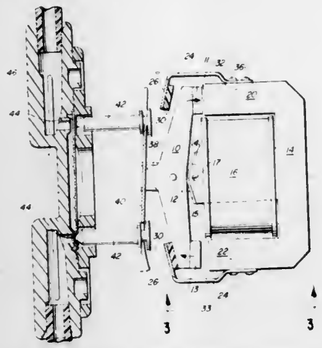


1. An electromagnet with a plunger-type armature and guide means therefor, said electromagnet comprising:
an elongated, tubular body made of an insulating thermoplastic material and having a stepped bore therethrough that defines an annular, axially oriented wall which is thinner at the opposed ends thereof than in the central portion, said tubular body further including a radially extending flange at both axially opposed ends thereof;
a pair of hollow, magnetic bodies positioned, respectively, within said stepped bore at the axially opposed ends of said tubular body, each said hollow body having a radially outwardly directed flange that bears against one of said flanges of said tubular body;
a pair of laterally spaced apart, axially extending and generally chordally oriented ribs on each said flange of said body;
a U-shaped magnetic back circuit defined by a pair of spaced apart legs that rest on said flanges of said hollow bodies and which are contained between said ribs and a connecting portion extending between a common end of said legs, an opening being further provided in each said leg with said openings in said legs being coaxial with each other as well as with said hollow bodies and said tubular body when said legs are positioned over said flanges of said hollow bodies whereby the armature is slidingly received therein;
two terminals partially imbedded in one of said flanges of said tubular body;
electrically conductive coil means wound about said tubular body between said flanges thereof and attached to said terminals; and
said insulating material encapsulating all of said electromagnet except the interior of said tubular body and said hollow bodies and the non-imbedded portion of said terminals.

4,236,132
ELECTROMAGNETIC SWITCH MEANS FOR A FLOW CONTROL DEVICE AND THE LIKE HAVING REDUCED SHOCK LEVELS

Nicholas Zissimopoulos, Schaumberg, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 12, 1979, Ser. No. 11,250
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—271 **7 Claims**

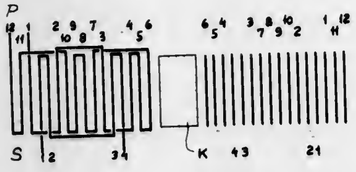


1. In an electromagnetic switch which comprises an armature pivotally movable between first and second pivotal positions about a fulcrum positioned between its ends, separate magnet means positioned at each end of said armature presenting opposite polarities outwardly from each end of the armature, and electromagnet core means, actuated by a single coil, defining arms of common polarity positioned adjacent said magnet means at each armature end, said magnet means being each respectively movable toward and away from an arm when pivoting between said first and second pivotal positions, whereby said armature can be moved between said first and second positions by changing the polarity of said electromagnet core means, and restraining means engagable with said armature for preventing the ends of said armature from pivoting into contact with said electromagnet core means, said restraining means comprising a pair of brackets, each carried by an arm of the electromagnet core means, each bracket being adapted to engage a side of said armature opposed to said electromagnet core means in one of said first and second pivotal positions.

4,236,133
TRANSFORMER WITH FOIL WINDINGS

Ole S. Seiersen, Kokkedal, Denmark, assignor to Christian Rovsing A/S, Ballerup, Denmark

Filed Jan. 26, 1979, Ser. No. 6,903
Claims priority, application Denmark, Jan. 30, 1978, 441/78
Int. Cl.[2] H01F 15/14
U.S. Cl. 336—69 **3 Claims**

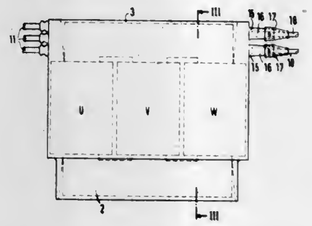


1. A transformer having a core onto which a primary winding and a secondary winding, which both consist of metal foil, are spirally wound and radial with respect to each other, the turns in the winding having the fewest turns being divided into pairs of contiguous turns, and each turn in each pair having an immediately adjacent turn of the other winding and the same number as said immediately adjacent turn in the order in which the turns conductively follow each other in the windings, seen from corresponding ends of the two windings.

4,236,134
MULTIPHASE TRANSFORMER FOR POWER TRANSMISSION IN A SUPPLY SYSTEM

Friedrich Alber, Köngen; Gerhard Altmann, Kirchheim; Wolfgang Bendel, Leonberg; Rudolf Dedelmahr, Aich; Hermann Eyrich, Kirchheim; Rudolf Link, Bissingen, and Klaus Seeliger, Weilheim, all of Fed. Rep. of Germany, assignors to Transformatoren Union AG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 8, 1979, Ser. No. 46,859
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826299
Int. Cl.[3] H01F 27/02
U.S. Cl. 336—96 **10 Claims**

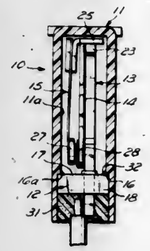


1. Multiphase transformer for power distribution in a supply network, comprising a single block of cast resin having high voltage and low voltage conductor windings embedded therein, and an iron core with a plurality of legs and an upper and lower yoke formed of closely-stacked transformer laminations centrally embedded in said block, said block having axially-extending ribs integral therewith defining troughs between said ribs and defining spaces between said ribs and said core, legs and yokes, watertight caps disposed between said ribs closing off the troughs and holding said core, legs and yokes, and mechanically compacted dry quartz sand filled in the spaces.

4,236,135
SEALED MOTOR PROTECTOR

Ronald L. Holden, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Oct. 2, 1978, Ser. No. 947,576
Int. Cl.[3] H01H 61/00
U.S. Cl. 337—89 **18 Claims**

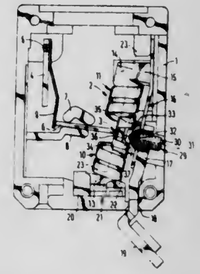


1. A motor protector comprising a housing assembly defining a sealed switch chamber, said housing assembly having a cup-shaped housing and a nonconductive header closing a mouth of said housing, a plurality of parallel support pins extending through and adhered to said header to form a tight seal therewith, the inner walls of said housing having a flat, continuous shoulder facing said mouth and sharply intersecting with said inner walls, one face of said header engaging said shoulder and the edges of said header snugly engaging a portion of the walls of the housing between the shoulder and said open mouth to form said chamber with support pins extending into said chamber, sealing means adhered to the header, the walls, and the support pins in at least a portion of the space between the header and the open mouth of the housing, a bimetal snap assembly cantilever mounted by welding adjacent one of said support pins in said chamber, said bimetal snap assembly including a movable contact mounted on the free end thereof, and a fixed contact welded to another one of said plurality of support pins, said bimetal assembly operating in response to predetermined bimetal temperatures to move said movable contact into and out of contact with said fixed contact.

4,236,136
TRIPPING DEVICE FOR AN OVERLOAD CIRCUIT BREAKER

Konrad Heydner; Josef Peter, and Rainer Völkl, all of Altdorf, Fed. Rep. of Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,176
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800032
Int. Cl.[3] H01H 71/16
U.S. Cl. 337—111 **11 Claims**

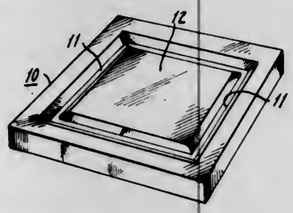


1. In an overload circuit breaker including a housing, a tripping device supported in the housing and having a helically wound, current-carrying bimetal strip having an axis and composed of two face-to-face arranged metal components situated, respectively, at the inside and at the outside of the bimetal strip; and a tripping portion forming part of the bimetal strip; the tripping portion executing a tripping motion as the bimetal strip undergoes deformation under the effect of heat generated by an excess current flowing through the bimetal strip; the improvement wherein said bimetal strip is formed of two electrically serially connected, oppositely wound bimetal helices each having an outer end constituting the opposite ends of said bimetal strip; securing means for affixing said bimetal strip to said housing at both said opposite ends; the bimetal helices each having an inner end connected to one another by a coupling part constituting said tripping portion of said bimetal strip; and further wherein said inner ends of said bimetal helices are bent radially inwardly towards said axis and said tripping portion projects radially outwardly from said axis and is situated within an envelope circumscribable about said bimetal helices.

4,236,137
SEMICONDUCTOR TRANSDUCERS EMPLOYING FLEXURE FRAMES

Anthony D. Kurtz, Englewood; Joseph R. Mallon, Franklin Lakes, and Timothy A. Nunn, Ridgewood, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Mar. 19, 1979, Ser. No. 21,960
Int. Cl.[3] G01L 1/22
U.S. Cl. 338—4 23 Claims

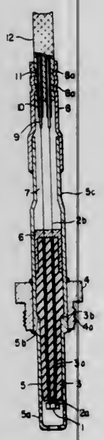


1. A pressure transducer, comprising:
(a) a diaphragm with a top surface having a relatively large main central area of a relatively uniform thickness surrounded by a thin continuous groove of a predetermined width and depth,
(b) first and second piezoresistive sensors mounted on said bottom surface and each positioned parallel to a respective edge of said groove and directly adjacent one another separated relatively by the width of said groove on said top surface, whereby when a force is applied to said top surface, one of said sensors is subjected to compression while said other is in tension.

4,236,138
GAS COMPONENT DETECTOR

Yoshihiro Segawa, Okazaki; Minoru Ohta, Anjo, and Eturo Yasuda, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 12, 1979, Ser. No. 19,402
Claims priority, application Japan, Mar. 17, 1978, 53-35145[U]
Int. Cl.[3] H01L 7/00
U.S. Cl. 338—34 5 Claims

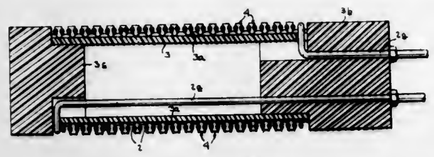


1. A gas component detector comprising:
an electrically insulating and heat-resistant ceramic body having a pair of through holes penetrating axially;
a detector element of a metal oxide positioned at one end of said ceramic body, an electrical resistance value of said detector element being varied depending on a gas component in gases to be detected;
a pair of electrodes connected to said detector element and extending into said through holes at one end of said ceramic body;
a pair of sub-lead-lines connected to said pair of electrodes by welding and extending out of said through holes and therebeyond at the other end of said ceramic body;
a metal pipe fixed to said ceramic body around an outer surface thereof, said pipe extending beyond said other end of said body and terminating in a reduced end portion;
a sealing material of an electrically insulating metal oxide filled between said other end of said ceramic body and said metal pipe to close openings of said penetrating holes at said other end thereof; and
an electrically insulating powder densely packed within the extended portion of said pipe for retaining said sub-lead-line pair in fixed spaced-relation and electrically insulating said pair from each other and from said pipe.

4,236,139
COIL ASSEMBLY

John H. Haglund, Danbury, Conn., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Feb. 13, 1979, Ser. No. 11,907
Int. Cl.[3] H01C 3/20
U.S. Cl. 338—302 3 Claims



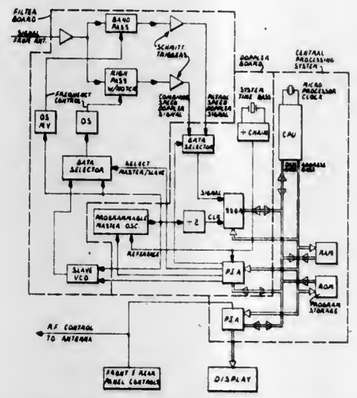
1. A tubular radiant heater electric resistance heating coil assembly comprising a core made of a refractory, and a helical extension spring coil of electric resistance heating wire having convolutions resiliently urged towards each other and held apart by spacers pinched between the convolutions, said spacers having indents engaged by said convolutions and having internal bases engaging said core and spacing the coil radially from the core and the spacers having external bases projecting radially from the coil and adapted to radially space the coil assembly from the inside of a tubular radiant heater casing, said spacers being each integrally made of a refractory that is substantially non-reactive with said resistance wire at high temperatures.

4,236,140
TRAFFIC RADAR DEVICE

John L. Aker, Merriam, and William D. Goodson, Chanute, both of Kans., assignors to Kustom Electronics, Inc., Shawnee Mission, Kans.

Filed Apr. 14, 1978, Ser. No. 896,376
Int. Cl.[3] G01S 13/58
U.S. Cl. 343—8 26 Claims

18. In a Doppler radar device for use in law enforcement and service vehicle speed surveillance and for determining the speed of a moving target vehicle when said platform vehicle is moving, the device comprising:
means for causing said device to emit radiated RF energy for producing a received Doppler signal from said moving target vehcle,

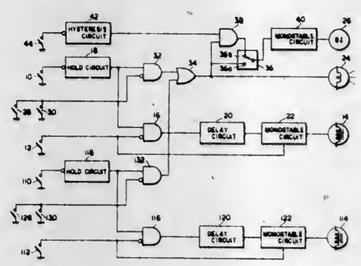


means for controlling said radiated RF energy to decrease the probability of detection of same by a traffic radar detector.

4,236,141
AUTOMATIC FASTENING AND ALARMING CIRCUIT FOR A VEHICLE SEAT BELT

Gosaku Terabayashi, Toyota; Tasuku Nakano, Gifu, and Tadanao Hamamoto, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Jan. 18, 1979, Ser. No. 4,615
Claims priority, application Japan, May 15, 1978, 53/64779[U]
Int. Cl.[3] B60R 21/10
U.S. Cl. 340—52 E 7 Claims

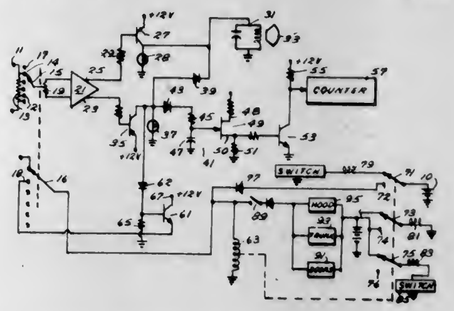


1. An automatic fastening and alarming circuit for a seat belt of a vehicle in a vehicle seat belt device having a seat belt previously extending over a seat for fastening to a rider sitting on the seat, a latch means for retaining the seat belt in a not-fastened state, electromagnetic means releasing the locking action of the latch means to unlatch the seat belt retained by the latch means, said automatic fastening and alarming circuit comprising:
a seat switch for detecting the sitting of the rider;
a hold circuit coupled to the seat switch;
a door switch for detecting the opening and closing of the doors;
a fastening, detecting switch for detecting the fastened state of the seat belt;
a vehicle speed detection circuit for detecting the speed of said vehicle and providing an output when the speed of said vehicle exceeds a predeterminned value;
a first And gate for generating a logical product of outputs of said hold circuit and said fastening detection switch;
a second And gate for generating a logical product of the outputs of said door switch and said hold circuit;
a third And gate for generating a logical product of outputs of said vehicle speed detection circuit and said first And gate;
an automatic fastening control circuit for supplying a releasing signal for a predetermined period of time to said electromagnetic means acuated by a logical product of said second And gate;
an alarm lamp actuated by said logical product from said first And gate; and
an alarm buzzer acuated by said logical product of said third And gate.

4,236,142
EXCESSIVE SPEED AND THEFT DETERRENT SYSTEM

Albert Lindsey, 10240 SW. 105 St., Miami, Fla. 33156

Continuation-in-part of Ser. No. 649,736, Jan. 16, 1976, abandoned, which is a continuation of Ser. No. 426,197, Dec. 19, 1973, abandoned. This application Jan. 26, 1978, Ser. No. 872,553
Int. Cl.[2] B60Q 1/54; B60R 25/10; G01D 9/00; G06M 1/22
U.S. Cl. 340—62 1 Claim



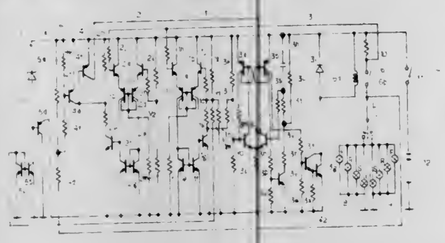
1. An excessive speed and theft deterrent system for automotive vehicles comprising means for generating a signal having a magnitude which is proportional to the speed of said vehicle, comparator means responsive to said generated speed proportional signal for generating an output signal when the magnitude of said generated speed proportional signal is greater than a preselected voltage level, said preselected voltage level corresponding to a predetermined speed, scaling means for varying the magnitude of said speed proportional signal to thereby vary the speed at which the output of said means for generating a speed proportional signal is equal to said preselected voltage, means responsive to the output signal of said comparator means for generating a pulse train, said pulse train having a predetermined frequency, means for delaying the generation of said pulse train after said comparator means has generated said comparator output signal, means for recording the number of pulses generated by said pulse generating means to thereby indicate to total time in which said vehicle has operated at speeds exceeding said predetermined speed, said comparing means generating a second output signal when the magnitude of said generated speed proportional signal is greater than a second preselected voltage level, said second output signal being generated when the speed of said vehicle approaches said predetermined vehicle speed, and means responsive to said second signal for energizing an indicator when the speed of said vehicle approaches the predetermined vehicle speed level.

4,236,143

APPARATUS FOR CONTROLLING VEHICLE DIRECTIONAL LAMPS

Tiaki Mizuno, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 16, 1978, Ser. No. 961,366
Claims priority, application Japan, Dec. 1, 1977, 52-144691
Int. Cl.[1] B60Q 1/34
U.S. Cl. 340—73 **5 Claims**



1. In a turn-direction indicating system of a vehicle in which two lamp groups, each having at least a front and a rear directional lamp connected in parallel with each other, are individually selectable by a turn-direction selecting switch, thereby producing a switch output signal, and coupled to a battery through a circuit comprising said selecting switch, a normally nonconductive switching means and a current detecting means, respectively coupled in series, an apparatus comprising:

said current detecting means which is responsive to an electric current flowing from said battery to the lamp group selected by said selecting switch and effective to produce a detection output signal in proportion to said electric current;

at least one reference means effective to produce a reference signal smaller than said detection output signal produced when at least one of said front and rear directional lamps in the lamp group selected by said selecting switch is connected;

at least one comparison means responsive to said detection output signal and said reference signal and effective to produce a comparison output signal when said detection output signal is larger than said reference signal;

logic means responsive to said comparison output signal and the switch output signal of said selecting switch and effective to produce a logic output signal indicative of closure of said selecting switch; and

switching control means responsive to said logic output signal and to said detection output signal, and coupled to said normally nonconductive switching means in order to render said normally nonconductive switching means conductive periodically.

4,236,144

INSPECTION SYSTEM FOR A GROUP OF TANKS

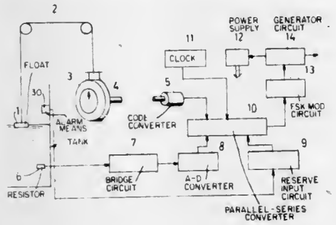
Yoshihiko Sunagawa, Kanagawa, Japan, assignor to Tokyo Keiso Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1978, Ser. No. 968,699
Claims priority, application Japan, Dec. 14, 1977, 52-150034
Int. Cl.[1] G08C 19/16; G08B 21/00
U.S. Cl. 340—870.18 **9 Claims**

1. An inspection system for a plurality of liquid containing tanks comprising:

a generator means at each of said tanks, each generator means including measuring means for measuring the temperature and the level of the liquid in a tank; converter means coupled to said measuring means for converting output signals from said measuring means into parallel digital signals; parallel-series conversion means coupled to said converter means for converting parallel digital signals from said converter means into series digital data signals and for adding a mark signal to said series digital data signals; clock signal generating means coupled to said parallel-series conversion means for generating a clock signal to control the output timing of the series digital data signals formed by said parallel-series conversion means; and means for transmitting the series digital data signals produced by said parallel-series conversion means, said series digital data signals representing the level and temperature of the liquid in the respective tank; and

a receiver means for receiving said signals transmitted by said generator means, said receiver means including selection means for selecting signals generated by a selected one of said generator means; pulse discriminating means coupled to said selection means for detecting a mark signal



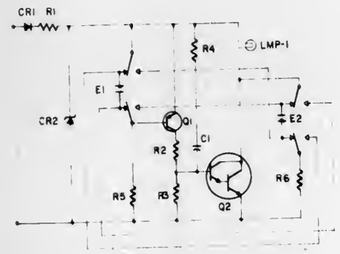
from the selected received signals; a further clock signal generating means for providing a clock signal having substantially the same frequency as that of said clock signal generated in said selected generator means after detection of said mark signal to provide synchronization between the receiver means and the received signals; series-parallel conversion means coupled to said further clock signal generating means of said receiver means for converting received series data into parallel data; and indicator means coupled to said series-parallel conversion means for displaying outputs of said series-parallel conversion means which correspond to the liquid temperature and liquid level in the tank associated with the selected generator means.

4,236,145

ELECTRONIC INTERVAL TIMING DEVICE

Ronald W. Schorsch, Federal Way, Wash., assignor to Service Computers, Inc., Seattle, Wash.

Filed Aug. 20, 1979, Ser. No. 67,441
Int. Cl.[1] G08B 5/38
U.S. Cl. 340—309.1 **14 Claims**



1. An elapsed-time reminder circuit, comprising:

(a) a pair of electrolytic timing cells, each having first and second operating states, said timing cells having a relatively low resistance in said first operating state and a relatively high resistance in said second operating state, said timing cells being configured and arranged so as to change state from said first operating state to said second operating state in response to the application thereto for a known time interval of a current having a first polarity, and further to change state from said second operating state to said first operating state in response to the application thereto of a current having a second polarity opposite to said first polarity;

(b) means supplying a current of said first polarity to one of said timing cells when said one timing cell is in said first operating state;

(c) electrical circuit means for detecting when said one timing cell changes state from said first operating state to said second operating state, including means generating an output signal upon detection thereof;

(d) means operative simultaneously with said detecting means for applying a current of said second polarity to the other timing cell when said other timing cell is in said second operating state, and changing the state of said other timing cell to a first operating state such that said other timing cell has been changed to a first operating state when said one timing cell changes state from said first operating state to said second operating state;

(e) indicator means responsive to said output signal for indicating to an operator when said one timing cell changes state from said first operating state to said second operating state and hence, when said known time interval has elapsed; and

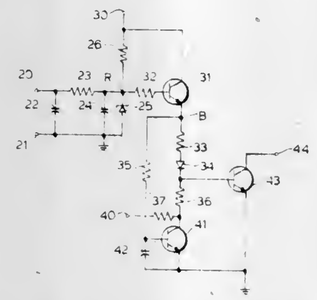
(f) means adapted to permit alternating reversal of said pair of timing cells, respectively, between a first connection in said detecting means and a second connection in said applying means.

4,236,146

SWITCHLESS CIRCUIT MALFUNCTION SENSOR

Scott A. Clark, and William E. Ulmer, both of Cedar Rapids, Iowa, assignors to S. A. Clark & Associates, Marion, Iowa

Filed Apr. 9, 1979, Ser. No. 28,370
Int. Cl.[1] G08B 21/00
U.S. Cl. 340—517 **1 Claim**



1. A two state output circuit for use in connection with a sensor line having a plurality of normally open and normally closed sensing devices comprising: first and second input terminals, said second input terminal connected to ground;

a first capacitor connected across said input terminals;

a first resistor connected to said first input terminal;

a second capacitor connected between said first resistor and ground;

a Zener diode connected in parallel with said second capacitor;

a first transistor having a collector connected to a power supply;

a second resistor connected between said Zener diode and said power supply;

a third resistor connected between a base of said first transistor and said Zener diode;

a fourth resistor connected to an emitter of said first transistor;

a diode connected to said fourth resistor for forward electrical conduction from said emitter of said first transistor;

a fifth resistor connected to said diode in series with said fourth resistor and said diode;

a second transistor having a collector connected to said fifth resistor and having an emitter connected to ground;

a sixth resistor connectingly disposed between said emitter of said first transistor and a base of said second transistor;

a seventh resistor connected between said collector of said second transistor and said power supply;

a third capacitor connectingly disposed between said base of said second transistor and ground; and

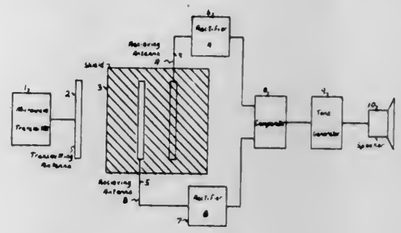
a third transistor having a base connected between said diode and said fifth resistor, an emitter connected to ground, and a collector connected to an output terminal, whereby a voltage produced at the emitter of said first transistor when said sensing devices are in respective normally open and normally closed states maintains said second transistor in a normally on state and said third transistor in a normally off state to normally produce a first output at said output terminal, and a second voltage produced at the emitter of said first transistor when any sensing device changes to an opposite state turns said second transistor off and said third transistor on to produce a second output state at said output terminal to activate said alarm.

4,236,147

AUTOMATIC DOORBELL

Noel Calvin, 2863 Buena Vista, Berkeley, Calif. 94708

Filed Dec. 9, 1977, Ser. No. 858,958
Int. Cl.[2] G08B 3/00, 13/18
U.S. Cl. 340—553 **3 Claims**



1. A system for detecting the approach of a person to a selected side of the system but not to the other side of said system, adaptable for use as an automatic doorbell, comprising:

microwave transmitting means for transmitting microwave radiation in the area of the approach to be detected;

spatially selective microwave receiving means for receiving microwave radiation originating in said microwave transmitting means, said microwave receiving means including a shield positioned to face the approach of a person to the system and further including at least one pair of receiving antennas positioned on opposite sides of said shield such that changes in the standing wave patterns surrounding said microwave transmitting means caused by the approach of a person are reflected in changes in the signal strength at the receiving antenna on the side of the shield facing the person, but not in the signal strength at the antenna on the opposite side of said shield;

rectifying means connected to each of said receiving antennas such that a D.C. voltage is produced that is proportional to the amplitude of the signal present at the associated antenna, said D.C. voltage being substantially equal to the peak value of the signal received by the associated antenna;

threshold detector means connected to each of said rectify-

ing means such that a change in the output of said rectifying means exceeding a preset threshold causes the generation by the associated threshold detector means of a logic level signal compatible with CMOS circuitry, said threshold detector means comprising separate CMOS micropower amplifying means responsive to changes in the output voltage of said rectifying means;

digital comparator—timer means connected to said threshold detector means; and

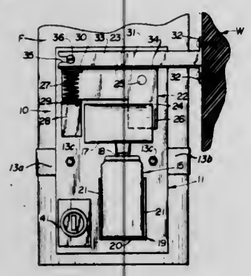
indicator means connected to said digital comparator-timer means for providing an indicator signal of the approach of said person on said selected side of said system, said digital comparator-timer means being operative to provide a signal to activate said indicator means only when a signal is received from said threshold detector means connected to the receiving antenna associated with said selected side of said system, said signal being generated by said digital comparator-timer means only after a predetermined period during which neither threshold detector means has generated a signal but not when a signal is generated by the other threshold detector means.

4,236,148

THEFT DETERRING AND SIGNALLING DEVICE FOR PORTABLE FIRE EXTINGUISHERS

Isadore Gurvis, Columbus, Ohio, assignor to Crown Auto Top Manufacturing Co., Columbus, Ohio

Filed Mar. 19, 1979, Ser. No. 21,687
Int. Cl.³ G08B *21/00, 13/14*
U.S. Cl. 340—568 **10 Claims**



1. An anti-theft alarm device for a portable fire extinguisher removably mounted on a supporting structure in predetermined relationship thereto comprising

a structural housing having attaching means adapted for securing of the housing to a fire extinguisher in fixed relationship, said housing defining an interior compartment and including removable cover means providing access to the compartment, said cover means securable in closing relationship by a locking device,

a sound producing device carried by said structural housing in the interior compartment thereof,

actuating means carried by said structural housing in the interior compartment thereof and operatively interconnected with said sound producing device to effect operation thereof, and

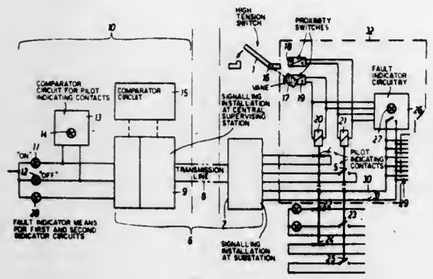
control means adapted to be mechanically in retained relationship on the supporting structure for the fire extinguisher and selectively interengageable with said actuating means and preventing operation thereof when the fire extinguisher is mounted on the supporting structure in the predetermined relationship and enabling operation of said actuating means when the fire extinguisher is displaced a predetermined distance from its described supported position.

4,236,149

STATUS INDICATING SYSTEM FOR THE INSTANTANEOUS REGISTERING OF THE SWITCHING POSITIONS IN AN ELECTRICALLY REMOTELY CONTROLLED HIGH TENSION PLANT

Gerno Soyck, Höveler Weg 47, Halver, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,162
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711416
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—644 **5 Claims**



1. In a status indicating system for high tension switches of a remotely supervised high tension plant comprising a multiplicity of substations each having a plurality of high tension switches each fitted with a movable switch shaft, each of said high tension switches being provided with two pilot indicating contacts signalling the respective switch position of off and on by a pair of two normally different and complementary pilot signals for each switch position, the pairs of pilot signals being delivered to a remotely located central supervising station which is fitted with indicating means for indicating the positions of off and on of the high tension switches and with a comparator circuit with indicating output to show when the pilot signals of a pair are not different from another, that improvement comprising:

(a) a multiplicity of proximity switches each delivering as normal values in the actuated state an output signal which is different from zero and in the non-actuated state another output signal, which is also different from zero;

(b) two by two of said proximity switches being associated with each supervised high tension switch and being located at a respective substation of said multiplicity of substations;

(c) each of said switch shafts of said high tension switches being provided with a vane which actuates in the off-position of its high tension switch one of the two associated proximity switches and in the on-position of the high tension switch the other one of said proximity switches;

(d) a multiplicity of pilot relays each controlled by the output of one of said proximity switches and each having one of said pilot indicating contacts;

(e) a multiplicity of first fault indicator circuits;

(f) said multiplicity of pilot relays being provided with change over contacts, the change over contacts of two pilot relays belonging to the two proximity switches of one of said high tension switches being disposed in one of said first fault indicator circuits to each deliver first fault signals when the output signals of said two proximity switches associated with one of said high tension switches are not different from another;

(g) a multiplicity of second fault indicator circuits

(h) the output signals of said two proximity switches associated with one of said high tensions switches being delivered to one of said second fault indicator circuits monitoring that at all times one of the two normal output signals of each proximity switch is present and delivering otherwise second fault signals; and

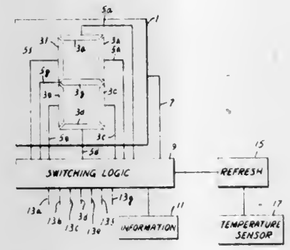
(i) a further fault indicator means at the central supervising station indicating when one of said first or said second fault signals is transmitted from the substation to the central supervising station.

4,236,150

LIQUID CRYSTAL DISPLAY SYSTEM

Mao-Jin Chern, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 18, 1978, Ser. No. 952,322
Int. Cl.³ G09F *9/35*
U.S. Cl. 340—713 **14 Claims**



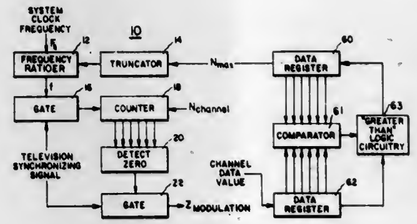
1. A field effect liquid crystal display system comprising a liquid crystal display cell containing a positive nematic liquid crystal material having a characteristic crossover frequency said display cell having one or more pairs of electrodes addressable by an associated electronic control means for applying information signals thereto, wherein the improvement comprises a temperature sensing electronic control means for selectively providing a refresh signal to each of said electrode pairs, said refresh signal being an oscillating voltage signal wherein the frequency of said signal is controlled as a function of the temperature of said liquid crystal material and is always greater than the crossover frequency of said liquid crystal material.

4,236,151

DYNAMICALLY VARIABLE SCALING METHOD AND APPARATUS FOR SPECTRAL DISPLAYS

John C. Russ, Palatine; Robert Carey, Deerfield, and Vinod K. Chopra, Vernon Hill, all of Ill., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 897,051
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—722 **3 Claims**



1. A method for the dynamic scaling of displayed information on a two-dimensional dynamic display comprising:

providing a maximum signal value, Nmax, defining the upper data limit of one axis of said display;

truncating said maximum signal value;

a frequency divider receiving as inputs a system clock signal in the output of said truncator and producing an output as a frequency F;

passing said frequency to a first gate and transmitting signals from said first gate to a counter means;

providing channel signals to be monitored to said counter means;

providing the output of said counter to a zero detection means; and

providing the output of said zero detection means to a second gate means;

providing a television synchronizing signal to said second gate means;

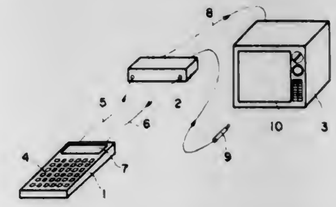
providing a Z modulation signal from said second gate means until said second gate means is disenabled by the detection of a zero from said zero detect means.

4,236,152

READOUT MEANS OF A CALCULATOR OPERATIVELY ASSOCIATED WITH A HOME USE TV IMAGE SCREEN

Sigeaki Masuzawa, Nara, and Isamu Haneda, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 9, 1978, Ser. No. 959,603
Claims priority, application Japan, Nov. 12, 1977, 52-136063
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—747 **40 Claims**



1. A display system for displaying the characteristic shape of an analog output function F(x) having a plurality of data points produced by an electronic calculator onto the television screen of a television receiver, comprising:

means included within said electronic calculator for providing data indicative of the function F(x); and

signal converter interface means connected between said means for providing and said television receiver, said signal converter interface means including means for converting said data indicative of the function F(x) into a composite video signal which may be received by said television receiver.

4,236,153

CHARACTER DISPLAY DEVICE

Willem Aling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 683,286, May 5, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,632
Claims priority, application Netherlands, May 9, 1975, 7505452
Int. Cl.³ G09G *3/04*
U.S. Cl. 340—756 **5 Claims**

1. A character display device comprising:

a first digital storage means for storing the information of characters to be displayed; a display means;

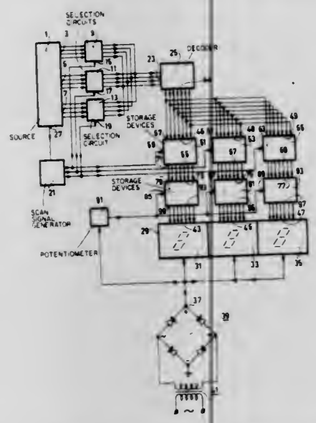
information input means connected to an input of said first digital storage means;

a throughput means;

an output of said first digital storage means being connectable to an information input of said display means by way of a throughput means;

a control circuit connected to said display means for cycling

said display means through successive cycles between a maximum display characteristic and a minimum display characteristic while maintaining predetermined maxima for the temporal variations in display actuation;



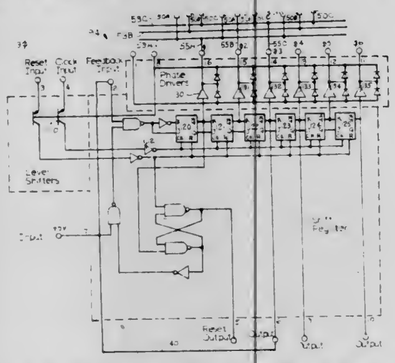
synchronizing means having a control input connected to an output of said control circuit and an output connected to said throughput means for controlling transmission of modified information to said first digital storage means, only starting from a predetermined phase of said control circuit.

4,236,154

SELECTABLE PHASE DRIVER FOR DOT MATRIX DISPLAY PANEL

James Y. Lee, Kendall Park, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 21, 1979, Ser. No. 40,759
Int. Cl.[1] G06F 3/14
U.S. Cl. 340—768 **2 Claims**



1. A display system for driving a Self-Scan dot matrix display panel, said panel comprising

an array of rows and columns of scanning cells defined by a plurality of row scan anodes and a plurality of column cathodes, an array of display cells defined by a plurality of row display anodes and said cathodes, said column cathodes being arrayed side by side in a series whereby each can be energized in turn in a scanning cycle beginning with the first cathode in the series,

the cathodes also being connected in groups, the groups being formed by connecting leads to selected spaced-apart cathodes in the series of cathodes, for example, every third cathode for 3 phase (ϕ) drive, every fourth cathode for 4 phase (ϕ) drive, every fifth cathode for 5 phase (ϕ) drive, every sixth cathode for 6 drive, every n^{th} cathode for n phase (ϕ) drive, so that, as an example, in 3 phase (ϕ) drive, the first lead is connected to the first, fourth, and seventh cathodes to form the first group; the second lead is connected to the second, fifth, and eighth cathodes to form the second group; the third lead is connected to the third, sixth, and ninth cathodes to form the third group; etc., so that each cathode in a group is separated from its corresponding mate cathode in an adjacent group by one cathode of every other group; so that, when operating potential appears on a lead, it is applied to all cathodes in each group of cathodes at the same time, however, only one cathode in the group turns on,

the series of panel cathodes being operated sequentially through said leads so that the first cathode of each group, beginning with the first cathode of the series, is energized first, then the second cathode of each group is energized, and then the third cathode in each group is energized, and the other cathodes are similarly energized, with the result that all of the cathodes are energized in turn, beginning with the first and ending with the last in the series of cathodes,

a driver circuit for driving each group of cathodes in turn,

a driver module for each driver circuit, said driver module including a series of flip-flops, there being one flip-flop for each driver circuit,

a clock input to each flip-flop,

a feedback input to the first flip-flop in the series,

each flip-flop having a first output terminal connected to one of said leads and thus to all cathodes in a group of cathodes of the same phase (ϕ), the first flip-flop output being connected to the first cathodes of each group, the second flip-flop output being connected to the second cathodes of each group, the third flip-flop output being connected to the third cathodes of each group, . . ., the n^{th} flip-flop being connected to the n^{th} cathode in each group, said output terminals also being selectively connectible to said feedback input to said series of flip-flops so that the number of cathodes in a group can be selected, whereby, as input pulses are fed into the series of flip-flops, successive output pulses from the successive flip-flops apply operating potential to each of the cathodes of the groups in turn, beginning with the first cathode in the series, until the selected flip-flop is reached which has its output connected to said feedback input, energization of such selected flip-flop causing the cycle of cathode energization to begin again so that the next successive clock pulses energize each of the cathodes in the panel have been energized and the entire scanning operation is begun again.

4,236,155

LIQUID CRYSTAL DISPLAY DEVICE

Mitsuo Nagata, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

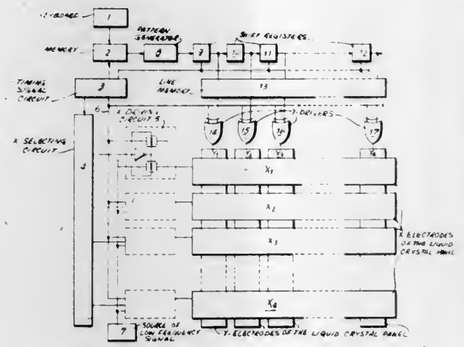
Filed Nov. 21, 1978, Ser. No. 962,747
Claims priority, application Japan, Nov. 22, 1977, 52-140457; Dec. 15, 1977, 52-150973
Int. Cl.[1] G06F 3/14
U.S. Cl. 340—784 **6 Claims**

1. A liquid crystal display device for operation in the twisted nematic mode comprising:

a cell for holding a liquid crystal material, said cell including picture elements in matrix array;

a nematic liquid crystal material in said cell, said material having a dielectric anisotropy sensitive to the frequency of an alternating electric field imposed thereupon, said anisotropy being positive for frequencies below a critical frequency, fC, characteristic of said material and negative for frequencies greater than fC; and

matrix addressing means connected with said cell for supplying thereto a timing signal and data signal, said timing signal consisting of a component of frequency fL and a component of frequency fH, fL being lower than fC and fH being higher than fC, said data signal consisting of one of said components, which, selectively is in phase with said one of said timing signal components for placing a picture element in off condition and 180° out-of-phase with said timing signal component for placing said picture



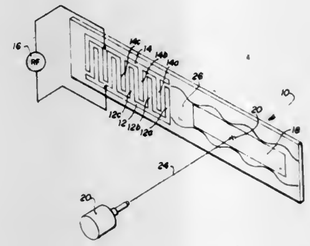
element in on condition, for subtracting said data signal from said timing signal, and for supplying the difference to selected elements in said cell for changing the sign of a dielectric anisotropy of the liquid crystal material therein and for thereby selecting the condition of said picture element.

4,236,156

SWITCHING OF THERMOCHROMIC AND PRESSURE SENSITIVE FILMS WITH SURFACE ACOUSTIC WAVES

Dayton D. Eden, Dallas, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Apr. 23, 1979, Ser. No. 32,448
Int. Cl.[1] G09F 9/00
U.S. Cl. 340—786 **19 Claims**



9. A method for erasing images created in vanadium oxide thin films, comprising:

generating a surface acoustic wave of high frequency in said film of sufficient energy to counteract the stresses present in said film.

10. A solid state information display comprising:

a thin film of pressure sensitive material capable of undergoing markedly increased reflectance at regions thereof subject to an external pressure in excess of a predetermined threshold pressure, the reflectance of said film exhibiting hysteresis with changes in external pressure such that any said increase in reflectance is substantially unchanged when said external pressure is removed; and

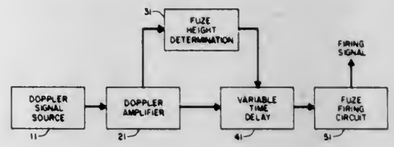
first, second and third means responsive to an RF signal for generating first, second and third surface acoustic waves in said film, said first, second and third acoustic waves creating regions of increased pressure in said film such that any point at which all three waves intersect will undergo a pressure in excess of said threshold pressure thereby causing an increase in reflectance of said film at said point of intersection.

4,236,157

TARGET DETECTION DEVICE

Daniel A. Goss; Roy M. Ito, and Larry H. Josephson, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1978, Ser. No. 974,599
Int. Cl.[1] G01S 13/42; F42C 13/04
U.S. Cl. 343—7 PF **17 Claims**



1. A target detection device comprising:

means for supplying Doppler signals, said Doppler signals having a Doppler frequency determined by the vertical velocity of said target detection device;

means for amplifying said Doppler signals connected to said means for supplying Doppler signals;

means for determining fuze height responsive to said means for amplifying said Doppler signals to generate a trigger output whenever said target detection device is a predetermined height above a target; and

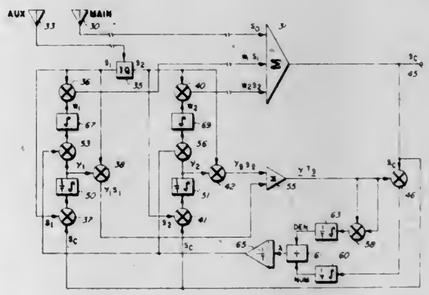
means for producing a velocity-dependent time delay operatively associated with said means for determining fuze height and said Doppler amplifier means, said velocity-dependent time delay being initiated by said trigger signal and being dependent in duration upon said Doppler frequency.

4,236,158

STEEPEST DESCENT CONTROLLER FOR AN ADAPTIVE ANTENNA ARRAY

Sam M. Daniel, Tempe, Ariz., assignor to Motorola, Inc., Schamburg, Ill.

Filed Mar. 22, 1979, Ser. No. 22,663
Int. Cl.[1] H04B 7/00
U.S. Cl. 343—100 LE **12 Claims**



1. In combination with an adaptive antenna array, a controller for producing substantially stable convergence of weights to reduce sidelobe interference comprising:

(a) a summing circuit providing an output signal which is the mathematical sum of input signals applied thereto;

(b) a main antenna connected to supply an input signal to said summing circuit;

(c) auxiliary antenna means providing at least one output signal; and

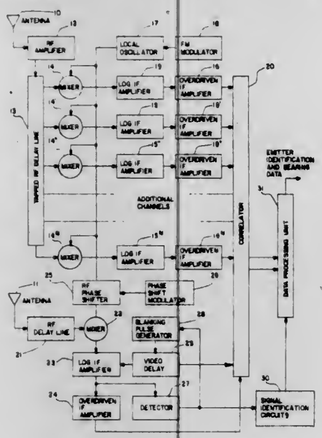
(d) data processing means connected to receive the output signal of said summing circuit and the signal from the auxiliary antenna means for processing the signals according to a steepest descent algorithm to supply output signals to inputs of said summing circuit having optimal feedback gain to substantially reduce sidelobe interference.

4,236,159

PASSIVE DIRECTION FINDING SYSTEM

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1975, Ser. No. 546,467
Int. Cl.³ G01S *3/02*
U.S. Cl. 343—113 R **9 Claims**



1. A passive direction finding system comprising;

at least one set of spaced apart antennas;

delay means operatively connected to the output of one of said at least one set of antennas and having a plurality of output taps thereon;

mixer means operatively associated with each of said output taps on said delay means and receiving an output therefrom;

oscillator means for producing an output signal at the output thereof;

said mixer means also operatively receiving the output signal from said oscillator means;

signal conditioning means operatively associated with said mixer means and receiving the output therefrom for amplifying and clipping the output of said mixer means;

said signal conditioning means and said mixer means being instrumented so that they are equivalent in number to the number of output taps on said delay means and correspond to a predetermined number of channels;

other mixer means operatively coupled to the output of the other of said at least one set of antennas and receiving the output therefrom;

said other mixer means also receiving an output signal from said oscillator means;

other signal conditioning means operatively coupled to the output of said other mixer means for amplifying and clipping the output of said mixer means;

said other mixer means and other signal conditioning means being instrumented so that they correspond to a reference channel;

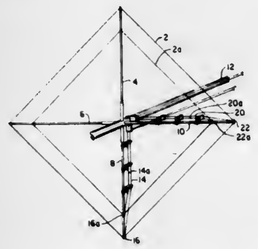
and correlator means operatively coupled to said signal conditioning means and said other signal conditioning means for determining the correlation between signals present in said channels and said reference channel.

4,236,160

LOOP DRIVEN ELEMENT ANTENNA SYSTEM AND VOLTAGE FEED SYSTEM

Gregory F. Johnson, 1931 Seascape Blvd., Aptos, Calif. 95003

Filed Oct. 10, 1978, Ser. No. 949,856
Int. Cl.³ H01Q *11/14*
U.S. Cl. 343—743 **37 Claims**



1. A feed system for antennas having a loop driven element comprising

a single conductor high impedance transmission line operating against ground, one end of said transmission line connected to a point on said loop, the other end remaining open circuited,

means for providing a ground for said transmission line to operate against, and

means for connecting a low impedance dual conductor transmission line to a point along said single conductor transmission line and to said ground means, said point spaced a substantial distance along said single conductor transmission line from the connection of said single conductor transmission line to said loop.

4,236,161

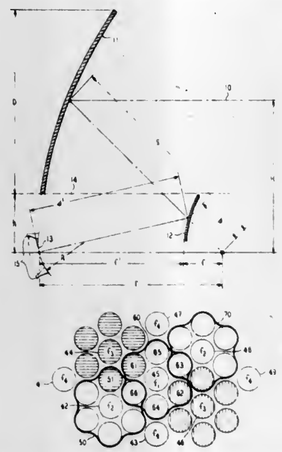
ARRAY FEED FOR OFFSET SATELLITE ANTENNA

Edward A. Ohm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 18, 1978, Ser. No. 943,064
Int. Cl.² H01Q *1/28*
U.S. Cl. 343—781 CA **12 Claims**

8. In a satellite communication system of the type wherein a predetermined zone of the surface of a celestial body is illuminated by plural electromagnetic energy beams produced by an array of feed elements disposed on the focal plane of an antenna of a satellite, adjacent ones of which feed elements illuminating respectively associated contiguous areas within the predetermined zone, a method of producing a plurality of contiguous composite beams, each of which composite beams is composed of the combined illumination of a plurality of feed elements and comprises an information transmission channel substantially independent of adjacent such channels, the method characterized by the step of

selectively simultaneously energizing overlapping ones of clusters of feed elements of the array, which overlapping clusters share selected ones of the feed elements, each cluster being energized at a preselected one of plural frequency bands and in the same polarization direction as every other cluster, with the plural frequency bands being assigned in multiple directions among the clusters across a



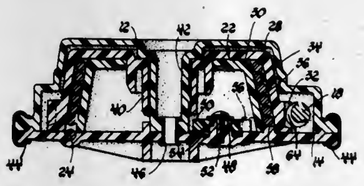
portion of the array so as to prevent overlapping clusters from being energized in the same frequency band.

4,236,162

ANTENNA ACTUATOR WITH A LOCATING AND REACTION SUPPORT SURFACE FOR THE CABLE STORAGE DRUM

David T. Carolus; Ralph W. Edwards, both of Dayton, and John R. Powell, Bellbrook, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1979, Ser. No. 47,068
Int. Cl.³ H01Q *1/10*
U.S. Cl. 343—903 **1 Claim**



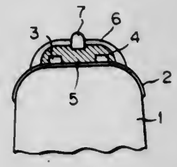
1. An improvement in power antenna actuators having a cable storage drum rotatably supported in a housing and driven by a worm which meshes with a worm gear formed integrally with the cable storage drum, said cable storage drum including a pair of cooperating frustoconical members between which the cable is stored, and a cover member enclosing the housing, wherein the improvement comprises; asupport rib formed in the cover and extending between the frustoconical members adjacent the mesh point of the worm and worm gear, said support rib preventing the frustoconical members from shifting transversely to the axis of the worm.

4,236,163

THERMAL RECORDING STYLUS

Kinzo Iino, Tokyo, Japan, assignor to Watanabe Sokki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 80,115
Claims priority, application Japan, Oct. 6, 1978, 53-137662[U]
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—139 C **5 Claims**



1. A thermal recording stylus comprising:

a supporting member having an end coated with a heat insulating layer;

an abrasion-resistant layer formed above said heat insulating layer for making up a space between said heat insulating layer and said abrasion-resistant layer;

an electric heater provided in said space between said heat insulating layer and said abrasion-resistant layer; and

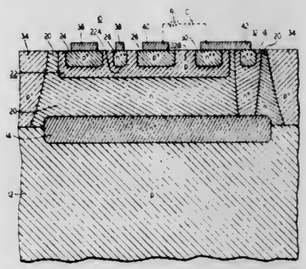
a recording head made of Type IIa diamond, having one end protruded from said abrasion-resistant layer, and having a portion embraced in said space between said heat insulating layer and said abrasion-resistant layer to make a heat conductive contact with said electric heater.

4,236,164

BIPOLAR TRANSISTOR STABILIZATION STRUCTURE

Henry Y. S. Tang, New York, N.Y., and Henry Y. S. Tang, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1977, Ser. No. 865,236
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—51 **4 Claims**



1. A transistor structure having a semiconductive body comprising:

a collector region of one conductivity type;

a base region located within a portion of the collector region, the base region having an active portion and a nonactive portion which are both of the opposite conductivity type of the collector region;

an emitter region of the one conductivity type located within a portion of the base region;

base contact means for providing low resistance electrical contact to the base region;

means for avoiding conditional stability when the transistor is operated in a circuit, the means including a first region of the one conductivity type but of a higher impurity concentration than the collector region; the first region being in contact with the nonactive portion of the base

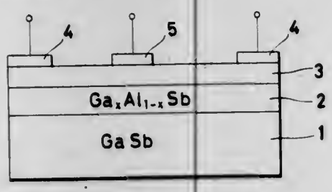
region, spaced apart from the base contact means, and electrically coupled to the collector region to form a compensating network comprising an equivalent resistance and capacitance serially coupled between the base contact means and the collector region; the resistance and capacitance having suitable values to stabilize the circuit, the values of the resistance and capacitance being substantially determined by the resistivity and/or geometry of the nonactive portion of the base region, the impurity concentration of the first region and/or the contact area between the first region and the nonactive portion of the base region.

4,236,165

PLANAR SEMICONDUCTOR DEVICE

Mitsuo Kawashima, Higashi-Kurume; Kimihiro Ohta, Mitaka, and Shoei Kataoka, Tanashi, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Dec. 5, 1978, Ser. No. 966,626
Claims priority, application Japan, Jun. 2, 1978, 53-65701
Int. Cl.³ H01L 29/161
U.S. Cl. 357—16 **6 Claims**



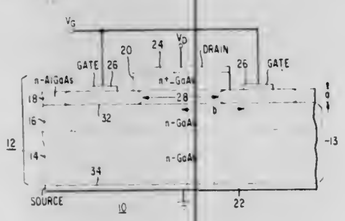
1. Planar semiconductor device comprising:
a GaSb substrate,
a crystalline growth layer of a $Ga_xAl_{1-x}Sb$ compound semiconductor formed on said GaSb substrate where x ranges between 0.1 and 0.3,
an active layer of a narrow energy band gap semiconductor formed on said crystalline growth layer, said narrow energy band gap semi-conductor being a III-V compound semiconductor having a lattice constant of between about 6.04 Å and about 6.2 Å, and consisting of one member selected from the group consisting of $Ga_yIn_{1-y}Sb$ $(0.7<y<0.8)$, $In\ As_ySb_{1-y}$ $(0.7<y<1)$ and $Ga_yIn_{1-y}Sb_yAs_{1-y}(0<y<1)$, and
electrodes formed on said active layer in the planar form.

4,236,166

VERTICAL FIELD EFFECT TRANSISTOR

Alfred Y. Cho, Summit, and James V. DiLorenzo, Millington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 5, 1979, Ser. No. 54,821
Int. Cl.³ H01L 29/80
U.S. Cl. 357—22 **11 Claims**



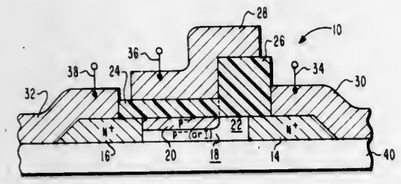
1. A field effect transistor (**10**) comprising
a body (**12**) of single crystal semiconductor material,
a source electrode (**22**), a drain electrode (**24**), and a gate electrode (**26**) formed on said body so as to define a current channel between said source and drain electrodes, the conductance of said channel being controllable by voltage applied to said gate electrode, characterized in that
said body includes a relatively narrow bandgap portion (**13**) having a pair of major surfaces (**32**, **34**), a wider bandgap active layer (**18**) epitaxially grown on, and substantially lattice matched to, one of said surfaces (**32**), and a narrower bandgap mesa (**20**) formed on, and substantially lattice matched to, said active layer,
said drain electrode is formed on said mesa,
said source electrode is formed on the other major surface (**34**) of said portion, and
said gate electrodes comprise a pair of elongated stripes (**26**) formed on said active layer adjacent both sides of said mesa.

4,236,167

STEPPED OXIDE, HIGH VOLTAGE MOS TRANSISTOR WITH NEAR INTRINSIC CHANNEL REGIONS OF DIFFERENT DOPING LEVELS

Murray H. Woods, Palo Alto, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,529
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 **8 Claims**



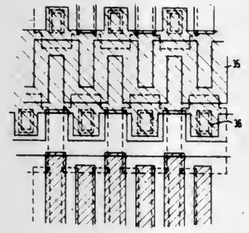
1. A field effect transistor comprising:
a body of near intrinsic semiconductive material of a first conductivity type having a first concentration of conductivity modifiers therein;
a pair of second conductivity type regions embedded in the semiconductive body, the pair of regions separated in the semiconductive body by an interstitial portion sharing a common boundary surface of the body of semiconductive material;
an intermediate region of the first conductivity type having a second concentration of conductivity modifiers therein located solely within the interstitial portion and sharing the common boundary surface of the semiconductive body, the intermediate region abutting one of the pair of regions of second conductivity type and spaced from the other of the pair, the concentration of conductivity modifiers present in the intermediate region of the interstitial portion being only slightly greater than the concentration of conductivity modifiers present in the body of near-intrinsic semiconductive material; and
a layer of insulating material adhered to the boundary layer having a first region of minimum thickness over and aligned with that section of the interstitial portion occupied by the intermediate region and having a second region of maximum thickness over both the remainder of the interstitial portion and a portion of the other of the pair of regions of second conductivity type.

4,236,168

ONE-DIMENSIONAL CCD SENSOR WITH OVERFLOW ARRANGEMENT

Heiner Herbst, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 15,050
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1978, 2813254
Int. Cl.³ H01L 29/78, 27/14, 31/00, 29/04
U.S. Cl. 357—24 **9 Claims**



1. An optoelectronic sensor comprising: a doped semiconductor body of first conductivity type; a row of sensor elements arranged on the semiconductor body comprising metal-insulator-semiconductor MIS capacitor means for the collection of optically generated minority carriers; said sensor elements being separated from one another by first means for providing a potential threshold for the minority carriers in the semiconductor body; at least one shift register formed of further MIS capacitors on each side of the sensor row; transfer gate electrodes arranged laterally at the sensor elements and which alternately connect the sensor elements with a capacitor of the two shift registers by charge-coupling; adjacent each sensor element the surface of the semiconductor body having an overflow area of second conductivity type which extends to a side of the sensor element opposite the corresponding transfer gate; the overflow areas being contacted with an overflow electrode via windows in an insulation layer over the overflow areas; second means for providing a smaller potential threshold for the minority carriers between the overflow areas and the sensor elements in comparison to the potential threshold between the sensor elements themselves; said insulation layer and an electrode layer forming sensor electrodes of the sensor MIS capacitors extending over the sensor element row; and said electrode layer of the sensor electrodes also forming the overflow electrodes.

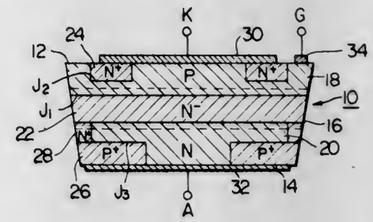
4,236,169

THYRISTOR DEVICE

Yoichi Nakashima; Yosikazu Takita; Sousi Suzuki; Katsumi Akabane, and Michihiro Misawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 19, 1979, Ser. No. 49,889
Claims priority, application Japan, Jun. 19, 1978, 53-73179
Int. Cl.³ H01L 29/747
U.S. Cl. 357—39 **4 Claims**

1. A thyristor comprising:
a semiconductor substrate with a first major surface, a second major surface opposing said first major surface, and a side surface connecting said first and second major surfaces, said semiconductor substrate including a first emitter layer of one conductivity type contiguous to said first major surface, a second emitter layer of an opposite conductivity type contiguous to said second major surface, a first base layer of said opposite conductivity type contiguous to said first emitter layer, a second base layer of said one conductivity type contiguous to said second emitter layer, a low impurity concentration layer of said one conductivity type interposed between said first and second base layers and having an impurity concentration lower than that of said second base layer, and a high impurity concentration region of said one conductivity type contiguous, on one hand, to the outer periphery of said second base layer and on the other hand, to said side surface of said semiconductor substrate and having an



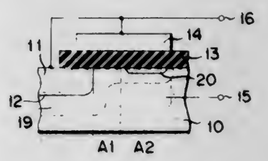
impurity concentration higher than that of said second base layer;
a cathode electrode in contact with said first emitter layer;
an anode electrode in contact with said second emitter layer; and
a gate electrode in contact with said first base layer.

4,236,170

GATE CONTROLLED NEGATIVE RESISTANCE SEMICONDUCTOR DEVICE

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1979, Ser. No. 41,883
Claims priority, application Japan, May 31, 1978, 53-64286; May 31, 1978, 53-64287; May 31, 1978, 53-64288
Int. Cl.³ H01L 29/66
U.S. Cl. 357—57 **10 Claims**



1. A negative resistance semiconductor device comprising at least one negative resistance semiconductor element, said negative resistance semiconductor element including:
first and second semiconductor regions of first and second conductivity types, these forming a PN junction;
a conductive electrode which is provided at least on the surface of said first semiconductor region with an insulating layer intervening therebetween, and is electrically coupled with said second semiconductor region;
a first terminal connected to said first semiconductor region;
a second terminal connected to said second semiconductor region;
structual means which provides a first positive resistance characteristic at said PN junction when an inverse bias voltage of a first voltage range is applied across said PN junction through said first and second terminals, provides a negative resistance characteristic at said PN junction when an inverse bias voltage of a second voltage range is applied therecross, and provides a second positive resistance characteristic at said PN junction when an inverse voltage of a third voltage range is applied thereacross; wherein said first positive resistance characteristic is obtained by forming a depletion layer continuous from said PN junction to the surface of said first semiconductor region adjacent said conductive electrode, and said negative resistance characteristic is obtained by forming an

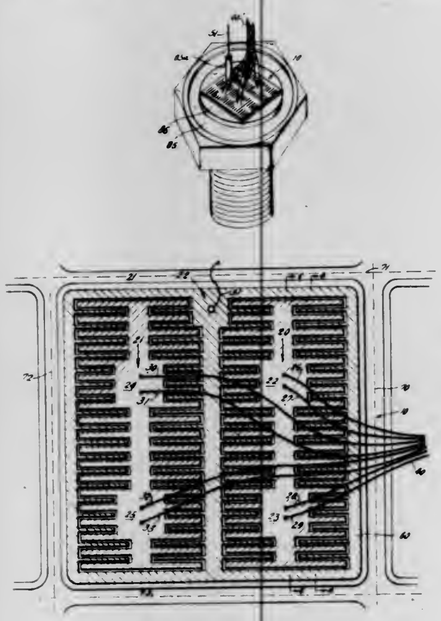
inversion layer of the second conductivity type which is on said depletion layer formed on the surface of said first semiconductor region adjacent said conductive electrode and is at a location separated from said PN junction.

4,236,171

HIGH POWER TRANSISTOR HAVING EMITTER PATTERN WITH SYMMETRIC LEAD CONNECTION PADS

Peter Shen, Palos Verdes, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Jul. 17, 1978, Ser. No. 925,379
Int. Cl.³ H01L 23/48, 29/44, 29/52
U.S. Cl. 357—68 **19 Claims**



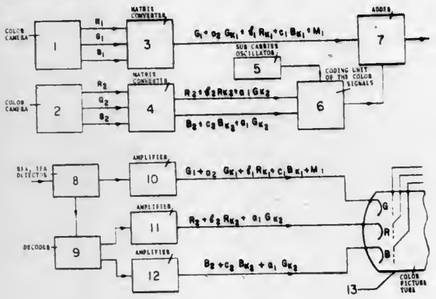
1. A high current high power transistor comprising a thin chip of semiconductor material having first and second flat parallel end surfaces; a first region of a first conductivity type extending from said first end surface and defining the collector region of said transistor; a second region of the other of the conductivity types defining the base of said transistor and extending across a central region of said chip and meeting said first region in a generally flat P-N junction; at least one emitter region of said first conductivity type extending into said second end surface of said chip and including a plurality of spaced elongated fingers extending laterally from the opposite sides of an enclosed rectangular area; said enclosed rectangular area having first and second centrally disposed enlarged, spaced connection pad areas having generally square configurations and each defined by the foreshortening of the roots of at least three of the fingers of said spaced elongated fingers which extend from said enclosed area; the material of said second and base region extending between said spaced elongated fingers of said emitter region and terminating on said second end surface of said chip and defining an elongated base-to-emitter junction which extends to said second end surface of said chip; a collector electrode connected to said first end surface of said chip; a base electrode connected to said second surface of said chip and atop said material of said second region; a base lead connected to said base electrode of said chip; an emitter electrode connected to said second end surface and extending over said at least one emitter region at said second end surface and electrically separated from said base electrode, and first and second flexible emitter leads connected to said first and second connection pad areas and connected to one another to serve as the emitter terminal for said transistor.

4,236,172

STEREOSCOPIC COLOR TELEVISION

Boris K. Krasnoperov, Sevastopolsky prospekt, 81, kv. 76, Moscow, U.S.S.R.

Filed Aug. 1, 1977, Ser. No. 820,601
Int. Cl.² H04N 9/60
U.S. Cl. 358—3 **4 Claims**



1. A method of stereoscopic colour television including the steps of separating, at the sending end, independent signals of colour-separated images carrying colour information on the green, red and blue components (G_1, R_1, B_1) of a first frame of the stereo pair and carrying colour information on the green, red and blue components (G_2, R_2, B_2) of the second frame of the stereo pair;

conversion, by means of matrixing, of said signals of colour-separated images carrying colour information on the green, red and blue components (G_1, R_1, B_1) of the first frame of the stereo pair into a composite signal consisting of a first colour signal carrying information on the green component (G_1), a second colour signal carrying limited information on the magenta, red and blue colours whose value is selected so as to provide stereoscopic pictures having these colours, and a third colour signal carrying limited information on the green colour whose value is selected so as to provide correct reproduction of the saturation of the green colour;

conversion, by means of matrixing, of said signals of colour-separated images carrying colour information on the green, red and blue components (G_2, R_2, B_2) of the second frame of the stereo pair into two signals, one of which consists of a signal carrying information on the red component (R_2), of the colour signal carrying limited information on the green colour whose value is selected so as to provide a stereoscopic picture of the objects of this colour, and a colour signal carrying limited information on the magenta and red colour whose value is selected so as to provide correct reproduction of the saturation of these colours, while the second signal consists of a signal carrying information on the blue component (B_2), of the colour signal carrying limited information on the green colour whose value is selected so as to provide a stereoscopic picture of the objects having this colour, and a colour signal carrying limited information on the magenta and blue colour whose value is selected so as to provide correct reproduction of the saturation of these colours;

transmission of said signals of the first frame of the stereo pair and the signals of the second frame of the stereo pair, obtained due to matrixing, through individual communication channels;

reception of said signals of the first frame of the stereo pair and said signals of the second frame of the stereo pair;

reproduction of the green, red and blue colours respectively;

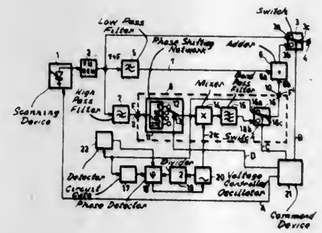
production of a television picture by separating the green component for one eye of the viewer and by separating the red and blue components for the other eye of the viewer.

4,236,173

APPARATUS FOR READING A DISC-SHAPED RECORD CARRIER HAVING A PAL COLOR TELEVISION SIGNAL

Martinus P. M. Bierhoff, and Adrianus H. Hoogendijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1979, Ser. No. 7,856
Claims priority, application Netherlands, Oct. 13, 1978, 7810298
Int. Cl.³ H04N 5/795
U.S. Cl. 358—8 **3 Claims**



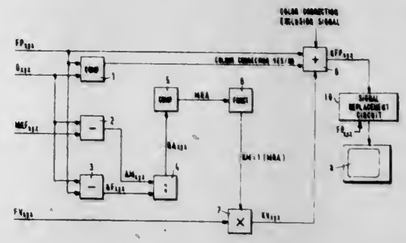
1. An improved apparatus for reading a disc-shaped record carrier, in particular an optically readable record carrier, on which a color television signal is recorded in a plurality of substantially concentric tracks, each track circumference containing one picture of said color television signal, which apparatus is provided with a scanning device for scanning the record carrier, control means for controlling the radial scanning position on the record carrier, a decoding device for the conversion of the signal being read into a standard PAL color television signal, a command device for abruptly changing the radial scanning position on the record carrier by applying command signals to the control means so as to realize a changed scanning sequence of the television pictures recorded on the record carrier, and a correction device controlled by the command device, which correction device comprises an input terminal which is coupled to the decoding device so as to receive the chrominance signal, an output terminal for supplying a corrected chrominance signal, and a correction circuit included between these two terminals, which correction circuit is adapted to maintain a chrominance signal on the output terminal which, regardless of the selected scanning sequence of the recorded television pictures, exhibits the line sequential phase alternation which is characteristic of a PAL color television signal, the improvement being characterized in that the correction device is provided with an oscillator circuit for generating a reference signal having a frequency equal to twice the PAL chrominance subcarrier frequency, a mixing circuit included in the correction circuit for mixing the chrominance signal obtained from the input terminal with the reference signal during selected time intervals dictated by the command device, a filter for extracting a frequency band around the PAL chrominance subcarrier frequency from the resulting mixed signal and applying this component to the output terminal, and phase correction means for introducing a relative phase shift of 0°, 90°, 180°, or 270° between the chrominance signals on the input and the output terminal in accordance with a pattern prescribed by the command device.

4,236,174

COLOR CORRECTION OF IMAGE DISPLAY

Ferenc Gall, Am Vogelsang 139., 8000 Munich 82, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,543
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1978, 2810430
Int. Cl.³ H04N 9/535, 1/46
U.S. Cl. 358—22 **9 Claims**



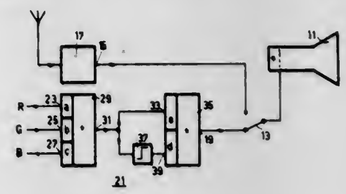
1. A method for the correction of the colors of an image, the image being split up into a plurality of image points, wherein a color to undergo maximum correction and a spatially limited domain around the extremity of the vector associated with it in the color space are selected, for each of the image points whose color is to be corrected a test is made to determine whether a color vector associated with the point has its extremity in the domain and correction by addition of a color correction vector is carried out for the color vectors whose extremity is located within the domain, the color correction vector resulting from a freely selectable vector and a superimposed quantity which makes the color correction vector maximum if the color vector to be corrected coincides with the vector of the color which is to undergo maximum correction and which makes it to be the closer to zero the closer the extremity of the color vector to be corrected is to the edge of the domain.

4,236,175

CONVERTER CIRCUIT AND MONOCHROME PICTURE DISPLAY DEVICE COMPRISING SUCH A CONVERTER CIRCUIT

Hermanus H. H. Groothuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1979, Ser. No. 8,915
Claims priority, application Netherlands, Feb. 15, 1978, 7801690
Int. Cl.³ H04N 9/52
U.S. Cl. 358—30 **5 Claims**



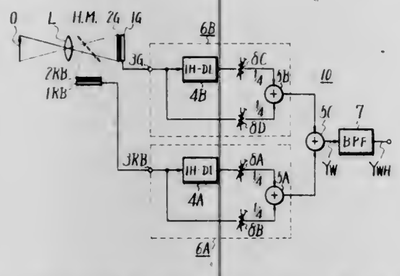
1. A converter circuit, having three inputs to each one of which a bivalent color signal (R, G and B) is supplied, for converting these bivalent color signals into a monochromatic signal (Y) appearing at an output thereof, having an amplitude which is different for each color combination, the converter circuit comprising an adder circuit and a non-linear circuit coupled to the adder circuit for obtaining a plurality of increased amplitudes of the monochromatic signal for color

signal combinations corresponding to the lowest amplitude, differing from zero, of the monochromatic signal.

4,236,176
LUMINANCE CIRCUIT FOR COLOR TELEVISION CAMERA

Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1979, Ser. No. 60,193
Claims priority, application Japan, Jul. 28, 1978, 53/92173
Int. Cl.³ H04N *9/07*
U.S. Cl. 358—43 **13 Claims**

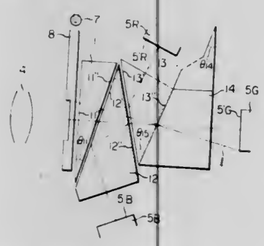


1. A color television camera system employing first and second solid state image sensors, comprising:
(A) a first imaging device for generating a first color signal of an image of an object on every line;
(B) a second imaging device for generating second and third color signals of the image of the object alternately line by line;
(C) optical means for projecting the same image of said object on said respective imaging devices;
(D) first comb-filter means receiving said first color signal from said first imaging device;
(E) second comb-filter means receiving said second and third color signals from said second imaging device; and
(F) a signal mixing circuit for synthesizing at least a part of a luminance signal receiving the outputs from said first comb-filter means and second comb-filter means.

4,236,177
BEAM SPLITTING PRISM ASSEMBLY WITH BIAS LIGHT SOURCE

Shigeru Ohshima, and Takeshi Sekiguchi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1979, Ser. No. 1,928
Claims priority, application Japan, Jan. 17, 1978, 53-3491; Feb. 3, 1978, 53-11293
Int. Cl.³ H04N *9/09*
U.S. Cl. 358—55 **1 Claim**



1. A television camera, comprising:
an objective lens;
a color resolution prism system positioned behind said objective lens, said color resolution prism system comprising first, second, third and fourth prisms arranged in this order from the side of said objective lens along the optical axis thereof, said first and second prisms being mutually separated by an air gap, said second and third prisms being mutually separated by an air gap, said second prism provided with a first dichroic coating on a face thereof facing said third prism, and said third and fourth prisms being mutually adhered through a second dichroic coating;
bias light introducing means disposed between said objective lens and a face of said first prism that faces said objective lens, at such a position that does not interfere with the image light which has passed through said objective lens; and
plural image pick-up devices respectively facing the exit faces of said color resolution prism system,
wherein the following inequalities are satisfied:

$$\cos^{-1}\left\{\frac{\cos(\theta 11+\beta)}{\sqrt{1-\cos^2\beta\tan^2\gamma}}\right\} < \sin^{-1}(1/n)$$

$$\cos^{-1}\left\{\frac{\cos(\theta 12-\theta 11+\beta)}{\sqrt{1-\cos^2\beta\tan^2\gamma}}\right\} < \sin^{-1}(1/n)$$

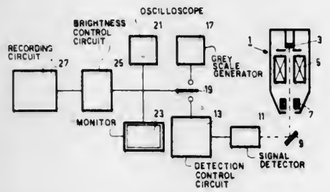
$$2\theta 12 > \theta 11 + \sin^{31}{}^{-1}(1/n) + \sin^{-1}(1/2nF)$$
$$2\theta 13 > \theta 12 - \theta 11 + \sin^{-1}(1/n) + \sin^{-1}(1/nF)$$
$$\theta 14 = \theta 11 - \theta 12 + \theta 13$$

where,
$\theta 11$: a prism angle of said first prism,
$\theta 12$: a prism angle of said second prism,
$\theta 13$: a prism angle of said third prism,
$\theta 14$: a prism angle of said fourth prism,
β: an angle formed between the optical axis of the objective lens and the bias light having the maximum incident angle to said image pick-up device in a plane perpendicular to the edge line of the prism
γ: an angle formed between the optical axis of the objective lens and the bias light having the maximum incident angle to said image pick-up device in a plane parallel to the edge line of the prism,
F: the minimum f-number applicable with the prism
n: the refractive index of the prism.

4,236,178
ELECTRON MICROSCOPE WITH BRIGHTNESS/CONTRAST INDICATOR

Johan C. Tiemeijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1979, Ser. No. 2,419
Claims priority, application Netherlands, Jan. 25, 1978, 7800869
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—93 **4 Claims**

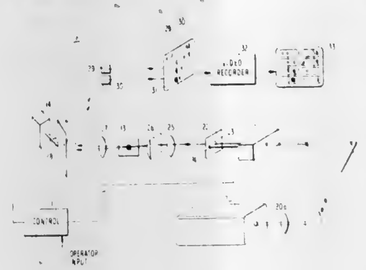


1. An electron microscope comprising a beam scanning device coupled to a television chain, visual display means for displaying a video signal generated from an object, adjusting means for adjusting contrast and brightness of a video signal to be displayed, said adjusting means comprising a series of LED elements combined in a circuit in which, when the video signal to be recorded reaches a given level, an LED element of the series which is adjusted for this particular level is activated.

4,236,179
VERSATILE MICROSECOND MULTIPLE FRAMING CAMERA

Russell W. Dreyfus, Mount Kisco, and Alfred J. Landon, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,570
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—93 **12 Claims**

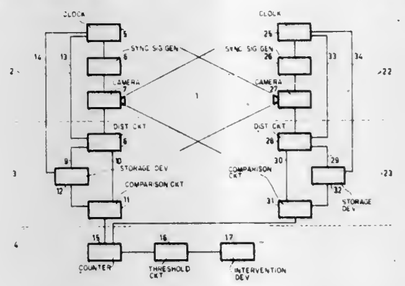


11. A versatile sub-microsecond camera capable of capturing images of sub-microsecond duration comprising:
ion laser means (**51**) emitting a pulsed illumination beam of duration less than 100 nsec.,
microscope means (**25, 26**) for focusing said pulsed illumination beam on a subject,
a resonant mechanical scanner (**14**) and a reflector (R) driven thereby located in a path of illumination from said subject,
a lens (**27**) for magnifying illumination reflected by said reflector,
and image recording means (**31, 32**) for recording an image located in a path of illumination from said lens.

4,236,180
MONITORING SYSTEM FOR MONITORING A FIELD

Jacques C. Cayzac, La Varenne St Hilaire, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,581
Claims priority, application France, Feb. 27, 1978, 78 05513
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—105 **6 Claims**

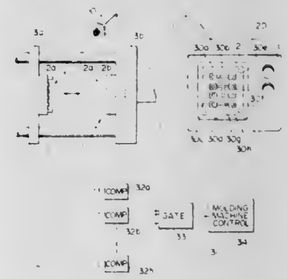


1. A monitoring system for monitoring a field for the detection of motion of objects within a given area, the system comprising a detection stage provided with a camera for signal recording with respect to the area to be monitored, a processing stage provided with a storage device and a comparison circuit for producing comparison signals in dependence on differences and signal agreements, respectively, between signals produced by the camera and delayed and not delayed in the storage device, said comparison circuit comprising a selective switching-on stage having an intervention device actuated in dependence on the number of comparison signals, wherein the system comprises at least two cameras spaced apart and being arranged at a different angle with respect to the area to be monitored by the cameras, each camera being connected through a processing stage to said, single, selective switching-on stage which further comprises means for adding together the comparison signals derived from the different camera signals, and a threshold device coupled between the intervention device and an output of the adding means delivering the sum of the comparison signals.

4,236,181
DEFECT DETECTING DEVICE

Ituo Shibata, 6-14 Matsukaze-cho, Hiratsuka-shi, Kanagawa-ken; Noboru Yamaguchi, 1101-1 Azamasaka, Isogo-machi, Isogo-ku, Yokohama-shi, and Shuichi Shibata, 1-30-26 Goten, Hiratsuka-shi, Kanagawa-ken, all of Japan

Filed Apr. 20, 1978, Ser. No. 898,078
Claims priority, application Japan, Apr. 28, 1977, 52-49734
Int. Cl.³ H04N *7/18*; **G01N** *21/00, 21/88*; **B29F** *1/00*
U.S. Cl. 358—106 **12 Claims**



1. A plastic injection mold watching device for detecting whether a hardened plastic article or a portion thereof remains in a movable mold half or in a fixed mold half of a mold in a molding machine where normally the hardened plastic article remains in the movable mold half as the latter half is separated from the fixed mold half and then the article is removed from the movable mold half after the latter half has been moved a predetermined distance from the fixed mold half, said device comprising,
an image forming means for forming a visible image on an inner surface of said movable mold half on an image forming medium,
photosensor means mounted on the image forming medium to receive light from at least a portion of the image formed thereon and give an output indicative of the brightness thereof, and
determining means responsive to said photosensor means includes means actuable before the plastic article is ejected to confirm that the whole plastic article is carried by the movable mold half and further means for determining whether the hardened plastic article remains in the movable mold half after the plastic article should have been ejected therefrom.

4,236,182

AUTOMATIC PRE-PROGRAMMING SYSTEM FOR TV RECEIVERS

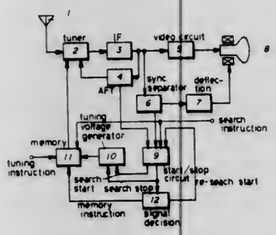
Nobuo Minoura, Ohtawara; Isao Matsumura, Yaita; Yasukazu Yoshinaga, both of Yaita; Takao Abumi, Yaita, and Kazuhiro Nakai, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1978, Ser. No. 900,199

Claims priority, application Japan, Apr. 30, 1977, 52-51527; Apr. 30, 1977, 52-51534; Jun. 28, 1977, 52-77500; Sep. 26, 1977, 52-116218; Sep. 19, 1977, 52-113093; Sep. 20, 1977, 52-113730

Int. Cl.³ H04N 5/44

U.S. Cl. 358—193.1 **12 Claims**



1. An automatic tuning scheme for use in TV receivers including an AFT detector comprising:

start/stop circuit means for creating a search start signal and a search stop signal upon the receipt of a search start instruction and the presence of a detected incoming signal, respectively, the presence of a detected incoming signal being determined at least in part in response to an output of said AFT detector;

tuning voltage generator means for generating a gradually varying tuning voltage under control of the search start signal and search stop signal;

memory circuit means for storing the tuning voltage from said tuning voltage generator means;

signal decision circuit means for determining whether the detected incoming signal is a true television signal including a television synchronizing signal by detecting the presence of the television synchronizing signal and the search stop signal, said signal decision circuit means providing a memory store instruction for the memory circuit means in the presence of the true television signal and providing a search re-start instruction for the start/stop circuit means in the absence of the true television signal, the tuning voltage stored in the memory circuit means being supplied to a tuner including a voltage-sensitive capacitance diode.

4,236,183

OPTICAL CONFIGURATIONS FOR A ROTATING POLYGON FILM SCANNER

Dennis G. Howe, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,031

Int. Cl.³ H04N 3/36

U.S. Cl. 358—214 **6 Claims**

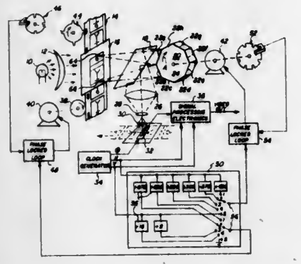
1. Apparatus for scanning film to produce a television signal, comprising:

means including a light source and a scan lens for projecting an image of a portion of the film;

solid-state line sensing means for scanning the image of the film in a direction generally perpendicular to the length of the film at a standard television line rate to produce a television signal;

a multifacet mirror having a plurality of reflecting facets arranged around a central axis, the facets being tangent to a circle of radius R, the polygon being located in the optical path between the scan lens and the film in a position such that the optical axis of the scan lens between the scan lens and the mirror and the axis of the mirror lie in the same plane;

means for rotating the mirror about said axis to cause successive facets to deflect the optical axis between the scan lens and the film gate to sweep an image of film past the line sensing means in a direction generally parallel to the length of the film, at a standard television field rate;



film gate means forming an aperture for defining the projected portion of the film and for constraining the film to coincide with the surface defined by an image of the line sensing means formed by the scan lens and deflected by the mirror, the film gate being located with respect to the mirror such that the center of the film gate lies in said plane.

4,236,184

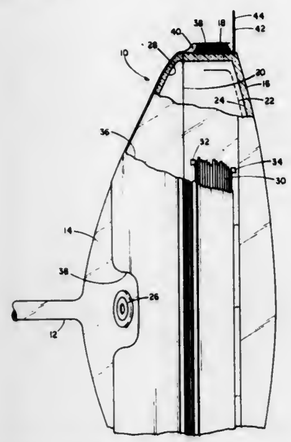
MULTI-FUNCTION STRUCTURE FOR A COLOR CATHODE RAY TUBE

Kazimir Palac, Carpentersville, and Raymond M. Stachniak, Wheaton, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 25, 1978, Ser. No. 945,766

Int. Cl.³ H04N 5/65; H04J 29/06

U.S. Cl. 358—245 **7 Claims**



1. In a color television picture tube having a glass bulb including a funnel and a faceplate with a rearward flange which mates with and is sealed to said funnel, a multi-function system comprising:

a pre-formed coil of electrically conductive wire engirding said flange of said faceplate, said coil including terminal means for connecting said coil to a source of degaussing current for abating residual stray magnetic fields within the tube;

annular enclosure means surrounding said flange and defining an enclosure containing said coil; and

a body of hardened binder in said enclosure whose configuration is defined by said enclosure means, reinforced by said coil of wire and serving to provide implosion protection for said tube.

4,236,185

METHOD FOR DISTORTION-FREE STILL PICTURE REPRODUCTION WITH MAGNETIC VIDEO TAPE

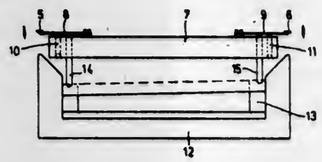
Michael Obremski, Fuerth, Fed. Rep. of Germany, assignor to Grundig E. M. V. Elektro-Mechanische Verswchsanstalt Max Grundig, Fuerth, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,335

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751180

Int. Cl.³ H04N 5/78; G11B 5/56

U.S. Cl. 360—10 **1 Claim**



1. A device for the recording, reproduction, and distortion-free reproduction of slant tracks recorded on magnetic video tape without any intermediate spacing between adjacent tracks, said device comprising: a drum; two video heads mounted in said drum and adapted to rotate in a common plane with different azimuth angles; a pair of spring leaves, each of said heads being mounted to one of said springs; a pair of plungers, each plunger having one end engaging one of said springs and an opposite end; and an axially adjustable ring mounted in said drum, said ring having an upper surface which rises linearly for half the width of a slant track about half its circumference and declines linearly over the remaining half of its circumference, said ring being adjustable between a first position out of contact with said plungers and a second position wherein said plungers' opposite ends engage said ring upper surface; and one of said plungers is shorter than the other of said plungers by the width of a slant track.

4,236,186

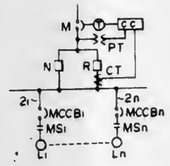
POWER BREAKER SYSTEM

Yoichiro Takagi, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1979, Ser. No. 4,200

Int. Cl.³ H02H 3/08

U.S. Cl. 361—9 **3 Claims**



1. A power breaker system which comprises:

a main breaker having a short timing delay function which is connected to a power source, said main breaker including a trip coil for operating the breaker mechanism;

a current limiting circuit for limiting fault current which is connected to said main breaker, said current limiting circuit including a linear current resistor in parallel with a non-linear circuit resistor;

a plurality of branch load circuits each consisting of a feeder breaker and a load which are connected to said current limiting circuit;

wherein said trip coil of said main breaker is controlled by a detector for detecting a current passing through said linear resistor of said current limiting circuit and by a device for generating an output for operating said trip coil in short timing delay after receiving a signal from said detector.

4,236,187

POWER SUPPLY VOLTAGE STABILIZER

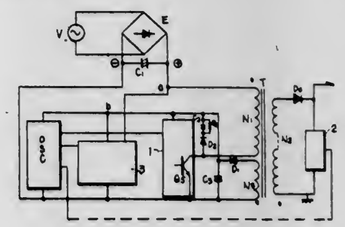
Daisuke Mochizuki, and Michiyuki Horiguchi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 950,781

Claims priority, application Japan, Oct. 18, 1977, 52/125509; Oct. 18, 1977, 52/125510

Int. Cl.³ H02M 1/18, 3/335

U.S. Cl. 361—36 **13 Claims**



1. A power supply voltage stabilizer comprising:

a transformer including a primary winding connected to a power source and a secondary winding for output purposes;

switching means connected to said primary winding for controlling power supply to said primary winding;

an oscillator circuit for controlling on/off operation of said switching means; and

abnormal condition detection means for developing a control signal for terminating oscillation operation of said oscillator circuit when an abnormal condition is detected;

said oscillator circuit including an astable multivibrator, and variable impedance means for varying an oscillation frequency of said astable multivibrator.

4,236,188

COAXIAL TERMINAL PROTECTION DEVICE WITH DISPOSABLE CARTRIDGE

Rudolph J. Prochazka, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 15, 1979, Ser. No. 3,179

Int. Cl.³ H02H 3/22

U.S. Cl. 361—111 **11 Claims**

1. Apparatus for affecting a circuit characteristic of an electronic device comprising:

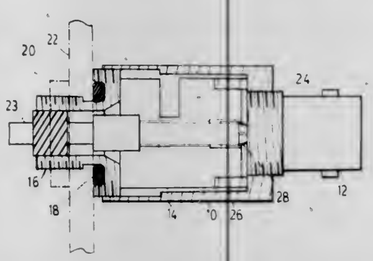
(a) first coaxial connecting means, having a first means for providing electrical contact with an internal conductor of a first coaxial device connected thereto and a second means for providing electrical contact with an external conductor of the coaxial device connected thereto,

(b) a housing attached to said first coaxial connecting means and in electrical contact with the second means thereof, and

(c) replaceable cartridge means having electrical components therein and electrical terminals connected thereto,

(d) said replaceable cartridge means adapted for fitting in

said housing, and having a first one of the electrical terminals thereof adapted to provide electrical contact with the internal conductor of the first coaxial device connected to said first coaxial connecting means by cooperating with said first means of said first coaxial connecting means,



(e) said replaceable cartridge means having a second electrical terminal thereof in electrical contact with said housing, and

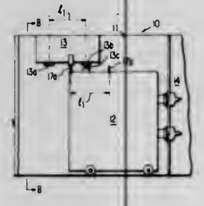
(f) said replaceable cartridge means having a third electrical terminal thereof adapted to establish electrical contact with said electronic device.

4,236,189

ENCLOSED SWITCHBOARD

Sizuo Yosida, Fuchu, Japan, assignor to Tokyo Shibaura Electric Company Limited, Kanagawa, Japan

Continuation-in-part of Ser. No. 860,169, Dec. 3, 1977, abandoned. This application May 21, 1979, Ser. No. 40,539
Claims priority, application Japan, Dec. 14, 1976, 51-166736
Int. Cl.³ H02B *1/04*
U.S. Cl. 361—337 **4 Claims**



1. An enclosed switchboard comprising:

a closed cubicle;

a circuit breaker housed movably in the closed cubicle and having driving means for driving the circuit breaker and an auxiliary contact;

a frame mounted in the cubicle;

a disconnecting switch having a stationary contact mounted on the frame and a movable contact mounted on the circuit breaker;

whereby when the circuit breaker is moved the movable contact contacts or separates from the stationary contact;

actuable controlling circuit means housed in the cubicle for supplying a signal to the driving means and for transmitting a signal relating to the state of the circuit breaker to an external circuit;

a position switch housed in the cubicle for responding the position of the circuit breaker;

a first pin mounted on the circuit breaker so as to cause the position switch to operate in response to the connecting position of the circuit breaker for actuating the controlling circuit means;

a second pin mounted on the circuit breaker so as to cause the position switch to operate in response to the testing position of the circuit breaker for actuating the controlling circuit means;

a first contactor mounted on the circuit breaker and connected with the auxiliary contact of the circuit breaker;

a second contactor mounted on the cubicle so as to contact with the first contactor when the circuit breaker is connected with the disconnecting switch; and

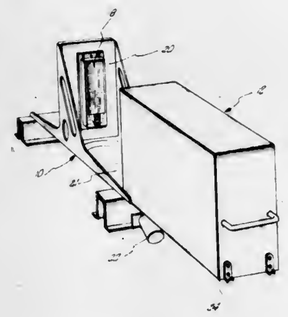
a third contactor mounted on the cubicle so as to contact with the first contactor when the circuit breaker is located on the testing position of the circuit breaker.

4,236,190

ELECTRICAL CONNECTOR STRUCTURE

Robert A. Hollingsead, Yorba Linda; Abraham Kuchler, and Clyde R. Pryor, both of Anaheim, all of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

Continuation of Ser. No. 613,348, Sep. 15, 1975, which is a continuation-in-part of Ser. No. 535,288, Dec. 23, 1974, abandoned. This application May 31, 1978, Ser. No. 911,065
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.³ H02G *1/02*
U.S. Cl. 361—391 **14 Claims**



1. For use in an electrical connector racking system which comprises a previously installed supporting member adapted to be connected to "in place" electrical equipment, and a modular, readily removable member supported on the supporting member and requiring electrical interconnection with said "in place" equipment; an electrical connector comprising:

a shell adapted to be mounted on the modular member near the bottom thereof;

another shell adapted to be mounted on the supporting member in alignment with the shell on the modular member;

a first electric-terminal-providing member fixedly supported inside one of the shells near the lower end thereof, said first member including an insulating support portion and a plurality of socket terminals carried thereby;

a second electric-terminal-providing member fixedly supported inside the other shell near the lower end thereof, said second member including an insulating support portion and a plurality of pin terminals carried thereby and aligned with the socket terminals;

a third electric-terminal-providing member fixedly supported inside one of the shells above the other such member therein, said third member including an insulating support portion and a pluraity of laterally engageable terminals carried thereby;

a fourth electric-terminal-providing member supported inside the other shell above the other such member therein and vertically movable toward and away from it, said fourth member including an insulating support portion and a plurality of laterally engageable terminals carried thereby and movable therewith into and out of engagement with the terminals in the third member;

the outer periphery of one of the shells being dimensioned to closely mate with the inner periphery of the other shell when the two are brought together, thereby guiding the shells as they are brought into mating position and protecting the terminals from forces acting in the plane of the interface of said shells;

at least one terminal each of the pin-and-socket interengaging pairs of terminals having sufficient play relative to its support portion to adjust for terminal misalignment;

at least one terminal of each of the laterally interengaging pairs of terminals having lateral flexibility to deflect after terminal engagement; and

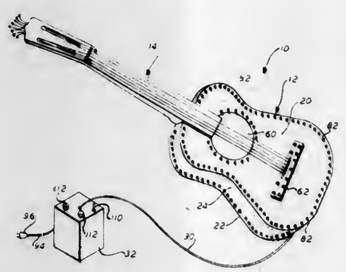
means for moving the fourth member vertically to bring its terminals into engagement with those of the third member after the shells have been moved into mated position.

4,236,191

ILLUMINATED MUSICAL INSTRUMENT

Fredy R. Martinez, Box 7308 Barrio Obrero Sta., Santurce, P.R. 00916

Filed Jan. 26, 1978, Ser. No. 872,576
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—32 **11 Claims**



1. The method of decorating a musical guitar instrument; comprising:

(a) providing purfling grooves in said guitar;

(b) disposing a fiber-optic bundle along a predetermined path in said purfling groves to follow the guitar shape and in proximity to a predetermined surface of said guitar instrument;

(c) disposing the separate ends of individual fibers of said fiber-optic bundle adjacent the surface of said instrument so that light carried by said individual fibers will be directed towards said predetermined surface of said musical instrument;

(d) providing a source of illumination for said fiber-optic bundle; and

(e) illuminating said fiber-optic bundle and said ends of said individual fibers to thereby illuminate in a decorative manner said musical instrument.

4,236,192

CABINET FOR EXAMINING AND IDENTIFYING SPECIMENS

Charles F. Duggan, Jacksonville, Fla., assignor to Brandons, Inc., Jacksonville, Fla.

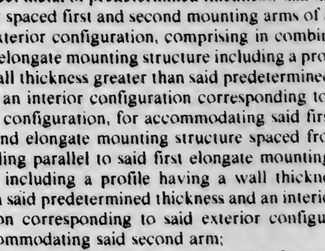
Filed Jan. 15, 1979, Ser. No. 3,346
Int. Cl.³ A47B *97/00*; A47F *11/10*
U.S. Cl. 362—133 **3 Claims**

1. A cabinet structure for illuminating a specimen to be examined with selected wavelengths of radiation comprising:

a hood having a top section with sidewalls sloping outwardly and downwardly to define a truncated pyramid and having an open bottom section defined by a rectangularly shaped skirt portion extending downwardly from the bottom of said top section;

an access door provided in said skirt for the insertion and removal of specimens beneath said hood;

illumination means disposed on the sidewalls of said hood, at least one of said illumination means including removable radiation filter means disposed across an opening in one of said sidewalls, and a light box normally in registry with said filter means, said light box including a plurality of removable light sources;



mounting means for said light box to permit pivoting of said light box out of registry with said filter means to facilitate the changing of said filter means or said light sources;

specimen viewing means on the top of said hood; and

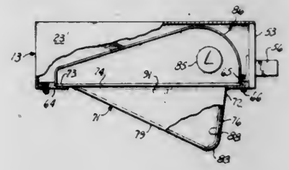
a bottom means including back lighting means removably attachable to the bottom of said skirt, whereby said cabinet structure may be selectively used with an open bottom when said removable bottom means is removed from said skirt or may be provided with specimen back lighting when said bottom means is attached to said skirt.

4,236,193

LIGHTING EQUIPMENT

Jason M. Brandt, Newport Beach, Calif., assignor to Sportolite, Inc., Newport Beach, Calif.

Filed Feb. 15, 1979, Ser. No. 12,531
Int. Cl.³ F21V *1/00*
U.S. Cl. 362—241 **23 Claims**



1. Apparatus for mounting a lamp relative to a pole with the aid of sheet metal of predetermined thickness, said lamp having mutually spaced first and second mounting arms of a predetermined exterior configuration, comprising in combination:

a first elongate mounting structure including a profile having a wall thickness greater than said predetermined thickness and an interior configuration corresponding to said exterior configuration, for accommodating said first arm;

a second elongate mounting structure spaced from and extending parallel to said first elongate mounting structure and including a profile having a wall thickness greater than said predetermined thickness and an interior configuration corresponding to said exterior configuration, for accommodating said second arm;

a third elongate mounting structure spaced from and located

between said first and second mounting structures and having a profile including a first wall of a thickness greater than said predetermined thickness and extending parallel to said first and second elongate mounting structures, a second wall of a thickness greater than said predetermined thickness and extending parallel to said first wall, and a third wall of a thickness greater than said predetermined thickness and extending between said first and second walls, and means for connecting said third wall to said pole; and

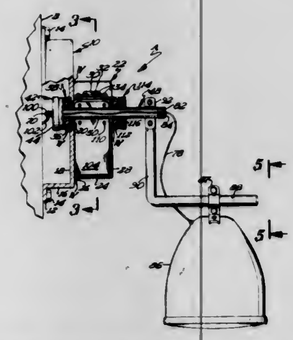
means including said sheet metal for mounting said first and second mounting structures relative to said third mounting structure.

4,236,194

LIGHT APPARATUS FOR A PIVOTAL BOOM

Raymond M. Norman, P.O. Box 92, Floodwood, Minn. 55736

Filed Oct. 12, 1979, Ser. No. 84,414
Int. Cl.³ F21V *33/00*; B60Q *1/12*, *3/00*
U.S. Cl. 362—370 **5 Claims**



1. A dampened light apparatus for a pivotal boom comprising:

(a) support means,

(b) means for connecting said support means to a boom,

(c) a well housing carried by said support means and having,

(d) a liquid contained therein

(e) an arm,

(f) means pivotally mounting said arm on said support means and said well housing,

(g) an electric light mounted on said arm,

(h) electric current conducting means carried by said light, said arm and said support means for connection with a source of electrical power for the actuation of said light,

(i) a dampening blade connected to and extending radially from said arm and extending into said liquid for movement therein so that when there is relative pivotal movement between said support means and said arm said blade moving through said liquid dampens the pivotal movement of said arm and the light thereon.

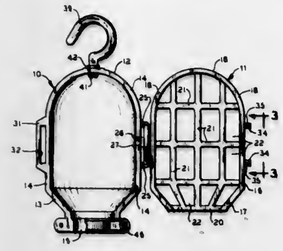
4,236,195

LIGHT GUARD

James W. Kovacik, Parma, Ohio, assignor to Alert Safety Lite Products Company, Bedford Heights, Ohio

Filed Mar. 28, 1979, Ser. No. 24,617
Int. Cl.³ F21V *15/00*
U.S. Cl. 362—376 **13 Claims**

1. A light guard comprising two generally complementary sections having peripheral portions adapted to face each other for a substantial extent along said portions to define an enclosure for a lamp and the like, means for detachably securing said sections together including hinge means at one such facing peripheral portions of said sections to pivot the sections relatively to each other, and latch means at another of such facing peripheral portions temporarily to secure said sections together, said latch means comprising catch means extending outwardly from a plurality of points along a peripheral portion of one of said sections, and finger means on a peripheral portion of the other section for each of said catch means adapted to engage said catch means upon pivoting the sections together to form said enclosure, said finger means for each of said catch means being movable toward one another to release said engagement of finger means and catch means.

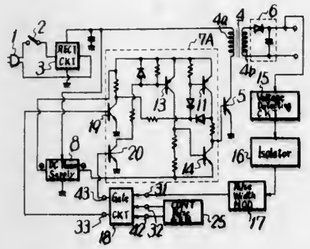


4,236,196

SWITCHING REGULATOR

Akio Koizumi, Tokyo, and Hiroshi Nakazawa, Kawagoe, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 968,136
Claims priority, application Japan, Dec. 16, 1977, 52-151341
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **6 Claims**



1. In a switching regulator including a DC voltage source having a pair of first and second DC output terminals, a switching transformer having primary and secondary windings and a magnetic core, a switching transistor having a control electrode, the main current path of which is connected in series between said first and second DC output terminals through said primary winding, rectifying means connected across said secondary winding and adapted to be connected with a load, and a pulse width modulator supplied with the output from said rectifying means so as to produce a PWM control signal the duty ratio of which is proportional to the voltage of said rectifying means, said switching regulator further comprising:

(a) control pulse generating means for producing a first control pulse signal which limits the maximum duty ratio of said PWM control signal and a second control pulse signal which has the duty ratio larger than that of said first control pulse signal;

(b) first gate circuit means supplied with said PWM control signal and said first control pulse signal to produce an ON-pulse at the output terminal thereof;

(c) second gate circuit means supplied with said PWM control signal and said second control pulse signal to produce an OFF pulse at the output terminal thereof; and

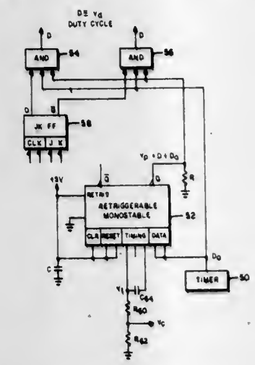
(d) circuit means for supplying the said ON and OFF pulse signals to said switching transistor so as to switch ON or OFF the same.

4,236,197

VOLTAGE REGULATION LOOP FOR INVERTER POWER SUPPLY

Randolph D. W. Shelly, Rosemere, Canada, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 1, 1979, Ser. No. 8,458
Int. Cl.³ H02P *13/20*; H02M *1/12*
U.S. Cl. 363—41 **2 Claims**



1. In a voltage regulation loop for an inverter power supply including pulse-width modulator means, the input of which is a control signal v_c that is generated from the power supply's output voltage v_o and the output of which is a duty cycle signal v_d that drives the power supply's inverter, the duty cycle D of said duty cycle signal v_d of which is varied by a variation in the control voltage v_c, an improved pulse-width modulator means, comprising:

timing means for generating a timing signal of cycle time T and of duty cycle D_0;

modulating means coupled to said timing means for generating a modulated output signal of cycle time T and of a variable duty cycle $D+D_0$;

enabling means for generating alternative first and second enabling signals of cycle time T;

first and second gating means;

means coupling said signals of duty cycle D_0 and of duty cycle $D+D_0$ to said first and to said second gating means;

means coupling said first enabling signal to said first gating means;

means coupling said second enabling signal to said second gating means;

said first and second enabling signals enabling said first and second gating means to generate respectively alternate pulse modulated output signals of cycle time T and a variable duty cycle D.

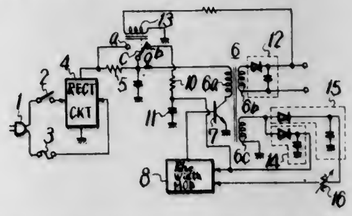
4,236,198

SWITCHING REGULATOR

Mitsuo Ohsawa, Chigasaki; Akio Koizumi, Tokyo, and Hiroshi Nakazawa, Kawagoe, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 968,135
Claims priority, application Japan, Dec. 16, 1977, 52-151343; Dec. 16, 1977, 52-151345
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—49 **7 Claims**

1. In a switching regulator including a DC voltage source having a pair of first and second terminals, a surge current protective resistor, a switching transformer having primary, secondary and tertiary windings and a magnetic core, a switching transistor having a control electrode, the main current path of which is connected in series between said first and second terminals through said primary winding and said surge current protective resistor, first rectifying means connected across said secondary winding and adapted to be connected with a load, a pulse width modulator to produce a PWM control signal the duty ratio of which is substantially proportional to the voltage of said first rectifying means, circuit means for supplying said PWM control signal to the control electrode of said switching transistor, and starter circuit means for starting said pulse width modulator and consisting of a series connection of a starting resistor and a capacitor, the connection point of which is connected to said pulse width modulator, said switching regulator further comprising:



(a) switching means for connecting in series said surge current protective resistor to said series connection of the starting resistor and capacitor when said switching regulator starts, while disconnecting said series connection from said first terminal of said DC voltage source and short-circuiting said surge current protective resistor when said switching regulator has started;

(b) circuit means for detecting the voltage of said tertiary winding of said switching transformer;

(c) second rectifying means for rectifying the output of said detecting means; and

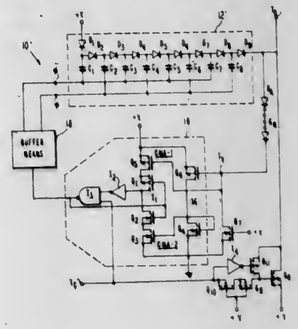
(d) circuit means for supplying the output of said second rectifying means to the connection point of said starting resistor and capacitor as a DC power source of said pulse width modulator.

4,236,199

REGULATED HIGH VOLTAGE POWER SUPPLY

Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1978, Ser. No. 964,388
Int. Cl.³ H02M *3/18*; H03B *5/02*
U.S. Cl. 363—60 **14 Claims**



1. A voltage supply comprising:

a voltage multiplier (VM) having an input and an output, and of the type which produces at its output a voltage whose level is proportional to the frequency and amplitude of the signal applied at its input;

a voltage controlled oscillator (VCO) having an oscillation control input and a signal output; and

direct coupling means connecting the VCO between the output and the input of the voltage multiplier for providing feedback across the voltage multiplier over a range of frequencies extending down to zero frequency including means direct current connecting the output of the voltage multiplier to the oscillation control input of the VCO, and means direct current connecting the signal output of the VCO to the input of the voltage multiplier for varying the frequency of the signals applied to the input of the voltage multiplier in accordance with the voltage level at the output of the voltage multiplier

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4,236,200

SEMICONDUCTOR CIRCUIT HAVING A SERIES-CONNECTED REACTOR

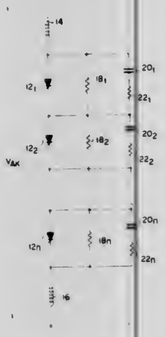
Koji Imai, Fuchu; Sumio Kobayashi, Yokohama; Ko Kumai, Kamakura, and Toshihiko Tsuji, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Nippon Kinzoku Co., Ltd., Tokyo, both of, Japan

Filed Aug. 30, 1978, Ser. No. 938,239

Claims priority, application Japan, Sep. 7, 1977, 52-107492

Int. Cl.[2] H02M 1/515

U.S. Cl. 363—135 **9 Claims**



1. A semiconductor circuit comprising:

at least one reactor including a closed magnetic path core of a compression molding which is made of a mixture of an insulating material and particles of magnetic substance, a conductor adapted to carry current for magnetizing said molding core and an insulating means for electrically insulating said molding core from said conductor; and

at least one semiconductor element connected in series with said reactor;

wherein the grain size of said magnetic substance particles is substantially 150 to 200 mesh; and

wherein said compression molding core has an integration degree of substantially 5 to 10 g/cm^3.

4,236,201

INVERTER DEVICE

Chihiro Okado, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 24, 1978, Ser. No. 954,886

Claims priority, application Japan, Oct. 27, 1977, 52-128105

Int. Cl.[1] H02M 1/06

U.S. Cl. 363—138 **7 Claims**

1. An inverter device comprising:

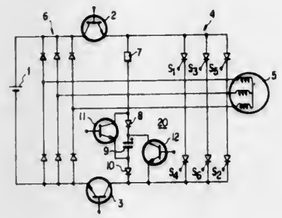
a bridge type inverter circuit;

means for connecting the bridge type inverter circuit between a source of direct current and a load;

a bridge type diode circuit connected in parallel with the bridge type inverter circuit;

a pair of switching means connected between the bridge type inverter circuit and the bridge type diode circuit; and

a commutating circuit including a series circuit of a first diode, a capacitor, a second diode and means for limiting current supplied to said capacitor connected in parallel with the bridge type inverter circuit, a first switch element



connected in parallel with the first diode and the capacitor and

a second switch element connected in parallel with the capacitor and the second diode for applying electric charge stored in the capacitor to the inverter circuit with reverse polarity when the inverter circuit is commutated.

4,236,202

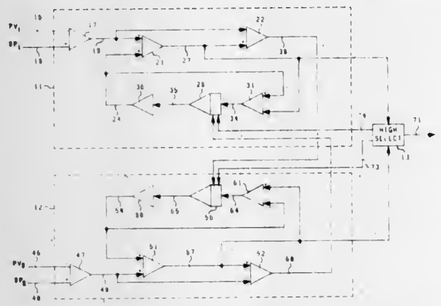
INTEGRAL TRACKING OVERRIDE CONTROL

Richard F. Giles, Elk View, W. Va., and Larry D. Gaines, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1978, Ser. No. 973,981

Int. Cl.[1] G06G 7/66; G05B 7/02, 11/42

U.S. Cl. 364—105 **31 Claims**



31. An integral tracking override control method comprising the steps of:

comparing a first process variable signal and a first set point signal for said first process variable signal and establishing a first signal responsive to the difference between said first process variable signal and said first set point signal, said first signal having at least a proportional term and an integral term;

comparing a second process variable signal and a second set point signal for said second process variable signal and establishing a second signal responsive to the difference between said second process variable signal and said second set point signal, said second signal having at least a proportional term and an integral term;

selecting said first signal or said second signal to be supplied as a process control signal;

forcing only the integral term of said first signal to be substantially equal to only the integral term of said second signal if said second signal is selected as said process control signal; and

forcing only the integral term of said second signal to be substantially equal only to the integral term of said first signal if said first signal is selected as said process control signal.

4,236,203

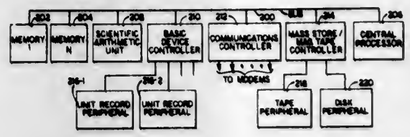
SYSTEM PROVIDING MULTIPLE FETCH BUS CYCLE OPERATION

John L. Curley, Sudbury; Robert B. Johnson, Billerica; Richard A. Lemay, Bolton, and Chester M. Nibby, Jr., Peabody, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 5, 1978, Ser. No. 867,270

Int. Cl.[1] G06F 1/04, 13/00

U.S. Cl. 364—200 **19 Claims**



1. A system comprising a plurality of units coupled to transfer information over a common bus between any two of said plurality of units during asynchronously generated information transfer cycles, a priority means coupled to said common bus for determining the priority of each of said plurality of units based on the relative position of each of said plurality of units from one end of said common bus said system comprising:

A. means, included in each of said plurality of units and coupled to said common bus, for generating a transfer cycle if a unit is the highest priority unit requesting said transfer cycle;

B. transfer logic, included in a first unit and coupled to said common bus, having

1. means for enabling the transfer over said common bus of first information from said first unit to a receiving unit of said plurality of units during a first transfer cycle, if said first unit is the highest priority requesting unit, said first information indicating that second information is requested to be transferred to said first unit from said receiving unit during a plurality of further transfer cycles, a last transfer cycle of said plurality of further transfer cycles indicating that it is said last transfer cycle, each transfer cycle, except said last transfer cycle of said plurality of further transfer cycles, indicating that it is not said last transfer cycle; and

2. means, coupled to said means for enabling, for indicating to said transfer logic that said second information has been requested;

C. means, included in said receiving unit and coupled to said common bus, for inhibiting the transfer of information with any other unit until said receiving unit transfers said second information to said first unit; and

D. control means, included in each of said units and coupled to said common bus and said means for generating, for enabling the transfer of information between any two of said plurality of units, except said receiving unit, at any time between the generation of said first transfer cycle and the completion of the transfer of said second information.

4,236,204

INSTRUCTION SET MODIFIER REGISTER

Stanley E. Groves, Round Rock, Tex., assignor to Motorola, Inc., Schaumberg, Ill.

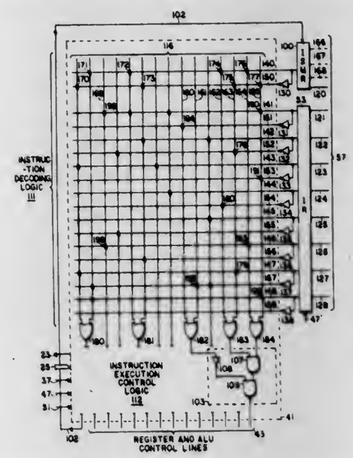
Filed Mar. 13, 1978, Ser. No. 885,709

Int. Cl.[1] G06F 9/30

U.S. Cl. 364—200 **18 Claims**

1. In a processor comprising a data bus, a plurality of registers and logic circuits, including an instruction register coupled to said data bus for temporarily storing an individual one of a plurality of instructions from two or more instruction sets, and an instruction decoding and control circuit responsive to said instruction register for decoding the contents of said instruction register and having a plurality of control lines for controlling the operation of said plurality of registers and logic circuits in accordance with said instructions, said processor further comprising:

an instruction set modifier register having a plurality of states each corresponding to one of said instruction sets,



said instruction decoding and control circuit being responsive to said instruction set modifier register for activating the same ones of said plurality of control lines when any one of a plurality of different instruction words, each from a different instruction set and representing an instruction which is common to each of said instruction sets, is stored in said instruction register, provided that the state of said instruction set modifier register corresponds to that instruction set containing said any one instruction word.

4,236,205

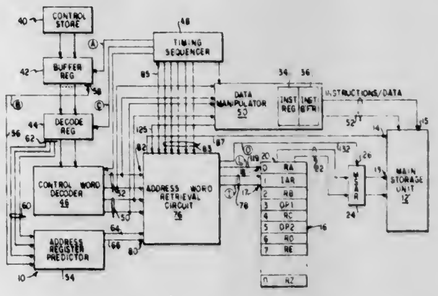
ACCESS-TIME REDUCTION CONTROL CIRCUIT AND PROCESS FOR DIGITAL STORAGE DEVICES

Douglas M. Kindseth, Stewartville, and Glen R. Mitchell, Pine Island, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,667

Int. Cl.[2] G06F 9/22

U.S. Cl. 364—200 **10 Claims**



6. An apparatus for controlling access to digital primary storage, comprising:

(a) a plurality of address registers, each address register

being capable of storing digital address information for determining an address of a storage location in the primary storage,

(b) a control store for storing a plurality of memory-access control words, each memory-access control word having an address field for identifying an address register;

(c) control-store reader means for reading a memory-access control word from the control store;

(d) predictor means for partially decoding an address field of the memory-access control word to predict an address register, so that a predicted storage location in the primary storage can be determined with the address information stored in the predicted address register;

(e) decoder means for fully decoding the address field of the control word to determine the address register containing the address information for determining the actual storage location to be accessed;

(f) predicted-location memory-access initiation means for initiating reading of the address information stored in the predicted address register prior to completion of the full decoding of the address field by the decoder means, to initiate a memory access to the predicted storage location; and

(g) access-override means for overriding a memory access initiated by the predicted-location memory-access initiation means and reinitiating a memory access to the actual storage location in the event the address register determined upon full decoding of the address field of the control word differs from the predicted address register.

4,236,206

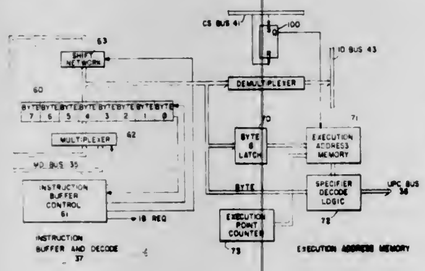
CENTRAL PROCESSOR UNIT FOR EXECUTING INSTRUCTIONS OF VARIABLE LENGTH

William D. Strecker, Harvard; Thomas N. Hastings, Lexington, both of Mass.; Richard F. Lary, Colorado Springs, Colo.; David P. Rodgers, Acton, and Steven H. Rothman, Bolton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 845,055, Oct. 25, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,453

Int. Cl.[1] G06F *9/34, 9/36*

U.S. Cl. 364—200 **17 Claims**



1. A central processor means for processing operands in response to instructions in a data processing system, the data processing system additionally including a memory means for storing the operands and instructions, each operand comprising at least one information bit and each instruction including an operation code having at least one information byte and certain of the instructions including at least one operand specifier, each operand specifier comprising at least one information byte and identifying the location for an operand in the data processing system, said central processor means comprising:

A. program counter means for identifying locations in the memory means of operation codes in successive instructions,

B. instruction retrieval means connected to said program counter means for normally sequentially retrieving successive bytes of information from the memory means to which said instruction retrieval means connects,

C. operation code decoding means connected to said instruction retrieval means for ascertaining, in response to the operation code, the number of operand specifiers that the instruction contains, and

D. operand specifier decoding means connected to said instruction retrieval means and to said operation code decoding means for sequentially decoding successive bytes of the information following the operation code to identify a location for each specified operand, said operand specifier decoding means being responsive to information in the operand specifier that identifies the total number of information bytes in that operand specifier, thereby to enable retrieval from the memory means of successive instructions comprising a variable number of information bytes stored in contiguous byte locations in the memory means.

4,236,207

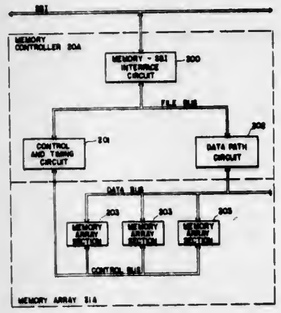
MEMORY INITIALIZATION CIRCUIT

Peter J. Rado, Acton; Srirama S. Durvasula, Chelmsford, and William H. Angell, Concord, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 845,417, Oct. 25, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,550

Int. Cl.[1] G06F *13/00*

U.S. Cl. 364—200 **6 Claims**



1. A memory array means for connection in a memory system wherein the memory system includes controller means for generating a sequence of address signals, predetermined data signals, a write control signal and an initialization control signal, said memory array means being connected to the controller means and comprising.

A. a plurality of memory module means, each said memory module means including:

i. a plurality of addressable storage locations,

ii. addressing means for selecting one of said storage locations in response to first address signals from the controller means,

iii. control means for controlling the transfer functions within said storage locations, and

iv. data transfer means for transferring data to and from the storage location selected by said addressing means in response to said control means,

B. transfer means for selectively establishing data paths between the controller means and said storage locations in all said memory module means, and

C. module selection means connected to said transfer means and said memory module means for selectively enabling one of said control means in said memory module means to transfer data in response to second address signals from said controller means for setting all storage locations in said memory array means to predetermined values including:

i. first means connected to said transfer means for establishing a data path from said transfer means to all said memory module means in parallel in response to the initialization control signal from

ii. second means connected to said transfer means to receive said initialization control signal and further connected to said control means in each said memory module for selecting all said memory modules in parallel to respond to the second address signals from the controller means thereby to transfer a predetermined data into all said modules in parallel.

4,236,208

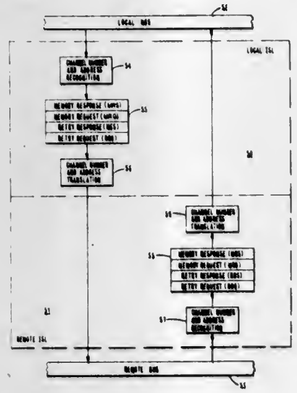
TEST MODE CONTROL LOGIC SYSTEM

David B. O'Keefe, Westford, Mass.; Kenneth E. Bruce, Nashua, N.H.; Ralph M. Lombardo, Jr., Lowell, Mass.; Bruce H. Tarbox, Billerica, Mass., and John W. Conway, Waltham, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 31, 1978, Ser. No. 956,384

Int. Cl.[1] G06F *3/04, 11/22*

U.S. Cl. 364—200 **4 Claims**



1. A logic control system for testing intersystem link (ISL) retry request (RRQ) logic data flow paths in a local ISL unit and a remote ISL unit in a data processing system wherein said remote ISL unit is in electrical communication with a remote communication bus, said local ISL unit is in electrical communication with a local communication bus, and said local ISL unit is in electrical communication with said remote ISL unit, and wherein said local and said remote ISL units respectively have local and remote memory hit bit generating means, local and remote channel hit bit generating means, and local and remote register means, which comprises:

(a) local control logic means in said local ISL unit responsive to binary coded information received from said local bus and stored in said local register means for initiating a local retry request (RRQ) cycle and a local transfer cycle in said local ISL unit to transfer said binary coded information from said local register means to said remote ISL unit;

(b) remote cycle selection logic means in said remote ISL unit responsive to test mode bits of output control commands received from said local bus for inhibiting in said remote ISL unit the detection of memory hit bit signals generated by said local and said remote memory hit bit generating means, and detecting channel hit bit signals generated by said remote channel hit bit generating means in said remote ISL unit, thereby completing any information transfer to said remote bus and from said remote bus to said remote register means within a single bus cycle time period;

(c) remote logic control means in said remote ISL unit responsive to said local RRQ cycle in said local ISL unit for initiating a remote RRQ cycle in said remote ISL unit, and responsive to detected ones of said channel hit bit signals for initiating a local RRQ cycle in said remote ISL unit to transfer said binary coded information from said remote register means to said local ISL unit; and

(d) channel address conversion logic means in said local ISL unit responsive to said test mode bits and to a remote RRQ cycle in said local ISL unit initiated by said local control logic means in response to said local RRQ cycle in said remote ISL unit for converting address bits of said binary coded information to a memory address command to be applied to said local bus, thereby accommodating the writing of said binary coded information under the control of said local logic control means into a memory unit in electrical communication with said local bus.

4,236,209

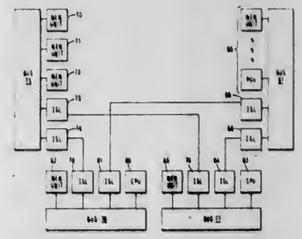
INTERSYSTEM TRANSACTION IDENTIFICATION LOGIC

Ralph M. Lombardo, Jr., Lowell; George J. Barlow, Tewksbury; John J. Bradley, Framingham, all of Mass.; Kenneth E. Bruce, Nashua, N.H.; John W. Conway, Waltham, and Bruce H. Tarbox, Billerica, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 31, 1978, Ser. No. 956,389

Int. Cl.[1] G06F *3/04, 13/00*

U.S. Cl. 364—200 **10 Claims**



1. In a data processing network including a plurality of data processing systems wherein each system is provided with common bus means for exchanging information between individual devices within said system, intersystem communication control apparatus comprising:

first logic control means coupled to a first one of said common bus means responsive to memory and non-memory access commands presented on said first common bus means for generating an address signal identifying a remote target device which is to be accessed in response to an access command;

programmable memory means operable in response to said address signal to indicate whether said remote target device to be accessed can be accessed through the control apparatus, said programmable memory means having stored in predetermined memory locations thereof first and second binary bit signals indicative of remote memory and non-memory target devices coupled to a second one of said common bus means;

second logic control means for applying said address signal to said programmable memory means to read therefrom a binary bit signal indicating that a remote target device is selected by said access command;

register means having dedicated register locations coupled to said first common bus means and including a memory request storage location and a retry request storage location, said register means operating in response to presentation on said first common bus means of a memory access

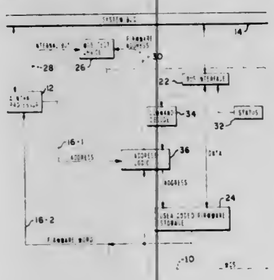
command to load into said memory request storage location data from said first common bus means, said register means further operating in response to presentation of a non-memory access command to load into said retry storage location data from said first common bus means; and transfer logic means responsive to a first binary bit read from said programmable memory means for transferring the data in said memory request storage location to said second common bus means for accessing a remote memory target device coupled thereto, said transfer logic means further being responsive to a second binary bit read from said programmable memory means for transferring the data in said retry request storage location to said second common bus means for accessing a remote non-memory target device coupled thereto.

4,236,210

ARCHITECTURE FOR A CONTROL STORE INCLUDED IN A DATA PROCESSING SYSTEM

Kiyoshi H. Terakawa, Framingham, and William E. Woods, Natick, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 2, 1978, Ser. No. 947,987
Int. Cl.[3] G06F 9/00
U.S. Cl. 364—200 **24 Claims**



1. A microprogram-controlled data processing system wherein a set of system control words is augmented by an externally-supplied set of user-generated control words, said system comprising:

a control store having a first control memory means for storing said set of user-generated control words;

a central processor unit having a second control memory means for storing said set of system control words, said central processor unit constructed and arranged to execute either a system control word or a user-generated control word under the control of said microprogram, said central processor unit further generating (1) addresses for addressing said first control memory means, (2) instructions for controlling said control store, and (3) data for storing in said first control memory means;

a bus for coupling said central processor unit to said control store and for transferring between said control store and said central processor unit said generated addresses, instructions, and data;

means in said control store for receiving said transferred addresses, instructions and data, and for addressing said first control memory means in response to said received addresses;

means in said control store for transferring an addressed user-generated control word from said first control memory means to said central processor unit over said bus;

means for interfacing said central processor unit with said control store, said interfacing means having address coupling means for transferring a central processor unit generated address designating a location in said first control memory means to said control store, and control word coupling means for transferring independently of said bus an addressed one of said user-generated control words from said first control memory means to said central processor unit;

means coupled to said bus for loading said externally-supplied set of user-generated control words into said first control memory means under the control of said central processor unit; and

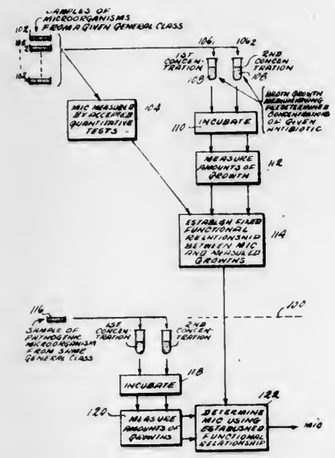
means, coupled to said first control memory means, for verifying that said user-generated control words loaded in said first control memory means by said loading means have been correctly loaded.

4,236,211

METHOD AND APPARATUS FOR DETERMINING THE MINIMUM CONCENTRATION OF ANTIBIOTIC NECESSARY TO AT LEAST INHIBIT MICROORGANISM GROWTH

James N. Arvesen, Princeton, N.J., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,683
Int. Cl.[3] G06F 15/20; C12Q 1/18; G01N 21/00
U.S. Cl. 364—413 **37 Claims**



37. Apparatus for determining the minimum inhibitory concentration (MIC) of a given antimicrobic agent with respect to a sampled microorganism from a given general class comprising:

means for measuring the amounts of growth of said sampled microorganisms during a predetermined time period in the presence of a predetermined number of respective predetermined concentrations of said antimicrobic agent and for providing electrical signals representative of such measured growth; and

means responsive to said electrical signals for automatically determining a substantially exact value of said MIC from said measured amounts of growth, said determined value of said MIC not being limited to said predetermined concentrations.

4,236,212

HELICOPTER PERFORMANCE CALCULATOR

Donald N. Arents, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Army, Alexandria, Va.

Filed Feb. 15, 1979, Ser. No. 12,418
Int. Cl.[3] G06F 9/06; B64C 19/00
U.S. Cl. 364—424 **5 Claims**

1. A device for aiding a helicopter operator in quickly determining the maximum hover weight of the helicopter comprising:

means for receiving a first input signal analogous to the air temperature outside of such helicopter,

means for converting said first input signal into a first electronic signal;

means for storing said first electronic signal;

means for receiving a second input signal analogous to the pressure altitude outside of such helicopter;

means for converting said second input signal into a second electronic signal,

means for storing said second electronic signal;

means for storing a plurality of other preprogrammed electronic signals analogous to the constants required and the calculations required in the computation of the available torque of such helicopter and the maximum hover weight of such helicopter;

first and second electrical switches;



first actuation means responsive to closing of said first switch for automatically converting said first and second electronic signals and certain ones of said other signals into a torque electronic signal analogous to the available torque of such helicopter;

display means for receiving said torque electronic signal and for producing an alphanumeric display readable by such operator analogous to said torque electronic signal;

second actuation means responsive to closing of said second switch for automatically converting said first and second electronic signals, certain ones of said other signals and said torque electronic signal into a hover electronic signal analogous to the maximum weight at which such helicopter can hover under ambient conditions; and

means for receiving said hover electronic signal and for producing on said display means an alphanumeric display readable by such operator analogous to said hover electronic signal.

4,236,213

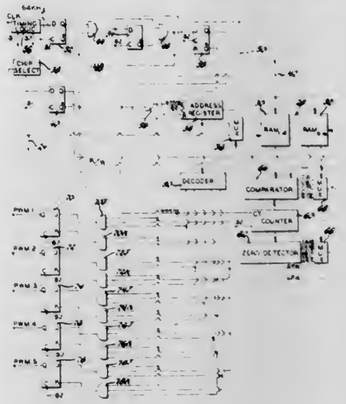
APPARATUS FOR PRODUCING PULSE WIDTH MODULATED SIGNALS

James D. Richardson, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1978, Ser. No. 963,694
Int. Cl.[3] G05B 15/00; F02D 37/00; H03K 3/017
U.S. Cl. 364—431 **9 Claims**

5. An engine control system comprising a microcomputer, means providing input data to said microcomputer, said microcomputer adapted to develop a plurality of control words defining desired engine operating conditions in response to said input data,

an engine control unit coupled to said microcomputer for data exchange therewith and including a counter, means for continuously clocking said counter, a plurality of RAM registers adapted to be loaded with respective ones of said control words by said microcomputer, a plurality of bistable output devices corresponding to respective ones of said RAM registers and responsive to a set pulse width command and a clear pulse width command for producing a bilevel output signal, logic means responsive to said control word and the state of said counter means for producing said set and clear pulse width commands, each of said control words having a first portion containing a pulse width number and a second portion containing a coded representation of the number of bits of said counter to be utilized by said logic means in producing said commands, microprogrammed control means, means providing a fixed frequency input to said microprogrammed control means, said microprogrammed control means sequentially transferring the content of said plurality of RAM registers to said logic means and selecting a corresponding one of said output devices in response to said fixed frequency input, said logic means producing said set pulse width command if the number of bits of said counter means specified by the code in said second portion of said control word are all the same value and producing said clear pulse width command if the count represented by the said number of bits of said counter means is greater than the pulse width number contained in said first portion of said control word.

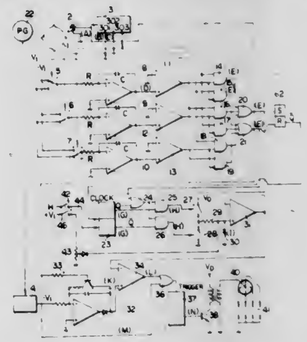


4,236,214

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Takao Sasayama, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 16, 1978, Ser. No. 869,626
Claims priority, application Japan, Jan. 17, 1977, 52-2904
Int. Cl.[3] F02P 5/08; F02B 5/02
U.S. Cl. 364—431 **16 Claims**



1. A method for enabling automatic control of the ignition

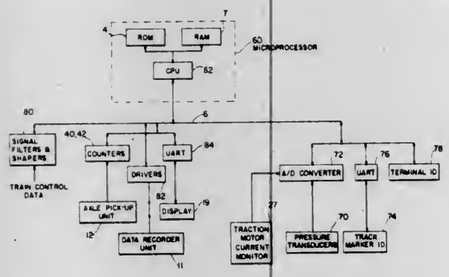
timing of an internal combustion engine, comprising the steps of detecting whether the engine speed is accelerating or decelerating and the magnitude of the acceleration or deceleration, generating a signal indicative of the acceleration or deceleration and the magnitude thereof, determining the direction and amount in shift of the ignition timing in response to the signal generated according to the results of each detection, and generating a signal indicative of the direction and amount in shift of the ignition timing for enablling automatic control of the ignition timing.

9. An apparatus for enabling control of the ignition timing of an internal combustion engine, comprising means for detecting whether the engine speed is accelerating or decelerating and the magnitude of the acceleration or deceleration, said detecting means generating a signal indicative of the acceleration or deceleration and the magnitude thereof, and means for determining the direction and amount in shift of the ignition timing in response to the signal generated by said detecting means according to the results of each detection by said detecting means, said shift-direction determining means generating a signal indicative of the direction and amount in shift of the ignition timing for enabling control of the ignition timing.

4,236,215
VEHICULAR DATA HANDLING AND CONTROL SYSTEM

Bernard E. Callahan, Hoffman Estates; George A. Carlson, Elk Grove Village; Richard N. Daniels, Wooddale; Richard H. Noens, Arlington Heights; Richard A. Stumpf, Des Plaines, and Richard H. Kruse, Deerfield, all of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Oct. 26, 1978, Ser. No. 954,925
Int. Cl.³ B60L 3/00
U.S. Cl. 364—436 **8 Claims**



1. In a vehicle data acquisition system, a speed determining circuit comprising:

transducer means for generating a first pulse signal having a frequency corresponding to the speed of the vehicle;

means for translating the first pulse signal to a second pulse signal, wherein each pulse of the second pulse signal has a width equal to the period of the first pulse signal;

counting means having a first input thereof connected to a clock and a second input thereof connected to the output of the translating means, the counting means being enabled by the second pulse signal to count clock pulses;

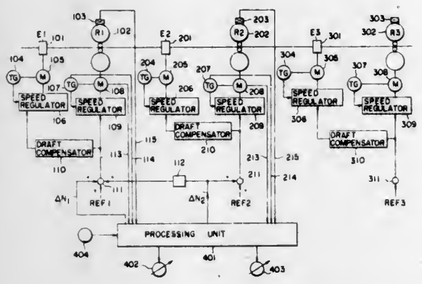
means for connecting the counting means to a microprocessor, the latter performing a "table look-up" procedure for equating a count in the counting means to a corresponding vehicle speed; and

means connected to the counting means for detecting a full count therein which is indicative of a vehicle at rest.

4,236,216
CONTROL SYSTEM OF INTERSTAND TENSION OF CONTINUOUS ROLLING MILLS

Yoshiharu Anbe, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation-in-part of Ser. No. 893,403, Apr. 4, 1978, abandoned. This application Apr. 27, 1979, Ser. No. 34,198
Claims priority, application Japan, Apr. 28, 1977, 52/49622
Int. Cl.³ G06F 15/46; B21B 37/00
U.S. Cl. 364—472 **14 Claims**



1. In a control system of the interstand tension of a continuous rolling mill including a plurality of stands each provided with mill rolls driven by a motor with a speed regulator, the improvement which comprises:

(a) one or more torque calculation devices each associated with each of the stands except the master stand and each adapted to calculate the torque of the associated stand,

(b) one or more no tension torque calculation devices each associated with each of the stands except the master stand and the stand on the upstream side of all of the other stands except the master stand and each adapted to calculate the no tension torque of the associated stand,

(c) one or more no tension torque memory devices each associated with each of the stands except the master stand, and each adapted to store the no tension torque of the associated stand,

(d) one or more no tension force memory devices each associated with each of the stands except the master stand and each adapted to store the no tension rolling force of the associated stand,

(e) one or more target torque calculation devices each associated with each of the stands except the master stand and each adapted to calculate the target tension torque for the associated stand,

(f) one or more speed correction calculation devices each associated with each of the stands except the master stand and each adapted to calculate the speed correction quantity for the motor of the associated stand, and

(g) one or more controlling means each associated with each of the stands except the master stand, each of the controlling means responsive to a reference speed signal for the motor of the associated stand and the speed correction quantity from the associated speed correction calculation device for controlling the speed regulator of the driving motor of the associated stand.

4,236,217
ENERGY UTILIZATION OR CONSUMPTION RECORDING ARRANGEMENT

Stanley P. Kennedy, 34 Greenmeadow Dr., Timonium, Md. 21093

Filed Apr. 20, 1979, Ser. No. 31,848
Int. Cl.³ G01R 21/00; G01D 9/00
U.S. Cl. 364—483 **10 Claims**

1. Electrical energy recording apparatus comprising

a removable solid state electronic recording cartridge including a protective cartridge case having a programmable read-only solid state electronic digital memory unit contained therewithin,

means for generating electrical pulses at a variable frequency varying as a function of instant electrical energy utilization at a given energy use location or facility,

means for converting the total number of pulses in each of a plurality of sequential time intervals into a succession of respective interval summation digital signals each of which is representative of the total pulses occurring in each respective successive time period,

temporary memory storage means for storing the first of said respective interval summation digital signals,

comparator means for comparing each succeeding interval summation digital signal with the then stored interval summation signal,

logic means responsive to the occurrence of a succeeding interval summation digital signal larger in value than the then stored interval summation digital signal to effect substitution of said larger value interval summation digital signal in said temporary memory means in replacement of the instant stored digital signal against which such larger replacement interval summation digital signal has been compared,

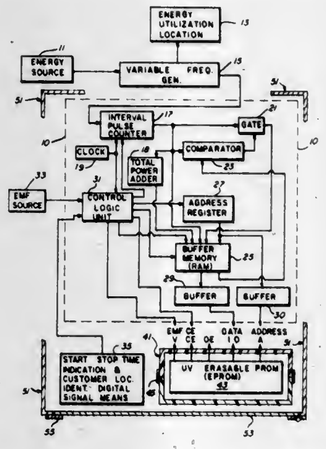
means for feeding each successive one of said interval summation digital signals to and recording such at respective sequentially successive memory locations on said removable recording cartridge programmable read-only solid state electronic digital memory unit,

means for recording in said cartridge read-only memory after the termination of a plurality of said time intervals, a digital signal equal in value to the interval summation digital signal then stored in said temporary memory and representing the peak energy utilization for the total of the recorded time intervals, said recording being effected at a selected open memory location in said removable cartridge read-only memory,

means for summing in a total energy utilization temporary memory the running composite total of said electrical pulses between the respective times of commencement and termination of recording of signals as a function of said pulses,

means for recording in said cartridge read-only memory at a selected open memory location a digital signal corresponding to the signal value then in said total energy utilization temporary memory at said termination time,

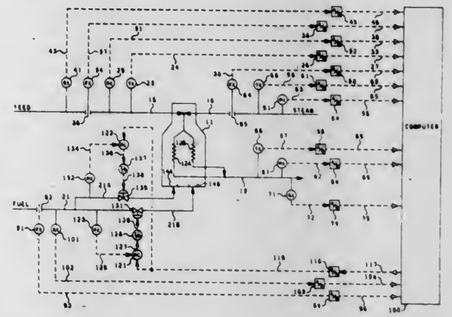
and means for recording in digital form on said removable cartridge read-only memory at respective open memory locations both the time of commencement and the time of termination of said time intervals.



4,236,218
CONTROL OF A CRACKING FURNACE

Wilbur N. Killebrew, Jr., Phoenix, Ariz., and Charles M. Stewart, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1979, Ser. No. 35,197
Int. Cl.³ G05B 13/04; G05D 7/06; G06F 15/46
U.S. Cl. 364—500 **43 Claims**



23. A method for operating a cracking furnace comprising the steps of:

combining a feed stream provided to said cracking furnace with a diluent fluid;

supplying fuel to said cracking furnace, the combustion of said fuel supplying heat to said cracking furnace;

removing a gaseous mixture, containing the products produced from the cracked components of said feed stream and containing said diluent fluid, from said cracking furnace;

establishing a first signal representative of a prediction of the mol percentage of said feed stream which will be cracked in said cracking furnace;

establishing a second signal representative of the actual mol percentage of said feed stream cracked in said cracking furnace;

establishing a third signal representative of a correction factor in response to said first signal and said second signal;

combining said first signal and said third signal to establish a fourth signal representative of a corrected prediction of the mol percentage of said feed stream which will be cracked in said cracking furnace;

establishing a fifth signal representative of the desired mol percentage of said feed stream cracked in said cracking furnace;

comparing said fourth signal and said fifth signal and establishing a sixth signal responsive to the difference between said fourth signal and said fifth signal; and

manipulating the heat input to said cracking furnace in response to said sixth signal.

4,236,219
TEMPERATURE CONTROL OF EXOTHERMIC REACTIONS

Wilbur N. Killebrew, Jr., Phoenix, Ariz., and Charles M. Stewart, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

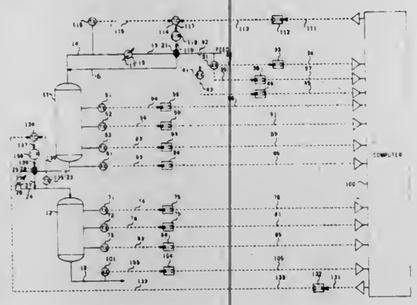
Filed May 2, 1979, Ser. No. 35,198
Int. Cl.³ G05B 13/04; G06F 15/46; C07C 5/02
U.S. Cl. 364—501 **52 Claims**

1. Apparatus comprising:

a first catalyst bed;

means for supplying a first feed stream containing a first constituent to said first catalyst bed, a portion of said first constituent in said first feed stream being removed from said first feed stream in said first catalyst bed;

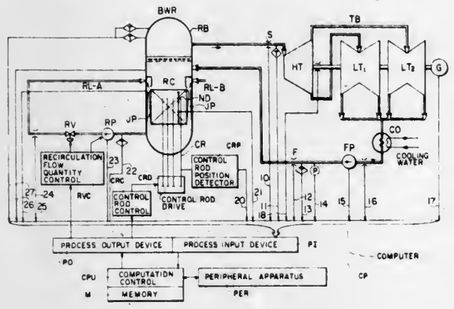
a second catalyst bed;
means for withdrawing the reaction effluent from said first catalyst bed as a first product stream and for supplying said first product stream as a second feed stream to said second catalyst bed, a portion of said first constituent in said second feed stream being removed from said second feed stream in said second catalyst bed;
means for withdrawing the reaction effluent, containing a substantially reduced concentration of said first constituent, from said second catalyst bed as a second product stream;
means for establishing a first signal representative of the percentage of said first constituent removed from said first feed stream in said first catalyst bed;
means for establishing a second signal representative of the percentage of said first constituent which is desired to be removed from said first feed stream in said first catalyst bed;



means for comparing said first signal and said second signal and for establishing a third signal responsive to the difference between said first signal and said second signal;
means for establishing a fourth signal representative of a prediction of the temperature change for said first feed stream required to compensate for changes in the flow rate of said first feed stream and changes in the concentration of said first constituent in said first feed stream so as to maintain said first signal substantially equal to said second signal;
means for combining said third signal and said fourth signal to establish a fifth signal representative of the temperature of said first feed stream required to maintain said first signal substantially equal to said second signal; and
means for manipulating the temperature of said first feed stream in response to said fifth signal.

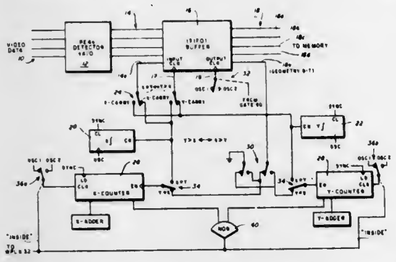
4,236,220
METHOD FOR CONTROLLING THE OPERATION OF NUCLEAR ELECTRIC GENERATING PLANT
Mineichi Kogami, Tokyo, and Toshikatsu Neda, Tokorozawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan
Filed Dec. 29, 1975, Ser. No. 644,813
Claims priority, application Japan, Dec. 25, 1974, 49-148184
Int. Cl.[2] G21D *3/08*
U.S. Cl. 364—504 **2 Claims**

1. A method of controlling the operation of a nuclear power electric generating plant by means of an electronic computer, said electronic computer including a computation control device, a memory device, a process input device and a process output device, said generating plant having a machine including a turbine-generator, comprising the steps of
presetting a predetermined operation target value and an operation limit of said machine into the memory device of said computer,
determining the present operation value of said machine,
obtaining the difference between said operation target value and the present operation value of said machine to produce an operation quantity at the output of a first control element,
storing an anticipation model in the memory device of said computer, said anticipation model anticipating the change in the operation state of said machine which would occur when the machine is controlled by said difference,
comparing said operation limit with a value determined by said operation model to produce a correction quantity at the output of a second control element,



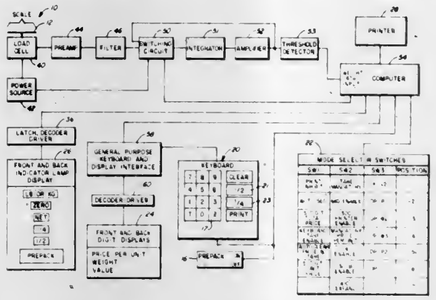
adding said operation quantity at the output of said first control element to the correction quantity at the output of said second control element to produce a control signal,
coupling said control signal to the memory device of said computer to modify said anticipation model, and
coupling said control signal to said machine through a third control element thereby controlling the output of said machine.

4,236,221
SCAN CONVERTER
Robert W. Cribbs, Placerville, and Gary L. Engle, Fair Oaks, both of Calif., assignors to Litton Industrial Products, Inc., Beverly Hills, Calif.
Filed Nov. 13, 1978, Ser. No. 959,975
Int. Cl.[3] G01N *29/00*; G01S *15/02*
U.S. Cl. 364—515 **7 Claims**



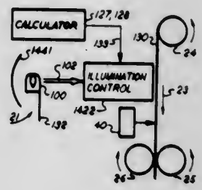
1. In an imaging system of the type including
video display means including a matrix of video picture elements,
memory means having an array of addressable locations for storing data for respective picture elements, the locations being accessed by the addressing of a co-ordinate pair of address lines and,
transducer means for launching an energy pulse into a body and for receiving pulse reflections from discontinuities in the pulse propogation path, the transducer means including means for producing an input signal indicative of the reflection amplitudes, the propagation path media being defined by successive contiguous body segments displayed as respective picture elements,
the improvement comprising:
means for resolving the propogation path into a pair of vectoral components;
means for producing respective first signals indicative of segment boundary crossings by the pulse in the vectoral direction having the faster rate of boundary crossings;
means for producing a second signal having a unique value indicative of a boundary crossing the pulse in the other vectoral direction;
means responsive to the first signals for sampling the input signal value;
means for applying the successively sampled input signal values to the memory means for storage as data signals; and
address means for accessing the memory location, associated with the appropriate picture element, the address means being responsive to the application of each data signal to change one co-ordinate of the address to that associated with successively adjacent picture elements in the fast vectoral direction and being further responsive to the unique values of the second signal to change the other co-ordinate of the address to that associated with successive adjacent picture elements in the other vectoral direction.

4,236,222
DIGITAL SCALE
Richard C. Loshbough, and Edward G. Pryor, both of Westerville, Ohio, assignors to Reliance Electric Company, Cleveland, Ohio
Division of Ser. No. 824,858, Aug. 15, 1977, Pat. No. 4,204,197. This application Jan. 15, 1979, Ser. No. 3,234
Int. Cl.[1] G01G *23/14*, *13/14*
U.S. Cl. 364—567 **8 Claims**



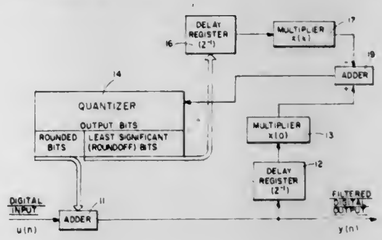
1. In a weight measuring system computing means of the type having circuit means for generating digital gross weight data, a tare memory means for storing data representing a tare weight, and means for periodically generating a net weight signal from the difference between the generated gross weight data and the tare weight data stored in said tare memory means, the improvement comprising means for modifying the tare weight data stored in said tare memory means by a predetermined amount to decrease the absolute value of the net weight in response to the generation of net weight data within a preselected range.

4,236,223
ELECTRO-OPTICAL PRINTER
Albert L. Stanly, 2285 W. Broadway, Anaheim, Calif. 92804, and Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803
Filed Dec. 27, 1976, Ser. No. 754,647
Int. Cl.[3] G06F *3/12*; G06K *15/12*
U.S. Cl. 364—710 **27 Claims**



1. A digital printer system comprising:
means for generating command signals;
electro-optical means for controlling illumination in response to the command signals; and
contact exposure means for contact exposing an illumination sensitive medium in response to the controlled illumination from said electro-optical means.

4,236,224
LOW ROUNDOFF NOISE DIGITAL FILTER
Tien-Lin Chang, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Dec. 26, 1978, Ser. No. 973,543
Int. Cl.[3] G06F *15/31*
U.S. Cl. 364—724 **5 Claims**



1. In a digital filter for filtering a digital input signal, said digital filter having delay means for delaying an output signal thereof for the period of a predetermined signal sampling sequence, means for multiplying the output of said delaying means by a predetermined factor, quantizer means for quantizing a function of the output of said multiplying means, the output of said quantizer means including predetermined "rounded" bits and predetermined least significant "roundoff" bits, an improvement being means for feeding back a signal representing the "roundoff" bits for subtraction from a signal representing the "rounded" bits comprising:
a delay device for delaying the "roundoff" bit output of said quantizer for a period equal to the period of said predetermined sequence,
means for multiplying the output of said last mentioned delay device by a predetermined integer, and
means interposed at the input of said quantizer for subtracting the output of said last mentioned multiplying means from the output of said first mentioned multiplying means, whereby the output of said subtracting means, which represents the difference between the rounded and roundoff bits for a previous sequence, is fed to the quantizer as the input signal thereto.

4,236,225

DATA BUFFER MEMORY OF THE FIRST-IN, FIRST-OUT TYPE, HAVING A VARIABLE INPUT AND A FIXED OUTPUT

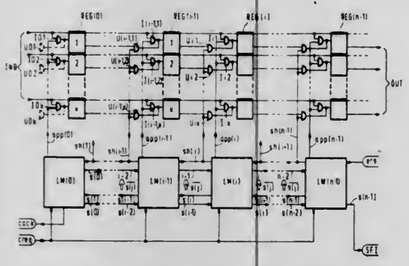
Pierre G. Jansen; Jozef L. W. Kessels, and Benny L. A. Waumans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,208

Claims priority, application Netherlands, Dec. 12, 1977, 7713707

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—900 **7 Claims**



1. A data buffer memory of the first-in, first-out type, having logic means for ensuring that an input for data to be written is situated substantially as near as possible to an output for data to be read depending on the filling of the buffer, thus providing an uninterrupted content of the buffer, said buffer having a plurality of registers, each register having at least one section, furthermore having an input bus for supplying data to an input of a register of said buffer assigned for this purpose, and an output connected to the last register of the buffer on which data to be read appear, said data buffer comprising:

logic means provided for each section of said buffer;

said logic means being at least functionally separate from said sections of said buffer except for connections;

said logic means being of the type enabling signals to be generated for a buffer having n registers (O, . . . n−1):

first logic means for detecting a condition that a register (i) is empty and that the next register (i+1) is full, plus determining where from the series of empty registers, the empty register adjoins a subsequent filled register;

second logic means for generating a shift signal for shifting the data in said buffer in the direction of the output register, indicating the status full of a preceding register and indicating the status empty of the relevant register (i);

third logic means for generating a status signal for the filling of a register (i) as the result of data entering said register;

said third logic means also serving to generate a status signal for the last register in said buffer when data is read from said last register.

4,236,226

MAGNETIC DOMAIN DEVICE

Evert H. L. J. Dekker; Ulrich E. Enz; Jan Haisma, and Klaas L. L. Van Mierloo, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 823,406, Aug. 10, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,981

Claims priority, application Netherlands, Aug. 27, 1976, 7609528

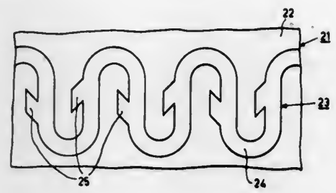
Int. Cl.³ G11C *19/08*

U.S. Cl. 365—20 **6 Claims**

1. A device for propagating magnetic domains comprising:

a first thin magnetic domain layer of a magnetizable material having an easy axis of magnetization which is substantially normal to the surface of the layer;

a single propagation pattern of electrically conductive material, of magnetic material, and of elements which cause an asymmetry force, said pattern comprising at least one propagation layer of material built up from the first layer of magnetizable material; and



bipolar current-supplying means, electrically communicating with the pattern of electrically conductive material, for propagating magnetic domains in the first layer.

4,236,227

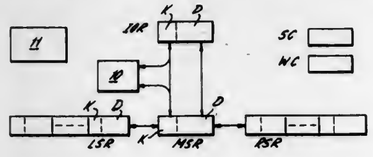
DATA STORAGE SYSTEM

Anthony V. Bull, Luton, and Richard M. Boardman, Hemel Hempstead, both of England, assignors to Honeywell Information Systems Inc., Brentford, England

Continuation of Ser. No. 873,562, Jan. 30, 1978, abandoned, which is a continuation of Ser. No. 582,540, May 30, 1975, abandoned. This application Jan. 2, 1979, Ser. No. 91

Int. Cl.³ G11C *15/00, 19/00*

U.S. Cl. 365—49 **11 Claims**



1. A self-sequencing storage system having shift registers for storing in a data file information records comprising key data and record data in a predetermined sequence based upon the key data in said information records and including a control circuit for controlling the access of records in said data file, the deletion of records from said data file, the shifting of said shift registers storing said data file, and the counting of records in said data file, said storage system comprising:

first shift register means for storing said information records;

second shift register means for storing said information records;

data port register means coupled to said first shift register means and said second shift register means, said first shift register means, said second shift register means and said data port register means controlled by said control circuit for shifting of information records between said first shift register means and said second shift register means, through said data port register means, said data port register means including a key data storage location and a record data storage location;

input/output register means for storing an information record, said input/output register means being coupled to said data port register means for the bidirectional transfer of key data and record data therebetween; and

key data comparator means coupled to said data port means and said input/output register means for comparing the key data of said information records shifted between said first shift register means and said second shift register means through said data port register means with key data in said information record stored in said input/output register and for gating an information record between said data port register means and said input/output register means during said addition of information records to said data file, said deletion of information records from said data file, and said access of information records in said data file to maintain said sequential order of said information records shifted between said first shift register means and said second shift register means through said data port register means.

4,236,228

MEMORY DEVICE FOR PROCESSING PICTURE IMAGES DATA

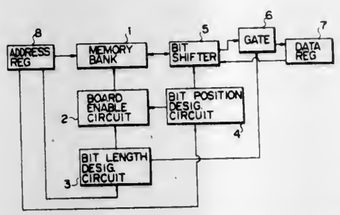
Takashi Nagashima, Oume, and Norio Aihara, Houya, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 887,336, Mar. 16, 1978. This application Jun. 27, 1979, Ser. No. 52,951

Claims priority, application Japan, Mar. 17, 1977, 52-2860577

Int. Cl.³ G11C *11/42*

U.S. Cl. 365—114 **5 Claims**



1. A memory device for processing a picture image which includes a memory bank having a plurality of memory boards each representing a mutually exclusive bit plane identified by an x and y address in which a bit representing picture element information can be stored; a board enable circuit connected to select a specific memory board for processing picture element information; a bit position designating circuit for generating a select signal including control information and being connected to said board enable circuit which receives said select signal in order to select a first said memory board for processing said picture information; a bit length designating circuit for generating a signal including control information representing a predetermined number of said memory boards to be selected in sequence and being connected to said board enable circuit which receives said sequential signal in order to select said memory boards for processing said picture information; and an address register comprising X and Y registers for storing X and Y address information for determining bit location of said predetermined number of memory boards selected by said board enable circuit and a register that stores said control information utilized by said bit position designation circuit and said bit length designation circuit.

4,236,229

SEMICONDUCTOR MEMORY CELL WITH SYNTHESIZED LOAD RESISTORS

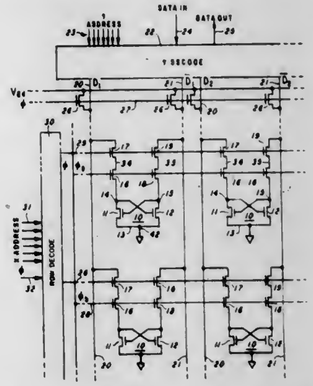
Edward R. Caudel, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1978, Ser. No. 925,891

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **11 Claims**

1. A static self-refresh memory formed in a face of a semiconductor body, comprising: an array of rows and columns of memory cells wherein each cell includes a pair of driver transistors and first and second pairs of coupling transistors of the same channel conductivity type formed at said face, each of the transistors having a current path in said face and a control electrode; a pair of storage nodes in said face with no d.c. path from said storage nodes to a voltage supply; a pair of complementary data lines at said face for each column, the data lines defining column lines; each pair of coupling transistors for each cell in each column having their current paths connected separately in series between one of the data lines and one of the storage nodes; means for precharging the pairs of data lines in all columns during a first time period; a plurality of first conductive strips on said face defining first row lines for applying operating voltage to the control electrodes of a first of the transistors in each of the pairs of coupling transistors separately for each row during said first time period; and a plurality of second conductive strips on said face defining second row lines for applying operating voltage to the control electrodes



of the other of the transistors in each of the pairs of coupling transistors separately for each row during a second time period after said first time period in each read/write operating cycle or refresh cycle; the first conductive strips applying operating voltage to the control electrodes of said first of the transistors during said second time period only during a read/write operating cycle and not during a refresh cycle; the second conductive strip in each row being adjacent to and parallel to the first conductive strip for such row.

4,236,230

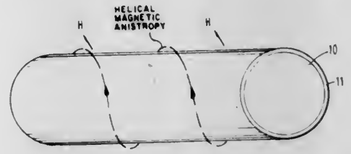
BISTABLE MAGNETOSTRICTIVE DEVICE

David A. Thompson, South Salem, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,250

Int. Cl.³ G11C *11/12*

U.S. Cl. 365—157 **18 Claims**



1. An elongated unitary magnetic device comprising

first and second portions having dissimilar chemical compositions,

at least said first portion being magnetostrictive and being capable of retaining net magnetization after being subjected to a magnetic field,

the net coercivity of said first portion being substantially greater than the net coercivity of the second portion,

said first and said second portions being separated along an interface of different composition providing a magnetic domain interface when said first portion has a net magnetization in a first direction and said second portion has a net magnetization substantially opposite from said first direction, and

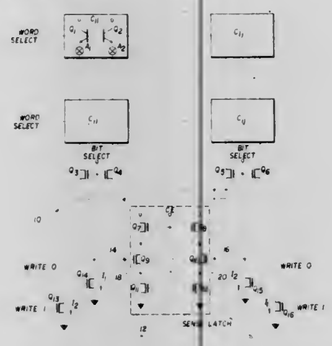
said first portion having a helical magnetic anisotropy about an axis along the overall length of said elongated device.

4,236,231

PROGRAMMABLE THRESHOLD SWITCHABLE RESISTIVE MEMORY CELL ARRAY

David L. Taylor, Carrollton, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 9, 1979, Ser. No. 82,505
Int. Cl.[1] G11C *11/34*
U.S. Cl. 365—163 11 Claims



1. In a memory array having a plurality of memory cells, word means for selecting a row of said array, a pair of bit lines per column, bit means for selecting a column of said array, and sensing means connected to said pair of bits line for sensing the electrical state of said pair of bit lines, the improvement comprising:

each cell including a pair of threshold means each switchable from a high resistance state to a low resistance state when a potential above its threshold is applied, each threshold means is connected to a respective bit line for the cell and have a different threshold; and

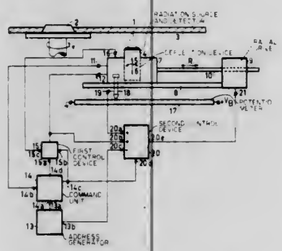
said sensing means including a bistable latch means for latching in one of two states in response to which threshold means switches first when a cell is selected by a ramp potential.

4,236,232

OPTICAL READ APPARATUS FOR READING A DISC-SHAPED RECORD CARRIER

Gerardus L. M. Jansen, and Leonardus G. H. Bovee, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1979, Ser. No. 8,134
Claims priority, application Netherlands, Oct. 17, 1978, 7810386
Int. Cl.[1] G11C *13/08*; G11B *7/00*
U.S. Cl. 365—234 5 Claims



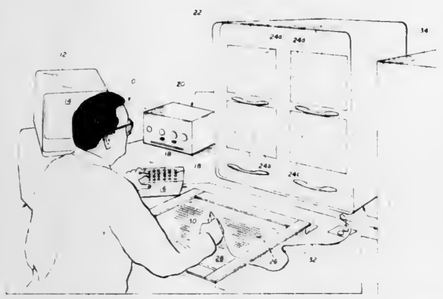
1. An improved optical read apparatus for reading a disc-shaped record carrier, on which information is recorded in accordance with a track configuration of substantially concentric tracks in the form of information units provided with an address, which apparatus comprises a read element for concentrating a read beam to a scanning spot on the information plane of the record carrier and detecting the information which is contained in the read beam after cooperation with said record carrier, an adjusting member carrying said read element for radially moving said read element, a drive arrangement for said adjusting member, a deflection device which cooperates with the radiation beam for radially shifting the scanning spot, a first control device for supplying a first control signal to the deflection device, a second control device for supplying a second control signal to the drive arrangement of the adjusting member, and a signal generator which cooperates with said first and second control devices for supplying a first reference signal which is indicative of the address of the desired information unit to be read so as to obtain a radial shift of the scanning spot to a position in which the desired information unit is read, the improvement being characterized in that the signal generator supplies a second reference signal which is indicative of the radial position of the desired information unit to be read, and that the apparatus is furthermore provided with a position indicator for supplying a position signal which is indicative of the radial position of the read element, and that the second control device supplies a second control signal which is dependent on the difference between the second reference signal from the signal generator and the position signal from the position indicator.

4,236,233

INTERACTIVE MULTIDIMENSIONAL CLASSIFICATION AND SORTING OF SEISMIC SEGMENT DATA

Robert S. Davis, Jr., and William A. Schneider, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1971, Ser. No. 214,188
Int. Cl.[1] G01V *1/34*
U.S. Cl. 367—71 24 Claims



1. A system for interpreting seismic segment data comprising:

means for displaying seismic segments within a space gate,

means for displaying parameters of said seismic segments including the RMS velocity as a function of time,

means for designating ones of said segments as primary seismic segments, and

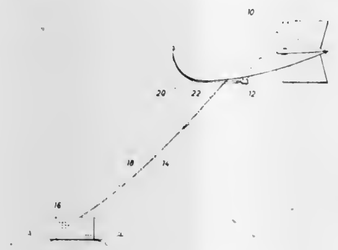
means for automatically computing and displaying the interval velocities of said primary seismic segments.

4,236,234

RADIO FREQUENCY SEISMIC GATHERING SYSTEM EMPLOYING AN AIRBORNE BLIMP

William T. McDavid, Cypress; James M. McKeever, Rosenberg, and Roger A. Imm, Houston, all of Tex., assignors to Fairfield Industries, Inc., Houston, Tex.

Filed Jul. 25, 1979, Ser. No. 60,625
Int. Cl.[1] G01V *1/22*
U.S. Cl. 367—77 10 Claims



1. In combination with a seismic gathering system employing

a plurality of field unit seismic detectors, each of the detectors including a receiver and a controllable rf transmitter, a predetermined received signal activating the transmitter at each of the detectors, and

a central data gathering station for transmitting predetermined signals to selectively controllably activate the transmitters at the field detectors and for receiving and recording the transmissions from the field detectors,

the improvement in a central gathering station comprising ground station apparatus including

recording means for recording seismic data,

a power supply for supplying operating power to said recording means and including a variable dc voltage output,

switching means connected to the variable dc voltage output from said power supply and to said recording means,

an rf coaxial cable connected to said switching means, and

blimp station apparatus including

a tethered aerodynamically stabilized blimp,

rf radio receiver means carried by said blimp and including decoupling means connected to said rf coaxial cable for separating rf signals from said variable dc voltage,

a preamplifier having a gain control connected to said decoupled variable dc output and having an rf output connected to said rf coaxial cable, and

antenna means for receiving field detector transmissions, said antenna means being coupled to said preamplifier for producing rf seismic data transmissions on said rf coaxial cable to said recording means.

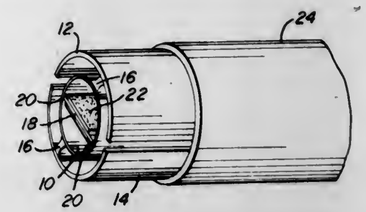
4,236,235

INTEGRATING HYDROPHONE SENSING ELEMENTS

Daniel E. Gilbert, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 24, 1978, Ser. No. 936,445
Int. Cl.[1] H04B *13/00*
U.S. Cl. 367—157 5 Claims

1. A hydrophone sensing element comprising a rigid cylinder, two rigid sensing surfaces disposed on opposite external sides of said cylinder and mechanically connected thereto essentially at two diametrically opposite points, and a piezoelectric polymer membrane extending diametrically across the cylinder and attached to the interior of the cylinder at two points displaced 90° from said first-mentioned points to tension



the membrane with energy applied through the cylinder from the sensing surfaces.

4,236,236

TIMEPIECE COMBINED WITH A THERMOMETER

Jean-Pierre Jaunin, La Neuveville, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed May 3, 1979, Ser. No. 35,760
Int. Cl.[1] G04B *37/12*
U.S. Cl. 368—11 8 Claims



1. Electronic timepiece including a time means for measuring and displaying time, and a temperature means for measuring temperature, said temperature means being electronically coupled to said time means;

said temperature means including a temperature transducer for measuring the temperature and transforming the temperature into an electrical signal and a mount for mounting said transducer to the rest of said electronic timepiece, said mount allowing movement of said transducer to assume either a first or a second position relative to said rest of said electronic timepiece, the first position being juxtaposed to certain other parts of the timepiece in order to measure the temperature of said certain other parts as an indication of the frequency drift caused by temperature variations within said timepiece, said second position being substantially away from said certain other parts of said timepiece to measure another temperature, for example that of ambient air; and,

said time means including a correcting means for receiving said electrical signal from said transducer when said transducer is in said first position and correcting the time display in response to said electronic signal.

4,236,237

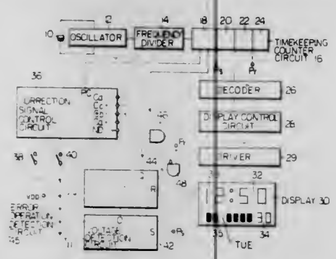
ELECTRONIC WRISTWATCH

Singo Ichikawa, Sayama, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 928,797
Claims priority, application Japan, Aug. 12, 1977, 52-107709[U]; Aug. 16, 1977, 52-109392[U]
Int. Cl.[1] G04B *9/00*; G04C *23/00, 9/00*
U.S. Cl. 368—66 12 Claims

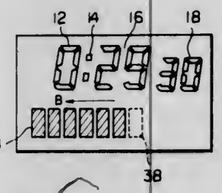
1. A battery warning system for an electronic timepiece powered by a battery, comprising:

a voltage detection circuit coupled to said battery for detecting a drop in voltage of said battery below a predetermined level to produce a detection signal indicative thereof;
means for providing the warning of a life of said battery in response to said detection signal; and
error operation detection circuit means comprising a



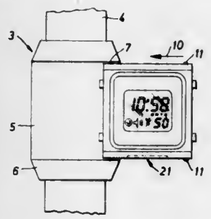
counter circuit means for counting said detection signal and producing a control signal to enable said warning providing means when a count of said detection signal reaches a predetermined count value within a predetermined time interval, and reset pulse generating means for resetting said counter circuit means when the count of said detection signal is less than said predetermined count value within said predetermined time interval.

4,236,238
ELECTRONIC DIGITAL TIMEPIECE HAVING A STOPWATCH FUNCTION AND A TIMER FUNCTION
Katsuhiko Komiyama, and Osamu Kamisawa, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan
Filed Apr. 11, 1979, Ser. No. 29,235
Claims priority, application Japan, Apr. 17, 1978, 53-44179
Int. Cl.[1] G04F *10/00*
U.S. Cl. 368—71 **14 Claims**



1. An electronic timepiece, comprising:
a source of a standard high frequency signal;
frequency divider means responsive to said standard frequency signal for producing a standard time signal and a train of clock pulses;
first counter circuit means responsive to said standard time signal for counting at least the hours and minutes of current time;
external actuation means for selectively generating first and second control signals;
second counter circuit means for receiving said train of clock pulses, being responsive to said first control signal for counting said clock pulses in an upward direction and responsive to said second control signal for counting said clock pulses in a downward direction;
direction indication drive signal generation means responsive to said first control signal for generating a first display drive signal and responsive to said second control signal for generating a second display drive signal;
digit display decoder means coupled to receive said first and second counter circuit contents and to thereby produce digit display drive signals; and
opto-electronic display means comprising a digit display pattern and an array of linearly arranged display segments, being responsive to said digit display drive signals for displaying the contents of said first and second counter circuits in digital form by said digit display pattern, and furthermore responsive to said first display drive signal for successively and cyclically activating and deactivating said linearly arranged display segments in a first direction, and responsive to said second display drive signal for successively and cyclically activating and deactivating said linearly arranged display segments in a second direction.

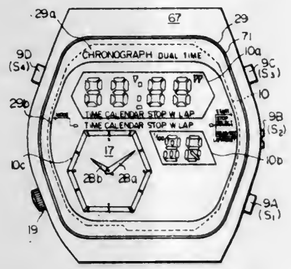
4,236,239
ELECTRONIC TIMEPIECE COMPRISING TWO DIFFERENT DISPLAYS
Max Imgrüth, Basel, and Claude A. Gygax, Evilard, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland
Filed Jul. 6, 1979, Ser. No. 55,246
Int. Cl.[1] G04B *19/24;* **G04C** *21/34;* **G04B** *37/00*
U.S. Cl. 368—72 **6 Claims**



1. An electronic timepiece comprising a support, a casing susceptible to turn entirely on itself in said support in order to expose in a first position a first face of said casing and in a second position a second face opposed to the first, said support comprising a rectangular plate with two opposed edges having upwardly extending wing portions giving the shape of a U having a relatively small height, an attachment means fixed to said plate in the neighbourhood of said wing portions, said casing being adapted to slide parallel to said wing portions from one edge to the other of said plate, and further to effect its turning movement in at least a third extreme position, the casing containing an energy source, electronic circuits and first and second separate displays, the first display occupying said first face of the casing and arranged to display the time by analog means and the second display occupying said second face and arranged to display the time by digital means.

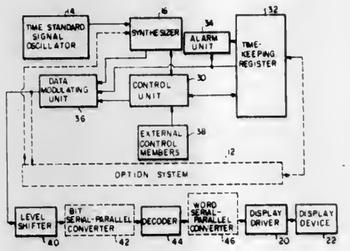
4,236,240
WATCH MODULE CONSTRUCTION
Masaru Yoshida, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan
Filed Sep. 18, 1979, Ser. No. 76,534
Claims priority, application Japan, Sep. 22, 1978, 53-116840
Int. Cl.[1] G04B *19/00;* **G04G** *9/00;* **G04F** *10/04*
U.S. Cl. 368—76 **17 Claims**

1. A watch module construction for an electronic timepiece powered by a battery, comprising:
a digital display device composed of a liquid crystal display cell being of a polygonal profile in plan, with one internal angle of said profile being in the range 180 degrees to 360 degrees;
an analog display device composed of time indicating hands;
a base plate;
a circuit board disposed substantially on the same plane as said base plate;
a cell support frame disposed on one side of each of said base plate and said circuit board, said cell support frame having a first recess in which said liquid crystal display cell is disposed, and a second recess in which said time indicating hands are disposed;
an IC chip mounted on the other side of said circuit board in substantially axial alignment with said display cell;



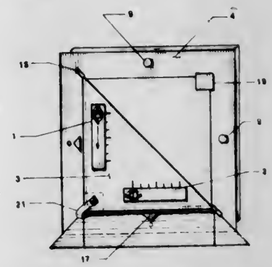
a wheel train bridge mounted on the other side of said base plate to provide an axial space between said wheel train bridge and the other side of said base plate at an area substantially in axial alignment with said time indicating hands; and
a wheel train mechanism disposed in said axial space between said wheel train bridge and said base plate.

4,236,241
ELECTRONIC TIMEPIECE
Shigeru Morokawa, Higashiyamato; Fukuo Sekiya, Tokorozawa; Yukio Hashimoto, Ishigami-Niiza; Yasushi Nomura, and Keiichiro Koga, both of Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan
Division of Ser. No. 626,791, Oct. 29, 1975, Pat. No. 4,150,535.
This application Sep. 15, 1978, Ser. No. 943,265
Claims priority, application Japan, Oct. 31, 1974, 49-125801
Int. Cl.[1] G04C *19/00, 3/00, 17/00*
U.S. Cl. 368—82 **10 Claims**



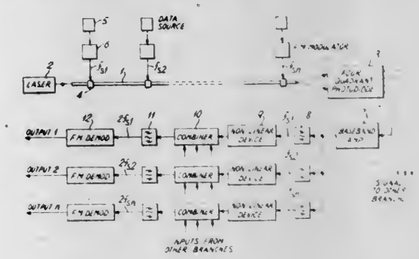
1. An electronic timepiece comprising:
a frequency supply for providing a relatively high frequency time base signal;
a frequency converter responsive to said relatively high frequency time base signal to provide a timing signal, a clock signal, and a time unit signal;
timekeeping circuit means responsive to said time unit signal to provide a time information signal;
means for chopping at least one of said timing signal, clock signal, and time information signal into periodic bursts to effect transfer of said at least one of said timing signal, clock signal, and time information signal from one part to another part in said timepiece; and
display means for displaying time in response to said time information signal.

4,236,242
DUAL TIMER DEVICE
Lyndon O. Barton, 26 Shull Dr., Newark, Del. 19711
Filed Aug. 21, 1979, Ser. No. 68,460
Int. Cl.[1] G04F *1/04;* **G04B** *37/00*
U.S. Cl. 368—95 **4 Claims**



1. A timing device comprising a hinged holder in the shape of a right triangle having two sides and a hypotenuse, two gravity actuated timers one of which is mounted parallel to one of said two sides and the other of which is mounted parallel to the other of said two sides, a frame in the shape of a rectangle, a base and a securing device to measure and control playing time in concentration games wherein:
a. the holder carries said timers and is hinged to the frame along a diagonal which is parallel to said hypotenuse such that said timers are rotatable in the plane perpendicular to that in which they are mounted,
b. said frame and said base provide indexing means for said timers,
c. said holder when in one direction rotating around said diagonal acting to stop one of said timers and when rotating in a direction opposite said one direction acting to stop another of said timers, and
d. said securing device attaches said holder to said frame.

4,236,243
TELECOMMUNICATION SYSTEMS
David E. N. Davies, Hemel Hempstead, and Stuart A. Kingsley, London, both of England, assignors to National Research Development Corporation, London, England
Filed Apr. 12, 1979, Ser. No. 29,532
Claims priority, application United Kingdom, Apr. 20, 1978, 15672/78
Int. Cl.[1] H04B *9/00*
U.S. Cl. 370—3 **9 Claims**



1. A telecommunications system comprising a multimode optical fibre highway, a source of coherent electromagnetic radiation of optical frequency at one end of the highway, a plurality of modulators spaced along the highway each comprising means for modulating an individual subcarrier signal with a data signal and means for periodically varying the optical path length of a short section of the highway with the

modulated subcarrier signal, and demodulating means connected to the other end of the highway said demodulating means comprising photodetector means, a plurality of channels selective to individual ones of the subcarrier frequencies and each of said channels including a non-linear device, a filter responsive to an even harmonic of the subcarrier in that channel, and an FM demodulator.

4,236,244

DIGITAL COMMUNICATIONS TRANSMISSION SYSTEM

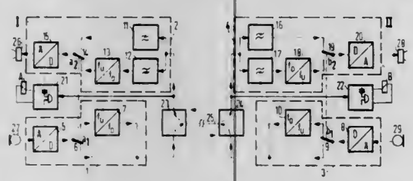
Herbert Strehl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,140

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807785

Int. Cl.[1] **H04L** *5/14*

U.S. Cl. 370—30 **14 Claims**



1. A digital communications transmission system comprising:

a transmission medium;

a pair of termination sets connected to opposite ends of said transmission medium; and

a calling terminal and a called terminal connected to respective ones of said termination sets,

said calling terminal including a transmitter operable to transmit signals in a first frequency position, and a receiver operable to receive signals in a second frequency position, said called terminal including a transmitter operable to transmit signals in said second frequency position and a receiver operable to receive signals in said first frequency position.

each of said transmitters comprising a digital input circuit for inputting digital signals, a frequency converter having an input, and an output connected to the respective termination set, a transmission transfer switch including an input connected to said digital input circuit, a first output connected to said input of said frequency converter, and a second output connected in common with said output of said frequency converter.

4,236,245

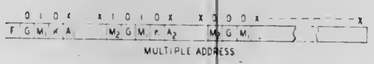
RING COMMUNICATION SYSTEM DATA PACKETS REUSABLE A VARIABLE NUMBER OF TIMES

Stanley L. Freeny, Middletown; Arthur B. Larsen, Colts Neck, and Thomas J. Pedersen, Lincroft, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 17, 1979, Ser. No. 30,811

Int. Cl.[1] **H04J** *6/02*

U.S. Cl. 370—94 **11 Claims**



1. In a transmission system (**102**) for passing packets of data through a plurality of stations (**101**), each data packet having a portion for accommodating a burst of data destined for an addressee station, a portion for accommodating data identifying the addressee station and data indicating whether the addressee station has withdrawn the data burst and wherein individual ones of the stations include data inserting means (**4, 5, 10, 12, 13, 7-10, 7-20, 7-21, 7-22**) effective when the station has a data burst thereat destined for a new addressee station and responsive to incoming data in the packet indicating that the data burst has been withdrawn therefrom for inserting the data burst thereat into a portion of the packet priorly accommodating the withdrawn data burst;

characterized in that the data inserting means (**4, 5**) includes means for inserting new addressee station identifying data subsequent to the portion of the packet accommodating the data identifying the addressee station which withdrew the data burst.

4,236,246

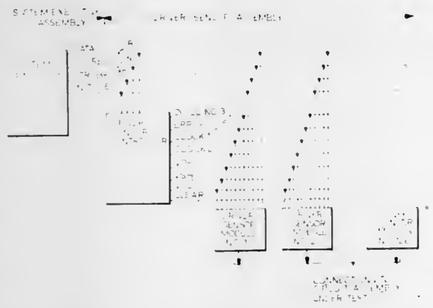
METHOD OF AND APPARATUS FOR TESTING ELECTRONIC CIRCUIT ASSEMBLIES AND THE LIKE

James K. Skilling, Harvard, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Nov. 3, 1978, Ser. No. 957,658

Int. Cl.[1] **G01R** *31/28;* **G06F** *11/00*

U.S. Cl. 371—27 **15 Claims**



1. A method of detecting and locating faults of electronic components and the like operating with digital signals and interconnected by nodes, that comprises, driving the nodes with voltage signals corresponding to true and false logic states of said components and a third state wherein the node voltage corresponds to that which would exist if the node were disconnected from the driving, said driving being effected in a predetermined and uninterrupted sequence of voltage signals corresponding to sequences of said states; sensing and detecting the sequences of states at said nodes; comparing the sequences of the detected states with a sequence of predetermined true, false and third-states; and indicating the comparison.

4,236,247

APPARATUS FOR CORRECTING MULTIPLE ERRORS IN DATA WORDS READ FROM A MEMORY

Carl-Erik Sundberg, Lund, Sweden, assignor to Organisation Européene de Recherches Spatiales, Paris, France

Continuation-in-part of Ser. No. 857,974, Dec. 6, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,730

Int. Cl.[1] **G06F** *11/10;* **G11C** *29/00*

U.S. Cl. 371—38 **3 Claims**

1. An apparatus for detecting and correcting multiple errors in a codeword read from a memory, comprising:

first circuit means for accepting the codeword from the memory and generating the syndrome word of said codeword;

second circuit means for checking the value of the syndrome word from the syndrome generating means and detecting the occurrence of a no-double error or a double error condition in the codeword;

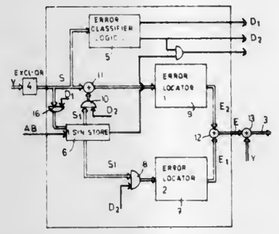
syndrome store means connected for storing the syndrome word from the syndrome generating means in response to the occurrence of a no-double error condition;

third circuit means coupled to the output of the syndrome generating means and being operative to transfer said syndrome word in response to a no-double error condition, said third circuit means being further operative to combine said syndrome word with the stored error syndrome from the syndrome store in response to a double error condition for generating a second error syndrome;

first error correction means in electrical communication with the output of said third circuit means and the input to said first circuit means for providing an error correction in response to the detection of a single error in the codeword or providing an error correction for the second error to occur in the codeword in response to the detection of a double error condition;

fourth circuit means in electrical communication with said syndrome store to select said stored syndrome word in response to a double error condition;

second error correction means in electrical communication with said fourth circuit means and the input to said first circuit means for providing an error correction for the first error to occur in the codeword in response to the detection of a double error condition.



4,236,248

TRANSMISSION SPEED SWITCHING SYSTEM

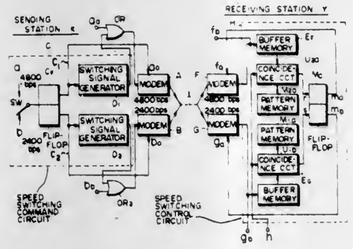
Hiroichi Teramura, 3-22-18, Kugahara, Ota-ku, Tokyo-to; Yasuhiro Yamazaki, 19-42, Sodegahama, Hiratsuka-shi, Kanagawa-ken, and Yasushi Wakahara, 3-17-23, Takanoda, Nerima-ku, Tokyo-to, all of Japan

Filed Apr. 20, 1978, Ser. No. 898,020

Claims priority, application Japan, Apr. 25, 1977, 52/47682

Int. Cl.[1] **H04L** *27/18*

U.S. Cl. 375—53 **3 Claims**



3. In a communication system having a transmission station for transmitting at different speeds by transmitting a carrier modulated by different code trains having respective symbol intervals S_i where $i = 1,2,3, \ldots, n$, and a receiving station having a plurality of demodulators for receiving at different speeds by enabling a selected one of said demodulators, the improvement comprising a transmission speed switching system wherein said transmission speed switching system is comprised of: modulation means in the transmission station for modulating the transmitted carrier by a code train having a symbol interval S satisfying the relationship $S = a_i S_i$ for all i where a_i are integers; demodulation means in the receiving station and cooperative with the enabled one of the demodulators in the receiving station for demodulating the carrier modulated by the code train having the symbol interval S and for developing an output code train indicative of transmission speed; and control means responsive to the output code train of said demodulation means for enabling a selected one of the demodulators of the receiving station corresponding to the transmission speed indicated by the output code train of said demodulation means.

4,236,249

CIRCUIT ARRANGEMENT FOR CORRECTING FREQUENCY ERRORS DURING A TRANSMISSION OF DATA

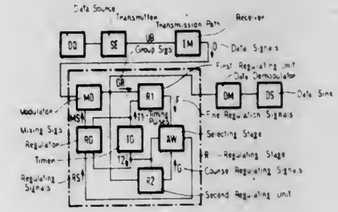
Erich Burger, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,729

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802784

Int. Cl.[1] **H03F** *9/10*

U.S. Cl. 375—79 **8 Claims**



1. A circuit arrangement for correcting frequency errors occurring during a transmission of data by means of data signals which are modulated according to a frequency-differential phase modulation, comprising a regulating stage means for generating corrected data signals from the data signals, said regulating stage means comprising:

a modulator means for generating group signals by converting the data signals with mixing signals, said group signals representing the corrected data signals;

a first regulating unit means for generating fine regulating signals from said group signals if a frequency error of the mixing signals is smaller than a given quantity;

a second regulating unit means for generating course regulating signals from said group signals if the frequency error is larger than said given quantity;

a selection stage means for generating regulating signals from either the fine regulating signals or the course regulating signals in dependence upon the magnitude of the frequency error; and

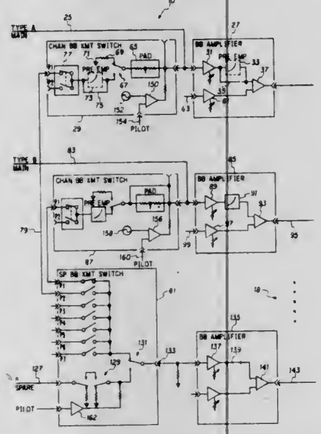
a regulator means for generating said mixing signals from timing pulses of a given repetition frequency supplied by a timer and in dependence upon the regulating signals which regulate a repetition frequency of the mixing signals.

4,236,250

MULTILINE SWITCH

Charles E. Huffman, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 21, 1979, Ser. No. 41,275
Int. Cl.[1] H04B 7/02
U.S. Cl. 455—49 6 Claims



3. Multiple channel communication apparatus for forwarding signals, at least one of which signals requires power redistribution before forwarding comprising, in combination:

a plurality of signal forwarding channels, each channel including main and spare circuits with each circuit being selectively alterable to provide power redistribution characteristics to signals passing therethrough;

a spare signal forwarding channel selectively connected for receiving signals from one of said spare circuits associated with an inoperative main circuit forwarding channel; and

means in said spare circuits for maintaining power levels of signals applied to said spare channel at substantially equal levels regardless of the source of the signals being forwarded.

4,236,251

FREQUENCY SYNTHESIZER RECEIVER HAVING MEMORY FOR STORING FREQUENCY DATA

Tsutomu Ohgishi, Hirakata; Toru Akiyama, Osaka, and Tadashi Sakurai, Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 29, 1977, Ser. No. 837,761
Claims priority, application Japan, Oct. 20, 1976, 51-127652
Int. Cl.[2] H04B 1/26
U.S. Cl. 455—180 21 Claims

1. A frequency synthesizer receiver, comprising:

first memory means for storing digital value data concerning a broadcasting frequency,

entry means coupled to said first memory means for selectively entering into said first memory means digital value data concerning a broadcasting frequency,

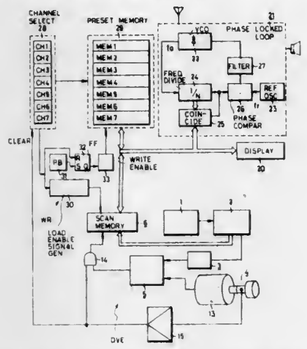
second memory means having a plurality of storing locations, each adapted for storing digital value data concerning a specified broadcasting frequency,

write enable means for said second memory means for selectively entering into said second memory means digital value data from said first memory means concerning a broadcasting frequency,

station selecting means operatively coupled to said second memory means for selecting one of said plurality of storing locations in said second memory means,

said second memory means being responsive to said station selecting means and said write enable means for loading the digital value data which is entered into said first memory means in the location of said second memory means selected by said station selecting means,

local oscillating means responsive to the digital value data stored in either of said first and second memory means for



providing an oscillation frequency signal the frequency of which is associated with said digital value data stored in said first and second memory means and

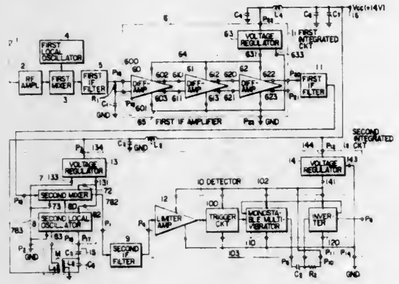
means for selectively and operatively coupling the output of either of said first and second memory means directly to said local oscillating means.

4,236,252

DOUBLE-CONVERTING FM TUNER

Yasuo Kominami, Kokubunji; Masanori Ienaka; Takeshi Wada, both of Kodaira; Yukihiko Miyamoto, and Tsuneo Yamada, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 6, 1979, Ser. No. 10,019
Claims priority, application Japan, Mar. 15, 1978, 53/28657
Int. Cl.[1] H04B 1/26
U.S. Cl. 455—207 8 Claims



1. A double-converting FM tuner comprising:

an antenna;

a radio frequency amplifier circuit for amplifying an FM radio frequency signal received at said antenna;

a first frequency converter circuit which is made up of a first mixer circuit and a first local oscillator circuit and which generates a first intermediate frequency signal from said FM radio frequency signal and a first local oscillation frequency signal generated at said first local oscillator circuit;

a first filter means for deriving said first intermediate frequency signal from said first frequency converter circuit;

a first intermediate frequency amplifier circuit coupled to said first filter means for amplifying said first intermediate frequency signal and limiting the amplitude of said first

intermediate frequency signal to a constant magnitude, said first intermediate frequency amplifier circuit being constructed in the form of a first semiconductor integrated circuit having first and second operating-voltage-feeding external terminals for supplying an operating voltage therebetween;

a second filter means coupled to said first intermediate frequency amplifier circuit for passing said first intermediate frequency signal therethrough and rejecting higher harmonic frequency components of said first intermediate frequency signal amplitude-limited by said first intermediate frequency amplifier circuit;

a second frequency converter circuit which is made up of a second mixer circuit and a second local oscillator circuit and which generates a second intermediate frequency signal from said first intermediate frequency signal derived through said second filter means and a second local oscillation frequency signal generated at said second local oscillator circuit, said second frequency converter circuit being constructed in the form of a second semiconductor integrated circuit having first and second operating-voltage-feeding external terminals for supplying an operating voltage therebetween;

a pulse count type FM demodulator circuit for obtaining an FM demodulation output signal from said second intermediate frequency signal, said pulse count type FM demodulator circuit being constructed in the form of a third semiconductor integrated circuit having first and second operating-voltage-feeding external terminals for supplying an operating voltage therebetween; and

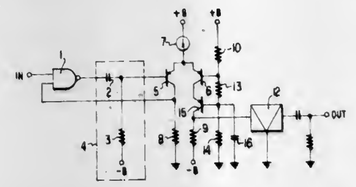
decoupling filter means for connecting respective ones of said first operating-voltage-feeding external terminals of the first and second semiconductor integrated circuits to said first operating-voltage-feeding external terminal of the third semiconductor integrated circuit and for preventing an undesired signal generated at said first operating-voltage-feeding external terminal of the third semiconductor integrated circuit from being transferred to said respective ones.

4,236,253

MONOSTABLE MULTIVIBRATOR FOR USE IN PULSE COUNT DEMODULATOR OR THE LIKE

Masaru Onishi, and Yukihiko Miyamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 74,680
Claims priority, application Japan, Sep. 18, 1978, 53-114281
Int. Cl.[1] H04B 1/16; H03D 3/04; H03K 3/284
U.S. Cl. 455—214 6 Claims



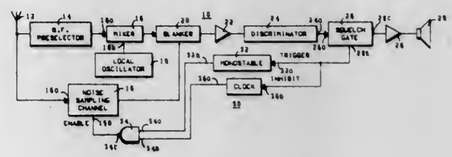
1. In a monostable multivibrator including a gate circuit having at least two inputs where an input signal is applied to a first one of the two inputs and a feedback signal to the other input, a differentiator circuit responsive to the output from the gate circuit, a differential inverter responsive to said differentiator circuit, supplying said feedback signal and including a current switching circuit having a pair of transistors where an output load is connected to the collector of one of said transistors for deriving an output signal, the improvement comprising an AC grounded base transistor connected in series between the collector of said one transistor and said output load.

4,236,254

RADIO RECEIVER BLANKER INHIBIT CIRCUIT

Michael J. Augustin, and Wade Williams, both of Fort Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 27, 1978, Ser. No. 890,735
Int. Cl.[1] H04B 1/10
U.S. Cl. 455—223 7 Claims



1. An improved blanker circuit for a radio receiver for processing a received signal having a blanker gate and blanking circuitry, the improvement comprising:

sense means for sensing, after the blanking gate, the relative signal to noise ratio of the receiver processed signal wherein said sense means comprises a squelch gate for squelching audio output of the receiver, said squelch gate responding to a predetermined degradation in said relative signal to noise ratio of said receiver processed signal to block said audio output; and

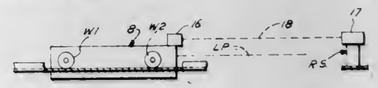
inhibitor means for inhibiting blanking action for a predetermined time period in response to said squelch gate sensing said predetermined degradation in said signal to noise ratio and blocking the audio output.

4,236,255

RACK ENTRY VEHICLE COMMUNICATION SYSTEM

Robert C. Burgener; Philip T. Martin, both of Columbus, Ohio, and John J. Lord, Pontiac, Ill., assignors to Interlake, Inc., Oak Brook, Ill.

Filed Dec. 15, 1978, Ser. No. 969,798
Int. Cl.[1] H04B 9/00
U.S. Cl. 455—603 12 Claims



1. In a vehicle for transporting loads among the racks of a warehousing system, improved apparatus for communicating variable information between the vehicle and a reference station as the vehicle is moving along a vehicle path comprising:

source means for generating optical radiation;

transducer means for converting optical radiation into corresponding electrical signals;

means for supporting the source means and transducer means in alignment along an optical path as the vehicle is moved along the vehicle path; and

transceiver means for modulating the generated optical radiation according to the information to be communicated and for converting the electrical signals resulting from received optical radiation into a useful form of information.

4,236,256

ASYNCHRONOUS DATA RECEIVER

Charles A. Brackett, Summit, N.J., and Stewart D. Personick, Cupertino, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 26, 1979, Ser. No. 23,736
Int. Cl.[2] H04B 1/00; H04L 25/49; G08C 9/00
U.S. Cl. 455—608 8 Claims

1. An asynchronous receiver for generating a binary electrical signal from a three-level electrical signal having a DC

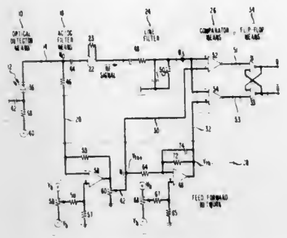
component and a bipolar AC component superimposed on said DC component, in which a positive pulse of the bipolar component corresponds to one transition of the binary signal and a negative pulse of the bipolar component corresponds to the opposite transition of the binary pulse, characterized by

filter means (**16**) for separating said DC component from said AC component into separate circuit paths,

amplifier means (**22**) in one of said paths for amplifying said AC component,

feed-forward means (**28**) in the other of said paths for generating from said DC component a pair of voltage thresholds,

comparator means (**26**) for comparing said amplified AC component with each of said thresholds and for generating an electrical pulse whenever said AC component is more positive than one of said thresholds or more negative than the other of said thresholds, and



flip-flop means (**34**) responsive to the output of said comparator means for regenerating said binary electrical signal.

DESIGN PATENTS

GRANTED NOV. 25, 1980

ERRATA

For CLASS	See PATENT NO.
D25-018	257,570

257,546
COSTUME
Robert Fletcher, Los Angeles, Calif., assignor to Paramount Pictures Corporation
Filed Apr. 10, 1979, Ser. No. 28,837
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—30

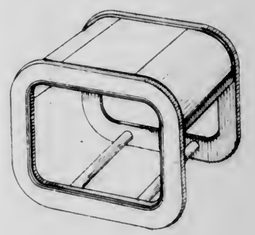


257,547
BELT BUCKLE OR SIMILAR ARTICLE
Ernest H. Smith, P.O. Box 891, West Sacramento, Calif. 95691, and Roddy Rodgers, Rte. 3, Box 725, Traveler's Rest, S.C. 29690
Filed May 17, 1978, Ser. No. 907,270
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—427

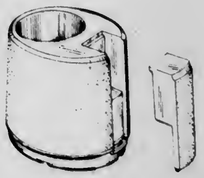




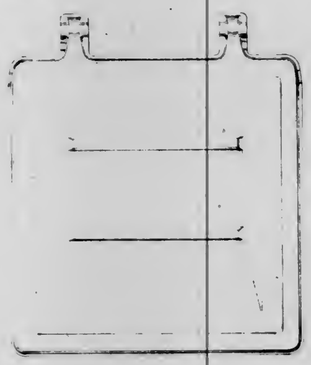
257,548
TABLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Amsterdam, N.Y.
Filed Aug. 12, 1977, Ser. No. 824,145
The portion of the term of this patent subsequent to Dec. 4, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



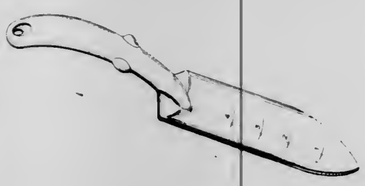
257,549
COMBINED BOTTLE WARMER AND MEASURING SPOON
David Chapman, Chicago, Ill., assignor to Gerber Products Company, Fremont, Mich.
Filed May 1, 1978, Ser. No. 901,926
Term of patent 14 years
Int. Cl. D7—*04, 03*
U.S. Cl. D7—69



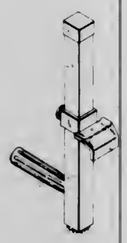
257,550
LID FOR A REFUSE CONTAINER
William J. Holcroft, Statesville, N.C., assignor to Rubbermaid Applied Products, Inc., Statesville, N.C.
Filed Feb. 3, 1978, Ser. No. 874,822
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194



257,551
TRANSPLANT TROWEL
Edward A. Nadle, Los Angeles, Calif., assignor to Enco Die Casting Co.
Filed Jul. 3, 1978, Ser. No. 921,601
Term of patent 14 years
Int. Cl. D8—*01*; D7—*99*
U.S. Cl. D8—10



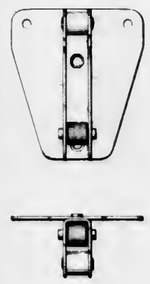
257,552
CARTON SCORING DEVICE
Haskell Sobol, 723 W. 101 Ter., Kansas City, Mo. 64114
Filed May 30, 1978, Ser. No. 910,479
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—14



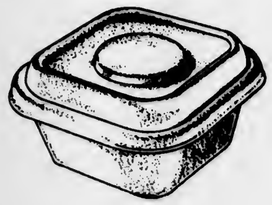
257,553
PORTABLE ELECTRIC-PLATING GUN
Keiichi Hashimoto, c/o Nippon Aviotronics Co., Ltd., 15-1, Nishishinbashi 1-chome, Minato-ku, Tokyo, Japan
Filed Jun. 30, 1978, Ser. No. 920,657
Claims priority, application Japan, Jan. 24, 1978, 53-1636
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



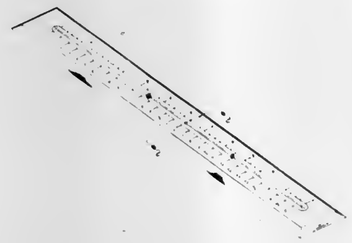
257,554
ANCHOR LINE ADJUSTER AND THE LIKE
Nathan A. Haft, 820 Tenth Ave., New York, N.Y. 10019
Filed Apr. 26, 1978, Ser. No. 900,202
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396



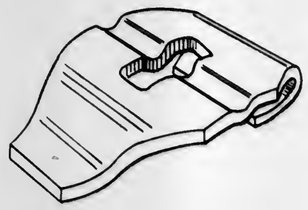
257,555
PACKAGING CONTAINER
Yoshitaka Ikushima, Machida, and Isao Ozawa, Tokyo, both of Japan, assignors to Aoba Shigyo Company, Limited and Mizuno Shigyo Company, Limited, both of, Japan
Filed Jan. 18, 1978, Ser. No. 870,523
Claims priority, application Japan, Sep. 20, 1977, 52-37183
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—425



257,556
RULER
Jerrell F. Fulton, 2454 W. Campbell Ave., Apt. 109, Phoenix, Ariz. 85015
Filed May 9, 1979, Ser. No. 37,465
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71



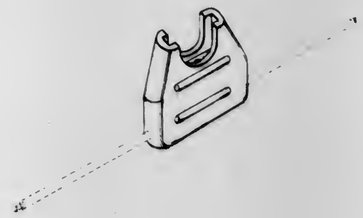
257,557
RAIL FASTENING CLIP
Albert E. Rex, Adelaide, Australia, assignor to Omark Industries, Inc., Portland, Oreg.
Filed Jul. 5, 1977, Ser. No. 812,754
Claims priority, application Australia, May 5, 1977, 71770/77
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—51



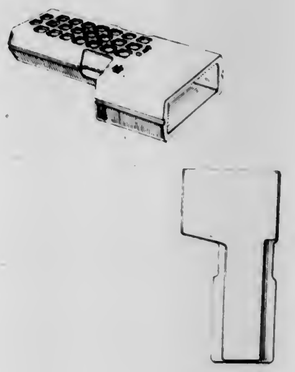
257,558
BOAT
Juichi Arima, Seattle, Wash., assignor to U.S. Industries, Inc., New York, N.Y.
Filed Oct. 14, 1977, Ser. No. 842,374
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



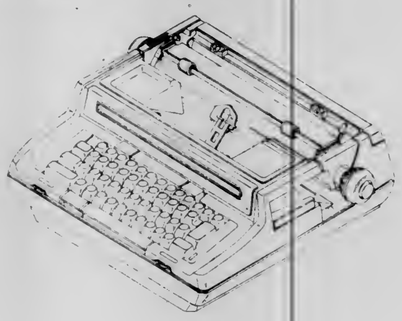
257,559
FUSE HOLDER
Sam A. Myles, Oak Park, Ill., assignor to Triplex Manufacturing Co., Chicago, Ill.
Filed Feb. 8, 1978, Ser. No. 876,183
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



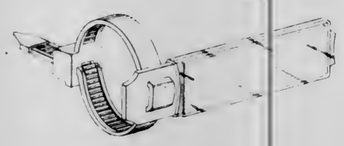
257,560
HAND HELD COMMUNICATION AID FOR THE MUTE AND HEARING IMPAIRED
Michael L. Jang, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Oct. 28, 1977, Ser. No. 846,610
Term of patent 14 years
Int. Cl. D18—*01*; D14—*02*
U.S. Cl. D14—40



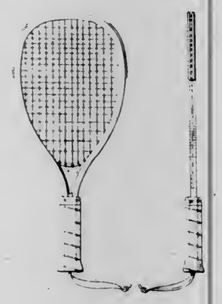
257,561
TYPEWRITER
Cornelius W. Christie, Fulton, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Jun. 1, 1979, Ser. No. 46,900
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



257,562
IDENTIFICATION LABEL
Drew R. Smith, 1128 E. Elm, Fullerton, Calif. 90064
Filed Dec. 29, 1977, Ser. No. 865,744
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—27



257,563
RACQUETBALL RACKET
Harleston J. Hall, Jr., Princeton; Paul A. Witte, and Thomas Johnson, both of Hopewell, all of N.J., assignors to AMF Incorporated, Plainsboro, N.J.
Filed Jul. 13, 1978, Ser. No. 924,219
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



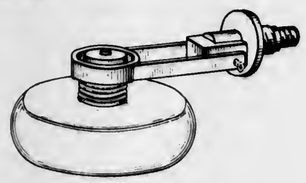
257,564
MOUNT FOR TELESCOPIC SIGHT
Gerald T. Weast, 23702 Crossley, Hazel Park, Mich. 48050
Division of Ser. No. 670,226, Mar. 25, 1976. This application Apr. 3, 1978, Ser. No. 893,161
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7



257,565
FISHING LINE HOLDER
Robert L. Slaughterbeck, 9925 S. Douglas, Oklahoma City, Okla. 73139
Filed Oct. 10, 1978, Ser. No. 950,251
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—99



257,566
LIQUID LEVEL CONTROL VALVE
Kent L. Kottmeier, 1068 Alden La., Buffalo Grove, Ill. 60090, and Anthony M. Kottmeier, 567 Sandpebble Dr., Schaumburg, Ill. 60193
Filed Jan. 13, 1978, Ser. No. 869,179
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



257,567
PLUNGER OPERATED PIPETTE
Billy H. Peacock, Hollywood, Fla., assignor to Disposable Plastics Corporation, Hallandale, Fla.
Filed May 3, 1978, Ser. No. 902,322
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—55



257,568
NOVELTY DISPLAY LAMP
Vincent B. Ream, 12900 NW. 30 Ave., Opa Locka, Fla. 33054
Filed Jul. 10, 1978, Ser. No. 922,836
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—26



257,569
BICYCLE ACCESSORY LIGHT FIXTURE
Anthony P. Serrecchia, 5912 Rose Ave., Long Beach, Calif. 90805
Filed May 30, 1978, Ser. No. 910,188
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—36



257,570
HUTCH
Roger W. Wollin, Lake Mills, Wis., assignor to Fiberdome Incorporated, Lake Mills, Wis.
Filed Sep. 5, 1978, Ser. No. 939,910
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D25—18

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF NOVEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Kimberly, James R., Sr., 4,235,939, Cl. 426-549.000.

A. Nattermann & Cie. GmbH: *See*—
Betzing, Hans, 4,235,793, Cl. 260-403.000.

A/S N. Foss Electric: *See*—
Nexo, Sten A.; and Frandsen, Andreas S., 4,236,075, Cl. 250-343.000.

A/S Strommens Vaerksted: *See*—
Capjon, Jan W., 4,235,300, Cl. 180-254.000.

Aarts, Petrus J. J.: *See*—
Wardenaar, Hendrik C.; Werner, Franz; Aarts, Petrus J. J.; and Beitler, Franz, 4,235,395, Cl. 242-199.000.

Aaton S.A.: *See*—
Beauviala, Jean-Pierre, 4,235,534, Cl. 352-191.000.

Aavid Engineering, Inc.: *See*—
Johnson, Philip A.; and McCarthy, Alfred F., 4,235,285, Cl. 165-80.00B.

AB Kabi: *See*—
Lundin, Ronny-Hugo L.; Westin-Sjodahl, Gertrud E.; Bergendal, Karin H. L.; and Fryklund, Linda M., 4,235,772, Cl. 260-112.50R.

AB Volvo: *See*—
Arvidsson, Krister E. G., 4,235,476, Cl. 301-108.00R.

ABC Trading Co., Ltd.: *See*—
Watanabe, Hiroshi; Aoyama, Ryushi; Hironaka, Yasuhira; and Oana, Hanji, 4,235,608, Cl. 55-181.000.

Abdel-Baset, Mahmoud B.: *See*—
Ratcliffe, Charles T.; and Abdel-Baset, Mahmoud B., 4,235,699, Cl. 208-8.0LE.

Abe, Hajime: *See*—
Yamaji, Kenkichi; Dietrich, Oelhschlagel; Abe, Hajime; and Tamura, Koichi, 4,235,007, Cl. 291-420.000.

Abe, Masaru: *See*—
Suzuki, Yasuo; Abe, Masaru; and Tezuka, Toshiro, 4,235,274, Cl. 152-354.00R.

Abe, Takashi; and Nagase, Shunji, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Perfluoro(4-methyl-2-oxabicyclo[4.4.0]decane) and method for manufacture thereof. 4,235,782, Cl. 260-345.200.

Abele, John E.; and Brown, Robert G., to Medi-Tech, Incorporated. Microbiological specimen sampling device. 4,235,244, Cl. 128-749.000.

Abramo, Aina L.: *See*—
Hernestam, Sven E. H.; Willard, Lars O.; Abramo, Aina L.; and Johansson, Hans-Bertil, 4,235,875, Cl. 424-54.000.

Abrams, Martin T.; Sargis, John R.; Seger, Paul H.; Beitner, Albert; and Bishop, Clifton C., to AES Technology Systems, Inc. Method and apparatus for transporting documents with preselected interdocument spacing. 4,235,431, Cl. 271-10.000.

Abthoff, Jorg; Schuster, Hans-Dieter; and Langer, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Converter for exhaust gas with removable insert housings having monolithic catalyst therein. 4,235,846, Cl. 422-171.000.

Abumi, Takao: *See*—
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,236,182, Cl. 358-193.100.

Acevedo, Ignacio. Torque-applying freely-reversible tool and drive-handle coupling. 4,235,133, Cl. 81-58.000.

Achelpohl, Fritz; and Schmidt, Horst, to Windmoller & Holscher. Plastics sack with internal closure member, base cover sheet and emptying means. 4,235,366, Cl. 229-60.000.

Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for making and stacking plastics bags. 4,235,659, Cl. 156-510.000.

Achini, Roland; Oppolzer, Wolfgang; and Gahwiler, Beat, to Sandoz Ltd. Treating muscular spasms and convulsions with 3-azabicyclo[3.1.0]hexanes. 4,235,921, Cl. 424-274.000.

Ackermann, Manfred, to Union Special Corporation. Bobbin thread tension device. 4,235,178, Cl. 112-229.000.

Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Water soluble agents effective as immunological adjuvants for stimulating in the host the immune response to various antigens and compositions, notably vaccines containing said water soluble agents. 4,235,771, Cl. 260-112.50R.

Adam, Jerome H.: *See*—
Gray, Floyd L.; Adam, Jerome H.; Susami, Larry; and Zamzow, Rick A., 4,235,454, Cl. 280-766.000.

Adams, Andrew B., Jr. Stringed musical instrument neck adjustable to counteract warping. 4,235,145, Cl. 84-293.000.

Aebli, Heinrich, to Gautschi Electro-Fours SA. Continuous flow oven. 4,235,591, Cl. 432-8.000.

AES Technology Systems, Inc.: *See*—
Abrams, Martin T.; Sargis, John R.; Seger, Paul H.; Beitner, Albert, and Bishop, Clifton C., 4,235,431, Cl. 271-10.000.

Aeschlimann, Peter: *See*—
Schaub, Andres; Dussy, Paul; Aeschlimann, Peter; and Koller, Stefan, 4,235,596, Cl. 8-456.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.
Camplan, Jean; Chaumont, Jacques; and Meunier, Robert, 4,236,097, Cl. 313-37.000.
Romette, Jean-Louis; Gellf, Gerard; and Thomas, Daniel, 4,235,687, Cl. 204-195.00M.
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,236,035, Cl. 585-25.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Abe, Takashi; and Nagase, Shunji, 4,235,782, Cl. 260-345.200.
Kawashima, Mitsuo; Ohta, Kimihiro; and Kataoka, Shoei, 4,236,165, Cl. 357-16.000.
Sano, Toshio; Takahashi, Masaharu; and Yokai, Masayuki, 4,235,647, Cl. 148-9.00R.

AGFA-Gevaert, A.G.: *See*—
Hofmann, Wilfried; Lusch, Herbert; and Rauffer, Walter, 4,235,536, Cl. 353-27.00R.

AGFA-GEVAERT N.V.: *See*—
DeRoeck, Joseph J.; and Van Steenwinkel, Frans, 4,235,655, Cl. 156-157.000.

Aginar, Antonio F. Furniture construction. 4,235,473, Cl. 297-440.000.

Aguilar, Henry. Index tab and method of making same. 4,235,031, Cl. 40-360.000.

Ahn, Chul S. Cassette storage case. 4,235,334, Cl. 206-387.000.

Ahrens, Karl: *See*—
Karrenbauer, Herbert; and Ahrens, Karl, 4,236,054, Cl. 200-145.000.

Aiba, Masahiko, to Sharp Kabushiki Kaisha. High-accuracy temperature control with heat resistance compensation. 4,236,064, Cl. 219-497.000.

Aihara, Norio: *See*—
Nagashima, Takashi; and Aihara, Norio, 4,236,228, Cl. 365-114.000.

Aisan Industry Co., Ltd.: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,235,210, Cl. 123-471.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Torii, Nozomu; and Ishikawa, Yoshiaki, 4,235,462, Cl. 292-216.000.

Aizawa, Hiroshi: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,235,538, Cl. 354-23.00D.

Aizawa, Tatsushi; Natori, Tatsuo; Hayashi, Masakatsu; and Tanaka, Takeo, to Hitachi, Ltd. Method of forming three-dimensional network porous metallic structure having continuous internal cavity. 4,235,277, Cl. 164-36.000.

Akabane, Katsumi: *See*—
Nakashima, Yoichi; Takita, Yosikazu; Suzuki, Sousi; Akabane, Katsumi; and Miwa, Michihiro, 4,236,169, Cl. 357-39.000.

Akao, Takeshi: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,235,354, Cl. 222-368.000.

Akebono Brake Industry Co. Ltd.: *See*—
Hirashita, Hiroshi, 4,235,313, Cl. 188-73.300.

Aker, John L.; and Goodson, William D., to Kustom Electronics, Inc. Traffic radar device. 4,236,140, Cl. 343-8.000.

Akiyama, Toru: *See*—
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, 4,236,251, Cl. 455-180.000.

A.B. Ferrosan: *See*—
Hernestam, Sven E. H.; Willard, Lars O.; Abramo, Aina L.; and Johansson, Hans-Bertil, 4,235,875, Cl. 424-54.000.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt A. G., 4,235,388, Cl. 242-47.010.

Akzo nv: *See*—
Kuijper, Cornelis J., 4,235,766, Cl. 260-33.4UR.

Al-Chalabi, Husain A., to UOP Inc. Process for the separation of olefins. 4,236,037, Cl. 585-670.000.

Albano, Mathew R. Precise dowel joint woodworking device. 4,235,565, Cl. 408-99.000.

Albatex A.G.: *See*—
Genini, Graziano, 4,235,261, Cl. 139-448.000.

Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, to Transformatoren Union AG. Multiphase transformer for power transmission in a supply system. 4,236,134, Cl. 336-96.000.

Albright, Jay D.: *See*—
Dusza, John P.; and Albright, Jay D., 4,236,005, Cl. 544-281.000.

Alcuri, Louis F., Jr.: *See*—
Aliotta, Joseph; and Alcuri, Louis F., Jr., 4,235,631, Cl. 75-251.000.

Alden Research Foundation: *See*—
Leighton, Robert D., 4,235,832, Cl. 264-230.000.

Alert Safety Lite Products Company: *See*—
Kovacik, James W., 4,236,195, Cl. 362-376.000.

Alfs, Helmut; Boehm, George; and Steiner, Heinz, to Chemische Werke Huels Aktiengesellschaft. Process for the manufacture of p-alkylphenols. 4,236,033, Cl. 568-793.000.

Aling, Willem, to U.S. Philips Corporation. Character display device. 4,236,153, Cl. 340-756.000.

Aliotta, Joseph; and Alcuri, Louis F., Jr., to Engelhard Minerals & Chemicals Corporation. Corrosion-resistant dental alloy having improved handling characteristics. 4,235,631, Cl. 75-251.000.

Alkem GmbH: *See*—
Druckenbrodt, Wolf-Gunther; Baumann, Siegfried; Krause, Roland; and Stoll, Wolfgang, 4,235,740, Cl. 252-301.10R.

Allen, A. Phil; and Hunsaker, Richard M. Apparatus for crushing beverage cans. 4,235,164, Cl. 100-53.000.

Allen, Donald D.; and Allen, Earl D. Microwave heater. 4,236,056, Cl. 219-10.55A

Allen, Earl D.: *See*—
Allen, Donald D.; and Allen, Earl D., 4,236,056, Cl. 219-10.55A.

Allen, Frank L., Jr., to Rockwell International Corporation. Textile bobbin. 4,235,392, Cl. 242-118.320.

Allied Chemical Corporation: *See*—
Lawson, Lawrence C.; Cascadden, Richard L.; Ross, Tsuneyo; and Greene, Patrick T., 4,235,453, Cl. 280-743.000.
Patel, Gordhanbhai N., 4,235,108, Cl. 73-356.000.
Ratcliffe, Charles T.; and Abdel-Baset, Mahmoud B., 4,235,699, Cl. 208-8.0LE.

Allis-Chalmers Corporation: *See*—
Heckenkamp, Edward B., 4,235,415, Cl. 251-77.000.

Alpers, Frederick C., to United States of America, Navy. Passive direction finding system. 4,236,159, Cl. 343-113.00R.

Althoff, Heinz J.; and Lommel, Heinz, to Metallgesellschaft Aktiengesellschaft. Al-Mn Alloy and process of manufacturing semifinished products having improved strength properties. 4,235,628, Cl. 75-148.000.

Altmann, Gerhard: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 4,236,134, Cl. 336-96.000.

Aluminum Company of America: *See*—
Bennett, Robert F.; Brown, Warren D.; Patterson, Clarence L.; and Sorensen, John C., 4,235,830, Cl. 264-29.700.
Wohleber, David A.; Edd, Jon F.; and Hennrich, Ronald L., 4,235,860, Cl. 423-495.000.

Aluminum Pechiney: *See*—
Delatte, Marc; and Chevalier, Philippe, 4,235,278, Cl. 164-433.000.

Alza Corporation: *See*—
Theeuwes, Felix, 4,235,236, Cl. 128-260.000.

Alzaidi, Samir A. Method and apparatus for measuring neutron flux. 4,235,670, Cl. 176-19.00R.

Ambrose, Richard J.: *See*—
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,235,979, Cl. 525-128.000.

American Color & Chemical Corporation: *See*—
Desai, Kishor A., 4,235,806, Cl. 260-465.00D.

American Cyanamid Company: *See*—
Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-I, 4,235,996, Cl. 542-415.000.
Dusza, John P.; and Albright, Jay D., 4,236,005, Cl. 544-281.000.
Floyd, Middleton B., Jr.; and Weiss, Martin J., 4,236,027, Cl. 562-500.000.
Grudzinskas, Charles V.; Wissner, Allan; and Chen, Sow-Mei L., 4,235,924, Cl. 424-278.000.
Wissner, Allan, 4,235,797, Cl. 556-443.000.

American Defibrator, Inc.: *See*—
Reinhall, Rolf; Johansson, Inge; Sandstron, Ake; Mukvist, Anders; and Elander, Lars, 4,235,665, Cl. 162-23.000.

American Gage & Manufacturing Co.: *See*—
Ross, Karl J.; and Johnson, Francis B., 4,235,420, Cl. 254-218.000.

American Home Products Corporation: *See*—
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,235,901, Cl. 424-248.510.
Dionne, Gervais; Asselin, Andre A.; and Humber, Leslie G., 4,235,903, Cl. 424-248.570.
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,236,004, Cl. 544-279.000.

American Standard Inc.: *See*—
Gillen, Harold C.; and Little, Donald R., 4,235,403, Cl. 246-182.00A.
Hart, James E., 4,235,477, Cl. 303-22.00R.

Amick, James A., to Exxon Research & Engineering Co. Solar cell module. 4,235,643, Cl. 136-246.000.

Amoroso, Michael J., to M.A.T. Industries, Inc. Vehicle with convertible wheels. 4,235,168, Cl. 105-215.00C.

AMP Incorporated: *See*—
Marks, Richard L.; and Weidler, Charles H., 4,235,502, Cl. 339-278.00R.

An, Viktor B.; Bukhtiarov, Ivan D.; Demin, Alexei S.; Potanin, Veniamin G.; and Spelchuk, Valery A. Method for producing trigger pulses in relation to preset phase of motion proceeding with continuously variable period and device for effecting same. 4,236,085, Cl. 307-106.000.

Anbe, Yoshiharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Control system of interstand tension of continuous rolling mills. 4,236,216, Cl. 364-472.000.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Screw extrusion press having temperature-control means. 4,235,581, Cl. 425-378.00R.

Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., to Anprosol Incorporated. Sterilization system. 4,235,332, Cl. 206-219.000.

Andersen, Shirley R.: *See*—
Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., 4,235,332, Cl. 206-219.000.

Anderson, Carl L.: *See*—
Kamath, G. Sanjiv; and Anderson, Carl L., 4,235,651, Cl. 148-171.000.

Anderson, Hans Christian M. Process and composition for neutralization of acidic combustion products and for boiler cleaning. 4,235,585, Cl. 431-3.000.

Anderson, Roy S.; and Pladek, Oscar J., to PQ Corporation. Base for defoaming compositions. 4,235,742, Cl. 252-358.000.

Ando, Kunio: *See*—
Saito, Takemi; Okamura, Kenjiro; and Ando, Kunio, 4,235,506, Cl. 350-16.000.

Ando, Moritoshi: *See*—
Ikeda, Hiroyuki; and Ando, Moritoshi, 4,235,504, Cl. 350-3.710.

Ando, Tsuneo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,235,210, Cl. 123-471.000.

Ang, Peter G. P.: *See*—
Sammells, Anthony F.; and Ang, Peter G. P., 4,235,955, Cl. 429-111.000.

Angeles Metal Trim Co.: *See*—
Cable, Daniel K.; and Doke, Jack, 4,235,054, Cl. 52-210.000.

Angell, William H.: *See*—
Rado, Peter J.; Durvasula, Srirama S.; and Angell, William H., 4,236,207, Cl. 364-200.000.

Anprosol Incorporated: *See*—
Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., 4,235,332, Cl. 206-219.000.

Antenore, Ronald L.: *See*—
Capra, Nicholas G.; and Antenore, Ronald L., 4,235,353, Cl. 222-256.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,235,705, Cl. 208-139.000.

Antos, George J., to UOP Inc. Hydrocarbon dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,235,755, Cl. 252-462.000.

Aoki, Eiichiro: *See*—
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,235,142, Cl. 84-1.030.

Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, to Kokkoman Shoyu Co., Ltd. Sealing structure for rotary valves. 4,235,354, Cl. 222-368.000.

Aoshima, Atsushi; Murobushi, Toshiaki; Mitsui, Ryoichi; and Tamura, Nobuhiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing tert-butanol from mixed butylenes. 4,236,034, Cl. 508-898.000.

Aoyagi, Hideo: *See*—
Horiuchi, Harumi; and Aoyagi, Hideo, 4,236,088, Cl. 307-240.000.

Aoyama, Ryushi: *See*—
Watanabe, Hiroshi; Aoyama, Ryushi; Hironaka, Yasuhira; and Oana, Hanji, 4,235,608, Cl. 55-181.000.

Apilat, Vitaly Y.: *See*—
Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V., 4,235,848, Cl. 422-249.000.

Applied Power Inc.: *See*—
Reynolds, Roy, 4,235,299, Cl. 180-328.000.

Aprato, Armando, to Ing. C. Olivetti & C., S.p.A. Non impact dot matrix printer. 4,235,555, Cl. 400-120.000.

Aquatech, Inc.: *See*—
DiVito, Angelo; and Fisco, Benjamin P., Jr., 4,234,980, Cl. 15-302.000.

Arbuckle, Norman B., to Kelder, Raymond C., a part interest. Suturing device. 4,235,177, Cl. 112-169.000.

Archibald, John L.; and Ward, Terence J., to John Wyeth & Brother Limited. βAdrenergic blocking piperidino ureas and thioureas. 4,235,915, Cl. 424-267.000.

Arco Medical Products Company: *See*—
Weiss, Lee E., 4,235,246, Cl. 128-785.000.

Arents, Donald N., to United States of America, Army. Helicopter performance calculator. 4,236,212, Cl. 364-424.000.

Arisawa, Masatoshi: *See*—
Watanabe, Hiroshi; and Arisawa, Masatoshi, 4,235,733, Cl. 252-107.000.

Arnason, Sigurdur I.; and Kleese, Edward J., to General Tire & Rubber Company, The. In-the-mold coating apparatus and method. 4,235,833, Cl. 264-255.000.

Arnaud, Johnny, to Hydrotreat, Inc. Electronic water treatment apparatus. 4,235,698, Cl. 204-302.000.

Arnegger, Richard E. Handpiece with continuous shaft and bell rotor. 4,235,595, Cl. 433-131.000.

Artos Engineering Company: *See*—
Stoehr, Herbert M., 4,235,384, Cl. 72-148.000.

Arvesen, James N., to Pfizer Inc. Method and apparatus for determining the minimum concentration of antibiotic necessary to at least inhibit microorganism growth. 4,236,211, Cl. 364-413.000.

Arvidsson, Krister E. G., to AB Volvo. Wheel cover for vehicle wheels. 4,235,476, Cl. 301-108.00R.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Aoshima, Atsushi; Murobushi, Toshiaki; Mitsui, Ryoichi; and Tamura, Nobuhiro, 4,236,034, Cl. 508-898.000.

Asai, Yoshihito: *See*—
Sasaki, Koji; and Asai, Yoshihito, 4,236,053, Cl. 200-144.00R.

Asano, Hidejiro; Maeda, Shigeyoshi; and Oyagi, Yashichi, to Nippon Steel Corporation. Method for the manufacture of a steel sheet adapted for use in ironing processing having good lubrication property. 4,235,947, Cl. 427-226.000.

Asano, Makoto; Kawashima, Saburo; Sugimoto, Kenichi; and Kobayashi, Tadashi, to Mitsui Toatsu Chemicals, Inc. Color-developing phenolic-aldehyde composition for pressure-sensitive recording sheet material and process for the preparation thereof. 4,235,769, Cl. 260-45.8NT.

Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, to American Home Products Corporation. 1-Hydroxyalkanamine pyrano(3,4-b)indole compositions and use thereof. 4,235,901, Cl. 424-248.510.

Asselin, Andre A.: *See*—
Dionne, Gervais; Asselin, Andre A.; and Humber, Leslie G., 4,235,903, Cl. 424-248.570.

Assmann, Bernd L.: *See*—
Brinkmann, Karl E.; and Assmann, Bernd L., 4,235,311, Cl. 188-71.700.

Associated Paper Industries Limited: *See*—
Singh, Tej K., 4,235,027, Cl. 36-44.000.

Astolfi, Pietro, to Pico-Glass S.n.c. di Beatrice Huber & C. Assembly in two parts with which to construct frames. 4,235,030, Cl. 40-156.000.

Aswell, James E.: *See*—
Denny, Lawrence A.; and Aswell, James E., 4,235,469, Cl. 294-96.000.

Atari, Inc.: *See*—
Hally, Michael L., 4,235,438, Cl. 273-127.00D.

Atchisson, Maxwell G. Concealment holster. 4,235,356, Cl. 224-192.000.

Aterianus, John S.: *See*—
Crawford, Donald C.; and Aterianus, John S., 4,235,329, Cl. 198-419.000.

Atkin, Curtis L.: *See*—
Stephen, Robert L.; Kablitz, Carl; van Dura, Dietz; Atkin, Curtis L.; and Jacobsen, Stephen C., 4,235,230, Cl. 128-213.00A.

Atlantic Richfield Company: *See*—
Castoe, Alonzo R.; and Bass, Jan W., 4,235,613, Cl. 62-17.000.
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,236,023, Cl. 560-207.000.
Kopf, Fred W., 4,235,701, Cl. 208-57.000.

Atlas Bolt & Screw Company, The: *See*—
Weidner, Harry C., Jr., 4,235,147, Cl. 85-9.00R.

Atwood, Wesley W.: *See*—
Smith, Hudson C.; Atwood, Wesley W.; and Myrick, John S., 4,235,854, Cl. 423-320.000.

Audibert, Francoise: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.

Aug, Conrad J.; and Reckinger, Arthur P., Jr., to International Business Machines Corporation. Circuit board and card interconnection system. 4,235,496, Cl. 339-45.00M.

Augustin, Michael J.; and Williams, Wade, to Motorola, Inc. Radio receiver blanker inhibit circuit. 4,236,254, Cl. 455-223.000.

Ausnit, Steven, to Minigrip, Inc. Method for making reclosable bags. 4,235,653, Cl. 156-91.000.

Austin, Robert A.; and Shackle, Dale R., to Mead Corporation, The. Process for the production of hot melt coating compositions containing microcapsules. 4,235,458, Cl. 282-27.500.

Autoclave Engineers, Inc.: *See*—
Smith, Charles W., Jr.; and Zimmerman, Franz X., 4,235,592, Cl. 432-205.000.
Zimmerman, Franz X., 4,235,841, Cl. 422-112.000.

Automobiles Peugeot: *See*—
Gardou, Guy R. M., 4,235,467, Cl. 293-135.000.

Avco Corporation: *See*—
Kim, Chi S., 4,235,605, Cl. 48-202.000.

Axen, Udo F., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-6-keto-PG compounds. 4,235,822, Cl. 568-330.000.

Axen, Udo F., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-6-keto-PG compounds. 4,236,025, Cl. 560-255.000.

B. F. Goodrich Company, The. *See*—
Hsu, Chin C.; and Chasar, Dwight W., 4,236,021, Cl. 560-174.000
Kroenke, William J., 4,235,770, Cl. 260-45.75R.

B & J Machinery Company, Inc.: *See*—
Cobble, James T., 4,235,175, Cl. 112-79.00R

Baatz, Henning; and Rittscher, Dieter, to Steag Kernenergie GmbH. Canister method of disposing of radioactive waste. 4,235,739, Cl. 252-301.10W.

Babcock & Wilcox Company, The: *See*—
Davis, Clarence E.; and Hoynak, Daniel, 4,235,020, Cl. 33-178.00F.

Babu, B. Naga P., to Caterpillar Tractor Co. Wear-resistant molybdenum-iron boride alloy and method of making same. 4,235,630, Cl. 75-244.000.

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. Octahydro-2H-pyrrolo[3,4-g]quinolines. 4,235,909, Cl. 424-258.000.

Bach, Nicholas J.: *See*—
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,235,776, Cl. 260-326.100.

Bachman, Joseph L.: *See*—
Johnson, A. David, Jr.; Ginther, George E., Sr.; and Bachman, Joseph L., 4,235,159, Cl. 493-309.000.

Badour, Leonard C.: *See*—
Christensen, Dean L.; Badour, Leonard C.; and Ebey, Frank S., 4,235,339, Cl. 206-444.000.

Baier, Alfred: *See*—
Schmunck, Karlheinz; Herbener, Klaus; Baier, Alfred; and Pfeuffer, Alfred, 4,235,422, Cl. 266-50.000.

Baker, Harold L., to Weyerhaeuser Company. Multi-purpose container blank. 4,235,364, Cl. 229-34.00R.

Baker, Richard H., to Exxon Research & Engineering Co. Floating power switch. 4,236,089, Cl. 307-254.000.

Baker-Waldeck Associates: *See*—
Shimko, Dalton L., 4,235,726, Cl. 210-523.000.

Baker, William E. Electrically actuated valve. 4,235,413, Cl. 251-11.000.

Balasubramanyan, Sugavanam: *See*—
Lewis, Terence; and Balasubramanyan, Sugavanam, 4,235,620, Cl. 71-92.000.

Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See*—
Winkler, Otto; and Moll, Eberhard, 4,235,572, Cl. 418-6.000.

Bannon, Robert P., to Shell Oil Company. Multistage condensation process. 4,235,706, Cl. 208-347.000.

Banzhaf, Heinz; and Dietrich, Robert, to J. M. Voith GmbH. Counterbalanced roller for paper machines. 4,235,124, Cl. 74-573.00R

Barber, Theodore C.: *See*—
Cox, Donald R.; and Barber, Theodore C., 4,234,986, Cl. 6-12.00R

Barksdale, Robert C.: *See*—
Dale, David; and Barksdale, Robert C., 4,235,083, Cl. 66-213.000.

Barlage, Bruno, to H. Neimeyer Sohne GmbH & Co. KG. Soil cultivating machine. 4,235,294, Cl. 172-48.000.

Barlow, George J.: *See*—
Lombardo, Ralph M., Jr.; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., 4,236,209, Cl. 364-200.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Dillon, Roy E., 4,235,071, Cl. 57-280.000.

Barnert, Heiko; and Schafer, Manfred, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Nuclear energy installation having a gas-cooled reactor core. 4,235,671, Cl. 176-38.000.

Barraud, Andre; Messier, Jean; and Ruaudel, Annie, to Commissariat a l'Energie Atomique. Photosensitive film usable in microgravure. 4,235,958, Cl. 430-281.000.

Bartlett, James L., Jr., to Hydranautics. Reverse osmosis membrane module. 4,235,723, Cl. 210-321.00R.

Bartley, William J.; Wilson, Thomas P.; and Ellgen, Paul C., to Union Carbide Corporation. Process for producing two-carbon atom oxygenated compounds from synthesis gas with minimal production of methane. 4,235,798, Cl. 260-449.00R.

Barton, Lyndon O. Dual timer device. 4,236,242, Cl. 368-95.000.

BASF Aktiengesellschaft: *See*—
Degner, Dieter; and Siegel, Hardo, 4,235,683, Cl. 204-78.000.
Dudeck, Christian; Lehmann, Gunter; Ross, Karl-Heinz; Fliege, Werner; Petri, Norbert; Diem, Hans; Meissner, Bernd; and Sauer, Wolfgang, 4,235,823, Cl. 568-402.000.
Eicken, Karl; Plath, Peter; and Pommer, Ernst-Heinrich, 4,235,928, Cl. 424-300.000.
Koenig, Karl-Heinz; Reitel, Christian; and Mangold, Dietrich, 4,235,814, Cl. 260-544.00C
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, 4,235,844, Cl. 422-138.000.
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,235,815, Cl. 260-544.00C.
Tschang, Chung-Ji; Klefenz, Heinrich; and Sanner, Axel, 4,235,973, Cl. 521-146.000.

BASF Wyandotte Corporation: *See*—
Gallagher, James A.; and Merkl, Bernard A., 4,235,765, Cl. 260-30.80R.

Bass, Jan W.: *See*—
Castoe, Alonzo R.; and Bass, Jan W., 4,235,613, Cl. 62-17.000.

Bass, Robert W.; Ferguson, Helaman R. P.; Fletcher, Harvey J.; Gardner, John H.; Harrison, B. Kent; and Larsen, Kenneth M., to Brigham Young University. Confinement of high temperature plasmas. 4,235,668, Cl. 176-3.000.

Bassett, Leslie, to Upton Industries, Inc. Air cooled electrode system for electrically heated molten bath furnaces. 4,235,424, Cl. 266-120.000.

Bateman, Linda R., to Du Pont de Nemours, E. I., and Company. Elastomeric terionomer blends. 4,235,980, Cl. 525-215.000.

Bates, Claude F., III; and Olson, Duane R. Collapsible basket. 4,235,331, Cl. 206-170.000.

Batson, Edward E.: *See*—
Kurz, John H.; and Batson, Edward E., 4,235,579, Cl. 425-174.400.

Battjes, Carl R., to Tektronix, Inc. Monolithic wideband amplifier. 4,236,119, Cl. 330-288.000.

Baudet, Gerard; Morio, Michel; and Vautrelle, Christian, to Bureau de Recherches Geologiques et Minieres. Selective flocculation process for treating fines of phosphate ores. 4,235,709, Cl. 209-5.000.

Bauer Bros. Co., The: *See*—
Ginaven, Marvin E., 4,235,724, Cl. 210-323.00R.

Bauer, Dennis P., to Ethyl Corporation. Preparation of 3-thenyl bromide. 4,235,685, Cl. 204-158.0HA.

Bauer, Horace P., to Budd Company, The. Railway car underframe end sill. 4,235,170, Cl. 105-402.000.

Bauer, Kurt; and Lange, Gerd-Karl, to Bayer Aktiengesellschaft. Esters of isocamphyl-guaiacol, process for their preparation and their use for the preparation of 3-[isocamph-5-yl]-cyclohexanol. 4,235,826, Cl. 260-951.000.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,235,717, Cl. 210-685.000.

Baumann, Siegfried: *See*—
Druckenbrodt, Wolf-Gunther; Baumann, Siegfried; Krause, Roland; and Stoll, Wolfgang, 4,235,740, Cl. 252-301.10R.

Baxter Travenol Laboratories, Inc.: *See*—
Kulle, Lee K.; and Rudzena, William L., 4,235,344, Cl. 215-250.000.
Mendoza, Daniel F.; and Hodgson, Charles E., 4,235,840, Cl. 422-64.000.
Zissimopoulos, Nicholas, 4,236,132, Cl. 335-271.000.

Bayer Aktiengesellschaft: *See*—
Bauer, Kurt; and Lange, Gerd-Karl, 4,235,826, Cl. 260-951.000.
Haas, Peter; and Wiedermann, Rolf, 4,235,976, Cl. 521-107.000.
Huhne, Volker; Taube, Carl; and Ditzer, Reiner, 4,235,773, Cl. 260-173.000.
Naumann, Klaus, 4,236,026, Cl. 562-401.000.
Petersen, Otto; and Schmidt, Hans-Dieter, 4,235,689, Cl. 204-195.00R.
Preiss, Michael; Konig, Hans-Bodo; Metzger, Karl G.; and Schmidt, Gunter, 4,235,774, Cl. 260-239.100.
Rademachers, Jakob; and Pfingmacher, Ingo, 4,235,861, Cl. 423-551.000.
Rambold, Wolfgang; Heine, Heinrich; Raederscheidt, Bruno; and Trenczek, Gerhard, 4,235,862, Cl. 423-607.000.
Reel, Henning; Kruckenberg, Winfried; and Schuadehutte, Karl H., 4,235,598, Cl. 8-584.000.
Ritter, Helmut; Hemmerich, Heinz-Peter; and Rosenkranz, Hans J., 4,235,768, Cl. 260-40.00R.
Scholl, Hans-Joachim; and Zenner, Armin, 4,236,016, Cl. 560-24.000.
Stadler, Peter; Metzger, Karl-Georg; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, 4,235,888, Cl. 424-180.000.

BBC Brown, Boveri & Company, Limited: *See*—
Stemmler, Herbert, 4,236,108, Cl. 323-114.000.

Beamer, John D., to Rain Bird Sprinkler Mfg. Corp. Interchangeable nozzle apparatus for full or part circle irrigation sprinklers. 4,235,379, Cl. 239-230.000.

Beauviala, Jean-Pierre, to Aaton S.A. Device for driving the claw shaft of a motion picture camera. 4,235,534, Cl. 352-191.000.

Bechthold, Horst, to Ealther & Cie Aktiengesellschaft. Process for purifying pyrolysis gases. 4,235,675, Cl. 201-2.500.

Beck, Boyd R.; Sher, Frank T.; and Tiers, George V. D., to Minnesota Mining and Manufacturing Company. Sulfonato-organosilanol compounds and aqueous solutions. 4,235,638, Cl. 106-287.120.

Becker, Erwin-Willy; Bley, Peter; Ehrfeld, Wolfgang; Ehrfeld, Ursula; and Krieg, Gunther, to Kernforschungszentrum Karlsruhe GmbH. Separation of gaseous or vaporous substances according to the separating nozzle principle. 4,235,606, Cl. 55-17.000.

Beckman Instruments, Inc.: *See*—
Berman, Arthur L.; and Kramer, Gordon, 4,235,525, Cl. 350-339.00R.
Berman, Arthur L.; and Kramer, Gordon, 4,235,526, Cl. 350-344.000.
Davidson, Howard R., 4,235,367, Cl. 233-26.000.

Beecham Group Limited: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,235,882, Cl. 424-117.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,235,784, Cl. 260-345.80R.

Beeman, Archie W.; and Beeman, Harold D. Pipe-conveying catwalk. 4,235,566, Cl. 414-22.000.

Beeman, Harold D.: *See*—
Beeman, Archie W.; and Beeman, Harold D., 4,235,566, Cl. 414-22.000.

Beggs, Donald; and Scarlett, John C., to Midrex Corporation. Impact bed gasifier-melter. 4,235,425, Cl. 266-147.000.

Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, to Thomson-CSF. Diphenylic esters exhibiting mesomorphic phases. 4,235,736, Cl. 252-299.000.

Behlau, Adolph. Heat reclaiming flue pipe. 4,235,286, Cl. 165-164.000.

Behr, Friedrich: *See*—
Schulten, Rudolf; Behr, Friedrich; and Wenzl, Helmut, 4,235,863, Cl. 423-648.00R.

Beitler, Franz: *See*—
Wardenaar, Hendrik C.; Werner, Franz; Aarts, Petrus J. J.; and Beitler, Franz, 4,235,395, Cl. 242-199.000.

Beitner, Albert: *See*—
Abrams, Martin T.; Sargis, John R.; Seger, Paul H.; Beitner, Albert; and Bishop, Clifton C., 4,235,431, Cl. 271-10.000.

Bekker, Marthinus J.; and Hall, Douglas J. M. Stabilizer for guns. 4,235,152, Cl. 89-14.00C.

Bekkering, Hendrik M., to Duphar International Research B.V. Syringe. 4,235,235, Cl. 128-218.00P.

Bell Telephone Laboratories, Incorporated: *See*—
Brackett, Charles A.; and Personick, Stewart D., 4,236,256, Cl. 455-608.000.
Cho, Alfred Y.; and Tsang, Won-Tien, 4,236,122, Cl. 331-94.50H.
Cho, Alfred Y.; and DiLorenzo, James V., 4,236,166, Cl. 357-22.000.
Ericsson, James W., 4,235,501, Cl. 339-191.00M.
Freeny, Stanley L.; Larsen, Arthur B.; and Pedersen, Thomas J., 4,236,245, Cl. 370-94.000.
Ohm, Edward A., 4,236,161, Cl. 343-781.0CA.
Tang, Henry Y. S.; and Tang, Henry Y. S., 4,236,164, Cl. 357-51.000.

Beloit Corporation: *See*—
Bergstrom, Jan I.; and Hergert, Richard E., 4,235,667, Cl. 162-203.000.

Belopavlovich, Peter; Michaels, Leonard H.; and Zic, Richard, to TRW Inc. Circuit connector. 4,235,500, Cl. 339-176.0MF.

Bendel, Wolfgang: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 4,236,134, Cl. 336-96.000.

Bendix Corporation, The: *See*—
Melotti, Angelo R., 4,235,375, Cl. 239-125.000.
Snyder, Gene L., 4,235,498, Cl. 339-90.00R.
Stadelmann, Joachim P., 4,235,101, Cl. 73-116.000.
Walter, Richard P.; Sisson, Albert E.; Erwin, Louis R.; and Kelso, Charles R., 4,235,374, Cl. 239-90.000.

Benevenuta, Gianfranco. Closure device for container doors. 4,235,463, Cl. 292-218.000.

Bennet, Joseph C.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,235,015, Cl. 29-857.000.

Bennett, John E.; and Elliott, Joseph E., to Diamond Shamrock Corporation. Oxygen selective anode. 4,235,697, Cl. 204-290.00F.

Bennett, Robert F.; Brown, Warren D.; Patterson, Clarence L.; and Sorensen, John C., to Aluminum Company of America; and Pullman Incorporated. Flue pressure control for tunnel kilns. 4,235,830, Cl. 264-29.700.

Beppu, Norio: *See*—
Yamada, Seiji; and Beppu, Norio, 4,235,544, Cl. 354-106.000.

Berchielli, Aldo S.; and Chireau, Roland F., to Yardney Electric Corporation. Method of making improved hydrogenation catalyst. 4,235,748, Cl. 252-430.000.

Bergendal, Karin H. L.: *See*—
Lundin, Ronny-Hugo L.; Westin-Sjodahl, Gertrud E.; Bergendal, Karin H. L.; and Fryklund, Linda M., 4,235,772, Cl. 260-112.50R.

Bergerud, Wilson L. Folding bed-frame member and bed assembly. 4,234,979, Cl. 5-133.000.

Bergstrom, Jan I.; and Hergert, Richard E., to Beloit Corporation. Method of and means for attaining uniformity in paper webs produced on a roll former. 4,235,667, Cl. 162-203.000.

Berkley & Company: *See*—
McMickle, Robert L., 4,234,998, Cl. 24-73.00C.

Berman, Arthur L.; and Kramer, Gordon, to Beckman Instruments, Inc. Liquid crystal display cell having a light field background. 4,235,525, Cl. 350-339.00R.

Berman, Arthur L.; and Kramer, Gordon, to Beckman Instruments, Inc. Liquid crystal display cell having a light field background. 4,235,526, Cl. 350-344.000.

Bernard, Nicolle; and Forterre, Gerard, to Societe Lignes Telegraphiques et Telephoniques. Wide band high power very high or ultra high frequency circulators. 4,236,125, Cl. 333-1.100.

Bernstein, Philip; Probst, William C.; Coffey, James P.; and Knipple, Charles J., to International Nickel Co., Inc., The. Mandrel for nickel rounds with a monolithic surface. 4,235,696, Cl. 204-281.000.

Beroff, Howard: *See*—
Spaven, George D.; Thomas, Joseph J.; and Beroff, Howard, 4,235,232, Cl. 128-214.400.

Berthold, Richard, to Sandoz Ltd. 1-(Indol-4-yloxy)-3-(2-substituted amino)-2-propanols and pharmaceutical use thereof. 4,235,919, Cl. 424-274.000.

Beseke, Kermit; and Kopecki, Ronald, to Motorola, Inc. Level control circuitry for two way communication system. 4,236,116, Cl. 328-169.000.

Besser Company: *See*—
Springs, Thomas W.; and Wallis, William F., 4,235,580, Cl. 425-211.000.

Best, Willie H. High heat transfer oven. 4,235,023, Cl. 34-31.000.

Bethlehem Steel Corporation: *See*—
Gilles, Herbert L.; and Shipman, Johnson, 4,235,276, Cl. 164-4.000.

Betzing, Hans, to A. Nattermann & Cie. GmbH. Process to obtain oily, highly purified phosphatidylcholines. 4,235,793, Cl. 260-403.000.

Beyer, Harold H., to Procter & Gamble Company, The. Liquid bleaching compositions. 4,235,732, Cl. 252-103.000.

Bez, Ulrich; and Buhren, Wolfgang, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Vacuum mattress, especially for rescue vehicles. 4,234,982, Cl. 5-455.000.

Bhasin, Madan M., to Union Carbide Corporation. Process for producing ethanol from synthesis gas. 4,235,801, Cl. 260-449.60R.

Bialobrzeski, Walter. Spring. 4,235,427, Cl. 267-153.000.

Bianchi, Camillo, to Silca S.p.A. Key structure having a coated grip. 4,235,087, Cl. 70-395.000.

Bianchino, Daniel C. Smoking pipe. 4,235,252, Cl. 131-193.000.

Bichsel, Heinz: *See*—
Neufeld, Kurt; Buxmann, Kurt; Bichsel, Heinz; and Gyongyos, Ivan, 4,235,646, Cl. 148-2.000.

Biedenkapp, Gerhard: *See*—
Warmbier, Dieter-Ernst; and Biedenkapp, Gerhard, 4,236,102, Cl. 318-341.000.

Bierhoff, Martinus P. M.; and Hoogendijk, Adrianus H., to U.S. Philips Corporation. Apparatus for reading a disc-shaped record carrier having a PAL color television signal. 4,236,173, Cl. 358-8.000.

Billeter, Henry R., to Sloan Valve Company. Empty and load brake device. 4,235,478, Cl. 303-23.00R.

Billets, Stephen F.: *See*—
Sudrabin, Leon P.; Billets, Stephen F.; Pollitt, Van Dyke J.; and Liszczynsky, Lubomyr, 4,235,688, Cl. 204-195.00F.

Billington, William P., to National Research Development Corporation. Cleaning apparatus. 4,234,992, Cl. 15-3.110.

Birnbaum, David, to General Signal Corporation. Speed insensitive wheel detector. 4,236,093, Cl. 310-155.000.

Birnbreier, Hermann: *See*—
Gross, Franz; and Birnbreier, Hermann, 4,235,956, Cl. 429-112.000.

Bishop, Clifton C.: *See*—
Abrams, Martin T.; Sargis, John R.; Seger, Paul H.; Beitner, Albert; and Bishop, Clifton C., 4,235,431, Cl. 271-10.000.

Black, John W. Removable sign post holding apparatus. 4,235,034, Cl. 40-607.000.

Blakey, Philip G.; Smith, Bryan K.; and Watson, Richard W., to BOC Limited. Processes for producing nitric acid by utilization of cold oxygen. 4,235,858, Cl. 423-393.000.

Bland, Coburn C., Jr.: *See*—
Meloche, Kenneth R.; Bland, Coburn C., Jr.; and Terry, Ronald R., 4,235,076, Cl. 60-602.000.

Blattner, Hans; and Storni, Angelo, to Ciba-Geigy Corporation. Substituted 5H-dibenz[b,f]azepine. 4,235,895, Cl. 424-244.000.

Bley, Peter: *See*—
Becker, Erwin-Willy; Bley, Peter; Ehrfeld, Wolfgang; Ehrfeld, Ursula; and Krieg, Gunther, 4,235,606, Cl. 55-17.000.

Blomberg, Folke I. Sensor for braking systems. 4,235,316, Cl. 188-181.00R.

Blount, David H. Process for the production of halohydrin-amine-silicate resinous products. 4,235,767, Cl. 260-37.0EP.

Blount, David H. Process for the production of epoxy cellular solid products. 4,235,974, Cl. 521-99.000.

Board of Regents, State of Florida: *See*—
Hench, Larry L.; and Buscemi, Paul J., 4,234,972, Cl. 3-1.900.

Boardman, Richard M.: *See*—
Bull, Anthony V.; and Boardman, Richard M., 4,236,227, Cl. 365-49.000.

BOC Limited: *See*—
Blakey, Philip G.; Smith, Bryan K.; and Watson, Richard W., 4,235,858, Cl. 423-393.000.

Bochner, Barry R. Method for testing and identifying microorganisms. 4,235,964, Cl. 435-34.000.

Boehm, George: *See*—
Alfs, Helmut; Boehm, George; and Steiner, Heinz, 4,236,033, Cl. 568-793.000.

Boeing Company, The: *See*—
Dhoore, Louis G.; and Schultz, William H., 4,235,303, Cl. 181-214.000.
Fitch, Robert E.; and Perry, Clifford R., 4,235,281, Cl. 165-1.000.
Gilbert, Daniel E., 4,236,235, Cl. 367-157.000.
Johnson, William R., 4,235,398, Cl. 244-119.000.
Shorey, Thomas H., 4,235,399, Cl. 244-137.00R.

Boelens, Harmannus: *See*—
Traas, Petrus C.; Boelens, Harmannus; and Wille, Hans J., 4,235,824, Cl. 568-486.000.

Bogeso, Klaus P., to Kefalas A/S. 2-Methylthio-6-fluoro-9-(1-methyl-4-piperidylidene)-thioxanthene and salts thereof, neuroleptic compositions and method of use. 4,235,916, Cl. 424-267.000.

Boldridge, Austin G., Jr., to Conversational Systems, Inc. Power measuring apparatus. 4,236,112, Cl. 324-142.000.

Bone, David P.; and Meschewski, Robert J., to Quaker Oats Company, The. Process for the production of a bacon analogue. 4,235,935, Cl. 426-249.000.

Bongers, Andreas M. G.: *See*—
Groen, Otto M.; Bongers, Andreas M. G.; Peeters, Bernard J. E.; and Lammers, Peter H. M., 4,235,193, Cl. 118-658.000.

Bonnie Enterprises, Inc.: *See*—
Cousins, Sydne, 4,235,240, Cl. 128-476.000.

Book, Wayne J.: *See*—
Ruis, David A.; Polhemus, Russell W.; and Book, Wayne J., 4,235,437, Cl. 272-134.000.

Boone, Philip. Bathroom equipment. 4,235,333, Cl. 206-233.000.

Borg-Warner Limited: *See*—
Gardner, Derek, 4,235,126, Cl. 74-688.000.

Borkowski, John W.; Lenze, La Vern J., Jr.; Campbell, Alan F.; and Nystrom, William A., to Stackpole Carbon Company. Graphite molding powder and method of preparation. 4,235,859, Cl. 423-448.000.

Borsi, Jozsef: *See*—
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsi, Jozsef; and Tardos, Laszlo, 4,235,912, Cl. 424-261.000.

Bos-Knox, Ltd.: *See*—
Simpson, George R.; and Sullivan, Herbert W., 4,235,522, Cl. 350-266.000.

Boschi, Pier M.; and Gozzo, Franco, to Montedison S.p.A.. Process for synthesizing 2-substituted semicarbazones and carbalkoxy hydrazones. 4,236,017, Cl. 560-24.000.

Bose, Ranendra K. Anti-air pollution system for exhaust gas. 4,235,845, Cl. 422-171.000.

Bourson, Lucien E.; Delavarenne, Serge Y.; and Tellier, Pierre, to Produits Chimiques Ugine Kuhlmann. 1,2,3,4,4a,9a-Hexahydro-9,10-anthracene-dione, its preparation and its application to the delignification of lignocellulosic materials. 4,235,666, Cl. 162-72.000.

Bovee, Leonardus G. H.: *See*—
Jansen, Gerardus L. M.; and Bovee, Leonardus G. H., 4,236,232, Cl. 365-234.000.

Boxer, Lawrence: *See*—
Howard, John F.; Tolosa, Felix P.; and Boxer, Lawrence, 4,235,971, Cl. 435-293.000.

Boyce, Laurence E., Sr.: *See*—
Dudas, Philip R.; and Boyce, Laurence E., Sr., 4,235,336, Cl. 206-419.000.

Boyd, David C.; Danielson, Paul S.; and Ference, Joseph, to Corning Glass Works. Colored soda-lime glassware. 4,235,634, Cl. 106-52.000.

Boyesen, Eyvind, to Performance Industries, Inc. Two cycle internal combustion engine. 4,235,206, Cl. 123-73.00V.

Boyle, John T. A., to John Wyeth & Brother Limited. 4-Aminoquinoline derivatives, useful as anti-inflammatory agents. 4,235,908, Cl. 424-258.000.

Brackett, Charles A.; and Personick, Stewart D., to Bell Telephone Laboratories, Incorporated. Asynchronous data receiver. 4,236,256, Cl. 455-608.000.

Bradley, John J.: *See*—
Lombardo, Ralph M., Jr; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., 4,236,209, Cl. 364-200.000.

Braham, Richard R. M., to Geosource Inc. Sorting apparatus using programmable classifier. 4,235,342, Cl. 209-564.000.

Brake, Arthur L.; and Harper, David A. C., to Bristol Aerojet Limited. Valved couplings. 4,235,267, Cl. 141-293.000.

Branchini, Ricky A. Comprehensive coolant system tester. 4,235,100, Cl. 73-49.700.

Brand, John R.: *See*—
Lubow, Raymond; and Brand, John R., 4,235,144, Cl. 84-1.160.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred, and Walter, Lothar, 4,235,480, Cl. 308-8.200.

Brandons, Inc.: *See*—
Duggan, Charles F., 4,236,192, Cl. 362-133.000.

Brandt, Jason M., to Sportolite, Inc. Lighting equipment. 4,236,193, Cl. 362-241.000.

Brasfield, Steven H.; and Shalita, Paul, to Ferro Corporation. Retroreflective assembly and method of manufacturing same. 4,235,512, Cl. 350-105.000.

Bravin, Ben, to Dynamex Corporation. Wire stranding machine and control means therefor. 4,235,070, Cl. 57-71.000.

Brewer, Jack J. Book readers clip. 4,235,457, Cl. 281-42.000.

Bridges, David F.; and Britt, Alton H., Jr., to Chromalloy American Corporation. Knockdown cabinet assembly. 4,235,493, Cl. 312-257.00R.

Bridgestone Tire Co., Ltd.: *See*—
Suzuki, Yasuo; Abe, Masaru; and Tezuka, Toshiro, 4,235,274, Cl. 152-354.00R.

Briggs, Alan: *See*—
Wassell, Leonard L.; Cole, Gerald B.; Briggs, Alan; and Pollock, James F., 4,235,836, Cl. 264-333.000

Brigham Young University: *See*—
Bass, Robert W.; Ferguson, Helaman R. P.; Fletcher, Harvey J.; Gardner, John H.; Harrison, B. Kent; and Larsen, Kenneth M., 4,235,668, Cl. 176-3.000.

Brinkmann, Karl E.; and Assmann, Bernd L., to K. Ernst Brinkmann, Industrieverwaltung. Mechanism for adjusting the air gap between the components of an electromagnetic brake. 4,235,311, Cl. 188-71.700.

Bristol Aerojet Limited: *See*—
Brake, Arthur L.; and Harper, David A. C., 4,235,267, Cl. 141-293.000.

British Aerospace: *See*—
Compton, Christopher J., 4,235,397, Cl. 244-12.500

Britt, Alton H., Jr.: *See*—
Bridges, David F.; and Britt, Alton H., Jr., 4,235,493, Cl. 312-257.00R.

Brodie, Angela M. H.; Brodie, Harry J.; and Marsh, David A. Ester derivatives of 4-hydroxy-4-androstene-3,17-dione and a method for inhibiting estrogen biosynthesis. 4,235,893, Cl. 424-243.000.

Brodie, Harry J.: *See*—
Brodie, Angela M. H.; Brodie, Harry J.; and Marsh, David A., 4,235,893, Cl. 424-243.000.

Broken Hill Proprietary Company Limited, The: *See*—
Kemlo, Kenneth G., 4,235,423, Cl. 266-99.000

Bromley, Keith, to United States of America, Navy. Frequency compression and expansion using an electrooptical processor. 4,236,043, Cl. 179-1.50H.
Brooks, Lula M. Play doll house and furniture puzzle. 4,235,039, Cl. 46-12.000.
Brooks, Ray G.; and Smith, Harvell M., to Johns-Manville Corporation. Method of using a low profile heat sealing iron. 4,235,652, Cl. 156-71.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki. 4,235,176, Cl. 112-158.00D.
Brown, Boveri & Cie Aktiengesellschaft: *See*—
Gross, Franz; and Birnbreier, Hermann. 4,235,956, Cl. 429-112.000.
Brown Company: *See*—
Olney, Wallace E.; and Wright, Robert G., 4,235,160, Cl. 493-63.000.
Brown, Robert G.: *See*—
Abele, John E.; and Brown, Robert G., 4,235,244, Cl. 128-749.000.
Brown, Stanley M.; and Woltermann, Gerald M., to Engelhard Minerals & Chemicals Corporation. Zeolitized composite bodies and manufacture thereof. 4,235,753, Cl. 252-455.00Z.
Brown, Warren D.: *See*—
Bennett, Robert F.; Brown, Warren D.; Patterson, Clarence L.; and Sorensen, John C., 4,235,830, Cl. 264-29.700.
Brown & Williamson Tobacco Corp.: *See*—
Psaras, John D.; and Sachleben, Leroy R., 4,235,249, Cl. 131-137.000.
Brownell, Peter, to Fram Corporation. Air filter. 4,235,611, Cl. 55-309.000.
Browning, Edgar P.; and Sturtz, Terry L., to Deere & Company. Remote transmission lubrication system. 4,235,307, Cl. 184-6.120.
Brubaker, Thomas G. Corner painting shield. 4,235,192, Cl. 118-504.000.
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Lombardo, Ralph M., Jr.; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., 4,236,209, Cl. 364-200.000.
O'Keefe, David B.; Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,236,208, Cl. 364-200.000.
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Bryant, Clyde C. Combination engine. 4,235,077, Cl. 60-618.000.
Bryant, Herman G., Jr.; Bullock, James F.; and Honeycutt, Robert G., to Liggett Group Inc. Stability of tobacco casing systems containing palladium. 4,235,251, Cl. 131-140.00B.
Budd Company, The: *See*—
Bauer, Horace P., 4,235,170, Cl. 105-402.000.
Buddenhagen, Uwe, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Internal combustion engine. 4,235,202, Cl. 123-276.000.
Buhren, Wolfgang: *See*—
Bez, Ulrich; and Buhren, Wolfgang. 4,234,982, Cl. 5-455.000.
Bukhtiarov, Ivan D.: *See*—
An, Viktor B.; Bukhtiarov, Ivan D.; Demin, Alexei S.; Potanin, Veniamin G.; and Spelchuk, Valery A., 4,236,085, Cl. 307-106.000.
Bull, Anthony V.; and Boardman, Richard M., to Honeywell Information Systems Inc. Data storage system. 4,236,227, Cl. 365-49.000.
Bullock, James F.: *See*—
Bryant, Herman G., Jr.; Bullock, James F.; and Honeycutt, Robert G., 4,235,251, Cl. 131-140.00B.
Bunk, Edward R: *See*—
Yarwood, Peter H.; Czajkowski, Arthur J.; and Bunk, Edward R., 4,235,224, Cl. 126-438.000.
Bunker Ramo Corporation: *See*—
Yue, David D., 4,235,674, Cl. 176-87.000.
Bureau de Recherches Geologiques et Minieres: *See*—
Baudet, Gerard; Morio, Michel; and Vautrelle, Christian, 4,235,709, Cl. 209-5.000.
Burgener, Robert C.; Martin, Philip T.; and Lord, John J., to Interlake, Inc. Rack entry vehicle communication system. 4,236,255, Cl. 455-603.000.
Burger, Erich, to Siemens Aktiengesellschaft. Circuit arrangement for correcting frequency errors during a transmission of data. 4,236,249, Cl. 375-79.000.
Burger, Reinhard. Traction arrangement for use by a sail surfer or water skier. 4,235,182, Cl. 440-34.000.
Burgess, Donn M.; Marr, Duane R.; Cappiello, Michael W.; and Omberg, Ronald P., to United States of America, Energy. Nuclear reactor composite fuel assembly. 4,235,669, Cl. 176-18.000.
Burke, Davoud & Associates: *See*—
Burke, Jerry A., Jr., 4,235,707, Cl. 209-3.000.
Burke, Jerry A., Jr., to Burke, Davoud & Associates. Method and apparatus for treating solid municipal refuse and other cellulose containing material. 4,235,707, Cl. 209-3.000.
Burr Oak Tool & Gauge Company: *See*—
Harman, Galen B., 4,235,137, Cl. 82-73.000.
Burroughs Corporation: *See*—
Lee, James Y., 4,236,154, Cl. 340-768.000.
Spall, James M., 4,235,092, Cl. 73-9.000.
Spall, James M., 4,235,093, Cl. 73-9.000.
Burroughs Wellcome Co.: *See*—
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,235,905, Cl. 424-251.000.
Buscemi, Paul J.: *See*—
Hench, Larry L.; and Buscemi, Paul J., 4,234,972, Cl. 3-1.900.

Butler, Douglas B.; Hendrickson, Thomas E.; and Koelsch, Ronald G., to Honeywell Inc. Semiconductor apparatus. 4,235,011, Cl. 29-571.000.
Butler, Marlow D., to Palmguard, Inc. Method and apparatus for recording image details of the palm of a hand. 4,236,082, Cl. 250-461.00R.
Butte, Walter A., Jr.; Murtaugh, William J.; and Mitchell, Richard E., to Suntech, Inc. Hydrogenation of aliphatic nitriles to primary amines. 4,235,821, Cl. 564-491.000.
Butterworth, Dennis: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,235,882, Cl. 424-117.000.
Butterworth, George A. M.: *See*—
Mesek, Frederick K.; Butterworth, George A. M.; and Cepuritis, Talivaldis, 4,235,237, Cl. 128-284.000.
Butz, Otmar, to Niro-Plan AG. Apparatus for welding a basin to a frame. 4,236,060, Cl. 219-125.100.
Buxmann, Kurt: *See*—
Neufeld, Kurt; Buxmann, Kurt; Bichsel, Heinz; and Gyongyos, Ivan, 4,235,646, Cl. 148-2.000.
Byram, Robert J., to General Motors Corporation. Low tire pressure sensor and air switch therefor. 4,235,185, Cl. 116-34.00R.
C. M. Industries: *See*—
Demarne, Henri; and Hallot, Andre, 4,235,897, Cl. 424-244.000.
Cable, Daniel K.; and Doke, Jack, to Angeles Metal Trim Co. Building wall structure. 4,235,054, Cl. 52-210.000.
Cagnioux, Sylvain: *See*—
Cothier, Rene; and Cagnioux, Sylvain, 4,235,347, Cl. 220-89.00A.
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., to Vapor Corporation. Vehicular data handling and control system. 4,236,215, Cl. 364-436.000.
Callahan, Dennis. Marking system. 4,235,459, Cl. 283-7.000.
Calvin, Noel. Automatic doorbell. 4,236,147, Cl. 340-553.000.
Campbell, Alan F.: *See*—
Borkowski, John W.; Lenze, La Vern J., Jr.; Campbell, Alan F.; and Nystrom, William A., 4,235,859, Cl. 423-448.000.
Camplan, Jean; Chaumont, Jacques; and Meunier, Robert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Ion source having fluid-cooled supply conductors. 4,236,097, Cl. 313-37.000.
Candle, Richard D., to Goodyear Tire & Rubber Company, The. Belt and methods of manufacture and splicing. 4,235,120, Cl. 474-254.000.
Canevari, Gerard P., to Exxon Research & Engineering Co. Composition and method for suppressing vapor loss of volatile hydrocarbons. 4,235,743, Cl. 252-382.000.
Cannon, James C., to PPG Industries, Inc. Ethylene epoxidation catalyst. 4,235,757, Cl. 252-476.000.
Canon Kabushiki Kaisha: *See*—
Fujibayashi, Kazuo, 4,235,519, Cl. 350-214.000.
Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,236,177, Cl. 358-55.000.
Tsunoi, Haruo, 4,235,166, Cl. 100-158.00R.
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,235,538, Cl. 354-23.00D.
Cantley, Richard E. Door lock construction. 4,235,464, Cl. 292-288.000.
Capella, Joseph A.; and Morrison, Dennis R., to Health Physics Systems, Inc. Method of and apparatus for decontaminating radioactive garments. 4,235,600, Cl. 8-137.000.
Capjon, Jan W., to A/S Strommens Vaerksted. Front wheel suspension for electric vehicles with front wheel drive. 4,235,300, Cl. 180-254.000.
Cappiello, Michael W.: *See*—
Burgess, Donn M.; Marr, Duane R.; Cappiello, Michael W.; and Omberg, Ronald P., 4,235,669, Cl. 176-18.000.
Capra, Nicholas G.; and Antenore, Ronald L., to James D. Pauls and J. Claybrook Lewis and Associates, Limited. Trigger operated dispensing device with accumulating chamber. 4,235,353, Cl. 222-256.000.
Carborundum Company, The: *See*—
Hirsch, James A., 4,235,586, Cl. 431-71.000.
Carey, Alexander, to ENG Helicopter Satellites, Ltd. Support apparatus for a camera. 4,235,405, Cl. 248-123.100.
Carey, Robert: *See*—
Russ, John C.; Carey, Robert; and Chopra, Vinod K., 4,236,151, Cl. 340-722.000.
Carl Still, Firma: *See*—
Tippmer, Kurt, 4,235,625, Cl. 75-91.000.
Carlo, Dennis J.: *See*—
Stoudt, Thomas H.; Carlo, Dennis J.; and Hagopian, Arpi, 4,235,994, Cl. 536-18.000.
Carlson, George A.: *See*—
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., 4,236,215, Cl. 364-436.000.
Carolus, David T.; Edwards, Ralph W.; and Powell, John R., to General Motors Corporation. Antenna actuator with a locating and reaction support surface for the cable storage drum. 4,236,162, Cl. 343-903.000.
Carome, Edward F. Optical fiber acoustical sensors. 4,235,113, Cl. 73-655.000.
Carter, James W.; Lee, Donald C.; Simeone, Vincent A.; and Cheever, Frank L., to United States of America, Army. Aeroload torque simulator. 4,235,103, Cl. 73-168.000.
Carver, Robert G., to Creative Cartons of Ashland, Inc. Collapsible stereoscopic viewer and film strip therefor. 4,235,514, Cl. 350-133.000.

Cascadden, Richard L.: *See*—
Lawson, Lawrence C.; Cascadden, Richard L.; Ross, Tsuneyo; and Greene, Patrick T., 4,235,453, Cl. 280-743.000.
Cascio, Giuseppe: *See*—
Manghisi, Elso; Cascio, Giuseppe; Fregnan, Giancarlo; and Porta, Roberto, 4,235,904, Cl. 424-251.000.
Case, Raymond D., to Xerox Corporation. Automatic document handler control. 4,235,550, Cl. 355-14.00R.
Casma di B. Marinoni & Figli: *See*—
Marinoni, Mirko; and Marinoni, Mario, 4,235,049, Cl. 49-488.000.
Cassidy, James L. Refrigeration and space cooling unit. 4,235,080, Cl. 62-87.000.
Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, to Merck & Co., Inc. Process for producing antibiotics by cultivation of *Streptomyces flavogriseus*. 4,235,967, Cl. 435-119.000.
Castoe, Alonzo R.; and Bass, Jan W., to Atlantic Richfield Company. Preparation of sales gas. 4,235,613, Cl. 62-17.000.
Catena, William J., to National Starch and Chemical Corporation. Anaerobic curing adhesive composition and process for making same. 4,235,986, Cl. 526-320.000.
Caterpillar Tractor Co.: *See*—
Babu, B. Naga P., 4,235,630, Cl. 75-244.000.
Sons, Charles C., Jr., 4,235,275, Cl. 152-410.000.
Caudel, Edward R., to Texas Instruments Incorporated. Semiconductor memory cell with synthesized load resistors. 4,236,229, Cl. 365-154.000.
Cayzac, Jacques C., to U.S. Philips Corporation. Monitoring system for monitoring a field. 4,236,180, Cl. 358-105.000.
Cazalet, Michael F. Container for prevention of postharvest decay, maturation and senescense of harvested crops. 4,235,750, Cl. 252-446.000.
CEM Compagnie Electro-Mecanique: *See*—
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Cepuritis, Talivaldis: *See*—
Mesek, Frederick K.; Butterworth, George A. M.; and Cepuritis, Talivaldis, 4,235,237, Cl. 128-284.000.
Certain-Teed Corporation: *See*—
Miedaner, Patrick M., 4,235,950, Cl. 428-36.000.
Chambers, R. William, to Deco Industries, Inc. Apparatus for obtaining hydrocarbons from rubber tires and from industrial and residential waste. 4,235,676, Cl. 202-118.000.
Chandon Investment Planning Ltd.: *See*—
Thoma, Hans A., 4,235,865, Cl. 424-1.000.
Thoma, Hans A., 4,235,866, Cl. 424-1.000.
Thoma, Hans A., 4,235,867, Cl. 424-1.000.
Chandramouli, Pitchaiya: *See*—
Leong, Sim Y.; Chandramouli, Pitchaiya; and Vasishth, Ramesh C., 4,235,989, Cl. 528-139.000.
Chang, Mike F.; and Roesch, Alfred, to General Electric Company. Open tube aluminum diffusion. 4,235,650, Cl. 148-189.000.
Chang, Tien-Lin, to Rockwell International Corporation. Low round-off noise digital filter. 4,236,224, Cl. 364-724.000.
Chapman, Charles C.: *See*—
Dixon, Rolland E.; and Chapman, Charles C., 4,236,036, Cl. 585-331.000.
Charbonnages de France: *See*—
Chauvin, Raymond; and Guillon, Pierre, 4,235,024, Cl. 34-57.00A.
Charette, Joseph R. Adjustable wrench adapted for use as a hammer. 4,234,987, Cl. 7-139.000.
Chasar, Dwight W.: *See*—
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Chaumont, Jacques: *See*—
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Chauvin, Raymond; and Guillon, Pierre, to Charbonnages de France. Fluidized bed treatment apparatus. 4,235,024, Cl. 34-57.00A.
Chedid, Louis: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.
Cheever, Frank L.: *See*—
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Chemische Werke Huels Aktiengesellschaft: *See*—
Alfs, Helmut; Boehm, George; and Steiner, Heinz, 4,236,033, Cl. 568-793.000.
Chemische Werke Munchen Otto Barlocher GmbH: *See*—
Rieber, Gernot; and Miller, Thomas H., 4,235,794, Cl. 260-413.000.
Chen, Charles C., to General Motors Corporation. Radioactive height sensor for automatic level control. 4,236,074, Cl. 250-308.000.
Chen, Sow-Mei L.: *See*—
Grudzinskas, Charles V.; Wissner, Allan; and Chen, Sow-Mei L., 4,235,924, Cl. 424-278.000.
Chern, Mao-Jin, to Minnesota Mining and Manufacturing Company. Liquid crystal display system. 4,236,150, Cl. 340-713.000.
Chester, Arthur W., to Mobil Oil Corporation. Cracking catalyst. 4,235,754, Cl. 252-455.00Z.
Cheung, Harry, to Union Carbide Corporation. Split stream methanation process. 4,235,044, Cl. 48-197.00R.
Chevalier, Philippe: *See*—
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Chevron Research Company: *See*—
Leonard, Donald J., 4,235,171, Cl. 110-188.000.

Lewis, Robert A.; and Honnen, Lewis R., 4,236,020, Cl. 560-159.000.
Suzuki, Shigeto, 4,236,028, Cl. 562-567.000.
Chicheva, Serafima A.: *See*—
Selivanov, Anatoly G.; Gromeiko, Grigory N.; Kirillov, Leonty N.; Zavolokina, Nina S.; Vlaschenko, Maria G.; Chicheva, Serafima A.; and Zhivetin, Valery V., 4,235,260, Cl. 139-98.000.
Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-I, to American Cyanamid Company. Bis(2-imidazolin-2-ylhydrazone)-9,10-dihydro-9,10-anthracenedicarboxaldehydes. 4,235,996, Cl. 542-415.000.
Chimenti, Robert J. L., to Exxon Research & Engineering Co. Detection of uranium by light induced luminescence. 4,236,071, Cl. 250-253.000.
Chireau, Roland F.: *See*—
Berchielli, Aldo S.; and Chireau, Roland F., 4,235,748, Cl. 252-430.000.
Chiron, Georges; and Giles, Maurice R., to Saint-Gobain Industries. Adjustment of the quantity of impregnating or coating material. 4,235,188, Cl. 118-101.000.
Chiron, Georges, to Saint-Gobain Industries. Control of impregnant or coating material. 4,235,190, Cl. 118-120.000.
Chlorine Engineers Corp., Ltd.: *See*—
Harada, Hiroyuki; Hirao, Kazuhiro; Mitani, Tadayuki; and Ichino, Masaaki, 4,235,684, Cl. 204-79.000.
Cho, Alfred Y.; and Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. Mesa devices fabricated on channeled substrates. 4,236,122, Cl. 331-94.50H.
Cho, Alfred Y.; and DiLorenzo, James V., to Bell Telephone Laboratories, Incorporated. Vertical field effect transistor. 4,236,166, Cl. 357-22.000.
Cho, Chi L. Selfcentered automatic coordinate measuring machine. 4,235,019, Cl. 33-174.0TA.
Choay, Jean: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.
Chopra, Vinod K.: *See*—
Russ, John C.; Carey, Robert; and Chopra, Vinod K., 4,236,151, Cl. 340-722.000.
Christensen, Burton G.; and Leanza, William J., to Merck & Co., Inc. N-Alkyl-N-acyl derivatives of thienamycin. 4,235,917, Cl. 424-274.000.
Christensen, Burton G.; Firestone, Raymond A.; and Leanza, William J., to Merck & Co., Inc. N-Alkylated derivatives of thienamycin. 4,235,920, Cl. 424-274.000.
Christensen, Dean L.; Badour, Leonard C.; and Ebey, Frank S., to Memorex Corporation. Latch and carrying handle assembly for magnetic recording disc cartridge. 4,235,339, Cl. 206-444.000.
Christian Rovsing A/S: *See*—
Seiersen, Ole S., 4,236,133, Cl. 336-69.000.
Chromalloy American Corporation: *See*—
Bridges, David F.; and Britt, Alton H., Jr., 4,235,493, Cl. 312-257.00R.
Chu, Richard C.; LaDue, James J.; and Shelkofsky, Clifford I., to International Business Machines Corporation. Data processor enclosure with tambour door. 4,235,494, Cl. 312-297.000.
Chung, Jing-yau, to General Motors Corporation. Sound intensity meter. 4,236,040, Cl. 179-1.0MN.
Ciba-Geigy Aktiengesellschaft: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,236,007, Cl. 544-328.000.
Ciba-Geigy Corporation: *See*—
Blattner, Hans; and Storni, Angelo, 4,235,895, Cl. 424-244.000.
Dousse, Roland; and Kagi, Ernst, 4,235,818, Cl. 564-199.000.
Fletcher, Ian J., 4,236,003, Cl. 544-254.000.
Reinert, Gerhard, 4,235,597, Cl. 8-526.000.
Schaub, Andres; Dussy, Paul; Aeschlimann, Peter; and Koller, Stefan, 4,235,596, Cl. 8-456.000.
Weber, Kurt; and Kirchmayr, Rudolf, 4,235,741, Cl. 252-301.220.
Ciccarello, Richard. Diffractionated golf ball. 4,235,441, Cl. 273-213.000.
Cincinnati Electronics Corporation: *See*—
Weller, Carroll; and Lippard, Bruce, 4,236,126, Cl. 333-81.00R.
Ciorbaru, Rita. *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.
Citizen Watch Company Limited: *See*—
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Komiyama, Katsuhiko; and Kamisawa, Osamu, 4,236,238, Cl. 368-71.000.
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,236,241, Cl. 368-82.000.
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Clack Corporation: *See*—
Clack, Richard E.; and Wies, Jack E., 4,235,340, Cl. 206-515.000.
Clack, Richard E.; and Wies, Jack E., to Clack Corporation. Salt grid for a brine tank. 4,235,340, Cl. 206-515.000.
Claflin, Warren E.: *See*—
Lilly, A. Clifton, Jr.; Claflin, Warren E.; Hardesty, William R.; Scott, George R.; Hopkins, Roger L.; and Lanzillotti, Harry V., 4,236,062, Cl. 219-384.000.

Clark, Peter J., to Strattwell Developments Limited. Fluid dispenser. 4,235,373, Cl. 239-34.000.
Clark, Richard F. Tire disintegrator. 4,235,383, Cl. 241-38.000.
Clark, Scott A.; and Ulmer, William E., to S. A. Clark & Associates. Switchless circuit malfunction sensor. 4,236,146, Cl. 340-517.000.
Clarkin, Edward J.: *See—*
Hays, George; and Clarkin, Edward J., 4,235,361, Cl. 228-173.00A.
Claycomb, Jack R., to Dresser Industries, Inc. Measuring while drilling tool. 4,235,021, Cl. 33-307.000.
Clayton, John P.: *See—*
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,235,784, Cl. 260-345.80R.
Cleare, Michael J.; and Hydes, Paul C., to Johnson, Matthey & Co., Limited. Staining with nitrido-bridged osmium or ruthenium compounds. 4,235,868, Cl. 424-3.000.
Cleveland, Joseph J., to GTE Products Corporation. Method for producing high strength low expansion cordierite bodies. 4,235,855, Cl. 423-327.000.
Coal Industry (Patents) Limited: *See—*
Monks, Harry, 4,235,475, Cl. 299-43.000.
Coats, Hector A., to Keystone Foods Corporation. Meat product. 4,235,941, Cl. 426-646.000.
Cobble, James T., to B & J Machinery Company, Inc. Loop forming and cutting apparatus for tufting machine. 4,235,175, Cl. 112-79.00R.
Coffey, James P.: *See—*
Bernstein, Philip; Probst, William C.; Coffey, James P.; and Knipple, Charles J., 4,235,696, Cl. 204-281.000.
Coffman, Paul M.: *See—*
Uzelmeier, Christopher W.; and Coffman, Paul M., 4,235,760, Cl. 260-28.50B.
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Cohen, Robert F.; and Cohen, Leonard, 4,235,376, Cl. 239-155.000.
Cohen, Marvin D. Method for extracting fatty acids from shortening. 4,235,795, Cl. 260-428.000.
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Coleman, John H., to United States of America, Energy. Heat exchanger with auxiliary cooling system. 4,235,284, Cl. 165-141.000.
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Norfleet, James, 4,235,874, Cl. 424-52.000.
Collins, Alford F.; and Dixon, Bill A., to Ford Motor Company. Vehicle seat belt retractor mechanism. 4,235,455, Cl. 280-803.000.
Combustion Engineering, Inc.: *See—*
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, deceased, 4,235,636, Cl. 106-66.000.
Mordarski, Walter J., 4,235,673, Cl. 176-82.000.
Comer, Robert C., to Toro Company, The. Filament mower. 4,235,068, Cl. 56-12.700.
Cominco Ltd.: *See—*
Crawshay, Alan, 4,235,256, Cl. 137-240.000.
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Barraud, Andre; Messier, Jean; and Ruaudel, Annie, 4,235,958, Cl. 430-281.000.
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Hariharan, Parameswaran; Hegedus, Zoltan S.; and Steel, William H., 4,235,505, Cl. 350-3.770.
Holan, George; and O'Keefe, David F., 4,235,926, Cl. 424-282.000.
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Klausz, Remy, 4,236,081, Cl. 250-445.00T.
Compton, Christopher J., to British Aerospace. Flow deflector blades. 4,235,397, Cl. 244-12.500.
Computer Peripherals, Inc.: *See—*
Staugaard, Kenneth, 4,235,167, Cl. 101-93.090.
Concast Incorporated: *See—*
Helms, Jimmy L.; and Tegtmeier, Richard J., 4,235,280, Cl. 164-444.000.
Condon, Chris J. Film projection lens system for 3-D movies. 4,235,503, Cl. 350-1.200.
Conger, Thurman W. Vehicular audio equipment securing device. 4,235,492, Cl. 312-242.000.
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Dodd, John R., 4,236,031, Cl. 568-788.000.
Dodd, John R., 4,236,032, Cl. 568-788.000.
Kegler, William H.; and McConaghy, James R., 4,235,703, Cl. 208-89.000.
McClaflin, Gifford G., 4,235,712, Cl. 210-708.000.
Conover, Clarence G. Catamaran boat dollies. 4,235,450, Cl. 280-47.320.
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Consolidated International Corp.: *See—*
Nineberg, Edward, 4,235,045, Cl. 49-41.000.
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Groleau, Rodney J., 4,235,577, Cl. 425-144.000.
Conversational Systems, Inc.: *See—*
Boldridge, Austin G., Jr., 4,236,112, Cl. 324-142.000.
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Lombardo, Ralph M., Jr.; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., 4,236,209, Cl. 364-200.000.
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Cooper, David A.; Monoski, William T.; and Vibert, Edward J., to GTE Products Corporation. Ground fault receptacle. 4,236,128, Cl. 335-18.000.
Cooper, Donald L.: *See—*
Davis, Howard C.; and Cooper, Donald L., 4,235,377, Cl. 239-215.000.
Cooper, Duane H., to National Research Development Corporation. Signal matrixing for directional reproduction of sound. 4,236,039, Cl. 179-1.0GQ.
Copeland Corporation: *See—*
DiFlora, Michael A., 4,236,092, Cl. 310-68.00C.
Cor Tech Research Ltd.: *See—*
Leong, Sim Y.; Chandramouli, Pitchaiya; and Vasishth, Ramesh C., 4,235,989, Cl. 528-139.000.
Corcelle, Francois; Hamon, Jean-Pierre; and Martin, Philippe, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Regulation of electron-beam welding generators. 4,236,058, Cl. 219-121.0EA.
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Boyd, David C.; Danielson, Paul S.; and Ference, Joseph, 4,235,634, Cl. 106-52.000.
Siegfried, Robert W., 4,235,616, Cl. 65-3.00A.
Cornu, Jozef; Taeymans, Jean R. J. M.; and Talbot, Jacques, to International Standard Electric Corporation. Signal generator and signal converter using same. 4,236,090, Cl. 307-268.000.
Cort, Joseph H. Method for producing high potency factor VIII. 4,235,881, Cl. 424-101.000.
Cosentino, Cesare C. Ribbon Package. 4,235,335, Cl. 206-389.000.
Cosmi, Vincent, to Dari-Desserts, Inc. Provolone cheese molding apparatus and mold assembly therefor. 4,235,578, Cl. 425-173.000.
Costello, Alan T.; and Lindsay, Robert J., to Imperial Chemical Industries Limited. Process for preparing cyclopropane carboxylic acids. 4,236,018, Cl. 560-124.000.
Costello, Michael. Burglarproof guard for window lock. 4,235,465, Cl. 292-346.000.
Cothier, Rene; and Cagnioux, Sylvain, to CEM Compagnie Electro-Mecanique. Air-tight molded resin enclosure with a safety membrane for electric devices. 4,235,347, Cl. 220-89.00A.
Couper, Alistair S.: *See—*
Steigelmann, Edward F.; Yahnke, Robert L.; Couper, Alistair S.; and Deepak, Chand, 4,235,983, Cl. 526-68.000.
Cousins, Sydne, to Bonnie Enterprises, Inc. Undergarment reinforcements. 4,235,240, Cl. 128-476.000.
Cox, Bruce P.; and DeVries, David P., to DeVries, David P. Lightweight concrete aggregate and method. 4,235,640, Cl. 106-308.00Q.
Cox, Donald R.; and Barber, Theodore C. Bee board cleaning device. 4,234,986, Cl. 6-12.00R.
Cox, Robert W. Rotary expansion and compression device. 4,235,217, Cl. 123-232.000.
Coxon, DeWayne A., to Jordan College. Solar-liquid heat system. 4,235,223, Cl. 126-437.000.
CPC International Inc.: *See—*
Leach, Harry W.; and Hebeda, Ronald, 4,235,970, Cl. 435-202.000.
Walon, Raoul G. P., 4,235,965, Cl. 435-95.000.
Crawford, Donald C.; and Aterianus, John S., to FMC Corporation. Article grouping and tiering apparatus. 4,235,329, Cl. 198-419.000.
Crawshay, Alan, to Cominco Ltd. Damper assembly for gas duct. 4,235,256, Cl. 137-240.000.
Creative Cartons of Ashland, Inc.: *See—*
Carver, Robert G., 4,235,514, Cl. 350-133.000.
Creighton, Albert M., Jr.; Foss, Charles L., Jr.; and Vandewalle, Neal R., to Illinois Tool Works Inc. Punch and stripper assembly for a reciprocating metal-punching press. 4,235,138, Cl. 83-139.000.
Cribbs, Robert W.; and Engle, Gary L., to Litton Industrial Products, Inc. Scan converter. 4,236,221, Cl. 364-515.000.
Crown Auto Top Manufacturing Co.: *See—*
Gurvis, Isadore, 4,236,148, Cl. 340-568.000.
Csanyi, Endre: *See—*
Kuszmann, Janos; Sohar, Pal; Csanyi, Endre; and Kiraly nee Vida, Emilia, 4,235,803, Cl. 260-456.00R.
Cummings, Raymond V. Fishing rod holder. 4,235,409, Cl. 248-538.000.
Curley, John L.; Johnson, Robert B.; Lemay, Richard A.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. System providing multiple fetch bus cycle operation. 4,236,203, Cl. 364-200.000.
Curtis, Carl F.; and Curtis, Edward D. Surface decking. 4,235,197, Cl. 119-28.000.
Curtis, Edward D.: *See—*
Curtis, Carl F.; and Curtis, Edward D., 4,235,197, Cl. 119-28.000.
Czajkowski, Arthur J.: *See—*
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D. Swarovski & Co., Glasschleiferei: *See—*
Swarovski, Daniel, 4,235,951, Cl. 428-40.000.
Daicel Chemical Industries Ltd.: *See—*
Harada, Hiroyuki; Hirao, Kazuhiro; Mitani, Tadayuki; and Ichino, Masaaki, 4,233,684, Cl. 204-79.000.
Daicel Ltd.: *See—*
Sakaguchi, Yasuhiro, 4,235,722, Cl. 210-247.000.
Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; and Langer, Hans-Joachim, 4,235,846, Cl. 422-171.000.
Stotz, Manfred; Komander, Gerhard; and Hilpert, Wolfgang, 4,235,215, Cl. 123-179.00H.
Dakin, Wayne R.: *See—*
Winslow, John S.; and Dakin, Wayne R., 4,236,050, Cl. 179-100.10G.
Dale, David; and Barksdale, Robert C., to Munsingwear, Inc. Method and apparatus for producing patterned effect on knitted fabric. 4,235,083, Cl. 66-213.000.
Dallmer, Helmuth. Hoof covering. 4,235,292, Cl. 168-4.000.
Daniel, Sam M., to Motorola, Inc. Steepest descent controller for an adaptive antenna array. 4,236,158, Cl. 343-100.0LE.
Daniels, Richard N.: *See—*
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., 4,236,215, Cl. 364-436.000.
Danielson, Paul S.: *See—*
Boyd, David C.; Danielson, Paul S.; and Ference, Joseph, 4,235,634, Cl. 106-52.000.
Dantzig, Jonathan A.; and Tyler, Derek E., to Swiss Aluminium Ltd. Method and apparatus for the degassing of molten metal. 4,235,627, Cl. 75-93.00E.
Dari-Desserts, Inc.: *See—*
Cosmi, Vincent, 4,235,578, Cl. 425-173.000.
Dart, Edward C.; Roberts, Roger C.; Perry, Antony R.; Nemcek, Jozef; and Graham, Neil B., to Imperial Chemical Industries Limited. Photopolymerizable composition comprising α,αdiketone catalyst. 4,235,686, Cl. 204-159.190.
Dau, Gary J.; Martel, Louis J.; and Scharton, Terry D., to Electric Power Research Institute. Apparatus and method for measuring the crevice gap clearance in a heat exchanger. 4,235,110, Cl. 73-579.000.
Davidow, Bernard: *See—*
Kaul, Balkrishena; Davidow, Bernard; and Millian, Stephen J., 4,235,864, Cl. 424-1.000.
Davidson, Howard R., to Beckman Instruments, Inc. Secondary centrifuge tube seal. 4,235,367, Cl. 233-26.000.
Davies, David E. N.; and Kingsley, Stuart A., to National Research Development Corporation. Telecommunication systems. 4,236,243, C. 370-3.000.
Davies, Jenkin E.: *See—*
van Dijk, Jan; and Davies, Jenkin E., 4,235,931, Cl. 424-327.000.
Davis, Charles J., to General, Inc., The. Locking brake for articulated vehicle. 4,235,308, Cl. 187-9.00R.
Davis, Clarence E.; and Hoyniak, Daniel, to Babcock & Wilcox Company, The. Inspection system for heat exchanger tubes. 4,235,020, Cl. 33-178.00F.
Davis, Doxie M.; and Gehman, John B., to United States of America, Navy. Automatic pulse controlled servo control system. 4,236,106, Cl. 318-599.000.
Davis, Howard C.; and Cooper, Donald L., to Wooster Brush Company, The. Portable paint spraying device. 4,235,377, Cl. 239-215.000.
Davis, Jack H. Bone transfixation pin guide. 4,235,428, Cl. 269-53.000.
Davis, Robert S., Jr.; and Schneider, William A., to Texas Instruments Incorporated. Interactive multidimensional classification and sorting of seismic segment data. 4,236,233, Cl. 367-71.000.
Davis, Thomas B.; and Girard, Theodore A., to Glyco Chemicals, Inc. Bleaching composition. 4,235,599, Cl. 8-108.00R.
Davison, Ellard D., Jr., to General Motors Corporation. Low friction oil control piston ring. 4,235,447, Cl. 277-138.000.
Dawson, Peter L.; and Willis, Edwin, to Lever Brothers Company. Clear liquid detergent composition containing MgABS and alkyl polyether sulphates 4,235,758, Cl. 252-544.000.
Dawson, Titus C. Fishing line signal device. 4,235,036, Cl. 43-17.000.
Dayco Corporation: *See—*
Wetzel, Robert E., 4,235,119, Cl. 474-205.000.
Debat, Jacques; Lemoine, Jean; and Gabillault, Francoise L., to Laboratoire Debat. *Stephania cepharantha* extract, its method of preparation and its use as pharmaceutical. 4,235,890, Cl. 424-195.000.
Deco Industries, Inc.: *See—*
Chambers, R. William, 4,235,676, Cl. 202-118.000.
Dedelmahr, Rudolf: *See—*
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 4,236,134, Cl. 336-96.000.
De Donno, Benito, to Super Stretch Co., Ltd. Friction type exercising device. 4,235,439, Cl. 272-132.000.
Deepak, Chand: *See—*
Steigelmann, Edward F.; Yahnke, Robert L.; Couper, Alistair S.; and Deepak, Chand, 4,235,983, Cl. 526-68.000.
Deere & Company: *See—*
Browning, Edgar P.; and Sturtz, Terry L., 4,235,307, Cl. 184-6.120.
de Filippis, Modeste; and Rollet, Jean. Heating and refrigerating tray cabinet for distributing hot and cold dishes. 4,235,282, Cl. 165-61.000.
DeFoe, Peter. Controlling the damping of flues. 4,235,219, Cl. 126-288.000.
Degner, Dieter; and Siegel, Hardo, to BASF Aktiengesellschaft. Electrolytic preparation of benzaldehydes. 4,235,683, Cl. 204-78.000.
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Thijs, Victor J. M., deceased; Huyghebaert, Paul E., administrator; De Jaeger, Nikolaas C.; and Tavernier, Bernard H., 4,235,959, Cl. 430-531.000.
Dejneka, Tamara: *See—*
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Dekker, Evert H. L. J.; Enz, Ulrich E.; Haisma, Jan; and Van Mierloo, Klaas L. L., to U.S. Philips Corporation. Magnetic domain device. 4,236,226, Cl. 365-20.000.
Delatte, Marc; and Chevalier, Philippe, to Aluminum Pechiney. Ring for a casting machine wheel. 4,235,278, Cl. 164-433.000.
Delavarenne, Serge Y.: *See—*
Bourson, Lucien E.; Delavarenne, Serge Y.; and Tellier, Pierre, 4,235,666, Cl. 162-72.000.
Delmer, William A. Multiple chamber drip irrigation hose. 4,235,380, Cl. 239-450.000.
Del Pesco, Thomas W., to Du Pont de Nemours, E. I., and Company. Modified montmorillonite clay catalyst. 4,235,751, Cl. 252-450.000.
Delta Materials Research Limited: *See—*
Robinson, William D., 4,235,576, Cl. 425-138.000.
DEMAG, Aktiengesellschaft: *See—*
Grimpe, Karl, 4,235,082, Cl. 64-28.00R.
Rath, Gero, 4,235,623, Cl. 75-11.000.
Demarne, Henri; and Hallot, Andre, to C. M. Industries. Benzodiazepine derivatives and pharmaceutical compositions thereof. 4,235,897, Cl. 424-244.000.
Demin, Alexei S.: *See—*
An, Viktor B.; Bukhtiarov, Ivan D.; Demin, Alexei S.; Potanin, Veniamin G.; and Spelchuk, Valery A., 4,236,085, Cl. 307-106.000.
Den-Con Tool Company: *See—*
Denny, Lawrence A.; and Aswell, James E., 4,235,469, Cl. 294-96.000.
Denny, Lawrence A.; and Aswell, James E., to Den-Con Tool Company. Pipe handling apparatus. 4,235,469, Cl. 294-96.000.
De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Novel electrodes and their use. 4,235,695, Cl. 204-268.000.
Dereser, Ernst H.; and Meulders, Jean-Marie, to Owens-Corning Fiberglas Corporation. Size composition. 4,235,764, Cl. 260-29.6NR.
Dermik Laboratories: *See—*
Packman, Albert M., 4,235,873, Cl. 424-47.000.
DeRoeck, Joseph J.; and Van Steenwinkel, Frans, to AGFA-GEVAERT N.V. Continuous coating of webs having spliced joints. 4,235,655, Cl. 156-157.000.
Desai, Kishor A., to American Color & Chemical Corporation. Cationic α-cyano-p-(N-benzyl-N-ethylamino)cinnamoyl dyes. 4,235,806, Cl. 260-465.00D.
Deutsch, Marshall E.; and Mead, Louis W., to Thyroid Diagnostics, Inc. Test device and method for its use. 4,235,601, Cl. 23-230.00R.
Deutsche Babcock Aktiengesellschaft: *See—*
Schulze, Gerd, 4,235,483, Cl. 308-26.000.
Develop Dr. Eisbein GmbH and Co.: *See—*
Eisbein, Jurgen; and Moser, Kurt, 4,235,549, Cl. 355-3.0DD.
DeVincent, Patsy: *See—*
Sullivan, Leo S., Jr.; DeVincent, Patsy; and Oldham, Wendell M., Jr., 4,235,426, Cl. 267-8.00R.
DeVries, David P.: *See—*
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De Vries, Donald H., to Rogers Corporation. High capacitance bus bar. 4,236,046, Cl. 174-72.00B.
Dewald, Bernd: *See—*
Engelmann, Manfred; Maier, Karl; Spange, Arno; Dewald, Bernd, Lenz, Hans-Joachim; and Teige, Wolfgang, 4,235,641, Cl. 106-308.00M.
Dewey, Chris A.; and Nelson, John L., to SCM Corporation. Platen variable. 4,235,556, Cl. 400-567.000.
Dexter, William F.: *See—*
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Dhoore, Louis G.; and Schultz, William H., to Boeing Company, The. Combination bulk absorber-honeycomb acoustic panels. 4,235,303, Cl. 181-214.000.
Diamond Shamrock Corporation: *See—*
Bennett, John E.; and Elliott, Joseph E., 4,235,697, Cl. 204-290.00F
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Diaz Nogueira, Eduardo; Redondo Abad, Angel L.; and Regife Vega, Jose M. Process for the elimination of accumulated iron in organic phases of fluid-fluid extraction that contain di-2-ethyl-hexyl phosphoric acid. 4,235,713, Cl. 210-638.000.
Didier Engineering GmbH: *See—*
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Wagener, Dietrich; Flockenhaus, Claus; and Meckel, Joachim F., 4,235,604, Cl. 48-197.00R.
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Dietrich, Oelhschlagel: *See—*
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Dietrich, Robert: *See—*
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Dietz, Richard E., to Phillips Petroleum Company. Polymerization of olefins. 4,235,746, Cl. 252-429.00C.

DiFlora, Michael A., to Copeland Corporation. Compressor motor protection. 4,236,092, Cl. 310-68.00C.

Diggs, Richard E. Method for desalinating water by preheating and distillation with solar energy. 4,235,680, Cl. 203-2.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Layered carboxy end terminated organophosphorus inorganic polymers. 4,235,990, Cl. 528-287.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Layered sulfonate end terminated organophosphorus inorganic polymers. 4,235,991, Cl. 528-391.000.

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Rado, Peter J.; Durvasula, Srirama S.; and Angell, William H., 4,236,207, Cl. 364-200.000.
Strecker, William D.; Hastings, Thomas N.; Lary, Richard F.; Rodgers, David P.; and Rothman, Steven H., 4,236,206, Cl. 364-200.000.

Dillon, Roy E., to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Yarn false twist apparatus. 4,235,071, Cl. 57-280.000.

DiLorenzo, James V.: *See—*
Cho, Alfred Y.; and DiLorenzo, James V., 4,236,166, Cl. 357-22.000.

Dines, Martin B.: *See—*
DiGiacomo, Peter M.; and Dines, Martin B., 4,235,990, Cl. 528-287.000.
DiGiacomo, Peter M.; and Dines, Martin B., 4,235,991, Cl. 528-391.000.

Dionne, Gervais; Asselin, Andre A.; and Humber, Leslie G., to American Home Products Corporation. 1-Hydroxyalkanamine tetrahydrocarbazoles and cyclopent[b]indoles, compositions and method of use. 4,235,903, Cl. 424-248.570.

Dionne, Gervais: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,235,901, Cl. 424-248.510.

Ditzer, Reiner: *See—*
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Divers, Edward F., to United States of America, Interior. Mine face ventilation system. 4,235,163, Cl. 98-50.000.

DiVito, Angelo; and Fisco, Benjamin P., Jr., to Aquatech, Inc. Apparatus for sewer cleaning and the like. 4,234,980, Cl. 15-302.000.

Dixon, Bill A.: *See—*
Collins, Alford F.; and Dixon, Bill A., 4,235,455, Cl. 280-803.000.

Dixon, Rolland E.; and Chapman, Charles C., to Phillips Petroleum Company. Catalytic alkylation of hydrocarbons. 4,236,036, Cl. 585-331.000.

Dobie, Donald M.: *See—*
Hannaford, James H.; Myrfield, Warren; Weiler, David H.; Trofimenkoff, Frederick N.; Consay, Joseph A.; and Dobie, Donald M., 4,235,050, Cl. 51-34.00D.

Dr. E. Fresenius Chemisch Pharmazeutische Industrie KG: *See—*
Schindler, Johannes G.; and Schael, Wilfried, 4,235,231, Cl. 128-214.00R.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Bez, Ulrich; and Buhren, Wolfgang, 4,234,982, Cl. 5-455.000.

Dodd, John R., to Conoco, Inc. Preparation of 5-t-butyl alkyl-substituted phenols. 4,236,031, Cl. 568-788.000.

Dodd, John R., to Conoco, Inc. Preparation of 6-t-butyl alkyl-substituted phenols. 4,236,032, Cl. 568-788.000.

Doebel, David H. Semi-tubular parabolic multiple core helix solar concentrator. 4,235,225, Cl. 126-438.000.

Dohi, Toshihide; and Kitaguchi, Sigeo, to Minolta Camera Kabushiki Kaisha. Method for producing composite optical elements of glass and polymer material. 4,235,654, Cl. 156-99.000.

Doke, Jack: *See—*
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Dolzhenkov, Boris S.: *See—*
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Dorma-Baubeschlag GmbH & Co. KG.: *See—*
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Dorn, Silvia; Pfiffner, Albert; and Zurfluh, Rene, to Hoffmann-La Roche Inc. Pesticidal 1,4-bis-[(-propynyloxy)-methyl]-benzene and 1,4-bis-[(2-propynyloxy)-methyl] cyclohexane. 4,235,932, Cl. 424-339.000.

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Dorrbeck, Frank: *See—*
Kolbl, Richard; Mehlan, Bernd; Gress, Josef; Dorrbeck, Frank; and Leichs, Rudolf, 4,235,351, Cl. 221-92.000.

Dotta, Angelo. Rapidly opening sealed package for wound dressing adhesive tape. 4,235,337, Cl. 206-441.000.

Douglas, George H.: *See—*
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,235,929, Cl. 424-301.000.

Dousse, Roland; and Kagi, Ernst, to Ciba-Geigy Corporation. Process for producing alpha-monochloroacetoacetic acid monomethylamide. 4,235,818, Cl. 564-199.000.

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McMath, Jack A., 4,235,266, Cl. 141-285.000.

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Jinkins, C. Eugene; and Legler, Bobby, 4,235,762, Cl. 260-29.300.
Jones, Giffin D., 4,235,972, Cl. 521-28.000.
Lee, John M.; and Bauman, William C., 4,235,717, Cl. 210-685.000.
Martin, Leandra P.; and Luecke, Robert A., 4,235,341, Cl. 206-601.000.
Sanderson, James S., 4,235,962, Cl. 435-16.000.
Scherubel, Gary A., 4,235,734, Cl. 252-142.000.

Dowling, Ralph O., to Kellogg-American, Inc. Compressed air dryer. 4,235,081, Cl. 62-93.000.

Drake, Charles A., to Phillips Petroleum Company. Purification of unsaturated dinitriles by contacting with chi-alumina prior to hydrogenation. 4,235,808, Cl. 260-465.80R.

Dresser Industries, Inc.: *See—*
Claycomb, Jack R., 4,235,021, Cl. 33-307.000.
Zyglewyz, Steve W., 4,235,295, Cl. 175-371.000.

Drexelbrook Controls, Inc.: *See—*
Maltby, Frederick L.; and Stern, David M., 4,235,106, Cl. 73-304.00C.

Dreyfus, Russell W.; and Landon, Alfred J., to International Business Machines Corporation. Versatile microsecond multiple framing camera. 4,236,179, Cl. 358-93.000.

Druckenbrodt, Wolf-Gunther; Baumann, Siegfried; Krause, Roland; and Stoll, Wolfgang, to Alkem GmbH. Method for the manufacture of $(U,Pu)O_2$ mixed crystals. 4,235,740, Cl. 252-301.10R.

Dubois, Jean-Claude: *See—*
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,235,736, Cl. 252-299.000.

DuBois, Loring E.; and Simpson, Lawrence D., to Western Electric Company, Inc. Apparatus for assembling a plurality of articles. 4,235,014, Cl. 29-760.000.

Dudas, Philip R.; and Boyce, Laurence E., Sr., to General Electric Company. Flash array package. 4,235,336, Cl. 206-419.000.

Dudeck, Christian; Lehmann, Gunter; Ross, Karl-Heinz; Fliege, Werner; Petri, Norbert; Diem, Hans; Meissner, Bernd; and Sauer, Wolfgang, to BASF Aktiengesellschaft. Preparation of diketones. 4,235,823, Cl. 568-402.000.

Dugan, David R.; and Prince, Kenneth E., to Owens-Illinois, Inc. Unitary molded container lid and tray for article packaging. 4,235,338, Cl. 206-443.000.

Duggan, Charles F., to Brandons, Inc. Cabinet for examining and identifying specimens. 4,236,192, Cl. 362-133.000.

Dulger, Viktor; and Ernst, Franz, to Dulger, Viktor. Adjustable stroke piston and crankshaft assembly. 4,235,130, Cl. 74-831.000.

Dunlop Limited: *See—*
Edwards, Reginald H.; and Holdsworth, John A., 4,235,273, Cl. 152-330.0RF.

Duphar International Research B.V.: *See—*
Bekkering, Hendrik M., 4,235,235, Cl. 128-218.00P.
van Dijk, Jan; and Davies, Jenkin E., 4,235,931, Cl. 424-327.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bateman, Linda R., 4,235,980, Cl. 525-215.000.
Del Pesco, Thomas W., 4,235,751, Cl. 252-450.000.
Felten, John J., 4,235,944, Cl. 427-125.000.
Fuchs, Julius J., 4,235,802, Cl. 260-453.0RW.
Henderson, Rosetta M., 4,236,008, Cl. 546-46.000.
Krespan, Carl G., 4,235,804, Cl. 260-458.00F.
Kring, Elbert V.; and Lautenberger, William J., 4,235,097, Cl. 73-23.000.
Needes, Christopher R. S., 4,235,644, Cl. 136-256.000.
Tocker, Stanley, 4,235,872, Cl. 424-19.000.

Durden, John A., Jr.; and Kurtz, Arthur P., Jr., to Union Carbide Corporation. Pesticidal carbamate esters of 5-oximino-1,3-oxazolidin-4-ones. 4,235,902, Cl. 424-248.530.

Durham, Harry G., to Shell Oil Company. Esters of 3-substituted-2-(aminocarbonyl)oxiranecarboxylic acids as lipogenesis inhibitors. 4,235,923, Cl. 424-278.000.

Durvasula, Srirama S.: *See—*
Rado, Peter J.; Durvasula, Srirama S.; and Angell, William H., 4,236,207, Cl. 364-200.000.

Dussy, Paul: *See—*
Schaub, Andres; Dussy, Paul; Aeschlimann, Peter; and Koller, Stefan, 4,235,596, Cl. 8-456.000.

Dusza, John P.; and Albright, Jay D., to American Cyanamid Company. Imidazo[1,5-a]pyrimidines. 4,236,005, Cl. 544-281.000.

Dutton-Lainson Company: *See—*
Haase, Reinhold A., 4,236,052, Cl. 200-51.090.

Dyckerhoff & Widmann A.G.: *See—*
Schambeck, Herbert, 4,235,055, Cl. 52-230.000.

Dykzeul, Theodore J., to Robertshaw Controls Company. Slip clutch assembly. 4,235,323, Cl. 192-95.000.

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Bravin, Ben, 4,235,070, Cl. 57-71.000.

Dynatech Laboratories, Incorporated: *See—*
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E. D. Parsons Engineering: *See—*
Parsons, Ian A., 4,235,067, Cl. 53-502.000.

E. R. Squibb & Sons, Inc.: *See—*
La Via, Anthony L.; and Gibbs, Irwin S., 4,235,900, Cl. 424-246.000.

Sipos, Frank; and Keseleski, Adam J., 4,235,993, Cl. 536-17.00R.
Sundeen, Joseph E.; and Dejneka, Tamara, 4,235,885, Cl. 424-177.000.

E-Systems, Inc.: *See—*
Shearer, Harry D.; and Fowler, Robert E., 4,236,110, Cl. 324-78.00Z.

Ealther & Cie Aktiengesellschaft: *See—*
Bechthold, Horst, 4,235,675, Cl. 201-2.500.

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Eastman Kodak Company: *See—*
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Howe, Dennis G., 4,236,183, Cl. 358-214.000.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,235,999, Cl. 542-427.000.
Irick, Gether, Jr.; and Kelly, Charles A., 4,236,013, Cl. 548-261.000.
Kohrt, Carl F.; and Willis, Roland G., 4,235,957, Cl. 430-203.000.
Phillips, Bobby M., 4,235,574, Cl. 425-72.00S.

Eaton Corporation: *See—*
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Larson, William M., 4,235,074, Cl. 59-93.000.
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Eckel, David S.: *See—*
Lechter, George; and Eckel, David S., 4,235,524, Cl. 350-299.000.

Eckle, Manfred: *See—*
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Edd, Jon F.: *See—*
Wohleber, David A.; Edd, Jon F.; and Hennrich, Ronald L., 4,235,860, Cl. 423-495.000.

Eden, Dayton D., to Vought Corporation. Switching of thermochromic and pressure sensitive films with surface acoustic waves. 4,236,156, Cl. 340-786.000.

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Carolus, David T.; Edwards, Ralph W.; and Powell, John R., 4,236,162, Cl. 343-903.000.

Edwards, Reginald H.; and Holdsworth, John A., to Dunlop Limited. Pneumatic tires. 4,235,273, Cl. 152-330.0RF.

Egli, Franz; and Egli, Franz, to Zentralschweizerischer Milchverbrand. Production of sterile yoghurt. 4,235,934, Cl. 426-43.000.

Egli, Franz: *See—*
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Ehrfeld, Wolfgang: *See—*
Becker, Erwin-Willy; Bley, Peter; Ehrfeld, Wolfgang; Ehrfeld, Ursula; and Krieg, Gunther, 4,235,606, Cl. 55-17.000.

Eicken, Karl; Plath, Peter; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Substituted cyanamides and their use as fungicides. 4,235,928, Cl. 424-300.000.

Eidelman, Lev G.: *See—*
Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V., 4,235,848, Cl. 422-249.000.

Eilers, Steven P. Polystyrene paddle sign. 4,235,033, Cl. 40-586.000.

Eisbein, Jurgen; and Moser, Kurt, to Develop Dr. Eisbein GmbH and Co. Developing station for an electrostatic copier. 4,235,549, Cl. 355-3.0DD.

Elam, James O. Cuffed endotrachael tube and method. 4,235,239, Cl. 128-207.150.

Elander, Lars: *See—*
Reinhall, Rolf; Johansson, Inge; Sandstron, Ake; Mukvist, Anders; and Elander, Lars, 4,235,665, Cl. 162-23.000.

Electric Power Research Institute: *See—*
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Elektro-Mechanik GmbH: *See—*
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Elger, Walter: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Ekkehard, 4,235,930, Cl. 424-305.000.

Eli Lilly and Company: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,235,909, Cl. 424-258.000.
Jones, Reuben G.; and Terando, Norman H., 4,235,995, Cl. 542-408.000.
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,235,776, Cl. 260-326.100.
Taylor, Harold M., 4,235,619, Cl. 71-66.000.
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Elliott, Joseph E.: *See—*
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Ellouz, Fabrielle: *See—*
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Emeury Jean-Marie L.: *See—*
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EMI Electrola Gesellschaft mit beschrankter Haftung: *See—*
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ENG Helicopter Satellites, Ltd.: *See—*
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Engelhard Minerals & Chemicals Corporation: *See—*
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Brown, Stanley M.; and Wollermann, Gerald M., 4,235,753, Cl. 252-455.00Z.

Engelmann, Manfred, Maier, Karl; Spange, Arno; Dewald, Bernd; Lenz, Hans-Joachim; and Teige, Wolfgang, to Hoechst Aktiengesellschaft. Dyeing agent compositions based on polypropylene wax. 4,235,641, Cl. 106-308.00M.

Engle, Gary L.: *See—*
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Erb, George H. Method and apparatus for converting relatively low temperature heat energy into useful work. 4,235,075, Cl. 60-527.000.

Erickson, Gerald. Bottle carrier. 4,235,468, Cl. 294-87.200.

Ericsson, James W., to Bell Telephone Laboratories, Incorporated. Connector. 4,235,501, Cl. 339-191.00M.

Ernst, Franz: *See—*
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Erwin, Louis R.: *See—*
Walter, Richard P.; Sisson, Albert E.; Erwin, Louis R.; and Kelso, Charles R., 4,235,374, Cl. 239-90.000.

Escher, Balint; and Romanet, Rene', to Societe Lignes Telegraphiques et Telephoniques. Encapsulating solid tantalum capacitors. 4,235,009, Cl. 29-570.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,235,006, Cl. 29-407.000.

Esquire, Inc.: *See—*
Nuver, Eric L. H., 4,236,100, Cl. 315-92.000.

Esseluhn, Werner F., to Western Electric Company, Inc. Apparatus for depositing materials on stacked semiconductor wafers. 4,235,191, Cl. 118-415.000.

Essrich, Wolfgang: *See—*
Kreissl, Ottmar; Nusselein, Manfred; and Essrich, Wolfgang, 4,235,499, Cl. 339-91.00R.

Etablissements Huret & Fils: *See—*
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Ethyl Corporation: *See—*
Bauer, Dennis P., 4,235,685, Cl. 204-158.0HA.
Hayes, Thomas H., 4,235,557, Cl. 401-49.000.

Evans, Ben E., to Merck & Co., Inc. Process for dibenzocycloheptene compounds. 4,235,820, Cl. 564-427.000.

Eventoff, Franklin N. Electronic apparatus. 4,235,141, Cl. 84-1.010.

Evers, Walter, to Pharmazeutische Fabrik Evers & Co. Therapeutic agent for the external treatment of psoriasis, tinea and eczemas 4,235,889, Cl. 424-195.000.

Evinrude, Ralph S., to Outboard Marine Corporation Marine propulsion device including propeller protection means 4,235,183, Cl 440-71.000.

Evrard, Jacques E. M. Article labelling machine 4,235,661, Cl 156-542.000.

Exxon Research & Engineering Co.: *See—*
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Baker, Richard H., 4,236,089, Cl. 307-254.000
Canevari, Gerard P., 4,235,743, Cl. 252-382.000
Chimenti, Robert J. L., 4,236,071, Cl. 250-253.000
Luckenbach, Edward C., 4,235,704, Cl 208-113.000
Metrailer, William J., 4,235,700, Cl 208-54.000
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F. Korbel & Bros.: *See*—
Williams, David W.; Jordan, James L.; and Huntsinger, James E., 4,235,940, Cl. 426-592.000.
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Facchini, Giovanni C. Board game with directional indicator. 4,235,443, Cl. 273-277.000.
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Failli, Amedeo: *See*—
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Fairfield Industries, Inc.: *See*—
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Faiz, Robert L.: *See*—
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Fansteel Inc.: *See*—
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Federighi, George B.: *See*—
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Federighi, George J.; and Federighi, George B. Dishwasher using steam to heat cold wash and rinse waters and spray them against dishes during the wash and rinse cycles. 4,235,642, Cl. 134-58.00D.
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Feliks, James J., to Mead Corporation, The. Aseptic container filler apparatus. 4,235,265, Cl. 141-85.000.
Felten, John J., to Du Pont de Nemours, E. I., and Company. Process for producing gold conductors. 4,235,944, Cl. 427-125.000.
Fenn, Lawrence E.; and Sperry, Charles R. Quick-acting electric cigar lighter. 4,236,061, Cl. 219-265.000.
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Fernandez Aldape, Jose M. Device for linear drawing. 4,235,022, Cl. 33-474.000.
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Ferro Corporation: *See*—
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Fidelity Electronics, Ltd.: *See*—
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Firth, William C., Jr., to Union Camp Corporation. Humate thinners for drilling fluids. 4,235,727, Cl. 252-8.50C.
Fisco, Benjamin P., Jr.: *See*—
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Fletcher, Ian J., to Ciba-Geigy Corporation. V-Triazolyl-[4,5-d]-pyrimidH. 4,236,003, Cl. 544-254.000.
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Flockenhaus, Claus, to Didier Engineering GmbH. Process for reducing the nitrogen oxide content of coke oven gases. 4,235,851, Cl. 423-235.000.
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Floyd, Middleton B., Jr.; and Weiss, Martin J., to American Cyanamid Company. Novel 11-alkoxy-9-keto (or hydroxy)-prostenoic acid derivatives and method for preparing same. 4,236,027, Cl. 562-500.000.
Floyd, William G. Puller for removing pulleys and the like from shafts. 4,235,004, Cl. 29-256.000.
FMC Corporation: *See*—
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Engel, John F., 4,235,927, Cl. 424-285.000.
Gibson, Donald L., 4,235,482, Cl. 308-26.000.
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,235,780, Cl. 260-343.500.
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Ford Motor Company: *See*—
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Mangels, John A., 4,235,857, Cl. 423-344.000.
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Foster, Charles H., to Eastman Kodak Company. Process for dehydrogenation of sterols to produce delta 4-3-ketosteroids. 4,235,791, Cl. 260-397.200.
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Fram Corporation: *See*—
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Schneider, Louis; and Resnick, Bruce M., 4,235,819, Cl. 260-565.000.
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Gall, John C., to Sears, Roebuck and Co. Material mixer. 4,235,553, Cl. 366-208.000.
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Gardou, Guy R. M., to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Bumper structures, particularly for vehicles. 4,235,467, Cl. 293-135.000.
Garigioli, Alberto, to Whitehead Motofides S.p.A. Oil bath air cleaner. 4,235,609, Cl. 55-226.000.
Garrett, Wayne H.; and Zbikowski, Ted, to Eaton Corporation. Brake actuator assembly. 4,235,312, Cl. 188-72.700.
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Gazda, Hans O. E. Device for separating gaseous mixtures. 4,235,612, Cl. 55-403.000.
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Geller, Douglas A.: *See*—
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Gray, Floyd L.; Adam, Jerome H.; Susami, Larry; and Zamzow, Rick A., 4,235,454, Cl. 280-766.000.
Humphrey, James S., Jr., 4,235,954, Cl. 428-412.000.
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Luce, John B.; and Vaughn, Howard A., Jr., 4,235,978, Cl. 525-101.000.
Rinde, John E.; and Perry, Richard M., 4,235,153, Cl. 91-1.000.
Sandland, Paul, 4,236,079, Cl. 250-445.00T.
General Foods Limited: *See*—
Newman, Alec T.; and Rhodes, David, 4,235,352, Cl. 222-129.000.
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Davis, Charles J., 4,235,308, Cl. 187-9.00R.
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Byram, Robert J., 4,235,185, Cl. 116-34.00R.
Carolus, David T.; Edwards, Ralph W.; and Powell, John R., 4,236,162, Cl. 343-903.000.
Chen, Charles C., 4,236,074, Cl. 250-308.000.
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Davison, Ellard D., Jr., 4,235,447, Cl. 277-138.000.
Griffin, Henry W., 4,235,056, Cl. 52-397.000.
Hebb, Edwin E., 4,235,212, Cl. 123-365.000.
Kortge, James O., 4,235,025, Cl. 35-17.000.
Meloche, Kenneth R.; Bland, Coburn C., Jr.; and Terry, Ronald R., 4,235,076, Cl. 60-602.000.
Nelson, Robert E., 4,236,115, Cl. 328-133.000.
Polak, James C.; Fackenthal, Harry; Lentz, Carl A.; Palmer, Walter E.; and Schaefer, Robert H., 4,235,320, Cl. 192-4.00B.
Reed, James R., 4,235,583, Cl. 425-464.000.
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Richardson, James D., 4,236,213, Cl. 364-431.000.
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Simancik, Carl D.; and Zemke, Kenneth M., 4,235,123, Cl. 74-475.000.
Steger, Charles B., 4,235,391, Cl. 242-107.40A.
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Holmes, Richard G.; and Sponseller, David R., 4,235,952, Cl. 428-60.000.
Genini, Graziano, to Albatex A.G. Pair of grippers for weaving looms without shuttle. 4,235,261, Cl. 139-448.000.
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Skilling, James K., 4,236,246, Cl. 371-27.000.
Gens, Theodore A., to Indianapolis Center for Advanced Research. Ammonia synthesis catalysts and process of making and using them. 4,235,749, Cl. 252-443.000.
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Braham, Richard R. M., 4,235,342, Cl. 209-564.000.
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Kohler, Karl-Albert, 4,235,371, Cl. 238-382.000.
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Gilbert, Daniel E., to Boeing Company, The. Integrating hydrophone sensing elements. 4,236,235, Cl. 367-157.000.
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Giles, Richard F.; and Gaines, Larry D., to Phillips Petroleum Company. Integral tracking override control. 4,236,202, Cl. 364-105.000.
Gillen, Harold C.; and Little, Donald R., to American Standard Inc. Speed control apparatus and method for railroad car retarders. 4,235,403, Cl. 246-182.00A.
Gillery, F. Howard, to PPG Industries, Inc. Reversible window unit for alternately reflecting and absorbing solar energy. 4,235,048, Cl. 49-390.000.
Gilles, Herbert L.; and Shipman, Johnson, to Bethlehem Steel Corporation. Method and apparatus for controlling caster heat removal by varying casting speed. 4,235,276, Cl. 164-4.000.
Gillespie, Richard L.: *See*—
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Vallera, Joseph J., 4,235,589, Cl. 431-344.000.
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Gingras, Richard P. Apparatus and method for in-line energization and de-energization of external loads in series with an external source of electricity in response to externally sensed parameters. 4,236,084, Cl. 307-39.000.
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Gittos, Maurice W.; and Letertre, Gerard J., to Merrell Toraude et Compagnie. 2-Pyrrolidone compounds and processes for making same. 4,235,778, Cl. 260-326.450.
Glaswerk Schuller GmbH: *See*—
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Gleason, John G., to Smithkline Corporation. 7β-Acyloxy-3-heterocyclicthiomethyl cephalosporins. 4,236,001, Cl. 544-26.000.
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Goguel, Olivier P. Immersable device for a progressive distribution in particular for feeding fish. 4,235,198, Cl. 119-51.00R.
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Olsen, Richard J.; Watts, George T.; and Griffiths, Robert I., 4,235,271, Cl. 152-186.000.
Gopel, Theo. Float-type carburetor. 4,235,827, Cl. 261-67.000.
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Gordon, Stanley H., to Thomson General Corporation. Electric welding. 4,235,115, Cl. 74-2.000.
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Goss, Daniel A.; Ito, Roy M.; and Josephson, Larry H., to United States of America, Navy. Target detection device. 4,236,157, Cl. 343-7.0PF.
Gould Inc.: *See*—
Snyder, Daniel S.; and Kaufman, Harold L., 4,235,558, Cl. 403-130.000.
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Graham, Neil B.: *See*—
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Grandclement, Gerard, to International Cold Forging Corporation. Electromagnet with plunger-type armature and a method for the production thereof. 4,236,131, Cl. 335-260.000.
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Gray, Floyd L.; Adam, Jerome H.; Susami, Larry; and Zamzow, Rick A., to General Electric Company. Stabilization system for a medical diagnostic device. 4,235,454, Cl. 280-766.000.
Greene, John, Jr., to Prince, Gregory S., a part interest. Automatic train stopping. 4,235,401, Cl. 246-172.000.
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Greenman, Edwin G.; and Nilo, Gary L., to Kimberly Clark Corporation. Melt transfer web. 4,235,657, Cl. 156-234.000.
Greiner, Norman R., to United States of America, Energy. High efficiency laser spectrum conditioner. 4,235,518, Cl. 350-162.00R.
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Kolbl, Richard; Mehlan, Bernd; Gress, Josef; Dorrbeck, Frank; and Leichs, Rudolf, 4,235,351, Cl. 221-92.000.
Greubel, Waldemar; and Kruger, Hans, to Siemens Aktiengesellschaft. Display device comprising a light valve unit in conjunction with the fluorescent plate. 4,235,527, Cl. 350-345.000.
Griffin, Henry W., to General Motors Corporation. Glass retaining clip. 4,235,056, Cl. 52-397.000.
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Grimpe, Karl, to DEMAG, Aktiengesellschaft. Detachable overload control coupling between rotating machine elements. 4,235,082, Cl. 64-28.00R.
Groen, Otto M.; Bongers, Andreas M. G.; Peeters, Bernard J. E.; and Lammers, Peter H. M., to Oce-van der Grinten N.V. Magnetic brush apparatus for developing charge images. 4,235,193, Cl. 118-658.000.
Groleau, Rodney J., to Control Process, Incorporated. Automatic curing cycle control system. 4,235,577, Cl. 425-144.000.
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Groothuis, Hermanus H. H., to U.S. Philips Corporation. Converter circuit and monochrome picture display device comprising such a converter circuit. 4,236,175, Cl. 358-30.000.
Gross, Franz; and Birnbreier, Hermann, to Brown, Boveri & Cie Aktiengesellschaft. Electrochemical storage battery. 4,235,956, Cl. 429-112.000.
Gross, Robert C.: *See*—
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Groves, Stanley E., to Motorola, Inc. Instruction set modifier register. 4,236,204, Cl. 364-200.000.
Grudzinskas, Charles V.; Wissner, Allan; and Chen, Sow-Mei L., to American Cyanamid Company. Prostacyclin analogs of the 1 series and related analogs wherein the carboxylic acid function has been replaced. 4,235,924, Cl. 424-278.000.
Grundig E. M. V. Elektro-Mechanische Verswchsanstalt Max Grundig: *See*—
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GTE Products Corporation: *See*—
Cleveland, Joseph J., 4,235,855, Cl. 423-327.000.
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Tozier, John E.; Shaffer, John W.; and Williams, William M., 4,235,590, Cl. 431-360.000.
Guidry, Joseph L. Fan disc. 4,235,052, Cl. 51-358.000.
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Schulz, Johann G. D.; and Onopchenko, Anatoli, 4,235,787, Cl. 260-346.300.
Selwitz, Charles M.; and McNulty, John G., 4,236,030, Cl. 568-756.000.
Gupta, Omkarnath R., to International Business Machines Corporation. Multi-stud thermal conduction module. 4,235,283, Cl. 165-80.00C.
Gurvis, Isadore, to Crown Auto Top Manufacturing Co. Theft deterring and signalling device for portable fire extinguishers. 4,236,148, Cl. 340-568.000.
Guthrie, James R. Tripable fishing rod holder. 4,235,035, Cl. 43-15.000.
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Gyogyszerkutato Intezet: *See*—
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Haas, Peter; and Wiedermann, Rolf, to Bayer Aktiengesellschaft. Use of phosphonates as trimerization catalysts for the production of polyisocyanurate synthetic resins. 4,235,976, Cl. 521-107.000.
Haas, Thomas C. Pot hangers. 4,235,407, Cl. 248-318.000.
Haase, Reinhold A., to Dutton-Lainson Company. Dead man switch for a winch. 4,236,052, Cl. 200-51.090.

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Haglund, John H., to Kanthal Corporation, The. Coil assembly. 4,236,139, Cl. 338-302.000.
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Stoudt, Thomas H.; Carlo, Dennis J.; and Hagopian, Arpi, 4,235,994, Cl. 536-18.000.
Hahn, Richard C. Safety topdeck for boilers. 4,235,201, Cl. 122-494.000.
Haisma, Jan: *See*—
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Bekker, Marthinus J.; and Hall, Douglas J. M., 4,235,152, Cl. 89-14.00C.
Hall, Frederick F. Electrolytic cells for hydrogen gas production. 4,235,694, Cl. 204-266.000.
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Demarne, Henri; and Hallot, Andre, 4,235,897, Cl. 424-244.000.
Hally, Michael L., to Atari, Inc. Pinball game spinning target. 4,235,438, Cl. 273-127.00D.
Halpaap, Herbert; Eckle, Manfred; and Rossler, Hubert, to Merck Patent Gesellschaft mit beschrankter Haftung. Fluorescent indicators for chromatography and sorption agents containing them. 4,235,716, Cl. 210-31.00C.
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Hamamoto, Tadanao: *See*—
Terabayashi, Gosaku; Nakano, Tasuku; and Hamamoto, Tadanao, 4,236,141, Cl. 340-52.00E.
Hammond, Earl G.: *See*—
Moon, Nancy J.; and Hammond, Earl G., 4,235,933, Cl. 426-41.000.
Hamon, Jean-Pierre: *See*—
Corcelle, Francois; Hamon, Jean-Pierre; and Martin, Philippe, 4,236,058, Cl. 219-121.0EA.
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Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,235,815, Cl. 260-544.00C.
Hampson, Jeffrey D.: *See*—
Rossall, Brian; and Hampson, Jeffrey D., 4,235,752, Cl. 252-551.000.
Hanamura, Yoshihiko; and Nishimura, Schinichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye fundus camera having variable power photographing optical system. 4,235,540, Cl. 354-62.000.
Handeland, George A. Chemical tablet dispensing device for wells. 4,235,849, Cl. 422-263.000.
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Hanji, Katsumi: *See*—
Shiga, Akinobu; Fukui, Yoshiharu; Hanji, Katsumi; Sasaki, Toshio; Okawa, Masahisa; Matsuura, Hideaki; and Yamada, Yasuharu, 4,235,984, Cl. 526-127.000.
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McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., 4,235,943, Cl. 427-34.000.
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Hannaford, James H.; Myrfield, Warren; Weiler, David H.; Trofimenkoff, Frederick N.; Consay, Joseph A.; and Dobie, Donald M., to Universal Skate Sharpener Ltd. Skate sharpening apparatus. 4,235,050, Cl. 51-34.00D.
Hansen, Joe C. Sampling and identifying apparatus and method. 4,235,963, Cl. 435-30.000.
Hanshin Engineering Co., Ltd.: *See*—
Nakajima, Risuke; Takei, Yoshio; Kawauchi, Shoroku; and Fujita, Tetsuo, 4,235,720, Cl. 210-220.000.
Hanson, Palmer C. Self-contained vise and support assembly. 4,235,429, Cl. 269-71.000.
Hanson, Paul B. Mattress for articulated beds. 4,234,981, Cl. 5-411.000.
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Harand, Elmar; and Michel, Eberhard, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor plant with pressurized water reactor secured against bursting or rupture. 4,235,672, Cl. 176-65.000.
Harasawa, Isamu; Hariki, Yukio; Maeda, Katsuhiko; and Nakamura, Kouichi, to Nippon Carbide Kogyo Kabashiki Kaisha. Method for cultivating algae and a covering material used therefor. 4,235,043, Cl. 47-1.400.
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Hariharan, Parameswaran; Hegedus, Zoltan S.; and Steel, William H., to Commonwealth Scientific and Industrial Research Organization Multi-color holograms with white-light illumination. 4,235,505, Cl. 350-3.770.
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Harman, Galen B., to Burr Oak Tool & Gauge Company. Tube cutter 4,235,137, Cl. 82-73.000.
Harper, David A. C.: *See*—
Brake, Arthur L.; and Harper, David A. C., 4,235,267, Cl. 141-293.000.
Harris Corporation: *See*—
Leitch, Clifford D., 4,236,042, Cl. 179-1.0GS.
Taylor, David L., 4,236,231, Cl. 365-163.000.
White, Charles M., 4,236,120, Cl. 330-296.000.
Harris, Philip G.: *See*—
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Harrison, B. Kent: *See*—
Bass, Robert W.; Ferguson, Helaman R. P.; Fletcher, Harvey J.; Gardner, John H.; Harrison, B. Kent; and Larsen, Kenneth M., 4,235,668, Cl. 176-3.000.
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Harsco Corporation: *See*—
Turner, John, 4,235,047, Cl. 49-371.000.
Hart, James E., to American Standard Inc. Variable load valve device 4,235,477, Cl. 303-22.00R.
Harvey, Ronald B., to Pako Corporation. Photographic printer with preset correction buttons. 4,235,551, Cl. 355-38.000.
Hashimoto, Katsutoshi: *See*—
Nakagawa, Sadayoshi; Shinohara, Mitsuharu; and Hashimoto, Katsutoshi, 4,236,051, Cl. 179-111.00E.
Hashimoto, Yasuhiro: *See*—
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Hassler, Dieter, to Siemens Aktiengesellschaft. Apparatus for ultrasonic scanning. 4,235,111, Cl. 73-626.000.
Hastings, Thomas N.: *See*—
Strecker, William D.; Hastings, Thomas N.; Lary, Richard F.; Rodgers, David P.; and Rothman, Steven H., 4,236,206, Cl. 364-200.000.
Hauni-Werke Korber & Co. KG: *See*—
Korber, Kurt A.; and Mielke, Johannes, 4,235,491, Cl. 312-223.000.
Schumacher, Peter, 4,235,248, Cl. 131-21.00A.
Severin, Hans H., 4,235,189, Cl. 118-119.000.
Zausch, Wolfgang; and Heitmann, Uwe, 4,235,330, Cl. 198-480.000.
Haworth, Floy, to Haworth, Juanita June, a part interest. Hi-lo two speed wing. 4,235,400, Cl. 244-218.000.
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Haworth, Floy, 4,235,400, Cl. 244-218.000.
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Hayashi, Tsuneyuki: *See*—
Shimada, Sachio; Tsunaki, Akio; Furuichi, Tatsuo; and Hayashi, Tsuneyuki, 4,235,656, Cl. 156-175.000.
Hayes, Robert A.: *See*—
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,235,979, Cl. 525-128.000.
Hayes, Thomas H., to Ethyl Corporation. Dispenser. 4,235,557, Cl. 401-49.000.
Hays, George; and Clarkin, Edward J., to Nooter Corporation. Process for producing a pressure vessel head or shell. 4,235,361, Cl. 228-173.00A.
Health Physics Systems, Inc.: *See*—
Capella, Joseph A.; and Morrison, Dennis R., 4,235,600, Cl. 8-137.000.
Hebb, Edwin E., to General Motors Corporation. Cam actuated fuel modulating engine governor. 4,235,212, Cl. 123-365.000.
Hebeda, Ronald: *See*—
Leach, Harry W.; and Hebeda, Ronald, 4,235,970, Cl. 435-202.000.
Heckenkamp, Edward B., to Allis-Chalmers Corporation. Auxiliary spring assisted valve linkage. 4,235,415, Cl. 251-77.000.
Hegedus, Zoltan S.: *See*—
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Hehl, Karl. Device for lubricating the tie rods of an injection molding machine. 4,235,575, Cl. 425-107.000.
Heiko Seisakusho, Ltd.: *See*—
Tobe, Hideharu, 4,235,084, Cl. 66-232.000.
Heine, Heinrich: *See*—
Rambold, Wolfgang; Heine, Heinrich; Raederscheidt, Bruno; and Trenczek, Gerhard, 4,235,862, Cl. 423-607.000.
Heinzerling, Jurgen, to U.S. Philips Corporation. X-ray apparatus for computed tomography. 4,236,080, Cl. 250-445.00T.

Heitmann, Uwe: *See*—
Zausch, Wolfgang; and Heitmann, Uwe, 4,235,330, Cl. 198-480.000.
Heller, Michael J.; and Ridgway, John A., to Standard Oil Company (Indiana). Digestible polyamino acids. 4,235,942, Cl. 426-656.000.
Helms, Jimmy L.; and Tegtmeier, Richard J., to Concast Incorporated. Spray nozzle for cooling a continuously cast strand. 4,235,280, Cl. 164-444.000.
Hemmerich, Heinz-Peter: *See*—
Ritter, Helmut; Hemmerich, Heinz-Peter; and Rosenkranz, Hans J., 4,235,768, Cl. 260-40.00R.
Hench, Larry L.; and Buscemi, Paul J., to Board of Regents, State of Florida. Bioglass coated metal substrate. 4,234,972, Cl. 3-1.900.
Henderson, Rosetta M., to Du Pont de Nemours, E. I., and Company. Fluorination of precursors for fluorine analogs of hydrocodone and oxycodone. 4,236,008, Cl. 546-46.000.
Hendrickson, Thomas E.: *See*—
Butler, Douglas B.; Hendrickson, Thomas E.; and Koelsch, Ronald G., 4,235,011, Cl. 29-571.000.
Henery, Vern A.: *See*—
Wagner, William E.; and Henery, Vern A., 4,235,945, Cl. 427-126.300.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Hiller, Guenter, 4,235,880, Cl. 424-94.000.
Hiller, Gunter, 4,235,879, Cl. 424-94.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Hiller, Gunter, 4,235,878, Cl. 424-94.000.
Zeidler, Ulrich; and Scheuermann, Fanny, 4,236,022, Cl. 560-198.000.
Hennrich, Ronald L.: *See*—
Wohleber, David A.; Edd, Jon F.; and Hennrich, Ronald L., 4,235,860, Cl. 423-495.000.
Henrick, Clive A., to Zoecon Corporation. Benzylpyrrolylmethyl esters of 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropanecarboxylic acid. 4,235,777, Cl. 260-326.430.
Henry, David G.; and Paulsen, Karen A. Device for carrying sheet or panel material. 4,235,355, Cl. 224-45.00P.
Henry, Richard K.; Seng, Stephen; Hohman, Charles M.; and Propster, Mark A., to Owens-Corning Fiberglas Corporation. Glass manufacturing process employing glass batch pellets. 4,235,618, Cl. 65-21.000.
Hepner, Robert J. Cooking stove exhaust air filtration system. 4,235,220, Cl. 126-299.00D.
Heraeus Quartzschmelze GmbH: *See*—
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,235,615, Cl. 65-3.00C.
Herbener, Klaus: *See*—
Schmunck, Karlheinz; Herbener, Klaus; Baier, Alfred; and Pfeuffer, Alfred, 4,235,422, Cl. 266-50.000.
Herbst, Heiner, to Siemens Aktiengesellschaft. One-dimensional CCD sensor with overflow arrangement. 4,236,168, Cl. 357-24.000.
Hercules, Incorporated: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,235,982, Cl. 525-284.000.
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., to Firestone Tire & Rubber Company, The. Amine terminated polymers and the formation of block copolymers. 4,235,979, Cl. 525-128.000.
Hergert, Richard E.: *See*—
Bergström, Jan I.; and Hergert, Richard E., 4,235,667, Cl. 162-203.000.
Herman Miller, Inc.: *See*—
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Hermann Berstorff Maschinenbau GmbH: *See*—
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Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,235,967, Cl. 435-119.000.
Hernestam, Sven E. H.; Willard, Lars O.; Abramo, Aina L.; and Johansson, Hans-Bertil, to A.B. Ferrosan. Anticaries piperidino compounds. 4,235,875, Cl. 424-54.000.
Hess, Hans-Peter; and Schultheiss, Wolfgang, to Metallwerk Max Brose GmbH & Co. KG. Window operating mechanism. 4,235,046, Cl. 49-352.000.
Heule, James E.: *See*—
Howson, David C.; and Heule, James E., 4,235,242, Cl. 128-695.000.
Heusler, Helmut; and Kiefer, Bruno, to O&K Orenstein & Koppel Aktiengesellschaft. Escalator with driver device for carrying of transportation carts. 4,235,327, Cl. 198-326.000.
Heydner, Konrad; Peter, Josef; and Volkl, Rainer, to Ellenberger & Poensgen GmbH. Tripping device for an overload circuit breaker. 4,236,136, Cl. 337-111.000.
Hibyan, Edward S.: *See*—
Ferris, Donald L.; Hibyan, Edward S.; and Faiz, Robert L., 4,235,570, Cl. 416-134.00A.
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Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitsu, 4,235,548, Cl. 355-3.00R.
Hiller, Guenter, to Henkel Kommanditgesellschaft auf Aktien. Animal feeds containing a mixture of tylosin and proteolytic enzymes. 4,235,880, Cl. 424-94.000.
Hiller, Gunter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Animal feeds containing a mixture of avoparcin or spiramycin and proteolytic enzymes. 4,235,878, Cl. 424-94.000.
Hiller, Gunter, to Henkel Kommanditgesellschaft auf Aktien. Animal feeds containing a mixture of Virginiamycin, zinc bacitracin or flavophospholipol and proteolytic enzymes. 4,235,879, Cl. 424-94.000.
Hills, Isaac. Toss and catch hand puppet. 4,235,042, Cl. 46-154.000.
Hilpert, Wolfgang: *See*—
Stotz, Manfred; Komander, Gerhard; and Hilpert, Wolfgang, 4,235,215, Cl. 123-179.00H.
Hilti Aktiengesellschaft: *See*—
Udert, Karl E.; Oechsle, Hans; and Pfeiffer, Heinz, 4,235,151, Cl. 85-84.000.
Hinckley, Anne F. Device for aligning the face and swing of a golf club. 4,235,440, Cl. 273-183.00A.
Hine, Charles R.; and Peot, Craig B., to Upjohn Company, The. Method and apparatus for feeding powder. 4,235,563, Cl. 406-23.000.
Hirao, Kazuhiro: *See*—
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Hirashita, Hiroshi, to Akebono Brake Industry Co. Ltd. Seal construction for sliding part of pin slide type disc brake. 4,235,313, Cl. 188-73.300.
Hirata, Akira, to Laurel Bank Machine Co., Ltd. Paper sheet storage box for paper sheet dispenser. 4,235,433, Cl. 271-162.000.
Hironaka, Yasuhira: *See*—
Watanabe, Hiroshi; Aoyama, Ryushi; Hironaka, Yasuhira; and Oana, Hanji, 4,235,608, Cl. 55-181.000.
Hirsch, James A., to Carborundum Company, The. Gas ignition control. 4,235,586, Cl. 431-71.000.
Hitachi Cable, Ltd.: *See*—
Yamaji, Kenkichi; Dietrich, Oelhschlagel; Abe, Hajime; and Tamura, Koichi, 4,235,007, Cl. 291-420.000.
Hitachi, Ltd.: *See*—
Aizawa, Tatsushi; Natori, Tatsuo; Hayashi, Masakatsu; and Tanaka, Takeo, 4,235,277, Cl. 164-36.000.
Kataoka, Keiji; and Yonezawa, Seiji, 4,235,507, Cl. 350-19.000.
Kawagoe, Hiroto, 4,235,010, Cl. 29-571.000.
Kominami, Yasuo; Ienaka, Masanori; Wada, Takeshi; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,236,252, Cl. 455-207.000.
Nakao, Toshiharu; Teranishi, Katsuya; and Kawagoshi, Makoto, 4,235,326, Cl. 198-326.000.
Nakashima, Yoichi; Takita, Yosikazu; Suzuki, Sousi; Akabane, Katsumi; and Misawa, Michihiro, 4,236,169, Cl. 357-39.000.
Sasaki, Koji; and Asai, Yoshihito, 4,236,053, Cl. 200-144.00R.
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Nakao, Toshiharu; Teranishi, Katsuya; and Kawagoshi, Makoto, 4,235,326, Cl. 198-326.000.
Hoadley, Arthur W.; and Vander Bok, Raymond S., to Western Michigan University, The Board of Trustees of. Normalized coefficient of lift indicator. 4,235,104, Cl. 73-180.000.
Hodgson, Charles E.: *See*—
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Hoebel, Peter, to Siemens Aktiengesellschaft. Apparatus for the detection and processing of electric signals. 4,236,086, Cl. 307-149.000.
Hoechst Aktiengesellschaft: *See*—
Engelmann, Manfred; Maier, Karl; Spange, Arno; Dewald, Bernd; Lenz, Hans-Joachim; and Teige, Wolfgang, 4,235,641, Cl. 106-308.00M.
Gebert, Ulrich; and Raether, Wolfgang, 4,235,899, Cl. 424-246.000.
Lang, Hans-Jochen; Muschaweck, Roman; and Hropot, Max, 4,235,918, Cl. 424-274.000.
Muller, Werner H.; and Freudenberger, Dieter, 4,235,790, Cl. 260-396.00R.
Hoexter, Robert S. Simulated violoncello. 4,235,143, Cl. 84-1.160.
Hoffmann-La Roche Inc.: *See*—
Dorn, Silvia; Pfiffner, Albert; and Zurfluh, Rene, 4,235,932, Cl. 424-339.000.
Imhof, Rene; and Kyburz, Emilio, 4,236,010, Cl. 546-138.000.
Hofmann, Wilfried; Lusch, Herbert; and Rauffer, Walter, to AGFA-Gevaert, A.G. Microfilm reader. 4,235,536, Cl. 353-27.00R.
Hohman, Charles M.: *See*—
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Holan, George; and O'Keefe, David F., to Commonwealth Scientific and Industrial Research Organization. Insecticidal esters. 4,235,926, Cl. 424-282.000.
Holden, Ronald L., to Therm-O-Disc, Incorporated. Sealed motor protector. 4,236,135, Cl. 337-89.000.
Holdsworth, John A.: *See*—
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Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde R., to Hollingsead-Pryor Enterprises, Inc. Electrical connector structure. 4,236,190, Cl. 361-391.000.

Holmes, Donald F., to Royal Marble Company, Inc. Simulated stone article and method for making same. 4,235,948, Cl. 428-15.000.
Holmes, Gordon W., to Professional Packaging Limited. Method and apparatus for molding holders for disc-like objects. 4,235,582, Cl. 425-438.000.
Holmes, Richard G.; and Sponseller, David R., to General Tire & Rubber Company, The. Bond seam coating of FRP moldings. 4,235,952, Cl. 428-60.000.
Holtzclaw, Carl B. Replaceable bearing assembly for a pump apparatus. 4,235,486, Cl. 308-189.00R.
Homma, Makoto: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honeywell Inc.: *See*—
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Honeywell Information Systems Inc.: *See*—
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Curley, John L.; Johnson, Robert B.; Lemay, Richard A.; and Nibby, Chester M., Jr., 4,236,203, Cl. 364-200.000.
Lombardo, Ralph M., Jr.; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., 4,236,209, Cl. 364-200.000.
O'Keefe, David B.; Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,236,208, Cl. 364-200.000.
Terakawa, Kiyoshi H.; and Woods, William E., 4,236,210, Cl. 364-200.000.
Honnen, Lewis R.: *See*—
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Hoogendijk, Adrianus H.: *See*—
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Hopkins, Roger L.: *See*—
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Horak, Jerry R.; Langworthy, Harold F.; Rauner, Frederick J.; and Gross, Robert C., to Eastman Kodak Company. Solid-state color imaging devices. 4,236,098, Cl. 313-371.000.
Horiguchi, Michiyuki: *See*—
Mochizuki, Daisuke; and Horiguchi, Michiyuki, 4,236,187, Cl. 361-36.000.
Horiuchi, Harumi; and Aoyagi, Hideo, to Soundesign Corp. Noise-free switching circuit for and method of electronically selecting audio input signals in audio systems. 4,236,088, Cl. 307-240.000.
Horvath, Steven: *See*—
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Hotton, Joseph G., to Neumann Engineering & Manufacturing Company. Vibration motor. 4,235,154, Cl. 91-39.000.
Howard, John F.; Tolosa, Felix P.; and Boxer, Lawrence, to Dynatech Laboratories, Incorporated. Inoculator. 4,235,971, Cl. 435-293.000.
Howe, Dennis G., to Eastman Kodak Company. Optical configurations for a rotating polygon film scanner. 4,236,183, Cl. 358-214.000.
Howes, Leslie D. Fuel economizer employing improved turbulent mixing of fuel and air. 4,235,828, Cl. 261-78.00R.
Howson, David C.; and Heule, James E., to Med General, Inc. Electronic circuit permitting simultaneous use of stimulating and monitoring equipment. 4,235,242, Cl. 128-695.000.
Hoyniak, Daniel: *See*—
Davis, Clarence E.; and Hoyniak, Daniel, 4,235,020, Cl. 33-178.00F.
HPS Company, Inc.: *See*—
Porta, Frank T., 4,235,297, Cl. 180-6.480.
Hropot, Max: *See*—
Lang, Hans-Jochen; Muschaweck, Roman; and Hropot, Max, 4,235,918, Cl. 424-274.000.
Hsia, Jen C.; and Tan, Chou-Tok, to University of Toronto, The Governing Council of the. Immunological materials. 4,235,792, Cl. 260-403.000.
Hsu, Chin C.; and Chasar, Dwight W., to B. F. Goodrich Company, The. Process for the manufacture of levulinic acid and esters. 4,236,021, Cl. 560-174.000.
Hubenko, Nicholas, to Pfizer Inc. Wire-feeding apparatus. 4,235,362, Cl. 226-181.000.
Huber, Rudolf, to Sulzer Brothers Limited. Plant for space heating and service water heating. 4,235,369, Cl. 237-2.00B.
Hubert, Gustav. Solenoid actuator having a long stroke. 4,236,130, Cl. 335-223.000.
Hudock, David L. Fitting replacement method. 4,235,259, Cl. 138-97.000.
Hudson Products Corporation: *See*—
Larinoff, Michael W., 4,235,571, Cl. 417-1.000.
Huffman, Charles E., to Rockwell International Corporation. Multiline switch. 4,236,250, Cl. 455-49.000.
Hughes Aircraft Company: *See*—
Kamath, G. Sanjiv; and Anderson, Carl L., 4,235,651, Cl. 148-171.000.
Hughes, George W. Tire inflation guide. 4,235,255, Cl. 137-224.000.
Huhne, Volker; Taube, Carl; and Ditzer, Reiner, to Bayer Aktiengesellschaft. Trisazo dyestuffs containing a naphtholamino sulfonic acid component and a phenylcarbonylamino-phenyl component. 4,235,773, Cl. 260-173.000.
Hull-Smith Chemicals, Inc.: *See*—
Remer, Robert K., 4,235,937, Cl. 426-534.000.
Humber, Leslie G.: *See*—
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,235,901, Cl. 424-248.510.
Dionne, Gervais; Asselin, Andre A.; and Humber, Leslie G., 4,235,903, Cl. 424-248.570.
Humphrey, James S., Jr., to General Electric Company. Polycarbonate article coated with an adherent, durable organopolysiloxane coating and process for producing same. 4,235,954, Cl. 428-412.000.
Hunsaker, Richard M.: *See*—
Allen, A. Phil; and Hunsaker, Richard M., 4,235,164, Cl. 100-53.000.
Hunsucker, Jerry H., to International Minerals & Chemical Corp. Melamine polymeric composition. 4,235,763, Cl. 260-29.40R.
Hunter Douglas International N.V.: *See*—
Vecchiarelli, Francis, 4,235,406, Cl. 248-251.000.
Huntsinger, James E.: *See*—
Williams, David W.; Jordan, James L.; and Huntsinger, James E., 4,235,940, Cl. 426-592.000.
Huret, Roger H. M., to Etablissements Huret & Fils. Bicycle derailleur. 4,235,118, Cl. 74-217.00B.
Huser, Jean P., to Utilis Mullheim AG. Cutting tool. 4,235,564, Cl. 407-101.000.
Hutchinson, Francis G.: *See*—
Fildes, Francis J. T.; and Hutchinson, Francis G., 4,235,988, Cl. 528-79.000.
Hutchinson Industrial Corporation: *See*—
Menke, Jon F., 4,235,664, Cl. 156-645.000.
Huyghebaert, Paul E., administrator: *See*—
Thijs, Victor J. M., deceased; Huyghebaert, Paul E., administrator; De Jaeger, Nikolaas C.; and Tavernier, Bernard H., 4,235,959, Cl. 430-531.000.
Hyatt, Gilbert P.: *See*—
Stanly, Albert L.; and Hyatt, Gilbert P., 4,236,223, Cl. 364-710.000.
Hydes, Paul C.: *See*—
Cleare, Michael J.; and Hydes, Paul C., 4,235,868, Cl. 424-3.000.
Hydranautics: *See*—
Bartlett, James L., Jr., 4,235,723, Cl. 210-321.00R.
Hydrotreat, Inc.: *See*—
Arnaud, Johnny, 4,235,698, Cl. 204-302.000.
Hyduk, Walter: *See*—
Schickling, Joseph H.; and Hyduk, Walter, 4,235,489, Cl. 308-236.000.
Hylo Table Pad Co., Inc.: *See*—
Rosen, Norman J., 4,235,053, Cl. 52-127.000.
Ibbott, Jack K. Device for introducing additional air into intake passage leading to combustion chamber. 4,235,209, Cl. 173-585.000.
Ichihara, Masuji: *See*—
Tanaka, Kyoichi; Takahashi, Kouzou; Kanada, Mitsuhiro; Kato, Yasuyuki; and Ichihara, Masuji, 4,235,985, Cl. 526-279.000.
Ichikawa, Singo, to Citizen Watch Company Limited. Electronic wristwatch. 4,236,237, Cl. 368-66.000.
Ichino, Masaaki: *See*—
Harada, Hiroyuki; Hirao, Kazuhiro; Mitani, Tadayuki; and Ichino, Masaaki, 4,235,684, Cl. 204-79.000.
Ichiyanagi, Toshikazu: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,235,538, Cl. 354-23.00D.
Ida, Takashi: *See*—
Uno, Takayoshi, deceased; Uno, Takaaki, heir; Uno, Yoshishige, heir; Uno, Hiroyoshi, heir; Ida, Takashi; Onaka, Minoru; and Shigeta, Hayato, 4,235,258, Cl. 137-556.000.
Ideguchi, Kyoichi: *See*—
Ueno, Masakazu; Sano, Akira; and Ideguchi, Kyoichi, 4,235,992, Cl. 536-5.000.
Ienaka, Masanori: *See*—
Kominami, Yasuo; Ienaka, Masanori; Wada, Takeshi; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,236,252, Cl. 455-207.000.
Watanabe, Kazuo; Ienaka, Masanori; Kominami, Yasuo; and Homma, Makoto, 4,236,117, Cl. 329-103.000.
Iida Sankyo Co., Ltd.: *See*—
Komatsu, Yasuo, 4,235,072, Cl. 368-218.000.
Iida, Wataru; and Tsujiuchi, Toshio, to Toyoda-Koki Kabushiki-Kaisha. Truing and dressing apparatus for grinding wheels. 4,235,218, Cl. 125-11.0CD.
Iino, Kinzo, to Watanabe Sokki Kabushiki Kaisha. Thermal recording stylus. 4,236,163, Cl. 346-139.00C.
Iizaka, Isao: *See*—
Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitsu, 4,235,548, Cl. 355-3.00R
Iizawa, Osamu; Fujiwara, Shinobu; Ueoka, Hisayoshi; Furukawa, Kiyoshi; Kikuchi, Nobuaki; and Tanaka, Hitoshi, to TDK Electron-

tes Co., Inc. High dielectric constant type ceramic composition. 4,235,635, Cl. 106-39.500.

Ikeda, Hiroyuki, and Ando, Moritoshi, to Fujitsu Limited. Holographic disk scanner. 4,235,504, Cl. 350-3.710.

Ikuno, Eiichiro, and Yoshizumi, Tomoki, to Nittetsu Steel Drum Co., Ltd. Apparatus for welding fittings to a container. 4,235,359, Cl. 228-29.000.

Illinois Tool Works Inc.: *See*—
Creighton, Albert M., Jr.; Foss, Charles L., Jr.; and Vandewalle, Neal R., 4,235,138, Cl. 83-139.000.

Imai, Koji; Kobayashi, Sumio; Kumai, Ko; and Tsuji, Toshihiko, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Kinzoku Co., Ltd. Semiconductor circuit having a series-connected reactor. 4,236,200, Cl. 363-135.000.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Photographic lens system. 4,235,521, Cl. 350-216.000.

Imgruth, Max; and Gygax, Claude A., to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Electronic timepiece comprising two different displays. 4,236,239, Cl. 368-72.000.

Imhof, Rene; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Phenylquinolizidines. 4,236,010, Cl. 546-138.000.

Imm, Roger A.: *See*—
McDavid, William T.; McKeever, James M.; and Imm, Roger A., 4,236,234, Cl. 367-77.000.

Imperial Chemical Industries Limited: *See*—
Costello, Alan T.; and Lindsay, Robert J., 4,236,018, Cl. 560-124.000.
Dart, Edward C.; Roberts, Roger C.; Perry, Antony R.; Nemcek, Jozef; and Graham, Neil B., 4,235,686, Cl. 204-159.190.
Fildes, Francis J. T.; and Hutchinson, Francis G., 4,235,988, Cl. 528-79.000.
Lewis, Terence; and Balasubramanyan, Sugavanam, 4,235,620, Cl. 71-92.000.
Pinto, Alwyn, 4,235,800, Cl. 260-449.500.
Smith, Robert D., 4,235,702, Cl. 208-87.000.
Wilson, Philip, 4,235,639, Cl. 106-298.000.

Inamura, Minoru; Takeuchi, Noboru; and Inukai, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Flux for brazing. 4,235,649, Cl. 148-24.000.

Incom International Inc.: *See*—
Tracy, Wayne R., 4,235,073, Cl. 59-11.000.

Indianapolis Center for Advanced Research: *See*—
Gens, Theodore A., 4,235,749, Cl. 252-443.000.

Industrial Management Company: *See*—
Rooklyn, Jack, 4,235,559, Cl. 403-262.000.

Industrias Techno Matic, S.A.: *See*—
Vazquez Rubianes, Juan, 4,235,319, Cl. 192-8.00R.

Ing. C. Olivetti & C., S.p.A.: *See*—
Aprato, Armando, 4,235,555, Cl. 400-120.000.

Ingle, Harold R., Jr., to Lockheed Corporation. Dielectric monitored composite assembly. 4,236,109, Cl. 324-61.00P.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,236,057, Cl. 219-69.00C.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Apparatus for detecting gap conditions in EDM processes with monitoring pulses. 4,236,057, Cl. 219-69.00C.

Institute of Gas Technology: *See*—
Sammells, Anthony F.; and Ang, Peter G. P., 4,235,955, Cl. 429-111.000.

Instituto Luso Farmaco d'Italia S.p.A.: *See*—
Manghisi, Elso; Cascio, Giuseppe; Fregnan, Giancarlo; and Porta, Roberto, 4,235,904, Cl. 424-251.000.

Interlake, Inc.: *See*—
Burgener, Robert C.; Martin, Philip T.; and Lord, John J., 4,236,255, Cl. 455-603.000.

International Business Machines Corporation: *See*—
Aug, Conrad J.; and Reckinger, Arthur P., Jr., 4,235,496, Cl. 339-45.00M.
Chu, Richard C.; LaDue, James J.; and Shelkofsky, Clifford I., 4,235,494, Cl. 312-297.000.
Dreyfus, Russell W.; and Landon, Alfred J., 4,236,179, Cl. 358-93.000.
Gupta, Omkarnath R., 4,235,283, Cl. 165-80.00C.
Kindseth, Douglas M.; and Mitchell, Glen R., 4,236,205, Cl. 364-200.000.
Thompson, David A., 4,236,230, Cl. 365-157.000.

International Cold Forging Corporation: *See*—
Grandclement, Gerard, 4,236,131, Cl. 335-260.000.

International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,235,247, Cl. 131-17.00R.
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,235,938, Cl. 426-535.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,235,729, Cl. 252-8.900.

International Minerals & Chemical Corp.: *See*—
Hunsucker, Jerry H., 4,235,763, Cl. 260-29.40R.

International Nickel Co., Inc., The. *See*—
Bernstein, Philip; Probst, William C.; Coffey, James P.; and Knipple, Charles J., 4,235,696, Cl. 204-281.000.

International Rectifier Corporation: *See*—
Shen, Peter, 4,236,171, Cl. 357-68.000.

International Standard Electric Corporation: *See*—
Cornu, Jozef; Taeymans, Jean R. J. M.; and Talbot, Jacques, 4,236,090, Cl. 307-268.000.

International Telephone and Telegraph Corporation: *See*—
Mandrik, Paul, 4,235,466, Cl. 293-128.000.
Natalizia, Angelo, 4,235,418, Cl. 251-359.000.

Inukai, Kazuhiro: *See*—
Inamura, Minoru; Takeuchi, Noboru; and Inukai, Kazuhiro, 4,235,649, Cl. 148-24.000.

Ionescu, Istrate. Heat-responsive alignment system and solar collection device. 4,235,222, Cl. 126-425.000.

Iowa State University Research Foundation, Inc.: *See*—
Miller, Michael R.; and Martin, David M., 4,235,603, Cl. 44-10.00R.
Moon, Nancy J.; and Hammond, Earl G., 4,235,933, Cl. 426-41.000.

Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bichromophoric benzotriazole-styrene ester ultraviolet stabilizers and their use in organic compositions. 4,235,999, Cl. 542-427.000.

Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Benzotriazole ultraviolet stabilizers and their use in organic compositions. 4,236,013, Cl. 548-261.000.

Ishida, Takashi: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,235,205, Cl. 123-472.000.

Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; Toki, Tadaaki; Komyoji, Terumasa; Sakashita, Nobuyuki; and Maeda, Kazuyuki, 4,235,621, Cl. 71-94.000.

Ishii, Kiyoshi: *See*—
Shioya, Toshio; and Ishii, Kiyoshi, 4,235,208, Cl. 123-568.000.

Ishikawa, Yoshiaki: *See*—
Torii, Nozomu; and Ishikawa, Yoshiaki, 4,235,462, Cl. 292-216.000.

Ishizaka, Hideo, to Terumo Corporation. Ultrasonic apparatus and method for measuring the density of liquid. 4,235,099, Cl. 73-32.00A.

Isono, Yoshihiro: *See*—
Wada, Kenichi; Tanaka, Susumu; Isono, Yoshihiro; Tabuchi, Kenji; Oka, Tateki; and Mizunoe, Hiroaki, 4,235,194, Cl. 118-657.000.

Ito, Kiyoshi, to Kabushiki Kaisha IDK. Secondary air guide ring for ignition plug. 4,235,214, Cl. 123-169.00V.

Ito, Roy M.: *See*—
Goss, Daniel A.; Ito, Roy M.; and Josephson, Larry H., 4,236,157, Cl. 343-7.0PF.

Itoh, Jiro; Miyadoh, Shinji; Itoh, Mitsugu; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, to Meiji Seika Kaisha Limited. Novel antibiotic BN-213 substance and its production. 4,235,883, Cl. 424-122.000.

Itoh, Mitsugu: *See*—
Itoh, Jiro; Miyadoh, Shinji; Itoh, Mitsugu; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,235,883, Cl. 424-122.000.

Iura, Yukio: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,235,538, Cl. 354-23.00D.

Iwashita, Tomonori: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,235,538, Cl. 354-23.00D.

Iwata, Hiroshi, to West Electric Co., Ltd. Photographic camera. 4,235,547, Cl. 354-60.00L.

J. M. Huber Corporation: *See*—
Kostinko, John A., 4,235,856, Cl. 423-329.000.

J. M. Voith GmbH: *See*—
Banzhaf, Heinz; and Dietrich, Robert, 4,235,124, Cl. 74-573.00R.

Jacobsen, Stephen C.: *See*—
Stephen, Robert L.; Kablitz, Carl; van Dura, Dietz; Atkin, Curtis L.; and Jacobsen, Stephen C., 4,235,230, Cl. 128-213.00A.

Jacobson, Sava. Remote playout control mechanism for a telephone answering device. 4,236,044, Cl. 179-6.00E.

Jacobsson, Kurt A. G., to Aktiebolaget IRO. Thread storage and delivery device. 4,235,388, Cl. 242-47.010.

Jakel, Michael: *See*—
Pav, Josef; Jakel, Michael; and Junk, Dieter, 4,235,002, Cl. 29-110.000.

Jakusch, Heinz: *See*—
Knotik, Karl; Leichter, Peter; and Jakusch, Heinz, 4,235,738, Cl. 252-301.10W.

Jamel, Billwayne. Periscope finder. 4,235,541, Cl. 354-79.000.

James D. Pauls and J. Claybrook Lewis and Associates, Limited: *See*—
Capra, Nicholas G.; and Antenore, Ronald L., 4,235,353, Cl. 222-256.000.

James, Raymond E., to Palletron Incorporated. Apparatus for assembling pallets. 4,235,005, Cl. 29-281.100.

Jansen, Gerardus L. M.; and Bovee, Leonardus G. H., to U.S. Philips Corporation. Optical read apparatus for reading a disc-shaped record carrier. 4,236,232, Cl. 365-234.000.

Jansen, Pierre G.; Kessels, Jozef L. W.; and Waumans, Benny L. A., to U.S. Philips Corporation. Data buffer memory of the first-in, first-out type, having a variable input and a fixed output. 4,236,225, Cl. 364-900.000.

Jarman, Trevor R.; and Govan, John R. W., to Talres Development (N.A.) N.V. Process for the production of polysaccharide. 4,235,966, Cl. 435-101.000.

Jasper Corporation: *See*—
Frobose, James W., 4,235,186, Cl. 116-227.000.

Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Timepiece combined with a thermometer. 4,236,236, Cl. 368-11.000.

Jellissen, Roy H., to Motorola, Inc. Hall effect ignition system housing. 4,235,213, Cl. 123-146.50A.

Jentsch, Dietrich, to Dorma-Baubeschlag GmbH & Co. KG. Automatic door closer constructed for releasably holding a door in a predetermined partly open position. 4,234,996, Cl. 16-52.000.

Jinkins, C. Eugene; and Legler, Bobby, to Dow Chemical Company, The. Stabilized phenolic resins. 4,235,762, Cl. 260-29.300.

Johansson, Hans-Bertil: *See*—
Hernestam, Sven E. H.; Willard, Lars O.; Abramo, Aina L.; and Johansson, Hans-Bertil, 4,235,875, Cl. 424-54.000.

Johansson, Inge: *See*—
Reinhall, Rolf; Johansson, Inge; Sandstron; Ake; Mukvist, Anders; and Elander, Lars, 4,235,665, Cl. 162-23.000.

John Wyeth & Brother Limited: *See*—
Archibald, John L.; and Ward, Terence J., 4,235,915, Cl. 424-267.000.
Boyle, John T. A., 4,235,908, Cl. 424-258.000.
White, John F.; and Ward, Terence J., 4,235,910, Cl. 424-258.000.

Johna, Nobuo: *See*—
Ohbu, Kazuo; Johna, Nobuo; and Kashiwa, Ichiro, 4,235,759, Cl. 252-545.000.

Johns-Manville Corporation: *See*—
Brooks, Ray G.; and Smith, Harvell M., 4,235,652, Cl. 156-71.000.
Patry, Francis J., 4,235,058, Cl. 52-408.000.

Johnson, A. David, Jr., to Wayne Automation Corporation. Method of making high strength shipping carton. 4,235,158, Cl. 493-334.000.

Johnson, A. David, Jr.; Ginther, George E., Sr.; and Bachman, Joseph L., to Wayne Automation Corporation. Machine for manufacture of high strength shipping cartons. 4,235,159, Cl. 493-309.000.

Johnson, Bruck K.: *See*—
Whiteside, George D.; Johnson, Bruck K.; and LaRocque, Arthur G., 4,235,539, Cl. 354-27.000.

Johnson, Francis B.: *See*—
Ross, Karl J.; and Johnson, Francis B., 4,235,420, Cl. 254-218.000.

Johnson, Gregory F. Loop driven element antenna system and voltage feed system. 4,236,160, Cl. 343-743.000.

Johnson & Johnson: *See*—
Mesek, Frederick K.; Butterworth, George A. M.; and Cepuritis, Talivaldis, 4,235,237, Cl. 128-284.000.
Mouwen, Herman C., 4,235,233, Cl. 128-214.00D.
Spaven, George D.; Thomas, Joseph J.; and Beroff, Howard, 4,235,232, Cl. 128-214.400.

Johnson, Joseph E., to Westinghouse Electric Corp. Process for forming glass-sealed multichip semiconductor devices. 4,235,645, Cl. 148-1.500.

Johnson, Matthey & Co., Limited: *See*—
Cleare, Michael J.; and Hydes, Paul C., 4,235,868, Cl. 424-3.000.

Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. 9-Hydroxyhexahydrodibeno[b,d]pyrans, 1-substituted-9-hydroxyhexahydrodibenzo[b,d]pyrans. 4,235,913, Cl. 424-263.000.

Johnson, Philip A.; and McCarthy, Alfred F., to Aavid Engineering, Inc. Self-fastened heat sinks. 4,235,285, Cl. 165-80.00B.

Johnson, Robert B.: *See*—
Curley, John L.; Johnson, Robert B.; Lemay, Richard A.; and Nibby, Chester M., Jr., 4,236,203, Cl. 364-200.000.

Johnson, Roy A., to Upjohn Company, The. Trans-2,3,4,5-tetradehydro-9-deoxy-5,9a-epoxy-PGF$_1$ amides. 4,235,783, Cl. 260-345.200.

Johnson, Roy A., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-9-deoxy-5,9α-epoxy-4,5-didehydro-PGF$_1$ compounds. 4,235,998, Cl. 542-426.000.

Johnson, William R., to Boeing Company, The. Thermal insulation for aircraft fuselage. 4,235,398, Cl. 244-119.000.

Jones, Giffin D., to Dow Chemical Company, The. High crush strength heterogeneous ion exchange resins of crosslinked polymers having vinyl halide monomer polymerized therein. 4,235,972, Cl. 521-28.000.

Jones, Reuben G.; and Terando, Norman H., to Eli Lilly and Company. 3-Nitropyrazole derivatives. 4,235,995, Cl. 542-408.000.

Jordan College: *See*—
Coxon, DeWayne A., 4,235,223, Cl. 126-437.000.

Jordan, James L.: *See*—
Williams, David W.; Jordan, James L.; and Huntsinger, James E., 4,235,940, Cl. 426-592.000.

Josef Martin Feuerungsbau GmbH: *See*—
Martin, Johannes J.; Martin, Walter J.; and Weber, Erich, 4,235,172, Cl. 110-281.000.

Josephson, Larry H.: *See*—
Goss, Daniel A.; Ito, Roy M.; and Josephson, Larry H., 4,236,157, Cl. 343-7.0PF.

Judge, John F. X.; and Lipshutz, Victor G., to Technicon Instruments Corporation. Infrared analyzer. 4,236,076, Cl. 250-347.000.

Junk, Dieter: *See*—
Pav, Josef; Jakel, Michael; and Junk, Dieter, 4,235,002, Cl. 29-110.000.

Juy, Dominique: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois, Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.

K. Ernst Brinkmann, Industrieverwaltung: *See*—
Brinkmann, Karl E.; and Assmann, Bernd L., 4,235,311, Cl. 188-71.700.

Kabbe, Hans-Joachim: *See*—
Stadler, Peter; Metzger, Karl-Georg; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, 4,235,888, Cl. 424-180.000.

Kablitz, Carl: *See*—
Stephen, Robert L.; Kablitz, Carl; van Dura, Dietz; Atkin, Curtis L.; and Jacobsen, Stephen C., 4,235,230, Cl. 128-213.00A.

Kabushiki Kaisha IDK: *See*—
Ito, Kiyoshi, 4,235,214, Cl. 123-169.00V.

Kabushiki Kaisha Suwa Seikosha: *See*—
Nagata, Mitsuo, 4,236,155, Cl. 340-784.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Terabayashi, Gosaku; Nakano, Tasuku; and Hamamoto, Tadanao, 4,236,141, Cl. 340-52.00E.

Kagi, Ernst: *See*—
Dousse, Roland; and Kagi, Ernst, 4,235,818, Cl. 564-199.000.

Kahaner, Joel M.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Tire with supporting and cushioning walls. 4,235,270, Cl. 152-7.000.

Kahn, Marvin L.; and Eapen, Kuttikandathil E., to Rich Products Corporation. Soft intermediate-moisture frozen beverage concentrates. 4,235,936, Cl. 426-330.300.

Kaiser, Willard D., to United States of America, Transportation. Rail flaw detector position control. 4,235,112, Cl. 73-634.000.

Kalfoglou, George, to Texaco Inc. Lignosulfonates as additives in oil recovery processes involving chemical recovery agents. 4,235,290, Cl. 166-273.000.

Kamada, Hitoshi: *See*—
Watanabe, Kenkichi; Furuya, Katusuke; and Kamada, Hitoshi, 4,235,061, Cl. 53-54.000.

Kamath, G. Sanjiv; and Anderson, Carl L., to Hughes Aircraft Company. Fabrication of GaAs-GaAlAs solar cells. 4,235,651, Cl. 148-171.000.

Kaminaka, Ikuyasu, to Sharp Kabushiki Kaisha. Microwave oven including a digital control system and a heater disposed in an oven cavity. 4,236,055, Cl. 219-10.55B.

Kaminski, David G.; and Grimm, David F., to Sperry Corporation. Programmable bus driver isolation. 4,236,087, Cl. 307-200.00A.

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Komiyama, Katsuhiko; and Kamisawa, Osamu, 4,236,238, Cl. 368-71.000.

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Kanervo, Seppo; and Rautiainen, Erkki. Planetary gear provided with friction planet wheels. 4,235,128, Cl. 74-798.000.

Kanthal Corporation, The: *See*—
Haglund, John H., 4,236,139, Cl. 338-302.000.

Kao Soap Co., Ltd.: *See*—
Watanabe, Hiroshi; and Arisawa, Masatoshi, 4,235,733, Cl. 252-107.000.
Watanabe, Hiroshi; and Mikata, Tsuruo, 4,235,898, Cl. 424-245.000.

Kaprelian, Edward K., to Questar Corporation. Dual focal length objective. 4,235,508, Cl. 350-27.000.

Karamian, Narbik A., to United States of America, Health, Education and Welfare. Distillation flask and apparatus for producing high-purity water having overflow liquid trap means. 4,235,677, Cl. 202-176.000.

Karasawa, Yukinori. *See*—
Kawase, Suminosuke; and Karasawa, Yukinori, 4,235,529, Cl. 351-14.000.

Karlsson, Hakan I.; and Ostman, Leif T., to Svenska Traforskningsinstitutet. Method and apparatus for measuring the ratio between web tension and substance. 4,235,102, Cl. 73-143.000.

Karrenbauer, Herbert; and Ahrens, Karl, to Licentia Patent-Verwaltungs-G.m.b.H. Gas-blast circuit breaker. 4,236,054, Cl. 200-145.000.

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Ohbu, Kazuo; Johna, Nobuo; and Kashiwa, Ichiro, 4,235,759, Cl. 252-545.000.

Kataoka, Keiji; and Yonezawa, Seiji, to Hitachi, Ltd. Optical system to condense light from a semiconductor laser into a circular spot. 4,235,507, Cl. 350-19.000.

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Kawashima, Mitsuo; Ohta, Kimihiro; and Kataoka, Shoei, 4,236,165, Cl. 357-16.000.

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Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, 4,236,078, Cl. 250-363.00R.

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Tabuchi, Katsuhiko; and Kato, Toshiaki, 4,235,241, Cl. 128-639.000.

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Kato, Yasuyuki: *See*—
Tanaka, Kyoichi; Takahashi, Kouzou; Kanada, Mitsuhiro; Kato, Yasuyuki; and Ichihara, Masuji, 4,235,985, Cl. 526-279.000.

Katschinski, Ulrich: *See*—
Feuchter, Peter; Katschinski, Ulrich; and Roller, Erling, 4,235,279, Cl. 164-443.000.

Kaufman, Harold L.: *See*—
Snyder, Daniel S.; and Kaufman, Harold L., 4,235,558, Cl. 403-130.000.

Kaufman, Kurt D., to Thomas C. Elder, Inc. 6 Or 8 Haloallyl substituted 7-hydroxycoumarins. 4,235,781, Cl. 260-343.440.

Kaul, Balkrishena; Davidow, Bernard; and Millian, Stephen J., to Research Corporation. Simultaneous radio immunoassay of multiple antigens and assay for cocaine metabolites. 4,235,864, Cl. 424-1.000.

Kauss, Wolfgang; and Muncke, Ludwig, to Fritzmeier AG. Utility vehicle with a self-contained driver compartment. 4,235,470, Cl. 296-190.000.

Kawagoe, Hiroto, to Hitachi, Ltd. Semiconductor integrated circuit device composed of insulated gate field-effect transistor. 4,235,010, Cl. 29-571.000.

Kawagoshi, Makoto: *See*—
Nakao, Toshiharu; Teranishi, Katsuya; and Kawagoshi, Makoto, 4,235,326, Cl. 198-326.000.

Kawase, Suminosuke; and Karasawa, Yukinori, to Tokyo Kogaku Kikai Kabushiki Kaisha. Apparatus for recording images of crystalline lens sections. 4,235,529, Cl. 351-14.000.

Kawashima, Mitsuo; Ohta, Kimihiro; and Kataoka, Shoei, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Planar semiconductor device. 4,236,165, Cl. 357-16.000.

Kawashima, Saburo: *See*—
Asano, Makoto; Kawashima, Saburo; Sugimoto, Kenichi; and Kobayashi, Tadashi, 4,235,769, Cl. 260-45.8NT.

Kawauchi, Shoroku: *See*—
Nakajima, Risuke; Takei, Yoshio; Kawauchi, Shoroku; and Fujita, Tetsuo, 4,235,720, Cl. 210-220.000.

Keefe, Donald J., to United States of America, Energy. Automatic sweep circuit. 4,236,067, Cl. 235-92.0PB.

Kefalas A/S: *See*—
Bogeso, Klaus P., 4,235,916, Cl. 424-267.000.

Kegler, William H.; and McConaghy, James R., to Conoco, Inc. Method for producing premium coke from residual oil. 4,235,703, Cl. 208-89.000.

Kelder, Raymond C.: *See*—
Arbuckle, Norman B., 4,235,177, Cl. 112-169.000.

Keller, Josef, to Fichtel & Sachs AG. Bicycle wheel hub with coaster brake. 4,235,318, Cl. 192-6.00R.

Kellogg-American, Inc.: *See*—
Dowling, Ralph O., 4,235,081, Cl. 62-93.000.

Kelly, Charles A.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,235,999, Cl. 542-427.000.
Irick, Gether, Jr.; and Kelly, Charles A., 4,236,013, Cl. 548-261.000.

Kelly, Robert C., to Upjohn Company, The. Bicyclic lactones. 4,235,779, Cl. 260-343.30P.

Kelso, Charles R.: *See*—
Walter, Richard P.; Sisson, Albert E.; Erwin, Louis R.; and Kelso, Charles R., 4,235,374, Cl. 239-90.000.

Kemlo, Kenneth G., to Broken Hill Proprietary Company Limited, The. Indication of levels in receptacles. 4,235,423, Cl. 266-99.000.

Kemper, Yves J., to Vadetec Corporation. Traction surface cooling system for torque transmissions. 4,235,127, Cl. 74-796.000.

Kendall, Robert R. Cap twister bottle opener. 4,235,132, Cl. 81-3.440.

Kennedy, Stanley P. Energy utilization or consumption recording arrangement. 4,236,217, Cl. 364-483.000.

Kenney, Clarence E. Windmill having thermal and electric power output. 4,236,083, Cl. 290-55.000.

Kerkenbush, Darle L.: *See*—
Melin, Arthur K.; Gillespie, Richard L.; Kerkenbush, Darle L.; Whittington, Jim L.; and Geller, Douglas A., 4,235,378, Cl. 239-229.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Barnert, Heiko; and Schafer, Manfred, 4,235,671, Cl. 176-38.000.
Schulten, Rudolf; Behr, Friedrich; and Wenzl, Helmut, 4,235,863, Cl. 423-648.00R.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Becker, Erwin-Willy; Bley, Peter; Ehrfeld, Wolfgang; Ehrfeld, Ursula; and Krieg, Gunther, 4,235,606, Cl. 55-17.000.

Keseleski, Adam J.: *See*—
Sipos, Frank; and Keseleski, Adam J., 4,235,993, Cl. 536-17.00R.

Kesling, Haven S., Jr.; and Zehner, Lee R., to Atlantic Richfield Company. Preparation of unsaturated monoesters by the catalytic oxidative carbonylation of diolefins with an enol ether or 1-alkoxycycloalkene. 4,236,023, Cl. 560-207.000.

Kessels, Jozef L. W.: *See*—
Jansen, Pierre G.; Kessels, Jozef L. W.; and Waumans, Benny L. A., 4,236,225, Cl. 364-900.000.

Kessler, Theodore P., to Timron, Inc. Fabric reel for plush fabrics. 4,235,390, Cl. 242-77.100.

Keystone Foods Corporation: *See*—
Coats, Hector A., 4,235,941, Cl. 426-646.000.

Khutoretsky, Garry M.: *See*—
Kutateladze, Samson S.; Lutset, Mark O.; Korolkov, Anatoly G.; Popov, Jury S.; Filippov, Iosif F.; Khutoretsky, Garry M.; Vvedensky, Jury N.; and Skachkov, Jury V., 4,236,091, Cl. 310-64.000.

Kibler, Robert L.; and Wolf, Peter, to Lambert Brake Corporation. Automatic adjuster for hydraulically actuated double disc. 4,235,310, Cl. 188-71.500.

Kiefer, Bruno: *See*—
Heusler, Helmut; and Kiefer, Bruno, 4,235,327, Cl. 198-326.000.

Kikuchi, Nobuaki: *See*—
Iizawa, Osamu; Fujiwara, Shinobu; Ueoka, Hisayoshi; Furukawa, Kiyoshi; Kikuchi, Nobuaki; and Tanaka, Hitoshi, 4,235,635, Cl. 106-39.500.

Killebrew, Wilbur N., Jr.; and Stewart, Charles M., to Phillips Petroleum Company. Control of a cracking furnace. 4,236,218, Cl. 364-500.000.

Killebrew, Wilbur N., Jr.; and Stewart, Charles M., to Phillips Petroleum Company. Temperature control of exothermic reactions. 4,236,219, Cl. 364-501.000.

Kim, Chi S., to Avco Corporation. Synthesizing gas from coal via synergetic reactions with steam and sulfur. 4,235,605, Cl. 48-202.000.

Kimberly Clark Corporation: *See*—
Greenman, Edwin G.; and Nilo, Gary L., 4,235,657, Cl. 156-234.000.

Kimberly, James R., Sr., to A. E. Staley Manufacturing Company. Base mixes simulating natural and dutch cocoa powders. 4,235,939, Cl. 426-549.000.

Kimura, Tadashi, to Olympus Optical Co., Ltd. Wide-angle retrofocus lens system. 4,235,520, Cl. 350-215.000.

Kinder, Richard A.; and Sherk, Fred T., to Phillips Petroleum Company. Method and apparatus for the selective absorption of gases. 4,235,607, Cl. 55-68.000.

Kindseth, Douglas M.; and Mitchell, Glen R., to International Business Machines Corporation. Access-time reduction control circuit and process for digital storage devices. 4,236,205, Cl. 364-200.000.

King, Harold B.; MacIvergan, Robert; and McKenzie, Gerald W., to General Electric Company. Nuclear fuel rod loading apparatus. 4,235,066, Cl. 53-500.000.

Kingsley, Stuart A.: *See*—
Davies, David E. N.; and Kingsley, Stuart A., 4,236,243, Cl. 370-3.000.

Kintner, Edwin K. Condenser cleaning system using sponge balls. 4,234,993, Cl. 15-104.06A.

Kiovsky, Thomas E., to Shell Oil Company. Modified terpolymer dispersant - VI improver. 4,235,731, Cl. 252-51.50A.

Kiraly nee Vida, Emilia: *See*—
Kuszmann, Janos; Sohar, Pal; Csanyi, Endre; and Kiraly nee Vida, Emilia, 4,235,803, Cl. 260-456.00R.

Kirby, William D. Flow operated valve. 4,235,254, Cl. 137-119.000.

Kirchmayr, Rudolf: *See*—
Weber, Kurt; and Kirchmayr, Rudolf, 4,235,741, Cl. 252-301.220.

Kirichenko, Anatoly I.: *See*—
Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V., 4,235,848, Cl. 422-249.000.

Kirillov, Leonty N.: *See*—
Selivanov, Anatoly G.; Gromeiko, Grigory N.; Kirillov, Leonty N.; Zavolokina, Nina S.; Vlaschenko, Maria G.; Chicheva, Serafima A.; and Zhivetin, Valery V., 4,235,260, Cl. 139-98.000.

Kirino, Osamu; Kato, Toshiro; and Yamamoto, Shigeo, to Sumitomo Chemical Company, Limited. N-Benzoylanthranilate derivatives as phytopathogeric fungicidal agents. 4,235,925, Cl. 424-282.000.

Kitaguchi, Sigeo: *See*—
Dohi, Toshihide; and Kitaguchi, Sigeo, 4,235,654, Cl. 156-99.000.

Kitz, Richard J.: *See*—
Savarese, John J.; Kitz, Richard J.; and Ginsburg, Sara, 4,235,906, Cl. 424-258.000.

Kiuchi, Michio: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,235,354, Cl. 222-368.000.

Kiwala, Jacob: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,235,247, Cl. 131-17.00R.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,235,729, Cl. 252-8.900.

Klaudinyi, Bela, deceased: *See*—
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, deceased, 4,235,636, Cl. 106-66.000.

Klaudinyl, Lenke G., executrix: *See*—
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, deceased, 4,235,636, Cl. 106-66.000.

Klausz, Remy, to Compagnie Generale de Radiologie. Radiographic apparatus. 4,236,081, Cl. 250-445.00T.

Kleese, Edward J.: *See*—
Arnason, Sigurdur I.; and Kleese, Edward J., 4,235,833, Cl. 264-255.000.

Klefenz, Heinrich: *See*—
Tschang, Chung-Ji; Klefenz, Heinrich; and Sanner, Axel, 4,235,973, Cl. 521-146.000.

Klein, Gary S.: *See*—
Van Manen, Dick T.; and Klein, Gary S., 4,235,949, Cl. 428-31.000.

Klein, Hermann, to Elektro-Mechanik GmbH. Device for the edge or center control of moving webs. 4,235,358, Cl. 226-22.000.

Kleine, Charles A.; and Middleton, Verne L., to Olin Corporation. Heat exchange panel. 4,235,287, Cl. 165-170.000.

Kleinewefers GmbH: *See*—
Pav, Josef; Jakel, Michael; and Junk, Dieter, 4,235,002, Cl. 29-110.000.

Klingel, Hans; and Klingel, Wolfgang, to Klingel, Wolfgang. Process for making translucent plates with light-scattering surfaces. 4,235,658, Cl. 156-244.120.

Klingel, Wolfgang: *See*—
Klingel, Hans; and Klingel, Wolfgang, 4,235,658, Cl. 156-244.120.

Knipple, Charles J.: *See*—
Bernstein, Philip; Probst, William C.; Coffey, James P.; and Knipple, Charles J., 4,235,696, Cl. 204-281.000.

Knoll International, Inc.: *See*—
Sapper, Richard F., 4,235,408, Cl. 248-608.000.

Knothe, Erich; Melcher, Franz-Josef; and Rossmann, Franz, to Sartorius GmbH. Control circuit for the switching motor of self-stabilizing balances. 4,235,296, Cl. 177-204.000.

Knotik, Karl; Leichter, Peter; and Jakusch, Heinz, to Vereinigte Edlstahlwerke Aktiengesellschaft (VEW); and Oesterreichische Studiengegesellschaft fuer Atomenergie GmbH. Technique for converting spent radioactive ion exchange resins into a stable and safely storable form. 4,235,738, Cl. 252-301.10W.

Kobayashi, Sumio: *See*—
Imai, Koji; Kobayashi, Sumio; Kumai, Ko; and Tsuji, Toshihiko, 4,236,200, Cl. 363-135.000.

Kobayashi, Tadashi: *See*—
Asano, Makoto; Kawashima, Saburo; Sugimoto, Kenichi; and Kobayashi, Tadashi, 4,235,769, Cl. 260-45.8NT.

Kobelt, Theodore W. Safety scissors. 4,235,016, Cl. 30-233.000.

Koblanski, John N., to Ocean Ecology Ltd. Means and method for sweeping material floating on water using vibrational energy. 4,235,711, Cl. 210-748.000.

Koelsch, Ronald G.: *See*—
Butler, Douglas B.; Hendrickson, Thomas E.; and Koelsch, Ronald G., 4,235,011, Cl. 29-571.000.

Koenig, Karl-Heinz; Reitel, Christian; and Mangold, Dietrich, to BASF Aktiengesellschaft. Manufacture of α-haloalkylcarbamyl halides. 4,235,814, Cl. 260-544.00C.

Koenig, Karl-Heinz: *See*—
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,235,815, Cl. 260-544.00C.

Koenig, Myron, to M. Argueso & Co., Inc. Water-insoluble thermoplastic compositions for rigidly holding or supporting articles during machining. 4,235,761, Cl. 260-28.5AV.

Koga, Keiichiro: *See*—
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,236,241, Cl. 368-82.000.

Kogami, Mineichi; and Neda, Toshikatsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for controlling the operation of nuclear electric generating plant. 4,236,220, Cl. 364-504.000.

Kohler, Jurgen: *See*—
Ludeke, Kai M.; Schiek, Burkhard; and Kohler, Jurgen, 4,235,107, Cl. 73-355.0EM.

Kohler, Karl-Albert, to Getzner Chemie Gesellschaft mbH & Co. Track arrangement for a railroad. 4,235,371, Cl. 238-382.000.

Kohrt, Carl F.; and Willis, Roland G., to Eastman Kodak Company. Thermal silver-dye bleach element and process. 4,235,957, Cl. 430-203.000.

Koizumi, Akio; and Nakazawa, Hiroshi, to Sony Corporation. Switching regulator. 4,236,196, Cl. 363-21.000.

Koizumi, Akio: *See*—
Ohsawa, Mitsuo; Koizumi, Akio; and Nakazawa, Hiroshi, 4,236,198, Cl. 363-49.000.

Kokkoman Shoyu Co., Ltd.: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,235,354, Cl. 222-368.000.

Kolbl, Richard; Mehlan, Bernd; Gress, Josef; Dorrbeck, Frank; and Leichs, Rudolf, to Sielaff GmbH & Co. Automatenbau Herrieden. Merchandise dispensing device for a vending machine. 4,235,351, Cl. 221-92.000.

Koller, Stefan: *See*—
Schaub, Andres; Dussy, Paul; Aeschlimann, Peter; and Koller, Stefan, 4,235,596, Cl. 8-456.000.

Komander, Gerhard: *See*—
Stotz, Manfred; Komander, Gerhard; and Hilpert, Wolfgang, 4,235,215, Cl. 123-179.00H.

Komatsu, Yasuo, to Iida Sankyo Co., Ltd. Motor drive circuit in digital type electronic time piece. 4,235,072, Cl. 368-218.000.

Kominami, Yasuo; Ienaka, Masanori; Wada, Takeshi; Miyamoto, Yukihiko; and Yamada, Tsuneo, to Hitachi, Ltd. Double-converting FM tuner. 4,236,252, Cl. 455-207.000.

Kominami, Yasuo: *See*—
Watanabe, Kazuo; Ienaka, Masanori; Kominami, Yasuo; and Homma, Makoto, 4,236,117, Cl. 329-103.000.

Komiyama, Katsuhiko; and Kamisawa, Osamu, to Citizen Watch Company Limited. Electronic digital timepiece having a stopwatch function and a timer function. 4,236,238, Cl. 368-71.000.

Komrow, Robert R.: *See*—
Pritchard, James F.; and Komrow, Robert R., 4,235,737, Cl. 252-301.10W.

Komyoji, Terumasa: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; Toki, Tadaaki; Komyoji, Terumasa; Sakashita, Nobuyuki; and Maeda, Kazuyuki, 4,235,621, Cl. 71-94.000.

Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, to FMC Corporation. Derivatives of 2H-pyran-2-one. 4,235,780, Cl. 260-343.500.

Konig, Hans-Bodo: *See*—
Preiss, Michael; Konig, Hans-Bodo; Metzger, Karl G.; and Schmidt, Gunter, 4,235,774, Cl. 260-239.100.

Kopecki, Ronald: *See*—
Beseke, Kermit; and Kopecki, Ronald, 4,236,116, Cl. 328-169.000.

Kopf, Fred W., to Atlantic Richfield Company. Aromatics from dripolene. 4,235,701, Cl. 208-57.000.

Korber, Kurt A.; and Mielke, Johannes, to Hauni-Werke Korber & Co. KG. Repository for storage of paper money or other valuables. 4,235,491, Cl. 312-223.000.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. Tetrahydro-2H-benzo[c]pyrroles. 4,235,776, Cl. 260-326.100.

Kornfeld, Edmund C.: *See*—
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,235,909, Cl. 424-258.000.

Korolkov, Anatoly G.: *See*—
Kutateladze, Samson S.; Lutset, Mark O.; Korolkov, Anatoly G.; Popov, Jury S.; Filippov, Iosif F.; Khutoretsky, Garry M.; Vvedensky, Jury N.; and Skachkov, Jury V., 4,236,091, Cl. 310-64.000.

Kortge, James O., to General Motors Corporation. Knee joint for anthropomorphic dummy. 4,235,025, Cl. 35-17.000.

Kostinko, John A., to J. M. Huber Corporation. Method of producing a zeolite of controlled particle size. 4,235,856, Cl. 423-329.000.

Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Method and apparatus for recording and reproducing a radiation image. 4,236,078, Cl. 250-363.00R.

Kovacik, James W., to Alert Safety Lite Products Company. Light guard. 4,236,195, Cl. 362-376.000.

Koyama, Nobuo. Method and apparatus for splitting a body of a butchered animal into two halves along the spine. 4,234,997, Cl. 17-52.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Harand, Elmar; and Michel, Eberhard, 4,235,672, Cl. 176-65.000.

Kramer, Gordon: *See*—
Berman, Arthur L.; and Kramer, Gordon, 4,235,525, Cl. 350-339.00R.
Berman, Arthur L.; and Kramer, Gordon, 4,235,526, Cl. 350-344.000.

Krasnoperov, Boris K. Stereoscopic color television. 4,236,172, Cl. 358-3.000.

Kraus, Hans. Turning tool with tip storage and retractable lever. 4,235,269, Cl. 81-438.000.

Kraus, Willibald, to TRW Inc. Cable strap. 4,235,404, Cl. 248-74.0PB.

Krause, Roland: *See*—
Druckenbrodt, Wolf-Gunther; Baumann, Siegfried; Krause, Roland; and Stoll, Wolfgang, 4,235,740, Cl. 252-301.10R.

Krebs & Cie: *See*—
Meyer, Maurice; and Stucki, Heinrich, 4,235,602, Cl. 23-293.00R

Kreiskorte, Heinz, to Thyssen Industrie AG. Servohydraulic press with a closed loop control circuit and method of operating a fluid pressure operated press. 4,235,088, Cl. 72-453.180.

Kreissl, Ottmar; Nusselein, Manfred; and Essrich, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg, Aktiengesellschaft; and Sourtau-Electric GmbH. Plug connection for contact supports. 4,235,499, Cl. 339-91.00R.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Preparation of perfluoroallyl fluorosulfate. 4,235,804, Cl. 260-458.00F.

Krieg, Gunther: *See*—
Becker, Erwin-Willy; Bley, Peter; Ehrfeld, Wolfgang; Ehrfeld, Ursula; and Krieg, Gunther, 4,235,606, Cl. 55-17.000.

Kring, Elbert V.; and Lautenberger, William J., to Du Pont de Nemours, E. I., and Company. Dosimeter for measuring gaseous contaminants. 4,235,097, Cl. 73-23.000.

Kroenke, William J., to B. F. Goodrich Company, The. Ammelinium beta-octamolybdate and composition containing same. 4,235,770, Cl. 260-45.75R.

Kruckenberg, Winfried: *See*—
Reel, Henning; Kruckenberg, Winfried; and Schuadehutte, Karl H., 4,235,598, Cl. 8-584.000.

Kruger, Hans: *See*—
Greubel, Waldemar; and Kruger, Hans, 4,235,527, Cl. 350-345.000.

Kruse, Richard H.: *See*—
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., 4,236,215, Cl. 364-436.000.

Kuchler, Abraham: *See*—
Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde R., 4,236,190, Cl. 361-391.000.

Kudamatsu, Akio: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,235,891, Cl. 424-224.000.

Kudo, Yoshihiko: *See*—
Nomoto, Kohki; and Kudo, Yoshihiko, 4,235,852, Cl. 423-235.000.

Kuhl, Joseph W., to Schindler Haughton Elevator Corp. Control for starting electric motors. 4,235,309, Cl. 187-29.00R.

Kuhlmann, Josef H. Battery arrangement for laying hens. 4,235,199, Cl. 119-48.000.

Kuijper, Cornelis J., to Akzo nv. Coating composition having an improved pot life. 4,235,766, Cl. 260-33.4UR.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; Mallon, Joseph R.; and Nunn, Timothy A., 4,236,137, Cl. 338-4.000.

Kulle, Lee K.; and Rudzena, William L., to Baxter Travenol Laboratories, Inc. Irrigation cap. 4,235,344, Cl. 215-250.000.

Kumai, Ko: *See*—
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Kume, Toyohiko: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,235,891, Cl. 424-224.000.

Kumins, Charles A.; and Warford, Milan L., to Tremco, Incorporated. Waterproofing sheet material. 4,235,953, Cl. 428-332.000.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,235,480, Cl. 308-8.200.

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Nomoto, Kohki; and Kudo, Yoshihiko, 4,235,852, Cl. 423-235.000.

Kurita Machinery Manufacturing Company Limited: *See—*
Nakamura, Masayuki; and Yokoyama, Hisayoshi, 4,235,721, Cl. 210-227.000.

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Kurtz, Arthur P., Jr.: *See—*
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Kurz, John H.; and Batson, Edward E., to Leesona Corporation. Synthetic plastics article manufacturing system. 4,235,579, Cl. 425-174.400.

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Kustom Electronics, Inc.: *See—*
Aker, John L.; and Goodson, William D., 4,236,140, Cl. 343-8.000.

Kuszmann, Janos; Sohar, Pal; Csanyi, Endre; and Kiraly nee Vida, Emilia, to Gyogyszerkutato Intezet. 1,6-Dimesyl-3,4-dimethyl-D-mannitol and a process for the preparation thereof. 4,235,803, Cl. 260-456.00R.

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Yano, Kohzo; Kuwagaki, Hiroshi; Hamada, Hiroshi; and Takechi, Sadatoshi, 4,235,528, Cl. 350-357.000.

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Corcelle, Francois; Hamon, Jean-Pierre; and Martin, Philippe, 4,236,058, Cl. 219-121.0EA.

Lake, Leo C., Jr., to Yamaha Motor Corporation. Vapor recovery fuel tank filler system. 4,235,263, Cl. 141-1.000.

Lambert Brake Corporation: *See—*
Kibler, Robert L.; and Wolf, Peter, 4,235,310, Cl. 188-71.500.

Lammers, Peter H. M.: *See—*
Groen, Otto M.; Bongers, Andreas M. G.; Peeters, Bernard J. E.; and Lammers, Peter H. M., 4,235,193, Cl. 118-658.000.

Lancaster, Patrick R., III; and Lancaster, William G., to Lantech Inc. Collapsible web wrapping apparatus. 4,235,062, Cl. 53-399.000.

Lancaster, William G.: *See—*
Lancaster, Patrick R., III; and Lancaster, William G., 4,235,062, Cl. 53-399.000.

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Landsrath, Walter. Snow anti-skid device for a motor vehicle wheel. 4,235,272, Cl. 152-213.00R.

Lang, Hans-Jochen; Muschaweck, Roman; and Hropot, Max, to Hoechst Aktiengesellschaft. Benzenesulfonamide derivatives and processes for their manufacture. 4,235,918, Cl. 424-274.000.

Lang, Stanley A., Jr.: *See—*
Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-I, 4,235,996, Cl. 542-415.000.

Lange, Gerd-Karl: *See—*
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Lange, Wilfried, to Fa. Dieter Haubold Industrielle Nagelgerate. Strip of fastening elements such as nails. 4,234,991, Cl. 10-28.000.

Langer, Hans-Joachim: *See—*
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Langworthy, Harold F.: *See—*
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Lanin, Jury N.: *See—*
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Larinoff, Michael W., to Hudson Products Corporation. Cooling equipment. 4,235,571, Cl. 417-1.000.

Larive, David. Conduit making method. 4,235,831, Cl. 264-129.000.

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Larsen, Darrell R., to Minneapolis Electric Steel Castings Company. Shell liner assembly for ore grinding mills. 4,235,386, Cl. 241-183.000.

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Larson, William M., to Eaton Corporation. Load chain end stop. 4,235,074, Cl. 59-93.000.

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Lauchenauer, Alfred E., to Raduner & Co. A.G. Tack spun materials. 4,235,946, Cl. 427-185.000.

Laughlin, Richard H., to Varo, Inc. Avalanche photodiode gain control system. 4,236,069, Cl. 250-214.0AG.

Laurel Bank Machine Co., Ltd.: *See—*
Hirata, Akira, 4,235,433, Cl. 271-162.000.
Watanabe, Kenkichi; Furuya, Katusuke; and Kamada, Hitoshi, 4,235,061, Cl. 53-54.000.

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Kring, Elbert V.; and Lautenberger, William J., 4,235,097, Cl. 73-23.000.

La Via, Anthony L.; and Gibbs, Irwin S., to E. R. Squibb & Sons, Inc. Cephradine compositions. 4,235,900, Cl. 424-246.000.

Lawrence, Frederick J., to Stewart & Shea. Sheet sorter. 4,235,435, Cl. 271-292.000.

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Le-Bo Products Company, Inc.: *See—*
Schwartz, Gary M.; and Simon, Louis, 4,235,490, Cl. 312-15.000.

Leach, Harry W.; and Hebeda, Ronald, to CPC International Inc. Protease inactivated α-amylase preparations. 4,235,970, Cl. 435-202.000.

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Lechter, George; and Eckel, David S., to Rorrim Incorporated. Reflecting apparatus. 4,235,524, Cl. 350-299.000.

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Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.

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Lee, Cleve L., to Perfection Manufacturing Company, The. Work control apparatus for an exerciser. 4,235,436, Cl. 272-73.000.

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Lee, Ving J.: *See—*
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Legler, Bobby: *See—*
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Leichs, Rudolf: *See—*
Kolbl, Richard; Mehlan, Bernd; Gress, Josef; Dorrbeck, Frank; and Leichs, Rudolf, 4,235,351, Cl. 221-92.000.

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Knotik, Karl; Leichter, Peter; and Jakusch, Heinz, 4,235,738, Cl. 252-301.10W.

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Leitch, Clifford D., to Harris Corporation. Compatible AM stereo system employing a modified quadrature modulation scheme. 4,236,042, Cl. 179-1.0GS.

Lemay, Richard A.: *See—*
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Polak, James C.; Fackenthal, Harry; Lentz, Carl A.; Palmer, Walter E.; and Schaefer, Robert H., 4,235,320, Cl. 192-4.00B.

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Engelmann, Manfred; Maier, Karl; Spange, Arno; Dewald, Bernd; Lenz, Hans-Joachim; and Teige, Wolfgang, 4,235,641, Cl. 106-308.00M.

Lenze, La Vern J., Jr.: *See—*
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Leonard, Donald J., to Chevron Research Company. Natural draft combustion zone optimizing method and apparatus. 4,235,171, Cl. 110-188.000.

Leong, Sim Y., Chandramouli, Pitchaiya; and Vasishth, Ramesh C., to Cor Tech Research Ltd. Production of thermosetting phenol-formaldehyde resins. 4,235,989, Cl. 528-139.000.

Leriverend, Jean-Paul M., to Ville De Rouen. Articulated automotive vehicle. 4,235,451, Cl. 280-408.000.

Leslie, Stewart T., to Syngergistics. Slow release pharmaceutical compositions. 4,235,870, Cl. 424-19.000.

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Leung, Linus K., to Standard Oil Company (Indiana). Process for improving polymerization performance of brown solid titanium trichloride catalyst component. 4,235,747, Cl. 252-429.00B.

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Levinson, Leo, to Xerox Corporation. Bi-directional pin feed apparatus. 4,235,360, Cl. 226-76.000.

Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Carbamate deposit control additives. 4,236,020, Cl. 560-159.000.

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Lichtgarn, Fred. Trace gas sensor. 4,235,690, Cl. 204-195.00R.

Liebermann, Leonard N., to TIF Instruments, Inc. Device for detecting inhomogeneities such as gas bubbles. 4,235,095, Cl. 73-19.000.

Liedholm, David W., to Raychem Corporation. Method of forming a strip heater expansion joint. 4,235,012, Cl. 29-611.000.

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Sackett, Roger W.; and Liethen, Thomas R., 4,235,298, Cl. 180-54.00A.

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Bryant, Herman G., Jr.; Bullock, James F.; and Honeycutt, Robert G., 4,235,251, Cl. 131-140.00B.

Liggett, Joseph. Collapsible lightweight shipping container. 4,235,346, Cl. 220-7.000.

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Link, Rudolf: *See—*
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Loge, Olaf: *See—*
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Lombardo, Ralph M., Jr.; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., to Honeywell Information Systems Inc. Intersystem transaction identification logic. 4,236,209, Cl. 364-200.000.

Lombardo, Ralph M., Jr.: *See—*
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Lopez, Fernand. Control device for the feeding and for the drainage of a column, column and demineralization station equipped with such a device. 4,235,718, Cl. 210-191.000.

Loqvist, Kaj-Ragner, to Wave Energy Development I Vastmanland Aktiebolag. Apparatus for electroplating an outer surface of a workpiece. 4,235,691, Cl. 204-212.000.

Lord, John J.: *See—*
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Loshbough, Richard C.; and Pryor, Edward G., to Reliance Electric Company. Digital scale. 4,236,222, Cl. 364-567.000.

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Luce, John B.; and Vaughn, Howard A., Jr., to General Electric Company. Flame retardant composition. 4,235,978, Cl. 525-101.000.

Luchaco, David G., to Lutron Electronics Co., Inc. Light control system. 4,236,101, Cl. 315-158.000.

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Luecke, Robert A.: *See—*
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Lusch, Herbert: *See—*
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Lutset, Mark O.: *See—*
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M. Argueso & Co., Inc.: *See*—
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MacDonald, J. Bradford. Pillow for colostomy. 4,234,974, Cl. 4-235.000.
Maciejewski, Jeremi. Apparatus for absorbing mechanical energy in particular energy of very strong shocks. 4,235,317, Cl. 188-268.000.
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Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,235,905, Cl. 424-251.000.
Malone, William H., to Republic Steel Corporation. Blast stove. 4,235,593, Cl. 432-217.000.
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Matsuda, Teruo; and Manabe, Kuniyoshi, 4,236,024, Cl. 560-244.000.
Mandrik, Paul, to International Telephone and Telegraph Corporation. Body side protective molding. 4,235,466, Cl. 293-128.000.
Mangels, John A., to Ford Motor Company. Method of nitriding silicon. 4,235,857, Cl. 423-344.000.
Manghisi, Elso; Cascio, Giuseppe; Fregnan, Giancarlo; and Porta, Roberto, to Instituto Luso Farmaco d'Italia S.p.A. 4-Aryl-5-piperazinoalkyl-1,3-dioxol-2-ones, and compositions. 4,235,904, Cl. 424-251.000.
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Marathon Equipment Company, Inc.: *See*—
Fenner, Gordon H.; and Fenner, Gary R., 4,235,165, Cl. 100-53.000.
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Marie, Georges R. P. Power laser emitting plasma confining wave beam. 4,235,517, Cl. 350-157.000.
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Marinoni, Mirko; and Marinoni, Mario, to Casma di B. Marinoni & Figli. Edge fitting assembly for a panel. 4,235,049, Cl. 49-488.000.
Marks, Richard L.; and Weidler, Charles H., to AMP Incorporated. Mounting means for mounting a connector in a panel. 4,235,502, Cl. 339-278.00R.
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Marschke, Carl R., 4,235,432, Cl. 271-11.000.
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Marschke, Carl R., to Marquip, Inc. Sheet feeding. 4,235,432, Cl. 271-11.000.
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Marshall, Larry J, to Raychem Corporation. Taped products processor. 4,235,328, Cl. 198-343.000.
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Dau, Gary J.; Martel, Louis J.; and Scharton, Terry D., 4,235,110, Cl. 73-579.000.
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Martin, Johannes J.; Martin, Walter J.; and Weber, Erich, to Josef Martin Feuerungsbau GmbH. Grate with compensating means for use in industrial furnaces. 4,235,172, Cl. 110-281.000.
Martin, John K., III: *See*—
Whitney, Douglass G.; and Martin, John K., III, 4,235,234, Cl. 128-216.000.
Martin, Leandra P.; and Luecke, Robert A., to Dow Chemical Company, The. Spirally wound container with strippable layer. 4,235,341, Cl. 206-601.000.
Martin, Philip T.: *See*—
Burgener, Robert C.; Martin, Philip T.; and Lord, John J., 4,236,255, Cl. 455-603.000.
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Corcelle, Francois; Hamon, Jean-Pierre; and Martin, Philippe, 4,236,058, Cl. 219-121.0EA.
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Stutzman, Gary L.; and Martino, Carlo F., 4,235,835, Cl. 264-328.200.
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Buddenhagen, Uwe, 4,235,202, Cl. 123-276.000.
Kreissl, Ottmar; Nusselein, Manfred; and Essrich, Wolfgang, 4,235,499, Cl. 339-91.00R.
Maslanka, William W.; and Spence, Gavin G., to Hercules, Incorporated. Organic pigments. 4,235,982, Cl. 525-284.000.
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Savarese, John J.; Kitz, Richard J.; and Ginsburg, Sara, 4,235,906, Cl. 424-258.000.
Massachusetts Institute of Technology: *See*—
Senturia, Stephen D., 4,236,121, Cl. 331-57.000.
Masser, Paul S. Vapor compression refrigeration and heat pump apparatus. 4,235,079, Cl. 62-87.000.
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Matino, Haruhiro. Gas display panel fabrication method. 4,235,001, Cl. 29-25.140.
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Sweet, Roger H., 4,235,041, Cl. 46-115.000.
Matthey, Jacques; Torre, Marcel; and Millenet, Andre D., to Mefina S.A. Control circuit for a direct current motor. 4,236,103, Cl. 318-345.00D.
Matty, Thomas C.; and Miller, Howard N., to Westinghouse Electric Corp. Train vehicle speed control apparatus. 4,235,402, Cl. 246-182.00B.
MCA Discovision, Inc.: *See*—
Wilkinson, Richard L., 4,236,105, Cl. 318-577.000.
Winslow, John S.; and Dakin, Wayne R., 4,236,050, Cl. 179-100.10G.
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Johnson, Philip A.; and McCarthy, Alfred F., 4,235,285, Cl. 165-80.00B.
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Rowe, Raymond A.; and McCartney, Joseph F., 4,235,693, Cl. 204-229.000.
McClaflin, Gifford G., to Conoco, Inc. Removal of anionic surfactants from water. 4,235,712, Cl. 210-708.000.
McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., to United Technologies Corporation. Thermal spray apparatus and method. 4,235,943, Cl. 427-34.000.
McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., to United Technologies Corporation. Thermal spray apparatus. 4,236,059, Cl. 219-121.00P.

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Kegler, William H.; and McConaghy, James R., 4,235,703, Cl. 208-89.000.
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Nelson, Gullmar V., 4,235,410, Cl. 249-60.000.
McCormick, Thomas J. Color movie film noise reduction system. 4,235,531, Cl. 352-27.000.
McDavid, William T.; McKeever, James M.; and Imm, Roger A., to Fairfield Industries, Inc. Radio frequency seismic gathering system employing an airborne blimp. 4,236,234, Cl. 367-77.000.
McDonnell Douglas Corporation: *See*—
Richardson, Ralph J.; Wiswall, Charles E.; and Rasmussen, Richard L., 4,236,123, Cl. 331-94.50G.
McElroy, Arthur H. Boring bar attachment for engine lathes. 4,235,135, Cl. 82-2.00R.
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Neild, Kenneth, 4,235,324, Cl. 192-131.00H.
McKeen, Joseph E. Solar powered water desalination system with a regenerative fixture. 4,235,678, Cl. 202-185.00R.
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McLendon, Thomas R. Adjustable wrench. 4,235,134, Cl. 81-91.00C.
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McMickle, Robert L., to Berkley & Company. Wire snap. 4,234,998, Cl. 24-73.00C.
McNeilab, Inc.: *See*—
Rasmussen, Chris R., 4,235,894, Cl. 424-244.000.
McNulty, John G.: *See*—
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Howson, David C.; and Heule, James E., 4,235,242, Cl. 128-695.000.
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Abele, John E.; and Brown, Robert G., 4,235,244, Cl. 128-749.000.
Medical College of Wisconsin, Inc., The: *See*—
Sasse, Edward A.; and Yorde, Donald E., 4,235,960, Cl. 435-7.000.
Medical Specialties, Inc.: *See*—
Gaylord, John F., Jr.; and Gaylord, John F., III, 4,235,228, Cl. 128-91.00R.
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Kolbl, Richard; Mehlan, Bernd; Gress, Josef; Dorrbeck, Frank; and Leichs, Rudolf, 4,235,351, Cl. 221-92.000.
Meijer, Roelf J.; and Michels, Albertus P. J., to U.S. Philips Corporation. Balanced variable wobble plate drive. 4,235,116, Cl. 74-60.000.
Meiji Seika Kaisha Limited: *See*—
Itoh, Jiro; Miyadoh, Shinji; Itoh, Mitsugu; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,235,883, Cl. 424-122.000.
Meissner, Bernd: *See*—
Dudeck, Christian; Lehmann, Gunter; Ross, Karl-Heinz; Fliege, Werner; Petri, Norbert; Diem, Hans; Meissner, Bernd; and Sauer, Wolfgang, 4,235,823, Cl. 568-402.000.
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Melin, Arthur K.; Gillespie, Richard L.; Kerkenbush, Darle L.; Whittington, Jim L.; and Geller, Douglas A., to Wham-O Mfg. Co. Water play toy. 4,235,378, Cl. 239-229.000.
Meloche, Kenneth R.; Bland, Coburn C., Jr.; and Terry, Ronald R., to General Motors Corporation. Vehicle engine having turbocharger bypass with boost control and converter warm-up functions. 4,235,076, Cl. 60-602.000.
Melotti, Angelo R., to Bendix Corporation, The. Fuel injection valve and single point system. 4,235,375, Cl. 239-125.000.
Melvin, Lawrence S., Jr.: *See*—
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Christensen, Dean L.; Badour, Leonard C.; and Ebey, Frank S., 4,235,339, Cl. 206-444.000.
Mendoza, Daniel F.; and Hodgson, Charles E., to Baxter Travenol Laboratories, Inc. Sample transfer arm assembly. 4,235,840, Cl. 422-64.000.
Menge, Richard J. Connector plate. 4,235,148, Cl. 85-13.000.
Menke, Jon F., to Hutchinson Industrial Corporation. Unitary type-carrier elements and method of making same. 4,235,664, Cl. 156-645.000.
Merck & Co., Inc.: *See*—
Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,235,967, Cl. 435-119.000.
Christensen, Burton G.; and Leanza, William J., 4,235,917, Cl. 424-274.000.
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Evans, Ben E., 4,235,820, Cl. 564-427.000.
Freidinger, Roger M.; and Veber, Daniel F., 4,235,886, Cl. 424-177.000.
Fullerton, William W., 4,235,877, Cl. 424-89.000.
Ratcliffe, Ronald W.; and Ruswinkle, Linda J., 4,235,922, Cl. 424-274.000.
Stoudt, Thomas H.; Carlo, Dennis J.; and Hagopian, Arpi, 4,235,994, Cl. 536-18.000.
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Halpaap, Herbert; Eckle, Manfred; and Rossler, Hubert, 4,235,716, Cl. 210-31.00C.
Meredith, David L. Method of gutter construction for swimming pools. 4,235,008, Cl. 29-428.000.
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Gallagher, James A.; and Merkl, Bernard A., 4,235,765, Cl. 260-30.80R.
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Gittos, Maurice W.; and Letertre, Gerard J., 4,235,778, Cl. 260-326.450.
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Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.
Meschewski, Robert J.: *See*—
Bone, David P.; and Meschewski, Robert J., 4,235,935, Cl. 426-249.000.
Mesek, Frederick K.; Butterworth, George A. M.; and Cepuritis, Talivaldis, to Johnson & Johnson. Absorbent open network structure. 4,235,237, Cl. 128-284.000.
Messenger, David F.: *See*—
Moudgil, Brij M.; Morey, Booker W.; and Messenger, David F., 4,235,708, Cl. 209-3.300.
Messenger, Joseph U., to Mobil Oil Corporation. Treating wells to mitigate flow-after-cementing. 4,235,291, Cl. 166-292.000.
Messer Griesheim GmbH: *See*—
Schmidt, Hartmut, 4,235,162, Cl. 98-19.000.
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Metallgesellschaft Aktiengesellschaft: *See*—
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Metalwash Machinery Corp.: *See*—
Mirza, Rohinton M., 4,235,187, Cl. 118-58.000.
Metrailer, William J., to Exxon Research & Engineering Co. Two-stage coking for the production of low metals coke. 4,235,700, Cl. 208-54.000.
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Preiss, Michael; Konig, Hans-Bodo; Metzger, Karl G.; and Schmidt, Gunter, 4,235,774, Cl. 260-239.100.
Metzger, Karl-Georg: *See*—
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Meyer, Maurice; and Stucki, Heinrich, to Krebs & Cie. Installation for mixing and separating two non-miscible liquids, inter alia for liquid-liquid extraction. 4,235,602, Cl. 23-293.00R.
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Belopavlovich, Peter; Michaels, Leonard H.; and Zic, Richard, 4,235,500, Cl. 339-176.0MF.
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Miedaner, Patrick M., to Certain-Teed Corporation. High temperature mineral fiber binder. 4,235,950, Cl. 428-36.000.

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Miki, Takao: *See*—
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Mikuni Kogyo Kabushiki Kaisha: *See*—
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Milam, Joseph E., to PPG Industries, Inc. Production of dichlorobenzene. 4,235,825, Cl. 370-210.000.

Miles, Gregory M., to Honeywell Inc. Flame responsive control circuit. 4,235,587, Cl. 431-73.000.

Miles, Norval W. Auxiliary starter mechanism for automobile engines and the like. 4,235,216, Cl. 123-179.00E.

Millenet, Andre D.: *See*—
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Miller, Carl L. Heater treater waste heat recovery system. 4,235,325, Cl. 196-46.000.

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Millian, Stephen J.: *See*—
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Milliken Research Corporation: *See*—
Marco, Francis W.; and Harris, Philip G., 4,235,735, Cl. 252-174.180.

Minigrip, Inc.: *See*—
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Minneapolis Electric Steel Castings Company: *See*—
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Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitsu, 4,235,548, Cl. 355-3.00R.
Wada, Kenichi; Tanaka, Susumu; Isono, Yoshihiro; Tabuchi, Kenji; Oka, Tateki; and Mizunoe, Hiroaki, 4,235,194, Cl. 118-657.000.
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Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, to Sharp Kabushiki Kaisha. Automatic pre-programming system for TV receivers. 4,236,182, Cl. 358-193.100.

Mirza, Rohinton M., to Metalwash Machinery Corp. Can handling equipment. 4,235,187, Cl. 118-58.000.

Misawa, Michihiro: *See*—
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Mitani, Tadayuki: *See*—
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Mitchell, Glen R.: *See*—
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Mitchell, Robert W. Folded column speaker enclosure. 4,235,301, Cl. 181-148.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Mitsuboshi Belting Limited: *See*—
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Mitsui, Ryoichi: *See*—
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Mitsui Toatsu Chemicals, Inc.: *See*—
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Miyadoh, Shinji: *See*—
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Miyahara, Junji: *See*—
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Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitsu, to Minolta Camera Kabushiki Kaisha. Electrostatic latent image transfer type copying apparatus. 4,235,548, Cl. 355-3.00R.

Miyamoto, Yukihiko: *See*—
Kominami, Yasuo; Ienaka, Masanori; Wada, Takeshi; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,236,252, Cl. 455-207.000.
Onishi, Masaru; and Miyamoto, Yukihiko, 4,236,253, Cl. 455-214.000.

Mizuno, Tiaki, to Nippondenso Co., Ltd. Apparatus for controlling vehicle directional lamps. 4,236,143, Cl. 340-73.000.

Mizunoe, Hiroaki: *See*—
Wada, Kenichi; Tanaka, Susumu; Isono, Yoshihiro; Tabuchi, Kenji; Oka, Tateki; and Mizunoe, Hiroaki, 4,235,194, Cl. 118-657.000.

Mjulendorf, Oleg S.: *See*—
Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V., 4,235,848, Cl. 422-249.000.

Mobay Chemical Corporation: *See*—
Stout, James R., 4,235,789, Cl. 260-380.000.
Uher, Joseph F.; and Loane, Charles M., Jr., 4,235,632, Cl. 75-257.000.

Mobil Oil Corporation: *See*—
Chester, Arthur W., 4,235,754, Cl. 252-455.00Z.
Messenger, Joseph U., 4,235,291, Cl. 166-292.000.
Otto, John B., Jr., 4,235,850, Cl. 423-7.000.
Weeter, Robert F., 4,235,289, Cl. 166-267.000.

Mochizuki, Daisuke; and Horiguchi, Michiyuki, to Sharp Kabushiki Kaisha. Power supply voltage stabilizer. 4,236,187, Cl. 361-36.000.

Mohler, David B., to Ledex, Inc. Material testing device. 4,235,114, Cl. 73-805.000.

Molex Incorporated: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,235,015, Cl. 29-857.000.

Moliterni, Samuel S. Bird feeder, cage and bag assembly. 4,235,196, Cl. 119-18.000.

Moll, Eberhard: *See*—
Winkler, Otto; and Moll, Eberhard, 4,235,572, Cl. 418-6.000.

Monks, Harry, to Coal Industry (Patents) Limited. Mineral mining equipment. 4,235,475, Cl. 299-43.000.

Monoski, William T.: *See*—
Cooper, David A.; Monoski, William T.; and Vibert, Edward J., 4,236,128, Cl. 335-18.000.

Montedison S.p.A.,: *See*—
Boschi, Pier M.; and Gozzo, Franco, 4,236,017, Cl. 560-24.000.

Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Organoleptic uses of 3-hydroxy-1-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-1-butanone. 4,235,247, Cl. 131-17.00R.

Mookherjee, Braja D.: *See*—
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,235,938, Cl. 426-535.000.

Moon, Nancy J.; and Hammond, Earl G., to Iowa State University Research Foundation, Inc. Process for converting whey permeate to oil-containing yeast. 4,235,933, Cl. 426-41.000.

Moore, Dawne A. Electric dental flosser. 4,235,253, Cl. 132-92.00R.

Moore, Robert L.: *See*—
Winter, John S.; and Moore, Robert L., 4,234,999, Cl. 24-81.00G.

Morbidi, Piero, to Officine Galileo S.p.A. Cryogenic equipment for very low temperatures. 4,235,078, Cl. 62-6.000.

Mordarski, Walter J., to Combustion Engineering, Inc. Chip sleeve for nuclear fuel elements. 4,235,673, Cl. 176-82.000.

Morey, Booker W.: *See*—
Moudgil, Brij M.; Morey, Booker W.; and Messenger, David F., 4,235,708, Cl. 209-3.300.

Morio, Michel: *See*—
Baudet, Gerard; Morio, Michel; and Vautrelle, Christian, 4,235,709, Cl. 209-5.000.

Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, to Citizen Watch Company Limited. Electronic timepiece. 4,236,241, Cl. 368-82.000.

Morris, Robert L.: *See*—
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,236,004, Cl. 544-279.000.

Morrison, Dennis R.: *See*—
Capella, Joseph A.; and Morrison, Dennis R., 4,235,600, Cl. 8-137.000.

Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., to Burroughs Wellcome Co. 1H-Pyrimido[4,5-c]-1,2-diazepines. 4,235,905, Cl. 424-251.000.

Morton-Norwich Products, Inc.: *See*—
White, Ralph L., Jr., 4,235,817, Cl. 564-163.000.

Moser, Kurt: *See*—
Eisbein, Jurgen; and Moser, Kurt, 4,235,549, Cl. 355-3.0DD.

Motion Analysis, Inc.: *See*—
Plagenhoef, Stanley C., 4,235,026, Cl. 36-32.00R.

Motorola, Inc.: *See*—
Augustin, Michael J.; and Williams, Wade, 4,236,254, Cl. 455-223.000.
Beseke, Kermit; and Kopecki, Ronald, 4,236,116, Cl. 328-169.000.
Daniel, Sam M., 4,236,158, Cl. 343-100.0LE.
Groves, Stanley E., 4,236,204, Cl. 364-200.000.
Jellissen, Roy H., 4,235,213, Cl. 123-146.50A.
Richardson, Lavoie, 4,235,648, Cl. 148-6.270.

Motosugi, Katsuhiko: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,235,210, Cl. 123-471.000.

Moudgil, Brij M.; Morey, Booker W.; and Messenger, David F., to Occidental Research Corporation. Method of separating a mixture of ore particles. 4,235,708, Cl. 209-3.300.

Mouwen, Herman C., to Johnson & Johnson; and Purolator, Inc. Bag for collecting, storing and administering including filtering blood, blood components, intravenous fluids and similar fluids. 4,235,233, Cl. 128-214.00D.

MTI Systems Corporation: *See*—
Young, David H., 4,235,357, Cl. 225-1.000.

Muhlich, Albert: *See*—
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,235,615, Cl. 65-3.00C.

Mukvist, Anders: *See*—
Reinhall, Rolf; Johansson, Inge; Sandstron, Ake; Mukvist, Anders; and Elander, Lars, 4,235,665, Cl. 162-23.000.

Muller, Hans, to Grapha-Holding AG. Apparatus for diverting groups of paper sheets or the like to processing machine. 4,235,434, Cl. 271-280.000.

Muller, Werner H.; and Freudenberger, Dieter, to Hoechst Aktiengesellschaft. Process for separating p-benzoquinone from the reaction products of phenol oxidation as quinhydrone. 4,235,790, Cl. 260-396.00R.

Multi-Products Co.: *See*—
Watson, Willie L., 4,235,288, Cl. 166-64.000.

Multinorm, B.V.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,235,069, Cl. 56-13.600.

Muncke, Ludwig: *See*—
Kauss, Wolfgang; and Muncke, Ludwig, 4,235,470, Cl. 296-190.000.

Munsingwear, Inc.: *See*—
Dale, David; and Barksdale, Robert C., 4,235,083, Cl. 66-213.000.

Murobushi, Toshiaki: *See*—
Aoshima, Atsushi; Murobushi, Toshiaki; Mitsui, Ryoichi; and Tamura, Nobuhiro, 4,236,034, Cl. 508-898.000.

Murphy, Gerald G. Solar energy system and apparatus. 4,235,221, Cl. 126-415.000.

Murtaugh, William J.: *See*—
Butte, Walter A., Jr.; Murtaugh, William J.; and Mitchell, Richard E., 4,235,821, Cl. 564-491.000.

Muschaweck, Roman: *See*—
Lang, Hans-Jochen; Muschaweck, Roman; and Hropot, Max, 4,235,918, Cl. 424-274.000.

Myrfield, Warren: *See*—
Hannaford, James H.; Myrfield, Warren; Weiler, David H.; Trofimenkoff, Frederick N.; Consay, Joseph A.; and Dobie, Donald M., 4,235,050, Cl. 51-34.00D.

Myrick, John S.: *See*—
Smith, Hudson C.; Atwood, Wesley W.; and Myrick, John S., 4,235,854, Cl. 423-320.000.

Naarden International N.V.: *See*—
Traas, Petrus C.; Boelens, Harmannus; and Wille, Hans J., 4,235,824, Cl. 568-486.000.

Nagabhushan, Tattanahalli L., to Schering Corporation, Patent Dept. 1-Aryl-2-acylamido-3-fluoro-1-propanols, methods for their use as antibacterial agents and compositions useful therefor. 4,235,892, Cl. 424-226.000.

Nagase, Shunji: *See*—
Abe, Takashi; and Nagase, Shunji, 4,235,782, Cl. 260-345.200.

Nagashima, Takashi; and Aihara, Norio, to Tokyo Shibaura Electric Co., Ltd. Memory device for processing picture images data. 4,236,228, Cl. 365-114.000.

Nagata, Mitsuo, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device. 4,236,155, Cl. 340-784.000.

Nagumo, Fumio, to Sony Corporation. Luminance circuit for color television camera. 4,236,176, Cl. 358-43.000.

Naito, Masayoshi, to Olympus Optical Co., Ltd. Device for picking up tissues from a body cavity. 4,235,245, Cl. 128-756.000.

Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of time-shared digital processing type. 4,235,142, Cl. 84-1.030.

Nakagami, Tatsuro: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,235,205, Cl. 123-472.000.

Nakagawa, Sadayoshi; Shinohara, Mitsuharu; and Hashimoto, Katsutoshi, to Hoshidenki-Seizo Kabushiki Kaisha. Electret microphone. 4,236,051, Cl. 179-111.00E.

Nakai, Kazuhiro: *See*—
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,236,182, Cl. 358-193.100.

Nakajima, Risuke; Takei, Yoshio; Kawauchi, Shoroku; and Fujita, Tetsuo, to Hanshin Engineering Co., Ltd. Underwater aerator. 4,235,720, Cl. 210-220.000.

Nakamura, Kouichi: *See*—
Harasawa, Isamu; Hariki, Yukio; Maeda, Katsuhiko; and Nakamura, Kouichi, 4,235,043, Cl. 47-1.400.

Nakamura, Masayuki; and Yokoyama, Hisayoshi, to Kurita Machinery Manufacturing Company Limited. Reinforcing patch plate applied to liquid passage hole in filter-surfaced expressing sheet on expressing filter plate. 4,235,721, Cl. 210-227.000.

Nakano, Tasuku: *See*—
Terabayashi, Gosaku; Nakano, Tasuku; and Hamamoto, Tadanao, 4,236,141, Cl. 340-52.00E.

Nakao, Toshiharu; Teranishi, Katsuya; and Kawagoshi, Makoto, to Hitachi, Ltd.; and Hitachi-Mito Kogyo, Ltd. Main frame construction of conveyor. 4,235,326, Cl. 198-326.000.

Nakashima, Yoichi; Takita, Yosikazu; Suzuki, Sousi; Akabane, Katsumi; and Misawa, Michihiro, to Hitachi, Ltd. Thyristor device. 4,236,169, Cl. 357-39.000.

Nakazawa, Hiroshi: *See*—
Koizumi, Akio; and Nakazawa, Hiroshi, 4,236,196, Cl. 363-21.000.
Ohsawa, Mitsuo; Koizumi, Akio; and Nakazawa, Hiroshi, 4,236,198, Cl. 363-49.000.

Nakos, Steven T.: *See*—
Preston, Frank J.; Nakos, Steven T.; and Rua, Louis, Jr., 4,235,975, Cl. 521-107.000.

Natalizia, Angelo, to International Telephone and Telegraph Corporation. Ball valve having metal seat rings. 4,235,418, Cl. 251-359.000.

National Association of Theatre Owners, Inc.: *See*—
Vlahos, Petro, 4,235,513, Cl. 350-129.000.

National Research Development Corporation: *See*—
Billington, William P., 4,234,992, Cl. 15-3.110.
Cooper, Duane H., 4,236,039, Cl. 179-1.0GQ.
Davies, David E. N.; and Kingsley, Stuart A., 4,236,243, Cl. 370-3.000.

National Starch and Chemical Corporation: *See*—
Catena, William J., 4,235,986, Cl. 526-320.000.

Natori, Tatsuo: *See*—
Aizawa, Tatsushi; Natori, Tatsuo; Hayashi, Masakatsu; and Tanaka, Takeo, 4,235,277, Cl. 164-36.000.

Naumann, Klaus, to Bayer Aktiengesellschaft. Separation of stereoisomeric vinylcyclopropanecarboxylic acids. 4,236,026, Cl. 562-401.000.

Naylor, Carter G.: *See*—
Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., 4,235,811, Cl. 260-513.00N.

Neda, Toshikatsu: *See*—
Kogami, Mineichi; and Neda, Toshikatsu, 4,236,220, Cl. 364-504.000.

Needes, Christopher R. S., to Du Pont de Nemours, E. I., and Company. Thick film silver metallizations for silicon solar cells. 4,235,644, Cl. 136-256.000.

Neel, Robert M., to Teledyne Industries, Inc. Thermostat assembly. 4,235,368, Cl. 236-94.000.

Neild, Kenneth, to McIntosh Laboratory, Inc. Safety control mechanism for press brake assembly. 4,235,324, Cl. 192-131.00H.

Nelson, Gullmar V., to McCord Corporation. Reinforcement panel and mold for making same. 4,235,410, Cl. 249-60.000.

Nelson, John L.: *See*—
Dewey, Chris A.; and Nelson, John L., 4,235,556, Cl. 400-567.000.

Nelson, Robert E., to General Motors Corporation. Synchronization detecting and indicating system. 4,236,115, Cl. 328-133.000.

Nelson, Ronald C., to Fidelity Electronics, Ltd. Electronic board game system. 4,235,442, Cl. 273-237.000.

Nemcek, Jozef: *See*—
Dart, Edward C.; Roberts, Roger C.; Perry, Antony R.; Nemcek, Jozef; and Graham, Neil B., 4,235,686, Cl. 204-159.190.

Neratoom, B. V.: *See*—
Verhey, Leendert A., 4,235,446, Cl. 277-135.000.

Ness, Virginia V. Paper tower holder and the like. 4,235,389, Cl. 242-55.200.

Neufeld, Kurt; Buxmann, Kurt; Bichsel, Heinz; and Gyongyos, Ivan, to Swiss Aluminium Ltd. Continuous strip casting of aluminum alloy from scrap aluminum for container components. 4,235,646, Cl. 148-2.000.

Neumann Engineering & Manufacturing Company: *See*—
Hotton, Joseph G., 4,235,154, Cl. 91-39.000.

Newby, Kenneth D. Portable set-off device for railroad motorcars. 4,235,370, Cl. 238-10.00R.

Newman, Alec T.; and Rhodes, David, to General Foods Limited. Water supply apparatus. 4,235,352, Cl. 222-129.000.

Nexo, Sten A.; and Frandsen, Andreas S., to A/S N. Foss Electric. Apparatus for measuring components of liquid samples. 4,236,075, Cl. 250-343.000.

Nibby, Chester M., Jr.: *See*—
Curley, John L.; Johnson, Robert B.; Lemay, Richard A.; and Nibby, Chester M., Jr., 4,236,203, Cl. 364-200.000.

Nicoulaud, Jean R.; and Fromaget, Georges, to Saint-Gobain Industries. Winding apparatus, especially for strands formed of thermoplastic material. 4,235,387, Cl. 242-18.00G.

Nidola, Antonio: *See*—
De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido M., 4,235,695, Cl. 204-268.000.

Nihon Radiator Co., Ltd.: *See*—
Suyama, Eizo, 4,235,304, Cl. 181-265.000.

Nihon Tokusho Noyaku Seizo K.K.: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,235,891, Cl. 424-224.000.
Nikkel, Ronnie D., to Phillips Petroleum Company. Method for straightening textured yarn. 4,235,000, Cl. 28-290.000.
Nikolai, William L. Method for sulfur dioxide control II. 4,235,853, Cl. 423-242.000.
Nikolsky, Vladimir S.: *See—*
Matochkin, Vadim V.; Nikolsky, Vladimir S.; Novikov, Semen E.; and Ryabinin, Valery N., 4,235,094, Cl. 73-11.000.
Nilo, Gary L.: *See—*
Greenman, Edwin G.; and Nilo, Gary L., 4,235,657, Cl. 156-234.000.
Nineberg, Edward, to Consolidated International Corp. X-ray film cassette pass-through. 4,235,045, Cl. 49-41.000.
Nippon Carbide Kogyo Kabashiki Kaisha: *See—*
Harasawa, Isamu; Hariki, Yukio; Maeda, Katsuhiko; and Nakamura, Kouichi, 4,235,043, Cl. 47-1.400.
Nippon Chemiphar Company, Limited: *See—*
Fujimoto, Yasuo; and Tamada, Terumi, 4,236,012, Cl. 548-229.000.
Nippon Electric Co., Ltd.: *See—*
Tanihata, Ryoichi; Shimazawa, Tsunehiko; and Shibayama, Yoshihisa, 4,236,049, Cl. 179-99.00R.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,235,142, Cl. 84-1.030.
Nippon Kinzoku Co., Ltd.: *See—*
Imai, Koji; Kobayashi, Sumio; Kumai, Ko; and Tsuji, Toshihiko, 4,236,200, Cl. 363-135.000.
Nippon Kogaku K.K.: *See—*
Sato, Akira, 4,235,510, Cl. 350-76.000.
Nippon Oil Co., Ltd.: *See—*
Tsuchiya, Shozo, 4,235,981, Cl. 525-244.000.
Nippon Shinyaku Co., Ltd.: *See—*
Ueno, Masakazu; Sano, Akira; and Ideguchi, Kyoichi, 4,235,992, Cl. 536-5.000.
Nippon Soken, Inc.: *See—*
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,236,138, Cl. 338-34.000.
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,235,096, Cl. 73-23.000.
Nippon Steel Corporation: *See—*
Asano, Hidejiro; Maeda, Shigeyoshi; and Oyagi, Yashichi, 4,235,947, Cl. 427-226.000.
Nippondenso Co., Ltd.: *See—*
Mizuno, Tiaki, 4,236,143, Cl. 340-73.000.
Sugaya, Kazuyoshi, 4,235,211, Cl. 123-511.000.
Niro-Plan AG: *See—*
Butz, Otmar, 4,236,060, Cl. 219-125.100.
Nishimura, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,235,207, Cl. 123-568.000.
Nishimura, Schinichi: *See—*
Hanamura, Yoshihiko; and Nishimura, Schinichi, 4,235,540, Cl. 354-62.000.
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; Toki, Tadaaki; Komyoji, Terumasa; Sakashita, Nobuyuki; and Maeda, Kazuyuki, to Ishihara Sangyo Kaisha Ltd. 2-Substituted phenoxy-3-chloro-5-trifluoromethyl pyridine useful as a herbicide. 4,235,621, Cl. 71-94.000.
Nissan Motor Company, Limited: *See—*
Ushiro, Masayuki, 4,235,262, Cl. 139-452.000.
Nittetsu Steel Drum Co., Ltd.: *See—*
Ikuno, Eiichiro; and Yoshizumi, Tomoki, 4,235,359, Cl. 228-29.000.
Niwa, Tomizo: *See—*
Itoh, Jiro; Miyadoh, Shinji; Itoh, Mitsugu; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,235,803, Cl. 424-122.000.
Noens, Richard H.: *See—*
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., 4,236,215, Cl. 364-436.000.
Nomoto, Kohki; and Kudo, Yoshihiko, to Kureha Kagaku Kogyo KabushikiKaisha. Process for treating an exhaust gas containing nitrogen oxides and sulfur oxides. 4,235,852, Cl. 423-235.000.
Nomura, Yasushi: *See—*
Morokawa, Shigeru; Sekiya, Fukuo; Hashimoto, Yukio; Nomura, Yasushi; and Koga, Keiichiro, 4,236,241, Cl. 368-82.000.
Nony, Jean-Claude. Expansible anchor plug. 4,235,150, Cl. 85-84.000.
Noonan, Robert P., to Standard Oil Company (Indiana). Method of making oriented containers. 4,235,837, Cl. 264-520.000.
Nooter Corporation: *See—*
Hays, George; and Clarkin, Edward J., 4,235,361, Cl. 228-173.00A.
Norfleet, James, to Colgate Palmolive Company. Dentifrice. 4,235,874, Cl. 424-52.000.
Norman, Raymond M. Light apparatus for a pivotal boom. 4,236,194, Cl. 362-370.000.
Normark, Olov M. Coupling between mechanical elements. 4,235,461, Cl. 285-340.000.
Norris, Philip R., to Polaroid Corporation. Card motion picture camera. 4,235,532, Cl. 352-82.000.
Norris, Philip R., to Polaroid Corporation. Card motion picture editing system. 4,235,533, Cl. 352-129.000.
Norris, Philip R., to Polaroid Corporation. Microfiche camera with lens and film transport system. 4,235,543, Cl. 354-86.000.
Norris, Philip R. Microfiche camera with cooperating shutter and light shield. 4,235,545, Cl. 354-123.000.
North American Philips Corporation: *See—*
Russ, John C.; Carey, Robert; and Chopra, Vinod K., 4,236,151, Cl. 340-722.000.
Novikov, Semen E.: *See—*
Matochkin, Vadim V.; Nikolsky, Vladimir S.; Novikov, Semen E.; and Ryabinin, Valery N., 4,235,094, Cl. 73-11.000.
Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research & Development Co., Ltd. Cephalosporin derivatives. 4,236,002, Cl. 544-28.000.
Nunn, Timothy A.: *See—*
Kurtz, Anthony D.; Mallon, Joseph R.; and Nunn, Timothy A., 4,236,137, Cl. 338-4.000.
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Method of treatment. 4,235,929, Cl. 424-301.000.
Nusselein, Manfred: *See—*
Kreissl, Ottmar; Nusselein, Manfred; and Essrich, Wolfgang, 4,235,499, Cl. 339-91.00R.
Nuver, Eric L. H., to Esquire, Inc. Lighting circuits. 4,236,100, Cl. 315-92.000.
Nygren, Gunnar, to Linden-Alimak AB. System for inspecting reinforcing cables. 4,235,305, Cl. 182-82.000.
Nystrom, William A.: *See—*
Borkowski, John W.; Lenze, La Vern J., Jr.; Campbell, Alan F.; and Nystrom, William A., 4,235,859, Cl. 423-448.000.
O&K Orenstein & Koppel Aktiengesellschaft: *See—*
Heusler, Helmut; and Kiefer, Bruno, 4,235,327, Cl. 198-326.000.
Oana, Hanji: *See—*
Watanabe, Hiroshi; Aoyama, Ryushi; Hironaka, Yasuhira; and Oana, Hanji, 4,235,608, Cl. 55-181.000.
Obremski, Michael, to Grundig E. M. V. Elektro-Mechanische Verswchsanstalt Max Grundig. Method for distortion-free still picture reproduction with magnetic video tape. 4,236,185, Cl. 360-10.000.
Occidental Petroleum Corp.: *See—*
Smith, Hudson C.; Atwood, Wesley W.; and Myrick, John S., 4,235,854, Cl. 423-320.000.
Occidental Research Corporation: *See—*
DiGiacomo, Peter M.; and Dines, Martin B., 4,235,990, Cl. 528-287.000.
DiGiacomo, Peter M.; and Dines, Martin B., 4,235,991, Cl. 528-391.000.
Moudgil, Brij M.; Morey, Booker W.; and Messenger, David F., 4,235,708, Cl. 209-3.300.
Oce-van der Grinten N.V.: *See—*
Groen, Otto M.; Bongers, Andreas M. G.; Peeters, Bernard J. E.; and Lammers, Peter H. M., 4,235,193, Cl. 118-658.000.
Ocean Ecology Ltd.: *See—*
Koblanski, John N., 4,235,711, Cl. 210-748.000.
Oechsle, Hans: *See—*
Udert, Karl E.; Oechsle, Hans; and Pfeiffer, Heinz, 4,235,151, Cl. 85-84.000.
Oesterreichische Studiengegesellschaft fuer Atomenergie GmbH: *See—*
Knotik, Karl; Leichter, Peter; and Jakusch, Heinz, 4,235,738, Cl. 252-301.10W.
Officine Galileo S.p.A.: *See—*
Morbidi, Piero, 4,235,078, Cl. 62-6.000.
Ogiu, Hisao; and Shimonaka, Hideki, to Olympus Optical Co., Ltd. Apparatus for suturing coeliac tissues. 4,235,238, Cl. 128-334.00R.
Ohbu, Kazuo; Johna, Nobuo; and Kashiwa, Ichiro, to Lion Fat & Oil Co., Ltd., The. Liquid detergent compositions. 4,235,759, Cl. 252-545.000.
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, to Sanyo Electric Co., Ltd. Frequency synthesizer receiver having memory for storing frequency data. 4,236,251, Cl. 455-180.000.
Ohm, Edward A., to Bell Telephone Laboratories, Incorporated. Array feed for offset satellite antenna. 4,236,161, Cl. 343-781.0CA.
Ohsawa, Mitsuo; Koizumi, Akio; and Nakazawa, Hiroshi, to Sony Corporation. Switching regulator. 4,236,198, Cl. 363-49.000.
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Kleine, Charles A.; and Middleton, Verne L., 4,235,287, Cl. 165-170.000.
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Imai, Toshihiro, 4,235,521, Cl. 350-216.000.
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Achini, Roland; Oppolzer, Wolfgang; and Gahwiler, Beat, 4,235,921, Cl. 424-274.000.
Orchimed S.A.: *See—*
Mieville, Andre, 4,235,896, Cl. 424-244.000.
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Stickney, Donald B., 4,235,181, Cl. 114-211.000.
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Karlsson, Hakan I.; and Ostman, Leif T., 4,235,102, Cl. 73-143.000.
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Otto, John B., Jr., to Mobil Oil Corporation. Process for the recovery of uranium from a saline lixiviant. 4,235,850, Cl. 423-7.000.
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Evinrude, Ralph S., 4,235,183, Cl. 440-71.000.
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Redmore, Derek; and Outlaw, Benjamin T., 4,235,838, Cl. 422-7.000.
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Dereser, Ernst H.; and Meulders, Jean-Marie, 4,235,764, Cl. 260-29.6NR.
Henry, Richard K.; Seng, Stephen; Hohman, Charles M.; and Propster, Mark A., 4,235,618, Cl. 65-21.000.
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Semersky, Frank E., 4,235,725, Cl. 210-516.000.
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Asano, Hidejiro; Maeda, Shigeyoshi; and Oyagi, Yashichi, 4,235,947, Cl. 427-226.000.
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Paetz, Frederic H., to Owens-Corning Fiberglas Corporation. Method and apparatus for packaging compressible material. 4,235,063, Cl. 53-436.000.
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Harvey, Ronald B., 4,235,551, Cl. 355-38.000.
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James, Raymond E., 4,235,005, Cl. 29-281.100.
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Polak, James C.; Fackenthal, Harry; Lentz, Carl A.; Palmer, Walter E.; and Schaefer, Robert H., 4,235,320, Cl. 192-4.00B.
Palmguard, Inc.: *See—*
Butler, Marlow D., 4,236,082, Cl. 250-461.00R.
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Partin, Igor A.: *See—*
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Partus, Fred P., to Western Electric Company, Inc. Vapor delivery system and method of maintaining a constant level of liquid therein. 4,235,829, Cl. 261-121.00R.
Pascal, Helene M.; and Emeury Jean-Marie L., to Societe Nationale des Poudres et Explosifs. Process for the synthesis of 2,4-dinitro-6-t-butyl-3-methylanisole, referred to as musk ambrette. 4,236,029, Cl. 568-584.000.
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Nudelman, Abraham; and Patchornik, Abraham, 4,236,002, Cl. 544-28.000.
Patel, Gordhanbhai N., to Allied Chemical Corporation. Device for measuring temperature using co-crystallized acetylenic compositions. 4,235,108, Cl. 73-356.000.
Paterik, Frank J., Jr. Self stowing vehicle leveling hydraulic jack. 4,235,542, Cl. 254-86.00H.
Patry, Francis J., to Johns-Manville Corporation. Roof structure and method of making the same. 4,235,058, Cl. 52-408.000.
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Pearcy, Frank. Adjustable pedestal for a boat seat. 4,234,989, Cl. 9-7.000.
Pearson, Chris C., to FMC Corporation. Pressurized oxygenation system and method. 4,235,719, Cl. 210-195.100.
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Freeny, Stanley L.; Larsen, Arthur B.; and Pedersen, Thomas J., 4,236,245, Cl. 370-94.000.
Peeters, Bernard J. E.: *See—*
Groen, Otto M.; Bongers, Andreas M. G.; Peeters, Bernard J. E.; and Lammers, Peter H. M., 4,235,193, Cl. 118-658.000.
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Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V., 4,235,848, Cl. 422-249.000.
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Sudrabin, Leon P.; Billets, Stephen F.; Pollitt, Van Dyke J.; and Liszczynsky, Lubomyr, 4,235,688, Cl. 204-195.00F.
Peot, Craig B.: *See—*
Hine, Charles R.; and Peot, Craig B., 4,235,563, Cl. 406-23.000.

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Lee, Cleve L., 4,235,436, Cl. 272-73.000.
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Boyesen, Eyvind, 4,235,206, Cl. 123-73.00V.
Perlin, Rafael. Automatic stepless transmission. 4,235,125, Cl. 74-674.000.
Perry, Antony R.: *See*—
Dart, Edward C.; Roberts, Roger C.; Perry, Antony R.; Nemcek, Jozef; and Graham, Neil B., 4,235,686, Cl. 204-159.190.
Perry, Clifford R.: *See*—
Fitch, Robert E.; and Perry, Clifford R., 4,235,281, Cl. 165-1.000.
Perry, Richard M.: *See*—
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Personick, Stewart D.: *See*—
Brackett, Charles A.; and Personick, Stewart D., 4,236,256, Cl. 455-608.000.
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Peter, Josef: *See*—
Heydner, Konrad; Peter, Josef; and Volkl, Rainer, 4,236,136, Cl. 337-111.000.
Peter, Lothar: *See*—
Peter, Oskar E.; and Peter, Lothar, 4,235,573, Cl. 403-13.000.
Peter, Oskar E.; and Peter, Lothar, to Peter, Oskar E. Double acting hub-to-shaft clamp connection. 4,235,573, Cl. 403-13.000.
Peters, Edward N., to Union Carbide Corporation. Method for producing carborane-siloxane polymers directly from carborane. 4,235,987, Cl. 528-5.000.
Petersen, Otto; and Schmidt, Hans-Dieter, to Bayer Aktiengesellschaft. Apparatus for detecting traces of a gas. 4,235,689, Cl. 204-195.00R.
Petersen, Uwe: *See*—
Stadler, Peter; Metzger, Karl-Georg; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, 4,235,888, Cl. 424-180.000.
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Sivertsen, John W., 4,235,037, Cl. 43-44.910.
Peterson, Glen. Subterranean irrigation means and system. 4,235,561, Cl. 405-45.000.
Peterson, William H., to Pullman Incorporated. Door locking mechanism for side dump railway hopper cars. 4,235,169, Cl. 105-251.000.
Petit, Jean-Francois: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,235,771, Cl. 260-112.50R.
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Redmore, Derek, 4,235,809, Cl. 260-502.500.
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Pfeiffer, Heinz: *See*—
Udert, Karl E.; Oechsle, Hans; and Pfeiffer, Heinz, 4,235,151, Cl. 85-84.000.
Pfenninger, Emil, to Sandoz Ltd. Substituted-9H-pyrrolo[3,4-b]quinolin-9-ones and treatment of allergic conditions with them. 4,235,907, Cl. 424-258.000.
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Pfizer Inc.: *See*—
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Hubenko, Nicholas, 4,235,362, Cl. 226-181.000.
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,235,913, Cl. 424-263.000.
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Pflugmacher, Ingo: *See*—
Rademachers, Jakob; and Pflugmacher, Ingo, 4,235,861, Cl. 423-551.000.
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Evers, Walter, 4,235,889, Cl. 424-195.000.
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Lilly, A. Clifton, Jr.; Claflin, Warren E.; Hardesty, William R.; Scott, George R.; Hopkins, Roger L.; and Lanzillotti, Harry V., 4,236,062, Cl. 219-384.000.
Utsch, Francis V., 4,235,250, Cl. 131-140.00P.
Phillips, Aretee J. Load moving apparatus. 4,235,421, Cl. 254-386.000.
Phillips, Bobby M., to Eastman Kodak Company. Spinneret orifice cross-section. 4,235,574, Cl. 425-72.00S.
Phillips Petroleum Company: *See*—
Dietz, Richard E., 4,235,746, Cl. 252-429.00C.
Dixon, Rolland E.; and Chapman, Charles C., 4,236,036, Cl. 585-331.000.
Drake, Charles A., 4,235,808, Cl. 260-465.80R.
Giles, Richard F.; and Gaines, Larry D., 4,236,202, Cl. 364-105.000.
Killebrew, Wilbur N., Jr.; and Stewart, Charles M., 4,236,218, Cl. 364-500.000.
Killebrew, Wilbur N., Jr.; and Stewart, Charles M., 4,236,219, Cl. 364-501.000.
Kinder, Richard A.; and Sherk, Fred T., 4,235,607, Cl. 55-68.000.
Nikkel, Ronnie D., 4,235,000, Cl. 28-290.000.
Wiley, Bruce F., 4,236,113, Cl. 324-366.000.
Pickles, Joseph, to Ferro Manufacturing Corporation. Tailgate window regulator. 4,235,117, Cl. 74-89.200.
Pico-Glass S.n.c. di Beatrice Huber & C.: *See*—
Astolfi, Pietro, 4,235,030, Cl. 40-156.000.
Pierce, Paul W. Plastic bee frame with reinforced supporting ears and notched frame bars. 4,234,985, Cl. 6-10.000.
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Marsh, Harold G.; and Pierret, James A., 4,235,629, Cl. 75-211.000.
Pilch, John S., to Ware Machine Service, Inc. Material handling machine with adjustable speed-power relationship for boom movement. 4,235,567, Cl. 414-694.000.
Pilipski, Mark, to Pilipski, Mark; Sturman, Martin F.; and Ebert, Michael. Saccharification of cellulose. 4,235,968, Cl. 435-161.000.
Pinto, Alwyn, to Imperial Chemical Industries Limited. Synthesis gas. 4,235,800, Cl. 260-449.500.
Pirio, Marcel R.: *See*—
Singh, Prithipal; and Pirio, Marcel R., 4,235,969, Cl. 435-188.000.
Pirzer, Hans: *See*—
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Pladek, Oscar J.: *See*—
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Plagenhoef, Stanley C., to Motion Analysis, Inc. Elastomeric shoesole. 4,235,026, Cl. 36-32.00R.
Plastronics, Inc.: *See*—
Rath, Lucien M.; and Schultze, W. Martin, 4,235,412, Cl. 251-10.000.
Plath, Peter: *See*—
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Plokhov, Viktor I.: *See*—
Semin, Sergei S.; Plokhov, Viktor I.; Partin, Igor A.; Dolzhenkov, Boris S.; and Lanin, Jury N., 4,235,626, Cl. 75-93.00R.
Polak, James C.; Fackenthal, Harry; Lentz, Carl A.; Palmer, Walter E.; and Schaefer, Robert H., to General Motors Corporation. Retarder and friction brakes. 4,235,320, Cl. 192-4.00B.
Polak's Frutal Works B.V.: *See*—
Lenselink, Willem, 4,235,805, Cl. 260-464.000.
Polaroid Corporation: *See*—
Norris, Philip R., 4,235,532, Cl. 352-82.000.
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Norris, Philip R., 4,235,543, Cl. 354-86.000.
Whiteside, George D.; Johnson, Bruck K.; and LaRocque, Arthur G., 4,235,539, Cl. 354-27.000.
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Pollitt, Van Dyke J.: *See*—
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Kutateladze, Samson S.; Lutset, Mark O.; Korolkov, Anatoly G.; Popov, Jury S.; Filippov, Iosif F.; Khutoretsky, Garry M.; Vvedensky, Jury N.; and Skachkov, Jury V., 4,236,091, Cl. 310-64.000.
Porta, Frank T., to HPS Company, Inc. Two-man utility vehicle. 4,235,297, Cl. 180-6.480.
Porta, Roberto: *See*—
Manghisi, Elso; Cascio, Giuseppe; Fregnan, Giancarlo; and Porta, Roberto, 4,235,904, Cl. 424-251.000.
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Powell, John R.: *See*—
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PPG Industries, Inc.: *See*—
Cannon, James C., 4,235,757, Cl. 252-476.000.
Gillery, F. Howard, 4,235,048, Cl. 49-390.000.
Milam, Joseph E., 4,235,825, Cl. 370-210.000.
Wagner, William E.; and Henery, Vern A., 4,235,945, Cl. 427-126.300.
PQ Corporation: *See*—
Anderson, Roy S.; and Pladek, Oscar J., 4,235,742, Cl. 252-358.000.
Preiss, Michael; Konig, Hans-Bodo; Metzger, Karl G.; and Schmidt, Gunter, to Bayer Aktiengesellschaft. Penicillin derivatives. 4,235,774, Cl. 260-239.100.
Preston, Frank J.; Nakos, Steven T.; and Rua, Louis, Jr., to Olin Corporation. Bis(dimethylbenzyl)diphenylamine scorch inhibitor for polyurethane foams containing halogenated phosphate esters. 4,235,975, Cl. 521-107.000.
Prince, Gregory S.: *See*—
Greene, John, Jr., 4,235,401, Cl. 246-172.000.
Prince, Kenneth E.: *See*—
Dugan, David R.; and Prince, Kenneth E., 4,235,338, Cl. 206-443.000.

Prinz, Benjamin; and Schmidt, Wolfgang, to Vereinigte Flugtechnische Werke-Fokker GmbH. Apparatus for projection on a cylindrical screen. 4,235,535, Cl. 353-11.000.
Pritchard, James F.; and Komrow, Robert R. Method for treating radioactive liquids. 4,235,737, Cl. 252-301.10W.
Probst, William C.: *See*—
Bernstein, Philip; Probst, William C.; Coffey, James P.; and Knipple, Charles J., 4,235,696, Cl. 204-281.000.
Prochazka, Rudolph J., to United States of America, Army. Coaxial terminal protection device with disposable cartridge. 4,236,188, Cl. 361-111.000.
Procter & Gamble Company, The: *See*—
Beyer, Harold H., 4,235,732, Cl. 252-103.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Bourson, Lucien E.; Delavarenne, Serge Y.; and Tellier, Pierre, 4,235,666, Cl. 162-72.000.
Professional Packaging Limited: *See*—
Holmes, Gordon W., 4,235,582, Cl. 425-438.000.
Propst, Robert L.; and Wodka, Michael A., to Herman Miller, Inc. Energy supply system including flat power cables for a space divider system. 4,235,495, Cl. 339-22.00R.
Propster, Mark A.: *See*—
Henry, Richard K.; Seng, Stephen; Hohman, Charles M.; and Propster, Mark A., 4,235,618, Cl. 65-21.000.
Pryor, Clyde R.: *See*—
Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde R., 4,236,190, Cl. 361-391.000.
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Loshbough, Richard C.; and Pryor, Edward G., 4,236,222, Cl. 364-567.000.
Psaras, John D.; and Sachleben, Leroy R., to Brown & Williamson Tobacco Corp. Method and apparatus for producing expanded tobacco from whole tobacco stems. 4,235,249, Cl. 131-137.000.
Puglise, Angelo. Crawler vehicle with dirt removing plate. 4,235,479, Cl. 305-12.000.
Pullman Incorporated: *See*—
Bennett, Robert F.; Brown, Warren D.; Patterson, Clarence L.; and Sorensen, John C., 4,235,830, Cl. 264-29.700.
Peterson, William H., 4,235,169, Cl. 105-251.000.
Purdy, James R. Base drum pedal assembly. 4,235,146, Cl. 84-422.00R.
Purolator, Inc.: *See*—
Mouwen, Herman C., 4,235,233, Cl. 128-214.00D.
Pusch, Gunter. Night sighting arrangement. 4,235,396, Cl. 244-3.110.
Pyrohm, Inc.: *See*—
Scherba, Michael B., 4,236,127, Cl. 333-175.000.
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Bone, David P.; and Meschewski, Robert J., 4,235,935, Cl. 426-249.000.
Questar Corporation: *See*—
Kaprelian, Edward K., 4,235,508, Cl. 350-27.000.
Rademachers, Jakob; and Pflugmacher, Ingo, to Bayer Aktiengesellschaft. Production of iron oxide pigments and sodium sulphate. 4,235,861, Cl. 423-551.000.
Rader Companies Inc.: *See*—
Smith, William C., 4,235,382, Cl. 241-28.000.
Radkevich, Alexei V.: *See*—
Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V., 4,235,848, Cl. 422-249.000.
Rado, Peter J.; Durvasula, Srirama S.; and Angell, William H., to Digital Equipment Corporation. Memory initialization circuit. 4,236,207, Cl. 364-200.000.
Raduchel, Bernd: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Ekkehard, 4,235,930, Cl. 424-305.000.
Raduner & Co. A.G.: *See*—
Lauchenauer, Alfred E., 4,235,946, Cl. 427-185.000.
Raederscheidt, Bruno: *See*—
Rambold, Wolfgang; Heine, Heinrich; Raederscheidt, Bruno; and Trenczek, Gerhard, 4,235,862, Cl. 423-607.000.
Raether, Wolfgang: *See*—
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Rain Bird Sprinkler Mfg. Corp.: *See*—
Beamer, John D., 4,235,379, Cl. 239-230.000.
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Ranford, Alan B.; and Satchell, Fred E., to Sherwood Medical Industries Inc. Adjustable tracheostomy tube assembly. 4,235,229, Cl. 128-207.170.
Rao, V. Durga N., to Ford Motor Company. Fabrication of rotary heat exchangers made of magnesium aluminum silicate glass-ceramic. 4,235,617, Cl. 65-18.000.
Rasmussen, Chris R., to McNeilab, Inc. 2-Benzhydrylimino-1,3-diazacarbocyclic compounds, compositions and methods of use. 4,235,894, Cl. 424-244.000.
Rasmussen, Richard L.: *See*—
Richardson, Ralph J.; Wiswall, Charles E.; and Rasmussen, Richard L., 4,236,123, Cl. 331-94.50G.
Ratcliffe, Charles T.; and Abdel-Baset, Mahmoud B., to Allied Chemical Corporation. Solubilization of coal with hydrogen sulfide and carbon monoxide. 4,235,699, Cl. 208-8.0LE.
Ratcliffe, Ronald W.; and Ruswinkle, Linda J., to Merck & Co., Inc. 3-(2-Aminoethylthio)-6-ethyl-7-oxo-1-azabicyclo [3.2.0]hept-2-ene-2-carboxylic acid. 4,235,922, Cl. 424-274.000.
Rath, Gero, to DEMAG, Aktiengesellschaft. Continuous smelting method for ferrochrome. 4,235,623, Cl. 75-11.000.
Rath, Lucien M.; and Schultze, W. Martin, to Plastronics, Inc. Tube clamping device. 4,235,412, Cl. 251-10.000.
Rau, John K.: *See*—
Rau, Kenneth R.; and Rau, John K., 4,235,264, Cl. 141-1.000.
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, to Heraeus Quartzschmelze GmbH. Method for the production of semiproduct for the production of light conducting fibers. 4,235,615, Cl. 65-3.00C.
Rau, Kenneth R.; and Rau, John K. Apparatus and method for facilitating removal of transmission pans. 4,235,264, Cl. 141-1.000.
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Raychem Corporation: *See*—
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Marshall, Larry J, 4,235,328, Cl. 198-343.000.
Raymond, Bernard R., to Societe pour l'Equipement de Vehicules. Ignition transducer for vehicle engines. 4,236,094, Cl. 310-168.000.
RCA Corporation: *See*—
Stewart, Roger G., 4,236,199, Cl. 363-60.000.
Woods, Murray H., 4,236,167, Cl. 357-23.000.
Reagan, Timothy A. Non-squeal disc brake. 4,235,314, Cl. 188-73.500.
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Reckinger, Arthur P., Jr.: *See*—
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Redmore, Derek, to Petrolite Corporation. α-Amino phosphonic acids. 4,235,809, Cl. 260-502.500.
Redmore, Derek; and Outlaw, Benjamin T., to Petrolite Corporation. Use of benzazoles as corrosion inhibitors. 4,235,838, Cl. 422-7.000.
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Reece, Daniel R. Portable chain saw mill. 4,235,140, Cl. 83-794.000.
Reed, James R., to General Motors Corporation. Extrusion die and method for making same. 4,235,583, Cl. 425-464.000.
Reel, Henning; Kruckenberg, Winfried; and Schuadehutte, Karl H., to Bayer Aktiengesellschaft. Azo dyestuffs containing a naphthalic imide coupler and polyether groups. 4,235,598, Cl. 8-584.000.
Regife Vega, Jose M.: *See*—
Diaz Nogueira, Eduardo; Redondo Abad, Angel L.; and Regife Vega, Jose M., 4,235,713, Cl. 210-638.000.
Reinecke, Erich: *See*—
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Reinert, Gerhard, to Ciba-Geigy Corporation. Granules of textile processing agents for use in organic solvent liquors. 4,235,597, Cl. 8-526.000.
Reinhall, Rolf; Johansson, Inge; Sandstron, Ake; Mukvist, Anders; and Elander, Lars, to American Defibrator, Inc. Method and apparatus for producing fiber pulp in a steam pressurized grinding system. 4,235,665, Cl. 162-23.000.
Reitel, Christian: *See*—
Koenig, Karl-Heinz; Reitel, Christian; and Mangold, Dietrich, 4,235,814, Cl. 260-544.00C.
Reiter, Gerhard, to Timken Company, The. Unitized multirow tapered roller bearing. 4,235,485, Cl. 308-187.100.
Reitz, Norman E., to Sotec Corporation. Layer of crystalline silicon having (111) orientation on (111) surface of lithium aluminum. 4,235,662, Cl. 156-612.000.
Reliance Electric Company: *See*—
Loshbough, Richard C.; and Pryor, Edward G., 4,236,222, Cl. 364-567.000.
Remer, Robert K., to Hull-Smith Chemicals, Inc. Bland protein product and process. 4,235,937, Cl. 426-534.000.
Republic Steel Corporation: *See*—
Malone, William H., 4,235,593, Cl. 432-217.000.
Research Corporation: *See*—
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Revels, Jewel W. Water distributor for toilet bowls. 4,234,975, Cl. 4-300.000.

Revesz, Clara: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,235,901, Cl. 424-248.510.
Reynolds, Roy, to Applied Power Inc. Gear shift connecting apparatus. 4,235,299, Cl. 180-328.000.
Rhodes, David: *See—*
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Ribas, Alberto L. Land reclamation system. 4,235,562, Cl. 405-128.000.
Rice, John O., to General Motors Corporation. Fuel control with learning capability for motor vehicle combustion engine. 4,235,204, Cl. 123-440.000.
Rich Products Corporation: *See—*
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Richard, Kenneth L., to York-Shipley, Inc. Apparatus in the fabric filter control of air pollution. 4,235,610, Cl. 55-302.000.
Richardson, James D., to General Motors Corporation. Apparatus for producing pulse width modulated signals. 4,236,213, Cl. 364-431.000.
Richardson, Lavoie, to Motorola, Inc. Method for immersion plating very thin films of aluminum. 4,235,648, Cl. 148-6.270.
Richardson, Ralph J.; Wiswall, Charles E.; and Rasmussen, Richard L., to McDonnell Douglas Corporation. High-power CO laser. 4,236,123, Cl. 331-94.50G.
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Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsi, Jozsef; and Tardos, Laszlo, 4,235,912, Cl. 424-261.000.
Ricoh Company, Ltd.: *See—*
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Rieber, Gernot; and Miller, Thomas H., to Chemische Werke Munchen Otto Barlocher GmbH. Method for the manufacture of metal soap granulates. 4,235,794, Cl. 260-413.000.
Rieter Machine Works Ltd: *See—*
Schenkel, Eduard; and Thalmann, Dieter, 4,235,393, Cl. 242-128.000.
Riggs, Donnie E. Orthotic stabilizer for athletic shoe. 4,235,028, Cl. 36-80.000.
Rinde, John E.; and Perry, Richard M., to General Electric Company. Linear motion, electromagnetic force motor. 4,235,153, Cl. 91-1.000.
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Lundholm, Sven G. K.; and Ringqvist, Sven A. V., 4,235,445, Cl. 277-30.000.
Ritter, Helmut; Hemmerich, Heinz-Peter; and Rosenkranz, Hans J., to Bayer Aktiengesellschaft. Production of readily dispersible titanium dioxide pigments. 4,235,768, Cl. 260-40.00R.
Rittscher, Dieter: *See—*
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Roberts, Roger C.: *See—*
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Robertshaw Controls Company: *See—*
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Robey, Roger L.: *See—*
Zimmerman, Dennis M.; and Robey, Roger L., 4,236,009, Cl. 546-112.000.
Robinson, Robert G. Point-of-sales display. 4,235,032, Cl. 40-539.000.
Robinson, William D., to Delta Materials Research Limited. Presses. 4,235,576, Cl. 425-138.000.
Rockwell International Corporation: *See—*
Allen, Frank L., Jr., 4,235,392, Cl. 242-118.320.
Chang, Tien-Lin, 4,236,224, Cl. 364-724.000.
Eshghy, Siavash, 4,235,006, Cl. 29-407.000.
Huffman, Charles E., 4,236,250, Cl. 455-49.000.
Spence, Daniel G., 4,236,104, Cl. 318-567.000.
Rockwood, Stephen D., to United States of America, Energy. CO_2 optically pumped distributed feedback diode laser. 4,236,124, Cl. 331-94.50H.
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Rodriguez, Daniel E., to Stanfield, James S. Apparatus for repairing sprocket holes on strip material. 4,235,660, Cl. 156-516.000.
Roesch, Alfred: *See—*
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Rogers Corporation: *See—*
De Vries, Donald H., 4,236,046, Cl. 174-72.00B.
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Rogers, Norman H.: *See—*
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Rohm GmbH: *See—*
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Roller, Erling: *See—*
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Romette, Jean-Louis; Gellf, Gerard; and Thomas, Daniel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Measuring cell for micro-assays, comprising membrane electrodes. 4,235,687, Cl. 204-195.00M.
Rooklyn, Jack, to Industrial Management Company. Construction of metal articles. 4,235,559, Cl. 403-262.000.
Rorrim Incorporated: *See—*
Lechter, George; and Eckel, David S., 4,235,524, Cl. 350-299.000.
Rosen, Norman J., to Hylo Table Pad Co., Inc. Protective table pad latch. 4,235,053, Cl. 52-127.000.
Rosenberg, Linda H. Harness for retaining a baby in a chair. 4,235,474, Cl. 297-465.000.
Rosenblum, Irving. Automatic headlight system. 4,236,099, Cl. 315-83.000.
Rosenkranz, Hans J.: *See—*
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Ross, Charles Y.; and Ross, Deltha M. Pail opening device. 4,234,988, Cl. 7-151.000.
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Ross, Karl-Heinz: *See—*
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Ross, Karl J.; and Johnson, Francis B., to American Gage & Manufacturing Co. Two piece cast ratchet winch. 4,235,420, Cl. 254-218.000.
Ross, Larry G.; and Ross, Lyola J. Emergency escape device. 4,235,306, Cl. 182-100.000.
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Ross, Larry G.; and Ross, Lyola J., 4,235,306, Cl. 182-100.000.
Ross, Roger J., to Singer Company, The. Underbed thread trimmer picking arm. 4,235,179, Cl. 112-286.000.
Ross, Tsuneyo: *See—*
Lawson, Lawrence C.; Cascadden, Richard L.; Ross, Tsuneyo; and Greene, Patrick T., 4,235,453, Cl. 280-743.000.
Rossall, Brian; and Hampson, Jeffrey D., to Lever Brothers Company. Detergent compositions containing alkyl sulfate isomers. 4,235,752, Cl. 252-551.000.
Rossler, Hubert: *See—*
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Rossmann, Franz: *See—*
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Rothman, Steven H.: *See—*
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Rowe, Raymond A.; and McCartney, Joseph F., to United States of America, Navy. Submersible energy storage apparatus. 4,235,693, Cl. 204-229.000.
Royal Marble Company, Inc.: *See—*
Holmes, Donald F., 4,235,948, Cl. 428-15.000.
Rua, Louis, Jr.: *See—*
Preston, Frank J.; Nakos, Steven T.; and Rua, Louis, Jr., 4,235,975, Cl. 521-107.000.
Ruaudel, Annie: *See—*
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Rudell, Elliot A.: *See—*
Sheiman, David M.; and Rudell, Elliot A., 4,235,515, Cl. 350-138.000.
Rudzena, William L.: *See—*
Kulle, Lee K.; and Rudzena, William L., 4,235,344, Cl. 215-250.000.
Ruis, David A.; Polhemus, Russell W.; and Book, Wayne J. Robotic exercise machine and method. 4,235,437, Cl. 272-134.000.
Russ, John C.; Carey, Robert; and Chopra, Vinod K., to North American Philips Corporation. Dynamically variable scaling method and apparatus for spectral displays. 4,236,151, Cl. 340-722.000.
Ruswinkle, Linda J.: *See—*
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Rye, Grover W.: *See—*
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S. A. Clark & Associates: *See—*
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Sun, Jack J., 4,235,710, Cl. 209-213.000.
Saberg, Ove. Device for use in measuring the thickness of surface layers and coatings. 4,235,018, Cl. 33-169.00F.
Sachleben, Leroy R.: *See—*
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Sackett, Roger W.; and Liethen, Thomas R., to Freightliner Corporation. Truck or truck tractor windshield air ram arrangement. 4,235,298, Cl. 180-54.00A.

Saha, Subrata. Method and apparatus for facilitating the non-invasive, non-contacting study of piezoelectric members. 4,235,243, Cl. 128-740.000.
Saint-Gobain Industries: *See—*
Chiron, Georges; and Giles, Maurice R., 4,235,188, Cl. 118-101.000.
Chiron, Georges, 4,235,190, Cl. 118-120.000.
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Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Tokusho Noyaku Seizo K.K. Combating pests with O-alkyl-S-alkyl-O-haloalkyl-phosphates. 4,235,891, Cl. 424-224.000.
Saito, Takemi; Okamura, Kenjiro; and Ando, Kunio, to Fuji Photo Optical Co., Ltd. Image stabilized optical system. 4,235,506, Cl. 350-16.000.
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Sakaguchi, Yasuhiro, to Daicel Ltd. Liquid treating unit. 4,235,722, Cl. 210-247.000.
Sakai, Akira: *See—*
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Salkin, Nicolas. Method for the preparation of stable aqueous solutions of complexes of polyvinylpyrrolidone and of halogens and the solutions obtained thereby. 4,235,884, Cl. 424-150.000.
Salter, Graham R., to Textron Inc. Diffuser. 4,235,372, Cl. 239-11.000.
Sammells, Anthony F.; and Ang, Peter G. P., to Institute of Gas Technology. Solid state photoelectrochemical cell. 4,235,955, Cl. 429-111.000.
Sanderson, James S., to Dow Chemical Company, The. Combination kit for transaminase assay of a body fluid. 4,235,962, Cl. 435-16.000.
Sandland, Paul, to General Electric Company. Tomographic scanning apparatus. 4,236,079, Cl. 250-445.00T.
Sandoz Ltd.: *See—*
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Berthold, Richard, 4,235,919, Cl. 424-274.000.
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Sano, Toshio; Takahashi, Masaharu; and Yokai, Masayuki, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for machining by thermal shock. 4,235,647, Cl. 148-9.00R.
Santilli, Arthur A.: *See—*
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Santora, Norman J.: *See—*
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Sanyo Electric Co., Ltd.: *See—*
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Sapper, Richard F., to Knoll International, Inc. Swivel-chair frame. 4,235,408, Cl. 248-608.000.
Sarges, Reinhard, to Pfizer Inc. Hydantoin derivatives. 4,235,911, Cl. 424-258.000.
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Sarle, Charles R.: *See—*
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Sartorius GmbH: *See—*
Knothe, Erich; Melcher, Franz-Josef; and Rossmann, Franz, 4,235,296, Cl. 177-204.000.
Sasajima, Kikuo; Ono, Keiichi; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Psychotropic γ-(heterocyclic substituted) butyrophenones. 4,235,914, Cl. 424-267.000.
Sasaki, Koji; and Asai, Yoshihito, to Hitachi, Ltd. Puffer type gas circuit breaker. 4,236,053, Cl. 200-144.00R.
Sasaki, Minoru, to Tokyo Shibaura Electric Co., Ltd. Apparatus for generating pulse width modulated waves. 4,236,114, Cl. 328-58.000.
Sasaki, Toshio: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Hanji, Katsumi; Sasaki, Toshio; Okawa, Masahisa; Matsuura, Hideaki; and Yamada, Yasuharu, 4,235,984, Cl. 526-127.000.
Sasayama, Takao, to Hitachi, Ltd. Ignition timing control system for internal combustion engine. 4,236,214, Cl. 364-431.000.
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Simancik, Carl D.; and Zemke, Kenneth M., to General Motors Corporation. Automatic transmission manual shift control assembly with a park lock mechanism. 4,235,123, Cl. 74-475.000.

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Sipos, Frank; and Keseleski, Adam J., to E. R. Squibb & Sons, Inc. N-Benzylideneamphotericin B, its methyl ester and process for making water-soluble salts thereof. 4,235,993, Cl. 536-17.00R.

Sisson, Albert E.: *See—*
Walter, Richard P.; Sisson, Albert E.; Erwin, Louis R.; and Kelso, Charles R., 4,235,374, Cl. 239-90.000.

Sivertsen, John W., to Peterson, Carlton F., a part interest. Fish line sinker. 4,235,037, Cl. 43-44.910.

Skachkov, Jury V.: *See—*
Kutateladze, Samson S.; Lutset, Mark O.; Korolkov, Anatoly G.; Popov, Jury S.; Filippov, Iosif F.; Khutoretsky, Garry M.; Vvedensky, Jury N.; and Skachkov, Jury V., 4,236,091, Cl. 310-64.000.

SKF Industries, Inc.: *See—*
Schard, Lothar, 4,235,487, Cl. 308-217.000.
Schickling, Joseph H.; and Hyduk, Walter, 4,235,489, Cl. 308-236.000.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,235,480, Cl. 308-8.200.

Skilling, James K., to GenRad, Inc. Method of and apparatus for testing electronic circuit assemblies and the like. 4,236,246, Cl. 371-27.000.

Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Ekkehard, to Schering, A.G. Novel acetylenic prostaglandins and processes for the preparation thereof. 4,235,930, Cl. 424-305.000.

Slaugh, Lynn H., to Shell Oil Company. Modified gamma alumina composition. 4,235,756, Cl. 252-463.000.

Sloan Valve Company: *See—*
Billeter, Henry R., 4,235,478, Cl. 303-23.00R.

Smith, Bryan K.: *See—*
Blakey, Philip G.; Smith, Bryan K.; and Watson, Richard W., 4,235,858, Cl. 423-393.000.

Smith, Charles W., Jr.; and Zimmerman, Franz X., to Autoclave Engineers, Inc. Autoclave furnace with mechanical circulation. 4,235,592, Cl. 432-205.000.

Smith, Harvell M.: *See—*
Brooks, Ray G.; and Smith, Harvell M., 4,235,652, Cl. 156-71.000.

Smith, Hudson C.; Atwood, Wesley W.; and Myrick, John S., to Occidental Petroleum Corp. Method for purifying wet process phosphoric acid. 4,235,854, Cl. 423-320.000.

Smith, Lloyd W.: *See—*
LaCoste, Bernard L.; Smith, Lloyd W.; and Finnimore, Thomas J., 4,235,416, Cl. 251-86.000.

Smith, Robert D., to Imperial Chemical Industries Limited. Hydrocarbon processing. 4,235,702, Cl. 208-87.000.

Smith, William C., to Rader Companies Inc. Method and apparatus for rechipping wood chips. 4,235,382, Cl. 241-28.000.

Smithkline Corporation: *See—*
Gleason, John G., 4,236,001, Cl. 544-26.000.
SmithKline-Rit: *See—*
Gits, Jacqueline; and Zygraich, Nathan, 4,235,876, Cl. 424-89.000.
Snajdr, Edward A.: *See—*
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, deceased, 4,235,636, Cl. 106-66.000.
Snamprogetti S.p.A.: *See—*
Lagana, Vincenzo; and Saviano, Francesco, 4,235,816, Cl. 564-72.000.
Snow, Bill D. Cot. 4,234,977, Cl. 5-110.000.
Snow, Bill D. Cot. 4,234,978, Cl. 5-111.000.
Snyder, Daniel S.; and Kaufman, Harold L., to Gould Inc. Ball joint design. 4,235,558, Cl. 403-130.000.
Snyder, Gene L., to Bendix Corporation, The. Electrical connector with locking means. 4,235,498, Cl. 339-90.00R.
Societe Anonyme Automobiles Citroen: *See—*
Gardou, Guy R. M., 4,235,467, Cl. 293-135.000.
Societe Chimique des Charbonnages-CdF CHIMIE: *See—*
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,236,035, Cl. 585-25.000.
Societe Industrielle de Boulogne: *See—*
Lis, Jean Z., 4,235,414, Cl. 251-24.000.
Societe Lignes Telegraphiques et Telephoniques: *See—*
Bernard, Nicolle; and Forterre, Gerard, 4,236,125, Cl. 333-1.100.
Escher, Balint; and Romanet, Rene', 4,235,009, Cl. 29-570.000.
Societe Nationale des Poudres et Explosifs: *See—*
Pascal, Helene M.; and Emeury Jean-Marie L., 4,236,029, Cl. 568-584.000.
Societe pour l'Equipement de Vehicules: *See—*
Raymond, Bernard R., 4,236,094, Cl. 310-168.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Imgruth, Max; and Gygax, Claude A., 4,236,239, Cl. 368-72.000.
Jaunin, Jean-Pierre, 4,236,236, Cl. 368-11.000.
Sohar, Pal: *See—*
Kuszmann, Janos; Sohar, Pal; Csanyi, Endre; and Kiraly nee Vida, Emilia, 4,235,803, Cl. 260-456.00R.
Sokol, Larry S.: *See—*
McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., 4,235,943, Cl. 427-34.000.
McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., 4,236,059, Cl. 219-121.00P.
Sokolov, Anatoly M.; Pelevin, Oleg V.; Kirichenko, Anatoly I.; Makarenko, Grigory G.; Eidelman, Lev G.; Mjulendorf, Oleg S.; Goriletsky, Valentin I.; Apilat, Vitaly Y.; and Radkevich, Alexei V. Apparatus for pulling single crystal from melt on a seed. 4,235,848, Cl. 422-249.000.
Sonoda, Tomiya; and Washida, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Image intensifier. 4,236,077, Cl. 250-361.00R.
Sons, Charles C., Jr., to Caterpillar Tractor Co. Rim construction for trouble-free tire mounting. 4,235,275, Cl. 152-410.000.
Sony Corporation: *See—*
Koizumi, Akio; and Nakazawa, Hiroshi, 4,236,196, Cl. 363-21.000.
Nagumo, Fumio, 4,236,176, Cl. 358-43.000.
Ohsawa, Mitsuo; Koizumi, Akio; and Nakazawa, Hiroshi, 4,236,198, Cl. 363-49.000.
Okamoto, Tsutomu; and Tamura, Hidemasa, 4,235,663, Cl. 156-624.000.
Shimada, Sachio; Tsunaki, Akio; Furuichi, Tatsuo; and Hayashi, Tsuneyuki, 4,235,656, Cl. 156-175.000.
Sorensen, John C.: *See—*
Bennett, Robert F.; Brown, Warren D.; Patterson, Clarence L.; and Sorensen, John C., 4,235,830, Cl. 264-29.700.
Sotec Corporation: *See—*
Reitz, Norman E., 4,235,662, Cl. 156-612.000.
Soundesign Corp.: *See—*
Horiuchi, Harumi; and Aoyagi, Hideo, 4,236,088, Cl. 307-240.000.
Souriau-Electric GmbH: *See—*
Kreissl, Ottmar; Nusselein, Manfred; and Essrich, Wolfgang, 4,235,499, Cl. 339-91.00R.
Soyck, Gerno. Status indicating system for the instantaneous registering of the switching positions in an electrically remotely controlled high tension plant. 4,236,149, Cl. 340-644.000.
Spall, James M., to Burroughs Corporation. Low friction bearing running torque measuring apparatus. 4,235,092, Cl. 73-9.000.
Spall, James M., to Burroughs Corporation. Low friction bearing starting torque apparatus. 4,235,093, Cl. 73-9.000.
Spange, Arno: *See—*
Engelmann, Manfred; Maier, Karl; Spange, Arno; Dewald, Bernd; Lenz, Hans-Joachim; and Teige, Wolfgang, 4,235,641, Cl. 106-308.00M.
Sparks, Robert; and Spector, George. Sleeping device for sitting position. 4,235,472, Cl. 297-392.000.
Spaven, George D.; Thomas, Joseph J.; and Beroff, Howard, to Johnson & Johnson. Hub device for preventing liquid leakage. 4,235,232, Cl. 128-214.400.
Spaziante, Placido M.: *See—*
De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido M., 4,235,695, Cl. 204-268.000.
Spector, George: *See—*
Sparks, Robert; and Spector, George, 4,235,472, Cl. 297-392.000.
Spekman, Paul, Jr., to Fremont Industries, Inc. Finishing compound for barrel and vibratory surface conditioning of ferrous and non-ferrous metals. 4,235,051, Cl. 51-316.000.
Spelchuk, Valery A.: *See—*
An, Viktor B.; Bukhtiarov, Ivan D.; Demin, Alexei S.; Potanin, Veniamin G.; and Spelchuk, Valery A., 4,236,085, Cl. 307-106.000.
Spence, Daniel G., to Rockwell International Corporation. Position sensing rotary switch and system. 4,236,104, Cl. 318-567.000.
Spence, Gavin G.: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,235,982, Cl. 525-284.000.
Sperry, Charles R.: *See—*
Fenn, Lawrence E.; and Sperry, Charles R., 4,236,061, Cl. 219-265.000.
Sperry Corporation: *See—*
Kaminski, David G.; and Grimm, David F., 4,236,087, Cl. 307-200.00A.
Walters, Ronald B., 4,235,105, Cl. 73-861.530.
Sperry Rand Corporation: *See—*
Shelly, Randolph D. W., 4,236,197, Cl. 363-41.000.
Sponseller, David R.: *See—*
Holmes, Richard G.; and Sponseller, David R., 4,235,952, Cl. 428-60.000.
Sportolite, Inc.: *See—*
Brandt, Jason M., 4,236,193, Cl. 362-241.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances, Inc. 2-Oxabicyclooctane derivatives, processes for preparing same and organoleptic uses thereof. 4,235,729, Cl. 252-8.900.
Springs, Thomas W.; and Wallis, William F., to Besser Company. Noise suppression structure for block making machinery. 4,235,580, Cl. 425-211.000.
Spurrell, Robert M., to Weyerhaeuser Company. Heat recovery from wet wood waste. 4,235,174, Cl. 110-346.000.
Stachniak, Raymond M.: *See—*
Palac, Kazimir; and Stachniak, Raymond M., 4,236,184, Cl. 358-245.000.
Stackpole Carbon Company: *See—*
Borkowski, John W.; Lenze, La Vern J., Jr.; Campbell, Alan F.; and Nystrom, William A., 4,235,859, Cl. 423-448.000.
Stadelmann, Joachim P., to Bendix Corporation, The. Adjustable engine crankshaft position sensor with preadvance timing signal capability and method of varying engine timing. 4,235,101, Cl. 73-116.000.
Stadler, Peter; Metzger, Karl-Georg; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, to Bayer Aktiengesellschaft. Pseudotrissaccharides, a process for their production and their use as medicaments. 4,235,888, Cl. 424-180.000.
Stamicarbon, B.V.: *See—*
Frisch, Kurt C.; Tummers, Daniel M. J.; and Te Nijenhuis, Anne, 4,235,977, Cl. 521-166.000.
Standard Oil Company (Indiana): *See—*
Heller, Michael J.; and Ridgway, John A., 4,235,942, Cl. 426-656.000.
Leung, Linus K., 4,235,747, Cl. 252-429.00B.
Noonan, Robert P., 4,235,837, Cl. 264-520.000.
Steigelmann, Edward F.; Yahnke, Robert L.; Couper, Alistair S.; and Deepak, Chand, 4,235,983, Cl. 526-68.000.
Standard Oil Company (Ohio): *See—*
Pesa, Frederick A.; and Haase, Thomas A., 4,235,744, Cl. 252-428.000.
Stanfield, James S.: *See—*
Rodriguez, Daniel E., 4,235,660, Cl. 156-516.000.
Stanly, Albert L.; and Hyatt, Gilbert P. Electro-optical printer. 4,236,223, Cl. 364-710.000.
Stapley, Edward O.: *See—*
Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,235,967, Cl. 435-119.000.
Stauffer Chemical Company: *See—*
Teach, Eugene G., 4,236,011, Cl. 548-215.000.
Staugaard, Kenneth, to Computer Peripherals, Inc. High speed dual pitch impact printer. 4,235,167, Cl. 101-93.090.
Steag Kernenergie GmbH: *See—*
Baatz, Henning; and Rittscher, Dieter, 4,235,739, Cl. 252-301.10W.
Steel, William H.: *See—*
Hariharan, Parameswaran; Hegedus, Zoltan S.; and Steel, William H., 4,235,505, Cl. 350-3.770.
Steger, Charles B., to General Motors Corporation. Lockbar release for inertia locking seat belt retractor. 4,235,391, Cl. 242-107.40A.
Steigelmann, Edward F.; Yahnke, Robert L.; Couper, Alistair S.; and Deepak, Chand, to Standard Oil Company (Indiana). Purification of olefin recycle to polymerization. 4,235,983, Cl. 526-68.000.
Stein, Klaus. Safety clutch for the drive of floor cleaning machines. 4,235,321, Cl. 192-56.00R.
Steiner, Heinz: *See—*
Alfs, Helmut; Boehm, George; and Steiner, Heinz, 4,236,033, Cl. 568-793.000.
Stemmler, Herbert, to BBC Brown, Boveri & Company, Limited. Variable phase-shifting transformer network. 4,236,108, Cl. 323-114.000.
Stephen, Robert L.; Kablitz, Carl; van Dura, Dietz; Atkin, Curtis L.; and Jacobsen, Stephen C., to University of Utah. Iodine composition and method for prevention and treatment of dialysis induced peritonitis. 4,235,230, Cl. 128-213.00A.
Stern, David M.: *See—*
Maltby, Frederick L.; and Stern, David M., 4,235,106, Cl. 73-304.00C.
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, to BASF Aktiengesellschaft. Process and apparatus for the manufacture of linear high molecular weight polyesters. 4,235,844, Cl. 422-138.000.
Stewart, Charles M.: *See—*
Killebrew, Wilbur N., Jr.; and Stewart, Charles M., 4,236,218, Cl. 364-500.000.
Killebrew, Wilbur N., Jr.; and Stewart, Charles M., 4,236,219, Cl. 364-501.000.
Stewart, Roger G., to RCA Corporation. Regulated high voltage power supply. 4,236,199, Cl. 363-60.000.
Stewart & Shea: *See—*
Lawrence, Frederick J., 4,235,435, Cl. 271-292.000.
Stickney, Donald B., to Oregon Link, Inc. Automatic blower control system for inboard marine engines. 4,235,181, Cl. 114-211.000.
Stiles, Alvin B.: *See—*
Wentworth, Theodore O.; and Stiles, Alvin B., 4,235,799, Cl. 260-449.500.
Stoehr, Herbert M., to Artos Engineering Company. Apparatus for providing taped coils of sheet material. 4,235,384, Cl. 72-148.000.
Stohrer, Kurt. Nosepad for spectacles. 4,235,530, Cl. 351-136.000.
Stoll, Wolfgang: *See—*
Druckenbrodt, Wolf-Gunther; Baumann, Siegfried; Krause, Roland; and Stoll, Wolfgang, 4,235,740, Cl. 252-301.10R.
Storni, Angelo: *See—*
Blattner, Hans; and Storni, Angelo, 4,235,895, Cl. 424-244.000.
Stotz, Manfred; Komander, Gerhard; and Hilpert, Wolfgang, to Daimler-Benz Aktiengesellschaft. Preliminary heating control installation for air-compressing internal combustion engines. 4,235,215, Cl. 123-179.00H.
Stoudt, Thomas H.; Carlo, Dennis J.; and Hagopian, Arpi, to Merck & Co., Inc. High molecular weight meningococcal group C vaccine and method for preparation thereof. 4,235,994, Cl. 536-18.000.
Stout, James R., to Mobay Chemical Corporation. Process for the preparation of 1-amino-2-bromo-4-hydroxyanthraquinone. 4,235,789, Cl. 260-380.000.
Strattwell Developments Limited: *See—*
Clark, Peter J., 4,235,373, Cl. 239-34.000.
Strausfeld, Hermann, to EMI Electrola Gesellschaft mit beschrankter Haftung. Trimming disc records. 4,235,136, Cl. 82-57.000.
Strecker, William D.; Hastings, Thomas N.; Lary Richard F.; Rodgers, David P.; and Rothman, Steven H., to Digital Equipment Corporation. Central processor unit for executing instructions of variable length. 4,236,206, Cl. 364-200.000.
Strehl, Herbert, to Siemens Aktiengesellschaft. Digital communications transmission system. 4,236,244, Cl. 370-30.000.
Stucki, Heinrich: *See—*
Meyer, Maurice; and Stucki, Heinrich, 4,235,602, Cl. 23-293.00R.
Stumpf, Richard A.: *See—*
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., 4,236,215, Cl. 364-436.000.
Stumpf, Walter, to Simmons Company. Thermally welded spring pockets. 4,234,983, Cl. 5-477.000.
Stumpf, Walter, to Simmons Company. Pocketed spring assembly. 4,234,984, Cl. 5-477.000.
Sturman, Martin F.: *See—*
Pilipski, Mark, 4,235,968, Cl. 435-161.000.
Sturtz, Terry L.: *See—*
Browning, Edgar P.; and Sturtz, Terry L., 4,235,307, Cl. 184-6.120.
Stutzman, Gary L.; and Martino, Carlo F., to Union Carbide Corporation. Thermosetting compositions for injection molding. 4,235,835, Cl. 264-328.200.
Styles, Virgil L.: *See—*
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,235,905, Cl. 424-251.000.
Suda, Minoru: *See—*
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,235,780, Cl. 260-343.500.
Sudrabin, Leon P.; Billets, Stephen F.; Pollitt, Van Dyke J.; and Liszczynsky, Lubomyr, to Pennwalt Corporation. Salt bridge reference electrode. 4,235,688, Cl. 204-195.00F.
Sugaya, Kazuyoshi, to Nippondenso Co., Ltd. Fuel pressure regulator. 4,235,211, Cl. 123-511.000.
Sugaya, Takao: *See—*
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,235,176, Cl. 112-158.00D.
Sugimoto, Kenichi: *See—*
Asano, Makoto; Kawashima, Saburo; Sugimoto, Kenichi; and Kobayashi, Tadashi, 4,235,769, Cl. 260-45.8NT.
Sullivan, Herbert W.: *See—*
Simpson, George R.; and Sullivan, Herbert W., 4,235,522, Cl. 350-266.000.
Sullivan, Leo S., Jr.; DeVincent, Patsy; and Oldham, Wendell M., Jr., to General Motors Corporation. Shock absorber with compression spring and dust tube. 4,235,426, Cl. 267-8.00R.
Sulzer Brothers Limited: *See—*
Huber, Rudolf, 4,235,369, Cl. 237-2.00B.
Sumitomo Chemical Company, Limited: *See—*
Kirino, Osamu; Kato, Toshiro; and Yamamoto, Shigeo, 4,235,925, Cl. 424-282.000.
Matsuda, Teruo; and Manabe, Kuniyoshi, 4,236,024, Cl. 560-244.000.
Sasajima, Kikuo; Ono, Keiichi; and Yamamoto, Hisao, 4,235,914, Cl. 424-267.000.
Shiga, Akinobu; Fukui, Yoshiharu; Hanji, Katsumi; Sasaki, Toshio; Okawa, Masahisa; Matsuura, Hideaki; and Yamada, Yasuharu, 4,235,984, Cl. 526-127.000.

Sumitomo Electric Industries, Ltd.: *See—*
Yonechi, Shinichi, 4,235,511, Cl. 350-96.230.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Fuel supply apparatus for internal combustion engines. 4,235,210, Cl. 123-471.000.
Sun, Jack J., to S. G. Frantz Company, Inc. Methods and apparatus for separating particles using a magnetic barrier. 4,235,710, Cl. 209-213.000.
Sunada, Yoichi: *See—*
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, 4,235,745, Cl. 252-429.00B.
Sunagawa, Yoshihiko, to Tokyo Keiso Kabushiki Kaisha. Inspection system for a group of tanks. 4,236,144, Cl. 340-870.180.
Sundberg, Carl-Erik, to Organisation Europeene de Recherches Spatiales. Apparatus for correcting multiple errors in data words read from a memory. 4,236,247, Cl. 371-38.000.
Sundeen, Joseph E.; and Dejneka, Tamara, to E. R. Squibb & Sons, Inc. Inhibitors of mammalian collagenase. 4,235,885, Cl. 424-177.000.
Suntech, Inc.: *See—*
Butte, Walter A., Jr.; Murtaugh, William J.; and Mitchell, Richard E., 4,235,821, Cl. 564-491.000.
Thompson, Robert M.; and White, David C., 4,235,714, Cl. 210-654.000.
Super Stretch Co., Ltd.: *See—*
De Donno, Benito, 4,235,439, Cl. 272-132.000.
Susami, Larry: *See—*
Gray, Floyd L.; Adam, Jerome H.; Susami, Larry; and Zamzow, Rick A., 4,235,454, Cl. 280-766.000.
Sutaruk, Alex, to Eaton Corporation. Fluid coupling device having more responsive engagement and disengagement. 4,235,322, Cl. 192-58.00B.
Sutter, Alfred: *See—*
Gamboni, Guido; Schmid, Walter; and Sutter, Alfred, 4,236,006, Cl. 544-286.000.
Suyama, Eizo, to Nihon Radiator Co., Ltd. Muffler. 4,235,304, Cl. 181-265.000.
Suzuki, Shigeto, to Chevron Research Company. Preparation of 6-amino-3-oxahexanoic acid compounds. 4,236,028, Cl. 562-567.000.
Suzuki, Sousi: *See—*
Nakashima, Yoichi; Takita, Yosikazu; Suzuki, Sousi; Akabane, Katsumi; and Misawa, Michihiro, 4,236,169, Cl. 357-39.000.
Suzuki, Yasuo; Abe, Masaru; and Tezuka, Toshiro, to Bridgestone Tire Co., Ltd. Tread reinforcing construction of pneumatic radial tire for heavy-load vehicles. 4,235,274, Cl. 152-354.00R.
Svenska Traforskningsinstitutet: *See—*
Karlsson, Hakan I.; and Ostman, Leif T., 4,235,102, Cl. 73-143.000.
Swaidan, Brian E., to United States of America, Navy. High performance solar still. 4,235,679, Cl. 202-234.000.
Swarovski, Daniel, to D. Swarovski & Co., Glasschleiferei. Glass mirror film, and methods for its production and use. 4,235,951, Cl. 428-40.000.
Sweet, Roger H., to Mattel, Inc. Figure toy. 4,235,041, Cl. 46-115.000.
Swiss Aluminium Ltd.: *See—*
Dantzig, Jonathan A.; and Tyler, Derek E., 4,235,627, Cl. 75-93.00E.
Neufeld, Kurt; Buxmann, Kurt; Bichsel, Heinz; and Gyongyos, Ivan, 4,235,646, Cl. 148-2.000.
Schneeberger, Fritz; Zweifel, Walter; and Weber, Hermann, 4,235,682, Cl. 204-35.00N.
Symons Corporation: *See—*
Schimmel, Vernon R., 4,235,560, Cl. 403-388.000.
Syngergistics: *See—*
Leslie, Stewart T., 4,235,870, Cl. 424-19.000.
Systron-Donner Corp.: *See—*
Winter, John S.; and Moore, Robert L., 4,234,999, Cl. 24-81.00G.
Syva Company: *See—*
Schwarzberg, Moshe, 4,235,869, Cl. 424-8.000.
Singh, Prithipal; and Pirio, Marcel R., 4,235,969, Cl. 435-188.000.
Szoka, Francis C., Jr.: *See—*
Papahadjopoulos, Demetrios P.; and Szoka, Francis C., Jr., 4,235,871, Cl. 424-19.000.
Tabuchi, Katsuhiko; and Kato, Toshiaki, to TDK Electronics Co., Ltd. Electrodes for living body. 4,235,241, Cl. 128-639.000.
Tabuchi, Kenji: *See—*
Wada, Kenichi; Tanaka, Susumu; Isono, Yoshihiro; Tabuchi, Kenji; Oka, Tateki; and Mizunoe, Hiroaki, 4,235,194, Cl. 118-657.000.
Tadokoro, Tomoo; Okimoto, Haruo; and Yoshii, Shinichi, to Toyo Kogyo Co., Ltd. Catalytic converter. 4,235,843, Cl. 422-119.000.
Taeymans, Jean R. J. M.: *See—*
Cornu, Jozef; Taeymans, Jean R. J. M.; and Talbot, Jacques, 4,236,090, Cl. 307-268.000.
Taguchi, Tetsuya: *See—*
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,235,538, Cl. 354-23.00D.
Taiho Kogyo Co., Ltd.: *See—*
Fukuoka, Tatsuhiko; Sakai, Akira; and Matsuda, Yoshimi, 4,235,481, Cl. 308-23.000.
Takabayashi, Yutaka, to Olympus Optical Co., Ltd. Electrically driven optical instrument with manual drive. 4,235,509, Cl. 350-44.000.
Takagi, Yoichiro, to Mitsubishi Denki Kabushiki Kaisha. Power breaker system. 4,236,186, Cl. 361-9.000.

Takahashi, Kouzou: *See*—
Tanaka, Kyoichi; Takahashi, Kouzou; Kanada, Mitsuhiro; Kato, Yasuyuki; and Ichihara, Masuji, 4,235,985, Cl. 526-279.000.

Takahashi, Masaharu: *See*—
Sano, Toshio; Takahashi, Masaharu; and Yokai, Masayuki, 4,235,647, Cl. 148-9.00R.

Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, to Toyo Stauffer Chemical Co., Ltd. Titanium trichloride catalytic component and method for homo-or co-polymerization of α-olefin. 4,235,745, Cl. 252-429.00B.

Takano, Hiroshi; Hashimoto, Yasuhiro; and Takesako, Mutsuo, to Mitsuboshi Belting Limited. Apparatus for testing power transmission belt. 4,235,091, Cl. 73-7.000.

Takashima, Toshiyuki: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,235,780, Cl. 260-343.500.

Takasu, Isamu. Speed reduction mechanism. 4,235,129, Cl. 74-805.000.

Takechi, Sadatoshi: *See*—
Yano, Kohzo; Kuwagaki, Hiroshi; Hamada, Hiroshi; and Takechi, Sadatoshi, 4,235,528, Cl. 350-357.000.

Takeda Chemical Industries, Ltd.: *See*—
Meguro, Kanji; and Kuwada, Yutaka, 4,235,775, Cl. 260-243.300.

Takei, Yoshio: *See*—
Nakajima, Risuke; Takei, Yoshio; Kawauchi, Shoroku; and Fujita, Tetsuo, 4,235,720, Cl. 210-220.000.

Takesako, Mutsuo: *See*—
Takano, Hiroshi; Hashimoto, Yasuhiro; and Takesako, Mutsuo, 4,235,091, Cl. 73-7.000.

Takeuchi, Noboru: *See*—
Inamura, Minoru; Takeuchi, Noboru; and Inukai, Kazuhiro, 4,235,649, Cl. 148-24.000.

Takeuchi, Yuzo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,235,210, Cl. 123-471.000.

Takita, Yosikazu: *See*—
Nakashima, Yoichi; Takita, Yosikazu; Suzuki, Sousi; Akabane, Katsumi; and Misawa, Michihiro, 4,236,169, Cl. 357-39.000.

Takitani, Masaru: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, 4,235,745, Cl. 252-429.00B.

Talbot, Jacques: *See*—
Cornu, Jozef; Taeymans, Jean R. J. M.; and Talbot, Jacques, 4,236,090, Cl. 307-268.000.

Talres Development (N.A.) N.V.: *See*—
Jarman, Trevor R.; and Govan, John R. W., 4,235,966, Cl. 435-101.000.

Tamada, Terumi: *See*—
Fujimoto, Yasuo; and Tamada, Terumi, 4,236,012, Cl. 548-229.000.

Tamura, Hidemasa: *See*—
Okamoto, Tsutomu; and Tamura, Hidemasa, 4,235,663, Cl. 156-624.000.

Tamura, Koichi: *See*—
Yamaji, Kenkichi; Dietrich, Oelhschlagel; Abe, Hajime; and Tamura, Koichi, 4,235,007, Cl. 291-420.000.

Tamura, Nobuhiro: *See*—
Aoshima, Atsushi; Murobushi, Toshiaki; Mitsui, Ryoichi; and Tamura, Nobuhiro, 4,236,034, Cl. 508-498.000.

Tan, Chou-Tok: *See*—
Hsia, Jen C.; and Tan, Chou-Tok, 4,235,792, Cl. 260-403.000.

Tanaka, Hitoshi: *See*—
Iizawa, Osamu; Fujiwara, Shinobu; Ueoka, Hisayoshi; Furukawa, Kiyoshi; Kikuchi, Nobuaki; and Tanaka, Hitoshi, 4,235,635, Cl. 106-39.500.

Tanaka, Kyoichi; Takahashi, Kouzou; Kanada, Mitsuhiro; Kato, Yasuyuki; and Ichihara, Masuji, to Toyo Contact Lens Co., Ltd. Polymer for contact lens and contact lens made thereof. 4,235,985, Cl. 526-279.000.

Tanaka, Noboru, to Tokyo Pipe Co., Ltd. Cigarette lighter utilizing catalyst. 4,235,588, Cl. 431-147.000.

Tanaka, Susumu: *See*—
Wada, Kenichi; Tanaka, Susumu; Isono, Yoshihiro; Tabuchi, Kenji; Oka, Tateki; and Mizunoe, Hiroaki, 4,235,194, Cl. 118-657.000.

Tanaka, Takeo: *See*—
Aizawa, Tatsushi; Natori, Tatsuo; Hayashi, Masakatsu; and Tanaka, Takeo, 4,235,277, Cl. 164-36.000.

Tang, Henry Y. S.; and Tang, Henry Y. S., to Bell Telephone Laboratories, Incorporated. Bipolar transistor stabilization structure. 4,236,164, Cl. 357-51.000.

Tang, Henry Y. S.: *See*—
Tang, Henry Y. S.; and Tang, Henry Y. S., 4,236,164, Cl. 357-51.000.

Tanihata, Ryoichi; Shimazawa, Tsunehiko; and Shibayama, Yoshihisa, to Nippon Electric Co., Ltd. Electronic key telephone system. 4,236,049, Cl. 179-99.00R.

Tarbox, Bruce H.: *See*—
Lombardo, Ralph M., Jr.; Barlow, George J.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; and Tarbox, Bruce H., 4,236,209, Cl. 364-200.000.
O'Keefe, David B.; Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,236,208, Cl. 364-200.000.

Tardos, Laszlo: *See*—
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsi, Jozsef; and Tardos, Laszlo, 4,235,912, Cl. 424-261.000.

Tarran, Phil K. Combined hand truck and step stool. 4,235,449, Cl. 280-30.000.

Taube, Carl: *See*—
Huhne, Volker; Taube, Carl; and Ditzer, Reiner, 4,235,773, Cl. 260-173.000.

Tavernier, Bernard H.: *See*—
Thijs, Victor J. M., deceased; Huyghebaert, Paul E., administrator; De Jaeger, Nikolaas C.; and Tavernier, Bernard H., 4,235,959, Cl. 430-531.000.

Taylor, David L., to Harris Corporation. Programmable threshold switchable resistive memory cell array. 4,236,231, Cl. 365-163.000.

Taylor, Harold M., to Eli Lilly and Company. Method of controlling aquatic weeds and algae. 4,235,619, Cl. 71-66.000.

Taylor, Michael J., to Rogers Corporation. High capacitance multilayer bus bar and method of manufacture thereof. 4,236,038, Cl. 174-72.00B.

TDK Electronics Co., Inc.: *See*—
Iizawa, Osamu; Fujiwara, Shinobu; Ueoka, Hisayoshi; Furukawa, Kiyoshi; Kikuchi, Nobuaki; and Tanaka, Hitoshi, 4,235,635, Cl. 106-39.500.

TDK Electronics Co., Ltd.: *See*—
Tabuchi, Katsuhiko; and Kato, Toshiaki, 4,235,241, Cl. 128-639.000.

Teach, Eugene G., to Stauffer Chemical Company. N-Acyl oxazolidines and thiazolidines as herbicides. 4,236,011, Cl. 548-215.000.

Technicon Instruments Corporation: *See*—
Judge, John F. X.; and Lipshutz, Victor G., 4,236,076, Cl. 250-347.000.

Teeters, Darrel L. Building structural element. 4,235,057, Cl. 52-404.000.

Tegtmeier, Richard J.: *See*—
Helms, Jimmy L.; and Tegtmeier, Richard J., 4,235,280, Cl. 164-444.000.

Teige, Wolfgang: *See*—
Engelmann, Manfred; Maier, Karl; Spange, Arno; Dewald, Bernd; Lenz, Hans-Joachim; and Teige, Wolfgang, 4,235,641, Cl. 106-308.00M.

Tektronix, Inc.: *See*—
Battjes, Carl R., 4,236,119, Cl. 330-288.000.

Tel-Ray Electronics Manufacturing Co., Inc.: *See*—
Lubow, Raymond; and Brand, John R., 4,235,144, Cl. 84-1.160.

Teledyne Industries, Inc.: *See*—
Neel, Robert M., 4,235,368, Cl. 236-94.000.

Tellier, Pierre: *See*—
Bourson, Lucien E.; Delavarenne, Serge Y.; and Tellier, Pierre, 4,235,666, Cl. 162-72.000.

Templin, Jackson R., to General Motors Corporation. Secondary cell charging system. 4,236,107, Cl. 320-21.000.

Tengler, Harvey N., to UOP Inc. Angular vibration isolator for seat back. 4,235,471, Cl. 297-361.000.

Te Nijenhuis, Anne: *See*—
Frisch, Kurt C.; Tummers, Daniel M. J.; and Te Nijenhuis, Anne, 4,235,977, Cl. 521-166.000.

Terabayashi, Gosaku; Nakano, Tasuku; and Hamamoto, Tadanao, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Automatic fastening and alarming circuit for a vehicle seat belt. 4,236,141, Cl. 340-52.00E.

Terakawa, Kiyoshi H.; and Woods, William E., to Honeywell Information Systems Inc. Architecture for a control store included in a data processing system. 4,236,210, Cl. 364-200.000.

Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi. Transmission speed switching system. 4,236,248, Cl. 375-53.000.

Terando, Norman H.: *See*—
Jones, Reuben G.; and Terando, Norman H., 4,235,995, Cl. 542-408.000.

Teranishi, Katsuya: *See*—
Nakao, Toshiharu; Teranishi, Katsuya; and Kawagoshi, Makoto, 4,235,326, Cl. 198-326.000.

Terry, Ronald R.: *See*—
Meloche, Kenneth R.; Bland, Coburn C., Jr.; and Terry, Ronald R., 4,235,076, Cl. 60-602.000.

Terumo Corporation: *See*—
Ishizaka, Hideo, 4,235,099, Cl. 73-32.00A.

Texaco Development Corp.: *See*—
Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., 4,235,811, Cl. 260-513.00N.

Texaco Inc.: *See*—
Kalfoglou, George, 4,235,290, Cl. 166-273.000.
Schlicht, Raymond C., 4,235,730, Cl. 252-51.50A.

Texas Instruments Incorporated: *See*—
Caudel, Edward R., 4,236,229, Cl. 365-154.000.
Davis, Robert S., Jr.; and Schneider, William A., 4,236,233, Cl. 367-71.000.
Yashin, Michael A.; and Rebelo, Lucilio A., 4,236,065, Cl. 219-544.000.

Textron Inc.: *See*—
Salter, Graham R., 4,235,372, Cl. 239-11.000.

Tezuka, Toshiro: *See*—
Suzuki, Yasuo; Abe, Masaru; and Tezuka, Toshiro, 4,235,274, Cl. 152-354.00R.

Thalmann, Dieter: *See*—
Schenkel, Eduard; and Thalmann, Dieter, 4,235,393, Cl. 242-128.000.

Theeuwes, Felix, to Alza Corporation. Device for dispensing drug by combined diffusional and osmotic operations. 4,235,236, Cl. 128-260.000.

Therm-O-Disc, Incorporated: *See*—
Holden, Ronald L., 4,236,135, Cl. 337-89.000.

Thery, Georges. Two-zone combustion chamber. 4,235,203, Cl. 123-275.000.

Thijs, Victor J. M., deceased; Huyghebaert, Paul E., administrator; De Jaeger, Nikolaas C.; and Tavernier, Bernard H. Photographic matt layers or surfaces. 4,235,959, Cl. 430-531.000.

Thoma, Hans A., to Chandon Investment Planning Ltd. Method for the determination of unbound hormones and pharmaceuticals. 4,235,865, Cl. 424-1.000.

Thoma, Hans A., to Chandon Investment Planning Ltd. Process for the total determination of hormones and pharmaceuticals. 4,235,866, Cl. 424-1.000.

Thoma, Hans A., to Chandon Investment Planning Ltd. Acrylamide copolymer matrix for radioimmune assay techniques. 4,235,867, Cl. 424-1.000.

Thomas, Brooks. Skiing simulator. 4,235,448, Cl. 280-11.1BT.

Thomas C. Elder, Inc.: *See*—
Kaufman, Kurt D., 4,235,781, Cl. 260-343.440.

Thomas, Daniel: *See*—
Romette, Jean-Louis; Gellf, Gerard; and Thomas, Daniel, 4,235,687, Cl. 204-195.00M.

Thomas Equipment Ltd.: *See*—
Ellis, Malcolm P., 4,235,293, Cl. 171-17.000.

Thomas, Joseph J.: *See*—
Spaven, George D.; Thomas, Joseph J.; and Beroff, Howard, 4,235,232, Cl. 128-214.400.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Temperature cycle indicating means for a sterilizer unit. 4,235,842, Cl. 422-116.000.

Thomas, Richard D., to H. H. Scott, Inc. Stereophonic signal indicating apparatus. 4,236,041, Cl. 179-1.0GN.

Thompson, Darrell T. Method of testing photographic film using multicolor sensitometer. 4,235,537, Cl. 354-20.000.

Thompson, David A., to International Business Machines Corporation. Bistable magnetostrictive device. 4,236,230, Cl. 365-157.000.

Thompson, Harold E. Container assembly. 4,235,343, Cl. 215-6.000.

Thompson-Hayward Chemical Company: *See*—
Fuhlhage, Donald W., 4,235,807, Cl. 260-465.00G.

Thompson, Robert M.; and White, David C., to Suntech, Inc. Hydrophilic polyamide film for semipermeable membranes. 4,235,714, Cl. 210-654.000.

Thomson-CSF: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,235,736, Cl. 252-299.000.

Thomson General Corporation: *See*—
Gordon, Stanley H., 4,235,115, Cl. 74-2.000.

Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. N-fluoromethyl-carbamic acid fluorides and their manufacture. 4,235,815, Cl. 260-544.00C.

Thyroid Diagnostics, Inc.: *See*—
Deutsch, Marshall E.; and Mead, Louis W., 4,235,601, Cl. 23-230.00R.

Thyssen Industrie AG: *See*—
Kreiskorte, Heinz, 4,235,088, Cl. 72-453.180.

Tiemann, Wilhelm, to Siemens Aktiengesellschaft. Plasma image display device. 4,236,096, Cl. 313-1.000.

Tiemeijer, Johan C., to U.S. Philips Corporation. Electron microscope with brightness/contrast indicator. 4,236,178, Cl. 358-93.000.

Tiers, George V. D.: *See*—
Beck, Boyd R.; Sher, Frank T.; and Tiers, George V. D., 4,235,638, Cl. 106-287.120.

TIF Instruments, Inc.: *See*—
Liebermann, Leonard N., 4,235,095, Cl. 73-19.000.

Timken Company, The: *See*—
Reiter, Gerhard, 4,235,485, Cl. 308-187.100.

Timron, Inc.: *See*—
Kessler, Theodore P., 4,235,390, Cl. 242-77.100.

Tippmer, Kurt, to Carl Still, Firma. Method of producing hydrogen and carbon-oxide-containing process gases for use for reducing ores. 4,235,625, Cl. 75-91.000.

Tirtiaux, Robert: *See*—
Osselet, Andre; and Tirtiaux, Robert, 4,235,810, Cl. 260-505.00A.

Tisch, Wilbur P. Air sampling apparatus. 4,235,098, Cl. 73-28.000.

Tobe, Hideharu, to Heiko Seisakusho, Ltd. Automatic control system for flat knitting machine. 4,235,084, Cl. 66-232.000.

Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Microencapsulated methomyl insecticide. 4,235,872, Cl. 424-19.000.

Tokai Denka Kogyo Kabushiki Kaisha: *See*—
Fujimoto, Osamu; Watanabe, Jiro; and Kushibe, Kazuyoshi, 4,235,812, Cl. 260-513.700.

Toki, Tadaaki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; Toki, Tadaaki; Komyoji, Terumasa; Sakashita, Nobuyuki; and Maeda, Kazuyuki, 4,235,621, Cl. 71-94.000.

Tokyo Keiso Kabushiki Kaisha: *See*—
Sunagawa, Yoshihiko, 4,236,144, Cl. 340-870.180.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Hanamura, Yoshihiko; and Nishimura, Schinichi, 4,235,540, Cl. 354-62.000.
Kawase, Suminosuke; and Karasawa, Yukinori, 4,235,529, Cl. 351-14.000.

Tokyo Pipe Co., Ltd.: *See*—
Tanaka, Noboru, 4,235,588, Cl. 431-147.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Anbe, Yoshiharu, 4,236,216, Cl. 364-472.000.
Imai, Koji; Kobayashi, Sumio; Kumai, Ko; and Tsuji, Toshihiko, 4,236,200, Cl. 363-135.000.
Kogami, Mineichi; and Neda, Toshikatsu, 4,236,220, Cl. 364-504.000.
Okado, Chihiro, 4,236,201, Cl. 363-138.000.
Sonoda, Tomiya; and Washida, Hiroshi, 4,236,077, Cl. 250-361.00R
Torita, Fumio, 4,235,085, Cl. 68-12.00R.
Uchida, Yukimasa, 4,236,170, Cl. 357-57.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Nagashima, Takashi; and Aihara, Norio, 4,236,228, Cl. 365-114.000.
Sasaki, Minoru, 4,236,114, Cl. 328-58.000.
Yosida, Sizuo, 4,236,189, Cl. 361-337.000.

Toldy, Lajos: *See*—
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsi, Jozsef; and Tardos, Laszlo, 4,235,912, Cl. 424-261.000.

Tolosa, Felix P.: *See*—
Howard, John F.; Tolosa, Felix P.; and Boxer, Lawrence, 4,235,971, Cl. 435-293.000.

Tomioka, Kentaro; and Futami, Shunichi, to G-C Dental Industrial Corporation. Dental compositions. 4,235,633, Cl. 106-35.000.

Tomoe Technical Research Company: *See*—
Uno, Takayoshi, deceased; Uno, Takaaki, heir; Uno, Yoshishige, heir; Uno, Hiroyoshi, heir; Ida, Takashi; Onaka, Minoru; and Shigeta, Hayato, 4,235,258, Cl. 137-556.000.

Toray Industries, Inc.: *See*—
Yoshii, Toshiya; Yamane, Toshihiro; and Saito, Yasuo, 4,235,365, Cl. 229-55.000.

Torii, Nozomu; and Ishikawa, Yoshiaki, to Aisin Seiki Kabushiki Kaisha. Door locking apparatus for vehicles. 4,235,462, Cl. 292-216.000.

Torita, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic washer. 4,235,085, Cl. 68-12.00R.

Toro Company, The: *See*—
Comer, Robert C., 4,235,068, Cl. 56-12.700.

Torre, Marcel: *See*—
Matthey, Jacques; Torre, Marcel; and Millenet, Andre D., 4,236,103, Cl. 318-345.00D.

Townsend, Douglas W. Electrolytic apparatus. 4,235,692, Cl. 204-228.000.

Toyo Contact Lens Co., Ltd.: *See*—
Tanaka, Kyoichi; Takahashi, Kouzou; Kanada, Mitsuhiro; Kato, Yasuyuki; and Ichihara, Masuji, 4,235,985, Cl. 526-279.000.

Toyo Kogyo Co., Ltd.: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Yoshii, Shinichi, 4,235,843, Cl. 422-119.000.

Toyo Stauffer Chemical Co., Ltd.: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, 4,235,745, Cl. 252-429.00B.

Toyoda-Koki Kabushiki-Kaisha: *See*—
Iida, Wataru; and Tsujiuchi, Toshio, 4,235,218, Cl. 125-11.0CD

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,235,210, Cl. 123-471.000.
Terabayashi, Gosaku; Nakano, Tasuku; and Hamamoto, Tadanao, 4,236,141, Cl. 340-52.00E.

Tozier, John E.; Shaffer, John W.; and Williams, William M., to GTE Products Corporation. Tinted UV cured coatings for photoflash lamps. 4,235,590, Cl. 431-360.000.

Traas, Petrus C.; Boelens, Harmannus; and Wille, Hans J., to Naarden International N.V. Method for the preparation of fragrances, and method for the preparation of perfume compositions. 4,235,824, Cl. 568-486.000.

Tracy, Wayne R., to Incom International Inc. Chain breaker. 4,235,073, Cl. 59-11.000.

Transformatoren Union AG: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 4,236,134, Cl. 336-96.000.

Treber, Norbert: *See*—
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,235,615, Cl. 65-3.00C.

Tremco, Incorporated: *See*—
Kumins, Charles A.; and Warford, Milan L., 4,235,953, Cl. 428-332.000.

Trenczek, Gerhard: *See*—
Rambold, Wolfgang; Heine, Heinrich; Raederscheidt, Bruno; and Trenczek, Gerhard, 4,235,862, Cl. 423-607.000.

Trio Kabushiki Kaisha: *See*—
Onishi, Masaru; and Miyamoto, Yukihiko, 4,236,253, Cl. 455-214.000.

Trofimenkoff, Frederick N.: *See*—
Hannaford, James H.; Myrfield, Warren; Weiler, David H.; Trofimenkoff, Frederick N.; Consay, Joseph A.; and Dobie, Donald M., 4,235,050, Cl. 51-34.00D.

Trowbridge, Howard W. Model airplane. 4,235,040, Cl. 46-79.000.

TRW Inc.: *See*—
Belopavlovich, Peter; Michaels, Leonard H.; and Zic, Richard, 4,235,500, Cl. 339-176.0MF.
Kraus, Willibald, 4,235,404, Cl. 248-74.0PB.

Tsang, Won-Tien: *See*—
Cho, Alfred Y.; and Tsang, Won-Tien, 4,236,122, Cl. 331-94.50H.

Tschang, Chung-Ji; Klefenz, Heinrich; and Sanner, Axel, to BASF Aktiengesellschaft. Macroporous polymeric carrier for covalently binding proteins, its preparation and its use for fixing active proteins. 4,235,973, Cl. 521-146.000.

Tsuboi, Shinichi: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,235,891, Cl. 424-224.000.
Tsuchiya, Shozo, to Nippon Oil Co., Ltd. Coating compositions. 4,235,981, Cl. 525-244.000.
Tsuji, Toshihiko: *See*—
Imai, Koji; Kobayashi, Sumio; Kumai, Ko; and Tsuji, Toshihiko, 4,236,200, Cl. 363-135.000.
Tsujiuchi, Toshio: *See*—
Iida, Wataru; and Tsujiuchi, Toshio, 4,235,218, Cl. 125-11.0CD.
Tsukamoto, Kenkichi. Loudspeaker. 4,235,302, Cl. 181-172.000.
Tsunaki, Akio: *See*—
Shimada, Sachio; Tsunaki, Akio; Furuichi, Tatsuo; and Hayashi, Tsuneyuki, 4,235,656, Cl. 156-175.000.
Tsunoi, Haruo, to Canon Kabushiki Kaisha. Fixing apparatus. 4,235,166, Cl. 100-158.00R.
Tubbs, Joseph T.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,235,015, Cl. 29-457.000.
Tummers, Daniel M. J.: *See*—
Frisch, Kurt C.; Tummers, Daniel M. J.; and Te Nijenhuis, Anne, 4,235,977, Cl. 521-166.000.
Turner, John, to Harsco Corporation. Armored door opener for field artillery ammunition support vehicle. 4,235,047, Cl. 49-371.000.
Turner, Wheeler M. Stabilized remote sensing high fidelity apparatus. 4,236,118, Cl. 330-105.000.
Tyler, Derek E.: *See*—
Dantzig, Jonathan A.; and Tyler, Derek E., 4,235,627, Cl. 75-93.00E.
Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Gate controlled negative resistance semiconductor device. 4,236,170, Cl. 357-57.000.
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Digital control camera. 4,235,538, Cl. 354-23.00D.
Uchiyama, Yasuji: *See*—
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,235,142, Cl. 84-1.030.
Udert, Karl E.; Oechsle, Hans; and Pfeiffer, Heinz, to Hilti Aktiengesellschaft. Expansion dowel. 4,235,151, Cl. 85-84.000.
Ueda, Hideo; and Sawaguchi, Hiroshi, to Fuji Photo Film Co., Ltd. Aromatic sulfonamide sulfonyl chloride compounds. 4,235,813, Cl. 260-543.00R.
Ueno, Masakazu; Sano, Akira; and Ideguchi, Kyoichi, to Nippon Shinyaku Co., Ltd. Method for producing high purity sterol glycosides. 4,235,992, Cl. 536-5.000.
Ueoka, Hisayoshi: *See*—
Iizawa, Osamu; Fujiwara, Shinobu; Ueoka, Hisayoshi; Furukawa, Kiyoshi; Kikuchi, Nobuaki; and Tanaka, Hitoshi, 4,235,635, Cl. 106-39.500.
Uher, Joseph F.; and Loane, Charles M., Jr., to Mobay Chemical Corporation. Particulate slagging composition for the extended optimum continuous casting of steel. 4,235,632, Cl. 75-257.000.
Uhlig, Albert R., to Owens-Illinois, Inc. One-piece safety closure for rigid containers having a bead finish. 4,235,349, Cl. 220-281.000.
Ulm, Raymond. Machine for cleaning railway tracks. 4,235,029, Cl. 37-104.000.
Ulmer, William E.: *See*—
Clark, Scott A.; and Ulmer, William E., 4,236,146, Cl. 340-517.000.
Underwood, Gene E., to 3U Partners. Fluid mixing system. 4,235,552, Cl. 366-137.000.
Union Camp Corporation: *See*—
Firth, William C., Jr., 4,235,727, Cl. 252-8.50C.
Union Carbide Corporation: *See*—
Bartley, William J.; Wilson, Thomas P.; and Ellgen, Paul C., 4,235,798, Cl. 260-449.00R.
Bhasin, Madan M., 4,235,801, Cl. 260-449.60R.
Cheung, Harry, 4,235,044, Cl. 48-197.00R.
Durden, John A., Jr.; and Kurtz, Arthur P., Jr., 4,235,902, Cl. 424-248.530.
Peters, Edward N., 4,235,987, Cl. 528-5.000.
Stutzman, Gary L.; and Martino, Carlo F., 4,235,835, Cl. 264-328.200.
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Ackermann, Manfred, 4,235,178, Cl. 112-229.000.
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Wassell, Leonard L.; Cole, Gerald B.; Briggs, Alan; and Pollock, James F., 4,235,836, Cl. 264-333.000.
United States of America
Army: *See*—
Arenis, Donald N., 4,236,212, Cl. 364-424.000.
Carter, James W.; Lee, Donald C.; Simeone, Vincent A.; and Cheever, Frank L., 4,235,103, Cl. 73-168.000.
Prochazka, Rudolph J., 4,236,188, Cl. 361-111.000.
Shreve, James S., 4,235,516, Cl. 350-150.000.
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Burgess, Donn M.; Marr, Duane R.; Cappiello, Michael W.; and Omberg, Ronald P., 4,235,669, Cl. 176-18.000.
Coleman, John H., 4,235,284, Cl. 165-141.000.
Greiner, Norman R., 4,235,518, Cl. 350-162.00R.
Keefe, Donald J., 4,236,067, Cl. 235-92.0PB.
Lee, Kien Y.; and Ott, Donald G., 4,236,014, Cl. 548-267.000.
Rockwood, Stephen D., 4,236,124, Cl. 331-94.50H.
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Karamian, Narbik A., 4,235,677, Cl. 202-176.000.
Interior: *See*—
Divers, Edward F., 4,235,163, Cl. 98-50.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Wang, David S.; and Warren, Aubrey D. Installing fiber insulation. 4,235,060, Cl. 52-743.000.
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Alpers, Frederick C., 4,236,159, Cl. 343-113.00R.
Bromley, Keith, 4,236,043, Cl. 179-1.50H.
Davis, Doxie M.; and Gehman, John B., 4,236,106, Cl. 318-599.000.
Goss, Daniel A.; Ito, Roy M.; and Josephson, Larry H., 4,236,157, Cl. 343-7.0PF.
Rowe, Raymond A.; and McCartney, Joseph F., 4,235,693, Cl. 204-229.000.
Swaidan, Brian E., 4,235,679, Cl. 202-234.000.
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Kaiser, Willard D., 4,235,112, Cl. 73-634.000.
U.S. Philips Corporation: *See*—
Aling, Willem, 4,236,153, Cl. 340-756.000.
Bierhoff, Martinus P. M.; and Hoogendijk, Adrianus H., 4,236,173, Cl. 358-8.000.
Cayzac, Jacques C., 4,236,180, Cl. 358-105.000.
Dekker, Evert H. L. J.; Enz, Ulrich E.; Haisma, Jan; and Van Mierloo, Klaas L. L., 4,236,226, Cl. 365-20.000.
Groothuis, Hermanus H. H., 4,236,175, Cl. 358-30.000.
Heinzerling, Jurgen, 4,236,080, Cl. 250-445.00T.
Jansen, Gerardus L. M.; and Bovee, Leonardus G. H., 4,236,232, Cl. 365-234.000.
Jansen, Pierre G.; Kessels, Jozef L. W.; and Waumans, Benny L. A., 4,236,225, Cl. 364-900.000.
Ludeke, Kai M.; Schiek, Burkhard; and Kohler, Jurgen, 4,235,107, Cl. 73-355.0EM.
Meijer, Roelf J.; and Michels, Albertus P. J., 4,235,116, Cl. 74-60.000.
Schinkel, Willem; and Versluijs, Cornelis, 4,236,072, Cl. 250-277.0CH.
Tiemeijer, Johan C., 4,236,178, Cl. 358-93.000.
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United Technologies Corporation: *See*—
Ferris, Donald L.; Hibyan, Edward S.; and Faiz, Robert L., 4,235,570, Cl. 416-134.00A.
McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., 4,235,943, Cl. 427-34.000.
McComas, Charles C.; Sokol, Larry S.; and Hanna, Earl M., 4,236,059, Cl. 219-121.00P.
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Hannaford, James H.; Myrfield, Warren; Weiler, David H.; Trofimenkoff, Frederick N.; Consay, Joseph A.; and Dobie, Donald M., 4,235,050, Cl. 51-34.00D.
University of Toronto, The Governing Council of the: *See*—
Hsia, Jen C.; and Tan, Chou-Tok, 4,235,792, Cl. 260-403.000.
University of Utah: *See*—
Stephen, Robert L.; Kablitz, Carl; van Dura, Dietz; Atkin, Curtis L.; and Jacobsen, Stephen C., 4,235,230, Cl. 128-213.00A.
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Uno, Takayoshi, deceased; Uno, Takaaki, heir; Uno, Yoshishige, heir; Uno, Hiroyoshi, heir; Ida, Takashi; Onaka, Minoru; and Shigeta, Hayato, 4,235,258, Cl. 137-556.000.
Uno, Motoka, heir: *See*—
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Uno, Takayoshi, deceased (by Uno, Motoka, heir); by Uno, Takaaki, heir; by Uno, Yoshishige, heir; by Uno, Hiroyoshi, heir; Ida, Takashi; Onaka, Minoru; and Shigeta, Hayato, to Tomoe Technical Research Company. Driving device for opening and closing a valve. 4,235,258, Cl. 137-556.000.
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Uno, Takayoshi, deceased; Uno, Takaaki, heir; Uno, Yoshishige, heir; Uno, Hiroyoshi, heir; Ida, Takashi; Onaka, Minoru; and Shigeta, Hayato, 4,235,258, Cl. 137-556.000.
UOP Inc.: *See*—
Al-Chalabi, Husain A., 4,236,037, Cl. 585-670.000.
Antos, George J., 4,235,705, Cl. 208-139.000.
Antos, George J., 4,235,755, Cl. 252-462.000.
Scott, Norman H., 4,235,847, Cl. 422-220.000.
Tengler, Harvey N., 4,235,471, Cl. 297-361.000.
Uozumi, Junzo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,235,210, Cl. 123-471.000.
Upjohn Company, The: *See*—
Axen, Udo F., 4,235,822, Cl. 568-330.000.
Axen, Udo F., 4,236,025, Cl. 560-255.000.
Hine, Charles R.; and Peot, Craig B., 4,235,563, Cl. 406-23.000.
Johnson, Roy A., 4,235,783, Cl. 260-345.200.
Johnson, Roy A., 4,235,998, Cl. 542-426.000.
Kelly, Robert C., 4,235,779, Cl. 260-343.30P.

Lincoln, Frank H., 4,235,997, Cl. 542-426.000.
Lincoln, Frank H., 4,236,000, Cl. 542-429.000.
Sih, John C., 4,235,788, Cl. 260-346.220.
Sih, John C., 4,236,019, Cl. 560-119.000.
Voorhees, John J.; and Wierenga, Wendell, 4,235,887, Cl. 424-180.000.
Upton Industries, Inc.: *See*—
Bassett, Leslie, 4,235,424, Cl. 266-120.000.
Ushiro, Masayuki, to Nissan Motor Company, Limited. Weft feeding mechanism of a shuttleless weaving loom. 4,235,262, Cl. 139-452.000.
Utilis Mullheim AG: *See*—
Huser, Jean P., 4,235,564, Cl. 407-101.000.
Utsch, Francis V., to Philip Morris Incorporated. Process for the expansion of tobacco. 4,235,250, Cl. 131-140.00P.
Uzelmeier, Christopher W.; and Coffman, Paul M., to Shell Oil Company. Antiplasticizer for high impact polystyrene. 4,235,760, Cl. 260-28.50B.
Vadetec Corporation: *See*—
Kemper, Yves J., 4,235,127, Cl. 74-796.000.
Valentino, Pearl T. Bed side rail container with removable liner. 4,235,350, Cl. 220-404.000.
Vallera, Joseph J., to Gillette Company, The. Flame-limiting device for a gas lighter. 4,235,589, Cl. 431-344.000.
VandeDrink, Kenneth R.; and Cole, Edward J. Foldable packaging case. 4,235,345, Cl. 220-6.000.
Van den Plas, Roger J. Q.; and Hokkeling, Pieter, to U.S. Philips Corporation. Electric lamp. 4,236,045, Cl. 174-50.610.
Vander Bok, Raymond S.: *See*—
Hoadley, Arthur W.; and Vander Bok, Raymond S., 4,235,104, Cl. 73-180.000.
Vandewalle, Neal R.: *See*—
Creighton, Albert M., Jr.; Foss, Charles L., Jr.; and Vandewalle, Neal R., 4,235,138, Cl. 83-139.000.
van Dijk, Jan; and Davies, Jenkin E., to Duphar International Research B.V. Compounds having pharmacological properties. 4,235,931, Cl. 424-327.000.
van Dura, Dietz: *See*—
Stephen, Robert L.; Kablitz, Carl; van Dura, Dietz; Atkin, Curtis L.; and Jacobsen, Stephen C., 4,235,230, Cl. 128-213.00A.
Van Manen, Dick T.; and Klein, Gary S., to Voplex Corporation. Non-wrinkling automotive trim strip. 4,235,949, Cl. 428-31.000.
Van Mierloo, Klaas L. L.: *See*—
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van Staveren, Hendricus C.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,235,069, Cl. 56-13.600.
Van Steenwinkel, Frans: *See*—
DeRoeck, Joseph J.; and Van Steenwinkel, Frans, 4,235,655, Cl. 156-157.000.
Vapor Corporation: *See*—
Callahan, Bernard E.; Carlson, George A.; Daniels, Richard N.; Noens, Richard H.; Stumpf, Richard A.; and Kruse, Richard H., 4,236,215, Cl. 364-436.000.
Varo, Inc.: *See*—
Laughlin, Richard H., 4,236,069, Cl. 250-214.0AG.
Vasishth, Ramesh C.: *See*—
Leong, Sim Y.; Chandramouli, Pitchaiya; and Vasishth, Ramesh C., 4,235,989, Cl. 528-139.000.
Vaughn, Howard A., Jr.: *See*—
Luce, John B.; and Vaughn, Howard A., Jr., 4,235,978, Cl. 525-101.000.
Vautrelle, Christian: *See*—
Baudet, Gerard; Morio, Michel; and Vautrelle, Christian, 4,235,709, Cl. 209-5.000.
Vazquez Rubianes, Juan, to Industrias Techno Matic, S.A. Clutch mechanism. 4,235,319, Cl. 192-8.00R.
Veber, Daniel F.: *See*—
Freidinger, Roger M.; and Veber, Daniel F., 4,235,886, Cl. 424-177.000.
Vecchi, John C. Progressive stamping press. 4,235,089, Cl. 72-472.000.
Vecchiarelli, Francis, to Hunter Douglas International N.V. Support bracket for a venetian blind. 4,235,406, Cl. 248-251.000.
Veldman, Donald R. Self-thread creating fastener and method and apparatus for making the same. 4,235,149, Cl. 85-47.000.
Vereinigte Edlsthalwerke Aktiengesellschaft (VEW): *See*—
Knotik, Karl; Leichter, Peter; and Jakusch, Heinz, 4,235,738, Cl. 252-301.10W.
Vereinigte Flugtechnische Werke-Fokker GmbH: *See*—
Prinz, Benjamin; and Schmidt, Wolfgang, 4,235,535, Cl. 353-11.000.
Verhey, Leendert A., to Neratoom, B. V. Sealing bushing for a member rotatable about an axis and extending through a wall of a housing. 4,235,446, Cl. 277-135.000.
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Schinkel, Willem; and Versluijs, Cornelis, 4,236,072, Cl. 250-277.0CH.
Vesterberg, Olof. Device for analysis. 4,235,839, Cl. 422-58.000.
Vetter, Craig W.; and Dexter, William F., to Vetter Design Works, Inc. Tub cover. 4,234,973, Cl. 4-500.000.
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Vetter, Craig W.; and Dexter, William F., 4,234,973, Cl. 4-500.000.
Vetter, Heinz; Friederich, Ernst; Schanz, Karl-Heinz; and Schikowsky, Hartmut, to Rohm GmbH. Method for making biaxially stretched articles of thermoplastic resin. 4,235,834, Cl. 264-290.200.
Vibert, Edward J.: *See*—
Cooper, David A.; Monoski, William T.; and Vibert, Edward J., 4,236,128, Cl. 335-18.000.
Vila, Juan R. Devices for covering objects with electrostatic dust. 4,235,381, Cl. 239-696.000.
Ville De Rouen: *See*—
Leriverend, Jean-Paul M., 4,235,451, Cl. 280-408.000.
Vinals, Joaquin F.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,235,247, Cl. 131-17.00R.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,235,729, Cl. 252-8.900.
Vlahos, Petro, to National Association of Theatre Owners, Inc. High-gain projection screen. 4,235,513, Cl. 350-129.000.
Vlaschenko, Maria G.: *See*—
Selivanov, Anatoly G.; Gromeiko, Grigory N.; Kirillov, Leonty N.; Zavolokina, Nina S.; Vlaschenko, Maria G.; Chicheva, Serafima A.; and Zhivetin, Valery V., 4,235,260, Cl. 139-98.000.
Vock, Manfred H.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,235,247, Cl. 131-17.00R.
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,235,938, Cl. 426-535.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,235,729, Cl. 252-8.900.
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Zenkner, Kurt, 4,235,568, Cl. 416-187.000.
Volkl, Rainer: *See*—
Heydner, Konrad; Peter, Josef; and Volkl, Rainer, 4,236,136, Cl. 337-111.000.
Vollmer, Regis R., to Westinghouse Electric Corp. Tube guide-expander. 4,235,013, Cl. 29-727.000.
Von Dziembowski, Kasimir: *See*—
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, 4,235,844, Cl. 422-138.000.
Voorhees, John J.; and Wierenga, Wendell, to Upjohn Company, The. Process for therapeutic treatment. 4,235,887, Cl. 424-180.000.
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Van Manen, Dick T.; and Klein, Gary S., 4,235,949, Cl. 428-31.000.
Vorbruggen, Helmut: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Ekkehard, 4,235,930, Cl. 424-305.000.
Voss, Eckart: *See*—
Stadler, Peter; Metzger, Karl-Georg; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, 4,235,888, Cl. 424-180.000.
Vought Corporation: *See*—
Eden, Dayton D., 4,236,156, Cl. 340-786.000.
Vvedensky, Jury N.: *See*—
Kutateladze, Samson S.; Lutset, Mark O.; Korolkov, Anatoly G.; Popov, Jury S.; Filippov, Iosif F.; Khutoretsky, Garry M.; Vvedensky, Jury N.; and Skachkov, Jury V., 4,236,091, Cl. 310-64.000.
W. R. Grace & Co.: *See*—
Siemer, Sidney R.; and Gordon, Richard S., 4,235,622, Cl. 71-113.000.
WABCO Fahrzeugbremsen GmbH: *See*—
Schlamann, Wilhelm; Feldmann, Joachim; and Reinecke, Erich, 4,235,315, Cl. 188-73.600.
Wada, Kenichi; Tanaka, Susumu; Isono, Yoshihiro; Tabuchi, Kenji; Oka, Tateki; and Mizunoe, Hiroaki, to Minolta Camera Kabushiki Kaisha. Dry process developing apparatus for use in electrophotographic copying machine. 4,235,194, Cl. 118-657.000.
Wada, Takeshi: *See*—
Kominami, Yasuo; Ienaka, Masanori; Wada, Takeshi; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,236,252, Cl. 455-207.000.
Wagener, Dietrich; Flockenhaus, Claus; and Meckel, Joachim F., to Didier Engineering GmbH. Method for processing coke oven gas. 4,235,604, Cl. 48-197.00R.
Wagener, Dietrich; Flockenhaus, Claus; and Meckel, Joachim F., to Didier Engineering GmbH. Method for processing coke oven gas. 4,235,624, Cl. 75-91.000.
Wagner, William E.; and Henery, Vern A., to PPG Industries, Inc. High resistivity electroconductive tin oxide films. 4,235,945, Cl. 427-126.300.
Wakahara, Yasushi: *See*—
Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,236,248, Cl. 375-53.000.
Wallace Murray Corporation: *See*—
Owen, Bruce R.; and Sarle, Charles R., 4,235,484, Cl. 308-122.000.
Wallis, William F.: *See*—
Springs, Thomas W.; and Wallis, William F., 4,235,580, Cl. 425-211.000.
Walon, Raoul G. P., to CPC International Inc. Starch hydrolysis at high dry substance. 4,235,965, Cl. 435-95.000.
Walter, Lothar: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,235,480, Cl. 308-8.200.
Walter, Richard P.; Sisson, Albert E.; Erwin, Louis R.; and Kelso, Charles R., to Bendix Corporation, The. Electronically controlled diesel unit injector. 4,235,374, Cl. 239-90.000.
Walter, Wolfgang, to Zahnradfabrik Friedrichshafen AG. Ball circulation type of spiral gearing. 4,235,122, Cl. 74-424.80R.

Walters, Ronald B., to Sperry Corporation. Hydraulic actuator controls. 4,235,105, Cl. 73-861.530.

Walton, Charles A. Personal identification and signaling system. 4,236,068, Cl. 235-380.000.

Wang, David S.: *See—*
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Ward, Terence J.: *See—*
Archibald, John L.; and Ward, Terence J., 4,235,915, Cl. 424-267.000.
White, John F.; and Ward, Terence J., 4,235,910, Cl. 424-258.000.

Wardenaar, Hendrik C.; Werner, Franz; Aarts, Petrus J. J.; and Beitler, Franz, to U.S. Philips Corporation. Magnetic tape cassette with pivoting cover. 4,235,395, Cl. 242-199.000.

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Pilch, John S., 4,235,567, Cl. 414-694.000.

Warford, Milan L.: *See—*
Kumins, Charles A.; and Warford, Milan L., 4,235,953, Cl. 428-332.000.

Warmbier, Dieter-Ernst; and Biedenkapp, Gerhard. Control system for spool drive of magnetic tape apparatus. 4,236,102, Cl. 318-341.000.

Warner, Paul L., Jr.; and Luber, Edward J., Jr., to Westwood Pharmaceuticals, Inc. 1-(2-Acylaminophenyl)imidazoles. 4,236,015, Cl. 548-346.000.

Warren, Aubrey D.: *See—*
United States of America, National Aeronautics and Space Administration; Wang, David S.; and Warren, Aubrey D., 4,235,060, Cl. 52-743.000.

Wasa, Kiyotaka: *See—*
Ono, Shusuke; Mitsuyu, Tsuneo; Yamazaki, Osamu; and Wasa, Kiyotaka, 4,236,095, Cl. 310-313.00A.

Washida, Hiroshi: *See—*
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Wassell, Leonard L.; Cole, Gerald B.; Briggs, Alan; and Pollock, James F., to United Kingdom Atomic Energy Authority. Method for making thermal insulating, fire resistant material. 4,235,836, Cl. 264-333.000.

Watanabe, Hiroshi; Aoyama, Ryushi; Hironaka, Yasuhira; and Oana, Hanji, to ABC Trading Co., Ltd. Rotary-type counter-current heat exchanger. 4,235,608, Cl. 55-181.000.

Watanabe, Hiroshi; and Arisawa, Masatoshi, to Kao Soap Co., Ltd. Antibacterial soap containing trichlorohydroxy diphenyl ether bactericide and an organic phosphoric ester as a stabilizer therefor. 4,235,733, Cl. 252-107.000.

Watanabe, Hiroshi; and Mikata, Tsuruo, to Kao Soap Co., Ltd. Liquid shampoo composition. 4,235,898, Cl. 424-245.000.

Watanabe, Hirozi: *See—*
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,235,354, Cl. 222-368.000.

Watanabe, Jiro: *See—*
Fujimoto, Osamu; Watanabe, Jiro; and Kushibe, Kazuyoshi, 4,235,812, Cl. 260-513.700.

Watanabe, Kazuo; Ienaka, Masanori; Kominami, Yasuo; and Homma, Makoto, to Hitachi, Ltd. FM Detector using a phase shift network and an analog multiplier. 4,236,117, Cl. 329-103.000.

Watanabe, Kenkichi; Furuya, Katusuke; and Kamada, Hitoshi, to Laurel Bank Machine Co., Ltd. Apparatus for detecting irregular arrangement of coins in coin packaging machine. 4,235,061, Cl. 53-54.000.

Watanabe Sokki Kabushiki Kaisha: *See—*
Iino, Kinzo, 4,236,163, Cl. 346-139.00C.

Water Refining Company, Inc.: *See—*
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Watson, Lionel E. Drinking vessels for reclining position usage. 4,235,348, Cl. 220-90.400.

Watson, Richard W.: *See—*
Blakey, Philip G.; Smith, Bryan K.; and Watson, Richard W., 4,235,858, Cl. 423-393.000.

Watson, Willie L., to Multi-Products Co. Well pumping control system. 4,235,288, Cl. 166-64.000.

Watts, George T.: *See—*
Olsen, Richard J.; Watts, George T.; and Griffiths, Robert I., 4,235,271, Cl. 152-186.000.

Waumans, Benny L. A.: *See—*
Jansen, Pierre G.; Kessels, Jozef L. W.; and Waumans, Benny L. A., 4,236,225, Cl. 364-900.000.

Wave Energy Development I Vastmanland Aktiebolag: *See—*
Loqvist, Kaj-Ragner, 4,235,691, Cl. 204-212.000.

Wayne Automation Corporation: *See—*
Johnson, A. David, Jr., 4,235,158, Cl. 493-334.000.
Johnson, A. David, Jr.; Ginther, George E., Sr.; and Bachman, Joseph L., 4,235,159, Cl. 493-309.000.

Weber, Erich: *See—*
Martin, Johannes J.; Martin, Walter J.; and Weber, Erich, 4,235,172, Cl. 110-281.000.

Weber, Hermann: *See—*
Schneeberger, Fritz; Zweifel, Walter; and Weber, Hermann, 4,235,682, Cl. 204-35.00N.

Weber, Kurt; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. v-Triazoles. 4,235,741, Cl. 252-301.220.

Weeter, Robert F., to Mobil Oil Corporation. Method for producing carbon dioxide from subterranean formations. 4,235,289, Cl. 166-267.000.

Wegner, Klaus; and Schillinger, Alois. Submersible pump for radioactive liquids. 4,235,569, Cl. 415-122.00R.

Weidler, Charles H.: *See—*
Marks, Richard L.; and Weidler, Charles H., 4,235,502, Cl. 339-278.00R.

Weidner, Harry C., Jr., to Atlas Bolt & Screw Company, The. Fastener having sealing head. 4,235,147, Cl. 85-9.00R.

Weiler, David H.: *See—*
Hannaford, James H.; Myrfield, Warren; Weiler, David H.; Trofimenkoff, Frederick N.; Consay, Joseph A.; and Dobie, Donald M., 4,235,050, Cl. 51-34.00D.

Weiss, Lee E., to Arco Medical Products Company. Epicardial heart lead and assembly and method for optimal fixation of same for cardiac pacing. 4,235,246, Cl. 128-785.000.

Weiss, Martin J.: *See—*
Floyd, Middleton B., Jr.; and Weiss, Martin J., 4,236,027, Cl. 562-500.000.

Weisz, William, to Singer Company, The. Compact feed bar. 4,235,180, Cl. 112-323.000.

Weller, Carroll; and Lippard, Bruce, to Cincinnati Electronics Corporation. Variable RF attenuator. 4,236,126, Cl. 333-81.00R.

Wemyss, George A. Joint. 4,235,059, Cl. 52-721.000.

Wenger, Harvey M., to Schmidt, Wilfred O. Bagger. 4,235,064, Cl. 53-451.000.

Wentworth, Theodore O.; and Stiles, Alvin B. Production of methanol. 4,235,799, Cl. 260-449.500.

Wenzl, Helmut: *See—*
Schulten, Rudolf; Behr, Friedrich; and Wenzl, Helmut, 4,235,863, Cl. 423-648.00R.

Werner, Franz: *See—*
Wardenaar, Hendrik C.; Werner, Franz; Aarts, Petrus J. J.; and Beitler, Franz, 4,235,395, Cl. 242-199.000.

West Electric Co., Ltd.: *See—*
Iwata, Hiroshi, 4,235,547, Cl. 354-60.00L.

Western Electric Company, Inc.: *See—*
DuBois, Loring E.; and Simpson, Lawrence D., 4,235,014, Cl. 29-760.000.
Esseluhn, Werner F., 4,235,191, Cl. 118-415.000.
Partus, Fred P., 4,235,829, Cl. 261-121.00R.

Western Michigan University, The Board of Trustees of: *See—*
Hoadley, Arthur W.; and Vander Bok, Raymond S., 4,235,104, Cl. 73-180.000.

Westin-Sjodahl, Gertrud E.: *See—*
Lundin, Ronny-Hugo L.; Westin-Sjodahl, Gertrud E.; Bergendal, Karin H. L.; and Fryklund, Linda M., 4,235,772, Cl. 260-112.50R.

Westinghouse Electric Corp.: *See—*
Johnson, Joseph E., 4,235,645, Cl. 148-1.500.
LaCoste, Bernard L.; Smith, Lloyd W.; and Finnimore, Thomas J., 4,235,416, Cl. 251-86.000.
Matty, Thomas C.; and Miller, Howard N., 4,235,402, Cl. 246-182.00B.
Vollmer, Regis R., 4,235,013, Cl. 29-727.000.

Westwood Pharmaceuticals, Inc.: *See—*
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,236,015, Cl. 548-346.000.

Wetzel, Robert E., to Dayco Corporation. Toothed belt. 4,235,119, Cl. 474-205.000.

Weyerhaeuser Company: *See—*
Baker, Harold L., 4,235,364, Cl. 229-34.00R.
Spurrell, Robert M., 4,235,174, Cl. 110-346.000.

Wham-O Mfg. Co.: *See—*
Melin, Arthur K.; Gillespie, Richard L.; Kerkenbush, Darle L.; Whittington, Jim L.; and Geller, Douglas A., 4,235,378, Cl. 239-229.000.

White, Charles M., to Harris Corporation. High speed, high efficiency amplifier circuit. 4,236,120, Cl. 330-296.000.

White, David C.: *See—*
Thompson, Robert M.; and White, David C., 4,235,714, Cl. 210-654.000.

White, John F.; and Ward, Terence J., to John Wyeth & Brother Limited. Benzoquinolizines having blood pressure lowering activity, and in some instances, anti-secretory activity. 4,235,910, Cl. 424-258.000.

White, Ralph L., Jr., to Morton-Norwich Products, Inc. 2-Amino-5-chloro-N-(2,2-dimethoxyethyl)benzamide. 4,235,817, Cl. 564-163.000.

Whitehead Motofides S.p.A.: *See—*
Garigioli, Alberto, 4,235,609, Cl. 55-226.000.

Whiteside, George D.; Johnson, Bruck K.; and LaRocque, Arthur G., to Polaroid Corporation. Photographic exposure control system utilizing a single photocell for three distinct purposes. 4,235,539, Cl. 354-27.000.

Whitney, Douglass G.; and Martin, John K., III. Subcutaneous injection system. 4,235,234, Cl. 128-216.000.

Whittington, Jim L.: *See—*
Melin, Arthur K.; Gillespie, Richard L.; Kerkenbush, Darle L.; Whittington, Jim L.; and Geller, Douglas A., 4,235,378, Cl. 239-229.000.

Wiedermann, Rolf: *See—*
Haas, Peter; and Wiedermann, Rolf, 4,235,976, Cl. 521-107.000.

Wiegert, Robert E., to Water Refining Company, Inc. Process for removing alkalinity and hardness from waters. 4,235,715, Cl. 210-670.000.

Wierenga, Wendell: *See—*
Voorhees, John J.; and Wierenga, Wendell, 4,235,887, Cl. 424-180.000.

Wies, Jack E.: *See—*
Clack, Richard E.; and Wies, Jack E., 4,235,340, Cl. 206-515.000.

Wightman, Lawrence W.: *See—*
Wightman, Stacy R.; and Wightman, Lawrence W., 4,235,090, Cl. 72-479.000.

Wightman, Stacy R.; and Wightman, Lawrence W. Dent pulling tool. 4,235,090, Cl. 72-479.000.

Wiley, Bruce F., to Phillips Petroleum Company. Electrical well logging tool, having an expandable sleeve, for determining if clay is present in an earth formation. 4,236,113, Cl. 324-366.000.

Wilkinson, Richard L., to MCA Discovision, Inc. Digital center tracking system. 4,236,105, Cl. 318-577.000.

Willard, Lars O.: *See—*
Hernestam, Sven E. H.; Willard, Lars O.; Abramo, Aina L.; and Johansson, Hans-Bertil, 4,235,875, Cl. 424-54.000.

Wille, Hans J.: *See—*
Traas, Petrus C.; Boelens, Harmannus; and Wille, Hans J., 4,235,824, Cl. 568-486.000.

William H. Rorer, Inc.: *See—*
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,235,929, Cl. 424-301.000.

Williams, David W.; Jordan, James L.; and Huntsinger, James E., to F. Korbel & Bros. Method and apparatus for riddling bottled wines in cases. 4,235,940, Cl. 426-592.000.

Williams, Wade: *See—*
Augustin, Michael J.; and Williams, Wade, 4,236,254, Cl. 455-223.000.

Williams, William M.: *See—*
Tozier, John E.; Shaffer, John W.; and Williams, William M., 4,235,590, Cl. 431-360.000.

Williamson, Warren G., to Robertshaw Controls Company. Stem seat for piston and cylinder type thermal device. 4,235,109, Cl. 73-368.300.

Willis, Edwin: *See—*
Dawson, Peter L.; and Willis, Edwin, 4,235,758, Cl. 252-544.000.

Willis, Roland G.: *See—*
Kohrt, Carl F.; and Willis, Roland G., 4,235,957, Cl. 430-203.000.

Wilson, Philip, to Imperial Chemical Industries Limited. Chrome pigment. 4,235,639, Cl. 106-298.000.

Wilson, Richard A.: *See—*
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,235,247, Cl. 131-17.00R.

Wilson, Thomas P.: *See—*
Bartley, William J.; Wilson, Thomas P.; and Ellgen, Paul C., 4,235,798, Cl. 260-449.00R.

Windmoller & Holscher: *See—*
Achelpohl, Fritz; and Schmidt, Horst, 4,235,366, Cl. 229-60.000.
Achelpohl, Fritz, 4,235,659, Cl. 156-510.000.

Winkler, Otto; and Moll, Eberhard, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Rotary displacement pump with intake through a first sealing slide. 4,235,572, Cl. 418-6.000.

Winslow, John S.; and Dakin, Wayne R., to MCA Discovision, Inc. System for recovering information from a movable information storage medium having a pilot signal with an aligned phase angle in adjacent tracks. 4,236,050, Cl. 179-100.10G.

Winter, John S.; and Moore, Robert L., to Systron-Donner Corp. Clamp assembly and fabrication thereof. 4,234,999, Cl. 24-81.00G.

Wisotsky, Max J., to Exxon Research & Engineering Co. Process for producing oil-soluble derivatives of unsaturated C_4-C_{10} dicarboxylic acid materials. 4,235,786, Cl. 260-346.740.

Wissner, Allan, to American Cyanamid Company. Silyl vinyl esters. 4,235,797, Cl. 556-443.000.

Wissner, Allan: *See—*
Grudzinskas, Charles V.; Wissner, Allan; and Chen, Sow-Mei L., 4,235,924, Cl. 424-278.000.

Wiswall, Charles E.: *See—*
Richardson, Ralph J.; Wiswall, Charles E.; and Rasmussen, Richard L., 4,236,123, Cl. 331-94.50G.

Wodka, Michael A.: *See—*
Propst, Robert L.; and Wodka, Michael A., 4,235,495, Cl. 339-22.00R.

Wohleber, David A.; Edd, Jon F.; and Hennrich, Ronald L., to Aluminum Company of America. Chlorination of aluminous material at superatmospheric pressure. 4,235,860, Cl. 423-495.000.

Wolf, Franz-Josef. Elastic seating element for a cutoff device. 4,235,257, Cl. 137-242.000.

Wolf, Peter: *See—*
Kibler, Robert L.; and Wolf, Peter, 4,235,310, Cl. 188-71.500.

Woltermann, Gerald M.: *See—*
Brown, Stanley M.; and Woltermann, Gerald M., 4,235,753, Cl. 252-455.00Z.

Woodfine, Clive F. Photographic camera system and a focal plane photographic camera shutter system. 4,235,546, Cl. 354-244.000.

Woods, Murray H., to RCA Corporation. Stepped oxide, high voltage MOS transistor with near intrinsic channel regions of different doping levels. 4,236,167, Cl. 357-23.000.

Woods, William E.: *See—*
Terakawa, Kiyoshi H.; and Woods, William E., 4,236,210, Cl. 364-200.000.

Wooster Brush Company, The: *See—*
Davis, Howard C.; and Cooper, Donald L., 4,235,377, Cl. 239-215.000.

Wright Line Inc.: *See—*
Olmstead, Charles H.; and Simone, James V., 4,236,066, Cl. 235-51.000.

Wright, Robert G.: *See—*
Olney, Wallace E.; and Wright, Robert G., 4,235,160, Cl. 493-63.000.

Xerox Corporation: *See—*
Case, Raymond D., 4,235,550, Cl. 355-14.00R.
Levinson, Leo, 4,235,360, Cl. 226-76.000.

Yahnke, Robert L.: *See—*
Steigelmann, Edward F.; Yahnke, Robert L.; Couper, Alistair S.; and Deepak, Chand, 4,235,983, Cl. 526-68.000.

Yamada, Michihiro, to Silver Seiko Limited. Keyboard signal storage mechanism. 4,235,554, Cl. 400-52.000.

Yamada, Seiji; and Beppu, Norio, to Minolta Camera Kabushiki Kaisha. Data imprinting lamp control circuit. 4,235,544, Cl. 354-106.000.

Yamada, Tsuneo: *See—*
Kominami, Yasuo; Ienaka, Masanori; Wada, Takeshi; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,236,252, Cl. 455-207.000.

Yamada, Yasuharu: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Hanji, Katsumi; Sasaki, Toshio; Okawa, Masahisa; Matsuura, Hideaki; and Yamada, Yasuharu, 4,235,984, Cl. 526-127.000.

Yamada, Yujiro: *See—*
Itoh, Jiro; Miyadoh, Shinji; Itoh, Mitsugu; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,235,883, Cl. 424-122.000.

Yamaga, Eiichi: *See—*
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,235,142, Cl. 84-1.030.

Yamaguchi, Noboru: *See—*
Shibata, Ituo; Yamaguchi, Noboru; and Shibata, Shuichi, 4,236,181, Cl. 358-106.000.

Yamaha Motor Corporation: *See—*
Lake, Leo C., Jr., 4,235,263, Cl. 141-1.000.

Yamaji, Kenkichi; Dietrich, Oelhschlagel; Abe, Hajime; and Tamura, Koichi, to Hitachi Cable, Ltd. Method of production of a wire-shaped composite addition material. 4,235,007, Cl. 291-420.000.

Yamamoto, Hisao: *See—*
Sasajima, Kikuo; Ono, Keiichi; and Yamamoto, Hisao, 4,235,914, Cl. 424-267.000.

Yamamoto, Shigeo: *See—*
Kirino, Osamu; Kato, Toshiro; and Yamamoto, Shigeo, 4,235,925, Cl. 424-282.000.

Yamamoto, Toshio: *See—*
Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitsu, 4,235,548, Cl. 355-3.00R.

Yamanaka, Hideo. Artificial corpus cavernosum device. 4,235,227, Cl 128-79.000.

Yamane, Toshihiro: *See—*
Yoshii, Toshiya; Yamane, Toshihiro; and Saito, Yasuo, 4,235,365, Cl. 229-55.000.

Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, to Brother Kogyo Kabushiki Kaisha. Stitch pattern generating system for a sewing machine. 4,235,176, Cl. 112-158.00D.

Yamazaki, Osamu: *See—*
Ono, Shusuke; Mitsuyu, Tsuneo; Yamazaki, Osamu; and Wasa, Kiyotaka, 4,236,095, Cl. 310-313.00A.

Yamazaki, Yasuhiro: *See—*
Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,236,248, Cl. 375-53.000.

Yano, Kohzo; Kuwagaki, Hiroshi; Hamada, Hiroshi; and Takechi, Sadatoshi, to Sharp Kabushiki Kaisha. Ceramics for electrochromic display. 4,235,528, Cl. 350-357.000.

Yardney Electric Corporation: *See—*
Berchielli, Aldo S.; and Chireau, Roland F., 4,235,748, Cl. 252-430.000.

Yarwood, Peter H.; Czajkowski, Arthur J.; and Bunk, Edward R. Solar heat collector block. 4,235,224, Cl. 126-438.000.

Yashin, Michael A.; and Rebelo, Lucilio A., to Texas Instruments Incorporated. Self-regulating electric heater. 4,236,065, Cl. 219-544.000.

Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, to Nippon Soken, Inc. Gas detection apparatus. 4,235,096, Cl. 73-23.000.

Yasuda, Eturo: *See—*
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,236,138, Cl. 338-34.000.

Yavis, Harry. Saber saw attachment. 4,235,017, Cl. 30-377.000.

Yeda Research & Development Co., Ltd.: *See—*
Nudelman, Abraham; and Patchornik, Abraham, 4,236,002, Cl. 544-28.000.

Yokai, Masayuki: *See—*
Sano, Toshio; Takahashi, Masaharu; and Yokai, Masayuki, 4,235,647, Cl. 148-9.00R.

Yokoyama, Hisayoshi: *See—*
Nakamura, Masayuki; and Yokoyama, Hisayoshi, 4,235,721, Cl 210-227.000.

Yonechi, Shinichi, to Sumitomo Electric Industries, Ltd. Optical fiber cable constructions and methods and apparatus for fabricating same. 4,235,511, Cl. 350-96.230.

Yonezawa, Seiji: *See—*
Kataoka, Keiji; and Yonezawa, Seiji, 4,235,507, Cl. 350-19.000.

Yorde, Donald E.: *See—*
Sasse, Edward A.; and Yorde, Donald E., 4,235,960, Cl. 435-7.000.

York-Shipley, Inc.: *See—*
Richard, Kenneth L., 4,235,610, Cl. 55-302.000.

Yoshida Kogyo K.K.: *See—*
Yunoki, Akio, 4,235,584, Cl. 425-545.000.

Yoshida, Masaru, to Citizen Watch Company Limited. Watch module construction. 4,236,240, Cl. 368-76.000.
Yoshida, Noriyuki: *See*—
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,235,176, Cl. 112-158.00D.
Yoshii, Shinichi: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Yoshii, Shinichi, 4,235,843, Cl. 422-119.000.
Yoshii, Toshiya; Yamane, Toshihiro; and Saito, Yasuo, to Toray Industries, Inc. Three-layered polypropylene films. 4,235,365, Cl. 229-55.000.
Yoshinaga, Yasukazu: *See*—
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,236,182, Cl. 358-193.100.
Yoshino, Masahiro, to Ricoh Company, Ltd. Liquid development apparatus. 4,235,195, Cl. 118-662.000.
Yoshizumi, Tomoki: *See*—
Ikuno, Eiichiro; and Yoshizumi, Tomoki, 4,235,359, Cl. 228-29.000.
Yosida, Sizuo, to Tokyo Shibaura Electric Company Limited. Enclosed switchboard. 4,236,189, Cl. 361-337.000.
Young, David H., to MTI Systems Corporation. Substrate separating machine and method. 4,235,357, Cl. 225-1.000.
Yue, David D., to Bunker Ramo Corporation. Pressurizer system for electric penetration assemblies. 4,235,674, Cl. 176-87.000.
Yunoki, Akio, to Yoshida Kogyo K.K. Hand-operated injection molding machine. 4,235,584, Cl. 425-545.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Walter, Wolfgang, 4,235,122, Cl. 74-424.80R.
Zajac, Jaroslav: *See*—
Schulz, Johann G. D.; and Zajac, Jaroslav, 4,235,728, Cl. 252-8.50C.
Zamzow, Rick A.: *See*—
Gray, Floyd L.; Adam, Jerome H.; Susami, Larry; and Zamzow, Rick A., 4,235,454, Cl. 280-766.000.
Zaner, Clifford: *See*—
Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., 4,235,332, Cl. 206-219.000.
Zann, Annie: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,235,736, Cl. 252-299.000.
Zausch, Wolfgang; and Heitmann, Uwe, to Hauni-Werke Korber & Co. KG. Apparatus for transporting portions of or entire smokers' products. 4,235,330, Cl. 198-480.000.
Zavolokina, Nina S.: *See*—
Selivanov, Anatoly G.; Gromeiko, Grigory N.; Kirillov, Leonty N.; Zavolokina, Nina S.; Vlaschenko, Maria G.; Chicheva, Serafima A.; and Zhivetin, Valery V., 4,235,260, Cl. 139-98.000.
Zbikowski, Ted: *See*—
Garrett, Wayne H.; and Zbikowski, Ted, 4,235,312, Cl. 188-72.700.
Zehner, Lee R.: *See*—
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,236,023, Cl. 560-207.000.
Zeidler, Ulrich; and Scheuermann, Fanny, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Esters of 1,2-dihydroxyalkanes as cosmetic emulsifiers and cosmetic emulsions containing them. 4,236,022, Cl. 560-198.000.
Zeiler, Hans-Joachim: *See*—
Stadler, Peter; Metzger, Karl-Georg; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, 4,235,888, Cl. 424-180.000.
Zemke, Kenneth M.: *See*—
Simancik, Carl D.; and Zemke, Kenneth M., 4,235,123, Cl. 74-475.000.
Zenith Radio Corporation: *See*—
Palac, Kazimir; and Stachniak, Raymond M., 4,236,184, Cl. 358-245.000.
Zenkner, Kurt, to Voith Getriebe KG. Fan rotor with tensioning means. 4,235,568, Cl. 416-187.000.
Zenner, Armin: *See*—
Scholl, Hans-Joachim; and Zenner, Armin, 4,236,016, Cl. 560-24.000.
Zentralschweizerischer Milchverbrand: *See*—
Egli, Franz; and Egli, Franz, 4,235,934, Cl. 426-43.000.
Zhivetin, Valery V.: *See*—
Selivanov, Anatoly G.; Gromeiko, Grigory N.; Kirillov, Leonty N.; Zavolokina, Nina S.; Vlaschenko, Maria G.; Chicheva, Serafima A.; and Zhivetin, Valery V., 4,235,260, Cl. 139-98.000.
Zic, Richard: *See*—
Belopavlovich, Peter; Michaels, Leonard H.; and Zic, Richard, 4,235,500, Cl. 339-176.0MF.
Zickendraht, Christian: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,236,007, Cl. 544-328.000.
Zimmerman, Dennis M.; and Robey, Roger L., to Eli Lilly and Company. Method of preparing 4A-arylhexahydro-1H-2-pyrindines and 4A-aryloctahydroisoquinolines. 4,236,009, Cl. 546-112.000.
Zimmerman, Franz X., to Autoclave Engineers, Inc. Double chambered high pressure furnace. 4,235,841, Cl. 422-112.000.
Zimmerman, Franz X.: *See*—
Smith, Charles W., Jr.; and Zimmerman, Franz X., 4,235,592, Cl. 432-205.000.
Zimmerman, Robert L.: *See*—
Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., 4,235,811, Cl. 260-513.00N.
Zissimopoulos, Nicholas, to Baxter Travenol Laboratories, Inc. Electromagnetic switch means for a flow control device and the like having reduced shock levels. 4,236,132, Cl. 335-271.000.
Zoecon Corporation: *See*—
Henrick, Clive A., 4,235,777, Cl. 260-326.430.
Zurfluh, Rene: *See*—
Dorn, Silvia; Pfiffner, Albert; and Zurfluh, Rene, 4,235,932, Cl. 424-339.000.
Zweifel, Walter: *See*—
Schneeberger, Fritz; Zweifel, Walter; and Weber, Hermann, 4,235,682, Cl. 204-35.00N.
Zyglewyz, Steve W., to Dresser Industries, Inc. Earth boring bit with renewable bearing surface. 4,235,295, Cl. 175-371.000.
Zygraich, Nathan: *See*—
Gits, Jacqueline; and Zygraich, Nathan, 4,235,876, Cl. 424-89.000.
3U Partners: *See*—
Underwood, Gene E., 4,235,552, Cl. 366-137.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF NOVEMBER, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Preus, Paul. Inflatable barrier for substances floating on water. Re. 30,438, Cl. 405-68.000.
Sokolowski, James H., to Upjohn Company, The. Treatment of genital tract diseases of domestic animals with prostaglandins. Re. 30,439, Cl. 424-181.000.
Upjohn Company, The: *See*—
Sokolowski, James H., Re. 30,439, Cl. 424-181.000.

LIST OF DESIGN PATENTEES

AMF Incorporated: *See*—
Hall, Harleston J., Jr.; Witte, Paul A.; and Johnson, Thomas, 257,563, Cl. D21-212.000.
Aoba Shigyo Company, Limited: *See*—
Ikushima, Yoshitaka; and Ozawa, Isao, 257,555, Cl. D9-425.000.
Arima, Juichi, to U.S. Industries, Inc. Boat. 257,558, 11-25-80, Cl. D12-62.000.
Atari, Inc.: *See*—
Jang, Michael L., 257,560, Cl. D14-40.000.
Chapman, David, to Gerber Products Company. Combined bottle warmer and measuring spoon. 257,549, 11-25-80, Cl. D7-69.000.
Christie, Cornelius W., to SCM Corporation. Typewriter. 257,561, 11-25-80, Cl. D18-1.000.
Disposable Plastics Corporation: *See*—
Peacock, Billy H., 257,567, Cl. D24-55.000.
Enco Die Casting Co.: *See*—
Nadle, Edward A., 257,551, Cl. D8-10.000.
Fiberdome Incorporated: *See*—
Wollin, Roger W., 257,570, Cl. D25-18.000.
Fletcher, Robert, to Paramount Pictures Corporation. Costume. 257,546, 11-25-80, Cl. D2-30.000.
Fulton, Jerrell F. Ruler. 257,556, 11-25-80, Cl. D10-71.000.
Gerber Products Company: *See*—
Chapman, David, 257,549, Cl. D7-69.000.
Haft, Nathan A. Anchor line adjuster and the like. 257,554, 11-25-80, Cl. D8-396.000.
Hall, Harleston J., Jr.; Witte, Paul A.; and Johnson, Thomas, to AMF Incorporated. Racquetball racket. 257,563, 11-25-80, Cl. D21-212.000.
Hashimoto, Keiichi. Portable electric-plating gun. 257,553, 11-25-80, Cl. D8-30.000.
Holcroft, William J., to Rubbermaid Applied Products, Inc. Lid for a refuse container. 257,550, 11-25-80, Cl. D7-194.000.
Ikushima, Yoshitaka; and Ozawa, Isao, to Aoba Shigyo Company, Limited; and Mizuno Shigyo Company, Limited. Packaging container. 257,555, 11-25-80, Cl. D9-425.000.
Jang, Michael L., to Atari, Inc. Hand held communication aid for the mute and hearing impaired. 257,560, 11-25-80, Cl. D14-40.000.
Johnson, Thomas: *See*—
Hall, Harleston J., Jr.; Witte, Paul A.; and Johnson, Thomas, 257,563, Cl. D21-212.000.
Kottmeier, Anthony M.: *See*—
Kottmeier, Kent L.; and Kottmeier, Anthony M., 257,566, Cl. D23-19.000.
Kottmeier, Kent L.; and Kottmeier, Anthony M. Liquid level control valve. 257,566, 11-25-80, Cl. D23-19.000.
Mizuno Shigyo Company, Limited: *See*—
Ikushima, Yoshitaka; and Ozawa, Isao, 257,555, Cl. D9-425.000.
Myles, Sam A., to Triplex Manufacturing Co. Fuse holder. 257,559, 11-25-80, Cl. D13-35.000.
Nadle, Edward A., to Enco Die Casting Co. Transplant trowel. 257,551, 11-25-80, Cl. D8-10.000.
Omark Industries, Inc.: *See*—
Rex, Albert E., 257,557, Cl. D12-51.000.
Ozawa, Isao: *See*—
Ikushima, Yoshitaka; and Ozawa, Isao, 257,555, Cl. D9-425.000.
Paramount Pictures Corporation: *See*—
Fletcher, Robert, 257,546, Cl. D2-30.000.
Peacock, Billy H., to Disposable Plastics Corporation. Plunger operated pipette. 257,567, 11-25-80, Cl. D24-55.000.
Peters-Revington Corporation: *See*—
Ungaro, Nicholas A., 257,548, Cl. D6-177.000.
Ream, Vincent B. Novelty display lamp. 257,568, 11-25-80, Cl. D26-26.000.
Rex, Albert E., to Omark Industries, Inc. Rail fastening clip. 257,557, 11-25-80, Cl. D12-51.000.
Rodgers, Roddy: *See*—
Smith, Ernest H.; and Rodgers, Roddy, 257,547, Cl. D2-427.000.
Rubbermaid Applied Products, Inc.: *See*—
Holcroft, William J., 257,550, Cl. D7-194.000.
SCM Corporation: *See*—
Christie, Cornelius W., 257,561, Cl. D18-1.000.
Serrecchia, Anthony P. Bicycle accessory light fixture. 257,569, 11-25-80, Cl. D26-36.000.
Slaughterbeck, Robert L. Fishing line holder. 257,565, 11-25-80, Cl. D22-99.000.
Smith, Drew R. Identification label. 257,562, 11-25-80, Cl. D20-27.000.
Smith, Ernest H.; and Rodgers, Roddy. Belt buckle or similar article. 257,547, 11-25-80, Cl. D2-427.000.
Sobol, Haskell. Carton scoring device. 257,552, 11-25-80, Cl. D8-14.000.
Triplex Manufacturing Co.: *See*—
Myles, Sam A., 257,559, Cl. D13-35.000.
Ungaro, Nicholas A., to Peters-Revington Corporation. Table. 257,548, 11-25-80, Cl. D6-177.000.
U.S. Industries, Inc.: *See*—
Arima, Juichi, 257,558, Cl. D12-62.000.
Weast, Gerald T. Mount for telescopic sight. 257,564, 11-25-80, Cl. D22-7.000.
Witte, Paul A.: *See*—
Hall, Harleston J., Jr.; Witte, Paul A.; and Johnson, Thomas, 257,563, Cl. D21-212.000.
Wollin, Roger W., to Fiberdome Incorporated. Hutch. 257,570, 11-25-80, Cl. D25-18.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 25, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3

1.9 4,234,972

CLASS 4

235 4,234,974
300 4,234,975
500 4,234,973

CLASS 5

18 R 4,234,976
110 4,234,977
111 4,234,978
133 4,234,979
411 4,234,981
455 4,234,982
477 4,234,983
4,234,984

CLASS 6

10 4,234,985
12 R 4,234,986

CLASS 7

139 4,234,987
151 4,234,988

CLASS 8

108 R 4,235,599
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456 4,235,596
526 4,235,597
584 4,235,598

CLASS 9

7 4,234,989
310 A 4,234,990

CLASS 10

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CLASS 15

3.11 4,234,992
104.06 A 4,234,993
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302 4,234,980
322 4,234,995

CLASS 16

52 4,234,996

CLASS 17

4,234,997

CLASS 23

230 R 4,235,601
293 R 4,235,602

CLASS 24

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81 G 4,234,999

CLASS 28

290 4,235,000

CLASS 29

25.14 4,235,001
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281.1 4,235,005
407 4,235,006
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570 4,235,009
571 4,235,010
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611 4,235,012
727 4,235,013
760 4,235,014
857 4,235,015

CLASS 30

233 4,235,016
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CLASS 33

169 F 4,235,018
174 TA 4,235,019
178 F 4,235,020
307 4,235,021
474 4,235,022

CLASS 34

31 4,235,023
57 A 4,235,024

CLASS 35

17 4,235,025

CLASS 36

32 R 4,235,026
44 4,235,027
80 4,235,028

CLASS 37

104 4,235,029

CLASS 40

156 4,235,030
360 4,235,031
539 4,235,032
586 4,235,033
607 4,235,034

CLASS 43

15 4,235,035
17 4,235,036
44.91 4,235,037
82 4,235,038

CLASS 44

10 R 4,235,603

CLASS 46

12 4,235,039
79 4,235,040
115 4,235,041
154 4,235,042

CLASS 47

1.4 4,235,043

CLASS 48

197 R 4,235,044
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202 4,235,605

CLASS 49

41 4,235,045
352 4,235,046
371 4,235,047
390 4,235,048
488 4,235,049

CLASS 51

34 D 4,235,050
316 4,235,051
358 4,235,052

CLASS 52

127 4,235,053
210 4,235,054
230 4,235,055
397 4,235,056
404 4,235,057
408 4,235,058
721 4,235,059
743 4,235,060

CLASS 53

54 4,235,061
399 4,235,062
436 4,235,063
451 4,235,064
472 4,235,065
500 4,235,066
502 4,235,067

CLASS 55

17 4,235,606
68 4,235,607
181 4,235,608
226 4,235,609
302 4,235,610
309 4,235,611
403 4,235,612

CLASS 56

12.7 4,235,068
13.6 4,235,069

CLASS 57

71 4,235,070
280 4,235,071

CLASS 59

11 4,235,073
93 4,235,074

CLASS 60

527 4,235,075
602 4,235,076
618 4,235,077

CLASS 62

6 4,235,078
17 4,235,613
87 4,235,079
4,235,080
93 4,235,081

CLASS 64

28 R 4,235,082

CLASS 65

2 4,235,614
3 A 4,235,616
3 C 4,235,615
18 4,235,617
21 4,235,618

CLASS 66

213 4,235,083
232 4,235,084

CLASS 68

12 R 4,235,085

CLASS 70

364 A 4,235,086
395 4,235,087

CLASS 71

66 4,235,619
92 4,235,620
94 4,235,621
113 4,235,622

CLASS 72

148 4,235,384
453.18 4,235,088
472 4,235,089
479 4,235,090

CLASS 73

7 4,235,091
9 4,235,092
4,235,093
11 4,235,094
19 4,235,095
23 4,235,096
4,235,097
28 4,235,098
32 A 4,235,099
49.7 4,235,100
116 4,235,101
143 4,235,102
168 4,235,103
180 4,235,104
304 C 4,235,106
355 EM 4,235,107
356 4,235,108
368.3 4,235,109
579 4,235,110
626 4,235,111
634 4,235,112
655 4,235,113
805 4,235,114
861.53 4,235,105

CLASS 74

2 4,235,115
60 4,235,116
89.2 4,235,117
217 B 4,235,118
424.8 R 4,235,122
475 4,235,123
573 R 4,235,124
674 4,235,125
688 4,235,126
796 4,235,127
798 4,235,128
805 4,235,129
831 4,235,130

CLASS 75

11 4,235,623
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93 E 4,235,627
93 R 4,235,626
148 4,235,628
211 4,235,629
244 4,235,630
251 4,235,631
257 4,235,632

CLASS 76

25 A 4,235,131

CLASS 81

3.44 4,235,132
58 4,235,133
91 C 4,235,134
438 4,235,269

CLASS 82

2 R 4,235,135
57 4,235,136
73 4,235,137

CLASS 83

139 4,235,138
278 4,235,139
794 4,235,140

CLASS 84

1.01 4,235,141
1.03 4,235,142
1.16 4,235,143
4,235,144
293 4,235,145
422 R 4,235,146

CLASS 85

9 R 4,235,147
13 4,235,148
47 4,235,149
84 4,235,150
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CLASS 89

14 C 4,235,152

CLASS 91

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39 4,235,154
361 4,235,155
363 R 4,235,156

CLASS 92

140 4,235,157

CLASS 98

19 4,235,162
50 4,235,163

CLASS 100

53 4,235,164
4,235,165
158 R 4,235,166

CLASS 101

93.09 4,235,167

CLASS 105

215 C 4,235,168
251 4,235,169
402 4,235,170

CLASS 106

35 4,235,633
39.5 4,235,635
52 4,235,634
66 4,235,636
213 4,235,637
287.12 4,235,638
298 4,235,639
308 M 4,235,641
308 Q 4,235,640

CLASS 110

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281 4,235,172
336 4,235,173
346 4,235,174

CLASS 112

79 R 4,235,175
158 D 4,235,176
169 4,235,177
229 4,235,178
286 4,235,179
323 4,235,180

CLASS 114

211 4,235,181

CLASS 116

34 R 4,235,184
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CLASS 118

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415 4,235,191
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658 4,235,193
662 4,235,195

CLASS 119

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28 4,235,197
48 4,235,199
51 R 4,235,198
51.11 4,235,200

CLASS 122

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CLASS 123

73 V 4,235,206
146.5 A 4,235,213
169 V 4,235,214
179 E 4,235,216
179 H 4,235,215
232 4,235,217
275 4,235,203
276 4,235,202
365 4,235,212
440 4,235,204
471 4,235,210
472 4,235,205
511 4,235,211
568 4,235,207
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CLASS 125

11 CD 4,235,218

CLASS 126

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299 D 4,235,220
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CLASS 128

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214 D 4,235,233
214 R 4,235,231
214.4 4,235,232
216 4,235,234
218 P 4,235,235
260 4,235,236
284 4,235,237
334 R 4,235,238
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639 4,235,241
695 4,235,242
740 4,235,243
749 4,235,244
756 4,235,245
785 4,235,246

CLASS 131

17 R 4,235,247
21 A 4,235,248
137 4,235,249
140 B 4,235,251
140 P 4,235,250
193 4,235,252

CLASS 132

92 R 4,235,253

CLASS 134

58 D 4,235,642

CLASS 136

246 4,235,643
256 4,235,644

CLASS 137

119 4,235,254
224 4,235,255
240 4,235,256
242 4,235,257
556 4,235,258

CLASS 138

97 4,235,259

CLASS 139

98 4,235,260
448 4,235,261
452 4,235,262

CLASS 141

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85 4,235,265
285 4,235,266
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CLASS 144

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CLASS 148

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2 4,235,646
6.27 4,235,648
9 R 4,235,647
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213 R 4,235,272
330 RF 4,235,273
354 R 4,235,274
410 4,235,275

CLASS 156

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99 4,235,654
157 4,235,655
175 4,235,656
234 4,235,657
244.12 4,235,658
510 4,235,659
516 4,235,660
542 4,235,661
612 4,235,662
624 4,235,663
645 4,235,664

CLASS 162

23 4,235,665
72 4,235,666
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CLASS 164

4 4,235,276
36 4,235,277
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444 4,235,280

CLASS 165

1 4,235,281
61 4,235,282
80 B 4,235,285
80 C 4,235,283
141 4,235,284
164 4,235,286
170 4,235,287

CLASS 166

64 4,235,288
267 4,235,289
273 4,235,290
292 4,235,291

CLASS 168

4 4,235,292

CLASS 171

17 4,235,293

CLASS 172

48 4,235,294

CLASS 173

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CLASS 174

50.61 4,236,045
72 B 4,236,038
4,236,046
77 R 4,236,047

CLASS 175

371 4,235,295

CLASS 176

3 4,235,668
18 4,235,669
19 R 4,235,670
38 4,235,671
65 4,235,672
82 4,235,673
87 4,235,674

CLASS 177

204 4,235,296

CLASS 179

1 GN 4,236,041
1 GQ 4,236,039
1 GS 4,236,042
1 MN 4,236,040
1.5 H 4,236,043
6 E 4,236,044
81 A 4,236,048
99 R 4,236,049
100.1 G 4,236,050
111 E 4,236,051

CLASS 180

6.48 4,235,297
54 A 4,235,298
254 4,235,300
328 4,235,299

CLASS 181

148 4,235,301
172 4,235,302
214 4,235,303
265 4,235,304

CLASS 182

82 4,235,305
100 4,235,306

CLASS 184

6.12 4,235,307

CLASS 187

9 R 4,235,308
29 R 4,235,309

CLASS 188

71.5 4,235,310
71.7 4,235,311
72.7 4,235,312
73.3 4,235,313
73.5 4,235,314
73.6 4,235,315
181 R 4,235,316
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CLASS 191

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CLASS 192

4 B 4,235,320
6 R 4,235,318
8 R 4,235,319
56 R 4,235,321
58 B 4,235,322
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131 H 4,235,324

CLASS 196

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CLASS 198

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CLASS 200

51.09 4,236,052
144 R 4,236,053
145 4,236,054

CLASS 201

2.5 4,235,675

CLASS 202

118 4,235,676
176 4,235,677
185 R 4,235,678
234 4,235,679

CLASS 203

2 4,235,680

CLASS 204

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35 N 4,235,682
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158 HA 4,235,685
159.19 4,235,686
195 F 4,235,688
195 M 4,235,687
195 R 4,235,689
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212 4,235,691
228 4,235,692
229 4,235,693
266 4,235,694
268 4,235,695
281 4,235,696
290 F 4,235,697
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CLASS 206

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233 4,235,333
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443 4,235,338
444 4,235,339
515 4,235,340
601 4,235,341

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8 LE 4,235,699
54 4,235,700
57 4,235,701
87 4,235,702
89 4,235,703
113 4,235,704
139 4,235,705
347 4,235,706

CLASS 209

3 4,235,707
3.3 4,235,708
5 4,235,709
213 4,235,710
564 4,235,342

CLASS 210

31 C 4,235,716
191 4,235,718
195.1 4,235,719
220 4,235,720
227 4,235,721
247 4,235,722
321 R 4,235,723
323 R 4,235,724
516 4,235,725
523 4,235,726
638 4,235,713
654 4,235,714
670 4,235,715
685 4,235,717
708 4,235,712
748 4,235,711

CLASS 215

6 4,235,343
250 4,235,344

CLASS 219

10.55 A 4,236,056
10.55 B 4,236,055
69 C 4,236,057
121 EA 4,236,058
121 P 4,236,059
125.1 4,236,060
265 4,236,061
384 4,236,062
400 4,236,063
497 4,236,064
544 4,236,065

CLASS 220

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7 4,235,346
89 A 4,235,347
90.4 4,235,348
281 4,235,349
404 4,235,350

CLASS 221

92 4,235,351

CLASS 222

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368 4,235,354

CLASS 224

45 P 4,235,355
192 4,235,356

CLASS 225

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CLASS 226

22 4,235,358
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181 4,235,362

CLASS 228

29 4,235,359
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CLASS 229

34 R 4,235,364
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CLASS 233

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CLASS 235

51 4,236,066
92 PB 4,236,067
380 4,236,068

CLASS 236

94 4,235,368

CLASS 237

2 B 4,235,369

CLASS 238

10 R 4,235,370
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CLASS 239

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CLASS 246

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CLASS 248

74 PB 4,235,404
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538 4,235,409
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CLASS 249

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CLASS 250

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231 SE 4,236,070
253 4,236,071
277 CH 4,236,072
306 4,236,073
308 4,236,074
343 4,236,075
347 4,236,076
361 R 4,236,077
363 R 4,236,078
445 T 4,236,079
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299 4,235,736
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301.1 W 4,235,737
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301.22 4,235,741
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382 4,235,743
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429 B 4,235,745
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429 C 4,235,746
430 4,235,748
443 4,235,749
446 4,235,750
450 4,235,751
455 Z 4,235,753
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462 4,235,755
463 4,235,756
476 4,235,757
544 4,235,758
545 4,235,759
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CLASS 260

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28.5 B 4,235,760
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29.4 R 4,235,763
29.6 NR 4,235,764
30.8 R 4,235,765
33.4 UR 4,235,766
37 EP 4,235,767
40 R 4,235,768
45.75 R 4,235,770
45.8 NT 4,235,769
112.5 R 4,235,771
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239.1 4,235,774
243.3 4,235,775
326.1 4,235,776
326.43 4,235,777
326.45 4,235,778
343.3 P 4,235,779
343.44 4,235,781
343.5 4,235,780
345.2 4,235,782
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345.8 R 4,235,784
345.9 R 4,235,785
346.22 4,235,788
346.3 4,235,787
346.74 4,235,786
380 4,235,789
396 R 4,235,790
397.2 4,235,791
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4,235,793
413 4,235,794
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428.5 4,235,796
449 R 4,235,798
449.5 4,235,799
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449.6 R 4,235,801
453 RW 4,235,802
456 R 4,235,803
458 F 4,235,804
464 4,235,805
465 D 4,235,806
465 G 4,235,807
465.8 R 4,235,808
502.5 4,235,809
505 A 4,235,810
513 N 4,235,811
513.7 4,235,812
543 R 4,235,813
544 C 4,235,814
4,235,815
565 4,235,819
951 4,235,826

CLASS 261

67 4,235,827
78 R 4,235,828
121 R 4,235,829

CLASS 264

29.7 4,235,830
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230 4,235,832
255 4,235,833
290.2 4,235,834
328.2 4,235,835
333 4,235,836
520 4,235,837

CLASS 266

50 4,235,422
99 4,235,423
120 4,235,424
147 4,235,425

CLASS 267

8 R 4,235,426
153 4,235,427

CLASS 269

53 4,235,428
71 4,235,429

CLASS 270

52 4,235,430

CLASS 271

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11 4,235,432
162 4,235,433
280 4,235,434
292 4,235,435

CLASS 272

73 4,235,436
132 4,235,439
134 4,235,437

CLASS 273

127 D 4,235,438
183 A 4,235,440
213 4,235,441
237 4,235,442
277 4,235,443
403 4,235,444

CLASS 277

30 4,235,445
135 4,235,446
138 4,235,447

CLASS 280

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47.32 4,235,450
408 4,235,451
615 4,235,452
743 4,235,453
766 4,235,454
803 4,235,455
804 4,235,456

CLASS 281

42 4,235,457

CLASS 282

27.5 4,235,458

CLASS 283

7 4,235,459

CLASS 285

229 4,235,460
340 4,235,461

CLASS 290

55 4,236,083

CLASS 291

420 4,235,007

CLASS 292

216 4,235,462
218 4,235,463
288 4,235,464
346 4,235,465

CLASS 293

128 4,235,466
135 4,235,467

CLASS 294

87.2 4,235,468
96 4,235,469

CLASS 296

190 4,235,470

CLASS 297

361 4,235,471
392 4,235,472
440 4,235,473
465 4,235,474

CLASS 299

43 4,235,475

CLASS 301

108 R 4,235,476

CLASS 303

22 R 4,235,477
23 R 4,235,478

CLASS 305

12 4,235,479

CLASS 307

39 4,236,084
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149 4,236,086
200 A 4,236,087
240 4,236,088
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268 4,236,090

CLASS 308

8.2 4,235,480
23 4,235,481
23.5 4,235,488
26 4,235,482
4,235,483
122 4,235,484
187.1 4,235,485
189 R 4,235,486
217 4,235,487
236 4,235,489

CLASS 310

64 4,236,091
68 C 4,236,092
155 4,236,093
168 4,236,094
313 A 4,236,095

CLASS 312

15 4,235,490
223 4,235,491
242 4,235,492
257 R 4,235,493
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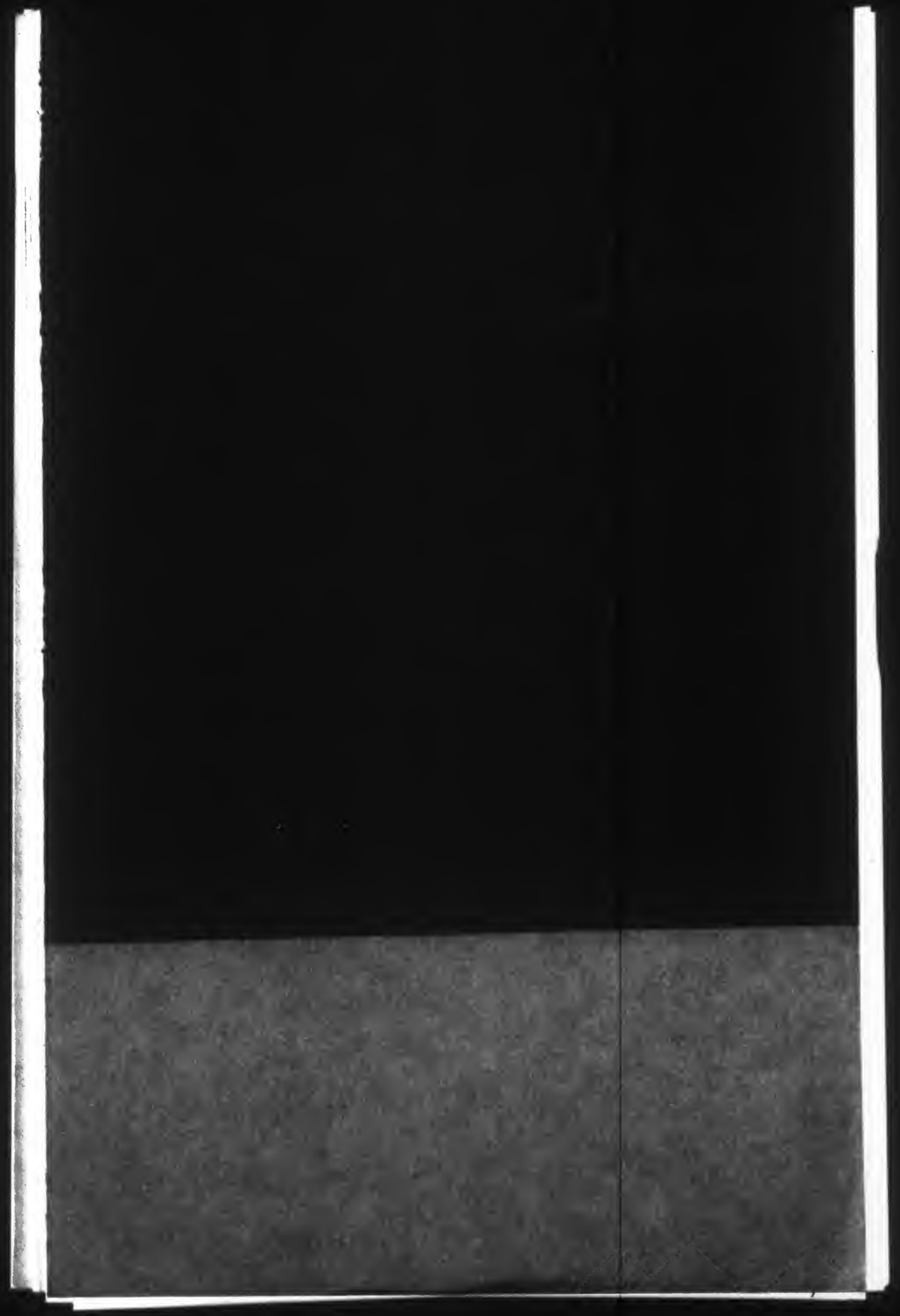
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